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Rehabilitation of cold-stunned loggerhead turtles in Italy (Bentivegna *et al.* pp. 1-3)

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Cold Stunned Loggerhead Turtles in the South Adriatic Sea

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Fifty-five loggerhead turtles (*Caretta caretta*) stranded in the South Adriatic (41°55'N; 15°18'-15°50'E) during a 15 day period (20 Dec 2001 - 22 Jan 2002) of unusual extremely cold weather. The coast where the episode occurred is located between the Fortore river's mouth and the head of the Gargano peninsula. It is separated by a thin strip of land from two larger saltwater lakes (Lesina and Varano, figure 1). Daily minimum air temperature during the stranding period following a severe cold-front was on average 1.5°C (3.6°C less than the statistical reference value between 1981 and 1990, found in: <http://guide.supereva.it/meteorologia>).

In the Mediterranean sea, mass cold stunning episodes have never before been recorded although similar events occur in the Atlantic Ocean and Gulf of Mexico (Brongersma 1982; Meylan 1986; Morreale *et al.* 1993; Witherington & Erhart 1989).

The loggerhead turtles, 35 alive and 20 dead, were discovered and collected by field officers of the Capitaneria di Porto. It was evident that the stranded turtles were affected by the cold water. They were debilitated, moved lethargically and made feeble attempts to dive. Others floated. Carapace, plastron and in some cases the head and the beak of almost all turtles were covered with barnacles, and showed lesions suggesting mycotic infections. All live turtles were housed at the Institute for the Study of Coastal Ecosystems (National Research Council, CNR) of Lesina and tagged by collaborators of the Centro Turistico Studentesco (CTS). Most of the turtles weighed between 5 and 11 kg (mean = 9.3 kg) and only 2 individuals with larger body masses of 25.1 kg and 40.0 kg, respectively, were found (figure 2). The curved carapace length (CCL) ranged from 19.8 to 67.1 cm (mean = 41.7 cm). From these data it can be concluded that all but the largest turtles were definitely immature.

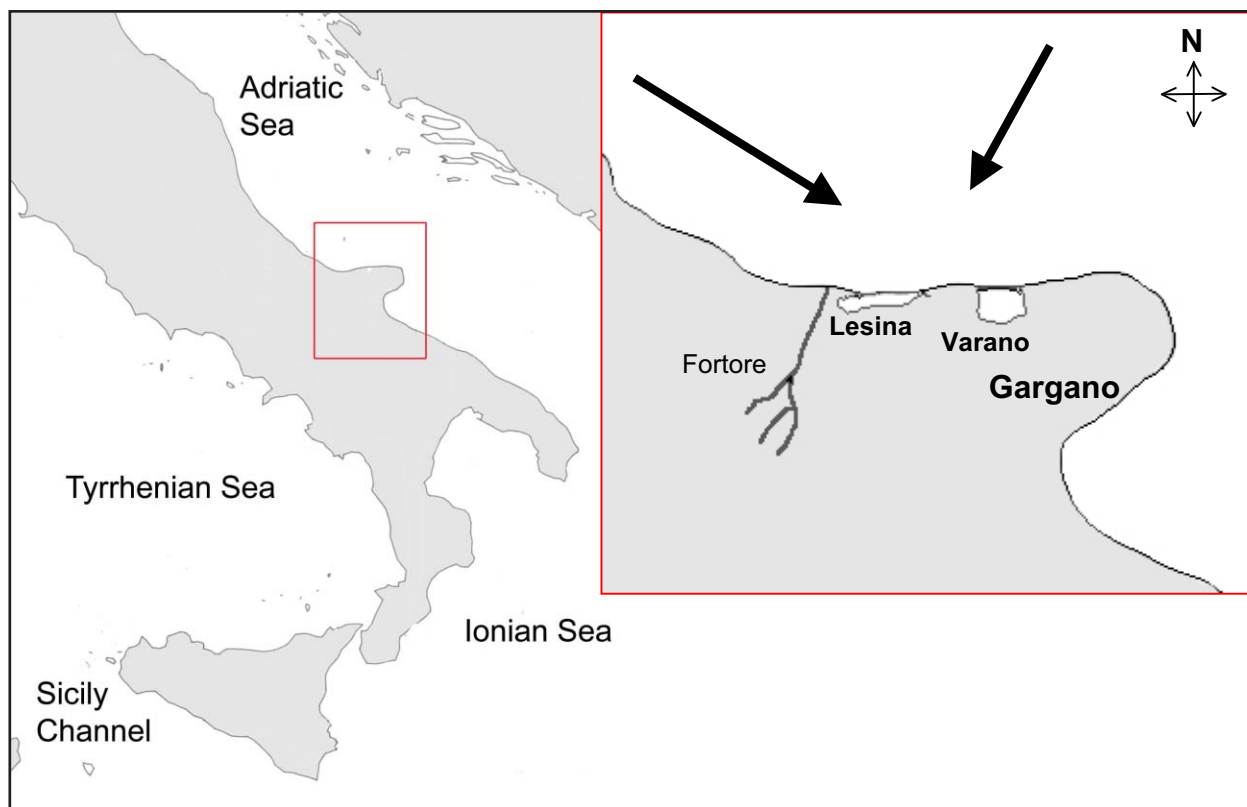


Figure 1. Strandings of cold stunned loggerhead turtles concentrated on a *ca.* 60 km long coastline between the Fortore river and the head of the Gargano peninsula. Arrows indicate prevailing currents.

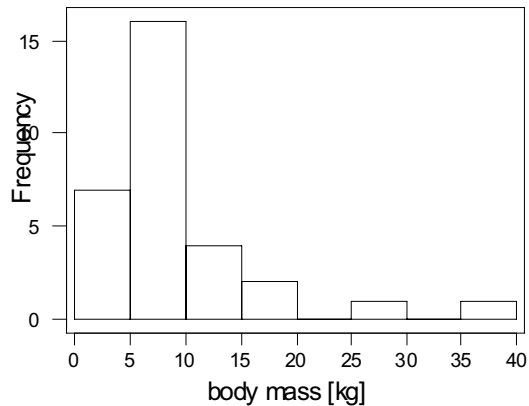


Figure 2. Frequency distribution of body mass of the stranded loggerhead turtles (n = 31).

On January 13th 2002, 18 of the rescued turtles were transferred to the Stazione Zoologica “Anton Dohrn” of Naples. They were kept in individual tanks with water of the prevailing temperature of the Gulf of Naples (15-17°C in January/February) and fed with anchovies. During the first month after the incident all turtles, except 2 which are under special medication, fed on average between 5 and 13 g per kg body mass each day. This can be considered as a normal feeding behaviour at this temperature range compared to food intake rates of other non-cold-stunned turtles which were housed in the Stazione Zoologica during the same period (F. Bentivegna personal observation). The turtles which had remained in Lesina were subsequently transferred to other host institutions: another 11 turtles were brought to Naples, 6 were taken by the World Wildlife Fund of Policoro-Herakleia and 4 were hosted by Oasi Blu of the Comune di Sperlonga.

At the time of writing almost all turtles seem to have recovered from the event. Two turtles died, one had ingested a fishing line, with the hook still attached, which lead to the convulsion of the whole intestine; the other one had a blood cystis in the lung. Most of the other turtles have commenced feeding and gained body mass accordingly. However, the extension of the myotic infections and the wounds, which are still not completely healed, require constant treatments. The group of the Zoological Station in Naples, including a veterinarian, is currently combating the mycosis using a purpose designed treatment regime. The aim is to release successfully rehabilitated turtles in May 2002 when the water temperatures have reached at least 18°C.

It is generally known that the cold stunning events happen when inshore marine turtle populations cannot avoid a sudden drop of temperature (George 1997). The

water temperatures in the Adriatic Sea remained high with average values between 19 - 21°C until 30 Oct 2001. Then in the following period temperatures dropped to between 11 and 15°C until 20 Dec 2001 (NOAA - CIRES Climate Diagnostic Center, <http://www.cdc.noaa.gov>). During the cold stunning period the water temperature in the area of the strandings was around 8.5°C (CNR Lesina).

It is possible that before the onset of the cold front some turtles were resident in the area while others originated from more northern regions. Indeed, the drop of water temperatures to critical values initiated in the North Adriatic Sea. In addition to this, the convergence of two currents in direction of the north coast of Gargano (one descending southwards along the Italian coastline and another crossing the Adriatic sea from the Dalmatian coast) may have contributed to the extraordinary number of strandings. In fact, the Gargano promontory protrudes across the Adriatic sea along an E-W axis. Thus the northern shore of Gargano intercepts everything in the sea which the prevailing NE and NNW winds blow southwards (figure 1). In this way turtles, already affected by low temperatures and unable to swim, may have been drifted passively by the current southwards were they were finally recovered.

Whatever the origin of these turtles, this event has shown the residence of immature loggerhead turtles during the winter in the Western Adriatic Sea. Previous surveys of stranded sea turtles have never, with single exceptions, reported turtles in this area during the winter months (Affronte & Gavanelli 2001; CSC 2000; 2001).

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Use of Pop-Up Satellite Archival Tags to Quantify Mortality of Marine Turtles Incidentally Captured in Longline Fishing Gear

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The incidental capture of marine turtles in longline fishing gear is generally accepted to be a significant factor contributing to the decline of sea turtle populations in both the Pacific and Atlantic Oceans (Heppell *et al.* 1999; NMFS 2001a). Pelagic stage juvenile hard-shelled turtles e.g. loggerheads (*Caretta caretta*) are generally hooked in the mouth, which presumably results from them actively biting the baited hook, whereas leatherback turtles (*Dermochelys coriacea*) are most often hooked in the flippers or become entangled in the fishing lines. While most turtles interacting with longline gear are eventually released alive, animals are often released with hooks remaining in their mouths, throats, gastrointestinal tracts, or flippers (Aguilar *et al.* 1995; Oravetz 1999). The ultimate effects of these hooks and the stress of capture are unknown. Rates of post-release mortality have not yet been adequately quantified, and available estimates remain highly controversial. Given the growth in U.S.-permitted longline fishing vessels in both the Pacific and Atlantic Oceans (Hoey 1996; Ito & Coan 1999) over the past two decades, the question of post-release mortality rates is of growing importance.

The assessment of sea turtle mortality attributed to hooking or entanglement is difficult and current estimates are based on a combination of known recorded mortality (i.e., the turtle was dead upon retrieval of the longline gear), cessation of transmissions from satellite tags (Parker *et al.* in press), and captive studies where

turtles hooked on longlines were placed in tanks and observed over time (Aguilar *et al.* 1995). Needless to say, the range of mortality estimates is extremely variable (ranging from 8 – 95% for loggerheads and leatherbacks), thus rendering a reasonable overall mortality rate following interactions with longline fishing gear undefinable (Aguilar *et al.* 1995; McCracken 2000; NMFS 2001a).

Our goal is to quantify the rates of mortality and morbidity in turtles released from longline gear by using state of the art pop-up satellite archival tags (PSATs). PSATs record data on swimming depth, water temperatures, and a daily estimate of geolocation (Hill & Braun 2001; Musyl *et al.* 2001). Originally designed to track the movement of large pelagic fish (Arnold & Dewar 2001; Lutcavage *et al.* 1999), PSATs can be programmed to automatically release after durations of up to two years after deployment, thereby providing an opportunity to determine long-term movement patterns and their associated physical environments. More important, however, PSATs will likewise release and begin transmission of stored data if the turtle either dies and sinks, or the tag is shed. Unlike conventional satellite tags, PSATs therefore provide data clearly differentiating mortalities from shed tags. Depth data collected by the tags may also be used to determine extent of morbidity following release.

