Observer Program for the Swordfish Longline Fisheries in the Azores

Final Report to

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Project Title: Observer Program for the Swordfish Longline Fisheries in the Azores

Objectives:

- Develop an observer program on swordfish longline boats in the Azores;
- Develop observer protocols; and
- Train observers in the identification and handling of sea turtles, and the protocols and data reporting techniques of the program.

Background:

The surface longline fishery around the Azores targets swordfish (*Xiphias gladius*). The fleet can be divided into three main components; open-deck wooden boats (ODWB), small-size cabin-deck boats (CDB_1) and large size cabin-deck boats (CDB_2). In 1998, the Azorean Ministry of Fisheries issued 17, 26 and 24 permits (= number of boats) for the 3 types of boats, respectively. The ODWB consist of small size fishing boats and can release an average of 800 hooks per set each day. This artisanal fleet, as well as the CDB_1, fishes for swordfish during the summer season and shifts to demersal stock fishery in the winter months. CDB_1 lack freezing capacity and stay for about one week at sea using an average of 1500 hooks per set each day. The large size CDB_2 conduct fishing campaigns that can last about a month due to their freezer capacity and release an average of 2500 hooks per set each day.

Bycatch from these fisheries is mainly sharks, but also includes loggerhead sea turtles (*Caretta caretta*) and occasionally leatherback turtles (*Dermochelys coriacea*), which are either hooked or entangled in the lines. Hooks are generally set at depths of 15-50 m and baited with squid, mackerel, or sometimes with shark meat. Light sticks are not commonly used in this area.

Results:

- An observer program was established in March 1998. The manager of the program was trained in sea turtle identification, proper handling of sea turtles, and the procedure for collecting skin samples for mtDNA sequence analyses. Data reporting techniques were developed.
- An observer was on board the longline vessel *Altair* (CDB_2) for 25 sets in May, 19 sets in August, 24 sets in October, 26 sets in November, and 6 sets in December. Data were collected by the chief engineer during months when the observer was not on board: 25 sets in June, 5 sets in July, and 21 sets in September.
- The gear used was the U.S. type longline system, composed of a monofilament mainline on which branchlines are attached successively with hooks at a fixed

distance. At six-hook intervals, a branchline with a buoy is attached for the suspension of the gear. The hook used was (Ancora) 17/0, and the bait was mackerel, squid, and shark meat. Between the hook and the branchline, a 30-cm steel leader was used to retain the shark bycatch. The gear was deployed at the end of the day, and remained during the night with an average of 35 nautical miles of line.

- The longline was set at depths of 15-50 meters.

- There were a total of 60 loggerheads caught ranging in size from 41-65 cm curved carapace length (n = 45, Figure 1). Fifteen turtles were not measured because they were not brought on board but rather released by cutting the line.

- The loggerheads captured on the longlines are the larger size classes in the region (Figure 2).

- The mean CPUE (number of turtles caught per 1000 hooks) for each month are shown in Figure 3.

- For the 60 turtles caught, 54 were hooked in the mouth, 3 in the esophagus, 1 in the eye, 1 in the foreflipper, and 1 was undetermined.

- Of the 60 turtles caught, 13 were captured on hooks baited with mackerel, 10 with squid, and, for 37 turtles, the bait was not determined.

- Of the 60 turtles caught, all were physically active except one that was dead as a result of the line having wrapped around its head and another that was weak when caught but recuperated somewhat before being released.

Recommendations:

- The first year of the observer program was very successful. Awareness of the problem of incidental capture of sea turtles in the swordfish longline fisheries was introduced to the commercial fishermen, fishery scientists and, management agencies in the Azores. It is recommended that the observer program be continued, and if funding permits, expanded to allow for greater coverage of the fishing fleet.

- Greater effort should be made to identify the bait used on hooks that captured turtles.

Literature Cited:

