

Marine Turtle Newsletter



No. 31 NOVEMBER 1984

Editor: Nat B. Frazer

Editorial Advisors:

Marine Policy Center
Woods Hole Oceanographic
Institution
Woods Hole, MA 02543 USA

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

EDITORIAL

The previous editor founded the MTN and built its circulation to more than 800 recipients in over 80 countries throughout the world. He made the MTN a vehicle for the expression of a variety of opinions and for the rapid dissemination of information on all aspects of the biology, management and conservation of sea turtles. Under his editorship, the MTN became a source document of inestimable value to all who study sea turtles -- so much so that it is difficult to believe that anyone could ever hope to maintain a current understanding of sea turtle biology and conservation without regularly reading the MTN. We all are fortunate to have had the benefit of Nicholas Mrosovsky's leadership as editor over the past 8 years (August 1976 - August 1984) and he deserves our heartfelt thanks for his service to us, his colleagues. His will be a difficult act to follow as editor; fortunately, he will continue to provide us with the fruit of his experience by remaining on as Editorial Advisor.

For the immediate future, I plan no substantial changes for the MTN. I hope to continue to provide rapid dissemination of information and the expression of a variety of opinions on sea turtle biology and conservation. Although the financial future of the MTN appears to be secure for the next few issues, I will continue to seek additional support. In no case, however, will I accept funds from any individual or organization that places restrictions on content. I will make the MTN available for the expression of a variety of well-worded, responsible opinions on all aspects of sea turtle conservation; I will not use it merely for my own proselytizing. As we address the biological and political problems surrounding sea turtle conservation, each of us would do well to recall the conclusion reached by S. C. Stearns in a recent paper on life history evolution, a conclusion that is also applicable to the study, management and conservation of marine turtles: "The problem is not to establish who is right, because no one is, but to identify the portion of truth perceived by each, and to discover how to connect those portions." If the MTN continues to be a thread connecting the truths perceived by each of us, then my editorship will be a successful one.

N. B. F.

Marine Turtle Newsletter



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No. 32 FEBRUARY 1985

Editor: Nat B. Frazer

Editorial Advisors:

Marine Policy Center
Woods Hole Oceanographic
Institution
Woods Hole, MA 02543 USA

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

MARINE TURTLE PROBLEMS IN BALI ISLAND

Five species of marine turtle occur in Indonesia. The three least commonly encountered species are: the leathery or leatherback turtle, Dermochelys coriacea, which has been protected under Nature Protection Laws since 1978; the olive ridley turtle, Lepidochelys olivacea; and the loggerhead turtle, Caretta caretta, both of which have been protected under Nature Protection Laws since 1980. All three species have limited distribution in Indonesia.

The two other species, the green turtle, Chelonia mydas, and the hawksbill turtle, Eretmochelys imbricata, have wide distribution and are not yet protected by law in Indonesia. However, the capture of these species and the collection of their eggs are being reviewed by the government so that they are not eliminated. In Denpasar and a number of other places in Indonesia (e.g., Manado and Jakarta) green turtle meat is eaten. In Bali in particular, the use of turtle for food continues and increased greatly in the 1970s, although it is hoped that the numbers slaughtered can be reduced with strengthened controls on illegal turtle hunting outside Bali.

Slaughtering is carried out at night by slaughterers in Denpasar in places overseen by the local government; the meat and entrails are sold to local people or to restaurants. The slaughter of turtles has been turned into a show for foreign tourists by the Bureau of Tourism and this has led to certain negative impressions among those foreign tourists who have never previously seen animals being slaughtered. It is not true that there is inhumane and cruel slaughter of turtles in Bali. The method of slaughter is the same as that used for cattle and other farm animals. What can be considered inhumane, however, is the method of transporting the turtles, during which they can suffer high mortality.

To oversee utilization of the green and hawksbill turtles so that they do not become rare or eliminated, the government has already taken some steps and hopes to expand these further by:

1. controlling illegal hunting of turtles throughout Indonesian waters;
2. setting up protected areas for turtles;

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Editor: Nat B. Frazer

Marine Policy Center
Woods Hole Oceanographic
Institution
Woods Hole, MA 02543 USA

Editorial Advisors:

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

COMPLETE SETS OF MTN STILL AVAILABLE

In the past, we have not been able to respond to requests for back issues of the MTN. Readers now have the opportunity to acquire a complete set of all back issues. The Chelonian Documentation Center has recently reprinted issues 1-30 of the MTN, available for US \$12.50 per set (Surface Mail Included). Copies are still available and may be obtained directly from the Chelonian Documentation Center, Box 125, 8700 AC Bolward, NETHERLANDS. (Those readers who still need to acquire copies only of issues 31, 32 or 33 may obtain them by writing to the MTN Editor, Biology Department, College of Liberal Arts, Mercer University, Macon, GA 31207 USA.)

GEORGIA SHRIMP FISHERMEN CONDUCT SEA TURTLE RESEARCH

Although Georgia (USA) nesting beach surveys typically encounter only adult female loggerheads, Caretta caretta, shrimp trawler vessel captains have reported encountering juvenile and adult specimens of both loggerheads and leatherbacks (Dermochelys coriacea), as well as juveniles of two other species -- green turtles (Chelonia mydas) and Kemp's ridleys (Lepidochelys kempi). Shrimp fishermen in Georgia have recently cooperated with scientists and conservationists by conducting valuable scientific research onboard their shrimp trawlers.

In the summer of 1984, twelve vessel captains of the Bryan County Fishermen's Cooperative (BCFC) were issued federal and state endangered species permits that authorized them to tag and collect data from live sea turtles prior to their release and to transport carcasses of dead turtles to the BCFC dock for further research. The project is a cooperative effort of the BCFC and five other agencies: the Georgia Sea Turtle Cooperative Research and Education Program (Institute of Ecology, University of Georgia, Athens, GA); the Georgia Department of Natural Resources (Coastal Resources Division, Brunswick, GA); the University of Georgia Marine Extension Service (Brunswick, GA); the National Marine Fisheries Service (Miami & St. Petersburg, FL); and the Savannah Science Museum (Savannah, GA).

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GEORGE H. BALAZS

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Editor: Nat B. Frazer

Editorial Advisors:

Marine Policy Center
Woods Hole Oceanographic
Institution
Woods Hole, MA 02543 USA

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

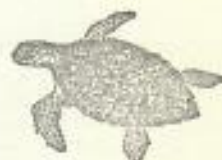
MTN BACK ISSUES NOW AVAILABLE

The Chelonian Documentation Center has recently reprinted issues 1-30 (1976-1984) of the Marine Turtle Newsletter in a limited edition of 500 copies. Although individual issues are not available separately, the entire set may be ordered from the CDC for US \$12.50 (Surface Mail included). Orders should be sent directly to: Chelonian Documentation Center, PO Box 125, 8700 AC Bolsward, Netherlands.

CITES MEETING — BUENOS AIRES 1985: DECISIONS ON SEA TURTLES

Suriname ranch: This proposal for ranching green turtles was considered at the 1983 Botswana meeting of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora). At that time the biological aspects were approved overwhelmingly (43 to 3) but overall approval was withheld contingent on Suriname providing details about labelling of their ranched products (see 1983 MTN 25:6-9). This matter was referred to the Technical Committee; at the Brussels meeting of the Committee in 1984 the marking system was found acceptable in principle. It was considered desirable that Suriname showed the actual labels and documentation to the parties in Buenos Aires. However, in Buenos Aires the USA proposed that uniform marking schemes should be applied to products from ranches, with the first ranch approved for a given species providing the model to be followed. The USA proposals, which included additional safeguards, were adopted at Buenos Aires (25 to 14). This introduced a new element, in that countries proposing ranching had not come prepared to meet these new requirements, and it was considered arbitrary to base the model scheme on which proposal came up first in the agenda. In any event, Suriname, France and the UK (Cayman Islands) agreed to institute a uniform system and to follow the USA proposals. In the plenary session the Chairman limited debate to the marking scheme. Suriname requested a secret ballot. Some parties were not clear if they were voting just on the marking, or on the overall proposal, but since the biological aspects had already been approved in Botswana, it probably amounted to the same thing. There were 26 votes in favor, 22 against, and 15 abstentions. Since a two-thirds majority was required, the Suriname proposal was rejected.

Marine Turtle Newsletter



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Editor: Nat B. Frazer

Department of Biology
College of Liberal Arts
Mercer University
Macon, GA 31207 USA

Editorial Advisors:

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

NOTE ADDRESS CHANGE

Readers who wish to send articles, reports, guest editorials or announcements for publication in the MTN will please note the editor's change of address, above. I apologize for any inconvenience or delays that may have been caused by the relocation. Those readers wishing to continue their financial support of the MTN should mail their donations to the new address. Checks should be made payable to: "Mercer University, Acct. No. 0-90003.4211." Please note that contributions are still tax-deductible in the USA.
NBF

MARINE TURTLES IN SARAWAK

Marine turtles in Sarawak constitute a major source of income for the Turtles Board and Malay charities administered by the Turtle Trust Ordinance of 1957. The turtle industry is run by the Turtles Board where only green turtle eggs are collected and marketed locally. All research and conservation management was carried out by the Sarawak Museum with the field assistance of the Turtles Board Staff.

Three species of marine turtles occur in Sarawak waters -- the green turtle (Chelonia mydas), the hawksbill turtle (Eretmochelys imbricata), and the loggerhead turtle, (Caretta caretta). The former two species are fully protected by law but the last is not. The leathery turtle (Dermochelys coriacea) is also protected by our Wildlife Protection Ordinance (1958), but this species has not been sighted in Sarawak for the last 10 years.

Of the three species of marine turtles recorded each year on our turtle islands (Talang Talang Besar, Talang Talang Kecil and Satang Besar), the green turtle is the most important and lays eggs throughout the year, with a peak season between July and October. The nesting beaches of each of the islands are relatively narrow and small, ranging in length from 100 to 300 m. In the months of January to March each year, a few hawksbills and loggerheads (fewer than 10 of each species) nest on two of our islands here. The nesting green turtles here are migrants, as there are no feeding grounds located around our islands.

The history of turtle egg collection by the locals dates back probably to the 16th century

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GEORGE H. BALAZS



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Editor: Nat B. Frazer

Department of Biology
College of Liberal Arts
Mercer University
Macon, GA 31207 USA

Editorial Advisors:

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

ACTION ALERT: **ROCKETS TO DISLodge RIDLEYS AT GAHIRMATHA**

Efforts are underway to shift the proposed national rocket testing range from Baliapal in the Balasore district of Orissa, to Satbhaya in the Cuttack district, because of protests by the inhabitants of Baliapal. This move, if implemented, will seriously affect the unique ecosystem of the 170 sq. km Bhitarkanika Wildlife Sanctuary, and more particularly, the Gahirmatha beach, where an estimated 800,000 olive ridleys nested in the 1984 season (Bhaskar, 1984). Besides turtles, the area also harbours the country's most important population of the saltwater crocodile and a rich avifauna.

It is interesting to note that the Sea Turtle Specialist Group, formed by the Government of India's Department of Environment, has recommended the creation of a marine national park at Gahirmatha, and a ban on fishing from Palmyras Point to False Point. About 300 dead ridleys washed ashore at the Gahirmatha beach in 1983 after having earlier drowned in trawl nets or died in poachers' vessels. Only a tenth as many were found in the succeeding year, thanks to the patrolling by the coast guard.

Bhaskar, S. 1984. Sea turtles in eastern India. *WWF Monthly Report*, August 1984:185-189.

INDRANEIL DAS, 18/20, Ballygunge Place (East), Calcutta - 700 019 INDIA.

[Those readers desiring more information or wishing to write letters protesting the proposed rocket testing range being built near the Gahirmatha nesting beach should correspond with Indraneil Das at the address given above. NBF]

SEA TURTLE WORK IN CHINA

Marine turtle conservation is being carried out in China, where marine turtles have been classified as protected animals. The First Session of the Marine Turtle Conservation Meeting was held at Huidong County, Guangdong Province in September 1985, attended by representatives of the China

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Editor: Nat B. Frazer

Department of Biology
College of Liberal Arts
Mercer University
Macon, GA 31207 USA

Editorial Advisors:

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

HARNESSING LEATHERBACKS

There is a paucity of information available on the behavior and physiology of sea turtles at sea, particularly when compared to the nesting data accumulated over recent decades. Although interest in such investigations is great, efforts continue to be inhibited by financial considerations, equipment limitations and restrictive monitoring opportunities.

In situ investigations require that instrumentation be mounted directly on a turtle for extended periods. This in turn requires that close attention be paid to instrument design and mounting. Any modification of the animal's behavior will, at the very least, bias the behavioral data obtained; at worst, the animal will be injured or killed. Recent interest in mounting remote tracking devices to free-swimming leatherback turtles, *Dermochelys coriacea*, compels us to share our experiences in this area. The purposes of this article are to describe a simple and effective harness design and to outline some avoidable problems.

Leatherbacks are the largest, as well as the most morphologically and physiologically divergent, of the sea turtles. They migrate farther (Pritchard 1973), dive deeper (Eckert et al. 1986), and range into colder waters (Bleakney 1965; Lazell 1980) than do any other sea turtles. They are also the most difficult sea turtle upon which to secure equipment. The body and carapace are encased in soft, easily abraded skin, making it impossible to bolt equipment or tow lines directly to the carapace as with hard-shelled species (Hopkins & Murphy 1981; Timko & Kolz 1982). We resolved this dilemma by developing a harness that resembles a pair of suspenders (Fig. 1). It is a simpler design than that of Fretey (1984), primarily because our instrumentation was smaller than his. Regardless of complexity, a successful harness should meet 4 criteria: (1) easy attachment to the turtle; (2) adequate security for equipment; (3) no injury or loss of mobility to the turtle; (4) eventual loss (degradation) should the turtle not be reencountered.

We found that 2.5 cm wide flat nylon or cotton webbing deeply incised the turtle's shoulders and scored the carapace. Chafing was eliminated by using 5 cm wide tubular nylon webbing and inserting 2.5 cm PVC ("clear flow" or "Tygon") tubing *into* the webbing of the shoulder straps (i.e., extending up and around the shoulders).

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GEORGE H. BALAZS

Editor: Nat B. Frazer

Department of Biology
College of Liberal Arts
Mercer University
Macon, GA 31207 USA

Editorial Advisors:

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

INFORMATION ON GREENS AND HAWKSILLS NEEDED FOR CITES/IUCN STUDY

The IUCN Conservation and Monitoring Centre has recently been contracted by the Secretariat of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) to report on the status of, and trade in, the green turtle, *Chelonia mydas*, and the hawksbill, *Eretmochelys imbricata*.

The report is intended to provide full, accurate, and impartial information to assist in the evaluation of the several proposals for commercial exploitation of these species expected to be presented at the 1987 CITES meeting. Included *where possible* will be estimates of nesting numbers and trends, of legal and illegal trade, and recommendations on the sustainability, or otherwise, of different forms of exploitation.

The purpose of this note is twofold: to inform readers that the project is underway, and to request their assistance in providing us with data and with their views on specific issues within the scope of the survey. Although we hope to work closely with the IUCN Marine Turtle Specialist Group, we are also particularly anxious to develop useful contacts outside the IUCN network, both to increase the data available and to ensure that we are aware of a variety of viewpoints.

By the time this note appears in print we will already have contacted a number of workers. May we urge anyone who has not received a letter from us, and who has information likely to be of use for the purposes of this project outlined above, to get in touch with us as soon as possible. Unfortunately, there is some urgency, since we need to have all basic data at hand at least by the end of 1986 in time to prepare the final report by April 1987. Any information will be gratefully received and fully acknowledged in our report.

B. GROOMBRIDGE, Senior Research Officer, IUCN Conservation Monitoring Centre, 219(c) Huntingdon Road, Cambridge CB3 0DL, ENGLAND.

Marine Turtle Newsletter



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LIBRARY OF
GEORGE H. BALAZS

Editor: Nat B. Frazer

Editorial Advisors:

Department of Biology
Mercer University
1400 Coleman Avenue
Macon, GA 31207 USA

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

FIBROPAPILLOMAS IN HAWAIIAN GREEN TURTLES

[This note is based on a presentation given by the author at the 6th Annual Workshop on Sea Turtle Biology and Conservation in Waverly, GA, USA. A presentation by Lew Ehrhart covering tumors in green turtles in east Florida was given during the same session.]

Neoplasms identified by the Registry of Tumors in Lower Animals (RTLA) as fibropapillomas are being commonly found on green turtles in the Hawaiian Islands. Up to 10% of the nesting females tagged each year at the principal breeding colony of French Frigate Shoals have these epithelial growths ranging from a few millimeters to 30 cm in diameter. They most frequently occur on the neck, eyes, flippers, jaw, tail and sometimes even in the mouth. In Hawaii, fibropapillomas have been recorded in turtles as small as 45 cm juveniles to adult males and females over 85 cm. However, none have been found in turtles 35-45 cm, the minimum size range at which recruitment to the benthic habitat takes place in Hawaii.

During 1985, 35% of the 51 stranded green turtles examined throughout Hawaii had fibropapillomas. Local divers and fishermen regularly report seeing afflicted turtles in coastal foraging pastures and underwater sleeping areas. Such sightings are believed to have increased considerably over the past 20 years.

