

THE LOGGERHEAD *CARETTA CARETTA* (LINNAEUS, 1758) PELAGIC MOVEMENTS THROUGH THE GIBRALTAR STRAIT

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The swordfish (*X. gladius* L.) fishery program of the IEO during the period 1989-90 followed the activity of vessels working with surface drifting gear off the Atlantic and Mediterranean waters of the Gibraltar Strait (DE LA SERNA, ALOT, 1990a). The surface drift gillnet fishing activity has been practiced on a seasonal basis since the seventies up to the beginning of the nineties. During the first years, this fishery was directed towards small tuna fish that were captured seasonally in areas close to the Moroccan coasts. Subsequently, the vessels had to leave these coastal fishing grounds and began the swordfish fishery after the necessary gear conversion. Drift net fishing (DE LA SERNA, ALOT, 1990b) was developed in an Atlantic area delimited to the south by the parallel 35° N and to the west by the meridian 07° W. It was later extended to the Alborán Sea, and subsequently prohibited by the Spanish Fisheries Administration in 1990. According to DE LA SERNA and ALOT (1990a) this fishery initiated the season in May. The principal swordfish catch stretched to the first part of July and the fish always got meshed in an E-W direction. The fleet newly commenced the fishery in August which could occasionally last to November. During this period, the direction of fish captured changed to W-E. Hence, from May to June, swordfish migrates towards the Mediterranean and inversely during August to November. This fleet accidentally catches the loggerhead turtle (*Caretta caretta*) and in lesser quantities the leatherback turtle (*Dermochelys coriacea*). This paper presents the observations and loggerhead catch by the aforementioned fleet during inspection embarkments carried out during 1989, 1990 and 1993. The turtles were released undamaged.

Five embarkments were done during May, June and August of 1989 and May, off the Gibraltar Strait area with the purpose of acquiring information of fishery technology, captured species, marine environment and its associated catch, such as, turtles and cetaceans (DE LA SERNA and ALOT, 1990b). During May and August 1990, a total of 4 and 7 embarkment days were carried out on board the drifting gillnet fishing vessels. These were done off the Alboran Sea and its immediate Atlantic waters indistinctly, in function of the months and following swordfish migration. In 1993, some embarkments were carried out by researchers from the University of Barcelona in the same kind of vessels (com. pers.). The first ones were done in Mediterranean waters of the Gibraltar Strait in July. The following ones were done in the same area during the first days of August. Swordfish size and weight sampling was conducted. Additionally, information on catch and effort fishing trip, catch situations and complementary environmental data, such as surface temperature, lunar phase, current direction, etc., was acquired.

A total of 38 loggerhead turtles (*Caretta caretta*) have been analyzed once captured by the gillnets; 16 of them were caught off the Atlantic side of the Gibraltar Strait, whereas 22 were caught off the Mediterranean side. During May and June, turtles only got meshed in the Atlantic in a W-E direction. A total of 9 turtles were captured during the inspection embarkments of these months. In the month of July, only 2 turtles were captured, both from the Mediterranean waters nearby the Gibraltar Strait. Observers report that these were meshed in an E-W direction towards the Atlantic. In August, turtle catch reports were both from the Mediterranean and Atlantic sides of the Strait. Nevertheless, they all got meshed in an E-W direction coming out of the Mediterranean. The greatest number of observations occurred during this period: 7 in the Atlantic and 20 in the Mediterranean.

The available information evidence turtle migration into the Mediterranean and inversely, in the opposite direction depending on the season. The Mediterranean entries occur in the preceding months to July, thereby, during the first semester. According to data from the Western Mediterranean surface longline fishery (CAMIÑAS, DE LA SERNA and ALOT, 1992 and CAMIÑAS *et al.*, 1993), during summer, the loggerhead western Mediterranean population migrates in an eastward direction, mainly along the Algerian coasts. This migration route originates from a Balearic resident population and from another group of Atlantic origin, as evidenced from the observations included in this paper. During July and August, a very important migration towards the Atlantic takes place, as the number of observed individuals show. Previous data from the surface longline fishery of the area indicated a migration towards the Alborán Sea of the western Mediterranean population during summer and autumn. The provided data not only corroborates this migration route, but also its exit through the Gibraltar Strait of numerous loggerheads. According to the gathered data from the mentioned longline fishery, this exit could be much more important during September and October, but there is no available information from inspection embarkments to sustain this, but as before commented, the swordfish fishery can last till November. The results presented confirm those of LAURENT *et al.* (1993), based on the distribution of genetic characters of the Atlantic and Mediterranean populations, among other studies (LAURENT, 1990; ARGANO *et al.* 1992; BOLTEN *et al.*, 1992) which include information on catch and recaptures of tagged specimens off the Atlantic and Mediterranean oceans.

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