Incidental Capture of Loggerhead Turtles (*Caretta caretta*) on Boa Vista (Cape Verde Islands)

L.F. López-Jurado, N. Varo-Cruz & P. López-Suárez
Biology Department. University of Las Palmas. 35017 Las Palmas. Canary Islands, Spain
(Email: llopez@dbio.ulpgc.es)

The sea is one of the major natural resources of the Cape Verde Islands, a small archipelago located 500 kilometers off the coast of Senegal (West Africa). This country consists of ten main islands and several islets, and possesses an Exclusive Economical Zone (EEZ) of about 734 square kilometers and a coastal perimeter of nearly 2000 kilometers. The marine shelf, whose limit is the 200 m isobath, is particularly extensive on the island of Boa Vista (Figure 1). It is likely that most of the loggerhead turtles (*Caretta caretta*) that breed in this archipelago are concentrated on this island (López-Jurado *et al.*, 1999).

All commercial trawling is strictly forbidden by the legislation of the Cape Verde Islands. Experimental trawling is permitted only with the authorization of the governmental organizations (Decree law No. 17/18 and 97/87) such as the National Institute of Fishery Development and the General Direction of Fisheries (Ministry of Agriculture and Environment). However, Cape Verde is a developing country where effective control in natural resource extraction is difficult to enforce. Frequently, foreign trawlers intrude upon the EEZ in the insular shelf, particularly in Boa Vista, to catch demersal fish species (General Marine and Harbor Director, pers. comm.).

Incidental capture in trawls is a well-known cause of mortality for sea turtles and have been reported all over the world (Eckert 1995; Hillestad *et al.* 1995; Lutcavage *et al.* 1997; Márquez 2000; Oravetz 1999; Pascual 1985; Seidal *et al.* 1995). Nevertheless, there are few illustrated examples, especially when massive incidental capture occurs. Here, we graphically report on the significant ecological damage caused by a trawl net in proximity of a turtle nesting colony at the beginning of the breeding season (see front cover of this issue).

On the 15th of June 2001 (at the beginning of the breeding season), a piece of a trawl net 20 m in length and 3 m in width was found on the shore of the island of Boa Vista (As Gatas Bay: 16º 12' N – 22º 42' W). Ten loggerhead turtles were found entangled in this net. The animals were measured (Curved Carapace Length CCL, Curved Carapace Width CCW) and sexed using

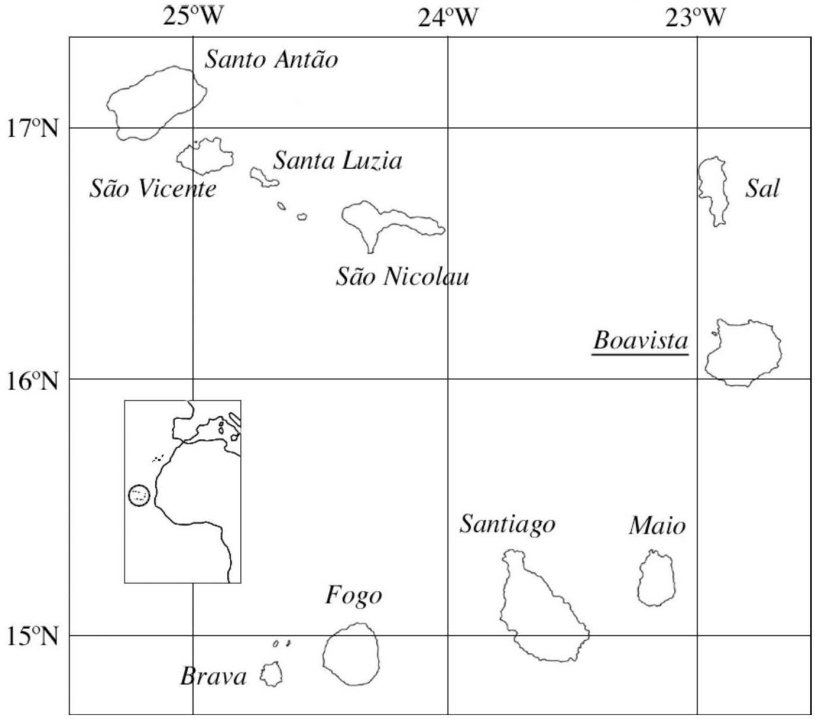

Figure 1. Map of Cape Verde Islands.

