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The Indian Ocean Turtle Newsletter was initiated to provide a forum for exchange of information on sea turtle biology and conservation, management and education and awareness activities in the Indian subcontinent, Indian Ocean region, and South/Southeast Asia. The newsletter also intends to cover related aspects such as coastal zone management fisheries and marine biology.

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Kartik Shanker

Ashoka Trust for Research in Ecology and the Environment (ATREE)

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Editorial
Surmounting the people vs. parks conundrum - conservation lessons from marine resource management in India

Kartik Shanker and Aarthi Sridhar

*Ashoka Trust for Research in Ecology and the Environment (ATREE)
659, 5th A Main Road, Hebbal, Bangalore 560024. Karnataka. India.
Email: kartik@atree.org and aarthi@atree.org*

The atmosphere in India is charged once again over a recurring controversy which pits forest people's rights against wildlife conservation. Over the last few months, 'human rights groups' and 'wildlife lovers' have argued about whether tribal land rights promised under the Scheduled Tribes (Recognition of Forest Rights) Bill, 2005 will result in support for India's deteriorating wildlife habitats or destroy any chances for its survival. Like its colonial predecessor, the Government of India protects terrestrial species' habitats by declaring them as national parks and sanctuaries from which people are excluded entirely. The resulting conflicts persist unabated and unresolved. The rigidity of this exclusionist approach in terrestrial area management is in stark contrast to the flexible case-specific methods applied for the management of marine resources by government and non-government agencies. Marine ecosystems require management measures that are distinctly different from those currently practiced in terrestrial areas. In fact, there may be lessons for the conservation of terrestrial areas from marine management strategies.

Much more densely inhabited than most forests, the coasts are necessarily used by numerous fishing communities concurrently. Community-based systems of fisheries management include fishing gear restrictions or closed seasons in specific areas, or bans on particular forms of fishing such as night fishing or dynamite fishing. In the late 1970s, modern fishing methods threatened the livelihoods of these communities and coastal ecosystems: mechanised craft and gear, principally trawlers with bottom trawling methods severely impacted fishing stocks. By the early 1980s, many coastal states in India had responded by introducing legislation and formalized some of the existing management measures in the form of Marine Fisheries

(Regulation) Acts. For example, the Orissa Marine Fisheries (Regulation) Act (OMFRA), introduced in 1982, prohibits all trawlers from fishing within 5 kilometre (km) of the shore. Through this law, the state has also regulated the use of certain fishing gears and permits only certain fishing practices in areas of turtle congregation. These laws are not designed to exclude people from their marine environments. The fisheries departments and government institutes, such as the Central Marine Fisheries Research Institute, have systems in place for monitoring stocks of marine species (even if only variably reliable). It appears that these kinds of conservation measures also recognise that humans have historically 'used' or consumed marine species, including those now classified as 'endangered'. Therefore, fisheries management prescribes conservation options that allow for the presence of humans and human activity, but calls for modifications in the range, intensity and nature of these activities.

Unfortunately, the official style of managing terrestrial systems is being extended to the management of marine species and their habitats as well. Furthermore, the little data that exist on marine species and their habitats have not been able to inform appropriate management decisions. In reality, the official response to demands for marine management has been to create a conservation mechanism identical to the terrestrial style as seen in the five marine protected areas created in the country: Gahirmatha in Orissa, Gulf of Kutch in Gujarat, Gulf of Mannar in Tamil Nadu and two protected areas in the Andaman and Nicobar Islands. In response, fishing communities have objected to the complete ban on human presence in these areas. These conflicts manifest themselves in varying forms and to differing degrees depending on the intensity with which these bans

have been enforced. The example of Orissa is apt here. For the last few years, conservationists have been trying, in vain, to prevent olive ridley turtles from being trapped in trawl fishing nets. National and international efforts to introduce Turtle Excluder Devices and to keep trawlers out of the Gahirmatha Marine Sanctuary have failed, due to the strong resistance from the trawling community. Already there was considerable discontent among various fishing communities, since the 1997 declaration of the Gahirmatha Marine Sanctuary, which denied them all fishing rights within a delineated core zone. Conservationists now recognise that a more effective strategy would be to focus efforts on the protection of offshore congregation patches. They also recognise that within the congregation areas, certain forms of fishing might be benign. Unmindful of these facts, the Orissa Forest Department is planning to declare the other two known congregation areas – off the Devi rookery and the Rushikulya rookery as marine sanctuaries. This would impinge on the rights of even the non-mechanised sector rather than simply restricting harmful activities. Ironically, since most major turtle congregations occur within 5-6 km of the shore, merely enforcing the fishing regulations of the OMFRA, which bans all mechanised fishing within 5 km of the coast, would effectively help in conserving these turtle populations. In contrast to laws governing protected areas, the OMFRA also has the flexibility to formulate creative rules that are area, activity and time specific.

Marine conservation is widely believed to have lagged behind terrestrial conservation. However, it is possible that marine management rules are more

successful since they view the protection of the environment as the conservation of ‘resources’ that have human uses; this being perhaps a more appropriate and realistic approach within this particular context. Many believe that wildlife conservation can succeed if it is done through means that protect people’s livelihood rights rather than those of a single endangered species. For example, protecting the interests of the traditional fisherfolk through the implementation of the OMFRA would protect the turtle congregations, albeit inadvertently. Today, conservationists and fisherfolk have rallied under the banner of the Orissa



S. Barale

Marine Resources Conservation Consortium. This alliance is possible because the fisheries laws only exclude certain activities rather than people. Not only can this practical, context-specific model form the basis for marine conservation in future, it could also serve as a powerful tool in refining terrestrial conservation methods as well.

The challenges to marine management systems are not uncomplicated. Marine management

systems based on restricting activities work well only where fishing communities are an integral part of the monitoring and enforcing mechanisms. Rapid technological advancements in fisheries and a noticeable systemic breakdown within the fishing communities make conformity to rules difficult. It is seen that only where fishing communities are still socially organised (such as the Mogaveera fisher caste members in Karnataka) and where the levels of awareness and political representation is greater, have the communities been able to enforce some form of indigenous or official fishing regulations. Therefore, an important lesson is: people are central to conservation efforts.

Second successive year of the Marine Turtle Conservation Project in Konkan, Maharashtra

Vishwas Katdare and Ram Mone

Sahyadri Nisarga Mitra, Chiplun, District Ratnagiri, Maharashtra 415605. India.
Email: sahyadricpn@rediffmail.com

Of the five species of marine turtles occurring on the Indian coast, the olive ridley *Lepidochelys olivacea* is the most common on the Maharashtra coast. The present note is based on the current year's marine turtle conservation activities. The 'Marine Turtle Conservation Project' was initiated by Sahyadri Nisarga Mitra (SNM) on the coast of Maharashtra in 2002-03. Poaching of eggs and adults as well as incidental drowning in fishing nets are the main threats to turtles in this area. This year, SNM conducted conservation work and successfully completed this programme in four villages in the district of Ratnagiri, Maharashtra. In the breeding season of 2003-04, SNM coordinated conservation work on Velas beach and additionally undertook conservation work on three more beaches (i.e. Anjarla, Saldure and Murud) in the district of Ratnagiri. A hatchery was erected on each beach and a person appointed to look after it. Our team members and locals conducted daily patrols to locate nests. We arranged awareness programmes in these villages in the form of village meetings, lectures, and exhibitions. Our efforts also included distribution of handbills, stickers, and posters regarding turtle conservation. In the above four sites, the Marine Turtle Conservation Project protected a total of 3506 eggs from 35 olive ridley nests and 1687 hatchlings were released.

Velas - Last year, the topography of Velas beach changed and became a little narrower. We located our hatchery on a small dune of sand about 10 metres away from last year's hatchery location. At Velas, we protected a total of 3028 eggs from 30 nests, and released 1500 hatchlings.

Anjarla - Located 5 kilometres south of Velas, Anjarla is located near an estuary mouth and has a beach measuring 4 kilometres. This village is a well-known tourist location as there is an old Ganesh temple located there. This beach is broad and

adjacent to human habitation. Tourists regularly visit this beach. Local accounts state that turtles used to nest on this beach in healthy numbers 10 years ago, but as tourist activity increased there has been a decline in the number of nesting turtles. SNM decided to undertake a conservation and awareness campaign in Anjarla. A total of 4 nests were protected in Anjarla with 385 turtle eggs and 153 hatchlings were released.

Saldure - Saldure is 6 kilometres south of Anjarla, and has a 2 km beach which is connected to the next village beach of Harnai. At Saldure beach, from 15:00 hours to 23:00 hours there is continuous bullock cart traffic on the beach. This may affect nesting as no turtles were encountered on this beach.

Murud - Our fourth site was at Murud, some 8 kilometres south of Anjarla. Murud has a 2 km long beach which is quite broad. Beach resorts are present on these beaches and tourist activity persists until late in the night on the entire beach. Here also, locals have observed a decrease in nesting turtles in the last ten years. We found only one nest in the entire season. In total, 93 eggs were protected and 34 hatchlings were released.

Table 1: Month-wise nests, eggs, and hatchlings of olive ridley turtles

Month	No. of nests	No. of eggs	Hatchlings
Nov.03	1	133	N/A*
Dec.03	15	1454	N/A
Jan.04	13	1256	226
Feb.04	5	534	847
Mar.04	1	129	534
Apr.04	N/A	N/A	80
Total	35	3506	1687

* Information not available

This year, we found two dead adult olive ridley turtles on Murud beach, and one young green turtle

Chelonia mydas at Saldure. Another turtle was found caught in a torn fishing net near the beach at Murud and released by locals. At Velas, a nest was completely eaten by a jackal, and eight other nests were partly robbed by jackals. They even attempted to enter the hatchery by digging under the mesh. To prevent this, we buried the mesh deeper. We also encountered difficulties due to attacks by jackals at the other sites. At Anjarla, we protected 4 nests, yet 5 others were lost to jackals. At Kelshi, some 3 kilometres from Velas, two turtles were killed and partially eaten by striped hyenas. Last year at Velas, the SNM protected a total of 5,372 eggs from 50 nests and released 2,734 hatchlings.

