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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-

May to 1 August). In addition, we collected data on strandings, hatch success of relocated and ***in situ*** nests, and on beach quality.

In 1995, the number of nesting olive ridley turtles (n=335) was the lowest ever recorded in the Galibi Nature Reserve (cf. Table 3 ***in*** Reichart and Fretey, 1993), making it clear that this population has not recovered in Suriname. Although stabilisation at some future time cannot be excluded, the Surinam olive ridley is presently in great danger of extinction. The number of nesting green turtles (n=6313) is comparable with data from previous years, suggesting that the Surinam green turtle population is stable, as it apparently has been since data collection began in 1968. The number of nesting leatherback turtles (n=1808) was low compared to previous years, but falls within apparently normal annual fluctuations and does not seem alarming.

The distribution of the olive ridley nesting effort is shifting. ***Arribadas*** are described at Eilanti, the northernmost beach in the Galibi Nature Reserve, in the late 1960's and this has traditionally been the main nesting beach for the olive ridley in Suriname. Today Eilanti appears to be less attractive as a nesting beach than the other beaches of Galibi. Table 1 shows clearly that the percentage of olive ridleys nesting on Eilanti has declined dramatically over the past decade (for more information, see Hoekert et al., 1996). In 1995, for the first time on record, more olive ridleys nested elsewhere in Galibi; namely, Pruimenboom and Baboensanti beaches. A possible cause for this may be that Eilanti is less accessible because of the recent formation of a sand bank ("the Spit") offshore. Observed high numbers of olive ridleys nesting on the Spit reinforces this idea.

Table 1. The numbers of olive ridleys nesting at Eilanti beach, the total numbers of olive ridleys nesting in the Galibi Nature Reserve (NR), and the percentage of olive ridleys nesting at Eilanti in 1984, 1989 and 1995. Source: 1984 and 1989 (Reichart and Fretey, 1993).

Description	1984	1989	1995
Number of nests laid at Eilanti Beach	615	271	55
Total number of nests at Galibi NR	732	424	335
Percentage of nests at Eilanti Beach	84%	63%	16%

While the Spit which has formed offshore the Eilanti beach was visited by substantial numbers of olive ridleys (31% of the total) and leatherbacks (27% of the total) in 1995, the site does not constitute suitable nesting beach habitat. It is almost completely flooded at spring tide; moreover, the ground water level is quite high, sometimes resulting in nest chambers being filled with water while turtles are digging. Finally, the Spit is very dynamic, sometimes experiencing considerable changes in beach condition during a spring tide. The percentage of false crawls at this site was significantly higher than at other beaches in Galibi in 1995 (Hoekert et al., 1996).

Hatch success was calculated for relocated and ***in situ*** olive ridley, green turtle and leatherback nests. Most nests were transferred to a hatchery directly after deposition. The hatching success of relocated nests appeared to be somewhat (but not significantly) lower than that of natural nests for the green turtle and the leatherback. Relocated green turtle nests had an average hatch success of 62% (sd=25%, n=17), while undisturbed nests had an average hatch success of 76% (sd=16%, n=13). The figures were 28% (sd=22%, n=40) and 31% (sd= 23%, n= 24), respectively, for leatherbacks. A statistical comparison between relocated and

undisturbed olive ridley nests could not be made because only two undisturbed nests were observed. Relocated olive ridley nests had an average hatch success of 63% (sd=24%, n=19), whereas the two nests left ***in situ*** had hatch successes of 2% and 56%.

Despite the current ban on harvesting olive ridley eggs, more than 40% of olive ridley nests were poached during the peak season in 1995. The three STINASU employees that patrol a limited beach area are not sufficient to stop or greatly reduce the occurrence of poaching. To achieve a significant reduction of egg theft, it is necessary that abandoned field stations be repaired and staffed once again.

We observed 13 stranded leatherbacks and two dead green turtles during the study period. Some leatherbacks showed injuries (e.g., fractured skull, pierced carapace); in one case, the head and flippers had been severed. Leatherbacks are accidentally caught by coastal fishermen, who often kill them to reduce net damage. Except for an occasional incident, no adults are slaughtered for food. However, there are recent reports of marine turtles being eaten by fishermen on shrimp vessels operating off the coast of Suriname (H. Reichart, pers. comm., 1996). The two stranded green turtles had been decapitated. They were probably killed by a jaguar (cf. Autar, 1994). The number of stranded turtles in 1995 was markedly lower than in 1993 or 1994 (H. Reichart, pers. comm., 1996), but exact data are not available and the cause of the decline is unclear.

Recently the U. S. has admonished the Surinam government once again to enforce the use of TEDs (turtle excluder devices). There are about 150 Surinam-based Korean and Japanese trawlers operating in Surinam waters. They all report the incidental catch of marine turtles, mostly olive ridleys. Mortality resulting from drowning in shrimp trawls occurs at a high level in Suriname. The use of TEDs in Surinam waters has been mandatory since 1992, but enforcement of the law is lacking. Insufficient evidence of TED compliance has been provided to the U. S. government so far, and for this reason Surinam-caught shrimp have been embargoed by the U. S. since May 1993 (for background see Reichart and Fretey, 1993).

In conclusion, it has been difficult to protect the Galibi beaches properly in recent years due to political problems between local inhabitants and STINASU and Government personnel. It is obvious that the local inhabitants need to be made more aware of the importance of sea turtles as a natural resource, and that they need to be more seriously involved in the management of the Galibi Nature Reserve. A management program for the Galibi Nature Reserve has been developed (Reichart, 1992) and should be implemented. The highest priority at this moment, however, should be given to (1) mandating and enforcing the use of TEDs in all trawlers plying Surinam waters and (2) enacting and enforcing a complete ban on the harvest of olive ridley eggs until such time as data indicate that the population has recovered. If these two recommendations are not achieved, the Surinam olive ridley is bound to become extinct.

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WILLEM E. J. HOEKERT and ARNOUD D. SCHOUTEN, BIOTOPIC, Saenredamstraat III, 1072 CA Amsterdam, THE NETHERLANDS, LUC H. G. VAN TIENEN and MARISKA WEIJERMAN, STINASU, P. O. Box 436, Paramaribo, SURINAME.

FOOD-REWARDED OPERANT LEARNING AND MEMORY IN THE EAST PACIFIC GREEN TURTLE

The development and extinction of food preferences (Grassman and Owens, 1982), food choice behavior (Steele et al., 1989), and some related topics have been studied in sea turtles, but there is a conspicuous lack of experimental studies of operant learning and memory in sea turtles. Operant learning can be defined as a "more or less permanent change of behavior, associated with the consequences of behavior" (Angermeier, 1994). It can be clearly distinguished from other forms of learning, such as classical conditioning, place learning, and observational learning, although consequences of behavior are also important in these types of learning paradigms (Angermeier and Peters, 1973; Angermeier, 1976).

Typically, in an operant learning paradigm, an organism learns that showing a certain type of behavior, such as manipulating its environment, can have positive consequences (e.g., food for a hungry animal). Thus, the response "produces" the reward, in contrast to classical conditioning, in which a stimulus leads to the response. In this context it is important to note that the manipulandum (e.g., lever, wheel, rod) itself cannot deliver the reward. If it does, we speak of place learning. In true operant learning, the reward is delivered independent of the manipulandum; that is, the reward is delivered by some mechanical device or, as in the study to follow, by hand.

During the summer of 1994, the authors tested 12 East Pacific green turtles (Chelonia mydas) for their ability to learn and remember food-rewarded operant responses. The study was conducted at the Sea Turtle Project Research Station in Bahia de los Angeles, Baja California, México. The animals were deprived of food for 1-2 days, removed from their holding tank, and placed singly into a 5 x 5 m testing tank. The depth of the water in the testing tank was 32-35 cm. A manipulandum made from a white plastic tube (approximately 5 cm in diameter) was fastened to the top of the tank wall, and inserted in such a way that the lower end was about 10 cm above the bottom of the testing tank.

Whenever the animal touched the manipulandum with any part of its body, it was rewarded with a small piece of fish (approximately 10 g). The reward was dropped in front of

the animal's head, to ensure that s/he would see it. A total of 15 consecutive responses were rewarded in this fashion, of which 13 could be included in the analysis of the results (one animal refused fish from the beginning, and another refused the reward after the 13th trial). Table 1 shows the size (curved carapace length) and weight of the animals used.

Table 1. Curved carapace length (CCL) and weight of East Pacific green turtles (n=11) participating in a study of food-rewarded operant learning and memory.

	Animal Identification Number										
	1	2	3	4	5	6	7	8	9	10	11
CCL (cm)	58	63	68	55	63	61	49	67	66	73	66
Weight (kg)	25	36	45	24	32	35	18	43	45	61	38

Six weeks after the learning procedure was applied to all animals, they were tested in a single trial for long-term memory of the learned response. As soon as an animal had made one response and been rewarded for it, it was removed from the testing tank and transferred to its living tank. The major measurement taken during all testing sessions was the latency to respond (Angermeier, 1994). The rationale for this procedure was as follows. By comparing latencies between all the trials, one can easily determine when there is no more significant reduction of these latencies. That is the point at which the organism cannot improve his performance; e.g., the point at which he has learned the required response. By adding a single trial for one reward during the memory test, the latency of this trial can also be compared with all other latencies and thus yields information about the permanence of the learned behavior. A summary of the results is shown in Table 2.

Table 2. Mean latencies and standard deviations to a series of 13 food-rewarded operant responses of East Pacific green turtles (n=11).

	Rewarded Response Number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Latency (sec)	1278	60	169	40	70	42	50	103	113	37	218	63	19
S.D.	1630	52	214	33	66	35	85	149	174	37	653	84	19

A statistical analysis of the results (Repeated Measures ANOVA) showed that the difference between the time it took for the first reward to be obtained and all other rewards (2-13 and memory trial) was highly significant ($F=5.03$; $df=13,130$; $p< 0.0001$). On the other hand, there were no significant differences between any of the other latencies (2-13 and memory trial). We concluded that the animals learned during the first rewarded response and that they showed long-term retention of the learned behavior. One other observation may be interesting. Each animal performed the response to the manipulandum in its own characteristic way: some with the right flipper, some with the left flipper, and some with the head.