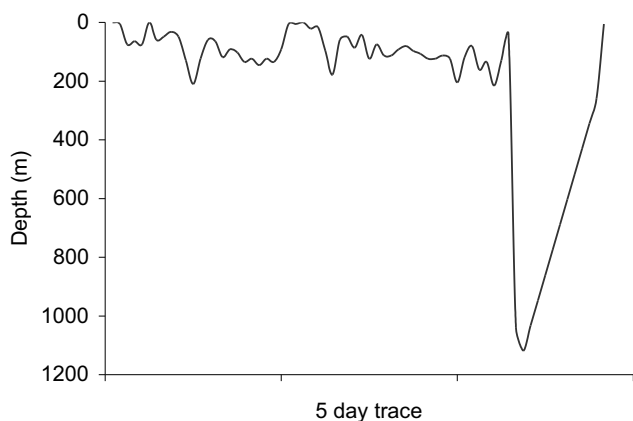


Figure 1. Depth data for a blue shark (*Prionace glauca*) tagged with a PSAT in April 2001.

Once at the surface, the tag will automatically transmit its archived data (including the pop-off location directly determined by ARGOS) to an overhead satellite. Some of the tags can conserve battery power by transmitting only when the satellite is in view (SIV). For a tag that has collected data for a year, it normally takes two to three weeks for the archived data to be downloaded.

In order to differentiate between the death of an animal and a shed tag, one can scrutinise depth data immediately prior to the tags release (and subsequent transmissions). We assume that if the tag is not released in response to a set parameter (e.g. at constant depth for 4 days, exceeds 1,500 m), and if the dive behaviour prior to the tag's transmission is considered normal behaviour, then the tag was simply shed.

In the absence of any mechanical/electronic failure or an unusual biological event (e.g., the tag is eaten by a shark), we are confident in the usefulness of PSATs for differentiating shed tags from mortality events. Our confidence is based partly on earlier success of tagging blue sharks (*Prionace glauca*). In a collaborative effort between the University of Hawaii and the National Marine Fisheries Service, 14 sharks were tagged with PSATs in the central Pacific following capture by longline gear. The tags were programmed to release at a depth (1200 m), which is well beyond the depth blue sharks would normally reach (Carey & Scharold 1990; Scarotta & Nelson 1977). The depth data record from one shark is shown in figure 1. The animal clearly exhibited normal movement patterns for the first five

days following release. After this point, it succumbed presumably to injuries sustained during the interaction with longline fishing gear. This is clearly evidenced by the sinking and eventual release of the PSAT at the programmed 1,200 m. We believe similar tag programming and function will be useful to indicate mortality events in marine turtles.

Given their longevity, PSATs also provide an opportunity to determine the long-term movement patterns of turtles and their associated physical environments (i.e., to correlate data on turtle dive-depth profiles and migratory routes with information on currents, sea surface temperatures, and primary productivity collected simultaneously by orbiting satellites). Collection of long-term data will, in turn, allow for the design of time-area fishery closures that are effective at reducing rates of turtle-longline gear interactions, but that are likewise acceptable to the fishermen.

We are currently employing PSATs designed by both Microwave Telemetry, Inc. (Columbia, Maryland, USA; www.microwavetelemetry.com) and Wildlife Computers (Washington, USA; www.wildlifecomputers.com). Algorithms used to estimate geographical positions from PSAT data are currently assumed to allow accuracy of $\pm 0.5^\circ$ longitude and $\pm 1.0^\circ$ latitude (Musyl *et al.* 2001), but double-tagging studies (i.e., placing both conventional platform terminal transmitters [PTTs] and PSATs on the same animal) are currently underway on leatherback turtles. The resultant data should allow us to better determine, and eventually further refine, the accuracy of light-based algorithms for providing daily geopositions from moving pelagic animals.

Attachment of PSATs to hard-shelled turtles

As PSATs had never before been used on marine turtles, our first task was to design an attachment method that would be strong, long-lasting, and non-harmful to the turtles. Furthermore, the chosen method had to be easily and reliably employed, even by inexperienced fisheries observers, under very difficult field conditions associated with small (generally less than 30 m) U.S. commercial longline vessels operating on the high seas. To meet all of these requirements, we designed a base plate that could be simply glued to the turtle's carapace, to which the tether to the PSAT is attached (photos submitted to editors and available from author). As the base plate must be resistant to crushing and loss of buoyancy at depth, we decided on a syntactic foam material designed to maintain its buoyancy down to 2,500 meters. The material, manufactured by Syntech

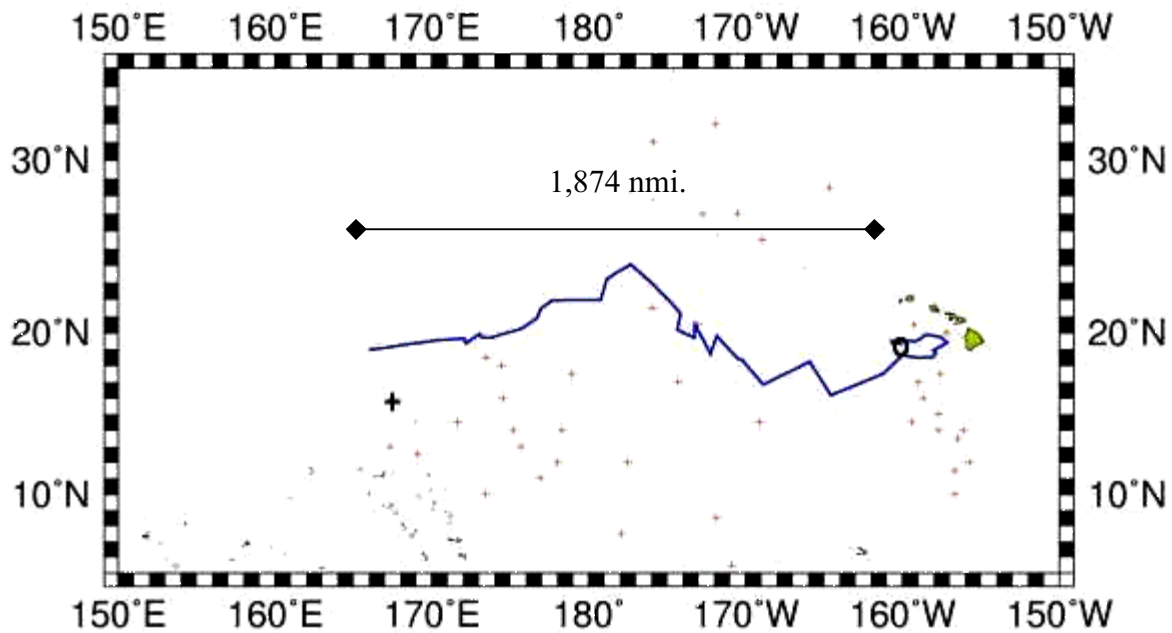


Figure 2. Preliminary daily geolocation estimates for an olive ridley turtle caught on commercial longline gear, fitted with a PSAT and released. Data generated for this graph have been analyzed using a state space Kalman filter statistical model, which was used to estimate geolocation errors, movement parameters and most probable tracks from the recovered data (Sibert *et al.* in press).

Materials, Inc., Springfield, Virginia, USA; www.syntechmaterials.com) is relatively inexpensive and easily fabricated into any desired shape using common tools.

We did find, however, that the length of the tether was critical. It had to be long enough such that the PSAT would float with its antenna upward (to allow successful transmission to an overhead satellite) in the event that the tag was shed with the base plate attached. Using a 123 kg (270lb) test fluorocarbon line, we found the minimum tether length to be 28 cm. To attach the PSAT and base plate to the tether, we used simple stainless steel crimps (available directly from Nicopress Inc.; The National Telephone Company, Cleveland Ohio, USA; www.nicopress.thomasregister.com) and that are matched to the diameter of the fluorocarbon line.

Most important, we have found that a simple marine epoxy (Marine Fix® Fast, Eclectic Products Incorporated, Houston, Texas, USA) to be highly suitable for attachment of the base plate to the carapace of hard-shelled turtles. It is inexpensive and available at local marine supply and home improvement stores. The two parts of the epoxy are simply mixed, and are then easily spread on the flat side of the base plate. The base plate is then applied to a relatively flat portion of the carapace, and gently pressed down. The epoxy

generally hardens enough within one hour (depending on ambient temperature) for the turtle to be released. Moreover, the epoxy will cure and adhere even if wet. In order to prevent the tag from sinking in the event that it is shed, the amount of epoxy used should be monitored. For example, with a 7.5cm diameter base plate, the amount of epoxy used should not exceed 165 g.) Furthermore, as the two-part epoxy needs only to be mixed in equal proportions, it is simpler to use than fiberglass resin. Our procedures and relevant observer training manual have been reviewed and approved by the NMFS Office of Protected Species.

We confirmed the suitability of this epoxy using four subadult green turtles maintained in captivity at the NOAA/NMFS Honolulu Laboratory Kewalo Research Facility. We found the dummy PSATS would remain attached for up to 9 months, but that the base plates could be removed by a firm tug on the tether. In other words, we found that the epoxy and foam base plate combination results in adequate adhesion to the carapace, yet still provides a margin of safety in that the PSAT will detach if it becomes entangled in marine debris. As important, we found no evidence of damage or obvious pathology in the area of the carapace covered by the base plate even after 9 months.

Practical Considerations PSAT Limitations

PSATs are designed to be deployed at sea by scientific observers, many of whom are likely to have little to no experience with sea turtles. Therefore, the PSAT attachment method described above is designed to provide the highest level of safety both to a turtle as well as to the person attaching the tag. There is some chance that adhesion with epoxy may allow the PSAT to detach sooner than if holes were drilled through the carapace and the tether “bolted” onto an animal. However, we prefer that the turtle have the ability to shed its tag, rather than risk it becoming trapped under a ledge or entangled in marine debris with the PSAT being so firmly attached as to prevent the turtle from freeing itself.

At present, the geolocation capabilities of PSATs are not as accurate and precise as conventional PTTs. Therefore for questions where fine-scale locations are required, PTTs are the more appropriate tool. For our purposes, however, one of the most important features of the PSAT is our resulting ability to differentiate between a shed tag from a mortality event, a situation not usually possible with conventional satellite tags, and for this, we sacrifice some fine scale geolocation resolution. Therefore, depending on the questions asked, use of a conventional tag may be preferred over a PSAT. For example, for use on marine turtles that live primarily in the neritic where fine-scale resolution of movement patterns is desired and where entrapment under ledges may be more likely than in the pelagic environment, a small conventional PTT glued to the carapace would likely be a better choice.

