Marine Turtle Newsletter

IUCN/SSC

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Editor: N. Mrosovsky* Editorial Advisor: Archie Carr

IMPORTS OF HAWKSBILL TURTLE SHELL IN JAPAN

based on information provided by Dr. Itaru Uchida,
Director,
Himeji City Aquarium,
Tegarayama, Himeji City,
670, Japan

Dr. Uchida writes to us that the following amounts of hawksbill turtle shell were imported in Japan over a 5 year period:

1971	35,207 kg.
1972	41,747 kg.
1973	72,963 kg.
1974	34,283 kg.
1975	36,667 kg.

This information came from the "Japanese Tortoise Shell Association Newsletter", 1976, v. 7, p. 3, printed in Nagasaki City, Japan. The existence of such a newsletter will be of interest in itself to people outside Japan.

Another point of interest is the drop in imports after 1973. Dr. Uchida is of the opinion that this is related to the convention on international trade in endangered species of wild fauna and flora. However, Japan has not ratified this convention and it is likely that hawksbill shells will still be available from other countries that also have not ratified this convention.

In 1975 the greatest imports to Japan were from:

Panama	9,313 kg.
Cuba	6,100 kg.
Indonesia	4,328 kg.
Singapore	2,702 kg.

Other countries supplying over 1,000 kg. in 1975 were: The Philippines, Kenya, Tanzania, Nicaragua and the Cayman Islands. Fuller information is in the Japanese Tortoise Shell Association Newsletter mentioned above.

All the figures given here refer to registered imports. Dr. Uchida thinks that unregistered import of hawksbill shells to Japan is relatively minor.

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Returning to registered imports, a total of 220 metric tons of hawksbill shell were imported into Japan between 1971 and 1975. It is difficult to translate this into numbers of turtles, but one estimate is that about 240,000 hawksbills were involved. The price of the shells is known, and for the 220 metric tons mentioned, was 2,963,143,000 yen (approximately $9.87 million, USA).

In summary:

1) Imports of hawksbill shells to Japan are clearly many thousands of turtles each year. (Suppose a hawksbill provides on average .91 kg. of scutes, then for 1975 alone, more than 40,000 hawksbills were involved).

2) It is possible that the convention on international trade in endangered species has, at least temporarily, reduced this trade. Another interpretation is that heavy buying occurred in 1973 in anticipation of the convention. In either case efforts to stimulate more governments to ratify this convention could have beneficial effects on the outlook for hawksbills.

3) It would be of interest to hear from Dr. Uchida, in the future, what actions he thinks might be appropriate, especially any by people outside Japan.

NOTES ON TURTLE CONSERVATION IN MALAYSIA

based on information sent by Encik K.W. Scriven,
Director, World Wildlife Fund Malaysia,
P.O. Box 769, Kuala Lumpur, Malaysia.

At Rantau Abang 72,000 leatherback eggs have been placed in the hatchery this year. Two new sanctuary areas are planned and it is hoped these will be established and protected by next May. The Government is providing M$75,000 for the establishment of a laboratory-research station, and it is hoped also to have an information centre which will be outside the sanctuary area. Details of a film showing the nesting of the leatherback and the hatching of the eggs will be announced in a future newsletter.

OLIVE RIDLEY TURTLES AND LEATHERBACKS FOUND IN THE SOLOMONS

On February 8th a Fisheries Division training team surprised two Olive Ridley turtles (Lepidochelys olivacea) mating on the surface off Guadalcanal. The turtles were hand-captured and taken back to Honiara where they were measured, weighed, tagged and photographed before being released in the same area as captured.

The Fisheries Division of the Solomon Islands Ministry of Natural Resources have started a Turtle project which although aimed at fishery management of the relatively common green (Chelonia mydas) and Hawksbill (Eretmochelys imbricata) species is also investigating the rarer species of turtles found in this area. A substantial population of the Leatherback (Dermochelys) and nesting areas have been identified which indicates that in the Solomons these creatures are not as rare as was commonly supposed. The Olive Ridleys captured were however the first recorded specimens of that species captured in the area. The male weighed 80 lbs. and shell back measured 27" x 26½", the female weighed 85 lbs. and shell back measured 28" x 27".