Fibropapillomas in green turtles were first described nearly 50 years ago by Smith and Coates (1938). At that time, 3 out of 200 green turtles (27 to 91 kg) examined at Key West, Florida (USA) had fibropapillomas. During the same year, Lucke (1937/38) mentioned that green turtles in the Dry Tortugas "not infrequently suffer from papillomatous neoplasms which may attain so great a size as seriously to interfere with their locomotion." Hendrickson (1958) stated that "occasional" green turtles nesting in Sarawak, Malaysia had ulcerated fibromas on their "throat and neck." Since the RTLA began accepting specimens in 1965 (Harshbarger 1974), fibropapillomas from green turtles have been verified from the Florida Keys (RTLA Accession Nos. 12 and 651), Hawaii (RTLA 121, 1767, 1774, 1856, 1883, 2097, and 3572), and the Cayman Turtle Farm (RTLA 3099). Jacobson (1981) reported

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LIBRARY OF
GEORGE H. BALAZS

Editor: Nat B. Frazer

Editorial Advisors:

Department of Biology
Mercer University
1400 Coleman Avenue
Macon, GA 31207 USA

Peter C. H. Pritchard
Anders G. J. Rhodin
Harold F. Hirth
N. Mrosovsky

ECUADOR TAKES A GIANT STEP BACKWARDS

After successfully closing the very destructive offshore olive ridley fishery that operated in Ecuador, it seems that the Ecuadorians have now taken a giant step backwards in sea turtle conservation. Reliable sources in Ecuador have informed your Editor that at least two turtle-processing plants have been reopened at Manta and turtle product exports to Mexico have apparently been authorized by the Ecuadorean Minister of Industry. The Minister is Sr. Ricardo Novoa Bejarano, who we are told was the one who signed the authorization for the exports while he was Vice-Minister of Fishing (i.e., just before he became Minister of Industry). The authorization, we are told, is in open violation of the Ecuadorean ban on fishing and trade in turtle products, a legally-binding measure taken jointly by the Ministries of Industry (including "fishing") and the Ministry of Agriculture (including "wildlife") at an earlier date. We are also informed that the authorities in the Ministry of Agriculture are surprised and saddened to see the new authorization reopening the trade. Our sources expressed the hope that the Agriculture authorities will initiate an inquiry as to how the wholesale butchering of turtles was allowed to resume (apparently, the main motive is money for the tanners rather than revenue from meat or shell products).

Readers may wish to write to Sr. Ricardo Novoa Bejarano, Ministerio de Industrias, Quito, Ecuador, expressing their dismay at the reopening of the turtle processing plants and the resumption of exports to Mexico.

GREEK LOGGERHEADS STILL NEED YOUR HELP, TOO

[The Editor encourages readers to write to Mr. Kouloumbis and Admiral Dounis at the addresses given below in support of the recommendations given by Greenpeace at the end of this article.]

The New Ministerial Decision

In December, last year, it was reported in the Greek national press that a Presidential Decree

See
Crouse papers

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STORY H. PHILLIPS



Marine Turtle Newsletter

Number 44 January 1989

Editors:

Karen L. Eckert
Scott A. Eckert
Department of Zoology
University of Georgia
Athens, Georgia 30602 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

IUCN RESOLUTION URGES MAXIMUM SIZE LIMITS, PROTECTION OF HABITAT, TED's

RECALLING that Kemp's ridley (Lepidochelys kempfi) sea turtle was included in IUCN's [International Union for the Conservation of Nature] Species Survival Commission's list of twelve most endangered species in 1986, and that their continued decline is largely due to the numbers drowned in shrimp trawl nets;

FURTHER RECALLING the effectiveness of the turtle excluder device (TED) in the prevention of sea turtle incidental catch by shrimp trawlers;

CONSIDERING that legal action has been taken to invalidate the United States Government's promulgation of the TED Regulations;

RECOGNIZING the importance of the IUCN General Assembly providing support to the United States Government for this valuable effort in what is a world-wide problem in sea turtle conservation;

CONCERNED that many sea turtle populations continue to decline as a direct result of human exploitation;

FURTHER CONCERNED that the level of international trade in sea turtle products, particularly of the shell and skin, remains very high, and that in many countries the level of national trade, particularly in meat and eggs, continues unabated;

RECOGNIZING that there are many other contributing factors to population declines, such as disturbance and destruction of the nesting and foraging habitats, ingestion of ocean debris and toxic pollutants, and incidental catch in different types of fishing gear;

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Editors:

Karen L. Eckert, Scott A. Eckert
Department of Zoology
University of Georgia
Athens, Georgia 30602 USA

Editorial Board:

Nat B. Frazer, Nicholas Mrosovsky, David W. Owens
Peter C. H. Pritchard, James I. Richardson

NINTH ANNUAL SEA TURTLE WORKSHOP

The Ninth Annual Workshop on Sea Turtle Conservation and Biology will be held at Jekyll Island, Georgia, 7-11 February 1989. The host for this year's meeting will be the Georgia Sea Turtle Cooperative Research and Education Program. Since the first humble Workshop in 1981, the event has evolved into a highly professional scientific meeting. International participation grows each year, with professionals attending from Canada, Mexico, Central and South America, the Caribbean, and the Pacific. Attendance is expected to exceed 300 this year. Federal and state agencies, local municipalities, universities, and foundations will be represented, as will private individuals involved with the conservation, research, and management of sea turtles.

During the meeting, panels of experts will provide public forums for debate on issues such as research needs, funding priorities, and management techniques. Paper sessions range from research to applied management and conservation. The 1989 Workshop is expected to highlight anatomy and histology, creative financing, protection and management of Florida's loggerhead sea turtle nesting beaches, progress toward implementation of the TED [see MTN 43:3-6], cooperative studies with the U.S. Army Corps of Engineers (dredging and beach renourishment), the status of the Kemp's ridley recovery program, current techniques for sexing sea turtles, and research and management needs in the Wider Caribbean.

A Workshop priority has always been to provide students with the opportunity to get involved with sea turtles, to meet professionals working in the field, and to present the results of their labor. The Workshop is also a reunion of friends, a time to share experiences and concerns, and a time to have fun! Please join us! For further information, contact DR. JAMES RICHARDSON, Institute of Ecology, University of Georgia, Athens, Georgia 30602.

Marine Turtle Newsletter



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Editor: Nat B. Frazer
Department of Biology
Mercer University
1400 Coleman Avenue
Macon, GA 31207 USA

Associate Editor: John P. Eylers

Editorial Board: Peter C. H. Pritchard, Anders G. J. Rhodin, Harold F. Hirth, N. Mrosovsky

MARINE TURTLES IN BALUCHISTAN (PAKISTAN)

Pakistan has long been known to support a large population of Green Turtles *Chelona mydas* (with a lesser number of Olive Ridleys *Lepidochelys olivacea*), nesting primarily at Hawkes Bay and Sandspit near Karachi, Sind Province (Ghalib and Zaidi, 1976; Kabraji and Firdous, 1984). There have been indications (Kabraji and Firdous, 1984) that the remaining coast of Pakistan, in Baluchistan Province (the Makran coast), may also hold significant numbers of sea turtles. At least 95% of the Baluchistan coast (>700 km long) consists of inaccessible and unfrequented sandy beaches - apparently suitable turtle habitat.

Three sources have provided data on turtles in Baluchistan. Butler (1877) reported nesting by large turtles, apparently *C. mydas*, on Astola (Haft Talar), a small island some 25 km from the mainland. Butler stated "there is no water on the island, which is barren, and only frequented by boats from Muscat, which catch fish and large numbers of turtle". Although few turtles were encountered on the nest beach on the evening of 28 May 1877, the shore was reportedly "strewn with the dry carcasses of turtles which had been killed by Arab fishermen for the sake of their oil...the stench along the beach in consequence was intolerable". Shockley (1949) recorded that *C. mydas* was seen frequently along the coast near Jiwani (Jiunri), adjacent to the border with Iran. As many as a dozen large turtles could often be seen close inshore at one particular "turtle cliff", and numerous turtle tracks could be seen on the beach (in September-November 1945). Later, in an unpublished letter (cited by Frazier, 1980), S. Telford reported information from reliable sources that "many thousands" of turtles were harvested from a beach at Ormara during 1975.

The following is a summary of a brief survey made between 19 and 22 January 1987, with the aim of gathering new data on Baluchistan turtles (reported fully by Groombridge, 1987). Beaches near the four main fishing towns on the Makran coast - Jiwani, Gwadar, Pasni and Ormara - were visited; local officials arranged contact with fishermen or others, who provided information or guidance to nest sites known to them. Our survey probably took place outside the main nesting season. At the two

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Editor: Nat B. Frazer
Department of Biology
Mercer University
1400 Coleman Avenue
Macon, GA 31207 USA

Associate Editor: John P. Eylers

Editorial Board: Peter C. H. Pritchard, Anders G. J. Rhodin, Harold F. Hirth, N. Mrosovsky

REPORT FROM OROLUK

Oroluk is a low coral atoll in the Caroline Islands in the mid-Pacific region. It is located about 1600 km ESE of Guam and about 300 km east from Pohnpei Island. This small island (18 hectares) historically has had large numbers of nesting green turtles, and Pritchard (1977) felt Oroluk was the most important nesting ground in the state. From June through July 1985 and May through August 1986 turtles were tagged and their activities watched.

The arrival of turtle project personnel on Oroluk in May 1986 was a sad day for them. The residents of the island (7 people) killed three female turtles and cooked turtle eggs to take with them on the field trip ship back to Pohnpei. Project staff also found that two turtles tagged in May 1985 were eaten in August of the same year.

During the 1986 period, some preliminary work was done to protect two nests with wire cages and to look at hatching success. Humerus bones were collected, and forwarded to Dr. George Balazs of US National Marine Fisheries Service in Honolulu.

So far, one turtle tagged during the project has been seen elsewhere. A 99 cm female was tagged while nesting on Oroluk 2 June 1986 and laid 72 eggs. The turtle was captured alive in Nan-Way Bay in Taiwan on 18 April 1987.

It should be noted that for 1985 observations, turtle nesting averaged 2.3 nests/month, and in 1986, 3.4 nests/month were seen. This is considerably fewer than the 9-15 nests per night reported by Pritchard (1977). We do not know if the current nesting pattern has two peaks in December-January and June-July as has been reported. Nesting (maybe some false crawls) is reported by Oroluk residents all year round.

By law, FSM citizens are allowed to take green turtles greater than 34 inches except during



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Editors:

Karen L. Eckert
Scott A. Eckert
Department of Zoology
University of Georgia
Athens, Georgia 30602 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

SEA TURTLES IN GUATEMALA: THREATS AND CONSERVATION EFFORTS

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Sea turtles are commercially harvested along both the Atlantic and Pacific coasts of Guatemala, Central America. Prices for turtles and turtle products are relatively high, so local harvesters usually opt to sell rather than to consume them. Guatemalan turtle products are sold for consumption in major population centers within the country, and possibly also in Mexico and El Salvador. Occurrence and use of sea turtles in Guatemala are summarized in Table 1.

Cultural and species differences on the Atlantic and Pacific coasts result in dissimilar harvest practices. On the Atlantic coast adult turtles are killed for meat, shell and calipee; eggs are also collected. On the Pacific coast eggs are collected, but it is considered a "sin" to intentionally kill an adult turtle; consequently this is not generally done. Commercial fishing enterprises are an exception. Shark fishermen kill *Lepidochelys olivacea* for bait, and *L. olivacea* inadvertently captured in shrimp trawls are cut open (whether alive or dead) to extract eggs. In contrast, Pacific residents of bordering El Salvador and Mexico are reported by Guatemalans to kill adult sea turtles both for their body parts and to hasten the collecting of eggs from turtles who are preparing to nest.

While populations of sea turtles in Guatemala have declined, demand and commerce have increased. Local people note that in the 1960's there were many more turtles nesting than at present along the Pacific coast between Puerto San José and the border with El Salvador. At that time, it is said, a person could easily collect enough turtle eggs to fill a 100-pound size grain sack in one night. Today it requires a great deal of perseverance and luck to be the first person to encounter even one nest on the beach. Not only do residents observe fewer turtles, but more people are hunting eggs. Virtually all eggs are currently being harvested.



Marine Turtle Newsletter

Number 46 July 1989

Editors:

Karen L. Eckert
Scott A. Eckert
Department of Zoology
University of Georgia
Athens, Georgia 30602 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

FLORIDA (USA) TERMINATES 'HEADSTART' PROGRAM

In an effort to increase Florida's green turtle population, the Florida Department of Natural Resources (DNR) began a "headstart" program in 1959. Over 18,000 hatchling green turtles were raised in captivity for 6-12 months prior to their release to offset high initial mortality. Approximately a dozen facilities around the state participated in the program, with the House of Refuge in Stuart [Florida] serving as the main facility. Through recaptures of tagged turtles, the project has provided important data on the survival and growth of captive-reared turtles in the wild. Also, through public displays and releases, the program has had tremendous success in making the public aware of the endangered status of this species.

The ultimate success of the project, measured by increasing Florida's green turtle population, remains unknown. From the beginning, headstarting was recognized as experimental in nature. To our knowledge, no headstarted juvenile turtle has ever been documented to nest as an adult. This could be due to incomplete surveillance of nesting beaches, loss of tags, or because of the long time it takes green turtles to become reproductively active. It is also possible that the lack of nesting records could be evidence that there are fundamental problems with the practice. Possible interference with imprinting mechanisms that guide turtles to the nesting beach, imbalance in sex ratios from artificial incubation of eggs, nutritional deficiency problems from confined maintenance of hatchlings, and behavioral modifications are all potentially serious problems that are cause for concern.

Florida DNR considers that a sufficient investment has now been made in the first phase of the headstart program; i.e., collecting, rearing and releasing young green turtles. The intent now is to implement the second phase which is to await the return of headstarted turtles to the nesting beach. If significant numbers of headstarted turtles begin appearing on nesting beaches, the Department will consider continuing the program.



Marine Turtle Newsletter

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Editors:

*Karen L. Eckert & Scott A. Eckert
Physiological Research Lab (A-004)
Scripps Institution of Oceanography
University of California-San Diego
La Jolla, California 92093 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

TENTH ANNUAL SEA TURTLE WORKSHOP

The Tenth Annual Workshop on Sea Turtle Conservation and Biology will be held at Hilton Head Island, South Carolina, 20-24 February 1990. The hosts for this year's meeting will be the Nongame and Heritage Trust Section of the South Carolina Wildlife and Marine Resources Department and the Museum of Hilton Head Island - Project Turtle Watch. Surpassing last year's excellent Workshop in Georgia will be hard to do. It was attended by 450 persons representing 15 countries. However, to celebrate a decade of workshops, we hope to make this year's meeting even better!

There will be paper and poster sessions featuring the efforts of federal and state agencies, local municipalities, universities and conservation organizations, as well as private individuals. There will be space and time available if groups such as the IUCN or WIDECAST wish to meet while everyone is in one place.

The Workshop's casual and friendly atmosphere is the perfect place for students and others just getting involved with sea turtles to interact with experienced professionals. The Workshop is also a time for fun and relaxation. There will be organized social events and free time to enjoy beautiful Hilton Head Island. Please plan to join us in the South Carolina Lowcountry for this, our special Tenth Annual Workshop. For those wishing to make early travel arrangements, please route yourself through Savannah, Georgia. For further information, contact: SALLY MURPHY, South Carolina Wildlife and Marine Resources Department, P.O. Box 12559, Charleston, South Carolina 29412 USA.

Part of the tremendous success of last year's workshop was the contributions from our foreign visitors. Jim Richardson has agreed to help coordinate this very worthy endeavor again this year, on behalf of the Steering Committee of the Tenth Annual Workshop. So, if you have the funds to sponsor a deserving student or scientist from abroad, please get in touch (soon!) with: DR. JIM RICHARDSON, Institute of Ecology, University of Georgia, Athens, Georgia 30602 USA. Thank you! See you all in February!

Marine Turtle Newsletter

Number 48 January 1990



Editors:

Karen L. Eckert & Scott A. Eckert
Physiological Research Lab (A-004)
Scripps Institution of Oceanography
University of California-San Diego
La Jolla, California 92093 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

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METAL AND PCB CONCENTRATIONS IN THE "HARLECH" LEATHERBACK

The leatherback turtle, *Dermochelys coriacea* (L.), is the largest and most pelagic of living turtles. Although it nests on exposed tropical beaches, the species forages widely in temperate waters, mainly upon medusae and siphonophores (Brongersma, 1969; Den Hartog and Van Nierop, 1984), and is a regular summer/autumn visitor to coastal waters around Japan, Peru, Newfoundland, Norway, the United Kingdom, Ireland and even Iceland (e.g., Nishimura, 1964; Bleakney, 1965). In temperate latitudes it tends to be associated with swarms of jellyfish such as *Rhizostoma* or *Cyanea*. Specialized medusivory makes it almost unique amongst air breathing vertebrates and places the species at the top of a poorly studied food chain.

The leatherback has other unusual features. The species is an exceptional deep diver (Eckert et al., 1986, 1989) and, unlike other living reptiles, possesses counter-current heat exchangers (Greer et al., 1973) together with extensive subcutaneous blubber which confers buoyancy and probably contributes to the facultative endothermy of the species (Pritchard, 1969; Mrosovsky and Pritchard, 1971; Frair et al., 1972; Mrosovsky, 1980). The leatherback is almost certainly very long lived (other sea turtle species may require > 30 years to reach sexual maturity: e.g., Limpus and Walter, 1980; Balazs, 1982), so the species would appear to be an ideal indicator of the degree of contamination of the oceanic food web by accumulating substances such as heavy metals and polychlorinated biphenyls (PCBs). However, the species is 'Endangered' (Groombridge, 1982) so killing specimens for analysis would be quite unacceptable. The present study arose from an unusual opportunity to collect fresh tissue samples from a large leatherback killed off the coast of the United Kingdom in 1988.