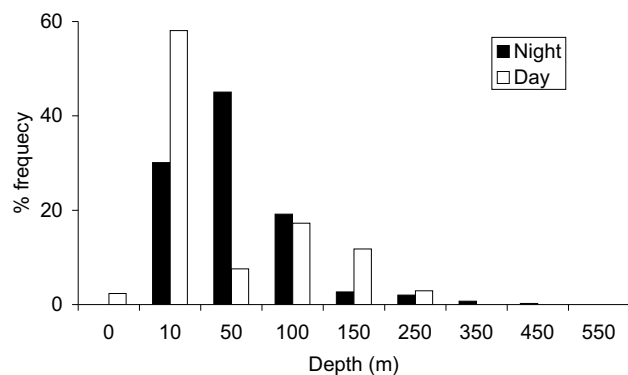


Figure 3. Histograms of time at depth (day and night) for an olive ridley turtle captured, fitted with a PSAT and released from a commercial longline vessel operating near the Hawaiian Islands.

Turtle successfully tagged at sea

On July 28, 2001, an olive ridley (*Lepidochelys olivacea*) was brought on board a Hawaii-based commercial longline vessel after being hooked in the mouth. The hook was not retrievable. The observer on board successfully applied a PSAT and released the turtle at 19° 22' N, 160° 7' W. The turtle was at liberty for 82 days before the tag was shed. During that time it traveled from 19° 22' N, 160° 7' W to 16° 1' N, 127° 30' W, indicating the turtle generally swam in a southwesterly (263°) course and covered a straight line distance of 1,874 NM (Fig. 2). (Detailed analysis of the actual daily geolocations of the turtle is still underway.) Histograms of dive-depth profiles (Fig. 3) indicate that during the day, the turtle spent nearly 60% of its time within the surface 50m, and in general, the turtle rarely exceeded depths of 250m. During the night, the turtle remained in somewhat deeper water, spending nearly 45% of the time between 10-100m. The maximum dive depth was recorded at 544 m, with a corresponding temperature of 4° C. More important, the data indicate that the turtle was still functioning normally after 3 months, despite the presence of the longline hook.

To date, observers on Hawaii-based commercial longline vessels have taken PSATs on over 55 longline trips over the last seven months. Because of current court-ordered restrictions on gear setting practices designed to reduce turtle interactions, the turtle described above has been the only one tagged with a PSAT within our program from the Hawaii-base longline fleet.

In an effort to tag a larger number of longline-caught turtles, we therefore recently traveled to Costa Rica where there is a substantial commercial longline fleet primarily targeting dolphin fish (dorado or mahimahi, *Coryphaena hippurus*) operating off the Pacific Coast. This fleet experiences a relatively high sea turtle bycatch (primarily juvenile olive ridley turtles). In collaboration with Randall Arauz (Central American Director, Sea Turtle Restoration Project), and with the full active cooperation of the commercial longline fishermen, we were able to deploy PSATs on four long-line caught animals. The severity of injury due to hooking differed among the four turtles was varied, and will eventually be correlated with data received from the PSAT. We were also able to capture three free-swimming juvenile olive ridleys. Turtles caught while free-swimming are especially valuable as data generated by these turtles will serve as true controls with which to compare the behaviour (and possible mortalities) of the hooked animals. The PSATs deployed were programmed to release after 6 or 12 months.

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Satellite Tracking of Post-Nesting Movements of Green Turtles *Chelonia mydas* from the Gangkou Sea Turtle National Nature Reserve, China, 2001

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Previously distributed widely throughout the waters of China and commonly found on nesting beaches in South China, green turtle (*Chelonia mydas*) regional breeding populations have declined dramatically in recent years. Presently only seven natural beaches in China are used by nesting green turtles. The single remaining mainland nesting beach is located in the Gangkou Sea Turtle National Nature Reserve (114°52'E, 22°33'N) in Guangdong Province. Since 1987, nesting turtles at this Reserve have been flipper-tagged annually, but to-date there are no records of sightings of these tagged individuals. In order to discover the post-nesting migratory routes and the foraging grounds of this nesting population, we recently tracked three individuals using satellite telemetry.

The Green Turtle Satellite Tracking Project at the Gangkou Sea Turtle National Nature Reserve began on August 17, 2001. Three green turtle females (numbered as 'Gangkou 1', 'Gangkou 2', and 'Gangkou 3') were equipped with Platform Transmitter Terminals, PTTs (Telonics, ST-6 Model) after successfully nesting in the Gangkou Reserve. Our PTT attachment procedures followed Schroeder *et al.* (2000). The following is a brief summary of the movements of each turtle also illustrated in figure 1:

'Gangkou 1' was deployed with a PTT (No. 10673, Duty cycle constantly on) on August 17, 2001. She left the breeding site on August 28th, 2001, at first traveling parallel to the coast in an easterly direction, and then detouring through oceanic waters in the south to reach

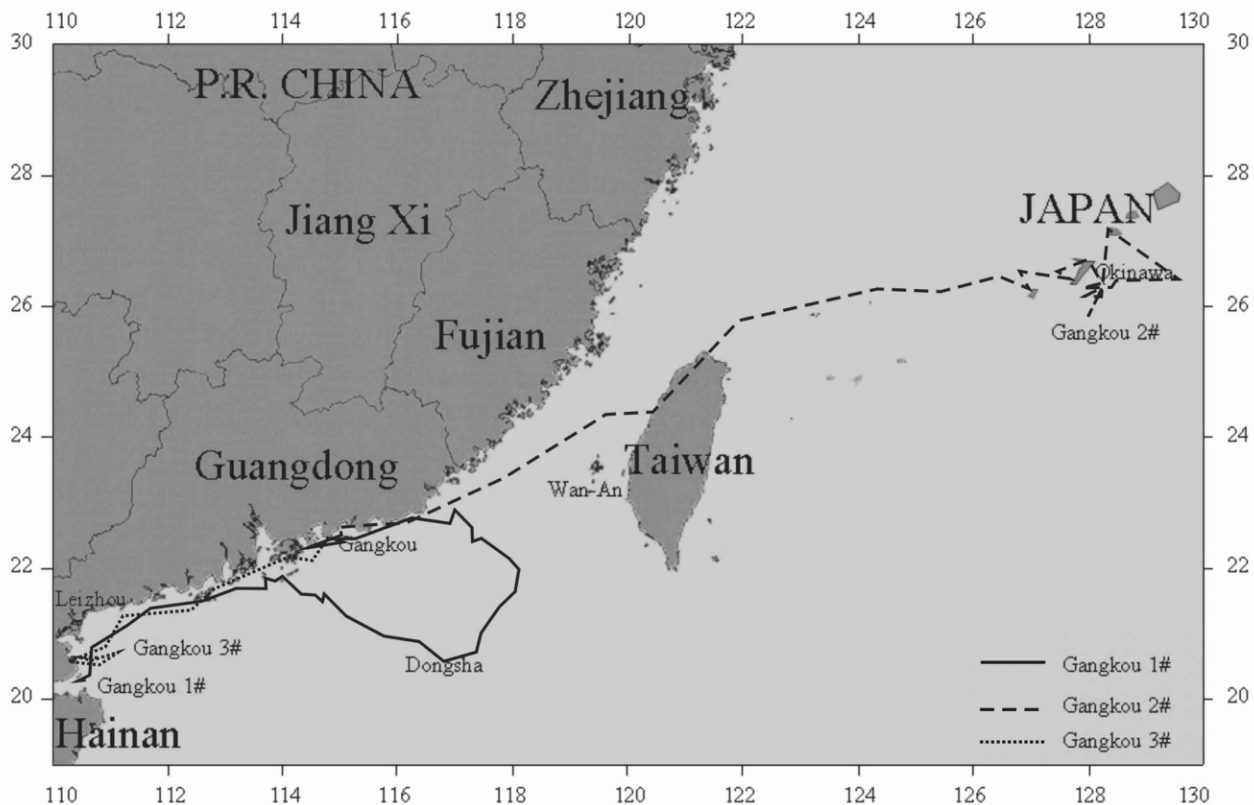


Figure 1. Routes of three green turtles tracked using satellite transmitters.

Dongsha Island, some 250 km southeast of Mainland China. She then began traveling in a northwesterly route towards the Mainland coast. Upon reaching the southwest coast of Mainland China, this female turtle continued to travel along the coast until she reached the waters near Leizhou Peninsula (111°38'E, 20°54'N) on September 23, 2001. The PTT ceased transmission on September 25, 2001. We were thus not able to ascertain with surety whether Leizhou Peninsula was her final destination. The total distance traveled by 'Gangkou 1' is estimated to be 1855km, and the average swimming speed was 3.0 km.hr⁻¹

'Gangkou 2' was deployed (Duty cycle 50%, 3 hours on, 3 hours off) on August 24, 2001. She left the breeding site on September 15, 2001 and initially moved northeastward along the Taiwan Strait, then moved along the northwest coast of Taiwan, before continuing her migration in oceanic waters in the same direction, eventually reaching Okinawa, Japan (127°13'E, 26°21'N) on October 9, 2001. As of December 5, 2001, the PTT was still transmitting data showing that the turtle remained in the waters near Okinawa. The estimated total distance traveled by 'Gangkou 2' was 1465 km and the average swimming speed during migration was 2.5 km.hr⁻¹.

'Gangkou 3' was deployed (No. 10676, Duty cycle constantly on) on August 28, 2001. She started her migration on August 29, 2001, moving along the southwest coast of Mainland China, and she arrived in the waters near Leizhou Peninsula (110°52'E, 20°55'N) on September 11, 2001. She remained there for 23 days until her PTT stopped transmission on October 4th, 2001. The estimated total traveling distance of 'Gangkou 3' was 484 km and the average swimming speed was 1.4 km.hr⁻¹.

The 3 turtles we tracked from the Gangkou Reserve migrated in two opposite directions, one direction was to the southwest to waters near the Leizhou Peninsula, China, and the other to the northeast to waters off Okinawa, Japan. Our results are similar to the migratory patterns of the green turtle population at Wan-An Island, 470 km northeast of the Gangkou Reserve. In that study, Cheng (2000) observed variable migratory patterns of post-nesting green turtles, with different turtles moving in different directions and traveling variable distances. Considering that 'Gangkou 1' made an unusual detour to the Dongsha Islands, which is another green turtle nesting site as reported by Cheng (1995), more studies, including mtDNA analysis, are needed to understand the relationship of the breeding populations at Gangkou

Reserve, Wan-An Island and Dongsha Island. The individual distances traveled by the 3 Gangkou turtles are comparable to those reported for yet another green turtle population in the South China Sea (Luschi *et al.* 1996).

Acknowledgements: The project was sponsored jointly by Guangdong Provincial Ocean and Fisheries Bureau, Knowledge Innovation Program of Chinese Academy of Sciences and Sea Turtle Reproductive Ecology Research Program of Guangdong Provincial Academy of Science. Mr. George Balazs, Leader of the Marine Turtle Research Program, National Marine Fisheries Service in Honolulu, USA and Dr C. H. Diong of Nanyang Technological University, Singapore, gave much help to start the project.

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Happenstance or Design: An Unusual Association between a Sea Turtle, Octocoral and Barnacle

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Marine turtles are known to attract and support a diversity of epibionts. At least 100 invertebrates have been listed as occurring on *Caretta caretta*, the loggerhead sea turtle (Caine 1986; Frazier *et al.* 1985, 1991; 1992, Frick *et al.* 1998, 2000) and we anticipate more species will be added in the future. The present study documents the unusual occurrence of two invertebrates on a marine turtle. As part of an ongoing project to tag and monitor loggerhead turtles that nest on the barrier islands along the coast of Georgia (see Williams & Frick 2001) we have also undertaken studies to understand the epibionts they support. Site selection on the host, density of predominant species and the effects of this fouling hopefully will provide information on the behavior and migratory paths of these tetrapod reptiles.

