

What to do when a protected species eats your fish?

A quantitative assessment of the interactions of dolphins and artisanal fisheries in El Hierro (Canary Islands)

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Introduction

- * For years, interactions have been a problem in many types of fisheries around the world.
- * Apart of the economic losses, there is a potential threat to certain groups of animals (cetaceans, birds, turtles, sharks, etc.)
- * In the Canary Islands there are interactions, especially with cetaceans, in the fishery of “el alto” (El Hierro, La Palma, Fuerteventura, Lanzarote).

What is the fishery of “el alto”?

- * A deep-sea fishery using vertical long-lines with 10-20 hooks at some 400-900m depth.
- * Target species: demersal species of rocky substrates.



Target species



Blackbelly rosefish
(*Helicolenus dactylopterus*)



Splendid alfonsino
(*Beryx splendens*)



Alfonsino
(*Beryx decadactylus*)



Stout beardfish
(*Polymixia nobilis*)



Rabbitfish
(*Promethichthys prometheus*)

Objectives

- * To quantify the level of interactions and the species involved.
- * To evaluate the economic losses for the fishermen.
- * To evaluate the damage to cetaceans.
- * To evaluate and propose solutions.

Metodology

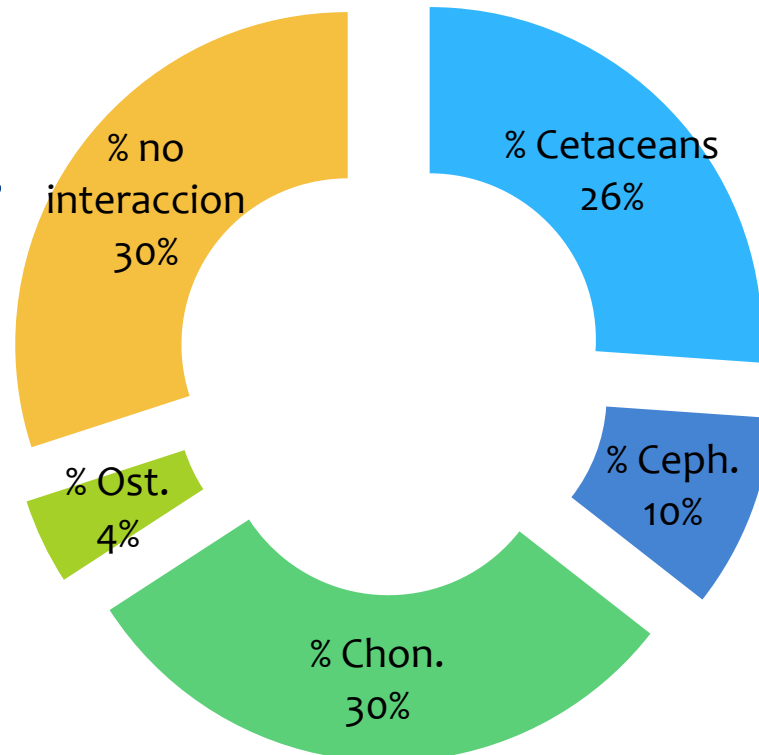
- * Observers on board:
 - * N° of throws.
 - * Time of effort.
 - * N° of hooks.
 - * Positions GPS.
 - * N° and species of fishes captured.
 - * Types of interactions: cetacean (what species), non cetacean (chondrichthyans, osteichthyes, cephalopoda).
 - * PhotoID.
- * In the harbour:
 - * Size and weight of each individual of each species.
 - * Economic gain of the fishermen.





Results

- * There are four types of interactions:
 - * Cetaceans
 - * Cephalopoda
 - * Chondrichthyans
 - * Osteichthyes





How we know what type of interaction?

	Damage in the fishing gear	Moment of the interaction	How is it recognized?
Chondrichthyans	Loss of hooks and weight	At the bottom	Strong vertical pulls in the line Fishes may show bites
Cephalopoda	No	Recovering gear	Jerking in the line Fishes show peak bites.
Osteichthyes	Loss of hooks is possible	At the bottom	Noticeable pulls (weaker than from sharks).
Cetaceans	Loss of hooks is possible	Recovering gear	Very strong vertical pulls and blockage of the electric hauler. Remains of the fish (maxilla and lips) may stay in the hook Often dolphins observed near the fishing boat.