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W. F. ANGERMEIER, Marine Behaviour Research Station, Furnish Lettermullen, Co. Galway, IRELAND and ANTONIO RESENDIZ S. HIDALGO, Instituto Nacional de Pesca, Sea Turtle Project Research Station, Bahia de los Angeles, Baja California, MEXICO.

SEA TURTLES AT TAIPIN TAO, SOUTH CHINA SEA

The Nan-sha Archipelago (or the Spratly Islands) is composed of 102 coralline islands, atolls and shoals. Taiping Tao (114º21-23'E, 10º22-23'N) is the largest island, measuring 360 m long and 1,365 m wide with an area of 0.48 km^2. Taiping Tao is forested with lowland tropical rainforest and reaches an average topographic height of 3.8 m (Fang and Li, 1994). The entire island is comprised of sand covered with guano, consisting mainly of moderate to well sorted coarse grained sand with an interstitial water content of 6% (by weight). The climate is tropical marine, dominated by trade winds which blow from the southwest from May to October and from the northeast from November to March. The current pattern is influenced primarily by the trade winds. Tides are diurnal, with a maximum amplitude of 1.2 m (UNEP/ IUCN, 1988). Taiping Tao has been occupied by Marines (military forces) from the Republic of China since 1948. In general, 100-150 Marines are stationed on the island.

Previous studies carried out at Taiping Tao include research on coral reefs, coralline fishes, plankton and nekton, mollusks, benthic algae, water quality, terrestrial flora and birds (Liu, 1975; Wu, 1981; Chang et al., 1981; Fang and Li, 1994). Despite the fact that the island has long been known as a nesting site for sea turtles, no scientific studies of turtles have been conducted. With the objective of gathering preliminary information on the species of sea turtle nesting on the island, as well as nest distribution and abundance, an expedition to the island was carried out from 5-20 April 1995. The expedition was organized with the collaboration of the Council of Agriculture and the Defense Department in the Republic of China (R.O.C.). Due to national security reasons, we were only allowed to stay on the island for five nights.

During the survey, two methods of investigation were employed. First, all Marines stationed on the island for more than four months were questioned about the species of sea turtle nesting on the island, as well as the location and timing of the nesting effort. Among 35 interviewees, 20 had been on the island for more than a year. Most of them were soldiers with experience guarding the shoreline for the security of the island at night. Based on the informa-

tion provided by these Marines, a preliminary map of the spatial and temporal distribution of nesting was constructed. Second, all potential nesting beaches were inspected once per night (1900-0500 hr) and again at dawn (0600-0700 hr) to search for fresh nesting tracks. Occasionally, beaches were also inspected later in the morning.

According to the Marines, both hawksbill and green turtles nest on the southern and eastern beaches of Taipin Tao. Most nesting occurs on the southeast coast where the least amount of development has occurred. Interviewees estimate that 10-100 nests are laid per year (hawksbill and green turtles combined), and that nesting occurs year around (peak: June-November). Most Marines had observed 25-35 nestings during their annual service. Individual females nest multiple times throughout the season, thus the number of females is not known.

Daytime beach surveys revealed four old nesting tracks and three false crawls; all were located on the southeast coast. Among them, two were made by hawksbill and five by green turtles. The tracks appeared to be at least a few days old. No nesting emergences were observed during the first four nights of the survey, but on 14 April two green turtles were observed returning to the sea. They measured 100 cm and 96 cm curved carapace length, respectively, and we tagged both with Inconel flipper tags (National Band and Tag Co., Style No. 681) on all four flippers. The tags bear the return address: P. O. Box 7-125, Keelung, Taiwan, 20224, R.O.C. The nests were located in grassy habitat and were left undisturbed.

Nan-sha archipelago has long been recognized as a major sea turtle nesting area in the South China Sea. Despite nearly 40 years of occupancy, the forests and beaches are relatively untouched. And, thanks to martial law, no artificial lights are allowed on at night. These and other rules promote suitable nesting conditions for the sea turtles. Nesting turtles have faced serious threats in the past, however, including egg collection and slaughter (soldiers once killed gravid females for meat during supply shortages). Fortunately the situation has improved in recent years since the Navy has provided more services and emphasized environmental issues on the island. Today no eggs are poached and morning beach patrols rescue nesting females trapped in defense trenches. However, existing beach barricades can still prevent the turtles from reaching nest sites above the high tide line on some beaches.

Political instability in the region complicates conservation measures. The archipelago is occupied by Marines from Mainland China, the Philippines, Malaysia, Vietnam, Brunei and Taiwan. Malaysia and Vietnam have constructed warplane landing tracks on some coralline islands. It has been reported that Mainland China has filled in several submerged coralline atolls with cement, turning them into "strategy islands." Others, such as Vietnam, have constructed buildings on every inch of soil on occupied islands. In addition, many countries claim waters within the archipelago as part of their Exclusive Economic Zone (see Gomez, 1996). Pirates and illegal fishing are among the serious problems plaguing the region. Recently, a fishing vessel from Taiwan was robbed and the first mate killed by pirates offshore Taiping Tao. These factors deepen the troublesome nature of conservation efforts in the region.

The slaughter and incidental capture of sea turtles are well known and serious threats throughout the South China Sea (Liang et al., 1990; Nishemura, 1990). Despite political differences, these shared problems face all nations of the region. It is impossible to estimate the existing status of sea turtles and implement conservation measures in the South China Sea without the cooperation of all parties. Therefore it must be strongly recommended that ASEAN (Association of Southeast Asia Nations) expand their sea turtle conservation program to include all states who deploy Marines to occupy islands in the South China Sea, and that all governments work cooperatively to save our declining sea turtle populations.

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I-JIUNN CHENG, Institute of Marine Biology, National Taiwan Ocean University, Keelung, Taiwan, 202, REPUBLIC OF CHINA.

SEA TURTLE NESTING AND UTILIZATION SURVEY IN SAO TOMÉ

São Tomé is part of a two island nation (along with its sister island, Príncipe) in the Gulf of Guinea, located approximately 200 miles offshore Gabon, off the west coast of Africa. The country gained independence from Portugal in 1975. It still relies heavily on faltering cocoa exports. Artisanal fishing is prevalent in coastal villages. The hunting of sea turtles represents significantly higher earnings than are otherwise available from line or net fishing and the turtle fishery is traditionally well-entrenched. Small shops around the capital city and on Príncipe sell “tortoise-shell” (hawksbill turtle shell) products to tourists and residents alike. São Tomé and Príncipe is not a signatory to CITES [Convention on International Trade in Endangered Species], nor does it have any national laws protecting sea turtles. Therefore, eggs, hatchlings, and adults are harvested with impunity.

In September 1994, a marine turtle survey was initiated on São Tomé as a project of collaboration between ECOFAC (European Community forestry conservation program) and the U. S. Peace Corps in São Tomé The goals of this preliminary study were to identify nesting species, seasonality, and nesting beaches, as well as to explore the effect(s) of human depredation on local sea turtle populations. Interviews were conducted with fishermen around the island. Written survey forms were distributed and explained during personal interviews. Four

beaches were selected as Index Beaches for nesting site surveys. Data were collected from 28 participating communities by the author (during his tour as a U. S. Peace Corps volunteer) and two local counterparts (Hipólito Lima and Artur Rosa de Sacramento). Due to insufficient manpower and resources, the status of sea turtles in neighboring Príncipe remains largely unexplored.

Our study revealed that four species of sea turtle are regularly encountered in São Tomé during their nesting seasons: Chelonia mydas (green turtle), Eretmochelys imbricata (hawksbill), Dermochelys coriacea (leatherback), and Lepidochelys olivacea (olive ridley). On 10 November 1995, a mature male Caretta caretta (loggerhead) was identified and photographed in the Feria do Ponto market in São Tomé City, where it was offered for sale. There had been verbal reports from fishermen that loggerheads were occasionally caught, but the market photograph was the first confirmation of this species in São Tomé and the only member of this species to be positively identified during the two year survey. Fishermen describe the loggerhead as "rare" and do not believe that it nests in São Tomé.

Nesting Seasons: Schneider (1992) reported nesting seasons for E. imbricata (August-February), C. mydas (July-November), D. coriacea (September-February), L. olivacea (August-December), and C. caretta (July-December). In contrast, our survey indicated that C. mydas nesting continues into January and probably February, three months beyond the time reported by Schneider (1992). Similarly, our interviews with fishermen suggest that nesting extends from October to February and that the months of November, December and January are most commonly identified as the "nesting season." These same three months predominate in catch and market surveys. Castroviejo et al. (1994) reported the main nesting season to be November -March, but did not specify species.

Nesting Beaches: A source of confusion with regard to the distribution of the nesting effort lies in the disparity that is often found between local site names and "official names" listed on maps. Two locally available maps (a 1958 Portuguese map and a 1992 tourist map) sometimes refer to the same beach by different names. To further complicate matters, many of these names are not used by residents. To maximize the usefulness of data, a sincere effort must be undertaken to standardize place names and to match these names to site data already archived.

Catch surveys and interviews with fishermen undertaken by the author and other project personnel in 1994 and 1995 indicate a greater number of nesting beaches than had been previously reported (see Atkinson et al., 1994). Our surveys indicate that nesting occurs on the northern, eastern and southern coasts. The northern and eastern coastal areas host the largest human settlements; the southern (especially southwestern) beaches are relatively pristine. The apparent lack of nesting on the western coast is likely due to the number of rocky beaches stretching the length of the coastline. However, a lack of fishing activity and reporting effort may contribute to an underestimate of nesting occurring on this coast.

Green and hawksbill turtle nesting appears to occur on most sandy beaches along the northern, eastern and southern coasts, with a relatively higher concentration of green turtle nesting along the southern coast (Porto Alegre area). This may be due to the relative isolation of the Porto Alegre area and, until recently, a relative lack of human disturbance. Our initial interviews indicated that leatherback nesting was limited to beaches between Ribeira Afonso and Porto Alegre (Figure 1). The capture of a female on the beach at Praia Juventude and subsequent interviews confirm that, at least historically, leatherback nesting occurred on some northern beaches as well, especially in the Fernao Dias/Micoló area. Nesting reports for olive ridleys are concentrated in the areas of Praia Micoló and Praia Melao on the northern coast; both beaches are located in traditional turtle hunting communities.