Turtle number	*Sex*	*CCL (cm)*	*CCW (cm)*	*PIT*
1	Male	89.0	83.0	
2	Male	82.0	74.0	
3	?Female	62.0	60.0	131215652A
4	Female	71.0	70.0	131115551A
5	Female	71.0	62.5	131123451A
6	?Female	69.0	66.0	131122672A
7	?Female	70.0	69.5	131164667A
8	Female	75.0	72.0	131144521A
9	?Female	68.0	66.5	Dead
10	Female	71.0	70.0	Dead

Table 1. ID number, Sex (F: female, M: male), Curved Carapace Length (CCL), Curved Carapace Width (CCW) and PIT number of the entangled loggerhead turtles.

tail length as an index (Table 1). Two nurse sharks, *Ginglymostoma cirratum* and one tope shark, *Galeorhinus galeus*, were also present in the net. Two female turtles and the tope shark were dead. The live turtles showed abrasions in different areas of their carapaces, skin and cephalic scales, apparently due to the friction from the net. We cannot be certain if the animals were victims of ghost fishing or whether some or all of the animals were captured and then discarded with the net.

Six live turtles (except both males) were PIT-tagged (Avid©) and all live turtles and sharks were subsequently released together. Four of the individuals had CCL measuring less than the smallest turtle (71.0 CCL) observed nesting on Boa Vista in the preceding 4 nesting seasons (Table 2). Thus we were not able to definitively assign sex, although we suspect all were female due to short tail length. Specimens 9 and 10 were autopsied but no developed eggs were found. The stomach was empty in one specimen and in the other several unidentified fish remains were found.

We have no information on the origin of the net, but because most animals were still alive when it was found, we suspect that their entanglement was relatively recent. It is important to note that males were encountered and that their CCL were greater than those of the females entangled. There is a popular belief in the Cape Verde Islands that the consumption of sea turtle meat, and especially the penis of the male, gives people sexual vigor. Because of this belief, males are selectively hunted by free diving in most of the islands (Cabrera *et al.*, 1999). However, there are currently insufficient data to assess the influence of sex-specific turtle captures on the sex ratio of the breeding population.

		1998	*1999*	*2000*	*2001*
CCW	**Mean (cm)**	81.8	81.9	80.9	81.5
	SD	4.81	4.87	3.66	4.36
	Range	74.5-103.0	74.0-107.0	71.0-104.0	73.0-106.0
	N	74	280	593	522
CCL	**Mean (cm)**	76.8	77.4	76.3	76.9
	SD	4.57	4.19	4.60	4.48
	Range	67.0-96.0	63.0-97.0	54.2-96.0	58.0-98.0
	N	73	278	593	523

Table 2. Mean curved carapace length (CCL) and curved carapace width (CCW) of nesting females from Boa Vista Island over a 4-year study period (1998–2001).

CABRERA, I., D. CEJUDO & L.F. LÓPEZ-JURADO. 1999. Human predation on marine turtles in the archipelago of Cape Verde, western Africa. In: H. Kalb & T. Wibbels (compilers), Proceedings of the 19th Annual Symposium on Sea Turtle Conservation and Biology. NOAA-TM-NMFS-SEFSC-443, pp. 217.

ECKERT, K.L. Anthropogenic threats to Sea Turtles. 1995. In: K.A. Bjorndal (Ed.). Biology and Conservation of Sea Turtles. Revised edition. Smithsonian Institute Press, Washington D.C. pp. 611-612

HILLESTARD, H.O., J.I. RICHARDSON, C. MCVEA & J.M.WATSON. 1995. Worldwide incidental capture of sea turtles. 1995. In: K.A. Bjorndal (Ed.). Biology and Conservation of Sea Turtles. Revised edition. Smithsonian Institute Press, Washington D.C. pp. 489-495.

