Eduardo J. Belda
(Associate Professor)
edbelpe@upv.es

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Population Abundance Trends of Long-Finned Pilot Whales and Bottlenose Dolphins at the Special Area of Conservation ¨Underwater valleys of the Mazarrón scarp"

Eduardo J. Belda1,5, Ramón Miralles2,5, Carles Gallardo2, Victor Espinosa1,5, Gal.la Serrano1, Blanca Feliu-Tena,3,5, Victor Gallego4

[1] Instituto de Investigación para la Gestión Integrada de Zonas Costeras (IGIC), Universitat Politècnica de València (UPV), C/Paranimf 1, Grau de Gandía, 46730 Valencia, Spain; [2] Institute of Telecommunications and Multimedia Applications (iTEAM), Universitat Politècnica de València (UPV), Camino de Vera S/N, 46022 Valencia, Spain; [3] Instituto Español de Oceanografía (IEO-CSIC), C.O. Murcia, C/el Varadero 1, Lo Pagan, 30740 Murcia, Spain; [4] Instituto de Ciencia y Tecnologia Animal, Universitat Politècnica de València (UPV), Camino de Vera S/N, 46022 Valencia, Spain; [5] Unidad Mixta de Investigación IEO-UPV, Tinglados Muelle Frutero, Grau de Gandia, 46370 Valencia, Spain

edbelpe@upv.es

BACKGROUND

Increase in maritime and recreational navigation is a potential threat to marine megafauna. Specially in protected areas, there is a need to

Distance sampling is commonly used to monitor the population abundance of cetaceans. Nonetheless, these surveys usually are biased due to their diving behaviour, i.e. g(0) is not 1, and the associated bias when recording cluster size.

Lack of information about population trends and difficulty to obtain accurate estimates of population abundance. This information is crucial for managing and conserving

METHODS

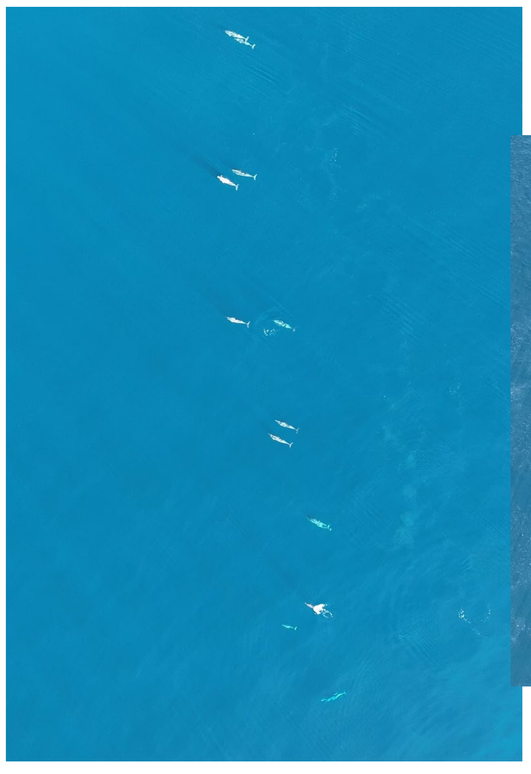
Employing an integrated methodological approach, we combined traditional distance sampling with boat and aerial surveys, enhancing these with drone imagery and acoustic monitoring.

Data collected 2018-2020; 2022 – 2023. Total effort = 4001 km; SAC area = 1542 km^2; Total number of sightings = 154