Results: species involved

- * Cetaceans: 2 species of dolphins



Bottlenose dolphin
(*Tursiops truncatus*)



Rough-toothed dolphin
(*Steno bredanensis*)

Results: species involved

* Non cetacean species that interact:



Gulper shark (*Centrophorus niaukang*)



Sharpnose sevengill shark
(*Heptranchias perlo*)

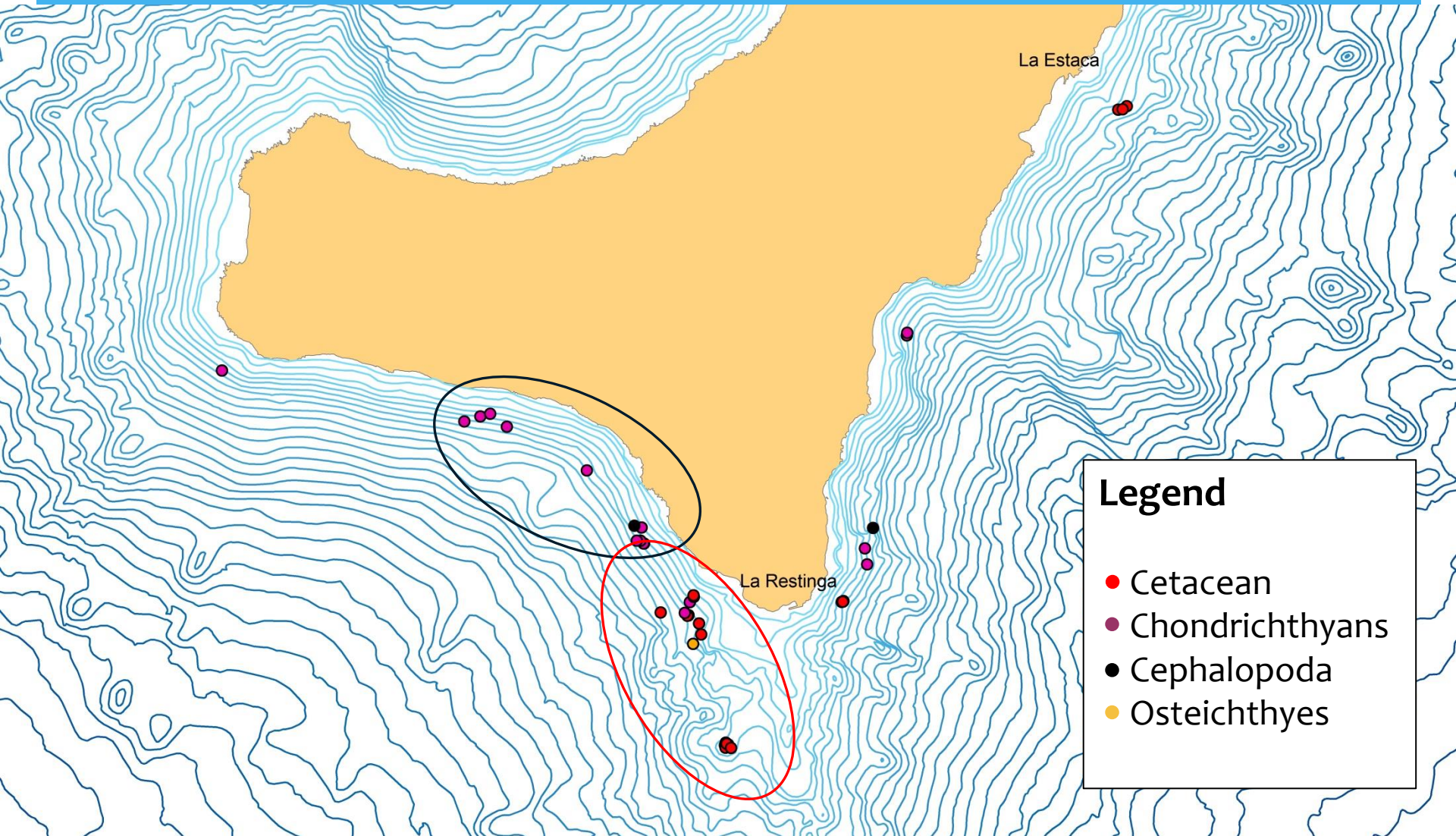


European flying squid (*Todarodes sagittatus*)



Oilfish (*Ruvettus pretiosus*)

Result: distribution of interactions



Results: economic and natural impact

- * **Economic losses:** 10.000€ estimated per year for the fishermen.



- * **Damage to dolphins:** 4 cases of bites or entanglements with hooks and lines in a year.



Results: solutions tested

- * A temporal fishery closure (Roger, 2008) imposed by a volcanic eruption (Oct. 2011-Jan. 2013) did not stop the interactions with dolphins.
- * Pingers (acoustic deterrent for cetaceans) were used and proved to be non effective.



Conclusions

- * Cetacean interactions occur in 26% of the fishing days.
- * Fishermen lose 10.000€ aprox. annually.
- * Effective deterrence methods are necessary.

On going work

- * To develop a mechanical system to prevent the access of the dolphins to the lines.
- * To quantify interactions in Fuerteventura.
- * To evaluate the status of the stock of target species.
- * Collaborations with fishermen.
- * Information to the public.



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Thanks for your attention