Part of the turtle programme involves a tagging exercise and anyone finding any species of turtle bearing tags from the Solomon Islands is asked to return them with as much information as possible on weight, size, condition and place and time of capture to Fisheries Division, Ministry of Natural Resources, Honiara. A reward will be paid.

R.H. James,
Principal Fishery Officer,
Ministry of Natural Resources, Honiara,
Solomon Islands

INDONESIAN MARINE TURTLE SPECIALIST GROUP

An Indonesian Marine Turtle Specialist Group has been formed. Its Chairman is:

Mr. I.N. Sumertha,
Indonesian Marine Turtle Specialist Group,
D/A Bagian Biologi Perikanan, Faperikan,
Institut Pertanian Bogor,
Bogor, Indonesia.

Several reports of marine turtles in Indonesia have already been written (see RECENT PAPERS, below). Turtle biologists visiting this area are urged to contact Mr. Sumertha.

WEST JAVA TURTLES ALMOST EXTINCT

The turtle populations at the southern part of the west Java coast have almost become extinct. They are scattered along the coast of Ciamis, Tasiknalaya, Garut and Cianjur. A turtles' breeding site at the Sukabumi sea coast, for instance, is visited only by less than 100 turtles during the breeding season today. People stated that this is due to continuous illegal hunting for years. Hundreds of young turtles were released several years ago in order to keep the biological equilibrium of the population.

The west Java Fishery Service has released about 1,200 young turtles recently, at the Southern part of the west Java sea coast, in Ciamis, Garut, Cianjur, Cipatujah and Pangandaran.

Kidrat Ikrasaputra, a staff member of the fishery service reported that during the fiscal year of 1975/1976 the Government assisted with a special fund of about 4.2 million rupiahs to support the program.

extracted from the Indonesian Nature and
Science Newsletter No. 18, June 1976

TAHITI ?

Mr. D.J. Brandon, (Turtle Project Officer, Department of Fisheries, Box 96, Rarotonga, Cook Islands, South Pacific), would appreciate hearing from anyone who knows of biologists and fisheries officers concerned with marine turtles in Tahiti.

BOOK AND FILM REVIEWS

This newsletter will review books and films concerning marine turtles if copies are sent to the editor. The editor reserves the right not to review material that is considered inappropriate.

MORE ON THE TAG LOSS PROBLEM

A number of letters on tag loss have been received. The relevant excerpts of those letters are printed below with only minor editorial changes.

1. Tagging of Leathery Turtles (Dermochelys coriacea) in Trengganu, Malaysia.

Rantau Abang in the State of Trengganu, Malaysia is one of the two known major nesting beaches for the Leathery Turtle (Dermochelys coriacea). The 12 miles nesting beach is facing the South China Sea. Turtles start to come in early April, and by the end of September, they disappear completely.

Trial tagging was conducted by the late Dr. E. Balasingam of the University of Malaya in 1966. The work was reported in the Malayan Nature Journal vol. 25 (1972) by Balasingam and Tho Yow Pong as follows.

"During the trial tagging two types of tags were used to mark and identify the female turtles, namely Monel metal tags and plastic tags. The former was obtained from the National Band and Tag Company, U.S.A. The plastic tags which are ordinary cow tags were obtained from Dalton Supplies, United Kingdom. Both types of tags were fitted on to the animal with the aid of tag applicators. The tags are applied approximately half way down the fore flipper and about 1½-2 inches from the trailing edge of the flipper. The plastic tags were applied on the right flipper and the Monel metal tags on the left flipper.

Some initial difficulties were experienced in the application of the tags. This was particularly true of the Monel tags, some of which did not fit firmly into the flippers. This was possibly due to the fact that the flippers were too thick to accommodate the tag's clinching mechanism. Another common snag was that the turtle's flipper being rather fleshy, the Monel tags, especially when loosely applied, tended to enlarge the perforation and tear the flesh at the region of the application. A number of Monel tags were lost in this manner after tagging. The plastic tags on the other hand were far more satisfactory because they were easy to apply and fitted well into the flippers. Among turtles which returned to nest after tagging, no losses of the plastic tags were recorded.

