



R e p o r t

MARINE TURTLES IN THE MID-ATLANTIC ISLANDS

I. Introduction

The present report summarizes available information on marine turtles in the Mid-Atlantic Islands, as commended by the DG. XI Section B.3 of the Commission.

Data have been collected from the literature, press and from direct interviews with local experts and colleagues (July-August 1989) for who's collaboration I like to express my gratitude.

To Miss Helen Rost Martins and Mr. Ricardo Serrão dos Santos from the Fisheries and Oceanographic Department of the University of Azores; to Mr. Jose M. Biscoito and Mr. Günther E. Maul from the Municipal Museum of Funchal; to Dr. Alberto Brito Hernández, from the Department of Marine Biology of the University of La Laguna and particularly to Dr. Luis F. López Jurado from the Veterinary Department and ASCAN, in Las Palmas, for their unpublished data.

II. About the species

Sea turtles are long-living reptiles adapted to live in the water, but returning to land several times in their life to lay eggs in the sand of beaches. Five species of sea turtles have been reported from Mid-Atlantic Islands' waters. In the following paragraphs I have summarized some general information of interest regarding each species.

A. *Dermochelys coriacea coriacea* (L. 1758) Fam. DERMOCHELYDAE

Common names: Lethary turtle (Engl.), Tartaruga de coiro (Port.) Tortuga laud (Span.).

The biggest turtle in Atlantic waters; it's carapace can measure 1.4 to 1.8 m with normal weights around 125 (maximum 725 Kg.). Easy to recognize because of its smooth and striped carapace, without plates.

A wide spread pelagic species living singly and mainly from medusae and tunicates. A very good swimmer of open sea, seasonally near the coast. Migration has not been fully confirmed. Present in Mediterranean and Atlantic waters. Breeding confirmed in the Mediterranean (SALVADOR, 1985) and Western Atlantic, but main nesting grounds (FAO, 1981) in Liberia and Gulf of Guinea; egg laying from September to February.

B. Eretmochelys imbricata imbricata (L. 1758) Fam. CHELONIIDAE

Common names: Hawksbill (Engl.), Tortuga carey (Span.).

Easy to recognize because of the imbricate dorsal scutes. Normally about 60 Kg weight and 80 cm of carapace length, maximum 120 Kg and 90 cm.

Hawksbills live commonly in coral reefs and are somewhat sedentary, but long travels (1.600 Km) are also known. An omnivore species that breeds singly or in small groups between August and March. More frequent in tropical waters, accidental in the Mediterranean, the Canaries and Western Atlantic.

C. Caretta caretta caretta (L. 1758) Fam. CHELONIIDAE

Common names: Loggerhead (Engl.), Tartaruga do mar (Port.), Tortuga boba (Span.).

Very common and widespread species. Normal weights of adults 105 Kg (max. 140), and length of carapace 110 cm (max. 125). To separate it from other chelonidae of similar aspects, count ventral marginal scutes: three without pores. Juvenile and subadults show serrate carapace margin with bifid caudal scute.

Atlantic Loggerhead's life history is not fully understood. The most important rookeries are in the Atlantic coast of peninsular Florida. The hatchlings leave the nesting grounds to return 4 or 5 years later, as adult. They travel as planktonic migrants in some kind of association with the Gulf Stream. Evidence exist (CARR, 1986) that at least one seasonal European colony forms regularly in the Azores (summertime) and perhaps seasonal stops repeat southwards (Madeira, Canaries?) in a sort of step-wise migration.

Very recently ECKERT & MARTINS (1989) reported of a 73 cm specimen tagged in Cape Cañaveral (Aug. 1986) that was recovered 552 days later (Feb. 1988) in Sao Jorge, in the Azores, 2 cm longer.

In any case, it seems to exist a regular transatlantic migration of Loggerheads. Thus specimens that we see in Mid-Atlantic islands' waters are not waifs, but apparently from the West Atlantic. On the other hand, breeding takes place also in the Mediterranean (Greece, Turkey, Israel and Egypt) and FAO (1981) reports nesting in the Cape Verde Islands, where eggs are heavily eaten by people.