In the 2003-04 season, we protected 3,506 eggs from 35 nests in four places and 1,687 hatchlings were released. This year we found much fewer nests (3) on the Velas coast, compared to last year (50).

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Turtle conservation & community development: Activities of the TREE Foundation

Sabita Currimboys

*Trust For Environment Education (TREE) Foundation,
No. 63, First Avenue, Vettuvankeni, Chennai, Tamil Nadu 600 041. India.
Email: treefoundation2002@yahoo.com; www.treefoundationindia.org*

The TREE Foundation is a registered charitable trust, founded in 2002. Since that time we have initiated several environmental education programmes in Panchayats, and in state-aided and private schools along the coast of Chennai. We have managed to cover several fishing villages during this year and conduct intensive programmes. The villages include Periya Neelangarai, Injambakkam, Pannayur, Nainar Uthandi and a few others. Our vision is to cover a stretch of 120 km from Chennai to Marakkanam. It is our endeavor to educate the people living along the coastline, not just of the need to save the olive ridley that comes to nest along our shores but, more importantly, that each and every species is interdependent and that we must therefore take care of our environment.

Environmental education

In October 2003, we conducted programmes in 11 schools along the East Coast Road reaching a total of about 4,965 children. We conducted painting competitions in December 2003 to encourage children to take extra effort to learn about

conserving sea turtles which was the theme of the event. About 43 children participated. A sand modeling competition was held simultaneously in 4 villages for the fishing community youth and huge replicas of the olive ridley were made by groups in each village. It was a windy, rainy day despite which the teams went about their task enthusiastically. Sixteen children and 98 youths took part in this event. The highlight of all these events was a street play "Niraindha Kattumaram" which means 'The Overflowing Catamaran' performed in all the five villages on January 10 and 11, 2004. This was presented by college students trained in folk theater (*Karupu Koothu*) and a fledgling group, *Alai Koothu* (a cultural unit of TREE foundation). This play highlighted the fact that fishermen could help to increase the wealth of the ocean and not just take away from it. It was explained that the yardstick of a healthy coastal environment and overall marine biodiversity is when a turtle returns to its natal beach to nest. Pamphlets in Tamil on the life and importance of the turtle were distributed immediately after the play.

Community involvement

Apart from our sea turtle conservation programmes, TREE Foundation also held a Peace March on September 11, 2004 - International Peace Day. As a member of Dr. Jane Goodall's 'Roots & Shoots International Network' we decided to take part in a programme that was being held all over the world by members of this network. A giant sized peace dove was made using recycled materials and was carried with the help of 45 children and 130 youth from the fishing villages together with friends of TREE Foundation. They proceeded down the East Coast Road from Periya Neelangarai fishing village to Injambakkam, a distance of 3 km, carrying the message of peace. TREE Foundation has also instituted programmes concerning community development. We have started self-help groups (SHGs) among the youth in each of the 5 villages and attended the meetings of the already established women's SHGs to help motivate them. This has helped in raising the level of commitment and has brought families together in their endeavor to better themselves. We have conducted courses for these SHGs on vermiculture and composting with the help of Murugappa Chettiar Research Centre (MCRC), Chennai.

We also instituted the Turtle Protection Force (KAP- Kadal Aamai Padhukavalargall), which has been very active. Considering the fact that they

work on a purely voluntary basis, they deserve credit. At present, there are about 7-9 volunteers in each of the five villages patrolling a distance of about 10 km along the Chennai coast.

Future plans

This nesting season has not been very encouraging. Only about 23 nests were sighted from January – February 2004. Beachfront lighting has caused havoc with the few hatchlings that did appear. We are tackling this issue by educating the communities that live along the beachfront. We hope this will help to reduce the casualties. Although the Forest Department has given us support by lending their presence at our meetings with the local fisherfolk we are still searching for some means of lending credibility to our personnel who patrol the beaches at night.

Despite a few drawbacks, we have had a good year with regard to building awareness among the general public. Although we haven't been able to tackle the resorts along the beaches, we have managed to convince a good many fishermen to treat the turtle with respect and have dispelled the notion that a turtle brings bad luck. We welcome suggestions and help from larger institutions with similar ideologies. We have been able to cover much ground depending solely on volunteers and hope to make considerably more progress this year.

Threats to sea turtles on the Rameswaram – Dhanushkhodi Coast

S. Krishnapillai

Principal Scientist (Retd.), CMFRI

7-49F, Deivakam Pilliyar Koil Street, N.G.O. Colony, Kottar (P.O.), Nagercoil 629 002. India.

Exploitation for trade

Turtle fishing has been practiced for a long time in the Gulf of Mannar and Palk Bay in Tamil Nadu. Five species of sea turtles - olive ridleys, green turtles, hawksbill turtles, loggerhead and leatherback turtles are recorded from this area (Bhupathy and Saravanan, 2002). Prior to 1972, there was legal live turtle trade between India and Sri Lanka. Live

turtles were transported by sailing boats from Pamban, Tamil Nadu to Jaffna, Sri Lanka (Agastheesapillai, 1996) and turtle shells were exported to France, U.K. and several other European countries. In 1960, it was estimated that an average of about 3000 to 4000 turtles were landed every year in the Gulf of Mannar area and 1000 turtles in the Palk Bay; green turtles formed 75% of the landings, and olive ridley and loggerhead

formed 20% (Jones and Fernando, 1973). The turtle trade was stopped in the early 1980s.

Accidental catch

Introduction of mechanisation in fisheries resulted in the accidental catch of turtles in gillnets, which became a major threat to their populations. The Indo-Norwegian project established a boat-building yard in Mandapam to construct 32-foot trawlers in 1970. Several trawlers were constructed under this programme and the fishermen of Mandapam, Pamban, Rameswaram and Kilakarai availed of loans to buy trawlers. The operation of trawlers in this area not only increased fish catch but also resulted in a substantial increase in the accidental catch and mortality of sea turtles. A recent study of sea turtles off the Tamil Nadu coast revealed that fishing is one of the major causes of turtle mortality there (Bhupathy and Saravanan, 2002).

Although rates of accidental catches of sea turtles are relatively high in this area, most of them go unreported or unnoticed. Accidental catch of olive ridleys, *Lepidochelys olivacea*, was reported at Pamban (Kasinathan, 1988) and off Dhanushkodi (Krishna Pillai *et. al.* 1989). The accidental catch of leatherback turtles, *Dermochelys coriacea*, was reported from Dhanushkodi (Krishna Pillai *et. al.* 1989), Rameswaram (Krishna Pillai *et. al.* 1995) and Mandapam (Rao *et. al.* 1989). Due to more attention in recent times to the conservation and management of sea turtles, (Jayaprakash *et. al.* 1993), the stranding of turtles has been reported

more frequently (Kasinathan and Palanichamy, 2002).

Recently, another threat has emerged in the form of dynamite fishing along the 19 km Rameswaram – Dhanushkodi coast. Dynamite fishing is practiced to catch fish, particularly soles, along the coast of Tamil Nadu and Kerala. Dynamite fishing in the Chaliyar river, north Kerala was reported by Lal Mohan (1991). Dynamite fishing is regularly practiced in the Rameswaram area, which often causes the death of endangered species, such as dolphins and sea turtles. Regular and continuous dynamite fishing operations caused the death of more than 10 turtles which were washed ashore during the end of January 2004 along the Rameswaram – Dhanushkodi coast.

Conclusion

Sea turtle populations in this area have already been depleted due to their over-exploitation for trade and from accidental drowning in fishing gear of gill nets and trawlers (Bhupathy and Saravanan, 2002). Boat propellers can also cause damage to the flippers and shells of sea turtles. Recently, dynamite fishing has become yet another threat to their populations. Such dynamite fishing should be stopped during the turtle nesting season (from December to March) to save the turtles from this additional threat. The state fisheries department, forest department and its wildlife wing, the Coast Guard and the local police should work together and take action to stop dynamite fishing and prevent further turtle mortality.

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Sighting of sea turtles in the Andaman Sea and Bay of Bengal

P. Kannan and M. Rajagopalan

Central Marine Fisheries Research Institute (CMFRI)
Mandapam Regional Centre, Mandapam Camp, Tamil Nadu 623 520. India.

Introduction

Four species of sea turtles, olive ridley (*Lepidochelys olivacea*), green turtle (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys imbricata*) nest on the Indian mainland coast and the Andaman and Nicobar group of Islands (Choudhury, 2001). However, little is known about the presence of sea turtles in Indian waters, apart from a few studies in Orissa (e.g. Ram, 2000). The present paper describes at-sea sightings of three species of sea turtles in the Bay of Bengal and Andaman waters during a cruise of the Fishing and Oceanographic Research Vessel Sagar Sampada.

Survey methods

Between 23 January and 15 February, 2005, we conducted at-sea observations of sea turtles during the research cruise 231 along the eastern coast of India in the Bay of Bengal and along the eastern and western sides of the Andaman and Nicobar Islands between 6° to 13°N and 91° to 94°E. Using binoculars (Vanguard BR.7500, 7X50 mm field: 7.1), we searched the ocean surface for signs of sea turtles during daylight hours (06:00-17:30). Each sighting was given a unique number and the following data were recorded: date and time of the observation, general locality (nearest land mark),

latitude & longitude, sea state, number of animals, distance from the vessel, depth of the area (m), weather conditions (wind speed, direction, sea swell and visibility), movement of the animals, presence of any other animals and activities of the turtles.

Results

During the 23-day survey period, we recorded a total of 15 sightings representing 3 species of sea turtles. They included 9 (56.3%) sightings in Andaman waters and 7 (43.7%) sightings in the Bay of Bengal on the east coast of India (Table 1). The majority of turtles observed were olive ridleys (n=14) while one green turtle was also seen. A leatherback turtle was also sighted in the south east of Barren Island. It was floating along with fishes near a wooden log at a point where the water depth was 783 m, approximately 5 m away from the vessel. Turtles were sighted mostly during morning (09:00 – 12:30) and evening (16:00-17:30) hours. In the Andaman area, the survey area was divided into five geographical sections and the cruise covered 1768 nautical miles. Two turtles were seen in the North Andaman region, 7 turtles were seen in the south Andaman area, particularly around Port Blair, and no turtles were seen around Little and Middle Andamans, nor around the Nicobar Islands (Car Nicobar, Katchall, Little Nicobar, Great Nicobar and Indira Point).