The most satisfactory time for the application of tags was when the turtle had just finished egg-laying. The turtle then did not react adversely to the application of the tags."

Following the successful application of the plastic cow tag, full scale tagging was launched in 1967. Personnel engaged by the Fisheries Department patrolled the entire nesting beach throughout the night starting in April and ending in September, recording and tagging all turtles coming ashore. Up to the end of this year's season a total of 9,533 tags were applied. The return of tagged

turtles is satisfactory, and a number of reports on sighting of the tagged turtle were received from Japan, Philippines, and Indonesia. In 1973 orange coloured tags with the appeal "Please release this turtle and inform Fisheries Department Kuala Trengganu, Malaysia" were introduced to replace the original white tags with numbers only.

So far only a few turtles were found with enlarged holes on the right flipper indicating the loss of the plastic cow tag. However, these tags might have been removed by human beings as one report in 1972 informed us that the tag was removed and kept as a souvenir before the turtle was released.

On the whole, we found that the plastic cow tag or the "Jumbo Rototag" as the supplier calls it, is satisfactory for this tagging work, and it has the following advantages over the metal Monel tag:

1. It is easy to apply.
2. It secures firmly on the flipper.
3. It does not corrode.
4. It can have the colour wanted and with wording printed.

Siow Kuan Tow,
State Director of Fisheries,
Kuala Trengganu, Malaysia.

2. Tagging of Green Turtles in the Galápagos.

Between 1970 and 1975, Peter Pritchard, Miguel Cifuentes (now Intendente del Parque Nacional de Galápagos), and various assistants of Pritchard tagged about 800 green turtles. The tagging took place only during the nesting season and on selected nesting beaches, thus all animals, apart from a couple of males, were females. From Sept. '75, two beaches were studied for 5 1/2 months. At least 95% of the turtles nesting on Quinta Playa that season were tagged (315 tagged). Since the study started in September, we have used a double tagging system - the standard monel cattle ear tag on the right foreflipper and a coloured plastic tag (Jumbo Rototag, Dalton, Henley, England) on the trailing edge of the right hindflipper. In the latter case a hole is made first with a leather punch in order to prevent buckling during insertion. Results so far have showed advantages and disadvantages of both. For nesting females on Quinta Playa, 3 out of 315 lost their metal tags but none lost their plastic ones. On Baltra, it was the reverse - out of 165 tagged, 3 lost the plastic ones and yet no metal ones were lost. On two occasions a plastic tag has been found near a net, where an entangled tagged turtle managed to free itself from the net but having its tag wrenched off during the process. With some turtles tagged either at the nesting beaches or at the feeding grounds, the plastic tags became covered with a filamentous green alga within a month which in a couple of cases made the number (but not the colour) unreadable. This is perhaps indicative of a sedentary type of existence. The numbers on plastic tags could be read either on the beaches or whilst in the water without disturbing the turtles at all, whereas with the metal tags turtles either have to be caught in the water or disturbed while nesting in order to read the numbers. On the other hand, a turtle tagged in 1970 by Peter Pritchard was seen nesting again this year (1976) - its tag in perfect condition and easily readable. One important advantage that the plastic tag has over the metal one is that it is fixed outside the flipper and can be seen to be good or not, whereas the metal one joins inside the flesh and can only be tested by trying to pry it apart.

We will continue to use the double tagging system as it serves our purposes - VIZ plotting inter-island migration (a different colour for each nesting beach and feeding lagoon readily identifies the place tagged) and our efforts to determine the most suitable type of tag to use.

Derek Green,
Principal Field Investigator,
Galápagos Green Sea Turtle Ecology Study,
Estacion Biologica Charles Darwin,
Isla Santa Cruz,
Galápagos.

3. Tagging at Aves Island, Venezuela.

At Isla Aves, where I have been tagging since 1971, tag loss through failure of monel cattle ear tags is a major problem. For example, last year, we had two remigration returns with tags and twenty without. The latter were unquestionable tag losses which carried a callus with a central perforation in the area we normally position the tag. Additional possible tag losses with flippers torn or suspiciously scarred in that area were tallied separately.