D. Lepidochelys kempii (Garman, 1880). Fam. CHELONIIDAE

Common names: Kemp's Ridleys (Engl.), Tartaruga loura (Por.)
Tortuga golfina (Span.).

Its carapace is typically as long as broad, but because of its similar resemblance, can be easily confused with a Loggerhead. The presence of inframarginal pores is a good character to separate them. Normal specimens are of 70 cm length and 42 Kg weight; maximum values 75 and 45 respectively.

Endemic to the Caribbean Sea, it lives in shallow waters, eats mainly crabs and breeds in the coast of Mexico during May and June. Nesting takes place synchronically at daylight and in high groups. Hatchlings are drifted with sargassus by the Gulf Stream and reaching Florida and the NW coast of the USA, they turn back to the south to breed. Some individuals are taken by the Gulf Stream to the East-Atlantic and may sporadically be seen in Mid-Atlantic Islands waters.

Whether there exists seasonal "stay-areas" during their voyages, it is not known. Maturity arrives at 7 years age.

NOTE: The Pacific Ridley, Lepidochelys olivacea (Eschscholtz, 1829), has been pointed by SALVADOR (1985) as a possible accidental visitor of the Canaries, but I have not been able to found any evidence that confirms it.

E. Chelonia mydas mydas (L. 1758).

Common names: Green turtle (Engl.), Tartaruga esverdeada (Port.), Tortuga verde (Span.).

Carapace of a characteristic olive tint, with 4 marginal non-imbricated scutes. Normal sizes about 90 cm, maximum of 105 cm. Weight from 80 Kg up to 140 Kg.

Green turtles are mainly herbivorous and take up to 50 years to reach breeding age. Females nest in the same spot year after year, but it has not been solved the question whether they were also born there or not. They are known to be long distance voyagers. Important breeding grounds exist in Turkey, Southeast coast of Africa (Cape Verde, Senegal, Congo), Brasil and Costa Rica (Tortuguero). Developing young live as planktonic migrants in the borders of currents in the open ocean (sargassum rafts?), perhaps in a similar scheme as that described for Loggerheads.

III. Local references

A. LEATHERY TURTLE

There are few and sporadic records from Madeira and the Canaries and almost all of single individuals.

SARMENTO (1948) reports from Madeira a 190 Kg specimen captured in January 1937, off Puerto Moniz, and says that in the last 10 years only six were seen in the vicinity of the coast.

In the Canaries, two recent observations were made NE of Fuerteventura not far from the coast, and another more a few miles South of Gran Canaria.

All individuals seem to be adult. Two dead males measured in Fuerteventura were of 1.20 m length. Stuffed specimen kept in the Museum of Funchal, the local Natural History Museum of Santa Cruz de La Palma, another in Hierro and those captured and shown in pictures in the newspapers are of similar sizes or much bigger.

Crew members of merchants covering the trip Gran Canaria - Cape Verde tell that Leathery turtles are steadily seen along the whole crossing. The species is easily identified.

B. HAWKSBILL

There is very little information about this species. BRONGERSMA (1968) wrote that the occasional presence of *E. imbricata* in European Atlantic waters was not definitely proven. He recorded it for Madeira on base of two museum specimens kept in Funchal. More recently, BRITO HERNANDEZ & CRUZ SIMO (1982) confirmed its presence in the Canaries, Southeast of La Palma. No information is available from the Azores.

C. LOGGERHEAD

Loggerheads are by far the most common turtles in Mid-Atlantic waters. They are well known by seamen and can easily be seen in schools in calm waters, particularly in the Azores and around Madeira. In Madeira people speak of "mar de tartarugas" (turtle sea) when it is very calm. Judging from experts references, it seems that Loggerheads are more abundant in the Azores and Madeira than in the Canaries. Summer is the best season.

Regarding the Canary Islands, STEINDACHNER (1891) mentioned that Loggerheads where somewhat more common in the shallow waters along the coasts, occurring singly and not in schools like it does on the African coast opposite the Canary Islands. However, recent observations refer to flocks of several dozens of individuals.