The "Harlech turtle" was a male, curved carapace length 159 cm (Table 1), that died after becoming entangled in whelk fishing lines four miles off Porthmadog, Gwynedd, Wales, on the afternoon of 22 September 1988 (Morgan, 1989). Fishermen cut the animal free and subsequently it washed ashore dead (drowned) on Harlech beach where it was found on 23 September. The water temperature in the Irish Sea at this time was about 12°C, the air temperature around 15°C. The turtle was transferred to a freezer store (-10°C) in Cardiff about 36 hours after death and was held there until dissected. The short interval between

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Editors:

Karen L. Eckert & Scott A. Eckert
Physiological Research Lab (A-004)
Scripps Institution of Oceanography
University of California-San Diego
La Jolla, California 92093 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

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KEMP'S RIDLEYS ARE RARER THAN WE THOUGHT

In 1989, 835 nests of the Kemp's ridley (*Lepidochelys kempi*) were recorded by the bi-national beach monitoring crew at Rancho Nuevo, Tamaulipas, Mexico (Márquez, personal communication). Despite intensive patrols, it was not possible to encounter all of the nesting turtles; the turtles spent a short time on land (about 45 minutes), showed unusually broad dispersal north of the camp headquarters at Barra Coma, and also a new tendency toward very early morning nesting during the 1989 season. Nevertheless, 201 turtles were tagged with Monel metal tags in 1989, and 74 turtles tagged in previous seasons were encountered. Of the 201, 116 were recorded nesting once, 72 twice, and 13 three times. Of the 74, 47 were seen once, 23 twice, and 4 three times. These data allow the calculation of an estimate of the average number of nests per female per season as follows.

Out of the 835 total nesting events, the turtle was seen (and tagged, or the tag number noted) on 404 occasions. Thus, based on the assumption that beach coverage was consistent throughout the season, there was $404/835 = 0.484$ chance of witnessing a given nesting event and consequently a $(0.484)^3$ probability of witnessing a three-time nester on all three occasions. So, if three-time nesters were observed on $13 + 4 = 17$ occasions, the actual season's total of three-time nesters can be estimated at $17/(0.484)^3 = 150$. Similarly, to estimate the actual total of two-time nesters, I note that the observed total of $72 + 23 = 95$ includes a subset of three-time nesters that were actually observed only twice. The chance of seeing a three-time nester on exactly two of its three nestings (i.e., on nestings 1 and 2, 1 and 3, or 2 and 3) may be estimated as $3 \times (0.484)^2 (1 - 0.484) = 0.363$. Thus, $150 \times 0.363 = 54.5$ of the three-time nesters would have been seen just twice, leaving $95 - 54.5 = 40.5$ actual double nesters observed both times. This corresponds to a true total (observed + unobserved) of $40.5/(0.484)^2 = 173.3$ double-nesters.

The triple and double nesters together thus produced $(150 \times 3) + (173.3 \times 2) = 796.6$ nests for the season, leaving just 38.4 nests ($835 - 796.6$) made by single nesters. So 835 nests were made by $(150 + 173.3 + 38.4) = 361.7$ turtles, giving an average of 2.31 nestings per turtle. This figure is much higher than accepted literature values; for example, Márquez et al. (1982) calculated a value of 1.326. Later this figure was revised upwards to 1.47 (1.45 for neophytes, 1.55 for remigrants); but it is clear in the latter calculation (Márquez et al., 1989) that no correction was made for the diminishing probability of observing a multiple nester on

Marine Turtle Newsletter

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Editors:

*Karen L. Eckert & Scott A. Eckert
Physiological Research Lab (A-004)
Scripps Institution of Oceanography
University of California-San Diego
La Jolla, California 92093 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

LIBRARY OF
GEORGE H. BALAZS

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Marine Turtle Newsletter

Number 50 July 1990

Editors:

*Karen L. Eckert & Scott A. Eckert
Physiological Research Lab (A-004)
Scripps Institution of Oceanography
University of California-San Diego
La Jolla, California 92093 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*



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GEORGE H. BALAZS

MEXICO PROCLAIMS TOTAL BAN ON HARVEST OF TURTLES AND EGGS

On 28 May 1990, the President of Mexico, Carlos Salinas de Gortari, announced a total and permanent ban on the capture of sea turtles and the trade in sea turtle products. The decree covers all sea turtle species which swim in Mexico's waters and/or nest on Pacific or Atlantic coast beaches. This means the immediate cancellation of all legal quotas and closure of the olive ridley turtle slaughterhouse in Oaxaca. The Presidential decree implies a substantial increase in on-site protection of remaining populations, more support for the "turtle camps" (base camps established on nesting beaches for research and conservation purposes), more support for research and training programs, and the development of alternative sources of income for local persons economically dependent on the officially sanctioned (or clandestine) exploitation of these species.

Mexico's responsibility for safeguarding those seven of the world's eight sea turtle species (including the East Pacific green turtle) which nest on its shores, and the critical role which Mexico plays in ensuring their future, have been seriously neglected in the past 15 years. This year, however, the Mexican "Grupo de los Cien" [Group of 100] and conservationists disclosed evidence of the wholesale slaughter of sea turtles and the blatant illegal trade in turtle products [see MTN 49:28], which gave rise to a public outcry demanding that the government guarantee the maintenance and preservation of these species and their habitats for future generations. International support received from more than 100 environmental organizations, conservation groups, universities, and those scientists who have been endeavoring for years to achieve effective protection of the sea turtles resulted in a barrage of tens of thousands of letters addressed to the President, making him acutely aware of the intense worldwide concern to prevent the ultimate extinction of these animals.

Hitherto, more than 20 sea turtle conservation and research programs have existed in Mexico, but they were unable to prevent the over-exploitation of species and the collapse of three of the four major nesting populations of the olive ridley. These programs, in existence now for many years and working diligently to save sea turtles in Mexico from extinction, include: (a) the establishment by SEPESCA of the first turtle camp in Mexico, at Rancho Nuevo, the only known nesting site for the world's population of Kemp's ridley turtles, (b) the 1978 agreement with the U. S. Fish and Wildlife Service to protect the beach at Rancho



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Number 51 October 1990

Editors:

*Karen L. Eckert & Scott A. Eckert
Physiological Research Lab (0204)
Scripps Institution of Oceanography
University of California-San Diego
La Jolla, California 92093-0204 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

ELEVENTH ANNUAL SEA TURTLE WORKSHOP

The Eleventh Annual Workshop on Sea Turtle Biology and Conservation will be held at Jekyll Island, Georgia, 26 February to 2 March 1991. This year's meeting will be hosted by the Florida Marine Research Institute of the Florida Department of Natural Resources (FDNR). Last year's highly successful Workshop in South Carolina brought together 450 participants! Paper and poster sessions will focus on sea turtle research and conservation efforts, both in the United States and abroad. There will be space and time available for groups such as the IUCN Marine Turtle Specialist Group or WIDECAST to meet, if desired. Both the contribution of foreign participants and the opportunity to interact with the international sea turtle community are special features of the annual Workshop. Dr. Jim Richardson has once again agreed to help coordinate support for participants from outside the continental U. S., on behalf of the 1991 Workshop Steering Committee. If you have funds to sponsor such an individual (student or scientist), please contact Dr. Richardson, Institute of Ecology, University of Georgia, Athens, Georgia 30602, *as soon as possible*. In addition, the 1991 Steering Committee has limited funds available for students within the continental U. S.; information will be included in the first workshop announcement. The first announcement and call for papers will be mailed in October. For those wishing to make early travel arrangements, the closest major airports are Jacksonville (Florida) and Savannah (Georgia). For further information, please contact BARBARA SCHROEDER, FDNR Marine Research Institute, P. O. Box 1319, Stuart, Florida 34995. We look forward to seeing you in February as we embark on a second decade of annual Workshops!

INCIDENTAL CAPTURE OF SEA TURTLES BY JAPANESE RESEARCH AND TRAINING VESSELS: RESULTS OF A QUESTIONNAIRE

All species of sea turtles are listed in CITES [Convention on International Trade in Endangered Species] Appendix I and, as such, are recognized as threatened with extinction. Incidental captures in fishing gear poses a major threat to the survival of sea turtles worldwide. In order to contribute to the present status of knowledge on incidental captures of sea turtles by Japanese fishing gear in international waters, the authors initiated a

Marine Turtle Newsletter

Number 52 January 1991

Editors:

*Karen L. Eckert & Scott A. Eckert
National Marine Fisheries Service
Southwest Fisheries Science Center
Post Office Box 271
La Jolla, California 92038-271 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*



FIJI BANS EXPORT OF TURTLE SHELL

On 25 October 1990, the Fiji government announced that it would ban the export of raw, unworked turtle shell as of 1 January 1991 and implement additional regulations to protect sea turtles in Fiji. These are to prohibit the sale of turtle eggs at all times, to prohibit the sale of turtle meat during the closed season (November to February, inclusive), and to require a permit from the Director of Fisheries to keep turtles in captivity. The government also endorsed further research to justify a total ban on the commercial exploitation of turtles within two years. The announcement represents a major step forward for sea turtle conservation in the country.

In the last five years the exports of turtle shell from Fiji have substantially increased. In 1989 more than two tonnes were exported (all to Japan), which required killing about 2000 adult hawksbill turtles. Although information on the turtle populations in Fiji is limited, available data indicate that this level of exploitation is unsustainable. It is likely that this trade is also consuming many non-resident hawksbill turtles which migrate to Fiji from neighboring countries.

The two main species of turtles which occur in Fiji are the green turtle (*Chelonia mydas*), locally called "vonudina" and the hawksbill turtle (*Eretmochelys imbricata*), locally called "taku". Both species are hunted in Fiji for traditional and ceremonial use and these practices will be unaffected by the new regulations.

The export ban decision follows a concerted effort by Greenpeace which has been lobbying the Fiji government for some time to stop the export of turtle shell and join CITES. In July, Greenpeace representatives Trevor Daly and HP Singh visited Fiji to meet with government leaders, local conservationists and the media to brief them on sea turtles and to gather support for a turtle shell export ban and other measures to increase turtle protection.

Neighboring Solomon Islands is now the only Pacific country still exporting turtle shell, with more than four tonnes sent to Japan in 1989. Greenpeace hopes to convince the Solomon Islands government to agree to a ban on turtle shell exports in the near future.

TREVOR DALY, Greenpeace, P. O. Box 51, Balmain, Sydney, 2041 AUSTRALIA.

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Number 53 April 1991



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GEORGE H. BALAZS

Editors:

*Karen L. Eckert & Scott A. Eckert
National Marine Fisheries Service
Southwest Fisheries Science Center
Post Office Box 271
La Jolla, California 92038-271 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

RECOVERY OF THE BLACK TURTLE IN MICHOACAN, MEXICO: AN INTEGRATED CONSERVATION APPROACH

The most important nesting and breeding grounds for the black sea turtle (*Chelonia m. agassizi*) on any mainland shore are the east Pacific areas of Maruata Bay and Colola in Michoacan, Mexico. The black turtle story on the Michoacan coast is an example of a formerly abundant resource which was utilized at a subsistence level for centuries, but which is now in severe peril because of commercial exploitation. The black turtle shares geographical boundaries with the Nahuatl indigenous group on the Michoacan coast. The local village elders remember when the beaches at night during the fall months were covered with nesting turtles, but now they are severely depleted because of the over-harvest of both adults and eggs. In the late 1960's, it is estimated that 500-1000 females nested nightly in Colola at the peak of the season. Today, only 60-100 females arrive to nest each night during the peak of the season (or about 800-1000 turtles per year).

As late as the 1950's there were no settlements at Maruata and Colola. The Nahuatl people made sporadic trips from their pueblos in the sierra to the black turtle nesting beaches to collect eggs. Eggs were transported by mule and burro back to the villages, where they were eaten fresh or hardboiled and dried for storage to supplement a meager diet of beans, corn, squash, and chiles. For many decades the Nahuatl people continued their limited harvest of eggs without affecting the turtle population. The expansion of international markets for sea turtle leather as a substitute for crocodile skin in the 1960's brought great hunting pressure to bear on the sea turtle populations of the Mexican Pacific. When a market for sea turtle products was introduced to the Nahuatl in the early 1970's, settlements in Colola and Maruata grew rapidly. The heavy exploitation of both adults and eggs resulted in a black turtle population collapse.

In response, Kim Clifton, an American with the Arizona-Sonora Desert Museum and in coordination with the Mexican Instituto Nacional de la Pesca, began a black turtle conservation program in Michoacan in 1980. In 1982, the Black Sea Turtle Recovery Program became the responsibility of the University of Michoacan, with the support of U. S. Fish and Wildlife Service and World Wildlife Fund-U. S. Every nesting season (August-January) hatcheries are set up at Colola and Maruata by University of Michoacan biologists. Eggs are transplanted to new nests dug in a corral situated on the nesting beach and

Marine Turtle Newsletter

Number 54 July 1991

Editors:

*Karen L. Eckert & Scott A. Eckert
National Marine Fisheries Service
Southwest Fisheries Science Center
Post Office Box 271
La Jolla, California 92038-0271 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*



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JAPAN BANS IMPORT OF HAWKSBILL SHELL EFFECTIVE DECEMBER 1992

On 20 March 1991, the U. S. government formally censured Japan under the Pelly Amendment for that country's continuing trade in endangered sea turtles, setting into motion negotiations which have culminated in Japan's announcing an end to its import of hawksbill sea turtle (*Eretmochelys imbricata*) shell for its centuries-old carving industry. Without doubt, resolution of this issue is one of the most important victories ever in the arena of sea turtle conservation, and one for which conservationists have worked for many years.

In this landmark decision Japan was cited for "undermining the effectiveness of international programs for the conservation of sea turtles" under the Pelly Amendment to the Fisherman's Protective Act of 1967 (22 U.S.C. 1978). This powerful but seldom-used legislation allows the United States to embargo fish and/or wildlife products from nations which undermine international conservation or fishery programs for endangered species. This was the first use of the wildlife provision of the Pelly Amendment. This action came in response to a petition brought by the Center for Marine Conservation, Environmental Defense Fund, National Audubon Society, and National Wildlife Federation in April 1990 to censure Japan and Mexico for their sea turtle trade.

The Pelly Amendment works in two phases. First, the Secretary of Commerce or Interior must make a determination that the nationals of a foreign country are, directly or indirectly, (1) conducting fishing operations and/or (2) engaging in trade or taking of protected species in a manner or under circumstances which diminish the effectiveness of an international fishery conservation program or an international program for endangered or threatened species, respectively. The Secretary certifies such fact to the President. Upon receipt of certification, the President has the discretion to impose partial or complete embargoes on fish and wildlife products from the offending country as long as he deems appropriate. He has 60 days to notify Congress of his intentions. If a country is certified under part (1) for fishing operations, fishery products can be embargoed. If a country is certified under part (2), wildlife products can be embargoed. Since 1974, seven countries have been certified on six separate occasions for fishing violations. Japan, the USSR, Chile, Peru, Korea, and Norway have been certified for whaling, and Korea and Taiwan were certified for fishing with drift nets in 1988. However, sanctions have never been imposed.

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Editors:

Karen L. Eckert & Scott A. Eckert
National Marine Fisheries Service
Southwest Fisheries Science Center
Post Office Box 271
La Jolla, California 92038-0271 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

TWELFTH ANNUAL SYMPOSIUM ON SEA TURTLE CONSERVATION AND BIOLOGY

Mark your calenders!

The Twelfth Annual Symposium (formerly the annual "Workshop") on Sea Turtle Biology and Conservation is scheduled for the last week in February 1992. Registration will begin on the evening of 25 February and Symposium sessions will be scheduled on 26, 27 and 28 February. Accommodations will be available for groups to meet on 24-25 February prior to the opening of the Symposium, and special events and working group meetings can be scheduled on 29 February. The location will be Villas By The Sea, Jekyll Island, Georgia, the same as last year. Room rates for 1992 will be the same as 1991 and you can make your reservations at any time by calling the Villas (in Georgia 1-800-342-6872, elsewhere in USA 1-800-841-6262, outside USA 912-635-2521). We will meet airline travelers at Brunswick (Georgia) and Jacksonville (Florida).

International participants: We strongly suggest that you arrive Sunday, 23 February, and depart Sunday, 1 March, to participate in international working group meetings of great value to the Symposium. If you are in need of financial assistance for international travel and have not yet requested it, do so immediately. Our funds are very limited. Also, each international participant must provide us with a FAX number by which we can correspond with you during January and February when so many plans are changing day to day.

Last year the Eleventh Annual Workshop brought together some 500 registered participants from 17 countries. The event was a great success, featuring a wide variety of oral and poster presentations on sea turtle research and conservation efforts around the world. The 1992 meeting promises to be the best one yet! Hope to see you all next February! [N.B. The 1990 Proceedings are available from Jim Richardson at the address below; the 1991 Proceedings will be available shortly. Further details in the January issue of the *Marine Turtle Newsletter*.]

JAMES I. RICHARDSON, 1992 Sea Turtle Symposium Coordinator, Institute of Ecology, University of Georgia, Athens, Georgia 30602 USA. Tel: 404-548-9046 (home), 404-542-6036 (office); FAX 404-542-6040; Telex 414190.

Marine Turtle Newsletter



Number 56 January 1992

Editors:

*Karen L. Eckert & Scott A. Eckert
National Marine Fisheries Service
Southwest Regional Office
c/o SWFSC, Post Office Box 271
La Jolla, California 92038-0271 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

LIBRARY OF
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OBSERVATIONS ON FIRST BREEDING BY A LOGGERHEAD TURTLE

Regular capture of loggerhead sea turtles (*Caretta caretta*) living year-around on coral reef feeding areas adjacent to Heron Island (southern Great Barrier Reef, Australia) began in August 1974. The turtles are captured by leaping onto them from a speedboat -- what we call our "turtle rodeo". Effectively all the loggerhead turtles living on Heron Island Reef were tagged using this technique by 1977. Since then, almost all new, untagged turtles have been relatively small; i.e., 70-85 cm curved carapace length (CCL). Loggerheads < 70 cm CCL are uncommon anywhere in the Great Barrier Reef. Each year a fresh crop of small loggerheads appears among the local turtles at Heron Island Reef. These new recruits to the feeding area typically remain on the reef over the years that follow and grow to maturity.