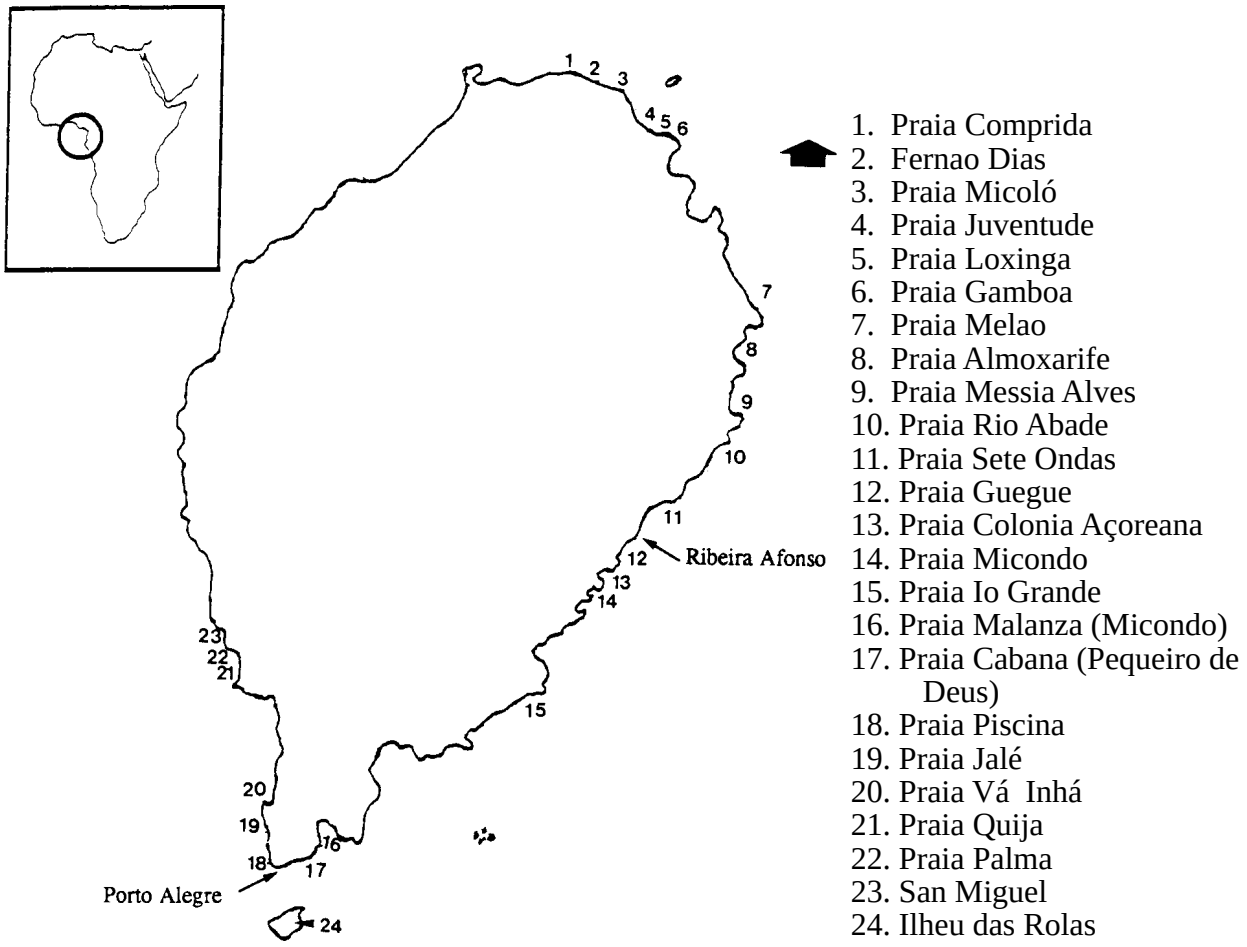

Figure 1. Sea turtle nesting beaches on São Tomé. Data were compiled from interviews with fishermen (who did not consistently distinguish between species) and the results of catch surveys. Names in parentheses are taken from a 1958 Portuguese map; they are rarely used today.

In 1995, catch data assembled by interviewing fishermen and surveying the fish market at Feria do Ponte (including the off site butchering plaza) indicate that olive ridleys were landed in numbers rivaling greens and hawksbills, the two most common species. Unusually high numbers of olive ridleys in the 1995 survey may be an artifact of better recognition skills and reporting by fishermen and survey personnel. In the past, local fishermen often misidentified the olive ridley as juvenile green turtle; with the help of species identification sheets donated by the WIDECAST project in the Caribbean Sea, species identification is now more reliable. Continued record-keeping is vital to understanding annual fluctuations in the composition of the sea turtle fishery.

Human Impact: There is little doubt that man is the main predator of sea turtles on São Tomé, as reported by Castroviejo et al. (1994). Aside from being a consumer of turtle meat and eggs, man is responsible for other detrimental effects to turtles. For example, the uncontrolled removal of beach sand for construction purposes threatens incubating nests, as well as future nesting activity since mining seriously compromises the structural integrity of the beaches from which sand is extracted. There is no regulatory oversight regarding the mining of beach sand.

The harvest of turtles and eggs is unregulated. Both males and females are captured during the breeding season. Beach vigilance, nets set close to nesting beaches, and snorkeling (with the use of hand held spears) are all means used to capture turtles. Contrary to statements by some fishermen that they "had not noticed any decline in turtle catches in twenty years" (see Atkinson et al., 1994), the vast majority of fishermen interviewed during this study reported a decrease in the number of sea turtles both seen and caught.

During the nesting season, leatherbacks, green turtles, hawksbills and olive ridleys are all sold in the market. They are killed for meat, but in the case of hawksbills, the shell is also prized. There are no national restrictions on the tortoise-shell market. Interest in products (e.g., jewelry) and polished shells seems mostly driven by tourists but, fortunately, there appears to be little organized exportation of large quantities of shell or shell products.

Domestic predators, especially dogs, also pose a survival threat to sea turtles. Nests are exhumed by dogs, and their barking may alert hunters to the presence of turtles on the beach. In contrast to some other countries (cf. Carr, 1967), feral pigs do not appear to pose a danger to turtle nests.

Conservation Efforts: In the past year (since October 1995), several public awareness activities have taken place to call attention to the plight of the turtles. Among these have been art exhibitions, media interviews, and even the purchase and subsequent release of two adult female leatherbacks from the Feria do Ponto market. The releases were heavily covered by the media and led to renewed discussion between the Fisheries Administration and ECOFAC, and eventually the drafting of proposed sea turtle conservation legislation. Due to the dependence of some fishermen and their families on income generated from the capture of turtles, public opinion may be slow to change. Legal changes will also come slowly. Total protection of turtles and their nests in São Tomé and Príncipe may be many years away; in any event, law enforcement will be difficult even if strong legislation is passed in this resource-poor country.

Recommendations: Continued study and monitoring of nesting stocks is vital, and this is true for Príncipe, as well, which has yet to be examined. More detailed work needs to be done on both islands to further establish and protect this important breeding ground off the west coast of Africa. The following recommendations are offered:

1. A comprehensive sea turtle study and an education campaign aimed at São Toméans should be continued in São Tomé and initiated in Pr íncipe. Resident and seasonal sea turtle populations should be identified. Index beaches and foraging sites should be selected and monitored on an ongoing basis. Research should be expanded to include hatch success, nest predation and studies of nest fate.

2. The extraction of sand should be restricted to selected inland sites, or to readily accessible non-nesting beaches where a scientific evaluation has concluded that neighboring beaches (where nesting may occur) will not be adversely affected. The evaluation should consider both ecological and economic (e.g., coastal tourism) impacts to mined and adjoining beaches.

3. A government enterprise should be established to control the mining of sand. All other sources should be illegal. A portion of the profits from this business should be earmarked for the training, equipping, and compensation of local beach guards at nesting sites. Government should explore alternative raw materials for cement. Such alternatives should be well advertised, inexpensive, and readily available. Fine volcanic rock has been used experimentally for aggregate, but cost, access and a lack of familiarity have so far hindered its acceptance.

4. A national goal should be established of total protection to sea turtles within São Tomé and Príncipe within a period of 3-5 years (maximum). With this goal in mind, legislation should be introduced to phase out the capture of turtles. All stakeholders should be invited to participate meaningfully in a dialogue to determine how best to phase out the capture of turtles. Effective immediately, the collection, possession, and sale of turtle eggs should become illegal.

5. A protected zone on the southwest coast from Porto Alegre north to San Miguel should be established immediately. This zone will have year round protection (by local guards paid by profits from the sand mining company) of both turtles and nests. Netting along these beaches should become illegal throughout the year. The zone should include Ilhue das Rolas, Praia Vá Inha, Praia Jalé, Praia Piscina, Praia Palma, Praia Quija, etc. (see Figure 1).

6. The Government of the Democratic Republic of São Tomé and Príncipe should accede to (and implement) the CITES treaty. In the interim, the possession and sale of tortoise-shell should become illegal. Government should buy out and close down the sea turtle craft shops and should secure funds to assist artisans in making the switch to utilizing sea shell or coconut shell, for example, instead of turtle shell. Public awareness campaigns should focus on the highly endangered status of the hawksbill turtle and the illegality of bringing sea turtle products into Europe, the U. S., and virtually all other nations of the world.

7. The use of eco-tourism initiatives should be explored as a means to assist in the collection of data on nesting turtles. For example, organized programs for eco- or adventure-tourists might be established to allow participants to camp on beaches with trained guides (local fishermen paid either by the sand mining enterprise or by a tourist agency) to observe nesting turtles, count eggs, etc.

In 1996, U. S. budgetary cuts forced the closure of the Peace Corps program in São Tomé. The sea turtle project is being continued by ECOFAC.