LÓPEZ-JURADO, L.F., I. CABRERA, D. CEJUDO, C. EVORA & P. ALFAMA 1999. Distribution of marine turtles in the archipelago of Cape Verde, Western Africa. In: H. Kalb & T. Wibbels (compilers), Proceedings of the 19th Annual Symposium on Sea Turtle Conservation and Biology. NOAA-TM-NMFS-SEFSC-443, pp. 245-247.

LUTCAVAGE, M.E., P. PLOTKIN, B. WITHERINGTON & P. L. LUTZ. 1997. Human impacts on sea turtle survival. In: P.L. Lutz & J.A. Musick (Ed.). The Biology of Sea Turtles. CRC Marine Science Series. CRC Press, Boca Raton, USA. pp 387-409.

MÁRQUEZ, R. 2000. Las tortugas marinas y nuestro tiempo. Second edition. La ciencia para todos / 144. Impresora y Ecuadernación Progreso, S.A. México, D.F. 198 pp.

ORAVETZ, C.A. 1999. Reducing incidental catch in fisheries. In: K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois, M. Donelly (Ed). Research and Management Techniques for the Conservation of sea Turtles. IUCN/SSC Marine Turtle Specialist Group Publication No 4. pp. 189-193.

PASCUAL, X. 1985. Contribución al estudio de las tortugas marinas en las costas españolas. I. Distribución. Misc. Zool. 9: 287-294.

SEIDEL, W.R. & C. MCVEA. 1995. Development of a sea turtle excluder shrimp trawl for the southeast U.S. penaeid shrimp fishery. 1995. In: K.A. Bjorndal (Ed.). Biology and Conservation of Sea Turtles. Revised edition. Smithsonian Institute Press, Washington, USA. pp. 497-502.

Observations on Sea Turtles in the State of Paraíba, Brazil

Rita Mascarenhas[1], Douglas Zeppelini Filho[1,2] & Valdi Silva Moreira[1]

[1]Associação Guajiru: Ciência –Educação e Meio Ambiente, Randal Cavalcante Pimentel No. 40, Bessa, João Pessoa, Paraíba, 58035-380 Brazil (E-mail: quelonia@ig.com.br; rita.mascarenhas@lycos.com)

[2]Departamento de Sistemática e Ecologia- Centro de Ciências Exatas e da Natureza, Universidade Federal da Paraíba. Campus I, Cidade Universitária João Pessoa, Paraíba, 58059-900 Brazil (E-mail: zeppelin@dse.ufpb.br)

Five species of marine turtle commonly occur on feeding and breeding grounds in Brazil, and the majority of regular nest monitoring efforts on the continental coast is concentrated on beaches stretching from the state of Sergipe south to the state of Rio de Janeiro (Marcovaldi & Marcovaldi 1999). Although organized monitoring has historically targeted the areas where turtles seem to be more numerous in Brazil, there is the possibility that turtles nest in lesser numbers elsewhere. Here we report sea turtle occurrences in the state of Paraíba, in northeastern Brazil.

We focused our monitoring on a narrow belt of seashore 1,800 m in length, named Mar do Macaco (in the municipality of Intermares) (7°S 34°W). This area bounded by the Jaguaribe river in the south and Ponta de Campina in the north, is in between the cities of João Pessoa and Cabedelo. The northern and southern extremes of this beach are also bounded by two coral reefs, clearly delimiting the sandy zone available for nesting turtles. The beach is backed by many residential and commercial buildings, and Intermares has a population of about 7,000 people. The local population and a variable number of tourists use the beach for many purposes, including surfing, jogging, fishing, and swimming, among others. Both cars and horses are regularly found on the beach, and at night artificial lighting from buildings and streets illuminates much of the beach.

We monitored this beach from December 2001 through August 2002 with the aid of volunteers. The protocols for fieldwork were modified from a Projeto TAMAR manual (unpublished). To organize the monitoring staff and to make their work easier, the nesting beach was divided in two halves: to the left of the "Bar do Surfista"(LSBS) and to the right of the "Bar do Surfista" (RSBS). The monitoring consisted