Let me introduce you to one such recruit, marked with tag number X2757. I first met her as an immature turtle on 19 May 1977 in the sandy lagoon area of Heron Island Reef. She measured 80 cm CCL and weighed 65.5 kg. She has now been captured 36 times on Heron Island Reef (as of April 1991) and she has never been captured feeding on any of the reefs adjacent to Heron Island Reef. In October 1982 she was examined internally by laparoscopy and identified as an immature female with an unexpanded oviduct. Her reproductive system has been examined annually by laparoscopy since 1985, when she was found to have recently completed the elongation and expansion of her oviducts and enlargement of her ovaries. Thus, based on the completion of development of her reproductive system, she first qualified to be called an adult in 1985 at 89.5 cm CCL. In March 1987 and again in March 1989, she was observed to be depositing yolk into large numbers of follicles in her ovaries. However, she did not complete vitellogenesis and therefore did not ovulate any eggs in either of these two years.

She was again in vitellogenesis in March 1990 (92.0 cm CCL, 98 kg) and later the same year she made her first successful breeding migration. She was recorded ashore on Lady Musgrave Island, 67 km from her home reef, laying eggs on 16 December 1990 and 18 days later on 3 January 1991, 13 years after she recruited to take up residence within the southern Great Barrier Reef. The number of eggs per clutch were not counted and, because the Lady Musgrave rookery was not monitored during the entire nesting season, the total number of clutches laid during the season was not recorded. During March-April 1991, at the completion of the 1990-91 breeding season, the turtles resident on Heron Island Reef were again captured

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Number 57 April 1992



Editors:

Karen L. Eckert & Scott A. Eckert
National Marine Fisheries Service
Southwest Regional Office
c/o SWFSC, Post Office Box 271
La Jolla, California 92038-0271 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

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GEORGE H. BALAZS

HAWKSBILL TURTLE NESTING AT MANATEE BAR, BELIZE, 1991

Manatee Bar, a regionally important nesting beach for the endangered hawksbill turtle (*Eretmochelys imbricata*), is located on the mainland coast of Belize approximately 20 miles south of Belize City. Manatee Bar received 108 hawksbill nests (> 15,000 eggs) on 8 km of beach in 1991. Nesting occurred from May to October, with a peak in late August and early September. Despite high productivity there is nearly 100% depredation of eggs by raccoons and coatimundis; thus, no significant numbers of hatchlings are produced at this site. Protection of nests from depredation is needed to preserve this rookery. Fencing individual nests while also chemically masking olfactory clues appears a promising means of egg protection. Gillnets set in waters adjoining the beach during the nesting season are a potential threat to turtles and should be restricted. Beach-front development should be limited to low impact schemes that encourage 'eco-tourism' and the long term protection of this important nesting area.

Introduction

In 1990, a national ground survey for sea turtle nesting in Belize located a previously unrecorded concentration of 160 hawksbill nests on an 8 km section of mainland beach south of the Manatee River Bar. These nests were easily counted by the presence of eggshells in and around each nest due to depredation. Typically, the nest chamber was penetrated from directly above and eggshells were scattered around the excavated chamber. This pattern is typical of raccoon depredation (Cornelius, 1986). Although we were able to count 160 nests, the actual tally for 1990 remains unknown for two reasons. First, nesting was still occurring when the patrol was conducted on 23 September; second, a few nests appeared to be from a previous nesting season. As the hawksbill is highly endangered worldwide (Groombridge and Luxmoore, 1989) and there are relatively few known nesting concentrations in the Caribbean Sea (Meylan, 1989), a follow-up study was planned for 1991 to determine the length of the nesting season, the total number of nests laid, and a means of controlling egg depredation by small mammals.

Methods

The 8 km beach south of Manatee Bar was patrolled every 3-4 days from 15 May to 15 August 1991 by a local resident hired to record sea turtle nesting activity. Thereafter the site

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

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GEORGE H. BALAZS

FIRST REPORT OF A LOGGERHEAD SEA TURTLE FROM ALASKA

A juvenile female loggerhead turtle, *Caretta caretta*, was found dead at the water's edge in a deep inlet on the north end of Shuyak Island, Alaska (58°33.9'N, 152°32.2'W) on 31 December 1991. It was towed by canoe to a Shuyak island residence and later transported to Kodiak by plane, where it was deposited in the freezer of the Office of Enforcement, National Marine Fisheries Service, until turned over to Kodiak College for study in early February. Kodiak weather was at or below freezing for most of the time that the turtle was not in a freezer. Identification was based on five pair of lateral scutes (the anteriormost contacting the nuchal scute), three pair of enlarged inframarginal scutes, the reddish-brown carapace, and the yellowish plastron. Morphometrics (Table 1) were obtained after Pritchard et al. (1983). The turtle weighed 37.8 kg.

The turtle was examined in detail to search for answers regarding its appearance in Alaska and cause of death. Encrusting barnacles were not present on either the carapace or the plastron. The outer margin of the left post-central scute had been broken and partially regenerated. The head and neck were missing above the fifth cervical vertebra. The hyoid bone and cartilage were missing as were the anterior portions of the esophagus and trachea. The respiratory and digestive systems were intact. Stomach, intestines, liver and gall bladder were examined for parasites and other anomalies but none were noted. The six-meter long stomach and intestinal tract contained a thick, viscous fecal material which tested negative for oily hydrocarbons with a black light. Embedded in the dark mass were five pieces of firm material about 50 mm long and 10 mm in diameter resembling the stipe of *Laminaria*. There was also an irregularly shaped piece of hard plastic (2 mm thick), about 200 mm² in area. Many small bird feathers (5-10 mm long) were collected from the gut.

There was much fatty tissue around the organs indicating that the animal was well nourished prior to its death. The fat was bright yellow and appeared fresh. The internal musculature was pink to red, appeared fresh and little disturbed except at the areas around the neck and rear leg. In general the flesh of the turtle appeared to be fit to eat, thus indicating that it had not been dead long or it had been frozen soon after death. The heart and pericardial chamber appeared intact. The female reproductive tract was small and the ovary was little developed. A large opening was present in the skin between the inguinal and anal scutes

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board: **LIBRARY OF
GEORGE H. BALAZS**

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

TEDs FALL VICTIM TO ELECTION YEAR POLITICS

In April, the National Marine Fisheries Service (NMFS) proposed new regulations which would require all U. S. shrimp trawlers, offshore and inshore, to use turtle excluder devices (TEDs) year-around [see MTN 58:7-8]. During a 90-day public comment period, including 12 public hearings throughout the southeast U. S., comments overwhelmingly supported the proposed regulations. In addition, the regulations (which included the use of TEDs in all waters at all times of the year, but also included a mechanism for NMFS to grant short-term emergency exemptions under certain circumstances) enjoyed the support of NMFS, the National Oceanic and Atmospheric Administration, and the Department of Commerce. None of this seemed to matter to the Bush Administration, however, which directed NMFS to file a ruling on 1 September requiring the year-around use of TEDs only by some boats in some waters.

The result was an "interim final rule" (i.e., a rule with the full weight of the law behind it, but that can be changed at any moment) extending current sea turtle conservation regulations in southeast U. S. Atlantic waters to require the use of TEDs year-around by shrimp trawlers 25 feet or longer operating in offshore waters. That's the good news. The bad news is a continuation of the status quo that gives captains of smaller boats and all boats operating in inshore waters from North Carolina to Texas a choice of either using TEDs or limiting tow times to 90 minutes (allowable tow times will be reduced to 75 minutes on 1 November). No additional changes were made in the conservation requirements for waters in the Gulf of Mexico. On 2 September, NMFS reopened the public comment period on the entire TED regulations package proposed in April for an additional 45 days.

The net effect of the interim final rule will be to increase protection for sea turtles in Atlantic offshore waters, but provide little increased benefit for turtles in inshore and Gulf waters. Unfortunately for sea turtles, most shrimpers opt for tow-time limits when given the choice. Tow-time limits are virtually unenforceable and, in any event, there is clear scientific evidence that even brief forced submergence can significantly impair sea turtles (Lutcavage and Lutz, 1991; Stabenau et al., 1991). Also important in this election year is the fact that the compromise ruling means the Bush Administration can put off making any difficult decisions on the rest of the regulatory package until after the November Presidential elections.

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

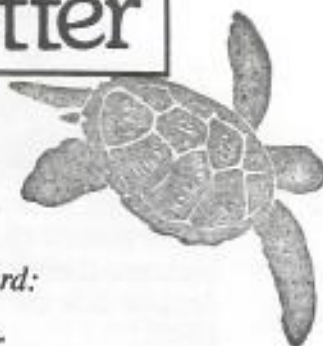
FIELD SURVEY OF LEATHERBACK NESTING BEACHES IN THE BIRD'S HEAD REGION, IRIAN JAYA, IS RENEWED

In 1985, a survey of nesting leatherback sea turtles (*Dermochelys coriacea*) and a tagging program was sponsored by the World Wide Fund for Nature (WWF) in the "Bird's Head" region of Irian Jaya, Indonesia (Figure 1). A report was written (Bhaskar, 1987), but the Project Leader subsequently returned to India with most of the data, including tag numbers, number of turtles tagged, and measurements. Tags since recovered cannot, therefore, be verified. We believe the tags are marked with "IRJA" and a number on one side, and "REWARD/HADIAH POST-TAG BOX 525 JAYAPURA INDO." on the other side. Since the 1985 tagging effort, local residents contend that there has been a noticeable drop in the number of leatherback turtles nesting each year (Betz and Welch, 1992). They believe that when the WWF researcher left, he took the turtles with him. Now, after a seven-year lapse, WWF's leatherback project has been reactivated in the Bird's Head region. For a six-day period in May 1992, a survey of nests and nesting females was carried out.

In the Bird's Head region there are two beaches which are known to be very important leatherback nesting sites: Pantai Warmamede (5 km long) and Pantai Wembrak (6 km long). Pantai Numfor (1 km long) is a much smaller beach but is no less important as a nesting site. All three beaches have been designated "Protected" by the Indonesian Government, a designation which, in theory, prohibits egg collection, taking of adult turtles, and trespassing. Two small villages with 10-20 people each are located at either end of these 12 km of nesting beaches. Divisions of the beaches are defined by running freshwater streams or rocky outcrops (Figure 2). Other smaller beaches extending to the east and west of these villages are also likely sea turtle nesting areas which will have to be surveyed.

Reaching the beaches for the purpose of surveying them is difficult. The turtle nesting beaches on the north coast of Bird's Head are accessible only by sea; there are no roads or landing strips. A boat ride in a local "long boat" rented out of Sorong takes six hours. Visiting the beaches from Sorong, it is necessary to stop into the community of Sausapor located four hours to the east of Sorong in order to report to the local police and region administration. Two local people from Kampong Saubeba (see Figure 2) accompanied the 1992 WWF field team to the nesting beaches. The team consisted of the WWF Programme Coordinator and three Department of Forestry personnel, including the project leader.

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

THIRTY YEARS OF SEA TURTLE CONSERVATION IN SOUTH AFRICA: 1963 - 1992

During 1963, the Natal Parks Board was asked to investigate the killing of nesting sea turtles on the coast of northeastern Zululand. A team consisting of an officer, Hennie van Schoor, two students, Humph McAllister and John Bass, and a game guard, Mbika, was dispatched to Bhanga Nek where it was found not only that sea turtles nested but that two species were involved -- the loggerhead (*Caretta caretta*) and the leatherback (*Dermochelys coriacea*). Killing was taking place and, it was believed, had been intensifying. The team started both protection and research, and 30 years later this program is the longest continuously running project on loggerhead and leatherback sea turtles in the world.

The turtle nesting season starts in October and ends with the departure of the season's hatchlings in the middle of March the following year. During the five month season, 56 km of the coast are patrolled every night both by vehicle and on foot. Over the years the emphasis of the patrols has changed from purely protection to primarily research as the local Thonga people lend greater and greater support to the protection program. Hardly a nesting turtle has been killed during the last 15 years.

As a result, populations of both species have grown dramatically. From fewer than 200 loggerhead females per year, more than 400 per year are now common. Leatherbacks reached an all time low in 1966/67 with only five females nesting, but over 70 females are now recorded regularly each year. In addition, the program has seen over 5000 loggerhead and nearly 1000 leatherback females tagged. Tags have been returned from Kenya, Tanzania, Mozambique and Madagascar, showing that the Zululand coast is home to many of the turtles living in the southwestern Indian Ocean.

This Natal Parks Board conservation program, shared since 1978 by the KwaZulu Bureau of Natural Resources, has been a great success and a credit to the conservation efforts of all South Africans.

GEORGE HUGHES, Natal Parks Board, P. O. Box 662, Pietermaritzburg, 3200 SOUTH AFRICA.

Marine Turtle Newsletter

Number 62 July 1993

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

A TRIBUTE TO JACK WOODY

When Jack Woody retired from the U. S. Fish and Wildlife Service (FWS) earlier this year, sea turtle conservationists said goodbye to a wonderful friend and mentor. As the National Sea Turtle Coordinator for the FWS, Jack was a powerful and tireless force for sea turtle conservation. We will remember him for many things, as champion of the Kemp's ridley, crusader for Turtle Excluder Device (TED) regulations, and outspoken advocate for conservation. But more than this, we will remember Jack for his support, guidance and friendship. During his 32 year service in wildlife conservation, Jack has nurtured and inspired hundreds of conservationists, leaving a legacy that will last for years to come.

It is surprising how few of his colleagues know about Jack's early days in conservation which he says he began as a "wildlife cop". After graduating from the University of California (Humboldt) with a B.S. in Wildlife Management, Jack moved his family to Nevada where he served as a warden/biologist for the state Fish and Game Commission. Nine years later he returned to school to earn an M.S. in Wildlife Management at the University of Nevada and, upon graduation, transferred to Washington D.C. to work for the FWS. The following year the Woodys returned to the West, this time to New Mexico, where Jack spent the next 22 years working for the Service. In 1975 Jack became the first Chief of Endangered Species in that region and in 1980 he was appointed as the first National Sea Turtle Coordinator for FWS. The following short accounts from four colleagues who worked closely with Jack illustrate the influence of his inspiration, hard work and friendship.

Javier Alvarado from Mexico's University of Michoacan writes, "I first met Jack in 1982, walking on Colola Beach, both of us escaping the crowd gathering around Michoacan's Governor who was visiting the field camp. It was my first season to work with sea turtles, and I didn't know what the future had in store for me. As Jack and I walked and talked, he began to share his enthusiasm and concern for sea turtles and for this fledging project in Mexico. Over the past 11 years Jack has continued to provide the guidance and inspiration that has enabled the black turtle project in Michoacan not only to survive, but to grow in many directions. He has listened to and supported new ideas and has always been accessible and enthusiastic. Jack has also been very influential in the establishment of other sea turtle conservation projects in Mexico, providing the technical assistance and financial support



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Number 63 October 1993

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

HEAD-START EXPERIMENT NO LONGER REARING KEMP'S RIDLEYS

As many sea turtle folks know, the captive rearing portion of the head-start experiment begun by the National Marine Fisheries Service (NMFS) in 1978 was terminated this year after 15 years of raising Kemp's ridley sea turtles (*Lepidochelys kempii*) and releasing them at about 10 months of age. Earlier this year, NMFS applied to the U. S. Fish and Wildlife Service (USFWS) for an amendment to their Convention on International Trade in Endangered Species (CITES) permit request to import 2,000 Kemp's ridley hatchlings from Mexico. After review of all pertinent information, USFWS denied the CITES permit amendment request on 19 July 1993. The experiment has been removing approximately 2,000 hatchlings per year for the past 15 years from the wild population of the most endangered sea turtle in the world. The denial of the permit for the further importation of this species for head-starting was based on sound biological reasoning. The decision appeal process allowed NMFS to bring new biological evidence to the attention of USFWS within 45 days of receipt of the denial letter. The deadline for the appeal in this case was 2 September 1993. NMFS did not choose to appeal the decision during that 45-day period.

The USFWS Office of Management Authority (OMA) based the CITES permit denial on a review by the Office of Scientific Authority (OSA) of the available biological evidence, including recommendations of the Southwest and the Southeast Regional Offices. The OSA could not establish that the continued removal of 2,000 wild hatchlings for the experiment would not be detrimental to the survival of the species. Contributing to the decision were the following: (1) many sea turtle researchers and managers have been outspoken in their opposition to the continued head-start of hatchling Kemp's ridleys, (2) a panel of experts, convened by NMFS in September 1992 to review the experiment, recommended that NMFS concentrate on marking wild hatchlings (as a control) and look for the 16,500 head-start turtles with adequate marking that have already been released rather than continue to head-start more Kemp's ridleys (Eckert et al., 1992), and, perhaps most importantly, (3) the Kemp's Ridley Recovery Plan (USFWS/NMFS, 1992) does not view the experiment as a recovery task and gives the head-start experiment no priority in the reestablishment of the species.

Head-start of Kemp's ridley sea turtles was begun in 1978 as part of a larger program of "last ditch efforts" to reverse an alarming decline in the nesting population of this species. In

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

"URGENT AND IMMEDIATE ACTION" NEEDED TO SAFEGUARD THE WORLD'S LARGEST AGGREGATION OF NESTING SEA TURTLES

Soon these textbook statistics may be all that remain of the olive ridley sea turtle (*Lepidochelys olivacea*), classified as "endangered" in the World Conservation Union's (IUCN) Red Data Book: The diminutive olive ridley is recognized by its nearly round carapace (the width about 90% of the length) and an adult color of olive green or brown dorsally and yellowish white ventrally. Adults rarely exceed 100 lb (45 kg) and 72 cm in shell length. The lateral plates (those to either side of the median on the shell) are divided into 5-9 pairs, whereas other sea turtles typically have 4-5 pairs. The species is omnivorous, favoring fish, crustaceans, mollusks, and tunicates in its diet. Females lay their eggs (about 100 at a time) on sandy beaches in tropical and subtropical latitudes.