On the night of 31 May, during the 2001 nesting season, we had the opportunity to examine one particular female loggerhead (curved carapace length 97.5 cm, width 92.0 cm) who came ashore to nest on Wassaw Island (31°53.4'N/80°58.4'W) where she was outfitted with tag number SSX-238. This female aroused no special interest during her initial foray ashore on May 31, at which time she was fouled by the coronulid turtle barnacles *Chelonibia testudinaria* and *Ch. caretta* both of which were gravid (with several hundreds of eggs at a stage of early cleavage with 1-3 yolk-free blastomeres at the anterior end of a single yolk cell). SSX-238 came ashore again on June 15 hosting an octocoral sprig about 60 mm in height, situated on the 4th vertebral scute. The coral had a side branch about 12 mm in length, which had the distal end stripped off about 6 mm from the tip. On June 27 the octocoral had been almost wholly stripped, but at this time a barnacle had settled on the axial skeleton. The last trip ashore for SSX-238 was on July 10 at which time the octocoral and barnacle, now having a rostro-carinal diameter of 3.6 mm, were removed for further study.

Upon closer examination, we determined the identities of the octocoral and barnacle in question to be that of *Leptogorgia virgulata* and *Conopea galeata*, two invertebrates commonly known to associate as host and commensal throughout the southeastern U.S. The yellow or purple octocoral *L. virgulata* is a shallow-

water tropical to subtropical species that may range as far north as Chesapeake Bay. Octocorals have been documented to settle upon nesting sea turtles in Georgia and South Carolina (Caine 1986; Frick *et al.* 1998) but they are more commonly found attached to immobile hard substrata. In the present case having settled on a sea turtle suggests that the turtle may have been somewhat sedentary during her internesting periods.

The barnacle *C. galeata* is an obligate symbiont of octocorals. It typically has a boat-shaped basis that partly surrounds or clasps the branch upon which it settles. It is a tropical to subtropical species that ranges from the Gulf of Mexico to South Carolina. In the eastern Pacific it commonly settles only on the axial skeleton of octocorals that have been stripped of the coenchyme (Gomez 1973; Molenock & Gomez 1972), usually by gastropods. The tissues covering the axial skeleton apparently do not provide as secure an anchor for the barnacles and therefore they select the axial skeleton. Under normal circumstances, the regenerating tissue of its host substratum soon covers the barnacle.

Far too little is known about conopean barnacles to speculate that they only settle where browsing has exposed the axial skeleton. However, loggerhead turtles, as noted earlier, support a diverse assemblage of invertebrates, among which are several gastropod species. Whether or not these can be designated as responsible for preying upon the octocoral cannot be determined at this time. Nevertheless, by the time the octocoral was removed from its host turtle essentially all of the coenchyme had been removed by browsing and a *C. galeata* had settled upon the axial skeleton.

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Apparent Beach Basking of an Atlantic Green Turtle (*Chelonia mydas*) at Dry Tortugas National Park, Florida

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Dry Tortugas National Park (24°38' N, 82°52' W) is a remote cluster of islands located approximately 113 kilometers (70 miles) west of Key West, Florida in the Gulf of Mexico. The park encompasses seven islands within its 260 square kilometer (100 square mile) boundary. At 30 acres (12 ha), Loggerhead Key is the largest of the seven islands. The Dry Tortugas Sea Turtle Monitoring Program was initiated in 1995 to monitor and document all sea turtle nesting activity within the park. Since 1995, daily beach surveys have been performed during the green turtle (*Chelonia mydas*) and loggerhead turtle (*Caretta caretta*) nesting seasons.

On August 19, 2001, at approximately 11:30 a.m. EDT, a juvenile green turtle was observed just above the high tide line on the southeastern beach of Loggerhead Key at Dry Tortugas National Park (photos presented to editor and available from author). The event occurred shortly after high tide on the day of a new moon. The sex and exact length of the turtle were undetermined, but carapace length was estimated at 50 cm. Assuming it was injured, researcher Nicole Ryan lifted the turtle to examine it. The turtle began thrashing its flippers, at which time the researcher set it down and it rushed into the sea. The track width measured 55 cm. Two other crawls of the same width were found on the

same day along the eastern side of Loggerhead Key, presumably earlier crawls from the same turtle. No other green turtle tracks were documented on park beaches during the 2001 nesting season.

It is the first time in seven years of daily beach monitoring at Dry Tortugas National Park that an apparent basking turtle has ever been documented. Green (1998) noted "*It is noteworthy that apart from the avoidance behaviour of female green turtles on Ascension Island (Mortimer 1981) there are no accounts in the literature of basking in Atlantic green turtles.*"

Acknowledgements: Special thanks to Anne Meylan for sharing her vast knowledge of sea turtles as well as editing the text. Additional thanks to Russell Reardon for his editing skills.

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A Record of the Northernmost, Verified Leatherback Sea Turtle Nesting Event on the East Coast of the USA

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Three sea turtle species have been documented to utilize the coast of Georgia, USA for nest deposition. Historically, loggerhead sea turtles (*Caretta caretta*) are the most common nesters observed. Leatherback (*Dermochelys coriacea*) and green (*Chelonia mydas*) turtles have also been observed nesting in Georgia, but to a lesser extent (Dodd & Mackinnon 2000). In one instance, an adult female Kemp's ridley turtle (*Lepidochelys kempi*) was observed crawling on the beach at Blackbeard Island, Georgia (31° 28.4' N, 81° 13.1' W) but no nest was deposited (U.S. Fish and Wildlife Service/Savannah Coastal Refuges, unpublished data).

Since nesting emergencies by sea turtles other than loggerheads are relatively rare events in Georgia and most state projects do not conduct nighttime research activities, data associated with these events are scarce. Here we report data collected from an adult female leatherback as well as nest and hatchling information obtained on Wassaw Island, Georgia. See Williams and Frick (2001) for survey and data collection methodologies.

At 0000 h on the night of 29 May 2001 Caretta Research Project (CRP) staff observed an adult female leatherback nesting on the north end of Wassaw Island (31° 54.3' N, 80° 56.2' W). The turtle hosted several platylepadid barnacles (*Platylepas* sp.) along the anterior margin of the carapace and bore two, ~ 12 cm long and 2 cm deep, wounds on corresponding locations of both front flippers. These wounds were situated along the interior trailing edge of each front flipper close to where the flipper attaches to the body. The origin of these wounds is unknown but both appeared to be healing well.

The leatherback carapace morphometrics were 157 cm (CCL) and 114 cm (CCW). No tags or tag scars were visible on the turtle and no P.I.T tag was detected anywhere outside of the carapace region. The female was tagged with two inconel tags (SSX-233, SSX-240), one in each hind flipper, and a single pit tag (# 407D1F1B1D) in the right front flipper.

Since the nest was deposited at the high water mark in an area subject to frequent tidal inundation, the nest was relocated to a less dynamic area of the beach and further from the high water mark. The distance between the sand surface to the top of the nest cavity containing the eggs measured 55.5 cm deep. The nest contained 27 yolkless eggs and 76 normal eggs.

The nest hatched in 74 days with a 66% hatch rate (50/76 eggs, not including 27 yolkless eggs). Ten unhatched eggs contained dead embryos in various stages of development, 14 appeared to have no development whatsoever and 2 unhatched eggs were too decomposed to determine if any development had occurred. Fifty hatchlings emerged from the nest and no dead hatchlings were found during the nest excavation.

The morphometrics and mass of 24 leatherback hatchlings were recorded. Morphometrics were recorded in mm using Vernier calipers and all sand was removed from hatchlings using a small paintbrush. Straight carapace length (SCL) was determined by measuring from the nuchal notch to the longest point of the tapering, posterior carapace. Straight carapace width (SCW) was determined by measuring the widest portion of the carapace from marginal edge to marginal edge. Depth was determined by measuring the highest profile of the carapace. The average morphometrics recorded were SCL = 61.0 mm (range = 59 – 62 mm), SCW = 42.6 mm (range = 40 – 47 mm) and depth = 26.8 mm (range = 25 – 28 mm). Hatchling mass was determined using a spring scale. The average mass was 46.3 g (range = 44 – 49 g).

This was the first leatherback nest recorded for Wassaw Island since the CRP began monitoring sea turtle nesting activity in 1973. Additionally, ours is the northernmost, verified report of leatherback turtle nesting along the east coast of the USA (Seyle 1985). Only 9 leatherback nests, including the previously discussed event, have been documented in Georgia from 1981 –2001 (Mark Dodd, Georgia Department of Natural Resources, *personal communication*).

Currently, it is unknown how many individual leatherback turtles utilize the Georgia coast for nest deposition or if leatherback turtles nesting in Georgia also represent those individuals that occasionally nest in other areas of the southeastern USA.

Acknowledgements: We thank Randy Isbister, Charles Warnock, Robert A. Moulis, Peter Range, John Robinette, Barb Zoodsma, Mark Dodd, Adam Mackinnon, the Wassaw Island Trust, the Turner Foundation, the Shared Earth Foundation, the National Fish and Wildlife Foundation, the Pentecost Ecology Trust Fund – Savannah Presbytery, all of the volunteers who participated on the *Caretta* Research Project and M. Godfrey for his helpful comments.

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Leatherback Turtles in Mid-South Atlantic Waters

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Ascension Island (7°57' S, 14°22' W) supports the second largest breeding population of green turtles *Chelonia mydas* in the Atlantic, with between 13,000 and 15,000 nests in the 1998-99 season (Godley *et al.* 2001). Small numbers of hawksbill turtles *Eretmochelys imbricata* are also found in the waters around Ascension, but have not been observed nesting there. In December 2001 a single leatherback turtle *Dermochelys coriacea* was recorded about 1 km off the west coast of the island. In January 2002 the Master of the Royal Mail Ship *St Helena* observed a second leatherback turtle at 12° 47' S, 9° 10' W.

Leatherback turtles are typically found throughout the tropical and temperate waters of the Atlantic, with large nesting populations in western Africa and north-east South America (Spotila *et al.* 1996). That these are the first records in these waters may be a reflection of the low numbers of would-be observers in the region or low densities of leatherback turtles in the area. These observations add to satellite tracking studies that have reported the transatlantic movement of post-nesting leatherbacks from the Americas (Ferraro *et al.* in press).

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MEETING REPORT

Signs of Success: Fourth Annual Meeting of the Sea Turtle Conservation Network of the Californias (Grupo Tortuguero de las Californias)

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“A network is non-hierarchical. It is a web of connections among equals. What holds it together is not force, obligation, material incentive, or social contract, but rather shared values and the understanding that some tasks can be accomplished together that could never be accomplished separately. One of the important purposes of a network is simply to remind its members that they are not alone.”