This rate of loss does not reflect poor application techniques. Because of the small number of turtles handled each season (150-200), each tag is examined for proper clenching before an animal is released. As an aside, the number of tags damaged in application has been reduced by pre-punching a hole through the flipper with a modified vise grip welding clamp. This is a quick procedure and almost assures proper clenching.

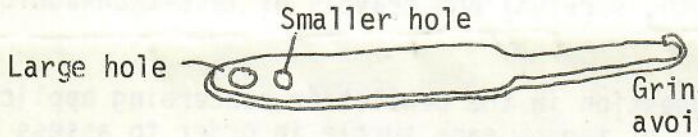
Based on the use of a fairly permanent secondary mark, the rate of tag loss during our brief tagging season at the nesting site (3-6 weeks) is almost nil, contrary to Schulz's experience. Since the tag loss problem became apparent two years ago, we have been cutting coded notches in the marginal bones using a simple system derived from my computer work, which permits individual recognition of animals independent of the monel tags. We had a number of remigration returns from two years ago. On all animals retaining tags from two years ago, the notches had healed partly but the numerical code remained readily and unambiguously readable. No animal which bore a tagging scar in the flipper, but no tag, was notched.

The sample of recovered tags I have examined is small, but at least one shows significant corrosion and in another the clenched tip appeared to have been gradually straightened out. A significant proportion of smaller tags (chicken-wing) of the same style which were applied to animals held in captivity for a year showed corrosion and some were ready to break in the portion of the tag embedded in the flipper tissue.

My overall impression is that in a corrosive environment like sea water the monel tags in common use today are designed to self destruct at the small retaining bar which holds the clenched tip of a closed tag. Corrosion is excited at sharp, deformed corners, such as are adjacent to the bar and will produce cracks, eventually causing it to break away. The implication in the IUCN Marine Turtle Newsletter (No. 1, 1976) that some sort of relative motion is necessary for crack formation is erroneous, but it would accelerate the process.

Cursory comparison of the tags I used this year with a few recovered examples suggests that the width of the retaining bar on the tags varies from year to year (presumably different dies) and I would be inclined to predict that survival of the tags used this year will be relatively poor because of more severe distortion at the end of the bar.

The form and mode of application of the present tag are convenient, but it needs to be redesigned so that there are no sharp corners in the closure. A minimum modification approach would be to lengthen the tang which is clenched and put round holes in the lower bar (see sketch).



Grind longer tang to avoid stress when clenched (no contact with sides of hole)

A change of materials for the tag would be beneficial, but would not eliminate the need for tag redesign. Contrary to the statement of the Newsletter (no. 1, 1976) the present alloy, Monel, Inconel, and a third Chromel A (which was suggested to me as the most resistant) all contain substantial amounts of nickel:

	Fe	Mn	Cu	Ni	Cr
Monel	1.5	1.0	20	67	
Inconel	5			80	15
Chromel A				80	20

Inconel work hardens rapidly so probably some modifications of the current tag-making process would be required. I do not favor a shift to a plastic tag, because, despite the superior resistance of some plastics to sea water, they are vulnerable to abrasion long-term.

William E. Rainey,
Island Resources Foundation,
P.O. Box 4187, St. Thomas,
U.S. Virgin Islands 00801.

4. Comments on Inconel Tags.

I now have 3,000 specially produced INCONEL tags. The National Band and Tag Company gave me the product that I asked for. Now only time will tell if they are as corrosion resistant as the alloy specialist at Huntington Alloys, International Nickel, predicted they would be. Contrary to Mr. Rainey's

interpretation about relative motion being necessary for crack formation, the statement in the IUCN Marine Turtle Newsletter (no. 1, 1976) is in reference to "working" of the metal in the manufacturing process, that is, in the process of forming the metal into strips, and shaping and stamping in the tag production process. This "works" the metal and can cause microscopic cracks.

Again, corrosion doesn't always take place at the locking mechanism in MONEL tags. It most often takes place where the tag is in contact with the internal tissue. Granted, this is usually the locking mechanism end, but frequently the tag will move around to another site, sometimes intermediate between the locking end and the curved end. In such cases, the number or return address will become obliterated.