Having been nearly eliminated over the course of this century at three of four historical nesting sites in Mexico, there are now only four significant *arribada* (mass nesting) beaches left in the world; namely, two on the Pacific coast of Costa Rica, one on the Pacific coast of Mexico, and one at Gahirmatha in Orissa, India. Gahirmatha stands alone as the site where more sea turtles nest than at any other spot on Earth -- more than a half million females laid eggs during a single week in March 1991! The phenomenon of the *arribada* is poorly understood by scientists, but the event itself is well-known. Thousands and thousands and thousands of females, wave after wave of them, come ashore to nest at once. And just as quickly, they are gone, leaving millions of eggs behind.

Why should we be concerned about an obviously healthy number of sea turtles nesting in a remote and distant place? Because the entire Gahirmatha population is seriously -- very seriously -- threatened. Readers of the MTN will remember that earlier this year Harry Andrews of the Madras (India) Crocodile Bank drew our attention to the plight of the Bhitarkanika Sanctuary, including Gahirmatha beach. Some 10 km from the beach the Government of India plans to develop a major fishing port for shrimp trawlers, a processing plant and large-scale prawn culture facility, and a road to be built straight through the mangroves. The tragedy is that there are viable alternatives to the siting of this commercial complex, including existing facilities at nearby Paradeep and Dhamara (both already have road access), which could be expanded in lieu of building an entirely new facility near the sensitive Bhitarkanika Sanctuary.



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Number 64 January 1994

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
1700 South Shores Road
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*



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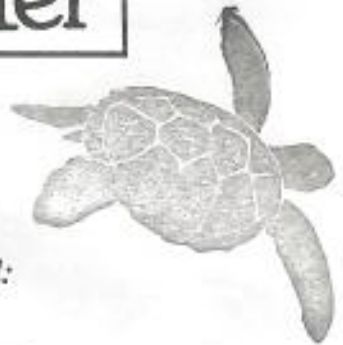
CONCERN RISES OVER THREAT TO INDIAN TURTLES

International concern is growing, environmentalists say, over a threat to the site where more sea turtles nest every year than in any other place on earth, the Gahirmatha beach in Orissa, India. The site, part of the Bhitarkanika nature sanctuary, is one of four remaining mass nesting beaches for the endangered olive ridley turtle, but by far the largest. According to scientists, more than 600,000 turtles arrived to lay their eggs during the course of a single week in March 1991, with 320,000 last year. Since olive ridleys lay a hundred or more eggs, the number of hatchlings can be enormous, and last year, more than three million are believed to have been hatched. Though the numbers are huge, the olive ridley, like other [sea] turtles, returns to lay its eggs in the place where it was born.

The Gahirmatha sanctuary is now threatened by Indian Government plans to develop a major fishing port for shrimp trawlers at Talchua, 10 km away, along with a processing plant, a large-scale prawn-culture facility and an access road straight through the mangroves near the nesting site. The port, according to local officials, is designed to be big enough to handle up to 500 fishing trawlers, and there are said by environmentalists already to be increasing numbers of adult turtles being caught in nets offshore. "Often," says Nicholas Mrosovsky, a top world expert on turtles, "they are killed as that is the quickest way to release them from the nets." With more fishing boats active, more turtles are bound to be caught, not least because whatever regulations are laid down to control the fishing, it is difficult to check the activity of each boat.

The Orissa State Government is planning to amend the Orissa Marine Fisheries Regulation Act 1982, to ban operation of trawlers within 20 km of the coastline, and is contemplating a ban on fishery activity off the Gahirmatha sanctuary during the turtle nesting season, but local environmentalists fear that even if the regulations are amended, enforcement will be insufficient. Existing legislation banning fishing within 5 km of the beach, for example, has not been very effective, with hundreds of dead turtles being reported every year. Moreover the port and its associated road is bound to create additional pressure on the mangrove forests, which are an important source of food for the olive ridleys. According to Shekar Dattatri, a young Madras-based film-maker who recorded the mass arrival of the olive ridleys a couple of years ago, "This is one of the few surviving naturalist spectacles in the world. Now I fear it will be lost forever."

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Number 65 April 1994

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

EDITORIAL: INDEX TO NEWSLETTER NUMBERS 31-65

We have devoted this issue to an Author and Subject Index of issue numbers 31-65 of the Marine Turtle Newsletter. We are very grateful to Barbara Wilhelm (San Diego, California) who, as a volunteer, spent many hours assisting us with compilation of the Subject Index. *Thank you Barbara!* (This has been no small task!) The last Index (nos. 1-30) was published in 1984 [MTN 30:1-15] by N. B. Frazer. As you peruse the following pages, it is easy to be humbled by the tremendous effort expended during the last decade throughout the world on behalf on these threatened and endangered marine reptiles. A great deal of effort has gone into the Marine Turtle Newsletter (MTN), as well, and a debt of gratitude is due former editors Dr. N. Mrosovsky and Dr. N. B. Frazer for establishing high standards. From small beginnings the newsletter has matured with the expanding fields of marine turtle research, management, conservation and policy. The MTN is now distributed quarterly in two languages (English, Spanish - Susana Salas, Coordinator/translator) to approximately 2500 persons in more than one hundred nations and territories.

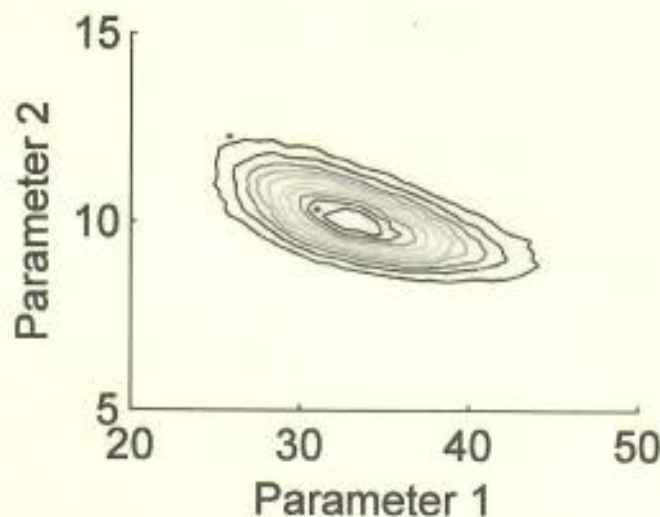
Field workers, policy-makers, and conservationists who have taken the time to summarize their findings, ask for assistance, and share their ideas have made, and continue to make, the MTN the useful and respected periodical that it is. Thoughtful contributions from authors in literally dozens of nations have kept the newsletter's objectives alive as we approach two decades of uninterrupted publication. As stated by N. Mrosovsky, the aims of the MTN are: (1) to provide a forum for exchange of information about all aspects of marine turtle biology and conservation, and (2) to alert interested people to particular threats to marine turtles, as they arise [MTN 1:1]. It is clear from the Index that the newsletter stands alone as the premier forum for the "exchange of information" about these species. As always, we invite you to submit articles about your work, to share your thoughts on how the MTN can be improved in the coming years and, last but not least, to consider a financial donation! And, as always, it is our privilege to serve you. KLE/SAE.

Note: Most articles are multi-faceted and indexing is often subjective. We tried to cross-reference each piece in at least three ways: species, geographic location, and primary subject matter. As an example of the latter, an article about a beach hatchery that discusses poaching, nest conservation, incubation, hatch success, etc. is likely to be indexed under "Hatcheries".

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Contour plot of random samples from a joint posterior distribution, where the height of the distribution is described by the contour lines (from Eguchi's introduction to Bayesian statistics, see pp. 1-5).

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Marine Turtle Newsletter

Number 77 April 1997

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

DISTINGUISHING CAPTIVE-REARED FROM WILD KEMP'S RIDLEYS

In 1996, the U. S. National Marine Fisheries Service's (NMFS) Galveston Laboratory, Gladys Porter Zoo (GPZ, Brownsville, Texas USA) and Instituto Nacional de la Pesca (INP) of Mexico initiated tagging of hatchling Kemp's ridleys (*Lepidochelys kempii*) at Rancho Nuevo, Tamaulipas, Mexico. NMFS, GPZ and INP personnel tagged 3,336 hatchlings with non-magnetized wire tags (Patrick Burchfield, GPZ, pers. comm., January 1997). The tags (manufactured by Northwest Marine Technology, Shaw Island, Washington USA) were injected into the *right* foreflipper. Plans are to wire-tag up to 10,000 more hatchlings in the *left* foreflipper in 1997, thus distinguishing them from the 1996 year-class.

The purpose of this paper is to alert the sea turtle research community to this tagging program, to provide background information concerning how and why it came about, and to provide criteria for distinguishing captive-reared from wild Kemp's ridleys.

Background

In 1992, Eckert et al. (1994) conducted a peer review of the Kemp's ridley head-start experiment, clarified its objectives, developed testable hypotheses and made recommendations for improvements (see also Wibbels, 1989 and Donnelly, 1994). They stated explicitly that head-started turtles were the experimental group and wild turtles were the control group. However, a direct comparison between head-started and wild year-classes was not possible, because ages of the wild turtles were unknown. There had been no tagging program for known-age wild turtles (see recommendations of Byles et al., 1996) comparable in magnitude to that for known-age, head-started turtles.

To provide a control, Eckert et al. (1994) recommended tagging as large a sample of wild hatchlings as possible in each of two consecutive seasons at Rancho Nuevo, using archival type tags (either internal wire or PIT, passive integrated transponder). The Galveston Laboratory is conducting PIT-tagging experiments on loggerhead (*Caretta caretta*) hatchlings, but use of this tag on large numbers of hatchlings released into the wild is cost-prohibitive, especially when the rate of tag returns is expected to be low. Eckert et al. (1994) recognized there were biases in using wild hatchlings as a control. Most head-started year-classes were released during years in which turtle excluder devices (TEDs) were not required in shrimp trawls, whereas the

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Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

OCCURRENCE OF ORAL FIBROPAPILLOMAS IN THE HAWAIIAN GREEN TURTLE: DIFFERENTIAL DISEASE EXPRESSION

Fibropapillomatosis (FP) is a tumor-forming transmissible sea turtle disease of relatively recent significance that globally affects mainly green turtles (*Chelonia mydas*). The disease has been most prominent in the Hawaiian Islands and Florida (USA) where half or more of the immature green turtles in some coastal foraging pastures are affected. The cause of FP is unknown; however, a herpes virus (Herbst, 1994; Herbst et al., 1995) and a retrovirus (Casey et al., 1996) have been implicated as possible etiologic agents. The mode of transmission and why the disease has become epidemic in some populations also remain to be determined. The usual outcome for most affected turtles in Hawaii is debilitation over a protracted period, followed by death.

In both Hawaii and Florida, where FP has been the focus of most studies to date, multiple fibropapillomas ranging in diameter from a few millimeters to 25 cm can occur on all skin surfaces of an animal. The most common sites of affliction are the axillary region of the flippers, and on the eyes, neck, and tail. Other sites affected less frequently include the carapace, plastron, and internal organs. The formation of tumors in the ocular region, causing partial or total loss of vision, has been well documented in both populations.

Differences have not been previously reported between green turtles in Hawaii and Florida in the expression of FP relating to the anatomic sites affected. Recent analysis of data for the Hawaiian population indicates that fibropapillomas commonly occur in the oral cavity and adjacent tissues. Between 1991-1995, 442 dead or moribund green turtles found stranded throughout Hawaii were examined and necropsied. Turtles with FP comprised 50% (n=222) and, of those, 61% (n=136) had oral fibropapillomas, ranging from mild to severe involvement. The size, site, and locally invasive nature of many of these growths indicated that normal breathing and feeding ability had been impaired, thereby contributing to stranding and death. In a separate study, also between 1991-1995, 561 green turtles were captured alive, examined, and released within Kaneohe Bay in Oahu, Hawaii. Turtles with FP made up 42% (n=236) and, of those, 40% (n=94) had oral tumors.

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Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

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FORENSIC APPLICATIONS OF MITOCHONDRIAL DNA MARKERS: ORIGIN OF A CONFISCATED GREEN TURTLE

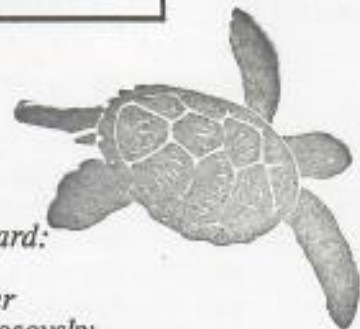
On 28 September 1993, a 35.6 cm green sea turtle (*Chelonia mydas*) was left at the Steinhart Aquarium (San Francisco, California) by a private citizen with the explanation that the turtle had been purchased in Abidjan, Ivory Coast, West Africa by a crew member of a cargo ship which had recently docked in San Francisco. Apparently the intention had been to consume the turtle, but the crew member had decided otherwise during the voyage. The turtle was in a poor state of health when left at the aquarium and was retained for rehabilitation. After the turtle was restored to health, Steinhart Aquarium requested guidance from the National Marine Fisheries Service (NMFS) and one of the authors (Eckert) on how and where the turtle should be released. Because of the circumstances surrounding acquisition, there was some concern that the turtle may not have originated in Africa, but rather had been taken from the Pacific. NMFS wished to accurately determine the region of origin before a repatriation plan was formulated. In practical terms, the question at hand was whether to release the turtle in the Atlantic or the Pacific Ocean.

Green turtle nesting populations typically contain distinctive mtDNA haplotypes (Bowen et al., 1992; Allard et al., 1994) which can be used to indicate the location of origin for sea turtles on distant feeding grounds (Norman et al., 1994; Broderick et al., 1994). The BEECS Genetic Analysis Core maintains an inventory of sea turtle DNA, including specimens from 16 *Chelonia mydas* rookeries in the Atlantic, Indian, and Pacific Oceans. This data bank provided the basis for the forensic application presented here.

A blood sample (<1 ml) was taken from the confiscated turtle following the protocol of Owens and Ruiz (1980). Blood was stored in a lysis buffer [100 mM Tris-HCl, pH 8; 100 mM EDTA, pH 8, 10 mM NaCl; 1.0% sodium dodecyl sulfate] in a blood:buffer ratio of approximately 1:10, as recommended by White and Densmore (1992). Our experience indicates that blood collected for DNA analysis can be preserved in lysis buffer for extended periods (>1 year) without refrigeration. This is a convenient approach for biologists who wish to stockpile material for genetic analysis. Lysis buffer is inexpensive to prepare and the ingredients can be found in any basic biochemical or genetic lab.

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

LATEST WORD ON THE TALACHUA JETTY, ORISSA, INDIA

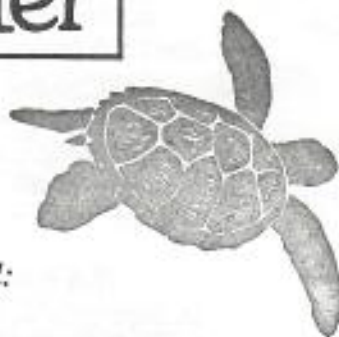
Although the first construction of the Talachua jetty collapsed, the Government of Orissa has now completed the jetty [see MTN 63 Supplement for background on this urgent issue]. The road over "Khola" inside the Bhitarkanika Sanctuary is complete, one more road is yet to be completed. In the Public Interest Case brought by the Centre for Environmental Law/WWF-India against the Government of Orissa [see MTN 66:26], the Orissa High Court has given a full stay on the operation of the jetty and the use of the roads inside the sanctuary until 31 October 1994. In addition, the Court has requested an environmental assessment report from an expert committee chosen by the Government of Orissa. The 11-member Environmental Impact Committee has representatives from the Government of Orissa, Government of India and others. No turtle biologists were invited to participate, despite the fact that the effect of the project on the world's largest population of sea turtles will constitute an important aspect of the report. The report is to be filed with the High Court by 31 October for further hearing on the case.

In the meantime, the Government of Orissa is bringing a bill before the State Assembly to remove sections of the Bhitarkanika Sanctuary from protected area status. This will effectively allow the operation of the jetty without permission from the Government of India. The Committee has called for public opinion on the beneficial vs. adverse effects of the jetty on the sanctuary and the sea turtles that nest there. We expect the mobilisation of a large number of letters in favour of operations associated with the new jetty. However, we have filed strong objections. Please write to: Registrar, Orissa High Court (Cuttack, Orissa, India; FAX: 91-674-400100) citing the Public Interest Case of WWF(India) vs. Government of Orissa on Bhitarkanika Sanctuary. *Help us!* We expect the next hearing some time in November.

P. MOHANTY-HEJMADI, P. O. Box 86, Bhubaneswar G.P.O. 751001 INDIA.

Editor's Note: It is impossible to express the gravity of this situation. At Talachua, some 10 km from the Bhitarkanika Sanctuary and the world's most important sea turtle nesting area (a half-million olive ridleys nested in a single week in March 1991), the Government of Orissa plans a major fishing port for shrimp trawlers (these trawlers drown turtles, 1000 washed ashore in 1991), a processing plant, shrimp farming facilities, ice factories, bridges, and roads slicing through the largest mangrove forest in India. We applaud WWF-India, we pray for good news.