Table 1: Sea turtle sightings during the cruise 231 on board FORV Sagar Sampada in Andaman Sea and Bay of Bengal

No	Date	Time	Lat & Long	Place	Depth (m)	Notes
1	25.1.05	12:35	13°34.46 N 86°51.02 E	Off North Andaman	3074	Adult olive ridley floating on the surface and moving easterly. Calm sea with slight sea swell, clear visibility and 134 nautical miles away from shore
2	25.1.05	16:25	13°37.52 N 87°31.02 E	Off North Andaman	3061	Sub-adult green turtle <i>Chelonia mydas</i> was sighted and moving westerly, 120 nautical miles away from the shore
3	30.1.05	11:00	12°29.63 N 93°28.20 E	Off Rangath Island, South Andaman	580	Adult olive ridley <i>Lepidochelys olivacea</i> , floating on the surface and moving northwesterly. Calm sea with slight sea swell, and 134 nautical miles away from shore
4	25.1.05	12:30	12° 01.06 N 93°59.56 E	Off Havelock Island South Andaman	1730	Sub-adult olive ridley, 175 nautical miles away from the shore
5	31.1.05	17:05	11°59.65 N 94° 07.57 E	South east of Barren Island	783	Juvenile leatherback observed, floating with a wooden pole surrounded by fishes
6	01.2.05	10:15	11°30.38 N 93°50.46 E	Off Port Blair, South Andaman	477	Adult olive ridley sighted in the open ocean
7	02.2.05	10:35	11°40.40 N 92°46.50 E	Near Ross Island South Andaman	54	Adult olive ridley, surfacing, barnacle was noticed attached to carapace
8	14.2.05	11:40 to 17:30	13° 03.52 N 87°37.56 E	Diglipur Island North Andaman	425	Adult olive ridley, feeding on the surface, moving north eastward
9	14.2.05	13:20	13°02.69 N 87°18.23 E	Off Chennai, Bay of Bengal	2200	Adult olive ridley, found on the surface and moving eastward
10	14.2.05	13:40	13°02.69 N 87°18.23 E	Off Chennai, Bay of Bengal	3107	Adult olive ridley, swimming on the surface and moving eastward
11	14.2.05	13:45	13°02.37 N 87°10.17 E	Off Chennai, Bay of Bengal	3100	Adult olive ridley, moving eastward
12	14.2.05	16:25	13°02.60 N 86°44.68 E	Off Chennai, Bay of Bengal	3072	Adult olive ridley, sighted 376 nautical miles away from Chennai coast, migrating eastward
13	14.2.05	16:45	13°02.91 N 86°39.56 E	Off Chennai, Bay of Bengal	3071	Adult olive ridley, sighted 368 nautical miles away from Chennai coast in the open ocean, migrating eastward
14	14.2.05	17:15	13°03.19 N 86°35.24 E	Off Chennai, Bay of Bengal	3000	2 adult olive ridleys, sighted 364 nautical miles away from shore, migrating eastward

Discussion

Sea turtle sightings were highest in South Andaman (43.8%) followed by North Andaman waters (12.5%). Sea turtles were not seen anywhere in

the Nicobar group of islands. There were 7 sightings of olive ridleys in the Bay of Bengal waters off the east coast of mainland India. Since olive ridleys migrate from the Indian Ocean and adjacent areas, passing through Tamil Nadu and Andhra Pradesh

waters to reach the mass nesting beaches in Orissa and follow the same route in reverse during their southbound migration (Kar, 1983, Subba Rao *et al.*,

1987, Shanker *et al.*, 2003), these sightings of olive ridleys in the Bay of Bengal may have been migrating turtles.

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The OMRCC Update – news on India’s first collaborative marine conservation initiative

Aarthi Sridhar¹ and Sanjiv Gopal²

1- Ashoka Trust for Research in Ecology and the Environment (ATREE)
659, 5th A Main, Hebbal, Bangalore 560024. India

Email: aarthisridhar@yahoo.co.uk

2-Assistant Coordinator, OMRCC

Greenpeace, 3360, 13th Main, HAL II Stage, Indira Nagar, Bangalore. India

Email: sanju7778@yahoo.com

The Orissa Marine Resources Conservation Consortium (OMRCC) is the first initiative for collaborative marine conservation action in India where scientists, fisherfolk and conservation organisations are attempting work together to develop and execute research initiatives and community-based conservation projects (Aleya 2005). When the OMRCC was formed in December 2004, several objectives were identified. The activities that the OMRCC could engage in range from advocacy efforts for rational turtle conservation measures, fisheries management, addressing issues related to destruction of marine biodiversity particularly from commercial and industrial activities and so on. What has the consortium achieved in the last eight months?

Even at the inception meeting of the OMRCC in December 2004, members felt that one of the first tasks of the OMRCC should be to focus on creating greater awareness on the sea turtle conservation legislations in Orissa. This would include spreading awareness about one of the significant conservation directions that many OMRCC members helped shape – the revised April 2005 orders of the Central Empowered Committee (CEC) constituted by the Supreme Court of India. The revised CEC orders recognized the fishing rights of the traditional fishing community while including elaborate mechanisms to ensure the protection of sea turtles (Anonymous, 2004). The members of the OMRCC had already earlier collaborated in November 2004 to organize

a day-long workshop on sea turtle conservation legislations in Ganjam for traditional fisherfolk.

In January 2005, it came to the OMRCC's attention that some field officers of the Orissa Forest Department had wrongfully detained a few traditional fishermen from the Gundalaba village in Puri district and prevented them from fishing in the coastal waters at the Devi river mouth, which is adjacent to one of the three mass nesting rookeries on the Orissa coast. This occurred despite the CEC having explicitly permitted this kind of benign fishing practice. This had antagonised the fisherfolk, who were also misinformed that turtle conservationists were behind this alleged blanket ban on fishing. On 23 February 2005, the OMRCC held a meeting at Gundalaba village near the Devi rookery and clarified to the fisherfolk what fishing practices the law permitted. The OMRCC recorded the fisherfolk's statements and sent an official complaint to the Orissa Forest and Fisheries Departments. The OMRCC members also clarified to the fisherfolk their position on sea turtle conservation measures. The OMRCC had its follow-up meeting the next day at Bhubaneswar where it was clear to the members that the revised orders of the CEC (Anon, 2004) must be made available to fishing communities and to government officials of the Fisheries and Forest Departments.

Over the next two months, the Ashoka Trust for Research in Ecology and the Environment, Bangalore designed booklets in Oriya and in English on marine conservation legislations applicable to Orissa, especially the sea turtle legislations in the state. They also designed hoardings to be placed at various locations near the three mass nesting sites. In the month of August, the booklets were distributed and the hoardings were erected. OMRCC members within the state and at the local sites are presently distributing booklets and

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spreading the message about the CEC's orders in the villages through this communication material. These tools of communication were designed with the inputs of local fishermen with an aim to be comprehensible for an audience that largely could not read. Members within the state, and especially Orissa Traditional Fish Workers' Union (OTFWU) will monitor the effectiveness of these tools over a period of time, which would further help in the development of effective information tools in the future.

Sekhsaria (2005) highlighted concerns with the construction of the Dhamra Port. The OMRCC has taken a serious view of the increasing number of development projects on the Orissa coast. With support from members such as Greenpeace and the OTFWU, the OMRCC will spearhead a campaign against the Dhamra Port due to its negative impacts on the Gahirmatha rookery. At present, there is a proposal for another commercial port at a location near the Jatadhar river mouth proposed by Posco, a South Korean company. The OMRCC will campaign against projects that will adversely impact the marine environment of the state.

Future plans

Over the next two years, the OMRCC plans to undertake several focused activities which will be executed by its various members. Members of the OMRCC met on 3 August 2005, wherein the members decided to develop specific activities including research studies, environmental campaigns, community-based environmental monitoring programmes, participatory conservation programmes, development of training material and conducting of workshops to facilitate fisheries management. The OMRCC is currently designing future projects and seeking funding for them.

Anonymous. 2004. Central Empowered Committee, Government of India, New Delhi. Visit of Central Empowered Committee to Orissa, February 10-14, 2004.

Sekhsaria, P. 2005. The Dhamra Port. *Indian Ocean Turtle Newsletter* 1: 14-16.

Recent Research on sea turtles

Summaries by Matthew Godfrey¹ and Mark Hamann²

1 - North Carolina Wildlife Resources Commission,
1507 Ann St., Beaufort, NC 28516 USA

Email: mgodfrey@seaturtle.org

2 - Tropical Environmental Studies & Geography
James Cook University,

Townsville, Queensland 4811. Australia.

Email: mark.hamann@jcu.edu.au

Tuxbury, S. M. & M. Salmon. 2005. Competitive interactions between artificial lighting and natural cues during seafinding by hatchling marine turtles. *Biological Conservation* 121: 311-316.

