



C. Nicolau

A FIRST ASSESSMENT OF THE CETACEANS' OCCURRENCE AND THREATS IN THE OFFSHORE WATERS OF MADEIRA



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INTRODUCTION

Cetaceans' research in the Madeira archipelago has been mainly restricted to the inshore waters (Freitas *et al*, 2004, Alves *et al* 2010, 2013). Consequently there is a lack of knowledge about cetaceans and of the interactions and impacts of human activities in the Madeira offshore waters. Therefore, between 2010 and 2012, within the CETACEOSMADEIRAI project, studies were conducted in the Madeira offshore waters.

AIMS

To identify which cetaceans' species occur in the offshore waters of Madeira, their relative abundance and encounter rate, and the impacts of human activities on cetaceans and the marine environment.

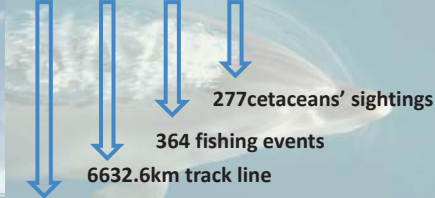
METHODS

- * Tuna fishing vessels were used as platforms of opportunity;
- * On effort:
 - Data about cetaceans' occurrence, encounter rate, relative abundance, and behaviour was collected;
 - Potential threats were identified and quantified: ship traffic, litter, and interaction between cetaceans and fisheries.



RESULTS & DISCUSSION

161 days on board the tuna fishing vessels:



50% of the fleet and the whole tuna fish season (March to September) were covered

Fig.1-Map of trips made on board the tuna fishing vessels in the Madeira EEZ (NE Atlantic).

Cetaceans

- * We observed 11 cetaceans' species;
- * *Delphinus delphis* was the most sighted species (33%), with the highest encounter rate (1.55 encounter per 100 km) and with the highest relative abundance (23.42 individuals per 100 km).

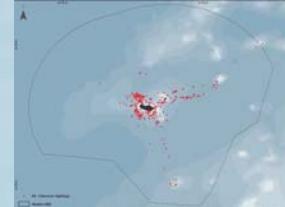


Fig.2-Map of cetaceans' sightings on board the tuna fishing vessels in the Madeira EEZ (NE Atlantic).

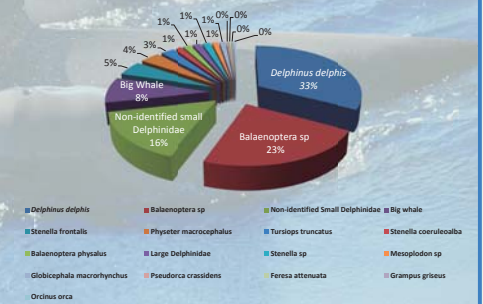


Fig.3 - Cetaceans' sightings occurrence (n=277)

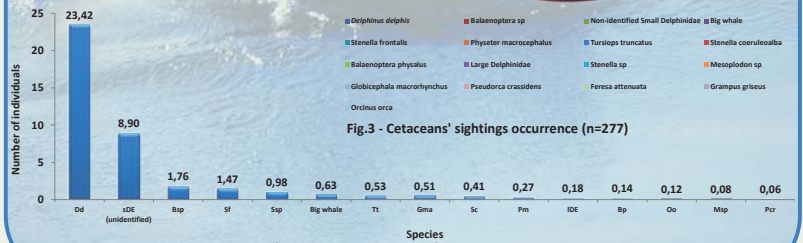


Fig. 4 – Cetaceans' relative abundance (no individuals per 100 km)

Threats analysis – Litter and Ship traffic

Litter

6 types of litter were recorded (n=48)
Plastic bags were the most sighted with 40%, and with an insignificant encounter rate (0.3 litter/100km)

Ship traffic

8 types of vessels were recorded (n=592),
Tuna fishing boats were the most sighted
The average number of boats per day was 4, a low number considering the size of the study area ~ 450 000 km²

Threats analysis – Interactions between Fisheries and cetaceans

Fisheries

A total of 364 fishing events were recorded :

- * No cetacean by catch was register;
- * We observed that in 9 % (31) of the fishing events, cetaceans were present;
- * In 3% (11) there was a disturbance in the fisheries caused by the cetaceans;
 - 35% cetaceans' disturbance (considering only their presence in the fisheries);

364 fishing events

* **Live Bait Fishery** (tuna fish is fed with live bait)
69 live bait fishing events:

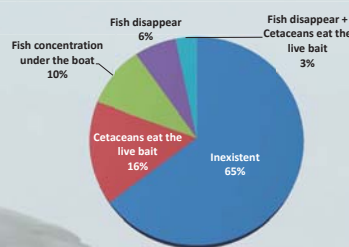
6%, cetaceans' present
3%, cetaceans' disturbance

* **Tuna Fishery events** (2 ways to fish the tuna):

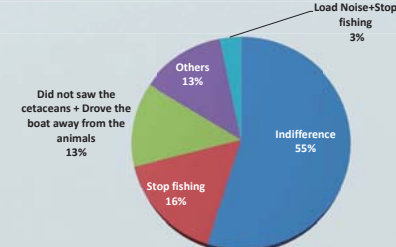
Occasional (43 fishing events):
5% cetaceans' present
2% cetaceans' disturbance

Holding the fish under the boat (252 fishing events):
10% cetaceans' present
3% cetaceans' disturbance

Cetaceans' behaviour in fisheries



Fishermen's behaviour towards cetaceans' presence in fisheries



MAIN CONCLUSIONS

- * We observed that 11 cetaceans' species occur in the Madeira EEZ, being the *D. delphis* the most sighted species, with a higher encounter rate and a higher relative abundance .
- * A low/moderate Interaction between cetaceans and fisheries were observed. Data indicates that ship traffic and litter are insignificant.
- * The methodology used in this study will be improved and incorporated in the Madeira archipelago Cetacean Monitoring Program.