(Meadows et al. 1992)

The 4th Annual Meeting of the Sea Turtle Conservation Network of the Californias was held in Loreto, Baja California Sur, Mexico, from January 25-27, 2002. Each year the meeting has taken place over the last weekend in January in Loreto, and with over 160 attendees this year, it has grown to over three times its original size in 1999. This year's event, organized by WiLDCOAST and the Grupo Ecologista Antares and sponsored by the World Wildlife Fund – Mexico, the David and Lucile Packard Foundation, Ocean Planet Research, IUCN, the Sea of Cortez International Preservation Foundation, Underwater Images Competition, and the Blue Planet Marine Research Foundation, carried the theme “Sea Turtle Conservation ~ The Next Generation” reflecting the progress the Network has made to date in its efforts toward sea turtle preservation along the 4,000 mile-long coastline of the Californias (California, Baja California, Baja California Sur, and the Gulf of California).

The Sea Turtle Conservation Network of the Californias is a web of local fisherman, concerned citizens, students and academics, researchers, and conservationists who work in their local communities to stop the devastation of sea turtle populations along the coast of the Californias. The yearly meeting of the Network gives the group's participants the chance to

review achievements, share new strategies, develop future goals, and spread the message of sea turtle conservation in hope of reversing the downward trend among turtle populations along the coast of the Californias. The Sea Turtle Conservation Network of the Californias (Grupo Tortuguero de las Californias) was formed on January 23rd 1999 at the office of the non-profit Grupo Ecologista de Antares, A.C. (GEA) in Loreto, BCS, “to bring together individuals and organizations working for the recovery of Californian sea turtles, to share knowledge, discuss results and issues, plan projects and conduct workshops on basic field research techniques.”

At risk in the region are five of the world's seven species of sea turtle, all of which are “threatened” or “endangered.” These include the loggerhead, East Pacific green (also known as the black turtle), leatherback, olive ridley, and hawksbill turtles. Even though the killing of sea turtles has been outlawed in Mexico since a 1990 presidential decree, researchers estimate that poachers in the Californias kill up to 35,000 sea turtles a year. The slaughter takes place to feed an increasing demand for turtle meat that has tragically kept pace with population growth in northwestern Mexico and southwestern U.S.

The first morning of this year's conference, groups within the Network presented updates on their respective communities which included: Bahía de Los Angeles, Bahía de Magdalena, Cabo San Lucas, Guerrero Negro, Laguna San Ignacio, La Paz, Loreto, Monterey Bay, Múlege, Punto Abreojos, Mazatlan, Sinaloa, San Diego and Monterey, California, and Colola, Michoacán. Miguel Lizarraga's summary of activities in his community of Puerto San Carlos reflected the efforts taking place in many of the communities. These included: increased vigilance, the mounting of educational campaigns, freeing incidentally captured turtles,

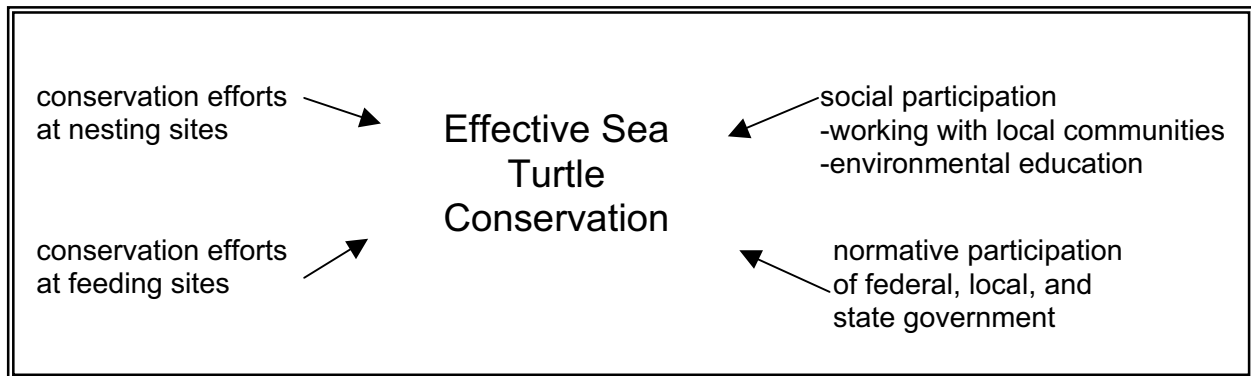


Figure 1.

discouraging the use of nets in areas frequented by turtles, development of a community sea turtle reserve, and working to expand collaboration with police and other authorities.

Representatives from other groups were able to add to this by recounting their own experiences. The Cabo San Lucas members highlighted the fact that over the past year they had established relations with a local ecotourism outfitter, finding a way to incorporate turtle observation into the company's repertoire of activities. Alfredo Gutiérrez from the Bahía Loreto group showed data collected in the local community based on monitoring campaigns of dead turtles. By looking through refuse sites, the researchers were able to record where shells had been discarded, and assumedly, where sea turtle meat was being consumed. This information could then be used to more accurately target efforts towards education and law enforcement. Students from Múlege and Laguna San Ignacio detailed their efforts at educating primary and secondary school children on the status of sea turtles. Similarly, Hans Fernan of WiLDCOAST in San Diego described his efforts to bring attention to the San Diego Bay's 60 resident green turtles, organizing a poster contest for local school children. While the representative from Bahía de Los Angeles noted that the community's remoteness provided a natural protection for the turtles, current plans of the Mexican federal government to build an *Escalera Náutica*, or Nautical Ladder, complete with resort hotels, golf courses, marinas and trailer parks promise to shatter this protection. On a positive note, representatives from Michoacán, kept away from the meeting due to current research efforts, forwarded on a slide graphing the

numbers recorded of nesting black turtles in the area. From 25,000 in 1970, the numbers plummeted to 4,000 in 1979, 2,000 in 1981 and bottomed out at less than 500 in 2001 until a rise in the 2001-2002 season, during which approximately 2,500 nesting females were counted. The reported noted that this increase in nesting turtles is in part due to the work of communities represented in the Network and conservation efforts focused on black turtle feeding and nursery areas.

In the afternoon sessions, representatives from the six established monitoring groups shared their techniques and results in capturing, tagging, and releasing turtles. Following this, Raquel Briseño of Sea Turtle Information Bank (BITMAR) presented a report on the state of conservation in the Mexican Pacific in which she presented a graphic represented by Figure 1. While the information contained within may seem obvious, it clearly summarizes the need for a multi-faceted "conservation mosaic" approach to achieving successful sea turtle conservation, reflecting many of the efforts made by the local groups in the Sea Turtle Network (Nichols *et al.* 2000). The following day the conference concluded with workshops on: Sea Turtle Identification, Procedures and Reporting for Stranded Turtles, Basic Research Techniques, Eco-Tourism, and Environmental Education.

In summary, the meeting brought to light several distinct themes. The first of these, and most germane to the successful development of the Network itself, is the importance of active local participation. Without the dedicated work of local fishermen and residents, efforts towards sea turtle conservation in the Californias would undoubtedly fail. WiLDCOAST and the Network have

developed an effective model achieving regional environmental gains by working at the local level. The second theme is that successful sea turtle conservation remains dependent upon the four-pronged assault of nesting site protection, protection of feeding and developmental sites, community education, and government participation. This leads into the third theme of institutional failure. In the end, Non-governmental organizations (NGOs) can only go so far in filling the vacuum created by ineffective government agencies. Without adequate resources, agencies such as PROFEPA will remain crippled, and altogether unable to fulfill their mandate of enforcing environmental regulations. The last theme of the meeting is that in addition to being a cultural issue, in the end, sea turtle conservation is an economic problem. Without alternative, sustainable development options, and resources to support conservation and management actions, turtle poaching will continue until ultimately,

the populations collapse. Those who make and influence policy should keep in mind each of these themes when attempting to address the issue of sea turtle conservation.

A complete meeting report, including abstracts of presentations and discussion notes will soon be available on the Wildcoast web site <<http://www.wildcoast.net>>.

The Fifth Annual Meeting of the Sea Turtle Network/ Grupo Tortuguero de las Californias will be held on January 24th-26th, 2003 in Loreto, BCS. Contact authors for details.

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NICHOLS, W. J., K.E. BIRD & S. GARCIA. 2000. Community-based research and its application to sea turtle conservation in Bahia Magdalena, BCS, Mexico. *Marine Turtle Newsletter* 89: 4-7.

ANNOUNCEMENTS

23rd Annual Symposium on Sea Turtle Biology and Conservation Kuala Lumpur, Malaysia 17-21 March, 2003

Nicolas J. Pilcher

President, International Sea Turtle Society, STS 2003 – KUALA LUMPUR, MALAYSIA

Dear Colleagues and Friends:

It is my pleasure to formally announce the upcoming 23rd International Sea Turtle Symposium, to be held at The Legend Hotel in Kuala Lumpur, Malaysia, from 17 to 21 of March, 2003, and to invite you to submit your papers for presentation. I look forward to personally welcoming each of you to this important event, which due to its venue location, brings with it many changes and, I hope, a new experience to all. This meeting will be hosted by the Community Conservation Network, WWF-Malaysia and the Department of Fisheries, Malaysia.

Adopting the theme "Living With Turtles", the meeting aims to bring together the world's foremost turtle biologists and conservationists, government, fisheries and indigenous community representatives, and people

who just love to love turtles, in a geographical setting that befits the migratory nature marine turtles. The much-anticipated move to a distant venue is finally upon us, and preparations have started in earnest to assure each of you a Symposium that is both informative and educational, but more importantly, one from which you will take home lessons from a part of the world which has been underrepresented in past meetings, and with which you can share your experiences and knowledge.

For those of you who will be undertaking your first long-distance migration, and for those who will be re-migrating, I assure you it will be a most worthwhile effort. The Legend Hotel has assured us they will provide the utmost in facilities and service to make this a memorable event. Kuala Lumpur itself, gateway to the

far east, offers wonderful opportunities to learn of new cultures and people in a country where different religions and ethnic origins coexist in peaceful and harmonious freedom. Just out of Kuala Lumpur await a myriad treasures: Taman Negara, a world famous, pristine rainforest reserve; Kuala Selangor, bird watching heaven and home to the synchronised fireflies; Malacca, ancient trading post and gateway to Asia for many ethnic groups; the list is endless. I assure you a trip to Malaysia will be more than just a Sea Turtle Symposium, it will be a memory of a lifetime. And just think, you'll be helping turtles, too.....

While the final details are being ironed out, I offer below some glimpses of what is in store. I look forward to a productive and informative gathering, to welcoming old friends, and to making many new ones.

Sincerely,
Nicolas J. Pilcher

Associated Events

One of the highlights of the meeting will be a mini-symposium on the interactions between indigenous cultures and marine turtles, at which we hope to bring together people from each major stakeholder group. The meeting will also help host the 10th Reunion of Latin American Sea Turtle Specialists (for additional details about these meetings, please contact Alejandro Fallabrino <afalla@adinet.com.uy>), and we will also welcome meetings of the Mediterranean Sea Turtle Specialists and the Reunion of West African Specialists and other regional groups prior to the symposium should they wish.