Sea turtle hatchlings usually emerge from their nests at night. They find their way to the ocean using visual cues: they move towards the brighter horizon and away from darker silhouettes. On natural beaches, the brightest horizon is the one over the ocean, due to reflection of starlight. The landward horizon usually has a dark silhouette formed by the dune and/or tree line. However, beaches that have a lot of human development usually have artificial light (from homes, businesses, hotels, highways, parking lots, etc.) that reaches the beach from landward side at night. Under these conditions, hatchlings often mistakenly move towards the artificial lights because they are brighter than the horizon over the ocean. This misdirected movement is called misorientation. Because misorientation of hatchlings can occur on any beach that has a human presence, there has been much research into how to reduce the impacts of artificial lights on emerging hatchling sea turtles. One technical solution has been to replace regular artificial lights with yellow low-pressure sodium bulbs. The light produced by these bulbs makes loggerhead hatchlings go in the opposite direction (the scientific term for this behaviour is “xanthophobia,” which means “afraid of yellow”). However, the yellow lights are not effective with other species of marine turtles. Therefore, other solutions are required. This study focuses on what happens to turtle hatchlings when they are presented with artificial light plus dark silhouette and a simulated ocean (that is, competitive cues). The work was performed in the laboratory (the hatchlings

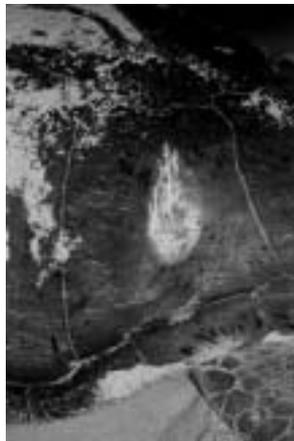


M. Godfrey

were released to the ocean a few hours after being tested in the lab). The researchers found that when bright, artificial light and dark silhouettes were presented together to the hatchlings, the hatchlings were attracted to the light, moving away from the ocean. However, when the intensity of the artificial light was reduced, darkening the silhouette, the hatchlings moved away from the light source and silhouette (i.e. the direction of the ocean). The results suggest that on beaches where artificial light cannot be eliminated, it may be possible to reduce misorientation by increasing natural silhouettes, through dune restoration or beach vegetation restoration. Of course, the results are not final. It is important to test the hatchlings on a real nesting beach. Also, only loggerhead hatchlings were used. It would be important to test other species to ensure that increasing silhouettes on beaches is an effective conservation method.

Bell, C. D. L., J. Parsons, T. J. Austin, A. C. Broderick, G. Ebanks-Petrie & B. J. Godley. 2005. Some of them came home: the Cayman Turtle Farm headstarting project for the green turtle *Chelonia mydas*. *Oryx* 39: 137-148.

Since the inception of sea turtle conservation activities, there has been an on-going discussion on the benefits of captive rearing of sea turtles. There are many forms and variations of captive rearing, ranging from the relatively simple (such as moving eggs to a protected hatchery for incubation) to the complex (such as maintaining a closed-cycle sea turtle “farm”). The general idea behind captive rearing is that intervention, in the form of removing turtles from the wild and placing them in a sheltered environment for a period of time, helps the survivorship of turtles because they are protected from natural predators and other threats.



J. Blumenthal

This study analyzes the outcome of a headstarting programme for green turtles at the Cayman Turtle Farm in the Cayman Islands, in the Caribbean. ‘Headstarting’ is a technique whereby sea turtle hatchlings are kept in captivity for several months to several years, and then released back into the wild, presumably to increase the chances that the young turtles will survive to maturity. More than 30,000 hatchling and yearling (aged one year) green

turtles were subject to headstarting and then released to the wild from the Cayman Turtle Farm facilities in the 1980s and 1990s.

One potential difficulty with analyzing the impacts of a headstarting programme is the question of how to identify the headstarted turtles 15-30 years later, when they are adults. In the case of Cayman Turtle Farm, the majority of the headstarted turtles were tagged and many were given “living tags.” Living tags are simple grafts (transfers) of lighter shell from the plastron (underbelly) of turtles to the darker shell of the carapace. As the turtle grows, the light-coloured graft will also grow, effectively becoming a permanent mark indicating that it was a headstarted turtle. To date, 392 of the tagged headstarted turtles were seen again. Seven of the turtles with living tags were seen again as reproductively active adults, including 3 females that were nesting on beaches in the Cayman Islands. The time to maturity for these females was 15-17 years after release, which is several years shorter than most biologists had estimated. However, it may be the case that the headstarting procedures contributed to a faster rate of maturity. Nevertheless, these preliminary results show that at least some turtles subjected to various forms of captivity (including headstarting) survive and reproduce after release into the wild. Also, the results show that the living tags are useful for marking hatchlings for future observation as adults.

Shanker K., J. Ramadevi, B. C. Choudhury, Singh, L. & R. K. Aggarwal. 2004. Phylogeography of olive ridley turtles (*Lepidochelys olivacea*) on the east coast of India: implications for conservation theory. *Molecular Ecology* 13: 1899-1909.

All sea turtle species except for the flatback turtle are globally distributed. For instance, the olive ridley sea turtle occurs in the Atlantic, Pacific and Indian Oceans, with nesting populations found in West Africa, eastern South America, western Central America, Australia, India, Sri Lanka, to name a few. Given their wide distribution, the question arises “How related are different populations of sea turtles?” This can be answered by studying the

genetics of sea turtles, to see whether or not different nesting populations of a single species have any genetic similarities.

In the case of olive ridleys, an initial study published in 1998 by Brian Bowen et al. found that nesting populations in different oceanic regions had different types and amounts of genetic markers, or unique codes in their DNA, suggesting that nesting

populations are segregated. The results also confirmed that olive ridleys display natal homing, where adult females return to nest on the beaches close to where they were born. However, the samples from South Asia that were used in the study only came from Sri Lanka, so it was not possible to ascertain the relatedness of olive ridleys that nest along the east coast of India and Sri Lanka. The new study focuses exactly on that question.

The results show that although olive ridleys from Madras to Gahirmatha share similar genetic markers (called haplotypes) and likely are one large regional “stock” or population; they are also different from all other olive ridley nesting populations that have been studied to date. Olive ridleys from the east coast of India are different genetically even from olive ridleys nesting in Sri Lanka. The study also found that the olive ridleys found on the east coast of India are the closest relatives of their sister



B. Tripathy

species, the Kemp’s ridleys found in Mexico, suggesting that these might be the ancestors of olive ridleys in the Pacific and Atlantic Oceans. The study results support the idea that regional nesting aggregations should be managed on a case-by-case basis, because they have unique genetic, behavioural and morphological characteristics. One important point is that these results are based on mitochondrial DNA, which is passed on from mother turtles to the hatchlings and therefore cannot provide information on the genetic contribution of males.

Tisdell, C. & C. Wilson. 2005. Do open-cycle hatcheries relying on tourism conserve sea turtles? Sri Lankan developments and economic-ecological considerations. *Environmental Management* 35: 441-452.

In many countries marine turtle eggs are purchased from licensed collectors and then incubated in a protective environment. In most cases this is done to save eggs from consumption or predation and increase the production of hatchlings. There have been numerous and ongoing debates for decades about the use and abuse of hatcheries as a conservation tool to protect marine turtle eggs. However, most of the debate has centered on the conservation merits of hatcheries, and there have been comparatively few discussions about the economic and social benefits and/or costs. In their recent paper, authors Clem Tisdell and Clevo Wilson, examine the economic and ecological impacts of marine turtle hatcheries in Sri Lanka. Their study is important for the management of marine turtles in other nations that use hatcheries as a management tool because hatcheries are often expensive to establish and maintain, they are often located in or adjacent to villages with low socio-economic standing, can be used as ecotourism sites and are virtually always dealing with the conservation of remnant populations of marine turtles.

Their main finding was that open-cycle hatcheries - those that take eggs from the wild and incubate them in protective environments - can produce balanced economic and environmental benefits if they are properly managed. However, if (1) the reasons for the development of hatcheries are not conservation oriented, (2) the conservation ‘need’ for the hatchery does not exist, or (3) poor ecological and/or economical practices are employed, then hatcheries do not necessarily result in positive conservation benefits. The authors also warn that when hatcheries purchase eggs from collectors a market value is established. This often leads to the value of eggs increasing and the subsequent disruption, or alteration of local community economies. Hence, increased economic reliance on hatcheries serving as local tourist attractions, or the consequent need to purchase eggs from collectors can, if not managed, lead to near total reliance on hatcheries for conservation. In these cases it makes the eventual transition from hatcheries to in situ beach management difficult.



C. Schauble

While the debate on the necessity and effectiveness of marine turtle hatcheries will continue indefinitely, Tisdell and Wilson have provided us with more food for thought. The authors have provided a fresh and necessary view towards understanding additional factors that affect the success of marine turtle hatcheries, and state the necessity of linking economic and environmental theory to assess the various impacts hatcheries may have on both marine turtle conservation and local economies.

Chaloupka, M. & C. Limpus. 2005. Estimates of sex- and age-class-specific survival probabilities for a southern Great Barrier Reef green sea turtle population. *Marine Biology* 146: 1251–1261.

It is often stated that green turtles are long lived animals – but just how long they live for has not been estimated. This recent paper, one of a series on population modeling by these authors, investigates the survivorship of green turtles in an environment that has no major artificial threats. This study is important because it addresses a substantial knowledge gap. While a majority of the research on green turtle survivorship has been conducted in areas where adult sized turtles are hunted for consumptive use, or on the egg/hatchling stage of the life cycle, this paper is one of few that describe survivorship in the intervening years.

Chaloupka and Limpus provide mathematical modeling on 954 capture-mark-recaptures (a method which allows population estimates based on recapture rates of marked animals) of green turtles at a single study site over a period of nine years. From these data they provide a comprehensive estimate on the survivorship of green turtles of both sexes and three age classes (juvenile, sub-adult and adult). Their main findings

include; (1) adult turtles have high annual survivorship (95%) and immature turtles have lower annual survivorship (85 to 88%), (2) these rates of annual survivorship bias are not different between sexes or over the nine years of the study, and (3) the average adult life span for a green turtle is 19 years. This adult life span, coupled with the average age of green turtles when they reach maturity, which is 35 to 40 years, means the life expectancy for green turtles is around 55 to 60 years.

These data are important for people involved with marine turtle management because they provide a quantitative estimate of natural survivorship, and therefore allow more accurate demographic models to be developed for green turtle populations. Such data could be used to compare annual survivorship in populations impacted by various threats such as egg harvest. Similar long term studies such as this one are essential if we are to develop better management strategies for marine turtle populations that are subject to human impacts.

A bibliography for sea turtles on the mainland coast in India

Sonya Sankaran, Basudev Tripathy and Kartik Shanker

Ashoka Trust for Research in Ecology and the Environment (ATREE)

659, 5th A Main Road, Hebbal, Bangalore 560024, India.