As you may recall, my main purpose in working so hard and long on this INCONEL project was to have an intermediate size (#681) tag of superior corrosion resistance for use in my studies of growth, survival and travels of less-than-adult size turtles.

I have thought about your suggestion in the newsletter concerning application of both INCONEL and a second type of tag on each turtle in order to assess performance. As far as MONEL goes as the second tag, I have decided against it. It would seem to me that by placing INCONEL and MONEL on the same turtle I might be creating a situation analogous to a storage battery. That is, dissimilar metals immersed in the body fluids. Perhaps I would be creating the conditions that would cause the alloys to deteriorate (though electrolysis). Perhaps I will try a plastic (chemically inert) tag as a second comparison.

George Balazs,
Hawaii Institute of Marine Biology,
P.O. Box 1346,
Kaneohe,
Hawaii 96744, U.S.A.

RECENT PAPERS

Reference	Address of Author
Balazs, G.H. 1976. Hawaii's seabirds, turtles and seals. World Wide Distributors Ltd., Honolulu.	George H. Balazs Hawaii Institute of Marine Biology P.O. Box 1346, Kaneohe Hawaii 96744, U.S.A.
(pamphlet with popular text, mostly photographs including ones of basking green turtles)	
Christensen, R.M. 1976. Special Report: Green sea turtle farming. Chelonia, 3(2), 2-6.	R.M. Christensen "Chelonia" 772 Spruce Street California, 94118, U.S.A.
(an account of the turtle "farming" controversy and the battle over whether turtle products should be legalized or banned in California; gives names of those involved and includes criticism of actions by IUCN)	

Fretey, J. and Lescure, J. 1976. Guyane française: les infortunes de la turtue marine. La Recherche, 70, 778-781.

(22,000 hectares have been decreed nature reserves in French Guiana, including coastal areas that are perhaps the world's most important leatherback rookery, but the authors fear that the authorities will be slow to put this into effect; slow progress in turtle conservation in French Guiana is contrasted with the situation in adjacent Surinam; description of leatherback habitat, predators, etc. In French)

J. Fretey
Musée d'Histoire Naturelle
(Reptiles et Poissons)
25 rue Cuvier
75005 Paris, France

Ireland, L.C., Frick, J.A. and Wingate, D.B. 1976. Open sea orientation of the hatching green sea turtle, Chelonia mydas. Bulletin of the Psychonomic Society, programme of 17th Annual meeting, p. 245 (abstract only)

(hatchlings were equipped with transmitters and tracked by night; once out to sea they were not distracted by lights)

Leonard C. Ireland
Department of Psychology
Oakland University
Rochester, Mi. 48063
U.S.A.

Lazell, J.D. 1976. This Broken Archipelago. Quadrangle, New York.

(book on herpetofauna of Cape Cod and nearby islands; includes information on marine turtles)

James D. Lazell, Jr.
Massachusetts Audubon Society
Lincoln, Mass. 01773
U.S.A.

Márquez M.R. 1976. Estado actual de la pesqueria tortugas marinas en México, 1974. Instituto Nacional de Pesca. Serie Information no. 146, 1-27.

(data on the extent of Mexican turtle fisheries from 1948-1973, showing declines in recent years; recommendations include making illegal the taking of turtles below minimum size; proposed legal carapace lengths in cms given for various species. In Spanish)

René Márquez Millan
Instituto Nacional de Pesca
Apartado Postal 79-052
México 7, D.F.
México

Márquez, M.R. 1976. Reservas naturales para la conservación de las tortugas marinas de México. Instituto Nacional de Pesca. Serie Informacion no. 183, 1-22.

(maps, estimated numbers nesting, seasons and present protection given for marine turtles nesting in Mexico; aims to be a basis for urgently needed changes in regulation. In Spanish)

René Márquez Millan
Instituto Nacional de Pesca
Apartado Postal 79-052
México 7, D.F.
México

Milsom, W.K. and Johansen, K. 1975. The effect of buoyancy induced lung volume changes on respiratory frequency in a Chelonian (Caretta caretta). Journal of comparative physiology, 98, 157-160.