Schedule of Events

March 16th (Sunday):

10th Latin American Sea Turtle Specialists Reunion begins

March 17th (Monday):

Check-in and Late Registration
10th Latin American Sea Turtle Specialists Reunion continues
Regional and Other Meetings
Late Registration begins
Social Gathering

March 18th (Tuesday):

Late Registration continues
Oral and Poster Sessions begin

March 19th (Wednesday):

Oral and Poster Sessions continue
Live Auction

March 20th (Thursday):

Oral and Poster Sessions continue to 3:00 pm
Plenary Session
STS 2003 Banquet

March 21st (Friday):

IUCN Annual General Meeting
Field Trips

The Meeting Venue

The 23rd Annual Sea turtle Symposium will be held in the Legend Hotel, at Putra Place, 100 Jalan Putra, 50350 Kuala Lumpur, Malaysia. The Legend Hotel has 620 rooms, a number of fine restaurants and lounges, and offers a fully serviced business center, recreation facilities, and a host of other services. A forty minute ride from Kuala Lumpur's International Airport (KLIA), the hotel is close to the city's main commercial district, and the KTM commuter train and STAR Light Rail Transit stations are just downstairs. Learn more about the hotel at <<http://www.kl-hotels.com/legend-kl/>>

Getting There

Malaysia Airlines offers non-stop services from many European capital cities, from South Africa and Mauritius, a number of cities in Australia, several places in the Middle East, all over South and Southeast Asia, and from Los Angeles in the USA. In addition, Singapore Airlines fly to a number of major cities around the globe, and offer a nearly hourly shuttle service to Kuala Lumpur. These two will probably be among the cheapest and most accessible airlines to bring you to the Symposium. From the USA, Northwest Airlines also fly to Kuala Lumpur, and a number of European carriers fly to both Kuala Lumpur and many US destinations, offering alternate travel routes.

We are currently negotiating discounted fares and will advise on these shortly. I would urge all of you to make bookings and purchase tickets early, as there are savings to be made on many tickets purchased in advance. Remember, while the ticket costs may be higher than hoped-for, the costs once in Malaysia will be drastically lower. Take for instance the Hotel rate, at just US\$ 45 per night all inclusive! Think also that this trip can not only get you to the 2003 STS, but to the experience of a lifetime, and what better way to look at things...

Once there, the Kuala Lumpur International Airport (KLIA) is about forty minutes from the city itself. There is a train shuttle service from the airport that will bring you to Sentral Station in Kuala Lumpur, from which you can take a taxi or a Light Rail Transit train to the hotel. Alternatively, taxis can be taken from the airport for about US\$ 20 each way (if a few people share, this can be a cheap easy way to get to the hotel).

Fare-Hunting and Reservations Assistance

In a new move for the Society, we will be teaming up with an international travel consultant, Morrison International, who will be assisting attendees in getting low fares to Kuala Lumpur and making flight reservations. Their web designer is currently adding a page to their web site <<http://www.morrisontravel.com/>> that will have an online booking form and a faxable form. I will post announcements on this shortly. There will be a page with the zone fares from North America and the Caribbean to Kuala Lumpur along with fares from the South American, European, Asian and Australian gateways. Symposium attendees just need to click on the logo for the symposium and they will be taken directly to the site. The Agency can also help with side trips, pre or post tours and anything else to help you travelers. Symposium participants will now be able to book online, via fax or direct with Morrison International. They will attempt to offer zone fares starting around \$750.00 (we will have the exact fares soon for all the zones and the cities in each zone) that will be published on their website, along with international destinations. Morrison International has been in services for over 50 years and has one of the best reputations in the travel industry with suppliers and clients, and their agents average over 15 years serving as travel consultants. We hope this will be a great help to all of you who will be coming so far to be with us in 2003.

Visas

Visas to enter Malaysia are only required for nationals from Bangladesh, Bhutan, India, Pakistan, Sri Lanka, Myanmar, Nepal, Nigeria, and the People's Republic of China. An additional Special Approval must be sought for a Visa by nationals from Israel and Yugoslavia. Other countries not listed above do not require a visa for social/business visit for a stay not exceeding one month.

Field Trips

Details on departure times and costs will be announced soon. However, please note that all field trips will take place *after* the last meeting (the IUCN meeting on the 21st), giving everyone the opportunity to attend at least one of the field trips. We might also schedule some of the trips on Saturday 22nd to give people an opportunity to participate in more than one trip.

Malacca Old Town / Turtle Information and Management Center: Hosted by WWF Malaysia and the Department of Fisheries, this trip will take you about two hours south of Kuala Lumpur to the magical city of Malacca. Here, traders came together in years past to form a melting pot of cultures and bring their own unique signatures on life, religion, cuisine and architecture, much of which is preserved today. A stop at the Turtle Information and Management Center will provide an insight into local educational and conservation campaigns to protect marine turtles.

Batu Caves: A short thirty-minute trip north of Kuala Lumpur and a mere climb of 272 steps are the impressive Batu Caves, site of a local Hindu temple and pilgrimage destination during the celebration of Taipusam, the Hindu festival of faith and endurance celebrated in Malaysia, Singapore, Mauritius, and South Africa.

Selangor Bird Sanctuary and Fireflies: Departing in the late afternoon, this trip will take you out to the coast to a wonderful mangrove and forest reserve, where migrating and resident birds abound. As the sun sets, you will proceed to the Selangor river, where you will be quietly rowed among the mangrove trees to observe the fireflies, which in a uniquely manner blink in synchrony, with one tree lighting up after the next.

Bird Park / Orchid Park: Within the city limits, the bird park is a massive enclosed area containing hundreds upon hundreds of species of birds in a carefully designed enclosed landscape. The Orchid Park, just across the road, offers a colourful view of the many orchids available in the far east, and even offers small cuttings and adult plants for sale. The National Planetarium, Butterfly Park and Tun Abdul Razak Memorial are all nearby.

Kuala Lumpur Treasure Hunt: For the first time ever, the Sea Turtle Symposium will host an exiting city-

wide treasure hunt with prizes for the lucky winners. The hunt will take you to a number of the city's key attractions, where you will be handed the clue to your next destination, giving you a first-hand glimpse of the wonders of Kuala Lumpur.

Call for Papers

While final details are being worked out, we would like to invite you to submit oral and poster presentations, which will be accepted until 15 November 2001. The programme committee will review each presentation and attempt to schedule a single session for most of the meeting, but for this we urge you to submit posters where possible, giving us more time to prepare a talk schedule from which you will get the very best of turtle biology and conservation.

If possible, please use the Symposium web site <<http://www.seaturtle.org/symposium/>> for your abstract submission. If you cannot access the Symposium web site, you may submit your abstract in one of three alternate ways: (1) as a text file attachment (other formats cannot be accepted) to an e-mail sent to <abstracts@seaturtle.org> - please note this e-mail account is for abstract submission only; (2) via fax sent to + 680-488 8730; or (3) via snail mail sent to Sam Sadove, Program Chair, Puffin Consulting, Inc. P.O. Box 361 Jamesport, NY 11947, USA. If you are not submitting your abstract over the web, you must include the following information, in this order, along with your abstract:

1. Name of presenting author.
2. E-mail of presenting author (strongly recommended).
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. Please place each author name on a separate line.
7. Author(s) affiliation(s) in the same order as above. Please clarify any multiple affiliations.
8. Abstract (in English) describing your presentation (250 words maximum).
9. Type of presentation you prefer to make (oral, poster, either oral or poster, or video/film).
10. Equipment needed (slide projector, overhead projector, computer projector system with MS Power Point or Corel Presentations, video tape player).

11. 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.

Resolutions

If you wish to submit a Resolution to be considered by the Board of Directors and the International Sea Turtle Society, please follow the guidelines presented at to the Symposium website for the submission of resolutions:

<<http://www.seaturtle.org/symposium/resolutions/>> or e-mail: <resolutions@seaturtle.org> for a set of guidelines. Complete the required fields and supply any additional information related to the proposed resolution. For submission via e-mail please send Resolutions to the following address: Resolutions Committee <resolutions@seaturtle.org>.

Symposium Registration

You must register to attend the Symposium. The preferred registration method is to visit us online at the Symposium's web site: <<http://www.seaturtle.org/symposium/>>. There you will find everything you need to know about the Symposium in addition to a user-friendly interface for Symposium registration. Please help us by registering via the Internet. However, if you do not have Internet access you may also register by post mail. If you cannot register at the Symposium web page, complete the following forms and send them to:

Carmen Leong
Symposium Registration Coordinator
PO Box 1017
Koror, Palau
Tel/Fax: ++ (680) 488 8730
E-mail: ccn@palaunet.com

Contact Carmen for all questions about registration and hotel accommodations.

REGISTER EARLY...DON'T WAIT..DO IT NOW!

Register on-line at:
<<http://www.seaturtle.org/symposium/>>

Alternatively, complete the following form and e-mail to Carmen Leong <ccn@palaunet.com> or fax to ++ (680) 488-8730

REGISTRATION FORM

PLEASE REGISTER ON-LINE AT: <<http://www.seaturtle.org/symposium/>>

First Name: _____ Last Name: _____ Name for Badge: _____

Post or Position: _____ Title (e.g., Dr., Mr., Ms.): _____

Institution or Affiliation: _____ Abbreviation of Institution: _____

E-mail Address: _____

Mailing Address: _____

City: _____ State: _____ Postal Code (Zip Code): _____

Country: _____ Country Phone Code (e.g., USA = 1): _____

Phone # with City/Area Code: _____ Fax # with City/Area Code: _____

require Spanish <=> English translation require French <=> English translation.

need a room reserved need roommates need a personal letter of invitation.

Payment Information (in US\$):

Pre-registration Prepayment (received by 1 February 2003) (Non-Student)* \$80 _____

Pre-registration Prepayment (received by 1 February 2003) (Student)* \$45 _____

Late Registration (received after 1 February 2003) (Non-Student) \$125 _____

Late Registration (received after 1 February 2003) (Student) \$65 _____

Social Gathering (food and drink provided) \$15 _____

Awards Banquet (Non-Student) \$30 _____

Awards Banquet (Student) \$20 _____

Coffee Break Sponsorship (acknowledgment in program & at break site) \$1,500 _____

Coffee Break Co-Sponsorship (with similar acknowledgment) \$500 _____

Vendor Table, 2.5 x 6.0 ft or 76 x 183 cm (For-Profit Organization) \$200 _____

Vendor Table, same size (Not-For-Profit Organization) \$75 _____

TOTAL PAYMENT in US\$ (fill in amount) \$ _____

*Individuals that pre-register but who will have difficulty prepaying by 1 February 2003 should contact Nicolas Pilcher, President, International Sea Turtle Society, by e-mail at nick@dominomail.unimas.my, fax at +(680) 488-8730, or post mail at Community Conservation Network, PO Box 1017, Koror, Palau, to request and explain the need for a waiver of the late registration fees.

Payment Method:

Check or Money Order Enclosed (make check or money order payable to International Sea Turtle Society)

Credit Card Payment: Card Type (Visa, MasterCard, Discover, or American Express) _____

Credit Card Number: _____

\$ Amount Authorized: _____

Cardholder Signature: _____

Travel Awards

The Travel Committee for the 2003 Symposium are pleased to announce that limited travel funds are available to assist participants in their efforts to attend the 2003 Symposium in Kuala Lumpur, Malaysia. As in previous years, awards should not be expected to cover the full cost of symposium travel. Priority will be given to those who will be presenting papers or posters, those who apply before the deadline, 15 November 2003, and to individuals from relatively under-represented regions. The committee looks favorably on those who demonstrate efforts to secure additional sources of travel funds or matching grants. If you are in need of assistance for travel to the 2003 Symposium in Kuala Lumpur, apply via the symposium web page before the deadline. No late applications will be considered.