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DAVID GRAFF, 10111 Lincoln Way West, St. Thomas, Pennsylvania 17252 USA. Inquiries may also be addressed to ECOFAC, C.P. 9 São Tomé, São Tomé e Príncipe, VIA Lisbon, Portugal.

MEAN ANNUAL NEST FREQUENCY FOR RENESTING LOGGERHEAD TURTLES (CARETTA CARETTA) ON THE SOUTHWEST COAST OF FLORIDA

Abstract: Ten years (1985-1994) of data collected from tagged renesting loggerhead sea turtles (Caretta caretta) on Key Island on the southwest coast of Florida were evaluated to determine internesting intervals and mean annual nest frequency. The data indicate that renesting females nest at mean intervals of 11.3 days and deposit a mean of 3.9 clutches of eggs per nesting season. Although other estimates of nest frequency from southwest Florida suggest that renesting loggerheads deposit "about" three clutches of eggs per reproductive season, the data from Key Island coincide with higher figures reported from Florida Atlantic beaches. If southwest Florida nest frequencies are higher than previously thought, the implication for conservation is that there may be fewer individuals in this subregional nesting population.

Introduction: Data from the eastern seaboard of the U. S. indicate that renesting loggerheads produce approximately 4.1 nests during a reproductive season (Murphy and Hopkins, 1984). In Florida, loggerheads have been reported to nest between one and seven times per reproductive season (Lenarz et al., 1981; Dodd, 1988; Addison, 1996; J. Richardson, pers. comm.). According to Dodd (1988), internesting intervals range from 12 to 20 days, with 14 day intervals being most often recorded. Most of the data on internesting periods are based on information from nesting beaches on Florida's east coast (Gallagher et al., 1972; Worth and Smith, 1976; Williams-Walls et al., 1983). On Florida's southwest coast, Davis and Whiting (1977) and LeBuff (1990) documented internesting intervals from Cape Sable (Everglades National Park) and Sanibel Island to be about 12 and 11 days, respectively. This paper documents nest frequency and internesting intervals for Caretta between 1985 and 1994 on Key Island, which is located about 50 km southeast of Sanibel Island and 124 km northwest of Cape Sable.

Materials and Results: Data were collected during annual field surveys on Key Island, Florida. The island is about 12 km in length. The southern 5.9 km of beach was patrolled five or six times each night (2100-0500 hr) from 15 May to 15 August. Access to an additional 3.2 km of nesting beach to the north of the study site was blocked by fallen Australian pine trees (Casurina equisitifolia) and was not patrolled. Nesting turtles encountered by research staff were double-tagged. A uniquely numbered Inconel tag (provided by the U. S. National Marine Fisheries Service) was placed in each forelimb. Nest dates were recorded on standard data record forms. Internesting intervals for renesting turtles were determined by subtracting the time and date of repeat nests from one another in sequential order beginning with the first nest. For example, if a tagged individual nested on 1, 11 and 23 June, her internesting intervals were 11-1=10 days and 23-11=12 days.

Observed internesting intervals ranged from 9-70 days. The distribution peaked at 9-17 days, with a secondary peak at 20-27 days (Figure 1). Only four turtles renested between days 17-19; however, from day 20 to day 27, renesting noticeably increased, forming the secondary peak. It is probable that the secondary peak is not as much a biological phenomenon as it is an artifact of sampling. These longer intervals most likely represent repeat nesting females which nested unobserved in the interim (e.g., at the unpatrolled north end of the island, or perhaps on another beach). The annual mean internesting intervals ranged from 10.5 days (1985) to 11.9 days (1988), with an overall mean of 11.3 days (range 9-17) for the decade. Where internesting intervals exceeded 17 days, the number of potential nests were estimated by interpolating missed nests based on modal internesting intervals of 10-13 days. A comparison of the seasonal means of actual and estimated internesting intervals revealed no statistically significant difference ($t=0.320$, $P=0.752$) indicating that the calculated means were comparable to the known means (11.4 days and 11.3 days, respectively).

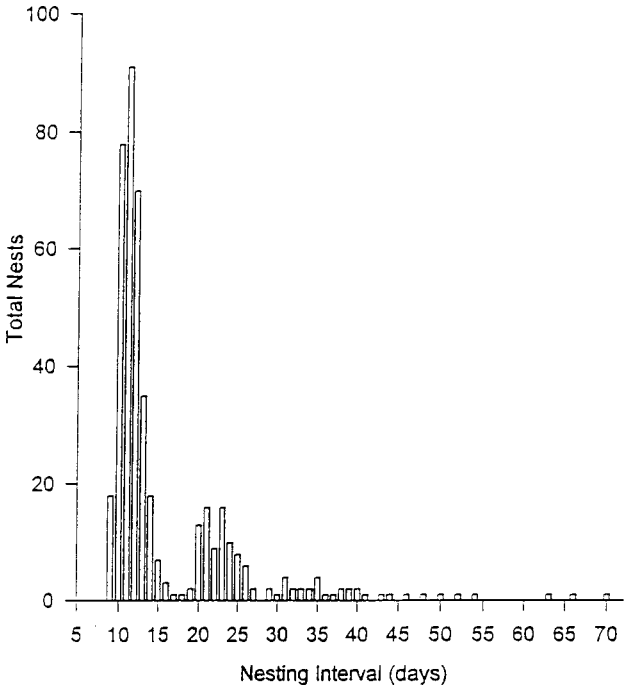

Figure 1. Total number of loggerhead turtle nests documented for each internesting interval.

The observed number of nests produced each year by renesting turtles was added to the number of potential nests to arrive at an estimated mean nest frequency that ranged from 3.5 (1985) to 4.3 (1992) nests per turtle per (Table 1). Observed nest frequency (range 2.1-3.4) was compared to estimated nest frequency to determine if the addition of the inferred number of nests resulted in enough of an increase in seasonal nest totals to result in a statistically significant shift in the estimate of annual nest frequency. Between 1985 and 1994, a total of 207 loggerhead turtles produced 645 documented nests; an additional 177 nests were assumed to have been laid unobserved. There is a statistically significantly difference ($t=5.939$, $P<0.001$) between the observed and estimated nest frequencies.

Table 1. Observed and estimated nest frequencies for multiple nesting loggerhead turtles on Key Island, Florida, 1985-1994.

Year	Observed	Estimated	Total
1985	2.1	1.4	3.5
1986	3.0	0.6	3.6
1987	3.2	0.4	3.6
1988	2.9	0.7	3.6
1989	3.2	0.8	4.0
1990	3.0	0.9	3.9
1991	3.4	0.8	4.2
1992	3.1	1.2	4.3
1993	3.0	1.2	4.2
1994	3.3	0.8	4.1
Mean	3.0	0.9	3.9

Discussion: For Sanibel Island in southwest Florida, LeBuff (1990) suggests that renesting loggerhead turtles nest about three times during a reproductive season at about 11-day intervals. Our estimates from Key Island indicate that on the lower west coast, the mean is some 30% higher (3.9 nests). Our data more closely reflect a nest frequency of 4.1 reported from Atlantic beaches (Murphy and Hopkins, 1984). The higher frequencies reported for Key Island are supported by the fact that between 1985-1994, 271 nests were deposited unobserved. This number exceeds our estimate (based on interpolation in cases where internesting intervals exceeded 17 days) of 177 nests laid unobserved by tagged, renesting turtles. Even though 314 more nests were deposited by turtles that were seen only once but could have been missed later, it would require only an additional six nests from unseen renesters to raise the mean frequency from 3.9 to 4.0. This indicates that seasonal nesting totals on the lower west coast may be slightly higher than indicated by the calculated estimate. A mean of four nests each season suggests that fewer loggerheads nest on the lower west coast than would be expected if the yearly mean were three.

Acknowledgments: I am indebted to my predecessor, Ron Mezich, for keeping accurate records in the early years of the Key Island project. The efforts of approximately 40 interns over the past 10 summers are also greatly appreciated. Thanks also to Jim Gore and two anonymous peers for their review of an earlier draft.

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DAVID S. ADDISON, The Conservancy, Inc., 1450 Merrihue Drive, Naples, Florida 34102 USA.

REPORT OF THE SEA TURTLE CONVENTION NEGOTIATIONS

The fourth round of negotiations of the "Inter-American Convention for the Protection and Conservation of Sea Turtles" held in Salvador, Brazil, 3-5 September 1996, resulted in the successful conclusion of the Convention. Representatives from the United States, Brazil, México, Colombia, Venezuela, Peru, Ecuador, Costa Rica, Honduras, Nicaragua, Suriname, Trinidad and Tobago, Bahamas, Dominica, and St. Lucia participated in the negotiations.

The Convention establishes national sea turtle conservation programs in the signatory countries. In ratifying the Convention, each signatory will agree to implement broad measures for the conservation of sea turtles, including prohibiting intentional take (except for subsistence take as allowed under the Convention) and domestic or international sale, promoting conservation and habitat restoration, and promoting efforts to enhance sea turtle populations. In addition, all commercial shrimp trawl vessels operating in the waters regulated by the Parties will use turtle exclude devices (TEDs) to reduce the incidental capture of sea turtles. Some exceptions to this requirement are allowed under the Convention and are discussed below.

The following outstanding issues from the previous round of negotiations were resolved to U. S. satisfaction:

* The use of trade measures: All Parties will act in accordance with the provisions of the World Trade Organization (WTO), as established at Marrakesh in 1994.

* Subsistence take of sea turtles: Parties may allow exceptions to the prohibition of intentional takes if such takes are for subsistence needs. The Party allowing such takes must consider the recommendations of the Consultative Committee and must develop a management plan that includes limits on levels of intentional takes.

* Geographic scope of the Convention: The geographic scope of the Convention restricting it to 35 North latitude to 35 South latitude was removed. The Convention now applies to all land and water areas of the Americas.

* Exceptions to the use of TEDs: Parties may claim an exemption from the use of TEDs on their shrimp trawl vessels if they are exclusively using other trawl gear that has been demonstrated not to pose a risk of incidental capture and mortality to sea turtles, or are operating under conditions where there is no likelihood of interactions with sea turtles. Parties claiming such exemptions will have to provide documented scientific evidence to the other Parties.