They have been reported various times from ships covering Las Palmas - Cádiz, about half of journey. More flocks were observed between Lanzarote and Fuerteventura and one between Tenerife and Gran Canaria. Merchant's crew report of a very rich area 60 miles NNW of the little island of Lobos. Perhaps Loggerhead schools are more common in the Canaries, especially in Eastearn waters, than has been considered untill now.

CARR (1986) refers to a special age group (the so called "lost year" turtles sizes = 150 - 300 mm of carapace length) to be localized in the Azores, but the presence of bigger sizes (750 mm) demonstrates that the situation is similar to that in Madeiran and Canarian waters. Sizes varie considerably, but with a clear dominance of young and halfgrown Loggerheads.

A 90% of some 50 Canarian specimens that arrived dead to the coast of Fuerteventura were young or subadults (all less than 450 mm); only a few were clearly adults.

In fact, because of the repeated capture of young specimens in the Northeast coast of La Palma, there was a controversy in the newspapers of 1981 regarding the possible nesting of Loggerheads in the Playa de Nogales. A study undertaken by ICONA (conservation authority) revealed that in spite of existing good feeding grounds there were no good conditions for turtle breed (sandbanks were unsuited because of subterranean sweet water discharges to the sea).

D. KEMP'S RIDLEYS

Kemp's Ridleys has been from the Azores only one time, a very young specimen. It is accidental in the Canaries (BRITO-HERNANDEZ & CRUZ-SIMO, 1982) but perhaps much common in Madeira (5 specimens in 30 years, G. Maul in BRONGERSMA, 1968). Specimens studied from the latter archipelago showed half-grown to adult sizes.

However, it is probable that several observations of Loggerheads are in reality of Kemp's Ridleys. These species can be easily mixed if not being paid some attention.

E. GREEN TURTLE

Like Kemp's Ridleys, Green Turtles are sometimes met in European Atlantic waters, but less often. This applies also to Azorean and Madeiran waters. SARMENTO (1948) writes about specimens captured by Madeiran fishermen below 1 m length, and also very little ones.

Young specimens have been repeatedly observed near the coast of Gran Canaria -especially in summer months- and Lanzarote. LOPEZ-JURADO (i.p.) believes that it may be rather common in

Canarian waters, even not having been recorded by BRONGERSMA (1968) or posterior authors. Four specimens that were kept in a local aquarium were also of small sizes.

Confirmed observations (LOPEZ-JURADO, i.l.) come from the NW of Gran Canaria (in Sardina) and at least 5 specimens in the Northeast (off Arinaga).

IV. Conservation

Turtle meat is not much appreciated. It is told to be fibrous and can only be of some help in a soup. Thus, fishermen rarely take them home when captured. They are thrown away as a leftover of fisheries. I can still remember (Tenerife, in the sixties) when big specimens were occasionally brought to the quay as a curiosity and given to the children just to play.

Only in Funchal, in Madeira, there has been a traditional exploitation of Loggerheads: the selling of stuffed specimens. BRONGERSMA (1968) visited the island in 1967 and wrote about it:

«How many turtles are captured around Madeira I do not know, but judging by the number of freshly butchered specimens I saw at Funchal in about two hour's time, I estimate that a thousand (and probably more) are taken each year.»

After the ratification of CITES by Portugal, this activity was a clear violation of the Convention. Thus, the Madeiran Government prohibited their capture and commerce by Regional Legislative Decree nº 18/85/M of 7th of September. The reorganization of the whole harbour in Funchal helped also to stop this activity and today it can be considered fully forgotten.

Legal protection for all sea turtles was adopted in Spain by Royal Decree 3181/1980 of the 30 of December. There was no commercial use of turtles like in Madeira, but people liked to keep them in aquariums, hotel or coastal pools as an attraction. In the present, Canarian conservation authorities confiscate these animals and bring them back to the sea.

Local scientist think that the possible existence of nesting grounds in these islands should not be totally disregarded. There are some vague references of turtles being observed on land in the beach of Cofete, in Fuerteventura, but SARMENTO (1948) tells about turtles coming out of the sea in calm moonnights, just to rest on the sand.