Applicants should follow this procedure:

1. Register for the symposium
2. Submit your abstract to the symposium for consideration (required for travel applicants from USA and Canada)
3. Using your symposium registration number, complete the online travel grant application in full, prior to the 15 November 2001 deadline.

Applicants should apply to the region from which he/she is traveling from NOT where the research was conducted. Awards will be announced by February 1, 2003, and all recipients are expected to apply for VISAS immediately upon award if they have not already done so.

Please contact the appropriate Regional Chair with any questions. It is greatly preferred that all correspondence is carried out by e-mail/internet; however, if this is impossible to access an online computer, applicants can make contact with their Regional Chairs by fax. Grant recipients are expected to attend the entire symposium.

Travel support contacts:

Travel Chair:

Jeffrey A. Seminoff <seminoff@zoo.ufl.edu>

Fax (USA): +352 392 9166

Africa:

Angela Formia <formiaa@cardiff.ac.uk>

Fax: (UK) + 44 2920 874 305

Asia and Pacific:

Nicolas J. Pilcher <nick@dominomail.unimas.my>

Fax: (Palau) +680 488 8730

Caribbean (English-speaking):

Karen Eckert <widecast@ix.netcom.com>

Fax: (USA) +858 451 6986

Europe:

Brendan Godley and Annette Broderick
<MTN@swan.ac.uk>

Fax: (UK) +44 1792 295 447

Latin America and Spanish-speaking Caribbean:

Ana R. Barragan <arbr@mixmail.com>

Fax: (México) +52 525 676 5502

USA and Canada:

Alan Bolten <abb@zoo.ufl.edu>

Fax: (USA) +1-352-392-9166

Travel Grants to Attend the 22nd Symposium on Sea Turtle Biology and Conservation in Miami, FL, USA

Jeffrey A. Seminoff

*Archie Carr Center for Sea Turtle Research, Department of Zoology
University of Florida, Gainesville, Florida (E-mail: seminoff@zoo.ufl.edu)*

The 22nd International Symposium on Sea Turtle Biology and Conservation has come and gone and we can look back on another successful meeting. With the regional specialist meetings for Latin America, Mediterranean, West Africa and WIDECAST, workshops on beachfront lighting and sea turtle anatomy, and special sessions on the Black Turtle and Sea Turtles and Human Cultures, this was the most diverse Symposium to date. Thanks to the generous support of the David and Lucile Packard Foundation, Sea Turtle

Symposium, National Marine Fisheries Service, Convention on Migratory Species, National Fish and Wildlife Foundation, and Oceanic Resource Foundation we were able maintain a high level of funding, despite unusually global economics, and were able to provide travel grants to 168 symposium participants. This list includes people from 67 countries from around the globe, a group that authored or co-authored over 35% of the paper and poster presentations. Managing the travel grants is an enormous task and fortunately we have a

tremendous group of individuals on the travel committee. This year's committee included Ana Barragan, Alan Bolten, Annette Broderick, Karen Eckert, Angela Formia, Fiona Glen, Brendan Godley and Nicolas Pilcher. This team worked overtime and deserves recognition and a hearty dose of appreciation from all grant the recipients along with everyone else who enjoyed and benefited from the international participation. In addition to the travel committee there were a number of individuals that greatly helped in the granting and travel organizing process: Ed Drane, our perennial fiscal guru and symposium treasurer helped all along the way, keeping us on track and providing valuable behind-the-scenes assistance. Donna Broadbent, the symposium coordinator, provided keen insights and helped keep track of housing and registration; her numerous late-night e-mails led me to wonder if she ever slept! Michael Coyne managed the website and travel grant database and continued to refine the entire process, making the

application and award process easier for all of us. Earl Possardt, with his presidential perspective, was able to lend a calming influence when he was not engulfed in larger plenary tasks. Perhaps of greatest importance has been the generous assistance of Jack Frazier and J. Nichols who have continued to lead the way with tracking down funding for the symposium and coordinating the Symposiums interactions with the David and Lucille Packard Foundation. The two have helped organize travel assistance and general symposium funding for years, and thanks to their help we were able to continue our tradition of excellence in getting a large number of people from around the world to attend this symposium. This team was outstanding and I would like to send a heartfelt thanks to everyone for the countless hours they volunteered for the symposium – we all benefited from their involvement in a variety of ways!

First Announcement: 2nd International Congress on Chelonian Conservation, Saly (near Dakar), Senegal (June 18-22, 2003)

The First Congress on Chelonian Conservation was held in July 1995 in France. SOPTOM, Senegalese and international organisations are now preparing the next international meeting on Chelonian Conservation, which will take place in Africa.

We would like to welcome a wide range of participants (researchers, naturalists, students, managers, field workers) from all the countries concerned by Chelonian Conservation. This meeting will allow a comparative survey of many programmes undertaken all over the planet, addressing various multidisciplinary approaches. It will aim to support and acknowledge field actions, conservation specialists and protection centres in each country. All species will be concerned, from tortoises to freshwater turtles and terrapins, as well as marine turtles.

Many topics will be discussed:

- philosophy and ethics of conservation,
- legislation, trade, traffic, links with authorities,
- ethnozoology, socio-economy, links with human populations,
- systematics, genetics, general biology,
- environment, habitat preservation, ecology,
- economy of conservation, financial aspects, international links,
- programmes and projects, conservation actions.

The congress will take place in Saly, a lovely little seaside resort with a meeting centre, an air-conditioned hotel, shops and beaches. Special cheap flights will be organized from Paris to Dakar. You can ask now for a registration document. We hope that many participants of developing countries (Asia, South America, Africa) will be able to attend the meeting, as it was in 1995, thanks to our special travel grants. For additional information please contact us (details below). A specific web page will be available soon at www.tortues.com

B.Culorier-Cornuault
(E-mail: bcornuault@soptom.com)
or B.Livoreil (E-mail: blivoreil@aol.com)
SOPTOM-Congress,
BP 24,
83590 Gonfaron,
France.

Could Sea Turtle Bones Store a Record of Oceanic Salinity?

Given recent studies on growth and thermoregulation, it has been hypothesised that the oxygen isotope signal in sea turtle bones may be correlated to ambient salinity.

As a graduate student at North Carolina State University (USA) I am interested in testing this hypothesis as part of my doctoral research. As such, I need to obtain bone samples from a relatively large number of sea turtles of various species and growth stages. Several institutions have been kind enough to provide samples already, but more samples are required in order to rule out biases caused by age, species, locality, etc. One of my advisors is associated with the North Carolina sea turtle stranding program, so we have a permit for obtaining sea turtle remains for this project.

Small pieces of carapace plates (medials or peripherals preferred) are needed from which I can remove *ca.* 50 mg of bone for isotopic analysis. The sampling process leaves a tiny scar on the bone surface about 1 cm long and 5 mm wide by 5 mm deep. At this

time, I especially need samples taken from sea turtles that lived in the western Pacific, Indian Ocean, eastern Atlantic Ocean, and the Mediterranean.

Why this project is important?

If oxygen isotopes in sea turtle bones record ambient salinity, they may provide a means of tracking sea turtle movements through water masses of differing salinities. Furthermore, fossil sea turtles could then be used as quantitative “paleosalinity indicators”. Paleosalinity measurements are needed for accuracy in climate modelling studies and environmental reconstructions.

If you can help provide bone specimens for this study, please contact me at the address below:

Alan Coulson,
Department of Marine, Earth, & Atmospheric Sciences,
North Carolina State University,
Raleigh, NC 27695
(E-mail:abcoulso@unity.ncsu.edu)

BOOK REVIEW

Title: Biology of Marine Birds

Year: 2001

Editors: Elizabeth A. Schreiber and Joanna Burger

Publisher: CRC Press

ISBN: 0849398827

Pages: 744pp

Price: \$79.95 US

To order:

CRC Press LLC, PO Box 31225, Tampa FL

33631-3225, USA

US Orders: Tel: 800 272 7737,

Fax: 800 374 3401

International: Tel+1 561 994 0555,

Fax: 561 989 8732

If ever a demonstration of the adage “never judge a book by its cover” were needed, then this book is the prime candidate. The sleeve has a series of appalling montages, with seabirds onto a coastal background photograph, looking like they were created using software developed in the late eighties. Yet what lies inside the garish exterior is over 700 pages containing

everything you will ever want (or need) to know about marine birds, and with chapters written by acknowledged experts from all over the world and the list of contributors reads like a *Who's Who* of seabird biology. In the words of one press release, “*the book provides the only complete summary of information about marine birds ever published*”, and its difficult to argue with this when a glance down the table of contents yields topics ranging from seabird conservation to salt balance.

Early chapters deal with the seabird fossil record and systematics. I found the discussion of how the fossil record has played in understanding current seabird community structure especially interesting. This combines an excellent demonstration of how we can use the evolutionary history of animals to understand present day traits, with some exciting reconstructions of long-extinct species.

It would be hard to argue that most of this book contains information that turtle biologists would find relevant. Most of the discussions, particularly those covering colonial breeding, mate choice, communication and chick development, are not surprisingly set in a seabird context. However there are a number of chapters

(some more than others) that may provide some interesting reading and perhaps indicate some potential avenues for research. Chapter 7, *Climate and weather effects on seabirds*, eventually looks at some large-scale weather/oceanographic events including El Nino and ENSO and how these effect prey populations and seabird movements. Chapters 12 and 14 cover reproductive energetics and salt balance, again these are topics that could provide some relevant information, such as how egg composition and water loss varies according to feeding and incubation ecology or osmoregulatory mechanisms used by animals living in a hypertonic environment.

The areas that *Marine Turtle Newsletter* readers are likely to find most interesting are covered in four main chapters. Chapter 5 investigates how seabird demography relates to the marine environment. There are discussions on factors that may lead to differences in demographic traits both within and among species. It is of interest that, because of their longevity (a trait shared with many turtle species) an understanding of demography can only be achieved by long-term studies. Moreover, there is still very little information on the survival and recruitment of young, a fundamental component of any population model. This must be a concern to turtle biologists since studies of seabird biology have are generally far easier to conduct than those of marine turtles.

Chapters 15 to 17 deal with, in turn, the effects of pollution, interactions with fisheries and conservation, topics that concern most marine vertebrates. There have been exhaustive studies of pollutant levels and effects on seabirds and chapter 15 is a comprehensive review of this subject. Chapter 16 covers the interactions, both positive and negative, between seabirds and fisheries, the most pertinent sections dealing with fishing gear entrapment and disturbance. The chapter on seabird conservation covers a many themes that all marine biologists will find depressingly familiar. Harvesting of eggs and adults, human disturbance (including scientists), climate change, introduced predators, the list goes on. It closes with a review of current legislation, outlining research priorities and the need for increased public awareness. In this latter section the authors point out that the legislation to reduce the bycatch of US long-lining vessels in the South Atlantic was strongly influenced by both scientific and public opinion. There is hope.

In short a very useful book, a must for anyone working with or interested in seabirds. From the point of view of a turtle biologist, some chapters could provide interesting ideas and approaches, but it may be slightly expensive as a personal purchase.

Stuart Bearhop, NERC Fellow, Division of Environmental and Evolutionary Biology, University of Glasgow, Scotland.