Email: kartik@atree.org

This bibliography aims to cover literature on sea turtles on the mainland coast of India. In the previous issue, we covered literature on sea turtles in Orissa, which forms a substantial body of work. We have included in this issue additional references on Orissa. The Andaman and Nicobar Islands and Lakshadweep Islands will be covered in an upcoming issue. We also hope to cover south, southeast Asia and Indian Ocean islands in upcoming issues.

This compilation does not include proceedings of small workshops, training programmes or meetings, since most of them do not constitute full or reviewed papers, and are largely either brief or extended abstracts. For the same reason, papers presented at the Annual Symposia of Sea Turtle Biology and Conservation are not included. We have, however, included articles from special collections that resulted from workshops or conferences such as the 'Proceedings of the Symposium on Endangered Marine Animals and Marine Parks' held in Cochin in 1985, and 'Proceedings of the Workshop on Sea Turtle Conservation', held in Madras in 1984, published as CMFRI Special Bulletin No. 18.

Included in this bibliography is the 'Proceedings of the National Workshop for the development of a national sea turtle conservation action plan' held in Bhubaneswar, Orissa in 2001, but we have not individually listed the papers presented, as these were primarily extended abstracts. This particular workshop (and numerous others) were conducted under the auspices of the GOI UNDP sea turtle project, executed by the Wildlife Institute of India (WII), Dehradun, between 2000 and 2002. Reports of various workshops conducted during the project can be obtained from the WII. Results from many of these projects have been published as papers in

Kachhapa and in other professional journals, which are listed here. In addition, all GOI UNDP sea turtle project results for 2000-2002 are to be published in "Marine Turtles of the Indian subcontinent", edited by Kartik Shanker and B.C. Choudhury (in press). The book also contains reviews of sea turtles in other south Asian countries, and other articles on sea turtles in India.

In general, we have not included publications where sea turtles are not the focus, such as field guides and wildlife books. We have not included press reports, as those are simply too numerous to list. However, we have included authored articles in the popular press, both in newspapers and magazines.

Bibliographies are dynamic, since papers are being produced constantly. Furthermore, the class of papers that merit inclusion depend on the judgement of the authors. Many references and papers are simply lost in inaccessible archives and surface periodically. Thus, no published bibliography can ever expect to be a finished work. To address this issue, we hope to have an integrated interactive bibliography on our website (www.seaturtle.org/iotn) where (a) all published bibliographies from the region can be integrated (b) references can be added from time to time by all users of the resource (c) information can be added from time to time, such as the availability of each paper and the source.

We hope that this bibliography will be useful to all biologists and conservationists interested in the sea turtles of India. We apologise for any significant lapses and welcome inputs, especially regarding obscure references that we may have missed. Eventually, we hope that this will become part of a print and online repository, that will serve the entire sea turtle conservation community.

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**The 26th International Symposium on Sea Turtle Biology and Conservation
“Diverse Cultures, One Purpose” (Island of Crete, Greece, 2-8 April 2006)
THIRD ANNOUNCEMENT**

Dimitris Margaritoulis

*President, International Sea Turtle Society, c/o ARCHELON, the Sea Turtle Protection Society of Greece, Solomou 57, GR-10432 Athens, Greece
Email: margaritoulis@archelon.gr*

Following previous announcements (MTN 108: 29; MTN 109: 18-19), please find below all the new information, which will assist you to make definite travel arrangements for the Symposium and, if you wish, to combine it with some holidays in Greece. I have tried to include alternative options considering your travel, places to eat outside the hotel, as well as trips both on Crete and/or from Athens. My major concern is to have everybody feel comfortable, and be part of the family no matter where he/she comes from and what he/she can afford. As you read these lines new information, concerning hotel reservation, registration, field trips, etc., might be already posted at the Symposium website <<http://www.seaturtle.org/symposium/>> which I urge you to visit regularly for keeping up with updates.

Why Crete? We have selected the Island of Crete in Greece for a number of reasons: it is located in the middle of the eastern Mediterranean at equal distances from Africa and Asia; it hosts a genetically important loggerhead nesting population; ARCHELON, the local host of the Symposium, conducts monitoring and conservation projects on Crete and interacts with the local authorities and communities; it is an island with a unique cultural identity and landscape diversity; it has a high-standard tourism and ample facilities to contain our gigantic event.

Venue, Transportation to Hotel: The Symposium venue is Capsis Beach Hotel, located at Aghia Pelaghia, a small village 25 km from Heraklion International Airport or 22 km from Heraklion town and harbor (for those who will arrive by ferry). The best way to reach the hotel is by taxi (estimated price: 25 Euros, from either the airport or the harbor); taxis in Greece can take up to 4 passengers,

provided that their luggage can fit in. Further, you can rent a car at the airport (car rental for a medium-size car is about 70 Euros per day, with unlimited mileage and full insurance; of course there are several smaller companies with less expensive offers). If you drive from the airport you follow the national highway, going west towards Rethymno town. After about 20 km you will see the sign to Aghia Pelaghia, turn right and after about 3 km you arrive at the hotel entrance.

How you can reach Heraklion: Heraklion is the capital city of Crete; with about 150,000 inhabitants. It is located on the north coast of Crete. You can get to Heraklion by the following ways:

1. By plane. The cheapest way to reach Heraklion is by air from Athens. All major airlines book tickets to Heraklion, mainly through the Athens International Airport. However, from some European cities there is a limited number of charter flights directly to Heraklion.

2. By boat. Heraklion has a large harbor, with daily ferries from Piraeus (the main port of Athens). The ferries sail usually at night (departing about 2000 and arriving at Heraklion 0600). This is very convenient as you do not lose daytime for traveling. A “deck-ticket” costs about 33 Euros/per person one way. A berth in a 4-berth cabin costs about 55 Euros one-way. You can have your own 4-berth cabin if you find the other 3 persons, irrespective of sex; otherwise there are separate 4-berth cabins for males and females, all with private bathroom. A two-berth cabin, with private bathroom, costs about 70 Euros per person one-way. Check before booking your tickets for departure times as these may change. Please check **Pre-Symposium Trips** below for further information and ideas.

Pre-Symposium Trips: For those of you who will have a stop-over in Athens we have some ideas on one-day trips to famous archaeological sites like Delfi and Mycenae. You can find these options by visiting <<http://www.astoria.gr/seaturtle/index.htm/>>. Please contact them directly for any arrangements that suit you.

Booking of Rooms: You can reserve a room at the hotel through the hotel's website <<http://www.capsis.gr/seaturtle/index.htm/>>. Please fill all the requested items in the Hotel Booking Form. Make sure you provide also the names of your roommates. If you encounter any problems or difficulties, please contact the Symposium Coordinator Thanos Belalidis <symposium@sympraxis.gr>. Although the deadline for reserving rooms seems far away (1 March 2006), you are advised to book your room the soonest possible, as rooms will be reserved on a "first-in/first-served" basis. We have arranged to keep the same prices well before and after the Symposium (if you would like to come earlier or extend your stay on Crete). See below Post-Symposium Trips.

Food and Drinks:

1. In the Hotel. You can have lunch or dinner at the hotel main restaurant (self-service) for 20 Euros. In the hotel there are also other restaurants and a traditional Tavernas with a-la-carte prices. Registered participants can have a light lunch, during the Symposium lunch breaks, in the form of a sandwich and soft drink for 5 Euros. Registered participants will have a 15% price discount in all bars within the hotel.

2. Outside the Hotel. There are several tavernas, cafés and bars in the nearby village of Aghia Pelaghia (less than 5 min walk from the hotel). We will recommend on-site the best choices as far as good, traditional and inexpensive food and drinks are concerned. Indicative cost of a medium meal: 12 Euros.

Registration and ISTS membership: All those who will attend the Symposium must register. **Pre-registration deadline is 15 November 2005** if you want to avoid the higher fees associated with late registration. Pre-registration fee is \$115.00

(U.S. dollars) for regular members of the International Sea Turtle Society (ISTS) and \$60.00 for student members. Late registration (after 15 November 2005) will be \$150.00 for regular members and \$75 for student members.

The registration fee will be paid on-line (in U.S. dollars) through the Symposium website <<http://www.seaturtle.org/symposium/>>. If, however, you prefer to mail your payments, please follow the instructions below:

Ask for a Registration Form from the address below (either through e-mail, fax or ordinary post) and, after you fill it, please mail it to the postal address below **together** with a cheque (in either U.S. dollars or Euros), payable to the **Sea Turtle Protection Society of Greece.**

ARCHELON, the Sea Turtle Protection Society of Greece
 Attn. Chrysanthe Otzakoglou
 Solomou 57, GR-104 32 Athens, Greece
 Tel./Fax: +30-210-5231342
 E-mail: tanty@archelon.gr

Please send the Registration Form and the cheque by using either registered mail or private courier. Do not forget to include the cheque together with the Registration Form. You will receive a confirmation as soon as the above have been received.

During your on-line (or postal) registration you will have the option of paying also for tickets to the **Welcome Cocktail** and the **Farewell Party** (see below).

Program: The Program Committee, comprising of no less than 35 people, will lead us through the following thematic sessions:

- Ecology and Evolutionary Biology
- Population Biology and Monitoring
- Conservation, Management and Policy
- Social Science Research
- Education, Outreach and Advocacy
- Behaviour and Movements
- Anatomy, Physiology and Health
- Fisheries

In addition, two Special Sessions have been fixed:

- Turtles and Climate Change
- Ecological Roles of Marine Turtles

In this Symposium, emphasis will be given to sea turtle conservation and research in Africa and in the Mediterranean. An important Panel Discussion with the preliminary title: "Cooperative Approaches to Finding Sea Turtle Bycatch Solutions in Longline Fisheries" is scheduled with the participation of several experts covering most ocean basins. A special presentation by the IUCN's Marine Turtle Specialist Group (MTSG) will bring forward the outcome of a recent workshop on Burning Issues on sea turtle research and conservation (coordinator: Rod Mast).

I remind you that the Program Committee invests a significant emphasis on the poster sessions during the Symposium.