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

1995 SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION

The 15th Annual Symposium on Sea Turtle Biology and Conservation will be held at the Hilton Head Island Beach and Tennis Resort (Tel: 803-842-4402), South Carolina, USA from 21-25 February 1995. This year's Symposium will be hosted by the Virginia Institute of Marine Science, College of William and Mary. Registration will begin on Tuesday, 21 February, and Symposium sessions will be scheduled on 22-24 February. Saturday, 25 February will be devoted to special meetings and to workshops. The symposium announcement and call for papers were mailed in October to all 1994 registered participants. If you did not receive the announcement and would like to attend, please send your name, complete mailing address and, if possible, FAX number to Thelma Richardson, Symposium Secretary, Institute of Ecology, University of Georgia, Athens, Georgia 30602 USA; FAX: (706) 542-6040.

As Chairperson of the International Travel Committee, Karen Eckert is coordinating support for non-USA participants. By the time the January issue is distributed, the foreign assistance travel grant fund will most likely have been expended. However, if you have questions about travel arrangements from outside the USA, contact Dr. Eckert at the WIDECAST Office, 17218 Libertad Drive, San Diego, California 92127; Tel/FAX (619) 451-6894. Please provide a FAX or e-mail number where you can be reliably reached. Limited travel assistance funds may still be available to students traveling within the continental United States. For details, contact Dr. C. K. Dodd, National Biological Survey, 7920 NW 71st Street, Gainesville, Florida 32653; FAX: (904) 378-4956. For information about the 'Latin American Forum' (19-20 February), contact Dr. Jack Frazier, CINVESTAV, A.P. 73 "Cordamex", Mérida, Yucatan, Mexico C. P. 97310; FAX: (5299) 812-919; e-mail: frazier@kin.cieamer.conacyt.mx.

The 1994 Symposium brought together 547 participants from 21 nations and territories and was a great success, featuring papers and posters on marine turtle research and conservation topics from around the world. 1994 Proceedings are available by writing to the National Marine Fisheries Service, Miami Laboratory, Sea Turtle Program, 75 Virginia Beach Drive, Miami, Florida 33149. We look forward to a very successful gathering in 1995 -- see you there!

J. A. MUSICK, President, 1995 Sea Turtle Symposium, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, Virginia 23062 USA; FAX: (804) 642-7327.

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Number 77 April 1997

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
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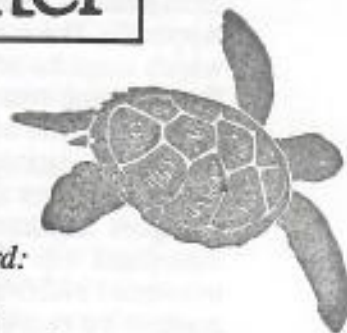
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Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
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C.I.T.E.S. APPROVES MARINE TURTLE RANCHING GUIDELINES

At its meeting in Fort Lauderdale, Florida USA in November 1994, the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) approved a rigorous set of guidelines interpreting the CITES regulations for ranched specimens (Conf. Res. 3.15) as they pertain to sea turtles. A major component of the new guidelines is the inclusion of requirements for "... the effective implementation of a national management plan for sea turtles", and that, "A party submitting a ranching proposal shall take the lead in the development and effective implementation of a regional management protocol designed to enhance the conservation of the population." Details for biological information needed, trade control mechanisms, ranch operation procedures, a statement describing conservation benefits, and regular reporting are specified.

The sea turtle ranching guidelines are designated CITES Conference Resolution 9.20, or simply "Conf. 9.20". The document represents a consensus built upon the base of an extensive consultative process that was conducted over the last three years [see MTN 61:23-24]. The issue was first brought to the floor of CITES where a succession of country delegates referred repeatedly to the need to recognize the special biology of sea turtles and the need for regional management of sea turtles while recognizing practical constraints and national sovereignty. Final wording of the document was thrashed out at a marathon negotiating session chaired by Dr. Robert Jenkins, Chairman of the CITES Animals Committee, and attended by more than 30 delegates representing 13 parties (countries) and six NGO's, including the IUCN/SSC Marine Turtle Specialist Group. Noteworthy among the representatives were both proponents and opponents of allowing controlled trade in sea turtle products from ranches. One observer commented that, "A significant consensus has been achieved when the Marine Turtle Specialist Group, Greenpeace International, the Bekko [hawksbill shell] Association of Japan, and the delegations from the USA, Cuba and South Africa all agree." The revised document was accepted by the full Conference after minor clarification, and was approved without dissent.

The new guidelines tighten and more strictly define the criteria by which proposals to engage in trade in ranched sea turtle products will be judged by CITES. Adoption of the guidelines will not immediately change the situation with regard to sea turtle trade. All species remain on Appendix I of CITES and only properly permitted international transfer for scientific



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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

1996 SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION

The 16th Annual Symposium on Sea Turtle Biology and Conservation will be held at the Hilton Head Island Beach and Tennis Resort (Tel 803-842-4402), South Carolina, USA from 27 February - 2 March 1996. This year's Symposium will be hosted by the University of Central Florida, University of Florida (Gainesville), and Florida Atlantic University. Registration will begin on Tuesday, 27 February, and Symposium sessions will be scheduled on 28 February - 1 March. Saturday, 2 March will be devoted to special meetings and workshops. The symposium announcement and Call for Papers will be mailed in early October to all 1995 registered participants. The Call for Papers and agenda will be coordinated by Dr. Jim Spotila, Dept. of BioScience/BioTech., Drexel University, 32nd & Chestnut Streets, Philadelphia, Pennsylvania 19104 USA; FAX (215) 895-1273. Those not registered at the 1995 Symposium may request an announcement from Thelma Richardson, Symposium Secretary, Institute of Ecology, Univ. of Georgia, Athens, Georgia 30602 USA; FAX (706) 542-6040.

Dr. Karen Eckert will coordinate financial support for non-USA participants. If you are presenting a paper or poster and are in need of financial assistance to attend the meeting, please contact Karen at the WIDECASST Office, 17218 Libertad Drive, San Diego, California 92127; Tel/FAX (619) 451-6894. Funds are limited and will be allocated by 1 December so *apply as soon as possible*; provide a FAX or e-mail number where you can be reliably reached. Limited travel assistance funds are also available to students traveling within the continental United States. For details, contact Dr. C. K. Dodd, National Biological Survey, 7920 NW 71st St., Gainesville, Florida 32653; FAX (904) 378-4956. For information about the 'Latin American Forum' which is expected to precede the Symposium, contact Dr. Jack Frazier, CINVESTAV, A.P. 73 "Cordamex", Mérida, Yucatan, Mexico C.P. 97310; FAX (5299) 812-919; e-mail: frazier@kin.cieamer.conacyt.mx.

The 1995 Symposium brought together 602 participants from 29 nations and territories and was a great success, featuring papers and posters on research and conservation projects from around the world. We look forward to a very successful gathering in 1996 -- see you there!

RICHARD A. BYLES, 1996 Sea Turtle Symposium President, U. S. Fish and Wildlife Service, P. O. Box 1306, Albuquerque, New Mexico 87106-1306; FAX (505) 766-8063.

Marine Turtle Newsletter

Number 71 October 1995

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

TEACHING CRITICAL CONCEPTS FOR THE CONSERVATION OF SEA TURTLES

I am here presenting two visual aids (in a format that can easily be photocopied and distributed as hand-outs) that have proved helpful in explaining complicated aspects of the life history of sea turtles. An understanding of these concepts is critical to the design and public acceptance of effective sea turtle management plans. The singular difficulty in understanding these concepts stems from the long delay between the cause and the visible effect of certain devastating practices.

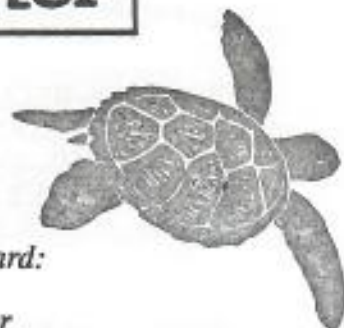
Scientific studies clearly demonstrate that, under natural conditions, most sea turtles are long-lived animals with delayed sexual maturity and high survivorship of adults. Unfortunately, these life history traits prevent a turtle population from showing early symptoms of over-harvest that are visible to the casual observer. They also limit the ability of populations to recover after having suffered extended over-exploitation (Congdon et al., 1993).

Over-harvest of eggs or of nesting females can continue for decades before it manifests itself at the nesting beach as a decrease in numbers of nesting females. In the interim, there may be no visible signs of population decline on the nesting beach, and so the general public often remains oblivious to the fact that over-exploitation is occurring. By the time the nesting population crashes, it may be too late to save the population at large from extinction.

These population dynamics are complicated, abstract, and difficult to explain to the general public, especially through words and mathematical equations alone. I have found, however, that people are very receptive to diagrammatic representation of these concepts, and the two presented here have proven to be effective educational tools.

Marine Turtle Newsletter

Number 72 January 1996



Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

ATOL DAS ROCAS BIOLOGICAL RESERVE: SECOND LARGEST CHELONIA ROOKERY IN BRAZIL

Atol das Rocas (3°52'S, 33°49'W), the only atoll in the South Atlantic Ocean, is located 144 miles off the northeastern coast of Brazil. The ring-shaped atoll is of volcanic origin, formed by calcareous algae and colonial mollusks. Two small islands, Farol and Cemitério, are permanently exposed with a total area of 7.2 km². In 1981, 1982 and 1986, the National Program for the Conservation and Management of Brazilian Marine Turtles (TAMAR Project/IBAMA) sent expeditions to the atoll to estimate the number of turtles that nested there. After verifying that the atoll is Brazil's second largest reproductive area for green turtles, Chelonia mydas -- the first being Trindade Island (Moreira et al. 1995) -- a comprehensive program of annual monitoring and data collection began in 1990.

— - Researchers are sent to the atoll at the end of December, at the start of the nesting season, and remain until July when the last hatchlings emerge from their nests. Beach patrols are conducted at night and nearly 100% of the nesting females are tagged. Turtles prefer to nest during the high tide to avoid being stranded by the receding waters. Tidal strandings are rare, but when they occur the turtles must wait for the next high tide to return to the sea. During four consecutive seasons of monitoring (1990-1994), TAMAR has documented 3411 nests and tagged 456 nesting females. The mean curved carapace length and width are 118.6 cm (range 100.0 - 134.0 cm, n=1188) and 108.7 cm (range 94.0 - 130.0 cm, n=1188), respectively. Based on the number of nests laid per month, the peak reproductive period occurs between the months of March and April. The nests are left *in situ* and show a hatch success rate of 75.4%. The average incubation period (egg laying to hatchling emergence) is 61 days (range 51-74 days, n=153 nests).

The Atol das Rocas Biological Reserve was created in 1979 as the first marine protected area in Brazil. Aside from the second largest nesting population of green turtles in the country, the atoll is also visited by thousands of migratory marine birds, and harbours noteworthy marine biodiversity. For a long time the atoll was a favored area for fishermen, but since 1990 the effective implementation of the Biological Reserve and the constant enforcement of its protected status have guaranteed the area's preservation.

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
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David W. Owens
Peter C. H. Pritchard
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BHITARKANIKA ECOSYSTEM PROTECTED BY COURT'S DECISION

Accomplishments of the Bhitarkanika Litigation:

- * **Orissa High Court orders all construction activities for roads and jetties to be put in abeyance.**
- * **Sanctuary is brought under a Centrally sponsored scheme of the Ministry of Environment and Forests to be funded by the Planning Commission.**
- * **World Bank stops aid for commercial aquaculture activity in the region.**
- * **World Bank sanctions a fund for holistic eco-development of the area.**
- * **For the first time, the Court orders punishment of Government officials involved.**

Bhitarkanika is a unique ecosystem situated on the eastern coast of India in the State of Orissa. The area includes Bhitarkanika Wildlife Sanctuary and Gahirmatha National Park, both of international repute. The uniqueness of the topography lies in the manner in which the region is crisscrossed by a network of rivers and flanked by the sea on one side. The region is home to a wide variety of spectacular plant and animal species, the keystone species being the olive ridley sea turtle (*Lepidochelys olivacea*). The area boasts wetlands, backwaters, and brackish water regions. The vegetation varies from the deltaic mangrove forests to the deciduous and semi-deciduous forests.

Instead of endeavouring to safeguard this rich natural heritage, the Orissa Government embarked on building roads, bridges and fishing complexes in the region violating the 1972 Wildlife Protection Act (WPA), the 1980 Forest Conservation Act (FCA), and the Coastal Regulation Zone (CRZ) Notification issued under the 1986 Environment (Protection) Act (EPA), thereby threatening the existence of the mangrove ecosystem. The Centre for Environmental Law (CEL), WWF-India filed a Writ Petition (OJC No. 3128 of 1994) and a stay application in the Orissa High Court at Cuttack on 22 April 1994 in a bid to save the Bhitarkanika

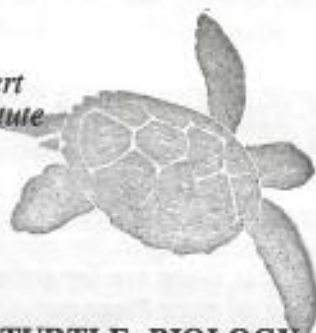
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1997 SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION

The 17th Annual Symposium on Sea Turtle Biology and Conservation will convene on 4-8 March 1997 at the Delta Orlando Resort in Orlando, Florida, USA. To make reservations call (407) 351-3340 ext. 1792, or from the USA or Canada call toll-free (800) 634-4763. This year's Symposium will be hosted by University of Central Florida, the Archie Carr Center for Sea Turtle Research (University of Florida), Florida Atlantic University, Mote Marine Laboratory, and Comité Nacional para la Protección y Conservación de las Tortugas Marinas (México).

Symposium registration will begin Tuesday, 4 March. Symposium sessions will be scheduled on 5-7 March. Saturday, 8 March will be devoted to special meetings and workshops. The Symposium Announcement and Call for Papers will be mailed in late August to all 1996 registered participants. Those not registered at the 1996 Symposium may request an Announcement from Thelma Richardson, Symposium Secretary, Institute of Ecology, University of Georgia, Athens, Georgia 30602 USA; Fax (706) 542-6040, e-mail: trichard@uga.cc.uga.edu. For information about the Latin American Forum preceding the Symposium, please contact Dr. Jack Frazier, CINVESTAV, A. P. 73 "Cordamex," Merida, Yucatan, México C. P. 97310; Fax (5299) 81 29 19, e-mail: frazier@kin.cieamer.conacyt.mx.

Karen Eckert (Wider Caribbean Sea Turtle Conservation Network, WIDECAST) and Marydele Donnelly (IUCN/SSC Marine Turtle Specialist Group) will coordinate financial support for non-USA participants. If you are presenting a paper or poster and are in need of financial assistance to attend the meeting, please contact Dr. Eckert at the WIDECAST Office, 17218 Libertad Drive, San Diego, California 92127 USA; Tel/Fax (619) 451-6894, e-mail: widecast@ix.netcom.com. Funds are limited and will be allocated by 1 January 1997. Grant applications should be received by 1 October 1996 (see MTN 73:8); later applications will be accepted, but those received by 1 October will be given priority attention. In any case, please provide a Fax or e-mail number where you can be *reliably* reached.

Limited financial assistance is available for students traveling within the continental United States and Canada. For details, please contact Dr. C. K. Dodd at the National Biological Service, 7920 NW 71st Street, Gainesville, Florida 32653 USA; Fax (904) 378-4956; e-mail: kdodd@nervm.nerdc.ufl.edu.

Marine Turtle Newsletter

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Number 75 October 1996

Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

IS THE SURINAM OLIVE RIDLEY ON THE EVE OF EXTINCTION? FIRST CENSUS DATA FOR OLIVE RIDLEYS, GREEN TURTLES AND LEATHERBACKS SINCE 1989

The olive ridley (*Lepidochelys olivacea*) population that nests in the Galibi Nature Reserve in Suriname is the largest and most important olive ridley population in the Western Atlantic. In the late 1960's, this population was abundant enough to produce *arribadas* (mass nesting events). At that time, almost all of the eggs were harvested in an uncontrolled manner by inhabitants of two nearby Carib villages. Despite conservation measures carried out by STINASU (Foundation for Nature Preservation in Suriname), which reduced poaching (Reichart and Fretey, 1993), the numbers of nesting females decreased drastically in subsequent years. In 1968, an estimated 3065 olive ridley nests were laid in the Galibi Nature Reserve (Schulz, 1975). In 1989, the estimated number of nests laid was only 424 (Reichart and Fretey, 1993), a decrease of more than 80% in 20 years. The number of olive ridleys elsewhere in the Guianas did not increase during this time, making it unlikely that the population had moved elsewhere (H. Reichart, STINASU, pers. comm., 1996).

The nesting population of green turtles (*Chelonia mydas*) in Suriname was relatively stable between 1968 and 1989, and has been estimated at 3700-7200 females (see Reichart and Fretey, 1993). During this same time, the number of leatherback turtles (*Dermochelys coriacea*) nesting in Suriname increased from 200 in 1968 to 12,401 in 1985 (Reichart and Fretey, 1993), probably due to the erosion of nesting beaches in neighboring French Guiana (Schulz, 1975). At the end of the 1989 nesting season, armed Carib villagers forced STINASU personnel out of the Galibi Nature Reserve. As a result, no data are available for the period 1990-1993. Nest counts restarted during the 1994 nesting season, but data are incomplete. Poaching of eggs has increased significantly in the intervening years.