NEWS AND LEGAL BRIEFS

This section is compiled by Kelly Samek. You can submit news items at any time online at <<http://www.seaturtle.org/news/>>, via E-mail to news@seaturtle.org, or by regular mail to Kelly Samek, 2811 SW Archer Road G-49, Gainesville FL, 32608, USA.

THE AMERICAS

Court Reduces US Control over Shrimp Imports

A federal court has reversed an international court opinion allowing the U.S. to ban shrimp imports from nations that do not do enough to protect endangered sea turtles. Last week, the United States Court of Appeals for the Federal Circuit reversed a ruling by the Court of International Trade that would have expanded the present U.S. embargo on imported shrimp. Critics of the embargo said it violated international trade agreements. Source: *Environment News Service*, 26 March 2002.

Record Number of Turtles Die on Florida Shores

A record number of sea turtles died on Florida beaches last year, largely due to shrimpers, experts said. In 2001, 1,337 dead or dying turtles were stranded on Florida shores, the most since biologists started monitoring them in 1980, the Florida Marine Research Institute announced. Shrimpers likely killed the most turtles, said Allen Foley, a biologist with the institute's Sea Turtle Research Group, adding that nearly a quarter of the turtles died after colliding with boat propellers and hulls. Source: *Associated Press*, 16 February 2002.

Dimming the Lights on Georgia's tallest bridge

Civic pride has clashed with sea turtle preservation in a debate over whether to hang decorative lights on what will be Georgia's tallest bridge. The 480-foot Sidney Lanier Bridge is expected to open in July and some wildlife officials are concerned that bright decorative lights would affect young sea turtles leaving their nests. When the US Fish and Wildlife Service expressed concerns that the lighting plan could affect young sea turtles, the cable and tower lighting was dropped from the building contract. Greg Masson, an assistant field supervisor with the service, said "turtle friendly" bulbs can be used on the bridge; they're already going to be installed in street lights on the north approach span of the bridge. Source: *Daytona Beach News-Journal*, 2 February 2002.

Odd Alliance Forms for Loggerheads

Conservationists and shrimp fishermen are drafting state legislation and say they would like to see it adopted before the seasons begin in mid-May. Both sides described their agreement as a compromise between current turtle excluder device regulations and a federal proposal for the Atlantic and Gulf coasts that has been inching through repeated delays. The TED opening required now, 12 by 35 inches, is too small to free some mature loggerheads studies show. The federal proposed rule would establish a 71 by 20-inch TED opening or a double flap. The compromise: an opening that would measure 20 inches by 35 inches when the net is stretched taut. Source: *Charleston Post-Courier*, February 2002.

Ombudsman orders joint action on turtles

The Costa Rican Ombudsman's office determined that the Environment Ministry and the Costa Rican Fishing Institute (INCOPECA) must find a way to close the gap in their enforcement of fishing and wildlife protection legislation. "If this doesn't work, we are considering filing criminal charges" said a cautiously hopeful Randall Arauz, president of the Costa Rican Sea Turtle Restoration Program which filed the formal complaint on the matter. ARAUZ claims INCOPECA consistently tries to duck its responsibility by saying it has no enforcement power, or by throwing the ball to the Environment Ministry. INCOPECA officials concede they cannot effectively regulate the fishing industry, but blame their impotence on scarce resources and a lack of legislative authority. Source: *Tico Times*, 8 March 2002.

Costa Rican Authorities Reject Oil Exploration

The National Technical Environmental Secretariat (SETENA) of Costa Rica's Ministry of the Environment and Energy released a 52 page justification for why they have rejected the Environmental Impact Assessment (EIA) presented by the Harken Energy Corporation in order to obtain permission to drill for oil off the country's Caribbean coast. SETENA's decision was a unanimous vote by the seven plenary commission members to reject the EIA as the project was deemed "not environmentally viable." The potential negative impacts the proposed drilling would have had on the area's globally important sea turtle populations and turtle related tourism were important factors in SETENA's decision. Source: *CCC press release*, 4 March 2002.

Turtle to Represent Endangered Species on New Tag

The loggerhead sea turtle will represent the plight of all of South Carolina's rare species as the critter on the state's new endangered species license plate. The turtle received two-thirds of the votes in a contest to determine what creature would be displayed on the new plate. Source: *Island Packet*, 7 February 2002.

Call for a Vatican Ban on Turtle Meat

A centuries-old Mexican tradition of eating sea turtles during the Lenten season is killing as many as 5,000 turtles each year, say conservationists. Wildcoast, a California-based conservation organization, has started a Spanish-language radio campaign. The group is part of a coalition that has asked the pope to reinforce the ban on turtle meat, which many Mexicans and Mexican-Americans eat during *Semana Santa*, or the days leading up to Easter Sunday. "Many of the consumers consider sea turtle to be fish because it swims. We humbly request that your holiness officially clarify that sea turtle flesh is meat and inappropriate for consumption during Lent," the Sea Turtle Conservation Network of the Californias said in a letter to Pope John Paul II. Source: *Associated Press*, 15 March 2002.

Pacific Groundfish Need More Protection

The National Marine Fisheries Service violated laws requiring protection of Pacific groundfish, a federal judge has ruled. The judge ruled that the federal agency failed to address the problem of bycatch: the accidental catching and killing of non-targeted fish and other species, such as sea turtles and birds and ordered the fisheries agency to revise its fishery management plan to comply with federal fisheries laws. Source: *Environmental News Service*, 19 April 2002.

Ban on Large-Mesh-Gill-Net Fishing

Federal fisheries regulators said yesterday that areas off Virginia and North Carolina will be closed to large-mesh-gill-net fishing to protect migrating sea turtles. The National Marine Fisheries Service said that the closures fall under an interim final rule, and that it would take comments until June 15. Gill-net fishing will be closed at all times south of Oregon Inlet and north of the South Carolina border. The closure will be temporary north of Oregon Inlet to Chincoteague, Va. In April and May of 2000, 280 sea turtles were found dead on beaches in North Carolina and Virginia. It was the largest number of deaths recorded by the agency, and four of the dead turtles had gill-net gear on them. Source: *Associated Press*, 19 March 2002.

Restrictions Would Protect Chesapeake Turtles

The National Marine Fisheries Service has proposed a seasonal ban on the use of certain fishing equipment in the Chesapeake Bay to protect sea turtles. The agency is seeking comment on its proposal to restrict the springtime use of a device that directs fish into traps known as pound nets. Pound net fisheries in the Chesapeake Bay target bait fish, croaker, menhaden, mackerel and other fish species. But the devices also entangle and drown endangered sea turtles in Virginia waters of the Chesapeake Bay during their spring migration. The fishers could continue to use pound nets as long as they have mesh smaller than 12 inches. Source: *Environment News Service*, 2 April 2002.

Moratorium on Pacific Long-lining could Save Leatherbacks

A moratorium on longline fishing in the Pacific Ocean is urgently needed to keep the world's largest living marine turtle from extinction, a conference of sea turtle experts declared Thursday. This week 50 leatherback turtle experts gathered in Pacific Grove for the Leatherback International Survival Conference to map strategies that might save the Pacific leatherbacks. To save the leatherbacks from extinction, the delegates passed a resolution that calls on the United Nations, the United States and all other nations "to institute a moratorium on pelagic longline, gillnet and other fisheries harmful to Pacific leatherback turtles until such activities can be conducted without harm to the species, and provide allocations of transitional aid to affected fishers and communities." Source: *Environment News Service*, 26 April 2002.

Sierra Club Sues Interior Department

The Sierra Club filed a lawsuit to stop oil and natural gas drilling on the Padre Island National Seashore. The complaint against the US Dept. of Interior seeks to halt heavy truck traffic that the environmental group alleges will threaten the endangered Kemp's ridley sea turtle, which nests on the seashore. In addition to naming Interior Secretary Gale Norton as a defendant, the Sierra Club also named the National Park Service and the US Fish and Wildlife Service. The suit involves a natural gas well projected managed by BNP Petroleum, a Corpus Christi company. In this case, the Sierra Club contends that the truck traffic could harm the endangered turtle's nesting. The organization is seeking a court injunction to cease the work until an environmental study is done, Richardson said. Source: *Corpus Christi Caller-Times*, 19 April 2002.

ASIA

10,000 Endangered Turtles Killed on Indian Coast

At least 10,000 endangered olive ridley turtles have been killed in the waters of the Bay of Bengal, conservation group Operation Kanchappa reported. Turtle carcasses have been washing up on the shores of the Indian state of Orissa since early December. The turtles are killed when they are trapped in the nets of fishing trawlers during their mating season, when they congregate in their nesting grounds in large numbers. The turtle death toll last year was 18,000. Source: *Environment News Service*, 5 February 2002.

Turtles Disappear from Thai Resort

Tourism in Phuket, a Thai resort island, is booming, but as more hotels and bars are constructed along its white-sand beaches, its wild inhabitants are being squeezed out. The biggest casualty are the island's colony of turtles. Thanu Nabnien, from Wildlife Fund Thailand, said the declining turtle population and destruction of mangrove forests were two of the most serious environmental problems caused by the expanding tourism industry. The pristine beaches favoured for the development of five-star resorts are unfortunately also the turtles' top choice for egg-laying. While the number of hatchlings has tumbled as a result of the beachside development, the young turtles who do make it to the sea face another hazard in the form of the Andaman Sea fisheries industry. Source: *AFP*, 28 February 2002.

Women's Conference Urges Turtle Harvest Ban

A women's conference in Palau has voted for a moratorium on the harvest of marine turtles. The motion has been referred to Palau's president. Conference delegates said marine turtles were an important food source for the people of Palau but feared continuous harvesting could lead to their extinction. Source: *ABC Radio Australia*, 18 April 2002.

EUROPE

Fishermen Join Efforts to Save UK's Turtles

A new UK Turtle Code will be launched that encourages fishermen to join in efforts to save endangered turtles in UK seas. The Code will be launched during a groundbreaking workshop, held by the Marine Conservation Society (MCS) in Swansea, which will bring fishermen, conservationists and scientists from England and Wales together for the first time to plan a research programme aimed at finding out

more about marine turtles in UK waters. The UK Turtle Code encourages fishermen, recreational boaters and other sea-users to immediately report all encounters with turtles in UK waters and advises fishermen on how to rescue turtles entangled in fishing gear. Source: *Marine Conservation Society press release*, March 2002.

OCEANIA

Commonwealth security threatens turtles

Motorbike security patrols along beaches near the venue of a Commonwealth leaders' summit are threatening endangered turtles. Local government wildlife officer Michael McNamara said the patrols by police and army could kill endangered turtles. McNamara said hundreds of turtles hatch along the Queensland Sunshine Coast between February and March and the bike patrols could easily crush nests of eggs or create wheel ruts in the sand too deep for the hatchlings to climb over. Source: *Reuters*, 1 March 2002.

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

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

- 1) The ACCSTR for inclusion in both the on-line bibliography and the MTN. Address: Archie Carr Center for Sea Turtle Research, University of Florida, PO Box 118525, Gainesville, FL 32611, USA.
- 2) The editors of the *Marine Turtle Newsletter* to facilitate the transmission of information to colleagues submitting articles who may not have access to on-line literature reviewing services.

NB. Email for Umigame Newsletter of Japan: <newsletter@umigame.org>

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