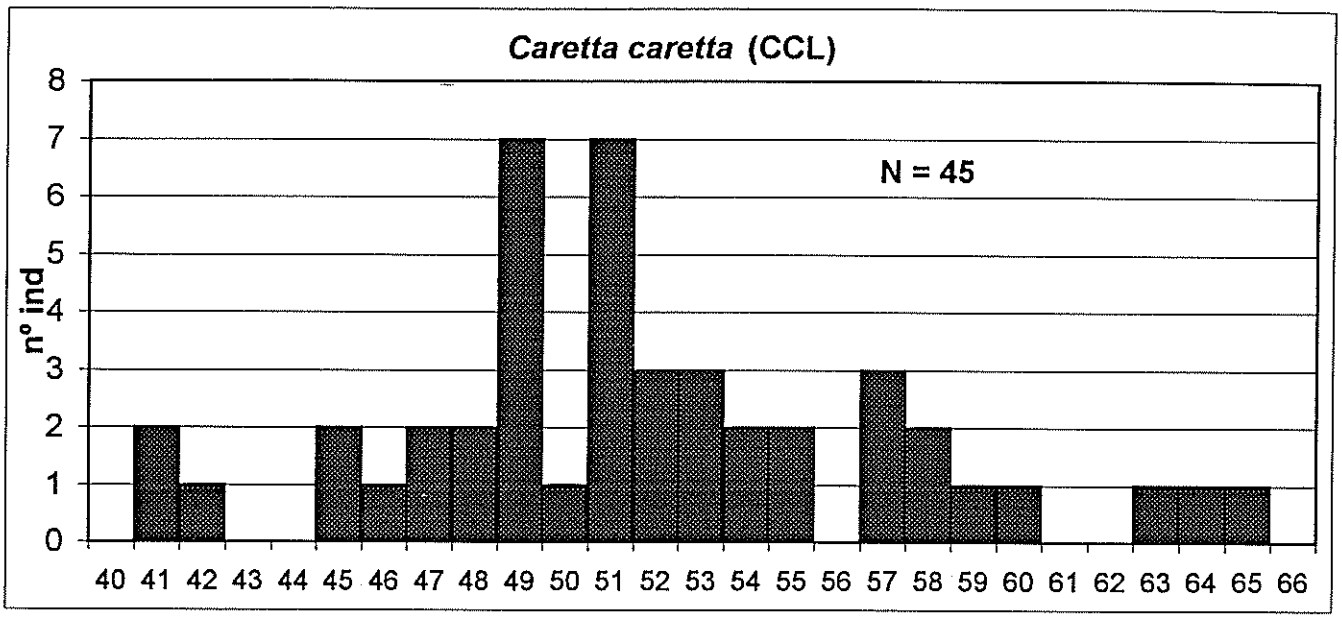
Bolten, A.B., H.R. Martins, K.A. Bjorndal, and J. Gordon. 1993. Size distribution of pelagic-stage loggerhead sea turtles (*Caretta caretta*) in the waters around Azores and Madeira. Arquipélago 11(A):49-54.

