Identifying Suitable Habitats for Harbour Porpoise *(Phocoena phocoena)* Conservation in Galician Waters, NW Spain

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Introduction

Iberian harbour porpoises (*Phocoena phocoena*) are a genetically distinct population (Fontaine et al. 2007) and eligible for Special Areas of Conservation under Annex II of the EU's Habitats Directive (92/43/EEC).

Aim 1: Define the Iberian harbour porpoise ecological niche.
Aim 2: Identify suitable areas for harbour porpoise conservation in Galician waters (NW Spain).

Methods

Boat-based surveys conducted throughout August and September 2017 in the Ria of Arousa, Galicia, NW Spain recorded 15 harbour porpoise sightings and 274 samples with the ecogeographic variables (EGVs):

➢ Depth
➢ Sea surface temperature (SST)
➢ Sea surface salinity (SSS)
➢ Slope
➢ Daily tidal coefficient (TC)

Data analysis was conducted in Biomapper through Ecological Niche Factor Analysis and a habitat suitability model.

Identification of 3 potential Special Areas of Conservation, that could contribute towards the successful conservation of Iberian harbour porpoises in coastal waters of NW Spain (Fig.2).

The Iberian Harbour Porpoise Ecological Niche

The Iberian harbour porpoise narrow ecological niche (Tolerance = 0.246) is primarily defined by **shallow areas with high salinity and high tidal coefficients**, relative to the available habitat (Table 1).

Table 1. Contribution of Ecogeographic Variables to Marginality and Specialisation.
The amount of specialisation explained by each factor is given in parentheses. Factor coefficients above 0.5 (bold) indicate the most important EGVs for each factor. EGVs are sorted by decreasing absolute value of marginality coefficients, for which Factor 1 accounts for 100%.

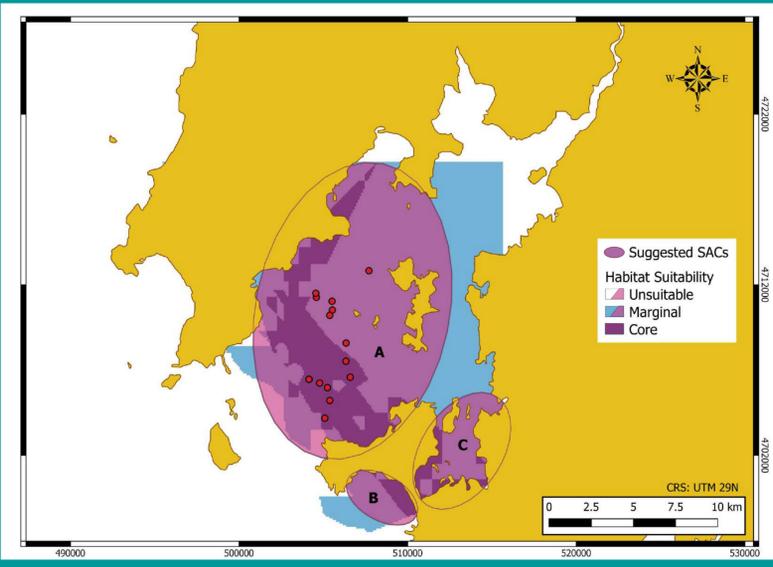| EGVs	Factor 1 (45.6%)	Factor 2 (33.8%)	Factor 3 (13.9%)	Factor 4 (5.5%)
Depth	**- 0.598**	0.439	0.370	0.464
TC	**0.516**	- 0.429	0.369	0.238
SSS	**0.510**	**0.639**	0.485	0.423
SST	0.323	0.437	**- 0.697**	0.057
Slope	- 0.107	- 0.155	- 0.077	**0.739**

Figure 2. Proposed Special Areas of Conservation
Proposal is based on the three clusters of core habitat identified by the habitat-suitability model, which also contain most sightings (red dots).

Harbour porpoises' specialised habitat preferences are likely related to areas of high prey availability (Díaz López and Methion 2018).

Identify Suitable Areas for Iberian Harbour Porpoise Conservation

Only 0.15% of the study area is considered highly suitable, thereby overlapping with most of the recorded sightings (Fig.1).
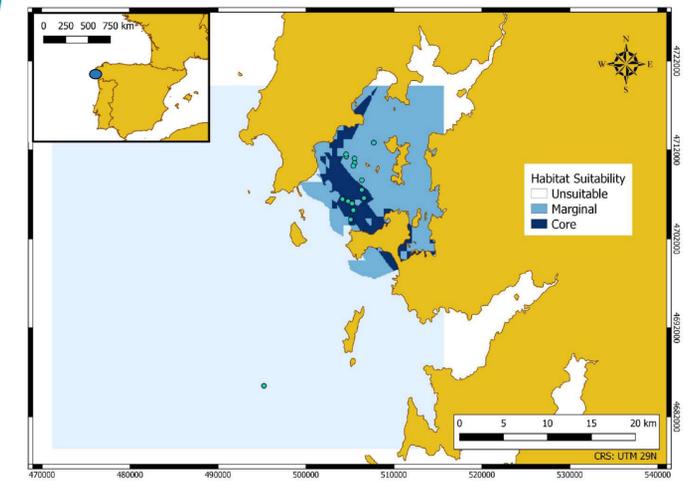

Figure 1. Habitat Suitability Map.
The model is reclassified (through Habitat Suitability Index-values) into unsuitable (0-25), marginal (25-72) and suitable/core (72-100) habitat for harbour porpoises. Recorded sightings (green dots) overlap with core and marginal habitat.

Future Recommendations

Evaluating anthropogenic impacts within the areas, to identify effective management strategies.

Prove that Area B and Area C form part of harbour porpoise realised niche.

Acknowledgements

References

Fontaine MC, et al., 2007. Rise of oceanographic barriers in continuous populations of a cetacean: the genetic structure of harbour porpoises in Old World waters. BMC Biology, 5:30.
Díaz López B and Methion S, 2018. Does interspecific competition drive patterns of habitat use and relative density in harbour porpoises? Marine Biology, 165:92.