At present time there exist only few marine protected zones in the islands under study but with none or very little relevance for sea turtle conservation. They are related to coastal nature protected areas, of reduced extent, with no development jet and could'nt be considered strictly as marine reserves (some in

project). None or very little relevance for conservation of sea turtles can be expected from those areas, i.e. Nature Reserves of the Bays of Praia, of São Lorenzo, the Anjos and Maía, in Santa Maria (Azores) or the Nature Park of Corralejo and Isla de Lobos in the Canaries.

An often overseen and permanent threat for sea turtles is the increasing abundance of all sorts of floating garbage in the ocean. For instance, NIEROP & DEN HARTON (1984) tell of finding tar, plastic scraps and nylon in the stomachs of young Loggerheads kept in the Cape Verde. However, little can be done to fight this civilization's calamity. Moreover, wind and currents favour the concentration of such garbage in driftlines, where seaturtles seem to convey.

V. Mass mortality

Dead stranded turtles are not unusual in the exposed coasts of the Mid-Atlantic Islands. They are dragged by dominant currents and their death may be referred to natural or known "artificial" causes. Some individuals show scars of hooks or nets, hooks and perhaps some plastics in the intestine. On the other hand, as mentioned before, fishermen do disregard turtles when trapped in nets (they usually die) or in "palangres" (long fixed line with hundreds of hooks). This can affect several individuals at a time; perhaps dozens.

However, since 1981, and especially during 1982, 1984, 1985 and 1987 (July) hundreds of dead Loggerheads arrived by sea to the northern coast of Alegranza, Montaña Clara, Graciosa, Lanzarote, Lobos and Fuerteventura, in the Eastern Canary Islands. A few arrived also to the NE of La Palma (Barlovento).

A check of 1 Km coast in Fuerteventura showed 49 dead Loggerheads and 2 Leathery Turtles). In only case the cause of death was confirmed: a hook with nylon snarled around head and flippers. Pitch on the body was probably affixed after death.

Post-mortem analysis of turtles was not feasible because they all were in different stages of advanced decomposition. An estimation of some 3-7 days floating dead in the sea was made, thus pointing to the origin of mortality being somewhere North of the Canaries. No official conclusions are available, but it is considered an unusual mortality.

Nonetheless, very recently (July 1989) some local and mainland newspapers have speculated with the possibility of radioactivity being the origin of turtle mass mortality. It is known that nuclear wastes were dumped in 1955, 1957-58 and 1961 SW and SE of Maderia, but no scientific confirmation of leakage or such a relation exists.

There has not been recorded mass mortality from Madeira nor from the Azores. However, if the referred phenomenon keeps repeating in the Canaries, it is worthwhile carrying out a more deeper study of its causes.

VI. Research activities

A. AZORES

An interesting research program on Loggerheads is carried out by the «Archie Carr Center for Sea Turtle Research» in collaboration with the Department of Oceanography of the University of Azores, with base in Horta, Faial. Heads of program are Dr. Karen Bjorndal and Dr. Allan Bolten (Dept. of Zoology, Univ. of Florida, Gainesville, FL., USA). The coordinator at Horta is Miss Helen R. Martins

During the last six years turtles have been captured in Azorean waters specially during tuna fish campaigns. Most of them come from South of Pico and South of Faial and are brought alive by fishermen who are paid some 500 - 600 PSc for each (= ECU). Weight and biometric data are being reported and the turtles marked before turned back to sea (about 600 in last campaign). More recently, blood samples are taken to study DNA affinities between populations.

Mr. Ricardo Serrão informed that the research programm will be increased during the next four years, involving testosterone analysis for dating age of individuals and also a complex satellite tracking program along their Gulf-stream voyage.

B. MADEIRA

At present no research is being carried on sea turtles in Madeira. The only existing institution that could take such activity is the «Museu Municipal do Funchal» which has some suited infrastructure (laboratories, ship, etc). It depends from the Town Council of Funchal and financement is short.

C. CANARIES

The situation in the Canary Islands regarding sea turtle research is similar to that in Madeira. Only very little has been done. Some of the confiscated specimens have been measured and marked before returning them to the sea; some areas have been checked, etc.