Other changes to the text of the Convention were made, as well. They include revisions to the list of recommended TEDs, an additional annex on the protection of sea turtle habitat, the creation of a Scientific Committee and a mechanism for countries outside the Western Hemisphere to negotiate complementary protocols.

* Recommended list of TEDs: The list of allowable TEDs was removed and replaced with the provision that the Parties will develop an initial list at their first meeting. Until that meeting, each Party will determine which TEDs to require.

* Annex on habitat protection: This annex encourages Parties to conduct environmental assessments of marine and coastal development activities, manage and regulate the use of beaches and coastal dunes in nesting areas, and establish protected areas where sea turtles nest or regularly occur.

* Scientific Committee: This Committee will analyze scientific information and provide recommendations on scientific and technical matters. The Convention also creates a Consultative Committee to examine annual reports to be submitted by the Parties.

* Complementary Protocols: The Convention calls upon Parties to negotiate with non-Party States a complementary protocol consistent with the objectives of the Convention. Any interested State can ratify a complementary protocol. The Convention itself is open only to States in the Americas or with territories in the Americas.

The Convention will be open for signature from 1 December 1996 through 31 December 1998 and will come into force after eight countries ratify it.

ANGELA SOMMA, NOAA National Marine Fisheries Service, Office Protected Resources (F/PR), 1335 East-West Highway, Silver Spring, Maryland 20910-3226 USA.

Editor's Note — We welcome informed opinions and analyses concerning the Convention, and we hope that other persons active in Government delegations or non-government advocacy groups will share their perspectives on this new legal instrument with our readers. Convention text will be excerpted in an upcoming issue of the MTN.

GREEN TURTLES WITH FIBROPAPILLOMA DISEASE IN THE BVI

Green sea turtles, Chelonia mydas, rarely nest in the British Virgin Islands (BVI), but they are prominent among the coastal marine vertebrate fauna. All size classes can be observed foraging in local waters throughout the year (Eckert et al., 1992). On 3 July 1996, while snorkeling in Deadmans Bay, Peter Island (18º22'N, 64º33'W), the author encountered three green turtles resting in sand/sea grass habitat (8-10 m depth), approximately 30 m apart. Close inspection of the turtles revealed varying degrees of tumor growth on their bodies caused by green turtle fibropapilloma disease. Associated with all three of these turtles were remoras (Remora sp.) and shark-suckers (Echeneis naucrates) of varying sizes which were attached to the turtles both on the shell and ventral areas.

The first turtle (90 cm curved carapace length (CCL), 70 cm curved carapace width (CCW)) [N.B. all measurements, both of turtles and of tumors, are estimates] had large tumors (15 cm long) on both hind flippers, both foreflippers and on one eye. This appeared to be the most advanced case of the three. It appeared as though this turtle was having difficulty moving around and it was possible to approach and touch the turtle without it being disturbed. The second turtle (80 cm CCL, 65 cm CCW) had smaller tumors which covered the dorsal part of the neck, and tumor growth had begun around both eyes. This appeared to be the least affected of the three. The third turtle (80 cm CCL, 65 cm CCW) had large tumors on both hind flippers, small (<10 cm) tumors on the left foreflipper, and tumor growth beginning on both eyes. This turtle showed difficulty in swimming; however, it was observed feeding.

Unfortunately, only a small area (2500 m^2) could be covered during the observation period because time was limited. Deadmans Bay is a large bay and includes vast areas of sea grass. The distribution and abundance of green turtles in the bay is unknown, as is the full extent of the occurrence of the fibropapilloma disease. According to the National Sea Turtle Recovery Action Plan (Eckert et al., 1992), "fibropapilloma disease has not been documented in

the BVI, but there have been unconfirmed reports dating back to the 1970's." With these observations we have now confirmed that this debilitating disease is present in the BVI. As green turtles are still captured for food throughout the BVI, especially during the open season, and the health risks posed to humans by tumor-afflicted turtles have not been investigated, it seems prudent that fishermen be warned not to keep or sell meat from diseased turtles.

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JULIE A. OVERING, Lewis & Associates, Ltd. - Environmental Consulting, P. O. Box 962, Road Town, Tortola, BRITISH VIRGIN ISLANDS.

SEA TURTLES IN THE EL PALMAR RESERVE, YUCATAN: A PRELIMINARY STUDY

During the months of June-July 1992, late June - July 1993, and late July - August 1994 (cumulative total: 98 field days), surveys were carried out to collect information on the reproductive ecology and biology of sea turtles nesting in El Palmar Reserve, located on the northwest coast of the Yucatán Peninsula, México. El Palmar is characterized by mangrove thickets, lagoons and coastal dunes; it encompasses 40 km of coastline. The study was conducted by the Tethys Research Institute (Milano, Italy), in cooperation with Biocenosis (Yucatán) and Europe Conservation, and with the help of many "eco-volunteers".

The study area included 30 km of beach within the Reserve. When a turtle was encountered nesting, a variety of data were collected at the time of egg laying: 1) species identification, 2) diagnostic markings (e.g., injury), 3) nest dimensions, 4) habitat preferences and 5) nesting behavior. Subsequently, data concerning nest temperature, hatch rate, and egg and hatchling depredation were recorded. Eggs were collected at the time of deposition and relocated to a protected hatchery; hatchlings were released immediately upon emerging from their nest. Local dune flora were collected and their locations described with respect to each nest site. We hope that the floral collection will provide a baseline for future study, including evaluating the effects of human activities in the Reserve.

The hawksbill turtle, Eretmochelys imbricata, is the only sea turtle which was observed to nest in El Palmar Reserve. Twenty-three individuals were observed laying eggs during the study period (1992-1994); all were tagged for later identification. From a total of 129 crawls observed during the study period on 30 km of patrolled beach, there were 84 nests (eggs were laid) and 36 false crawls (eggs were not laid). The data show a mean of 4.3 crawls/km (sd= 2.79, range 0-11, n=129 crawls), including an average of 2.8 confirmed nests/km (sd=2.32, range 0-9, n=84). The highest density of nesting (31.6%) was near El Palmar lighthouse.

Despite the fact that data were not collected throughout the entirety of each nesting season, it is clear from comparative analyses with other databases in the region that the number of nesting turtles, as well as nest density (monthly average), are low compared to other areas of the Yucatán Peninsula (Castañeda, 1987; Escanero et al., 1991; Frazier, 1991; Garduño and Lope, 1991; Rodriguez et al., 1993; Miranda-Ruelas, 1992; Garcia and Rodriguez, 1993; Licona Alvarez, 1994; López de la Portilla, 1994; Moctezuma Morales, 1994). Potentially this is a reflection of negative human influence within the Reserve, such as the disturbance or killing of turtles, egg collection, and/or depredation by dogs and raccoons.

The average curved carapace length of the gravid females was 94.2 cm (sd=3.91, range 88-100, n=20). The average curved carapace width was 84.4 cm (sd=3.94, range 76-90, n= 20). During nocturnal beach patrols, 121 tracks of adult hawksbill turtles were studied and information on nesting, crawl width, and pattern was collected. The average clutch size was 168 eggs (sd=32.1, range 113-225), n=27). The average weight of an individual egg was 34 g (sd=2.73, range 27.0-40.5, n=506 eggs from 20 nests). Average hatchling length and weight was 4.3 cm (sd=0.18, range 3.2-4.6, n=215 hatchling from 20 nests) and 17.1 g (sd=2.17, range 12.5-23.5, n=146), respectively. These data do not differ appreciably from literature values (e.g., Witzell, 1983; Rodriguez et al., 1993; Acosta Lugo, 1995).

This study has proven important not only in providing baseline data on sea turtle nesting in this pristine Reserve, but also in documenting the exclusive presence of Eretmochelys. The observation of only this species of sea turtle at El Palmar, as well as its low density in comparison with population estimates at other nesting beaches in the Yucatán region, emphasize that further study is needed to determine whether these low densities represent an historical norm or are the result of antropogenic interference. In an area where the impact of human activities on these endangered reptiles remains difficult to evaluate, additional data would help toward the establishment of a conservation strategy for the Reserve.

Conservation initiatives undertaken in 1992-1994 have raised public awareness (including within local fishing communities) concerning sea turtle conservation issues, but more is needed. The project will continue to emphasize research and data collection, but will move toward a comprehensive conservation and management initiative for the nesting beach. Specific actions will include: 1) survey the beach to evaluate habitat use by turtles and to monitor human activities; 2) initiate systematic sampling of the beach to assess temporal and spatial nesting patterns; 3) tag turtles to shed light on migratory movements; 4) provide support to the local group, Biocenosis, therby enabling the group to effectively protect the sea turtles; and 5) promote conservation education within nearby fishing communities, including the participation of community members in sea turtle recovery efforts.

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MADDALENA BEARZI, Tethys Research Institute, 13955 Tahiti Way 257, Marina del Rey, California 90292 USA; e-mail: 103131.2200@compuserve.com

1995 RECORDS OF SEA TURTLES IN THE GULF OF VENEZUELA, STATE OF ZULIA

Between April and June, 1995, field surveys were conducted on the northeastern coast of the Gulf of Venezuela; specifically, on the beaches of Caimare Chico between Caño Paijan and Caño Sagua. Also included were the beaches within the Los Olivitos Wildlife Refuge and Fisheries Reserve. Of the five species of sea turtle previously reported in the area (Sideregts et al., 1978), four of them where encountered during these surveys (Aguilera and Acuña, 1996). There was no evidence of nesting.

Three stranded leatherback turtles (Dermochelys coriacea) were found on the beach at Caño Sagua. The first, found on 27 April 1995 about 5 km south of the Caño, measured approximately 130 cm curved carapace length (CCL). The turtle was found in an advanced state of decomposition and had nylon cord around its right front flipper, suggesting that it had been snared in a fisherman's net. The second leatherback was found on 6 May 1995 on the

same beach. A third leatherback (125 cm CCL, 73 cm curved carapace width (CCW)) was found tangled in a fisherman's net at Quisiro Beach, within the boundaries of the Los Olivitos Wildlife Refuge and Fisheries Reserve; it was released alive. Despite reports that the leatherback is rare in the area (Acuüa and Toledo, 1994), fishermen indicate that it is, in fact, the most common sea turtle and that its distribution is related to the presence of jellyfish (Scyphozoa).