(when weights are added to turtles, lung volume changes and buoyancy is maintained)

William K. Milsom
Department of Zoology
University of British Columbia
Vancouver, B.C. V6T 1W5
Canada

Milsom, W.K. 1975. Development of buoyancy control in juvenile Atlantic loggerhead turtles, Caretta c. caretta. Copeia, no. 4, 758-762.

(ability to control buoyancy development over the first year; lung volumes also increase over this time)

William K. Milsom
Department of Zoology
University of British Columbia
Vancouver, B.C. V6T 1W5
Canada

Musquera, S., Massegú, J. and Planas, J. 1976. Blood proteins in turtles (Testudo hermanni, Emys orbicularis and Caretta caretta. Comparative Biochemistry and Physiology, 55 3a, 225-230.

S. Musquera
Departmento de Fisiología Animal
Facultad de Biología
Universidad de Barcelona
Spain

Prange, H.D. 1976. Energetics of swimming of a sea turtle. Journal of experimental biology, 64, 1-12.

(swimming speeds, oxygen consumption and drag measurements on juvenile green turtles; estimates that Brazil-Ascension Island round trip by an adult would require 21% of body mass in fat stores)

H.D. Prange
Department of Zoology
Gainesville, Florida 32611
U.S.A.

Sumertha, I.N. et al. 1976. Study of the marine turtle habitat in Pangumbahan Island, Sukabumi. Report from the Institut Pertanian, Bogor. 57 pp.

(lists both terrestrial and marine vegetation in the area, shows graphs of egg production related to rainfall; gives sand particle size on beaches used by different turtle species. Text in Indonesian)

I.N. Sumertha
Fakultas Perikanan
Institut Pertanian Bogor
Bogor, Java, Indonesia

Witham, P.R. 1976. Evidence for ocean-current mediated dispersal in young green turtles, Chelonia mydas (Linnaeus). M.Sc. Thesis, University of Oklahoma, Norman, Oklahoma.

(tag returns of "head started" turtles; data on growth rates of hatchlings on different diets)

P.R. Witham
Florida Department of Natural Resources
P.O. Box 941, Jensen Beach
Florida 33457
U.S.A.

Worth, D.F. and Smith, J.B. 1976. Marine turtles nesting on Hutchinson Island, Florida, in 1973. Florida Marine Research Publications no. 18, 1-17.

(nesting patterns and numbers of turtles surveyed in order to evaluate possible effects of the operation of a nuclear power plant in this area; data on predation on nests included)

Dewey F. Worth
Marine Turtle Studies
P.O. Box 974
Jensen Beach, Fla. 33457
U.S.A.

FLORIDA INTERREGIONAL CONFERENCE ON SEA TURTLES

A conference on marine turtles was held at the Florida Institute of Technology, Jensen Beach Campus, Florida, on July 24 - 25, 1976. This was sponsored by the Florida Department of Natural Resources, Marine Research Laboratory. Although it had been expected originally that the conference would be quite small, there were 119 registered participants at the meeting, attesting to the great interest in this topic. The proceedings of this meeting will probably be published later. Meanwhile here is a list of papers presented.

C.H. Dodge
Congressional Research Service
Library of Congress
Washington, D.C. 20540 U.S.A.

Effect of temperature on incubation time of box turtle (Terrapene carolina carolina - Linne) eggs and post-natal development: applicability to sea turtle conservation and mariculture.

Hilton Bruch
Department of Zoology
University of Georgia
Athens, Georgia 30602 U.S.A.

An analysis of hatchery results from twelve years of loggerhead conservation efforts.

P. Ross Witham
P.O. Box 941
Jensen Beach, Fla. 33457 U.S.A.

Methods and facilities for pen-rearing the green sea turtle, Chelonia mydas.

H.G. Haines and G. Rebell
Department of Dermatology
University of Miami
School of Medicine
P.O. Box 520875
Biscayne, Annes
Miami, Fla. 33152 U.S.A.

Review of infectious diseases of mariculture green turtles.

D.W. Owens and J.R. Hendrickson
Department of Zoology
Colorado State University
Fort Collins, Colorado 80523 U.S.A.

Endocrine studies on the green sea turtle, Chelonia mydas.

R.E. Isaacks, D.R. Harkness and P.R. Witham
1201 N.W. 16th Street
Miami, Fla. 33125 U.S.A.