The recent interest on sea turtles due to the mass mortality news has promoted some official activity, but with little results nor continuity. However there are scientist (Dr. L.F. López Jurado, Veterinary Dep.) and amateurs (in Gran Canaria and Fuen-

teventura) that are demonstrating a growing interest in these reptiles.

The main Gran Canarian conservationist association ASCAN has started distributing questionnaires on turtle observation to the maritime companies that cover the trip between the East Canarian Islands.

There are various private consultings and scientific institutions which could take a formal research program. Official institutions are:

- The University of La Laguna with Departments of Marine Biology, and Animal Biology with a section of Veterinary placed in Las Palmas, in Gran Canaria.
- The «Instituto Oceanográfico de Canarias», based in Tenerife and dependent of the C.S.I.C (National Research Council).
- The «Museo Insular de Ciencias Naturales» of the «Cabildo Insular» de Tenerife (island government).
- The «Centro Tecnológico Pesquero de Taliarte» of the Cabildo of Gran Canaria.

VII. Conclusion

Five species of sea turtle have been recorded from Mid-Atlantic Islands waters. Only two of them, Loggerheads and Leatherery Turtle can be considered as constant, the others, as occasional or accidental visitors. However, more research is needed regarding Green Turtles in the Canaries. Leatherery Turtles are scarce and seen only singly, whether Loggerheads are very abundant and can be observed all year around, but particularly in the summer, in large schools.

For all species one can assume that their presence in these waters is somehow related to the current circulation of the North Atlantic. They all probably come from the Eastern Atlantic where they breed, travelling along the Gulf Current with more or less delay in their voyages. The presence of young and half-grown specimens speaks in favor of this hypothesis.

In this region, no special factors seem to threat turtle population besides the normal ones known from other areas. However, the repeated mass mortality phenomenon observed in the Canaries point to some unknown causes that merit research.

An intensive research program on migration of Loggerheads and some other aspects of their biology is being developed in the Azores. Apart from that no other mayor research is undertaken in

Madeira or the Canaries, wheter there are institutions capable to doing so.

La Laguna, 22 of August 1989

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VIII. Literature

- CARR, A. (1986): Rips, fads, and little Loggerheads.- *Bioscience* 36(2): 92 - 100.
- ECKERT, S.A. & H.R. MARTINS (1989): Transatlantic travel by juvenile Loggerhead Turtle.- *Marine Turtle Newsletter*, 45, p. 15.
- FAO (1981): Tortues Marines.- in. Fiches FAO d'identification pur les besoins de la pêche atlantique centre-est. Zones de pêche 34 et 47 (en partie). Volume VI. - Canada, fonds fiduciaires. Fao.
- GUZMAN NARANJO, P. (1987): Informe sobre la mortandad de tortugas en aguas Canarias.- Centro de Tecnología Pesquera Taliarte, 3 pp. (not published).
- LOPEZ JURADO, L.F. (in press): Sinópsis de la Herpetofauna Canaria.
- NIEROP, M.M. van & J.C. den HARTOG (1984): A study on the gut contents of five juvenile Loggerhead turtles, Caretta caretta (Linnaeus) (Reptilia, Cheloniidae), from the south-eastern part of the North Atlantic Ocean, with emphasis on coelenterate identification.- *Zoologische Mededelingen*, 59: 35-54.
- PASCUAL GONZALEZ, L. (1987) Informe sobre la aparición de tortugas muertas en las playas y costas de la Isla de Lanzarote.- Dirección General de Medio Ambiente y Conservación de la Naturaleza, 2 pp. (not published).
- SALVADOR, A. (1985): Guía de campo de los Anfibios y Reptiles de la Península Ibérica, Islas Baleares y Canarias.- Santiago Carcía Editor, Madrid, 212 pp.
- SARMENTO, A.A. (1948): Vertebrados da Madeira. Vol. 1. (Mamíferos, aves, répteis, batráquios).- Junta Geral do Distrito Autónomo do Funchal, 317 pp. [2nd edition]
- STEINDACHNER, F. (1891): Über die Reptilien und Batrachier der westlichen und östlichen Gruppe der canarischen Inseln.- *Ann. naturh. Mus. Wien* 6(3): 287-306.