Fishermen also report that the Los Olivitios Wildlife Refuge and Fisheries Reserve is an important feeding area for juvenile and subadult green and hawksbill turtles. On 1 May 1995, a green turtle (Chelonia mydas) (71 cm CCL, 53 cm CCW) and a hawksbill turtle (Eretmochelys imbricata) (28 cm CCL, 20 cm CCW) were found stranded on Quisiro Beach within the Refuge. The hawksbill was released alive. Finally, on 6 May 1995, an olive ridley (Lepidochelys olivacea) was found on Caimare Chico Beach. No measurements were taken; there were no apparent injuries. This is only the second report of a ridley in the Gulf of Venezuela.

In addition to field surveys, talks were given to fishermen on the biology of sea turtles, threats to sea turtle survival, and the laws which protect them in Venezuela. During these discussions, fishermen reported that observations of sea turtles were more frequent between March and May. At this time of year, sea turtles are migrating between the Goajira Peninsula and the western Venezuelan state of Falcon. The results obtained during this project indicate fishermen are unaware of the current status of sea turtles. For this reason, systematic efforts should be initiated to improve the conservation of sea turtles by broadening public awareness campaigns, and priority should be given to assembling more information about the distribution and abundance of sea turtles in the Gulf of Venezuela.

This work was accomplished thanks to financing from the PEQUIVEN, El Tablazo, Miranda Municipality. Field work was conducted by E. Rivera, M. Alvarez, J. Pineda, E. Lopez (volunteer biologist) and members of the Center for Excursions at the University of Zulia: A. Fernandez, B. Leal and C. Morales. Invaluable logistical support was provided by: PRODUSAL S.A., Polar Brewery, Mayor's Office of the Miranda Municipality, Bioindustries of Venezuela, Mr. T. Romay, Nava Wetter family and Mr. E. Martinez (Environmental Education Division Chief MARNR-Zulia). We thank Hedelvy Guada (WIDECAST-Venezuela) for her collaboration and review of this document.

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MARGARITA AGUILERA TECPETROL, Torre Ejecutiva. Av. 4 Bella Vista, entre calles 75 y 76, Maracaibo, Estado Zulia, VENEZUELA and ALEXANDER J. ACUÑA P., PROFAUNA, Ministerio del Ambiente y de los Recursos Naturales Renovables, Cabecera del Puente sobre el Lago de Maracaibo, Sector Puntica de Piedras, Maracaibo, Estado Zulia, VENEZUELA.

LEGISLATION PROTECTING MARINE TURTLES IN PERU

On 30 September 1977, the Ministry of Agriculture in Peru dictated the Ministerial Resolution (RM) 1710-77-AG/DGFF, classifying various species of wild fauna and flora within the categories of protection established in Article 7 of the Conservation of Wild Fauna and Flora Regulations (Supreme Decree by the Ministry of Agriculture No. 158-77-AG). This Resolution (RM No. 1710-77-AG) listed five species of marine turtles in the "Vulnerable Situation" category (these are Caretta caretta, Chelonia mydas, Dermochelys coriacea, Eretmochelys imbricata, and Lepidochelys olivacea) due to excessive hunting and habitat destruction. Subsequently, on 14 September 1990, by means of RM 1082-90-AG/DGFF, the Ministry of Agriculture abolished RM 1710-77-AG and approved a new protection classification for species of wild flora and fauna. The classification of the five marine turtle species was unchanged. Caretta caretta was listed in both Resolutions, the relevant authorities apparently unaware of the fact that this species does not occur in Peru (e.g., see Dodd, 1990a,b). This error was corrected by Pulido (1991) in not listing Caretta among the fauna of Peru.

The Ministry of Fisheries, considering that the hydro-biological resources of Peruvian coast are a national heritage and aware that the Ministry is entrusted with their conservation, enacted RM 1065-76-PE on 31 December 1976. This Resolution banned the capture of Dermochelys coriacea in coastal waters, while allowing the capture of Chelonia mydas (exceeding 0.8 m in total length) on 20 islands and at 17 locations. The ruling was promulgated due to the indiscriminate fishing of these species and was an attempt at their conservation. However, the Chelonia fishery continued with unchanged (or heightened) intensity. To some extent this was due to the fact that the Resolution was ambiguous in its phrasing of the permissible length. In Peru, the fishermen are used to interpreting "total length" at their own convenience. Sometimes this is interpreted as carapace length, and sometimes as head-to-tail length. The distinction is important, because if turtles need only be 80 cm head-to-tail, then subadults can legally be landed. Vargas et al. (1994) report the average straight carapace length of 130 Chelonia legally taken at Caleta Constante, Piura to be 0.7 m; only in average head-to-tail length did these turtles exceed 0.8 m.

On 2 March 1995, by means of RM 103-95-PE, the Ministry of Fisheries banned the capture of all species of marine turtles, but without abolishing RM 1065-76-PE (which was given "provisional status" until the necessary investigations into the status of marine turtles in Peru could be carried out). In the 16 years between these Resolutions, very little information concerning the biology and population status of marine turtles in Peru had been assembled. The present situation is complicated by redundant jurisdiction and confusion regarding which government agency is responsible for marine turtles. Article 2 of the Supreme Decree No. 158-77-AG gives authority to the Ministry of Agriculture's ***Direccion General Forestal y de Fauna*** to establish technical, administrative and economic conditions for the hunting or taking of wild fauna, as well as for its conservation. Marine turtles are included because they nest on land (cf. article 4). On the other hand, the Ministry of Fisheries is endowed with the same obligation under its laws to set conditions regarding marine turtles.

The duality of authority creates interference and confusion, as well as wasting the scare resources of time and money. The legal framework for the conservation of marine turtles in Peru must be consolidated, and agreement must be reached whereby our marine turtle resource, which is greatly endangered, will be provided with the protection required to regain healthy population sizes. Moreover, scientific researchers should be the ones who define the proper guidelines for resource management, and scientists must be provided with economic and administrative support if this important work is to be realized.

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VICTOR R. MORALES, Calle Erik Díaz Cabre 138, Urb. Humbold, Lima-18, PERU and PATRICIA VARGAS, Inca Garcilzao de la Vega 453, Salamanca de Monterrico, Lima-3, PERU. Translated from its original Spanish by Dr. M. Horning.

PROGRESS FOR SEA TURTLES: SEA TURTLE CLUB BONAIRE

Bonaire, Netherlands Antilles (Caribbean Sea), is surrounded by vivid coral reef formations and sea grass meadows which provide forage and shelter for juvenile green and hawksbill sea turtles. Moreover, some beaches on the island support small nesting populations of hawksbill and loggerhead sea turtles. Although the turtle fishery (including egg collection) has been forbidden by law since 1991, a small number of sea turtles are harvested illegally. The hunting is pursued by a small group of fishermen who have traditionally hunted sea turtles for their meat, which is believed to have magical healing powers. The hunt threatens remaining populations, but our major concern at the present time is not this clandestine market, but rather the continuing development of the tourism industry. For example, Klein Bonaire, an uninhabited islet off the west coast, is constantly the focus of private building plans. The islet includes the main turtle nesting habitat in Bonaire. As presently conceived, development of the islet is sure to have negative consequences for the surrounding coral reef, as well as to the nesting colony.

The Sea Turtle Club Bonaire (STCB), founded in 1991, is a Bonairian-Dutch non-profit organization, and its main goal is to save the sea turtles that visit Bonaire from extinction. The first comprehensive sea turtle conservation project of the STCB was executed in 1993, using recommendations made in the WIDECAST Sea Turtle Recovery Action Plan for the Netherlands Antilles (Sybesma, 1992) as a guide for project development and the implementation of field conservation priorities. Beach monitoring results, as well as sighting reports from the dive school network established by the STCB, indicated that Bonaire was still visited by juvenile, subadult and adult turtles of several species. The results were made available to the public, including policy-makers, educators, and the media. Apart from the monitoring and sightings database, an extensive awareness campaign was undertaken, targeting schools, law enforcement agencies and the general public (Van Eijck and Eckert, 1994).

In 1995, a follow-up project was organized in cooperation with the University of Amsterdam and a consortium of local nature conservation organizations, including the Bonaire Marine Park and ***Tene Boneiru Limpi*** (Keep Bonaire Clean). The project was sponsored by WWF-Netherlands and the Dutch National Postcode Lottery. Again, sea turtle nesting activity was monitored throughout the breeding season. Although the number of nests we documented did not differ appreciably from 1993, new nesting beaches were identified. Moreover, a prom-

ising pilot project on photo identification of juvenile green and hawksbill turtles was initiated. Apart from the research, the STCB focussed once again on public awareness. The 1993 project had revealed a large demand for educational materials suitable for local schools; thus, the 1995 campaign held as a priority the development and distribution of such materials. Related activities included snorkel trips for school children (organized by the Bonaire Marine Park and ***Tene Boneiru Limpi***, with STCB Project Assistants participated as guides) and the organization of several beach cleanup actions during World Cleanup Day in September (Valkering et al., 1996).

In 1996, the STCB launched its third sea turtle conservation project, which again consisted of a thorough monitoring of gravid females during the nesting season, in-water surveys of primary foraging areas on the east coast, and an extensive public awareness campaign (largely sponsored by WWF-Netherlands). The STCB has nurtured excellent working relations with the local media (print, radio, TV) and, as a result, we are able to reach a large segment of the Bonairian public with our message. It appears that the general public is becoming noticeably more aware of the living treasures the island has to offer, since a broad-based grassroots movement is now standing firm against any ill-conceived development of Klein Bonaire. It is also gratifying to note that the nesting activity of the turtles increased this year, although we know in our scientific hearts that this is just a happy coincidence to the success of our research and education campaigns. Apart from the work mentioned above, the STCB is considering the establishment of an environmental educational center, which will enable the several conservation groups on Bonaire to present themselves to the larger public.