In this article we present the first data on the number of olive ridley, green, and leatherback turtles nesting in the Galibi Nature Reserve since 1989. Data were collected by the authors and by STINASU employees from 1 February-31 July 1995, spanning virtually all of the olive ridley, green turtle and leatherback nesting seasons. All the beaches of the Galibi Nature Reserve were monitored (about 13 km) during this period. The Spit (a newly formed sand bank about 4 km in front of Eilanti) was monitored only during the olive ridley nesting season (mid-

Marine Turtle Newsletter

August 1996

Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

A Special Notice to Readers

The Marine Turtle Newsletter (MTN) is 20 years old this month, having been inaugurated in August 1976 by Dr. Nicholas Mrosovsky at the University of Toronto (Ontario, Canada). Anniversaries tend to invoke introspection, and this one is no different! The newsletter has seen tremendous growth over the course of the last two decades, with English and Spanish editions delivered quarterly to more than 2000 readers in more than 110 nations and territories around the world. The continued expansion in readership is great, but it also raises an issue that we all need to consider -- namely, cost! The newsletter's aims, as articulated in the premier issue, are "(1) to provide a forum for exchange of information about all aspects of marine turtle biology and conservation, and (2) to alert interested people to particular threats to marine turtles, as they arise." We are committed to these objectives, which, in practice, demand timely distribution and global access. Both are costly to attain.

For those unfamiliar with the history of the MTN, let's review why the newsletter was initiated. In the mid-1970's, as it became clear that sea turtles were endangered throughout most of their global ranges, scientists and managers struggled to design and implement research and conservation programs with very limited knowledge of sea turtle biology. There was no doubt that survival prospects would be enhanced by the international and timely sharing of ideas and methodologies. Dr. Mrosovsky designed the MTN to be an informal publication to serve the needs of a growing research community. He opened the charter issue with these remarks: "Efforts are going on all over the world to save marine turtles from extinction. Marine turtles are widely distributed and their migrations take them across international boundaries. These facts complicate both arriving at an understanding of their biology and devising the necessary measures for their conservation. Given this situation, the authorities at IUCN and the members of the IUCN Marine Turtle Specialist Group felt that better communication between workers in different parts of the world was needed."

By 1980, recipients included colleagues in 70 countries. In August 1984, an Index to past issues was compiled illustrating the depth and breadth of the newsletter's coverage of contemporary issues, research and survey results, and conservation techniques. Circulation had climbed to more than 800, with readers in some 80 countries. Many topics first aired in the newsletter had been taken up by other media, spreading the news about the dire circumstances

facing many of the world's remaining sea turtle populations. In November 1984, Dr. Nathaniel Frazer took the helm and noted in his opening editorial that, *"Under [Dr. Mrosovsky's] editorship, the MTN became a source document of inestimable value to all who study sea turtles -- so much so that it is difficult to believe that anyone could ever hope to maintain a current understanding of sea turtle biology and conservation without regularly reading the MTN."*

We came on board as co-Editors in November 1988 and established a Spanish edition, "Noticiero de Tortugas Marinas" (NTM), in early 1990. Making the newsletter available in Spanish had long been requested by the growing Latin American research community. The newsletter remains the foremost means of information-sharing on matters of import to sea turtles, the habitats upon which they depend, and the human communities that depend on the sea turtles. Readership continues to increase, and the MTN/NTM is now read in virtually every country of the world. The annual budget is about \$28,000 -- \$11,000 in printing, \$11,000 in mailing, \$4000 for translation services (NTM), and \$2000 for supplies. In recent years, the U. S. Fish and Wildlife Service (FWS) has contributed nearly one-half of the budget (\$12,000 per year). The balance has been met by the kindness of other donors and readers, each of whom is credited at the end of each issue.

Dr. Richard Byles, FWS National Sea Turtle Coordinator and MTN benefactor, has left the Service and the future of the office he held is uncertain. As a result, we can no longer depend on the support of FWS. In the short-term, the U. S. National Marine Fisheries Service may come to the rescue; alternatively, the MTN/NTM will be suspended until other sources of support are identified. The issue, however, is not the loss of a specific donor, as painful as that is, but the question of how to establish the MTN/NTM on solid financial footing into the next century. We are often asked why we don't initiate a subscription fee. The simple answer is that we are full to capacity (and beyond!) with the demands of a 12-week production cycle, related (and some not-so-related) correspondence directed to the Editorial office, fund raising, annual reports, financial statements, etc. To maintain subscribing members, even just within the U. S. (so we only had to deal with one currency!), would irreparably compromise our sanity.

In lieu of a subscription service, we'd like to see how much mileage we can gain from the simple act of letting you know that four issues (one year) of the MTN/NTM costs US\$ 14.00 to print and mail. The math is simple: $\$28,000/2000 \text{ readers} = \$14/\text{reader}$. Roughly half (45%) of our readers are within the U. S. So, if every U. S. reader contributed \$20.00 per year (and those of you who routinely donate more would continue to do so!), all expenses would be met. Alternatively, we could "publish" the MTN on a Web Page on the internet and let you "download" (print) it if you wanted to archive a hard copy. That would theoretically eliminate all printing and mailing costs! In reality, however, we must remember that many readers live in parts of the world where the internet is neither accessible nor likely to be free. And even assuming that all U. S. readers could access the newsletter from the internet, which, of course, is far from the truth, the financial savings are not large. The cost of printing would decline, but since less than 5% of the budget is allocated to U. S. postage, mailing costs would remain high.

In the end, we will pursue multiple avenues. We will establish a Web Page (and hope that those of you who are willing to access this format will remove your names from the mailing list), we will reformat the printed copy to use space more efficiently, and we will hope that each of you will make a private assessment of how much the MTN/NTM means to you. If it holds value, we urge you to contribute meaningfully every year to the cost of production. This would not only keep the newsletter afloat, but it would measurably ease the burden of fund raising and eliminate the need for a membership officer. Finally, if you can live without the newsletter, we hope you'll let us remove you from the mailing list! We continue to enjoy the development of the MTN/NTM each quarter, and we hope that it serves you well. -- KLE/SAE

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Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

OCCURRENCE OF ORAL FIBROPAPILLOMAS IN THE HAWAIIAN GREEN TURTLE: DIFFERENTIAL DISEASE EXPRESSION

Fibropapillomatosis (FP) is a tumor-forming transmissible sea turtle disease of relatively recent significance that globally affects mainly green turtles (*Chelonia mydas*). The disease has been most prominent in the Hawaiian Islands and Florida (USA) where half or more of the immature green turtles in some coastal foraging pastures are affected. The cause of FP is unknown; however, a herpes virus (Herbst, 1994; Herbst et al., 1995) and a retrovirus (Casey et al., 1996) have been implicated as possible etiologic agents. The mode of transmission and why the disease has become epidemic in some populations also remain to be determined. The usual outcome for most affected turtles in Hawaii is debilitation over a protracted period, followed by death.

In both Hawaii and Florida, where FP has been the focus of most studies to date, multiple fibropapillomas ranging in diameter from a few millimeters to 25 cm can occur on all skin surfaces of an animal. The most common sites of affliction are the axillary region of the flippers, and on the eyes, neck, and tail. Other sites affected less frequently include the carapace, plastron, and internal organs. The formation of tumors in the ocular region, causing partial or total loss of vision, has been well documented in both populations.

Differences have not been previously reported between green turtles in Hawaii and Florida in the expression of FP relating to the anatomic sites affected. Recent analysis of data for the Hawaiian population indicates that fibropapillomas commonly occur in the oral cavity and adjacent tissues. Between 1991-1995, 442 dead or moribund green turtles found stranded throughout Hawaii were examined and necropsied. Turtles with FP comprised 50% (n=222) and, of those, 61% (n=136) had oral fibropapillomas, ranging from mild to severe involvement. The size, site, and locally invasive nature of many of these growths indicated that normal breathing and feeding ability had been impaired, thereby contributing to stranding and death. In a separate study, also between 1991-1995, 561 green turtles were captured alive, examined, and released within Kaneohe Bay in Oahu, Hawaii. Turtles with FP made up 42% (n=236) and, of those, 40% (n=94) had oral tumors.

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Editors:

*Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA*

Editorial Board:

*Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson*

DISTINGUISHING CAPTIVE-REARED FROM WILD KEMP'S RIDLEYS

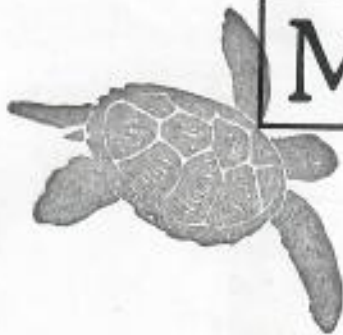
In 1996, the U. S. National Marine Fisheries Service's (NMFS) Galveston Laboratory, Gladys Porter Zoo (GPZ, Brownsville, Texas USA) and Instituto Nacional de la Pesca (INP) of Mexico initiated tagging of hatchling Kemp's ridleys (*Lepidochelys kempii*) at Rancho Nuevo, Tamaulipas, Mexico. NMFS, GPZ and INP personnel tagged 3,336 hatchlings with non-magnetized wire tags (Patrick Burchfield, GPZ, pers. comm., January 1997). The tags (manufactured by Northwest Marine Technology, Shaw Island, Washington USA) were injected into the *right* foreflipper. Plans are to wire-tag up to 10,000 more hatchlings in the *left* foreflipper in 1997, thus distinguishing them from the 1996 year-class.

The purpose of this paper is to alert the sea turtle research community to this tagging program, to provide background information concerning how and why it came about, and to provide criteria for distinguishing captive-reared from wild Kemp's ridleys.

Background

In 1992, Eckert et al. (1994) conducted a peer review of the Kemp's ridley head-start experiment, clarified its objectives, developed testable hypotheses and made recommendations for improvements (see also Wibbels, 1989 and Donnelly, 1994). They stated explicitly that head-started turtles were the experimental group and wild turtles were the control group. However, a direct comparison between head-started and wild year-classes was not possible, because ages of the wild turtles were unknown. There had been no tagging program for known-age wild turtles (see recommendations of Byles et al., 1996) comparable in magnitude to that for known-age, head-started turtles.

To provide a control, Eckert et al. (1994) recommended tagging as large a sample of wild hatchlings as possible in each of two consecutive seasons at Rancho Nuevo, using archival type tags (either internal wire or PIT, passive integrated transponder). The Galveston Laboratory is conducting PIT-tagging experiments on loggerhead (*Caretta caretta*) hatchlings, but use of this tag on large numbers of hatchlings released into the wild is cost-prohibitive, especially when the rate of tag returns is expected to be low. Eckert et al. (1994) recognized there were biases in using wild hatchlings as a control. Most head-started year-classes were released during years in which turtle excluder devices (TEDs) were not required in shrimp trawls, whereas the



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Editors:

Karen L. Eckert & Scott A. Eckert
Hubbs-Sea World Research Institute
2595 Ingraham Street
San Diego, California
92109 USA

Editorial Board:

Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

EDITORIAL: DEFINING MOMENTS

The Preamble of Agenda 21, adopted by Governments at the "Earth Summit" of Rio de Janeiro in 1992 (U.N. Doc. A/Conf.151/26, Vol. I-IV), proposes that, "Humanity stands at a defining moment in its history." It goes on, "We are confronted with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our wellbeing. However, integration of environment and development concerns, and greater attention to them will lead to fulfillment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future." It wisely concludes, "No nation can achieve this on its own; but together we can -- in global partnership for sustainable development."

More and more we hear that in order to survive, multilateral collaboration is the key. While this is certainly the case with humanitarian and security issues, perhaps nowhere is it more obvious than in the conservation of migratory species. As Eckert and Sarti (this issue) have shown, not even the largest nesting assemblages in the world are immune from threats faced thousands of miles from the nesting beach. Without a unity of conservation purpose at the inter-governmental level, remnant breeding assemblages around the world will ultimately fail. The Western Hemisphere has recently met this challenge head-on with the newly negotiated *Inter-American Convention for the Protection and Conservation of Sea Turtles*. It's not a perfect treaty, but it is a start. We invite our global readership to study this new accord and to wish it well. With a little luck, it will define a balanced approach to sea turtle conservation well into the next century ... and serve as a model for other regions to follow.

This will be the last issue edited by Scott and I. After ten years (we accepted responsibility for the newsletter in 1988 when we were still in Graduate School), it's time for someone else to enjoy this unique position of service. The newsletter has grown tremendously over the last decade, and we have loved every minute of it. Remarkably, there is much more change to come! The next year will be a time of profound transition. You can expect new Editors, a new Editorial Board, a fresh format and presentation style (including photographs and half-tones), more editorials and other regular features, an online option, and, very likely a subscription fee. We know you will give the new Editors the consistent support that has meant so much to us ... and we look forward to simply *reading* each issue! With fond regards, KLE/SAE

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Marine Turtle Newsletter



Number 79 January 1998

Editors:

Brendan J. Godley & Annette C. Broderick
Marine Turtle Research Group
Division of Environmental and
Evolutionary Biology
Graham Kerr Building
University of Glasgow
G12 8QQ Scotland U.K.

Editorial Board:

Karen L. Eckert
Nat B. Frazer
Nicholas Mrosovsky
David W. Owens
Peter C. H. Pritchard
James I. Richardson

PRESENT STATUS OF GAHIRMATHA BEACH IN BHITARA KANIKA SANCTUARY, ORISSA

In 1997, the mass nesting (*arribada*) of the world's largest population of olive ridley turtles (*Lepidochelys olivacea*) did not take place on the Gahirmatha Beach of the Bhitara Kanika Sanctuary, situated on the east coast of India in Kendrapara district of Orissa state. The silence was deafening.

Generally the mass nesting takes place twice per year, once in the early part of January and again in early April; in some years, the event happens only once. While there are records of past years in which nesting failed to occur, the present situation cannot help but illicit grave concern. Historically, the pristine and remote beach at Gahirmatha has been well protected by a rich mangrove forest, and it has attained the pride of place as the site of the world's largest sea turtle nesting event. These mass nestings, which scientists refer to as *arribadas*, average 2-6 lakhs females per year [1 lakh = one hundred thousand], each laying more than 100-150 eggs.

Despite the usual mating aggregations in October 1996 off the coast of the sanctuary, the turtles did not commence with egg-laying. What happened? Offshore fishing is one explanation. Between October and April each year, fishing is prohibited within 20 km of the coast to avoid threatening the sea turtles. Notwithstanding, hundreds of trawlers and gill-netters operated in the area throughout the closed season last year (i.e. during the 1996-1997 nesting season), blatantly violating the law. They were mostly from Orissa and neighboring West Bengal, though foreign trawlers also intruded into the area. Thousands of turtles were entangled in these nets and were killed. Some were swept to the shore by tidal action -- more than 4000 washed ashore dead during what should have been the nesting season. Some dead dolphins were also found.

The Orissa government has been very callous to this disastrous situation. The state's Fisheries Department indiscriminately licenses trawlers without judging the availability of fishing resources in the area. There are already two fishing harbours at Dhamra and at Paradeep to the north and south of Bhitara Kanika sanctuary. Without studying the economic viability of any proposal, landing facilities were recently constructed on the fringe of the Bhitara Kanika sanctuary at Talchua (construction is complete, but the site has yet to be commissioned

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April 1998.



Project TAMAR biologists record data and release adult hawksbill turtle, in conjunction with fishermen at Praia do Forte, Brazil (Marcovaldi *et al.* pages 5-7).

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Editorial:

The MTN/NTM heading towards the year 2000

Guest Editorial:

Messages in Bottles

Articles:

Activities by Project TAMAR in Brazilian Sea Turtle Feeding Grounds
Green Turtle, *Chelonia mydas* in the Island of Poilão, Bolama-Bijagós Archipelago,
Guinea-Bissau, West Africa
Community turtle conservation at Río Oro on the Pacific coast of Costa Rica

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Baby Girls, Old Cattle and Sea Turtles
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Association of a Unique Chelonid Herpesvirus with Sea Turtle Fibropapillomas

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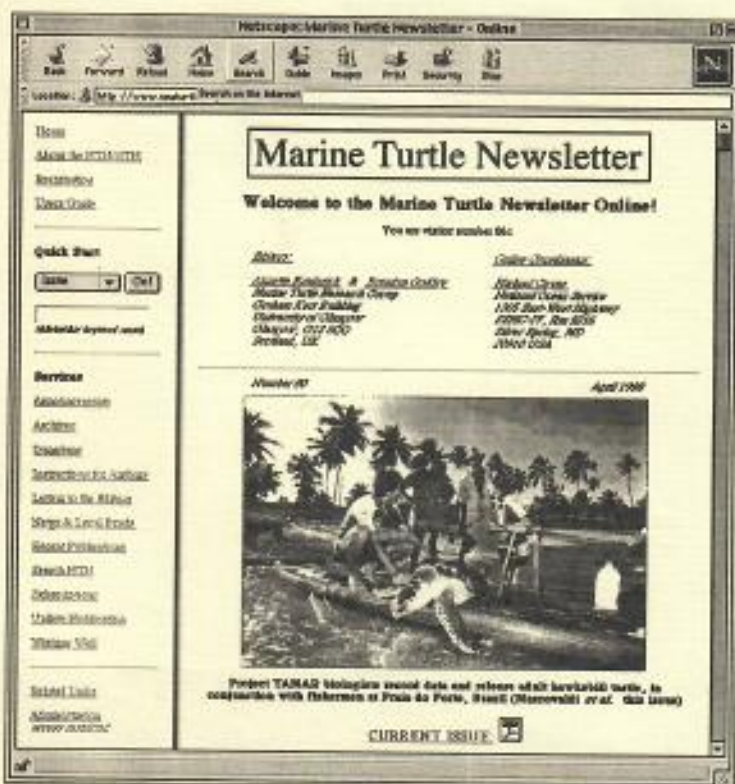


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Marine Turtle Newsletter

Issue Number 81.

July 1998.