If you have further suggestions for Workshops, Discussions or other side-events, please contact the Program Chair Dr Brendan Godley <bgodley@seaturtle.org> or the Program Coordinator Dr Kartik Shanker <kartik@atree.org>.

Call for Papers: All abstracts for oral or poster presentations must be submitted on-line. **Deadline for submission of abstracts is 15 November 2005.** The instructions for composing and submitting abstracts are found at the symposium website. Abstracts (250 words maximum) need to be of high quality or they may be rejected by the Program Committee.

If you cannot access the Symposium website, you may send your abstract and the additional information required (see below) to Alan Rees, either through e-mail to <alan@archelon.gr> or by registered mail (or private courier) to the following postal address: ARCHELON, the Sea Turtle Protection Society of Greece, Attn. Alan Rees, Solomou 57, GR-10432 Athens, Greece. In case you use the post or courier, please have your abstract and the additional information, as a Microsoft Word file, on a diskette (please avoid sending a hard copy). Make sure that you have mailed your abstract by 15 November 2005, at the latest.

Always remember that registration and payment are required before you will be allowed to submit abstracts.

Information required for abstract submission

1. Name of presenting author
2. Email of presenting author (an e-mail contact is required)
3. Fax number of presenting author
4. Date this information was submitted (DD/MM/YY)
5. Title of presentation (ALL IN UPPERCASE)
6. All authors of the presentation in the order you want them to appear in the program. Place each author's name on a separate line.
7. Author(s) affiliation(s) in the same order as above. Please clarify any multiple affiliations.
8. Abstract describing your presentation (250 words maximum). The abstracts must be submitted in English.
9. The session to which you are submitting your presentation. You must choose the most appropriate session given above under **Program**. If it does not fit under any of the sessions, please label it as "Other" and the Program Committee will place it in the most appropriate session.
10. Specify the type of presentation you wish to make. Your choices are: oral, poster, either oral or poster, or video/film.
11. Equipment needed. Your choices are: slide projector, overhead projector, computer projector with MS Power Point, video/DVD player, or other (please give details).
12. Indicate whether you are a student and whether you would like to be considered for the Archie Carr Student Paper Awards (given to both oral and poster presentations of merit). Recently graduated presenters who are presenting work done as students will qualify for these awards.
13. Indicate if you need an acceptance letter sent to someone else.

Notice of Acceptance: Final decisions on abstract acceptance will be made by the Program Committee. All first authors will be notified of the acceptance of their oral or poster by **15 January 2006**. If you need an acceptance letter sent to someone other than yourself, please specify this in your abstract submission.

Proceedings: In this Symposium we will make an attempt to have the Proceedings ready on-site. For this we shall need your help as follows: The authors of the accepted initial abstracts (250 words max) will have the opportunity to modify and/or extend their abstracts up to 500 words (without graphics and/or tables). This can be done on-line, through the Symposium website, by **15 February 2006** at the latest. Those unable to access the Symposium website can send their extended or modified abstracts on a diskette as described above under **Call for Papers**. In case of no submission of extended abstracts, the original abstract (if accepted) will be published in the Proceedings.

Cancellations: If you are about to cancel your presentation, please inform immediately the Program Chair Dr Brendan Godley <bgodley@seaturtle.org> or the Program Coordinator Dr Kartik Shanker <kartik@atree.org>.

Travel Grants: The deadline for travel grant applications is **15 November 2005**. Instructions for Travel Grants can be found on the Symposium website.

Regional Meetings: The following regional meetings are scheduled so far:

Africa 4 April, Jacques Fretey <jfretey@imatech.fr>

IOSEA (Indian Ocean & South-East Asia), 4 April, Douglas Hykle <iosea@un.org>

Mediterranean, 3 & 4 April, Paolo Casale <paolo.casale@tiscali.it>

RETOMALA (Latin America), 3 & 4 April, Ana Barragan <arbr@mixmail.com>

WIDECAST (Caribbean), 3 & 4 April, Karen Eckert <keckert@widecast.org>.

For more specific information on the regional meetings, please contact the individual meeting coordinators specified above.

Post-symposium Trips: We have arranged with a local travel agency some guided trips on Crete, all after the end of the Symposium. These trips, combining nature walks and archaeological/cultural visits, will be held between 8 and 10 April 2006. You may find detailed information at: www.legrand.gr/seaturtle/index.htm. Please,

contact the agency directly for any arrangements you might wish. In case you encounter any difficulty or problem, please contact the Symposium Coordinator Thanos Belalidis <symposium@sympraxis.gr>.

Resolutions: If you wish to submit a resolution proposal to be considered by the Board of Directors of the ISTS, please follow the Resolution Guidelines posted to the Symposium website. Resolution proposals can be submitted on-line through the Symposium website and the deadline for submission is **31 January 2006**. For an update on the current status of resolutions, see an article on the recent ISTS BoD retreat in this issue of the Marine Turtle Newsletter.

Vendor & Display Tables: Vendor & Display Tables will be located at the Exhibition Hall, which is very close to the Posters' area and the coffee-breaks' area. We have done this on purpose in order to allow people to have an enjoyable daylight socializing area. By renting a Vendor & Display Table you can exhibit or sell items from your organization (e.g., books, handicrafts, brochures) or advertise products from your company or agency. It is possible to install an internet line or power supply (220 Volts) at your Table, as per your request. For further information please contact the Vendor & Display Table Coordinator Aliki Panagopoulou <aliki@archelon.gr>.

Coffee-break Sponsors: Several companies and organizations have already promised to sponsor a coffee-break or part of it. We thank them very much. We need some more sponsors. I remind you that one coffee-break for 600 people will cost about 2,700 Euros (about 3,300 USD at the time of writing this) but we can do with less by splitting a coffee-break among several sponsors. Sponsors' names will be acknowledged on site, unless they do not wish so. Please, consider this need and do your best to locate potential sponsors to cover this heavy Symposium expense.

Welcome Cocktail: It will contain the usual canapés with free beer or soft drink in the beautiful surroundings overlooking the Aegean Sea. And of course, some local surprises.....

Farewell Party: We are currently investigating various options to combine the usual “banquet dinner” with something local and traditional. It is more than certain that we will fix something good for you with the help of the many local friends and the weather, of course. We have also arranged a reduced ticket for “students”.

Visas: You can find out which nationalities need a visa to enter Greece at the Ministry of Foreign Affairs’ website: <www.mfa.gr/english/foreign_policy/eu/visa_inf.html>. Please, apply for a visa **well in advance** to the Consulates of Greece in your country (contact details can be found at: www.mfa.gr/english/the_ministry/missions/). If you encounter difficulties in obtaining a visa, please contact the Symposium Coordinator Thanos Belalidis <symposium@sympraxis.gr> explaining the problem and providing your full personal details; we will try to help you but we shall need plenty of time for that.

Volunteers: We have already a number of dedicated Greek volunteers, mostly members or

friends of ARCHELON. But we need international participation. Seize the pleasure of being a volunteer for the Symposium on Crete and be prepared to interact with the Greek volunteers. If interested, please contact the Volunteer Coordinator Brian Hutchinson <b.hutchinson@conservation.org>.

Accompanying members: If you are considering bringing members of your family with you, not participating in the Symposium, please note that there are various things to do either in the hotel (spa facilities, animation, indoor and outdoor sports), the surrounding village of Aghia Pelaghia, other nearby villages or Heraklion town.

Communications: Please do not neglect to regularly visit the Symposium website <http://www.seaturtle.org/> for updated information. If you have any questions, please contact the Symposium Coordinator Thanos Belalidis <symposium@sympraxis.gr> or myself.

See you all on Crete!

MTSG UPDATE:

IUCN/SSC Marine Turtle Specialist Group Hosts the Second Burning Issues Assessment Workshop

Roderic B. Mast¹, Brian J. Hutchinson², Emily Howgate³ & Nicolas J. Pilcher⁴

1 - Co-Chair, IUCN/SSC Marine Turtle Specialist Group, Conservation International, Center for Applied Biodiversity Science, 1919 M Street NW, Washington, DC 20036 USA

Email: r.mast@conservation.org

2 - Program Officer, IUCN/SSC Marine Turtle Specialist Group, Address as above

Email: bhutchinson@conservation.org

3 - Intern, Sea Turtle Flagship Program, Conservation International, Address as above

Email: ehowgate@conservation.org

4 - Co-Chair, IUCN/SSC Marine Turtle Specialist Group, Marine Research Foundation, 136 Lorong Pokok Seraya 2, Taman Khidmat, 88450 Kota Kinabalu, Sabah, Malaysia

Email: pilcher@tm.net.my

Introduction

The second MTSG Burning Issues Assessment Workshop (BI2) was held at the Headquarters of Conservation International (CI) from August 18-20, 2005. Present were 16 MTSG members hailing from half a dozen countries and representing expertise from most of the MTSG’s twelve sub-regions. Also present was the Program Officer of

the IUCN Freshwater Turtle and Tortoise Group, and other scientists with priority-setting expertise from CI’s Global Marine Division, and the Center for Applied Biodiversity Science (CABS). After a brief introductory talk by MTSG Co-Chair Roderic Mast on the history of the Burning Issues; and another by CABS Scientist, Penny Langhammer,

on strategies and methods for determining Key Biodiversity Areas (KBAs), the “BI2 Team” launched into two full days of discussions on how the MTSG can best achieve its global priority-setting task as mandated in our mission statement:

MTSG MISSION

To develop and support strategies, set priorities, and provide tools that promote and guide the conservation of marine turtles and their ecological roles and habitats

The MTSG takes its responsibilities in priority setting very seriously, and the group has embarked upon a multi-year plan to not only re-assess the IUCN Red List status of all seven sea turtle species at the global scale, but also to conduct Red Listing assessments at the level of genetic stocks, an effort that began in earnest in the Mediterranean in April 2005 under the leadership of MTSG Red List Focal Point, Jeffrey Seminoff (see MTN 109:12-14). Red Listing will continue to be of critical concern to the MTSG, despite the oft-cited difficulties that the Red List criteria pose when applied to wide-ranging, long-lived, long-generation marine species like sea turtles (Mrosovsky 2003).