Much progress has been made in Bonaire since 1991, and while we are a small island with relative small (but apparently stable) sea turtle populations, we are proud of the results. We owe a lot of our success in organizing and implementing a successful, multifaceted sea turtle conservation program to the ready availability of a compressive, peer-reviewed Sea Turtle Recovery Action Plan (Sybesma, 1992) which served to guide our efforts and prioritize our objectives, as well as assisting us in the design of appropriate methodology and the evaluation of results. We think that our project can serve as a model for larger recovery (or management) plan based projects, and we would like to offer our experience to groups who are seeking advice, especially in the organization of public awareness campaigns and the establishment of national sightings networks. Our latest project report can be obtained by sending US$ 10.00 (money order preferred) to the author at the address below.

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TOM VAN EIJCK, Sea Turtle Club Bonaire, Madurastraat 126 hs, 1094 GW Amsterdam, THE NETHERLANDS; e-mail: tvaneyck@bio.vu.nl

A NOTE ABOUT KEMP'S RIDLEYS NESTING IN TEXAS

In the last issue of the Marine Turtle Newsletter (see MTN 74:5-7), I described nesting by two head-started Kemp's ridley sea turtles at Padre Island National Seashore (PINS), Texas, during 1996. Based on the locations of the living tags on these turtles, we were able to determine that they were members of the 1983 and 1986 year classes, respectively. At the time of writing, however, it remained uncertain whether they had been experimentally "imprinted" to PINS or to Rancho Nuevo, México. We can now say conclusively that both turtles detected nesting at PINS earlier this year had been imprinted to that area.

DONNA J. SHAVER, National Biological Service, Padre Island National Seashore, 9405 S. Padre Island Drive, Corpus Christi, Texas 78418 USA.

A NOTE ABOUT DECLINING LEATHERBACKS IN MEXICO

The authors of the article on declining leatherback turtles in México (see MTN 74:2-5) inadvertently neglected to specify the field reports from which the data used to construct Figure 1: "Number of nesting crawls (nests and false crawls combined) made by leatherback sea turtles each year at Playa Mexiquillo, Michoacán" were drawn. The source documents were these:

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LAURA SARTI M., Lab. Tortugas Marinas, Facultad de Ciencias, UNAM Depto. Biología, Circuito Exterior, Ciudad Universitaria, México D.F. 04510 MEXICO and Instituto Nacional de la Pesca, Pitogoras 1320 5º Piso, Col. Sta. Cruz Atoyac, México D.F. 03200 MEXICO; e-mail: lsm@hp.fciencias.unam.mx

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A NOTE OF THANKS

We would like to express our gratitude to Dr. David Owens of Texas A&M University for taking time out of his very busy schedule, which is already full beyond capacity with teaching, research and administrative duties, to assist us with the Recent Papers section each quarter. For the past year Dave has taken the lead on conducting computer searches of reference databases for current sea turtle listings. Without his kind assistance, we could not offer the Recent Papers section. Nor would the section be as complete or timely as it is if readers did not submit reprints directly to the MTN. Since it typically takes a year or more for a published paper to appear in the reference databases, notice of your new paper will appear much more quickly if you send us a reprint! This is especially true for articles published in non-U.S. journals which may not be surveyed at all by the databases we access. Finally, we will include an e-mail address if you [the author] will provide us with that information. — KLE/SAE

TECHNICAL REPORTS

KEINATH, J. A., D. E. BARNARD, J. A. MUSICK and B. A. BELL (Compilers). 1996. Proceedings of the Fifteenth Annual Symposium on Sea Turtle Biology and Conservation, 20-25 February 1995, Hilton Head Island, South Carolina, USA. NOAA Tech. Memo. NMFS-SEFSC-387. 355 pp. + app. Available from: Wayne Witzell, NOAA/ NMFS Southeast Fisheries Science Center, 75 Virginia Beach Drive, Miami, Florida 33149 USA. ***[Note: All requests must be made by mail, requests made via phone, fax or e-mail will not be filled. A return address label must be provided.]***

MEYLAN, A., B. SCHROEDER abd A. MOSIER. 1995. Sea Turtle Nesting Activity in the State of Florida 1979-1992. Florida Marine Research Publ. 52:1-51. Available from: Florida Marine Research Inst., Florida Department of Environmental Protection, 100 8th Ave. SE, St. Petersburg, Florida 33701 USA.

BOOK REVIEW

CAUGHT IN THE NET: THE CONFLICT BETWEEN SHRIMPERS AND CONSERVATIONISTS
by Anthony V. Margavio and Craig J. Forsyth, with Shirley Laska and James Mason
176 pages (6 x 9 inches), cloth edition only
3 black/white photographs; 1 line drawing
Copyright 1996; Language English; ISBN 0-89096-669-9
Publisher: Texas A & M University Press, Drawer C, College Station, Texas 77843
Price: US$ 32.50 plus $4 shipping within the U. S. ($5 shipping to foreign destinations)

Anyone working near shrimp or sea turtles during the last decade would have found it hard to avoid the TED [turtle excluder device] controversy — a controversy as intense if not as broadly known as the controversy over northern spotted owls and logging in the Pacific Northwest region of the U. S. Remarkably, the TED controversy has received little comprehensive academic review. With publication of **CAUGHT IN THE NET: THE CONFLICT BETWEEN SHRIMPERS AND CONSERVATIONISTS**, we had reason to hope for a careful, disinterested analysis. We will have to wait.

Instead of drawing upon readily available materials, **CAUGHT IN THE NET** relies on hearsay evidence and recirculates rumors that are no more credible today than they were ten years ago. Although the authors conducted extensive surveys of shrimp fishermen's attitudes, which they seem to accept for objective reality, the authors did little to investigate the thinking, decisions, and activities of sea turtle scientists and conservationists.

For example, rather than reviewing the extensive literature on the status of sea turtles and their capture in shrimp trawls, Margavio and Forsyth rely on the views of a single biologist, whose singular opinions just happen to coincide with the interests of TED opponents. Astonishingly, based on this biologist's critique, the authors dismiss the conclusion of the 1990 National Academy of Sciences' review that incidental capture in shrimp trawls has been the major anthropogenic cause of sea turtle mortality. Similarly, they question the motives of sea turtle scientists in Government, but leave unexamined the motives of scientists whose daily work was with the shrimp industry.

Margavio and Forsyth deal no more responsibly with the conservation community. The authors renew the charge that conservationists did little to protect sea turtles from other threats

such as poaching, beach development, and international trade. These charges are similar to those raised by international traders in sea turtles who told conservationists that the real problem was shrimp fishing, or by condominium developers who pointed the finger at them both. All three groups shared one thing in common — they were being dogged by conservationists. When I first became involved in sea turtle conservation in 1980, there already were hundreds of scientists and volunteers in the U. S. and beyond who were working to address all these problems and more. Even a casual inquiry into sea turtle conservation efforts over the last 25 years would have revealed as much.

CAUGHT IN THE NET adopts a sadly cynical view of people's motivations for trying to conserve sea turtles. In this instance, the authors insist that conservation groups pressed for the adoption of TEDs in order to maintain funding support from their members and to divert attention from nameless corporate evildoers ... never mind that for decades scientists had been issuing calls to action that Government and industry ignored, or that these same conservationists had been battling corporate misdeeds as well.

Finally, the authors of **CAUGHT IN THE NET** lump shrimp fishermen from North Carolina to Texas together into an undifferentiated mass of anger. Here they do a disservice to the rich diversity of attitudes and views that mark a fishery composed of hundreds of docks, thousands of boats, and tens of thousands of individual people. In doing so, the authors misrepresent the challenge of provoking change in that fishery.

Some people would like to bury the TED controversy in the past, while others would like to settle old arguments. The intensity of the TED controversy and its long history begs for some careful, comprehensive analysis. As L. A. Nielsen suggested in his 1995 article in Fisheries ("The Practical Use of Fisheries History"), evaluating and analyzing past conflicts can help guide our response to future conflicts. Remarkably, there is little interest in such historical analysis. **CAUGHT IN THE NET** might have corrected that deficiency, but instead the book has merely compounded it.

MICHAEL L. WEBER, 228 1/2 South Juanita Avenue, Redondo Beach, California 90277 USA.

NEW BOOK AVAILABLE: SPECIAL PRICE FOR MTN READERS

THE BIOLOGY OF SEA TURTLES
Edited by Peter L. Lutz and John A. Musick
448 pages (6 x 9 inches), cloth edition only
Copyright 1996; Language English; ISBN 0-8493-8422-2
Distributor: Miami Aqua-culture, Inc., 4606 S.W. 74 Ave., Miami, Florida 33155 USA
Price: US$ 75.00; ***US$ 70 for MTN subscribers***

During the last 20 years, the science of sea turtle biology has expanded at an exponential rate, leading to major advances in many areas. This book synthesizes the results of these advances and focuses on how these endangered marine reptiles operate in, adapt to, and are dependent upon particular features of their marine environment. It addresses threats to survival presented by man-made changes to ocean and coastal zones. The first book of its kind, **THE BIOLOGY OF SEA TURTLES** fills a substantial void in the literature. The book includes data on population genetics and phylogeny, sensory biology, migration and orientation, hatchling behavior, age and growth, reproduction and endocrinology, sex determination, diving physiology, and osmoregulation. Source: CRC Publishers, ***New Title Information.***

THESES AND DISSERTATIONS

DUTTON, PETER HOWARD. 1995. Molecular Evolution of Sea Turtles with Special Reference to the Leatherback, Dermochelys coriacea. Ph.D. Dissertation, Texas A&M University. [UMI, 300 N. Zeeb Road, Ann Arbor, Michigan 48106 USA; order no. GAX96-15803]

PHILLIPS, LISA MICHELLE. 1994. Green Sea Turtle (Chelonia mydas) Culture: An Historical Perspective, Current Methodology and Considerations for Expanding Intensive Commercial Production. Master of Science Thesis, Simon Fraser University (Canada). [UMI, 300 N. Zeeb Road, Ann Arbor, Michigan 48106 USA; order no. GAXMM-06771]

LEGAL BRIEFS

PALM BEACH, FLORIDA — In just over a month, four local men have been charged with poaching marine turtle eggs from dunes on Singer Island, prompting the Florida Marine Patrol and other agencies to begin special night surveillance. The Marine Patrol uses night vision scopes to spot turtle egg thieves in the dark more than a mile away, said Lt. Royce Hamilton of the Marine Patrol. Although it hasn't been called into anti-poaching service this year, a Marine Patrol helicopter has forward-looking infrared radar that provides nighttime images of people on the beach by focusing on body heat, Hamilton said. All the men charged so far had taken loggerhead turtle eggs and have not been arrested previously on turtle egg violations. Loggerheads are considered by federal authorities to be a threatened species. Maximum penalties if convicted on illegal possession of a marine turtle egg are one year in jail and a $1000 fine in state court, and five years in prison and a $25,000 fine in federal court. Source: excerpted from ***The Palm Beach Post***, 28 June 1996.

