

# INTERACTIONS BETWEEN KILLER WHALES (*ORCINUS ORCA*) AND RED TUNA (*THUNNUS THYNNUS*) FISHERY IN THE STRAIT OF GIBRALTAR

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## INTRODUCTION:

Sightings of Killer Whales have been reported in the area of The Strait of Gibraltar for more than 500 years. (Bayed and Beaubrun, 1987, Aloncle, 1964, Morcillo, pers comm). This area is also very important for tuna fisheries. The Red Tuna migrates every year throughout the Strait of Gibraltar entering the Mediterranean sea in spring to breed, and leaving the Mediterranean sea in summer (Rodriguez, J. 1964). For the last 500 years, the traditionnal way of fishing Red Tuna has been the Almdraba (pound nets), where the Killer Whales were interacting in the Strait and in close tuna fisheries areas (Morcillo, M., pers. com.). This large fast swimming fish species appears to be the main fish prey of Killer Whales in the area in spring and summer. In the last decade fishermen have been starting to use drop lines to catch the Red Tuna, and it is just this interaction that is the topic of the study. This research project started in 1998 in The Strait of Gibraltar using different whale-watching boats.

## METHODOLOGY:

During the year of 1998, interviews to fishermen were carried out in order to know exactly where the fishing boats were seeing the Killer Whales and the possible interactions with them in the area of Tarifa. This area was considered the "Killer Whales Area(Study area I in fig 1)" in this study and the only place where the whale watching Orca trips were taking place. (Fig.1). In the summers of 1999 and 2000, 16 dedicated Killer Whale whale-watching trips with one or two experienced observers onboard were carried out in the study region. These trips had an average duration of 3:50 hrs and two different boats ,of 7 and 9-m long, were used for this purpose between 22th July and 20th August of both years. Data concerning number of individuals, social structure, and general behaviour were recorded, and pictures of the dorsal fins were taken for identification purposes in each one of the sightings, although not all the animals were photographed in each sighting due to the whale watching conditions.

Observations regarding to the depredation of tuna from the drop line by the Killer Whales, as well as the reactions of the fishermen were also recorded. Furthermore, the number and type of fishing vessels observed around the group of animals were also identified.

## RESULTS:

Seven thousand six hundreds and thirty seven nm were sailed in the rest of the research area, (Study area II in Fig 1). 1084 sightings of Common Dolphins (*Delphinus delphis*),

Striped Dolphins (*Stenella coeruleoalba*), Bottlenose Dolphins (*Tursiops truncatus*), Long Finned Pilot Whales (*Globicephala melas*), Sperm Whales (*Physeter macrocephalus*) and Fin Whales (*Balaenoptera physalus*), were recorded but no Killer Whales was observed in this area. Killer Whales were only observed in what we call the "Killer Whales area", Study area I in Fig. 1. This area is centred 5 miles north of Tanger, next to the sea mountains "Monte Tartesos", "Cañón de Bolonia" and "Cresta Kmara". In both seasons of 1999 and 2000, of 16 Killer Whale dedicated whale watching trips, 12 sightings of Killer Whales were recorded in the "study area I". In a 75 % of the total sightings, an average of 8.62 (0.769 sd) individuals were recorded. Eight individuals were identified. The sightings had a maximum of 9 and a minimum of 7 animals. Photos of the animals' dorsal fin were taken in 10 of the sightings, which were classified in three categories: bad, good, and excellent, and only the 158 pictures included in the last two categories were taken into account for photo-identification purposes. Eight of the Killer Whales were captured at least more than once during 1999 and 2000. The animals were observed during a total of 19 hours and 11 minutes. The behaviours recorded were socialising, for 36min (3.1%), and feeding for 18h35min (96.9%). Killer Whales were always observed in the presence of fishing boats where the average abundance was 102 within a radius of 700-1000 meters. Witnessed interactions consisted of either removing the fish from the drop line hooks or biting the caught fishes.

## **DISCUSSION**

### **THE GROUP OF KILLER WHALES**

The data reveals the presence of a stable group of at least 8 individuals of Killer Whales in the "Killer Whales area", while the identification of a 9th needs confirmation. Although the trips were done only in a small part of The Strait of Gibraltar, Killer Whales were not sighted in the rest part of the study area. Other areas such as the eastern and western part of the Strait and other seasons are not contemplated in this work. The observation of the feeding behaviour and the fact that no attack of the Killer Whales to other prey was observed, suggest that the main diet during the summer period should be Red Tuna.

### **INTERACTIONS WITH FISHERIES**

According to the records, when the fish is being lifted, the Killer Whales try to steal or bite it. This competition for the same resource (Red Tuna Fish), is the main reason why so many interactions between Killer Whales and fisheries have been described in the region for a long time. In certain times, it seems that fishermen really dislike these attacks of the Killer Whales, and they can even throw stones over them, or try to scare them by riding the boat over them. On 26th July 2000, a shoot-like sound was recorded, but it was not possible to clarify if it was only to threaten the animals or to hurt them. Beside this, the fast development of the whale watching platforms in the area (5 to 6 boats are awaited for this summer 2001) (Urquiola and de Stephanis, 2001) the presence of some research vessels (3 boats are awaited for the summer 2001), the interests for the mass media (local and international T.V. channels), and the local political problems regarding the fishing international agreements could create management problems between these sectors and the fishing community, and could interfere in this Killer Whales group.

## **CONCLUSIONS**

In the summers 1999 and 2000, a group of 8 animals at least regularly took advantage of the presence of a drop line fishery west to The Strait of Gibraltar to obtain easy food by stealing hooked fishes. This group has probably specialised in this feeding strategy. Clear interactions between fishing boats and Killer Whales exist in the area during the summers. These interactions and the depletion of the Red Tuna stocks due to over fishing is likely to result in negative impacts on both Killer Whales and fishermen in this area. Management procedures should be developed, to preserve Killer Whales and the interest of fishermen.

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## REFERENCES

ALONCLE, H., 1964. Premières observations sur les petits cétacés des côtes marocaines. Bulletin de l'Institut des Pêches Maritimes du Maroc, 12: 21-42.

BAYED, A. & BEAUBRUN, P.-Ch., 1987. Les mammifères marins du Maroc : inventaire préliminaire. Mammalia, 51(3): 437-446.

RODRIGUEZ RODA, J. 1964. Biología del Atún, *Thunnus thynnus* (L.), de la Costa Suratlántica de España. Inv. Pesq. 25:33-146

URQUIOLA, E., DE STEPHANIS, D, 2001. "Growth of whale watching in Spain. The Succses of the platforms in south mainland. New rules". In *European Research on Cetaceans 14*. G. Proc. 14 th Ann. Conf ECS. Cork, Ireland, 5-9 April 2000 (Eds. P.G.H Evans, R. Pitt-Aiken and E. Rogan,). European Cetacean Society, Cambridge, England. 400 pp.



**Fig.1 Study Area**