The Burning Issues attempt go a step beyond Red Listing, and they offer an even more compelling tool to assist the global sea turtle research and conservation community for activities related to media, communications and public outreach. Moreover they serve as a guide to influence governments, foundations and donor agencies of all sorts; and they are an effective internal compass for our own movement, assuring that we are focusing our attention on those species, regions, and research and conservation needs that are of gravest and most urgent concern in preventing sea turtle extinctions.

Burning Issues History

The concept, name and first draft of the Burning Issues were all born out of a December, 2003 MTSG Visioning Retreat that was held in Shepherdstown, WV, USA with some 30 MTSG members present (see MTN 104:21-22). The initial products were a series of lists highlighting what the experts at that meeting believed to be the most

important global priorities for Research and Conservation, as well as a single list that highlighted critical worldwide issues as they relate to certain sea turtle stocks regionally (i.e., leatherbacks in the Pacific). The group even produced a “good news” list that would focus attention on what appear to be success stories in the making (i.e., the apparent turn-around in Kemp’s ridley numbers and their return to nesting beaches in Texas, USA).

All of these Burning Issues lists were created with some trepidation by the scientists present, however, as it was questioned whether a small group could ever accurately represent the full scope of global understanding of sea turtles. Furthermore, it was feared that the Burning Issues might be seen as a sort of triage that would result in important, though non-listed populations being considered not worthy of attention. This uncertainty prevented the MTSG from aggressively marketing the Burning Issues, and though all of the results of the first Burning Issues Assessment were made public, very little was undertaken to widely share them with communities outside the readership of the MTN or the approximately 300 MTSG members worldwide.

The aforementioned list of critical worldwide issues by population and region however, passively drew the greatest attention, and demonstrated its value when its top issue (leatherbacks in the Pacific) was chosen as the theme of the 2004 Sea Turtle Symposium (STS) in San Jose, Costa Rica. The Pacific leatherback became the STS XXIV logo, and the centerpiece of a major global press campaign that reached several hundreds of millions of readers and TV and radio audiences worldwide (see Mast, MTN 104:15-19). The Burning Issues List validated the importance of that important conservation issue and elevated it to global-scale attention. The direct and indirect results of this ranged from enhanced public awareness of threats to sea turtles worldwide, to a declaration by Costa Rica’s President to enhance the protection of all marine biodiversity in that country by expanding protection in the marine realm (see Boza & Padilla, MTN 105:14-15).

These experiences provided solid evidence that the Burning Issues list could indeed be a valuable aid

to conservation, and the MTSG leadership decided that a greater attempt would be made to assess Burning Issues more effectively and on a more regular basis. This sentiment was echoed at the MTSG Annual General Meeting in Savannah, GA in January 2005, with several Members emphasizing the need to refine the methodology and solidify the criteria used for defining the Burning Issues.

Methods and Results of the BI2 Workshop

The workshop began with a discussion of the group's expectations and the main questions that we would attempt to answer over the subsequent days. These included:

- What are the criteria for defining the Burning Issues?
- How many Burning Issues lists do we want and what will the final products look like?
- How do we involve the entire MTSG community in defining Burning Issues?
- How often do the Burning Issues need updating?
- How do we evolve from subjective (expert opinion) to increasingly more objective criteria over time?

The group set upon its task, and soon decided that to keep the process moving ahead, we would use "expert opinion" as the principle criteria for determining the Burning Issues, such that the process does not stagnate as do so many conservation processes due to "analysis paralysis," or being put "on hold" until more data (that is never quite enough) can be generated. It was felt that our greatest asset is the expert opinion of the MTSG network as a whole, and that the best way to proceed is to tap further into this group by devising mechanisms for full membership participation.

After lengthy dialogue on the pros and cons of site-based priority-setting methodologies, such as the KBA approach used by CI, and on taxon-based methods such as those used very effectively by BirdLife International, we recognized that both of these are desirable, but they pose serious limitations when applied to sea turtles. Hence, we chose to focus our prioritization efforts on a threat-based methodology, universally used in Risk Management, which identifies "Hazards" (what threatens turtles?), then proceeds to "Exposures" (how

specifically are they affected?), examines the "Effects" (what is the effect of exposure to the hazard?), and finally results in a Judgment – a path forward for conservation action to address each Hazard.

The group developed a simple questionnaire that will be administered on-line by SEATURTLE.ORG and will allow the entire MTSG membership to participate in assessing the relative intensity of each Hazard in their region / ocean basin for each species, allowing us to fill-in the blanks concerning "Exposures." As we refined the list of broad and specific Hazards we used the following questions to guide our choices:

- Is this Hazard important to prevent sea turtle extinction?
- Is this Hazard important for conserving marine biodiversity?
- Is this Hazard relevant for implementing conservation actions?

The list of broad Burning Issue Hazards as defined by the group follows below, and this list is currently under review by the entire MTSG membership using an on-line survey. It will be subsequently refined based on the membership's response in order to provide a more concise view of the relative intensity of these Hazards, and prioritized laundry list of more specific sub-hazards to sea turtles globally and by ocean basin. This represents the first step in what will become a consensus-driven Burning Issues Assessment process in which the entire MTSG membership will participate regularly.

Burning Issues Assessment – Broad Hazards to Sea Turtles

Note: "Burning Issues" are defined as hazards that will result in decline, local extinction and / or prevent recovery of sea turtles.

Fisheries Impacts: *Sea turtles virtually everywhere are impacted by fisheries, especially longlines, gill nets, and trawls. The most severe of these impacts are bycatch mortality, habitat destruction and food web changes.*

Coastal Development: *Sea turtle habitats are degraded and destroyed by coastal development. This includes both shoreline and*

seafloor alterations, such as nesting beach degradation, seafloor dredging, vessel traffic, construction, and alteration of vegetation.

Directed Take: *Sea turtles and their eggs are killed by people throughout the world for food, and for products including oil, leather and shell.*

Pollution and Pathogens: *Marine pollution, including plastics, discarded fishing gear, petroleum by-products, and other debris directly impact sea turtles through ingestion and entanglement. Light pollution disrupts nesting behavior and hatchling orientation, and leads to hatchling mortality. Chemical pollutants can weaken sea turtles' immune systems, making them susceptible to pathogens.*

Global Warming: *Global warming may impact natural sex ratios of hatchlings, will increase the frequency of extreme weather events, and may increase the likelihood of disease outbreaks for sea turtles. Global warming will result in loss of nesting beaches, and cause other alterations to critical sea turtle habitats and basic oceanographic processes.*

Next, the BI2 Team set out to refine the Burning Issues lists of key Research Needs, Conservation Themes, and what became known as the “top ten list” of sea turtle conservation priorities by stock and region. These lists are being reviewed and refined, and will be presented publicly at the STS XXVI in Crete. We agreed that reviewing the Burning Issues annually in a small forum such as the BI2 workshop and the one convened in December, with an ever-changing cast of MTSG experts, would be desirable, and that every effort should be made to follow these gatherings with fine-tuning of the results by the entire membership, as we are doing for BI2.

Conclusion

It has been said that, “*If you do not know where you are going, then any road will get you there.*”

Arguably, the MTSG’s most important function is to map out the fastest and best roads that will lead to our vision:

MTSG Vision

We envision marine turtles fulfilling their ecological roles on a healthy Planet where all peoples value and celebrate their continued survival

We want to emphasize that setting priorities is not triage, but rather focus. We understand that there is a value in pure scientific research, whether its themes appear on our priority research issues list or not; just as we understand that all conservation efforts for sea turtles are worthy ones, whether they are *Burning Issue* priorities or not. What the Burning Issues provide is a road map to assure that while we are undertaking the rest of the work, we are not losing sight of what matters the most.

We also know that, “*all journeys begin with a single step,*” and we recognize that the Burning Issues are merely a single, first step; they are not perfect, nor can they ever be given Nature’s mystery, the incomplete understanding of sea turtles, and the subjective nature of our human analyses. In their imperfection however, lies their perfection, which is their currency, their *now-ness*. What the Burning Issues aim to be is a *snapshot* of what the world’s top experts in sea turtle conservation and biology believe to be our most important priorities, *today*. In the end, we have pledged to not allow sea turtle extinctions to occur on our watch, and the Burning Issues will help us to keep that promise.

Acknowledgements: The authors recognize the ready, willing, able and indefatigable members of the BI2 Team: Alan Bolten, Charlotte Boyd, Milani Chaloupka, Michael Coyne, Nancy FitzSimmons, Nat Frazer, Arlo Hemphill, Emily Howgate, Brian Hutchinson, Penny Langhammer, Dimitris Margaritoulis, Roderic Mast, Frank Paladino, Barbara Schroeder, Kartik Shanker, Manjula Tiwari, Sebastian Troëng, Tony Tucker, and Peter Paul van Dijk. Special thanks to Emily Howgate for serving as Rapporteur.

MROSOVSKY, N. 2003. Predicting extinction: Fundamental flaws in IUCN’s Red List system, exemplified by the case of sea turtles. <http://members.seaturtle.org/mrosovsky/>

Announcements

Developments under the IOSEA Marine Turtle Memorandum of Understanding

By the time this issue of the IOTN newsletter is distributed, the IOSEA Website (www.ioseaturtles.org) will have undergone a major transformation, to improve its functionality and appearance. Among the new features on offer:

- ❖ An appealing new look with a cleaner, more efficient presentation of a vast amount of useful current information; many of the pages have been set up to be “print-friendly”, to allow for instant generation of aesthetically-pleasing reports;
- ❖ A versatile search function allows users to query the entire website, including the archives and news stories, for particular keywords;
- ❖ The project database, containing some 50 entries, now has an integrated keyword search and sort facility that makes for a very powerful investigative tool;
- ❖ The “Useful contacts” list has also been transformed into a searchable, sortable database to increase its versatility;
- ❖ The functionality of the Online Reporting Facility has been improved to allow for quicker and even more sophisticated queries of national report data;
- ❖ The “What’s New” feature has been upgraded to allow for auto-generation of monthly messages to subscribers;
- ❖ The “Message Board” captures, in a central location, useful information and announcements; and
- ❖ “Headlines” appear in a more dynamic, space-saving display;
- ❖ A “Species Overview” section has been added containing, for the time being, basic information on the species covered by the IOSEA MoU, which will be expanded and upgraded systematically in the coming months;
- ❖ A link has been added to a new set of pages designed to contain specialized information on the Year of the Turtle - 2006 campaign (see below).