Relationship between the major phosphorylated metabolic intermediates and oxygen affinity of whole blood in the loggerhead (Caretta caretta) and the green turtle (Chelonia mydas) during development.

T.H. Richardson
LCI Loggerhead Turtle Research
University of Georgia
Athens, Georgia 30602 U.S.A.

Variations in nesting behavior of loggerheads: studies of individual turtles.

H.O. Hillestad, M.H. Smith and D.O. Straney
University of Georgia
203 Forestry Building
Athens, Georgia 30602 U.S.A.

Genetic variability in loggerhead and green sea turtles.

O.R. Talbert, J.M. Will and J.M. Dean
Belle W. Baruch Institute
University of South Carolina
Columbia, S.C. 29208 U.S.A.

Nesting beach orientation in adult and hatchling loggerhead sea turtles (Caretta caretta).

J.I. Richardson, H.O. Hillestad and C. Ruchdeschal
Department of Zoology
University of Georgia
Athens, Georgia 30602 U.S.A.

Site specificity of loggerheads in the St. Andrews Sound area of Georgia.

R. Bell
Box 3127
Jekyll Island, Georgia 31520 U.S.A.

Thirteen years of tag recoveries from the Little Cumberland Island loggerhead turtle project.

F.J. Schwartz
Institute of Marine Sciences
University of North Carolina
Moorehead City, N.C. 28557 U.S.A.

Behavioral and tolerance responses to natural cold winter water temperatures by three species of sea turtles in North Carolina.

J. Bennett and K. Kleerekoper
Biology Department
Texas A&M University
College Station, Texas 77843 U.S.A.

Some laboratory observations on locomotor responses of the hatchling and juvenile green turtle, Chelonia mydas, to chemical stimulation.

P.C.H. Pritchard
Florida Audubon Society
P.O. Drawer 7
Maitland, Fla. 32751 U.S.A.

Marine turtles of the U.S. Pacific Trust Territories (Micronesia): Distribution, survival status, and conservation needs.

L.M. Ehrhart and R.G. Yoder
Florida Technological University
P.O. Box 25000, Orlando,
FLA 32816, U.S.A.

The marine turtles of the Merritt Island National Wildlife Refuge, Kennedy Space Center, Florida.

Lt. Col. Joe Brown Florida Marine Patrol 202 Blount Street Tallahassee, Fla. 32304 U.S.A.	Florida's enforcement of marine turtle conservation laws.
H.R. Bullis, Jr., and S. Drummond 75 Virginia Beach Drive Miami, Fla. 33149 U.S.A.	Sea turtle captures off south-eastern United States by exploratory fishing vessels, 1950-1976.
J.I. Richardson Department of Zoology University of Georgia Athens, Georgia 30602 U.S.A.	Population estimates for nesting loggerheads in the St. Andrews Sound area of Georgia.
René Marquez M. INP, Apartado Postal 79-052 México 7, D.F. México	Natural reserves for the conservation of marine turtles of Mexico.
Kavanaugh Francis P.O. Box 2067 South Padre Island Texas 78578 U.S.A.	The atlantic ridley sea turtle conservation programs at South Padre Island, Texas, and Rancho Nuevo, Tamaulipas, Mexico.
T.M. Mann 3763 N.W. Fourth Ave. Apt. 1 Boca Raton, Fla. 33431 U.S.A.	The impact of developed coastline on nesting and hatching sea turtles in south-east Florida.
L.H. Ogren and D.R. Ekberg N.M.F.S., Gulf Fisheries Center P.O. Box 4218 Panama City, Fla. 32401 U.S.A.	National sea turtle program.

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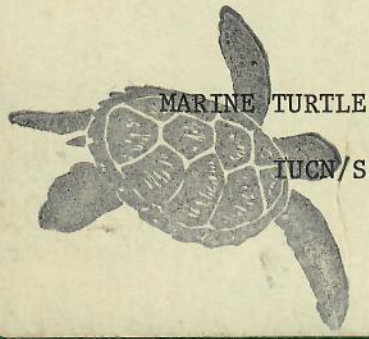

MARINE TURTLE NEWSLETTER

IUCN/SSC