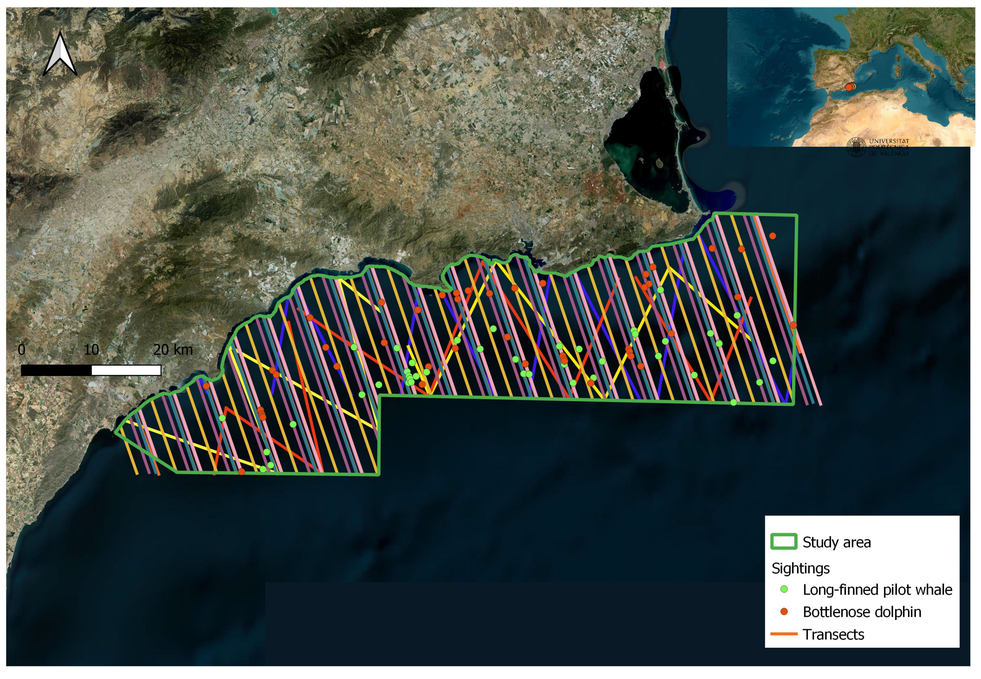
Abundance was estimated using distance sampling methods. Analyses were conducted with software R using package "distance"

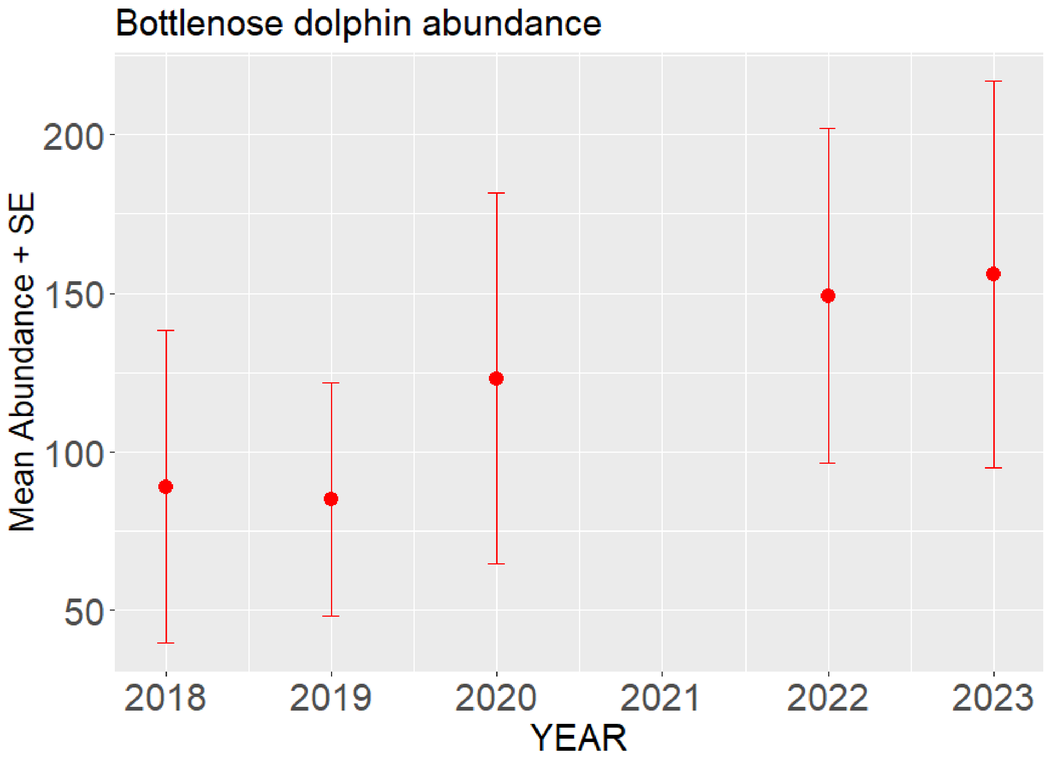
Perception bias: We used the ratio of acoustic detections vs visual detections ; In 2023 we used AUV video recordings of sightings to estimate bias in estimate group size from visual data

