

TWO DECADES OF STUDIES ON CETACEAN DISTRIBUTION AND ECOLOGY IN THE CANARY ISLANDS: A GENERAL REVIEW.

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Abstract: We carry out a general review of the main studies developed in the Canary Islands during the XXI century on the ecology and distribution of free-ranging cetacean populations. The particular location and oceanographic conditions make the archipelago one of the world's most important hotspots for cetacean diversity (Morales, 2015; Servidio, 2014). However, the 30 species reported in bibliography for these waters (Herrera et al, 2021) have been monitored with very different intensity, depending on ecological reasons, accessibility and technical issues.

We conducted a general review of previous bibliography and a later analysis of 31 selected articles. The final objective has been to identify the most important areas, time periods and environmental conditions explaining the presence of the species and populations, as well as the methods and technologies used by each of the research teams.

Up to 26 different species and 3 taxonomic groups (baleen whales, pilot whales and beaked whales) have been the targets of the studies considered. The most cited species are: *Globicephala macrorhynchus* (12 articles), *Mesoplodon densirostris* (11), *Ziphius cavirostris* (9), *Tursiops truncatus* (8), *Delphinus delphis* (6), *Stenella frontalis* (6) and *Steno bredanensis* (6). Wider taxonomic groups are targeted in 3 studies (baleen whales) or 2 studies (pilot whales, beaked whales).

A total of 35 locations have been identified, in most cases coinciding with the leeward coasts of the islands (sheltered from the trade winds and rich in prey resources) (Herrera et al, 2021). Information about the duration of the studies was extracted from 29 of the articles, showing a wide range from just several days to 22 years. Occurrence of the animals throughout the year could only be analysed in 23 studies, where presence all year round (combined with a marked spring peak) was the most frequent case.

The methods and technologies involved across the whole set of studies were also varied (18 different types). The main ones include the use of motor vessels and deployment of hydrophones (18 occasions each), photo-ID (10), D-tags (9), GIS (9) and databases (8).

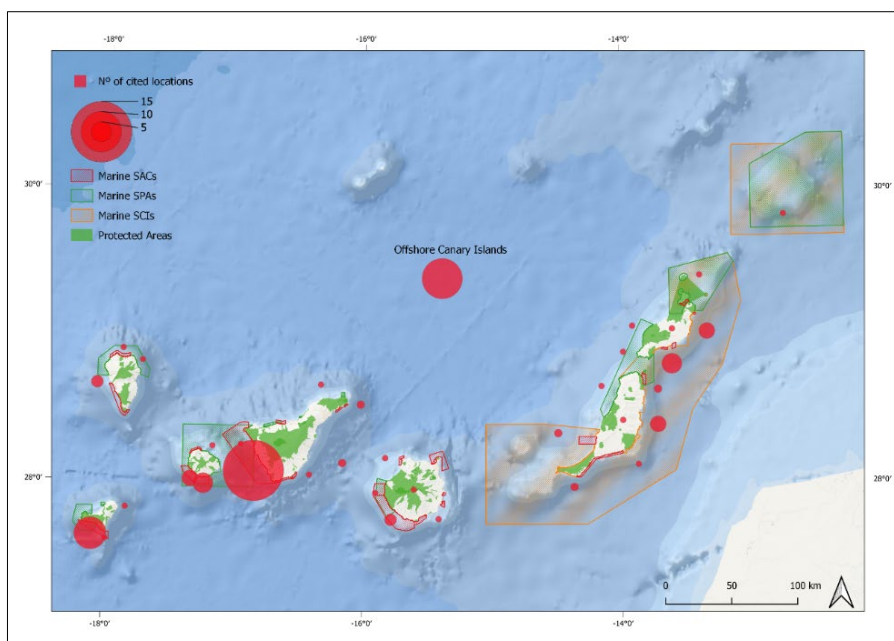


Figure 1. Number of cited locations within the 31 reviewed studies.

The reviewed articles include 27 different topics, the most recurrent being behaviour and distribution (17 cases for both), echolocation and social communication (10 cases each), as well as habitat use and foraging strategies (8 for both). Secondary information primarily includes oceanographic data, maritime traffic and presence of boats.

Despite the variety of contexts and objectives covered by this set of studies, some patterns and trends have been identified. As a closing recommendation to avoid unbalanced monitoring of species and areas, we propose to prioritize the acquisition of time series data through strategic transects in offshore waters. This could be addressed either with sets of moored or drifting hydrophones or, ideally, with autonomous vehicles equipped with passive acoustic monitoring (PAM) systems, capable of covering wider areas.

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