The MTN is now Online (Coyne, this issue, pages 1-4)

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Guest Editorial: Sea Turtles on the Internet

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Green Turtle Nesting at Akyatan Beach, Turkey, 1994-1997

Marine Turtles in the Orango National Park (Bijagós Archipelago, Guinea-Bissau)

Marine Turtle Exploitation in Bronze Age Oman

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Unusual Record of a Juvenile Hawksbill Sea Turtle in a Mangrove Estuary, El Salvador

Possible Link Between Sea Turtle Bycatch and Flipper Tagging in Greece

Egypt Project Underway

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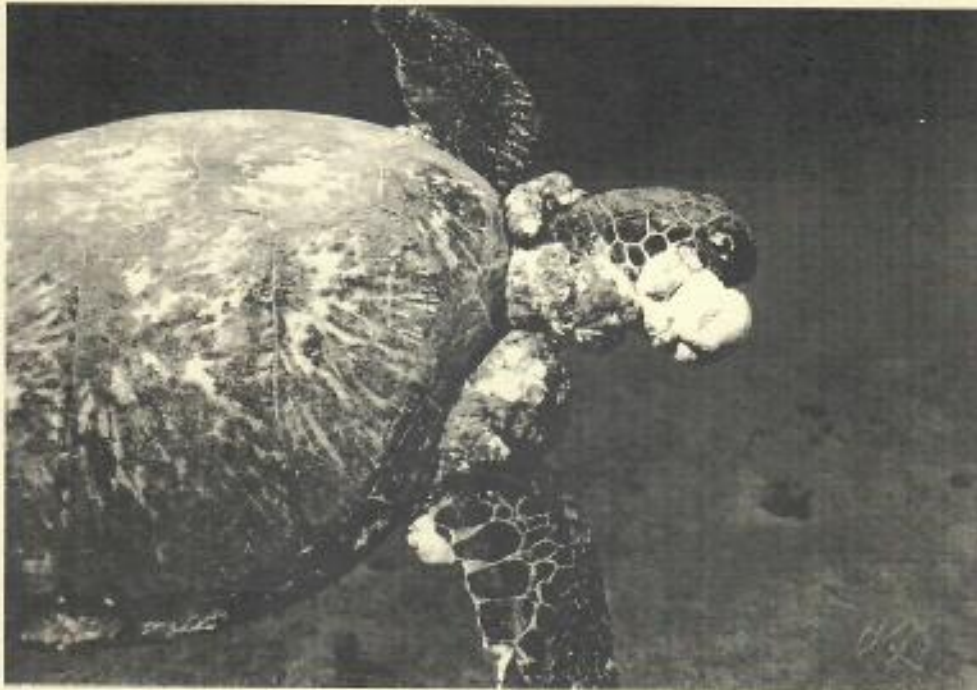
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Marine Turtle Newsletter

Issue Number 82.

October 1998.

Photo credit: Ursula Keuper-Bennett



Fibropapillomas in marine turtles: a meeting report summarising current knowledge (Aguirre, pages 10-12).

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More Kemp's Ridley Turtles Return to South Texas to Nest
Site Fidelity and Size Frequencies of Juvenile Green Turtles (*Chelonia mydas*) Utilising Near Shore Reefs in St. Lucie County, Florida

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Tag Recovery Supports Satellite Tracking of a Green Turtle
Green Turtle Tagged in Brazil Recovered in Trinidad
Olive Ridley Tagged in Orissa Recovered in the Coastal Waters of Eastern Sri Lanka

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January 1999.



Mortality of olive ridley turtles at Orissa continues (Pandav & Choudhury, pages 10-12).

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Common Sense Conservation

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Genetic Consequences of Coastal Development: The Sea Turtle Rookeries at X'cacel, Mexico
An Update on the Mortality of the Olive Ridley Sea Turtles in Orissa, India
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ISSN 0839-7708

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Issue Number 84.

April 1999.



Inter-American Convention for the Protection and Conservation of Sea Turtles (Frazier, pages 1-3).

IN THIS ISSUE:

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Update on the Inter-American Convention for the Protection and Conservation of Sea Turtles.

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Historical Overview of Marine Turtle Exploitation, Ascension Island, South Atlantic.

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Browsing of Mangroves by Green Turtles in Western Australia.

University Project on the Study and Conservation of Cuban Sea Turtles.

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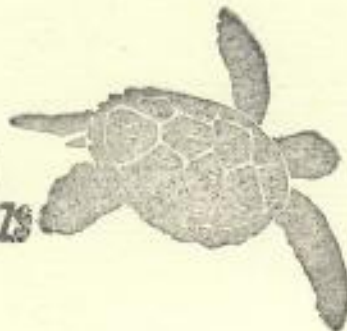
Meeting Report

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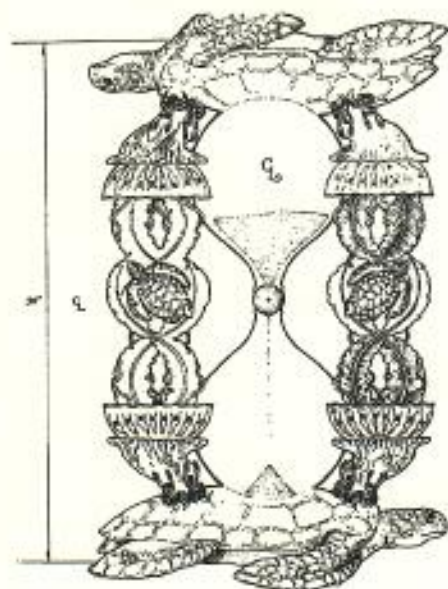


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Marine Turtle Newsletter

Issue Number 85.

July 1999.



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AN HOURGLASS

AS - A - SCULPTURAL
ALLEGORY

BY - GLASS, SAND & BRONZE

*Completed at half life sign
Wayne Davis Blvd. 1999*

Get the Sand Out: Support for Sea Turtle Fundraiser Needed (see page 25).

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MTN/NTM Housekeeping.

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Results of the Kemp's Ridley Nesting Beach Conservation Efforts in México.

Marine Turtle Survey at Phra Thong Island, South Thailand.

Current Status of Nesting Sea Turtles in the Northern Colombian Caribbean.

Sea Turtles of El Salvador.

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Olive Ridley Turtle Records from South Banyuwangi, East Java.

From One Feeding Ground to Another: Green Turtle Migration Between Brazil and Nicaragua.

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SUBSCRIPTION RENEWAL

We ask that you please take the time to fill out the enclosed form and mail it to us so that you continue to receive the *Marine Turtle Newsletter*. In addition, if you have a change of address to inform us of please do so now. If we have not received a reply from you by 1st January 2000 then we shall assume that you no longer wish to receive the Newsletter and remove you from the mailing list. Libraries and organizations will only be removed from the mailing list by direct request. This subscription renewal only applies to the hard copy *MTN*.

Now is the time to consider subscribing to the electronic version of the *MTN/NTM* to help us to reduce printing and mailing costs. Details are given in this issue (85). Please also consider, at this time, making a donation towards the production, printing and distribution of the *MTN/NTM*. If you are able to subscribe electronically you are already helping, but the *MTN/NTM* still needs funds for production. Thank you if you have recently made a donation (ACB/BJG).

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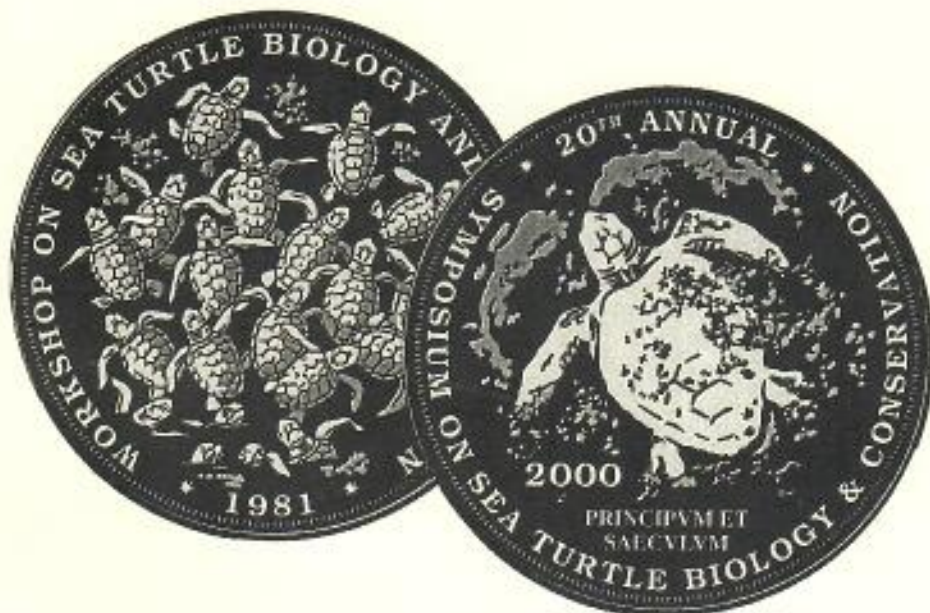
Marine Turtle Newsletter,
c/o Chelonian Research Foundation,
168 Goodrich Street, Lunenburg,
Massachusetts 01462, U.S.A.

Email: RhodinCRF@aol.com
Fax: +1 978 582 6279

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October 1999.



20th Symposium - call for papers (Witherington, pages 16-19).

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Operation Kachhapa: In Search of a Solution for the Olive Ridleys of Orissa.

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Marine turtles in Egypt (Clarke & Campbell pp. 19-20; Venizelos & Nada pp. 12-13).

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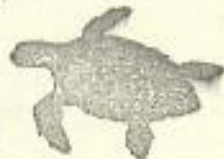
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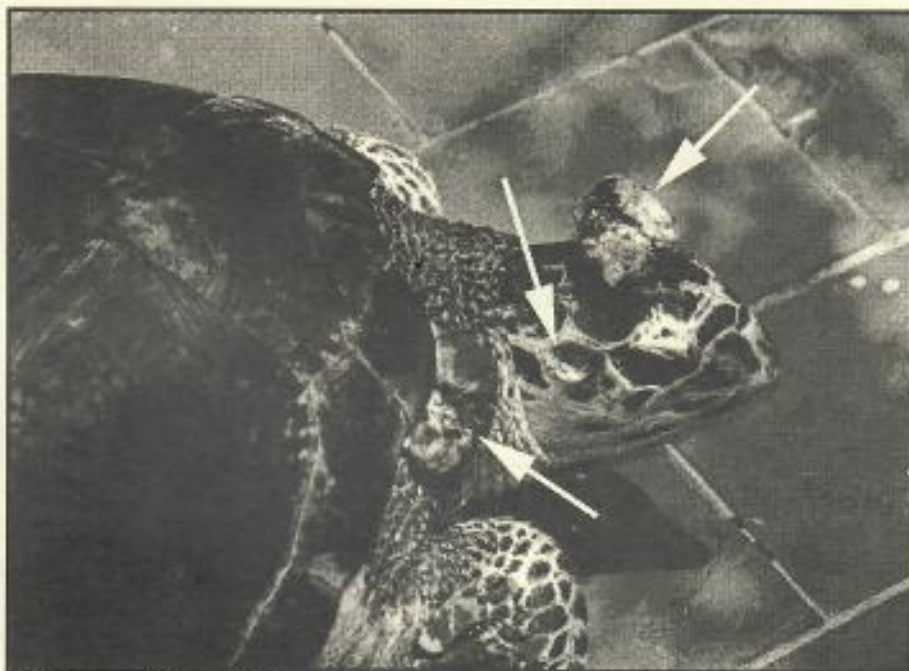
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Fibropapillomas in hawksbill turtles (D'Amato & Moraes-Neto pp.12-13).

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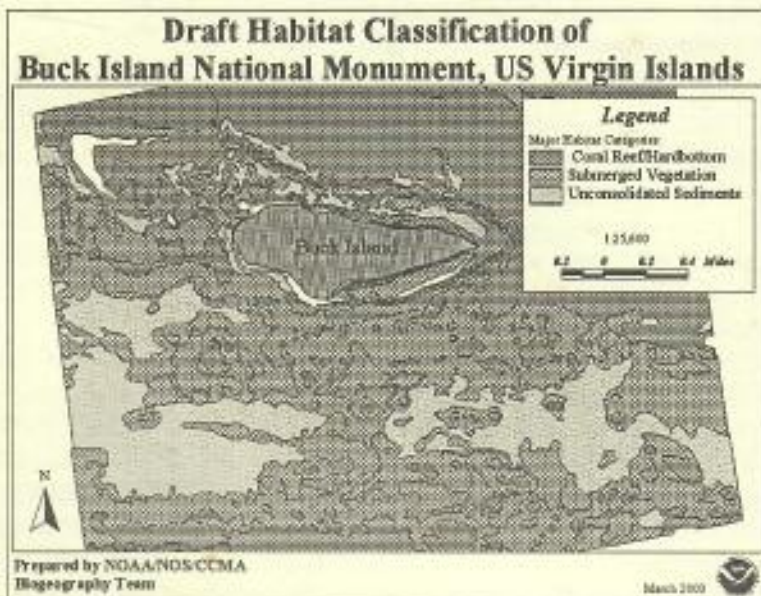
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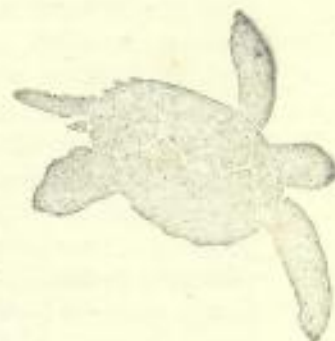
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Mapping the benthic habitats of Puerto Rico and the US Virgin Islands (pp. 26).

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Can ecotourism be developed around marine turtles in French Guiana? (Godfrey & Drif pp. 1-4).

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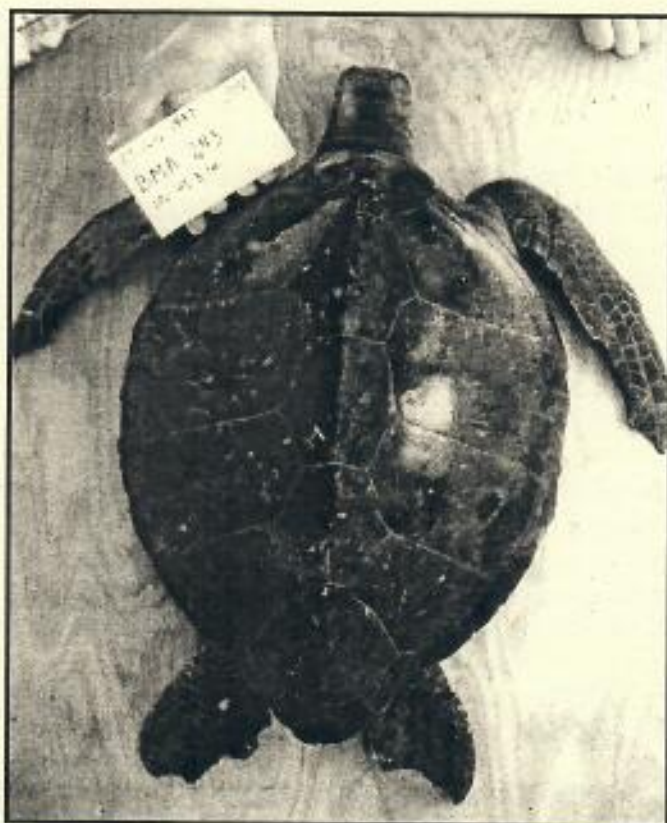
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Juvenile East Pacific green turtle, Baja California Sur, Mexico (Nichols *et al.* pp.10-11).

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Marma Tribal trader offering olive ridley turtle eggs for sale in a market at Bandarban, Bangladesh (Islam pp. 10)

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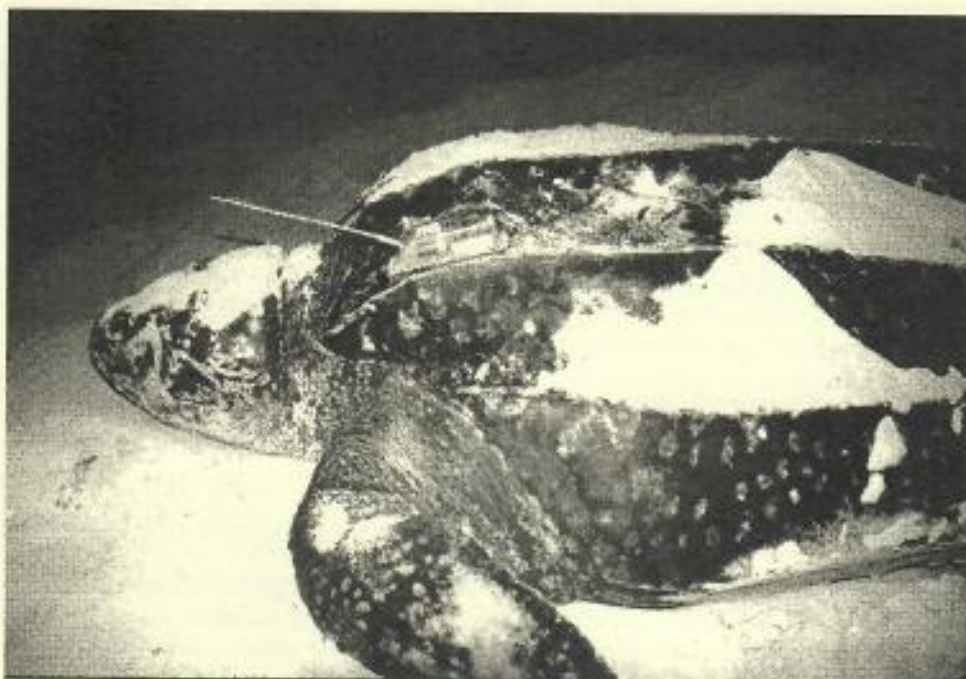
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