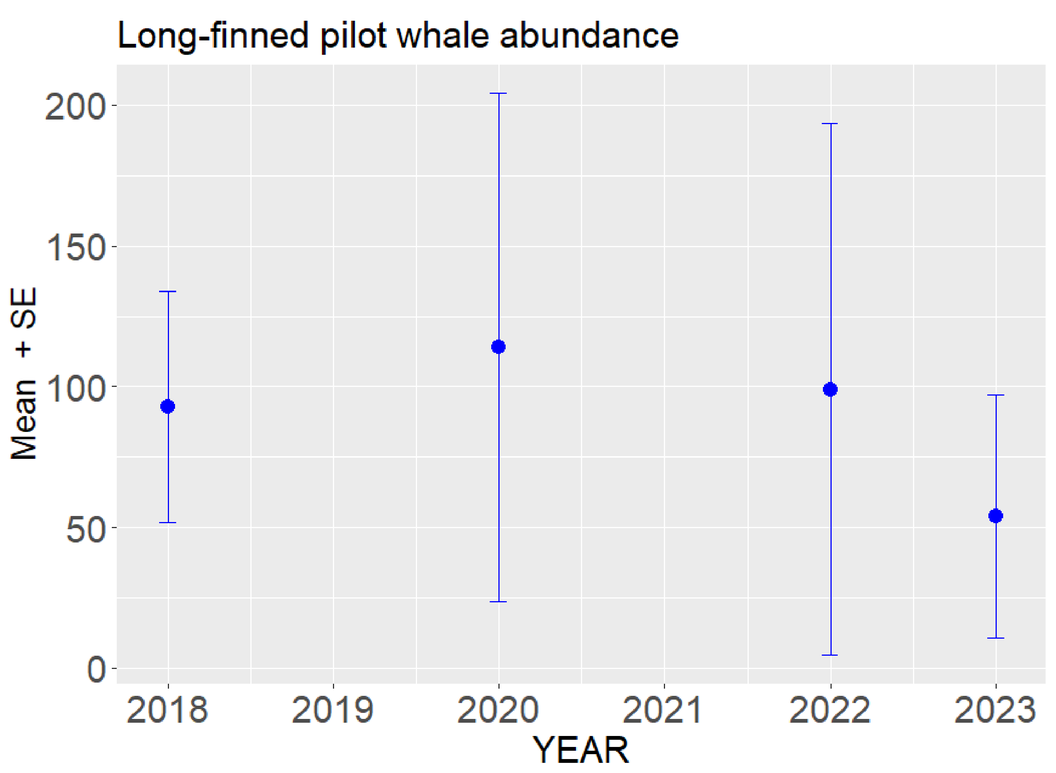
RESULTS



Examples of perception bias: Dolphins at different depths that cannot be seen from the boat bias in cluster size. This also affects g(0)







DISCUSSION

Population trends: no clear trend in any of the two species due to low precision of the estimates

Use of AUVs and acoustic detections: Cluster size was usually underestimated. Compared with AUV images, visual cluster size used to be 14% (range 0-50%) smaller. Clear standardised protocols for the use of AUVs are needed.

Bottlenose dolphin: The bottlenose dolphin population remained stable or increased over the five-year period, suggesting resilience to the prevailing environmental conditions and human activities.

Long-finned pilot whale: The results may suggest a decline, though lack of precision of the estimates prevents obtaining a clear result. Nonetheless, the results raise concerns and underscore the need for improved population estimates**.**

NOTE: It's important to consider that these trends, if they exist, might reflect changes in distribution rather than actual shifts in population abundance.

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