Behind the scenes, the management system for the website has been completely overhauled to allow for more efficient posting and updating of information on the site.

Apart from these improvements, the website retains all of the substantive features that users have grown accustomed to: the Interactive Mapping System (IMapS), the Electronic Library, the Flipper Tag Series, the Profile of the Month, regular news features, and a whole host of other information. The Secretariat encourages IOTN readers to take advantage of this unique “one-stop shop” for information on marine turtle conservation in the Indian Ocean – South-East Asian region.

Year of the Turtle - 2006

Next year has been declared the Indian Ocean – South-East Asia (IOSEA) ‘Year of the Turtle’ (YoT). This exciting campaign will raise awareness of the diversity of social, cultural, ecological and economic values of marine turtles, as well as the habitats on which they depend. The theme of the YoT, “*Cooperating to Conserve Marine Turtles – Our Ocean’s Ambassadors*”, is intended to stimulate collaborative, concerted actions to conserve and manage these threatened animals. The YoT has five separate objectives that will shape the activities of countries across the region:

- (1) To increase public and media awareness of the diversity of social, cultural, ecological and economic values of marine turtles - at international, regional and community levels.
- (2) To develop sound policies that recognize and emphasize the socio-economic benefits of conserving turtles, whilst ensuring that any traditional or other use of turtles is sustainable.
- (3) To conserve habitats of importance for marine turtles, through a new international initiative to create a network of key sites throughout the IOSEA region.
- (4) To highlight the urgent need to address the problem of fisheries by-catch, by increasing policy linkages between the objectives of the IOSEA Marine Turtle MoU and the interests of relevant regional fisheries management organisations.
- (5) To enhance funding and other forms of support available for marine turtle conservation and research in the IOSEA region.

The IOSEA YoT 2006 is shaping up to be a significant milestone for marine turtle conservation in the region, and interest continues to grow each day. The campaign will consist of numerous country-specific YoT events held across the region, coordinated under the IOSEA umbrella. The IOSEA Secretariat and a YoT Steering Committee provide overall direction and leadership for the campaign, but the YoT events to be held in each country are decided upon at national and local levels. With less than five months until the launch of the campaign, at the Meeting of IOSEA MoU Signatory States (SS4) in February/March 2006, the IOSEA Secretariat encourages all IOTN readers to get involved in this “once in a lifetime” campaign by nominating activities you would like to host in your country.

A range of projects is being developed to promote the YoT and ensure the year is a great success for the ongoing conservation of marine turtles. These include preparation of fundraising items, such as a YoT 2006 wall calendar, T-shirts and pens, and a collection of silver jewellery. These promotional products will be produced and distributed free to countries for use either as gifts or to raise funds for turtle conservation. Other initiatives include printing of postcards to help promote the campaign, and the development of a DVD highlighting the main issues facing marine turtles in the region. The latter will be suitable for use at YoT events, for soliciting potential sponsors and (in its shortened, public service announcement format) for raising public awareness. If significant sponsorship is secured, the IOSEA Secretariat proposes to develop a YoT documentary that could be screened on major cable TV channels across the region. Similarly an Ambassadorial Dinner, which would bring together regional Ambassadors to fundraise and celebrate marine turtles, could be a significant YoT event if financing is secured.

The Secretariat is also developing some longer-term conservation projects that will ensure that research and science continue to inform marine turtle conservation efforts well beyond 2006. A YoT tagging initiative could supply YoT numbered and registered titanium tags to countries in the IOSEA region that have been unable to develop or maintain

a comprehensive tagging programme. A YoT Leatherback/Tsunami Assessment project, already underway, will complete a detailed evaluation of the conservation status of the Leatherback turtle in the region post the December 2004 tsunami. Finally, an ongoing project to develop a comprehensive network of coastal and marine sites of importance for marine turtles in the region is expected to come to fruition in 2006. The sites will include important nesting, foraging, developmental and migratory habitats, and will serve as models of best practice that may be replicated throughout the region and elsewhere.

A YoT Steering Committee has been convened and is providing leadership for the overall direction of the campaign. Committee membership was determined at the Third Meeting of IOSEA Signatory States (Bangkok, March 2005), and its members are drawn from five Signatory States, one non-Signatory, two Advisory Committee members, one commercial organization and one intergovernmental body. The committee works remotely, chaired by Ms. Elisabeth McLellan (WWF International) and serviced by the YoT Organiser (Ms. Stephanie Dunstan).

The types of activities that countries across the region may conduct as part of the campaign is wide-ranging and open to suggestion. They could include the development of national marine turtle action plans, declaration of new protected areas, initiation or extension of long-term census work, tagging and release of satellite-tracked turtles, training workshops on fishery by-catch mitigation and public awareness-raising about marine turtles through print and audio-visual media. From the second half of October 2006, dedicated YoT web pages linked to the IOSEA Website will be the main source of information for YoT activities, containing a searchable calendar of all YoT events, as well as media briefings and a downloadable YoT logo. The IOSEA MoU Secretariat welcomes the participation and contributions of IOTN readers in the YoT campaign. Please use this opportunity to celebrate marine turtles and showcase to the rest of the world your work in helping to conserve marine turtles. If you have any ideas for events or activities you would like to conduct please contact the IOSEA Secretariat by email: iosea@un.org.

The Marine Turtle Newsletter (<http://www.seaturtle.org/mtn/>)

The Marine Turtle Newsletter is published quarterly (January, April, July, October) and distributed free of charge to over 110 nations and territories. Started over two decades ago, it remains the only periodical of its kind. Throughout the world, scientists and non-scientists alike rely on this humble but highly acclaimed publication for timely information concerning the biology, conservation, management, legal status and survival prospects of all species of endangered and threatened sea turtles.

The aims of the Newsletter, as articulated in the first issue, are:

1. to provide a forum for exchange of information about all aspects of marine turtle biology and conservation, and
2. to alert interested people to particular threats to marine turtles, as they arise.

Original manuscripts are welcome; peer-review is routine. Free and timely publication contribute to the vital role that the Newsletter plays in sea turtle conservation in many developing nations. Because most sea turtles are globally distributed and all are highly migratory, international availability ensures an open line of communication among scientists, conservationists, and policy-makers in multiple range states.

The Marine Turtle Newsletter is also published online <<http://www.seaturtle.org/mtn/>>. If you would like to subscribe or submit anything for publication contact the Editors Dr. Annette Broderick and Dr. Brendan Godley at mtn@seaturtle.org or by post at:

c/o Marine Turtle Research Group
Centre for Ecology and Conservation
University of Exeter in Cornwall
Tremough Campus
Penryn TR10 9EZ UK

Conservation and Society (<http://conservationandsociety.org>)

Conservation and Society' is a peer-reviewed interdisciplinary journal that aims to promote work on the theory and practice of conservation. Conservation and Society was initiated two years ago as an interdisciplinary journal to integrate conservation research from the natural and social sciences. Although the journal was originally visualized to have a focus on South Asia, its geographical scope has been expanded to include issues regarding conservation from developing countries around the world. The journal is committed to disseminating information in the developing world. **Free online access** is available for all articles and subscriptions are highly subsidised for Asia, Africa and Latin America.

Individuals are encouraged to become donor subscribers for which they will be credited on the journal as well as on the website. These donations subsidise free/discounted online access and hard copy distribution in the developing world. As we are trying to produce this journal independent of a publisher, individual donations are of critical importance in determining the future of the journal in terms of free online access and subsidized distribution in the developing world. Please visit the journal website:

<http://www.conservationandsociety.org> or email editor@conservationandsociety.org for further details and enquiries.

Editor

Kartik Shanker

*Ashoka Trust for Research in Ecology and the Environment (ATREE)
659, 5th A Main Road, Bangalore 560024. India.*

Email: kartik@atree.org

Editorial Board

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Bangladesh

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University of California, Davis, USA

Michael Coyne

Duke University, USA

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*Ashoka Trust for Research in Ecology and the
Environment (ATREE), India*

Sonya Sankaran

*Ashoka Trust for Research in Ecology and the
Environment (ATREE), India*

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CONTENTS

Editorial

- Kartik Shanker & A. Sridhar Editorial: Surmounting the people vs. parks conundrum - conservation lessons from marine resource management 1

Articles

- Vishwas Katdare & R. Mone Second successive year of the Marine Turtle Conservation Project in Konkan, Maharashtra 3
- Sabita Currimboys Turtle conservation & community development - Activities of the TREE Foundation 4
- S. Krishnapillai Threats to sea turtles on the Rameswaram Dhanushkhodi Coast 5
- P. Kannan and M. Rajagopalan Sighting of sea turtles in the Andaman Sea and Bay of Bengal 7
- Aarthi Sridhar & S. Gopal The OMRCC Update news on Indias first collaborative marine conservation initiative 9
- Matthew Godfrey and M. Hamann Recent research on sea turtles 11
- Sonya Sankaran, B. Tripathy & K. Shanker A bibliography of literature on sea turtles in India 15
- Dimitris Margarotoulis The 26th International Symposium on Sea Turtle Biology and Conservation Diverse Cultures, One Purpose (Island of Crete, Greece, 2-8 April 2006) THIRD ANNOUNCEMENT 34
- Roderic B. Mast, B.J. Hutchinson, E. Howgate & N.J. Pilcher MTSG UPDATE: IUCN/SSC Marine Turtle Specialist Group Hosts the Second Burning Issues Assessment Workshop 38

Announcements

- Developments under the IOSEA Marine Turtle Memorandum of Understanding 42
- The Marine Turtle Newsletter 44
- Conservation and Society 44