* * *

MAALAEA, MAUI — Hawksbill sea turtles are so rare than only two or three try to nest on Maui [Hawaii, USA] each year. But human intrusion has turned one nesting spot into a lethal gauntlet. A hawksbill laden with eggs was killed by a passing car at Kealia Beach early yesterday. As most sea turtles do, female hawksbills return to the beach where they were born to lay their eggs, but turtles returning to Kealia Beach find the area drastically changed in the last 25 years. Erosion has reduced the width of the sand beach [and] condominiums have sprouted on both ends of the beach. With homes, hotels and businesses, Kihei's population has grown from barely 1600 in 1970 to an estimated 15,000 today, not including visitors. North Kihei Road, which runs within 50 feet of the shoreline, has turned from a pot-holed country road to a 45-mph, two-lane thoroughfare with cars speeding to and from Kihei. Hau and Kathryn Smith, managers of the Kealia Pond National Wildlife Refuge, said it appeared the turtle had crawled up the beach, looking for a safe place to nest. It climbed over a low sand dune and crawled across the road, where it was struck. Source: excerpted from ***The Honolulu Advertiser***, 20 August 1996.

* * *

HONG KONG — Hong Kong conservationists were left horrified when a passerby took the eggs laid by an endangered green turtle after the reptile returned to the water, an official said Monday. Green turtles used to nest on one of Hong Kong's offshore islands until pollution and increasing numbers of people drove them away. So when word spread over the weekend that a rare green turtle had been spotted for the first time in many years laying eggs on the

beach on the southern side of Lamma Island, conservationists were delighted. But their delight soon turned fury when they realized that the eggs had been taken by the passerby, said Frazer McGilvray, spokesman for the Hong Kong Marine Conservation Society. The collecter gave the eggs away to his friends as presents, he added. It is a criminal offense to take turtle eggs in Hong Kong, but it was not immediately known whether the passerby, whose identity was not divulged, would be charged. Source: ***Reuter News Service***, Hong Kong, 2 September 1996.

* * *

BRISBANE, QUEENSLAND — The Australian Government's refusal to meet new standards for the protection of marine life could threaten the local [prawn] industry. The Federal Government has ruled out forcing Australian prawn trawlers to be fitted with devices to stop them from trapping turtles in their nets. The decision means the Australian prawn industry will be locked out of the U. S. market. The U. S. recently introduced stringent laws banning the importation of prawns caught in countries where turtles are not protected from the industry. Resources Minister Warwick Parer has ruled out making the protection devices mandatory because of industry opposition. Up to 6000 turtles each year are caught by prawn trawlers in Australian waters, with most ending up drowned or badly injured by the nets. Source: excepted from ***Courier Mail*** (Brisbane), 14 September 1996.

SOCIEDAD MESOAMERICANA PARA LA BIOLOGIA Y LA CONSERVACION

The ***Sociedad Mesoamericana para la Biología y la Conservación*** (Mesoamerican Society for Biology and Conservation) was formed on 14 January 1996, at Lake Yojoa, Honduras, by biologists representing five countries and numerous branches of the biological sciences. The new society will serve biologists and conservationists throughout Central America and Mexico by publishing a news bulletin ("Mesoamericana") and by sponsoring annual congresses in Mesoamerica. Persons interested in the society are invited to become founding members, or just subscribe to the bulletin. Institutions are also invited to help found the society, the first ever of its kind in Mesoamerica.

The first general meeting of the membership took place in June 1996 at the Universidad Nacional Autónoma de Honduras in Tegucigalpa. At the meeting, 68 participants representing five Central American countries, the USA, and Norway, attended a one-day symposium on Mesoamerican biology. Attendees elected officers to one-year terms, passed the Society's by-laws, and formed an organizing committee to host the first international congress on Mesoamerican biology and conservation in the summer of 1997. The inaugural issue of "Mesoamericana" was presented at the June meeting.

Members receive the quarterly "Mesoamericana", which includes news in Spanish and English of current projects, meetings, and literature, as well as biographical sketches on founding members, and short, non-technical articles of general use to biologists working in Mesoamerica. The Society initially intends to publish technical articles in proceedings of annual symposia or congresses. The second issue of Mesoamericana will be published in September 1996. For information about submitting items for publication, contact the editor, Carlos René Ramírez Sosa, 4a. Avenida Sur #1, Apopa, San Salvador, El Salvador; Tel: (503) 336-0152; e-mail: cramirez@biblio.ues.edu.sv.

The cost of basic membership for 1996 is US$ 20 for individuals and $40 for institutions (includes 3 issues of "Mesoamericana"). The cost of a founding membership is $50. Institu-

tions can become founders for $200, which includes a subscription to the bulletin. Founding members and founding institutions will be acknowledged in the bulletin. Founding memberships for North Americans will be available up until the 1997 congress. Donations larger than $200 are welcome, and donors will be recognized in print as benefactors. Checks should be made out to "Mesoamerican Society for Biology and Conservation" or "Sociedad Mesoamericana para la Biología y la Conservación." Membership fees or other donations may be sent to Oliver Komar, Department of Zoology, Ohio Wesleyan University, Delaware, Ohio 43015 USA; Tel: (614) 369-0175; Fax: (614) 368-3299; e-mail: ookomar@cc.owu.edu.

Mesoamerican residents and institutions have 50% lower basic membership costs ($10/$20), and can contact directly the Society's secretary, Silvia C. Chalukián, at Departmento de Recursos Naturales y Conservación Biológica, Escuela Agrícola Panamericana, Apartado 93, Tegucigalpa, Honduras; Tel: (504) 76-6140; Fax: (504) 76-6234; e-mail: eapdrn@ns.hondunet.net or eaphpcs@ns.hondunet.net.

All members and others active in Mesoamerican biology and conservation are encouraged to attend the Society's 1997 congress at the Universidad Nacional Autónoma de Honduras, Tegucigalpa, tentatively planned for June 1997. More information will soon be available. Anyone interested in attending the meeting and symposium may contact the society's president Gerardo Borjas. Licenciado Borjas is the local organizing committee chair. He may be reached by mail at Apartado 30-357, Toncontín, Tegucigalpa M.D.C., Honduras; Tel/Fax: (504) 33-9576; e-mail: gborjas@ns.unah.hondunet.net. The scientific program chair is Gustavo Adolfo Ruíz (also the Society's vice president), of the Universidad Centroamericana in Managua, Nicaragua, who may be contacted by e-mail at atenic@nicarao.apc.org. More information will be announced in the Society's bulletin "Mesoamericana."

OLIVER KOMAR, Department of Zoology, Ohio Wesleyan University, Delaware, Ohio 43015

ACTIVIST JOB OPPORTUNITY

The Sea Turtle Restoration Project (STRP) of Earth Island Institute (San Francisco, USA) is looking for a full-time activist to work on our Turtle-Safe™ Shrimp certification campaign and other campaigns. The job entails: (1) working with restaurants and food stores locally and nationally to help them make Turtle-Safe™ shrimp available to their customers, (2) publicity and media work, (3) liaison with shrimp fishers, distributors and retailers, (4) associated networking, writing, outreach and activist support and (5) fund raising assistance.

Applicants must demonstrate strong communications skills (written, verbal), good computer skills (word processing, database management; some desktop publishing would be a bonus), an ability to work independently, think creatively, and self-motivate, and a history of environmental and/or animal welfare activism. It would also be helpful (but not strictly necessary) to have a basic knowledge of ocean issues, and/or some sales/business background.

The position will be based at the STRP in West Marin (Forest Knolls, California), about 45 minutes from San Francisco. Salary is commensurate with experience and follows Earth Island Institute's guidelines for non-profit salary levels. We are interviewing immediately and will make a hiring decision by the end of October. Please mail, Fax or e-mail your resumé to: Sea Turtle Restoration Project, P. O. Box 400, Forest Knolls, California 94933 USA; Fax (415) 488-0372, e-mail: Candace@earthisland.org

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 have been mailed to 1996 registered participants. Copies can be requested 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," Mérida, Yucatán, México C. P. 97310; Fax: (5299) 81 29 19, e-mail: frazier@kin.cieamer.conacyt.mx.

Karen Eckert and Marydele Donnelly 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 reviewed only as funds are available. Please provide a Fax or e-mail number where you can be ***reliably*** reached. Limited financial assistance is also available for students traveling within the continental U. S. and Canada. For details, please contact Dr. C. K. Dodd, Natl. Biological Service, 7920 NW 71st Street, Gainesville, Florida 32653; Fax: (904) 378-4956; e-mail: kdodd@nervm.nerdc.ufl.edu.

JEANETTE WYNEKEN, 1997 Sea Turtle Symposium President, Department of Biological Sciences, Florida Atlantic University, 777 Glades Road, Boca Raton, Florida 33431-0991 USA; Fax: (561) 367-2749, e-mail: jwyneken@acc.fau.edu

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ISSUE INSERT

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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

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 bery 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. Mrovosky 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 authorties 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, recipents included colleagues in 70 countries. In August 1984, an Index to past issues was compiled illustrating the depth and breath 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 can be 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 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 readers = $14/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 hope that it serves you well. -- KLE/SAE