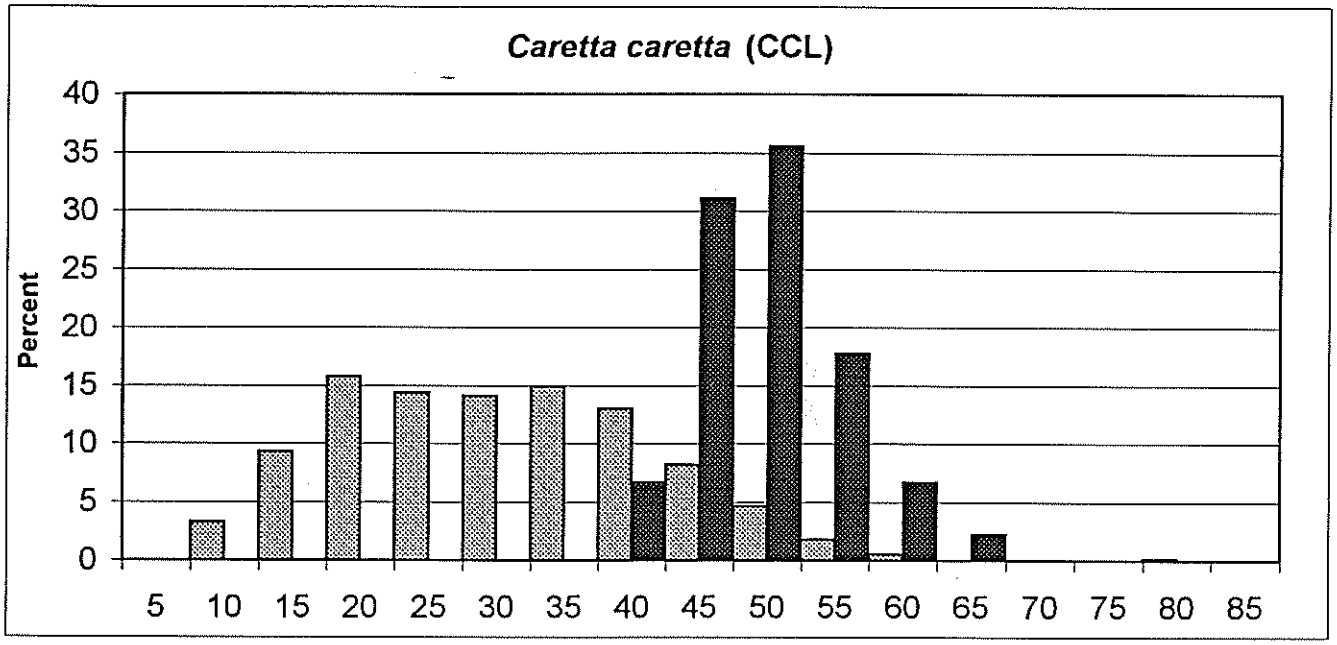
Figure Legends

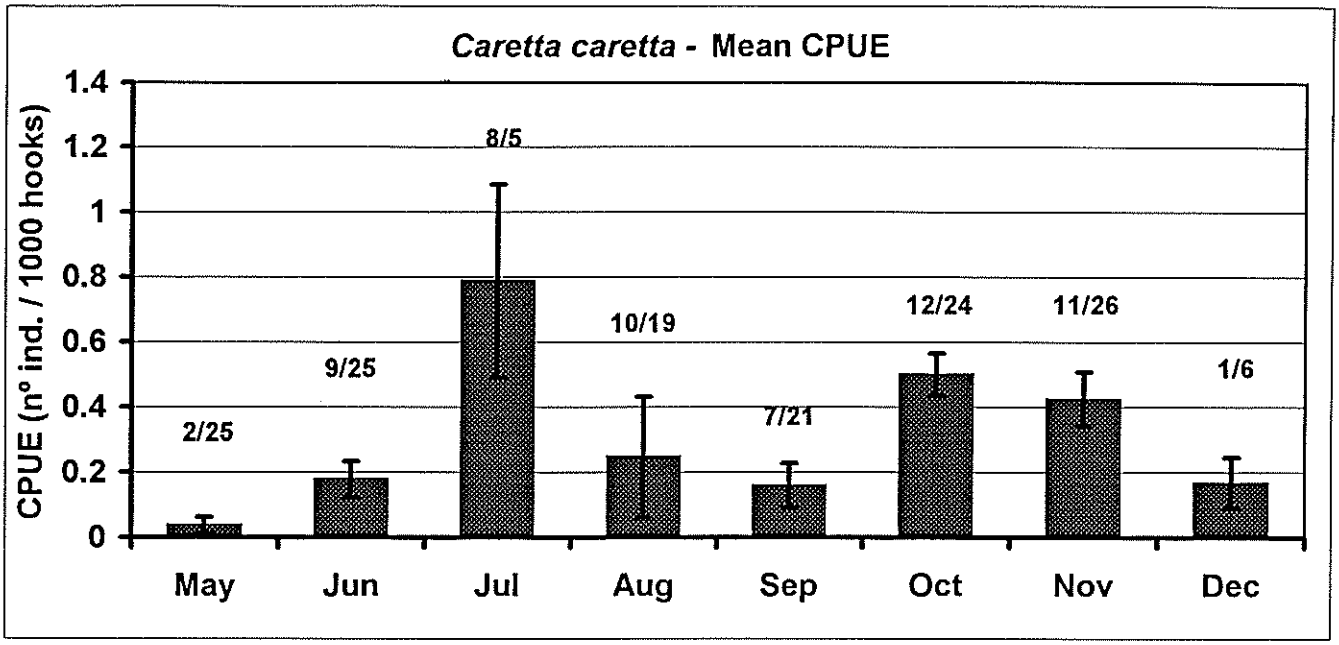
Figure 1. Size distribution (curved carapace length, cm) of loggerheads captured by the longline fisheries in the Azores.

Figure 2. Comparison of the size distribution of all loggerheads in the waters around the Azores (n=761; hatched bars; Bolten et al., 1993) and those captured by the longline fishery in the Azores in 1998 (n=45; solid bars).

Figure 3. Mean catch of turtles per unit effort (CPUE; number of turtles/1000 hooks) for the fishing vessel *Altair* each month during 1998 for loggerhead sea turtles captured in longline fisheries around the Azores. Fractions above the bars represent the number of turtles caught per number of sets. Error lines represent the error at a confidence level of 0.95.


Caretta caretta (CCL)
N = 45
nº ind
0
1
2
3
4
5
6
7
8
40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66


Caretta caretta (CCL)
Percent
40
35
30
25
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85


Caretta caretta - Mean CPUE
CPUE (n° ind. / 1000 hooks)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2/25
9/25
8/5
10/19
7/21
12/24
11/26
1/6
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec