Seabird spatial and temporal distribution off the central Catalan coast

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15TH INTERNATIONAL Seabird Group Conference CORK, IRELAND

"SCAN ME FOR MORE INFORMATION ON THE PROJECT"

INTRODUCTION

Few studies have focussed on collecting year-round, **systematic seabird presence data** at sea along the **Catalan coast** in recent years. Understanding seabird temporal and spatial distribution at sea is a crucial first step for species conservation as it can provide information on potential interactions with human activities *(Waggit et al., 2020)*.

In the present study spatial and temporal distribution and relative abundance were assessed for nine species of seabirds, namely: **Cory's shearwater** *(Calonectris diomedea)*, **Atlantic puffin** *(Fratercula arctica)*, **European storm petrel** *(Hydrobates pelagicus)*, **Audouin's gull** *(Larus audouinii)*, **Northern gannet** *(Morus bassanus)*, **Mediterranean** and **Balearic shearwaters** *(grouped as Puffinus sp)*, **Mediterranean gull** *(Ichthyaetus melanocephalus)* and **Sandwich tern** *(Thalasseus sanvicensis)*.

AIMS

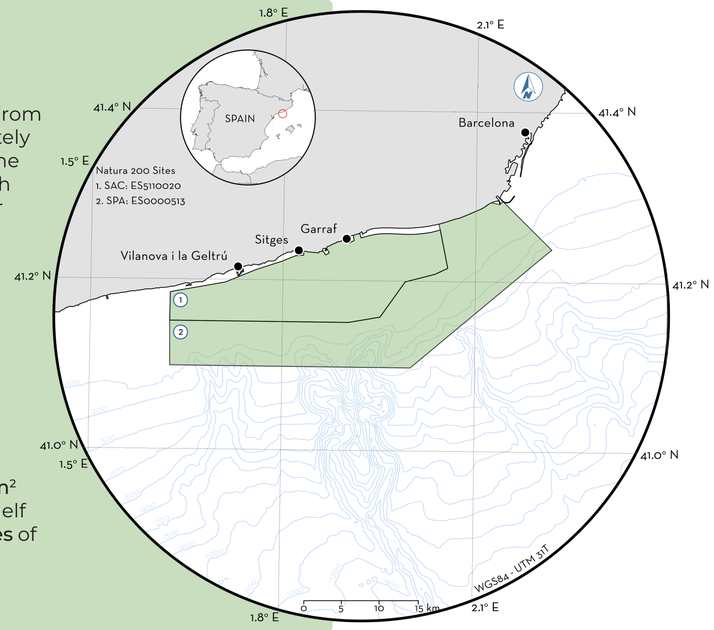
- Understand the temporal distribution and abundance of these eight seabird species.
- Provide baseline information for future studies.

STUDY AREA

The **study area** was located south from **Barcelona**, covering approximately **3,700 km²** above Catalan the continental shelf and slope, which is characterised by underwater features such as **4 underwater canyons** *(Canals et al., 2013)*.

The area is an **important feeding ground** for several seabird species such as **Balearic** or **Cory's shearwaters**, and a wintering ground for species such as **Northern gannets** or **Atlantic puffins**, among others *(Bécares, 2015)*.

Two **Natura 2000** sites cover **672 km²** above the continental shelf and shelf break, giving **protection** to **22 species** of seabirds.



METHODS

Data were collected along 75 dedicated boat surveys within the project ***Plomes al Mar*** carried out by **Associació Cetàcea**. In total **3,623 nm** were covered between **January 2020 and December 2021** (March, April, November, December 2020 and January 2021 could not be surveyed due to SARS-CoV-2 restrictions). Surveys were conducted along different transects following a straight course (between 100° and 230° in 5° intervals) from Garraf harbour.

For each of the species of interest, the individuals observed in an imaginary strip of **300 metres** at each side of the research vessel as it moved forward at a constant speed were counted. Species were identified through direct observation with binoculars or photographs when identification at sea was not possible. For every observation, the location (using a hand-held GPS), the species and the number of individuals were recorded.

The **relative abundance** was calculated as the number of individuals/km² for each month. QGIS 3.14 was used to analyse the spatial distribution and the relative abundance of the different seabird species, taking into account the observation effort (calculated as the position of the research vessel every 5 minutes from the start of the trip) carried out.

RESULTS

Common name	Scientific name	No. Observations											Total
		F	M	A	M	J	JL	A	S	O	N	D	
Mediterranean and Balearic shearwaters	*(Puffinus sp.)*	42	25	74	130	158	38	4	8	95	25	44	643
Cory's shearwater	*(Calonectris diomedea)*	0	0	0	32	163	79	17	1	42	0	0	334
Mediterranean gull	*(Ichyateus melanocephalus)*	39	48	5	0	0	12	8	4	68	44	77	305
Audouin's gull	*(Larus audouinii)*	1	19	18	30	39	15	3	3	7	1	2	138
European storm petrel	*(Hydrobates pelagicus)*	0	0	15	25	34	26	17	9	2	0	0	128
Atlantic puffin	*(Fratercula arctica)*	78	16	10	4	0	0	0	0	0	0	6	114
Northern gannet	*(Morus bassanus)*	22	5	1	2	25	0	0	0	26	17	8	106
Sandwich tern	*(Thalasseus sandvicensis)*	5	19	8	18	25	3	3	1	7	3	4	96
Total		187	132	131	241	444	173	52	26	247	90	141	1864

DISCUSSION

In terms of abundance and distribution, the studied species can be classified in three main groups:

- **Coastal species** such as the northern gannet, the sandwich tern and to a lesser extent, the Audouin's gull.
- **Pelagic species** such as the European storm petrel and the Atlantic puffin.
- **Species with a broader distribution** in the study area such as the Mediterranean gull and the three species of shearwaters.

Despite reproduction of threatened or vulnerable seabird species of the genus Puffinus has not been documented in Catalunya (*Franch et al., 2021*), the preliminary results of this study suggest that the study area could be and **important feeding ground** for these species during their breeding season (*Bécares, 2015*). Additionally, the area seems to be an **important wintering ground** for species such as the Mediterranean gull, the Atlantic puffin and the Northern gannet.

This study highlights the importance of **continuous**, **recurrent** and **year-round** data collection on abundance and distribution of seabird species. These data provide valuable information on population trends, phenology and distribution, and, combined with information on human-induced threats, allow for the evaluation of the effectiveness of the Natura 2000 Network sites in the long-term.

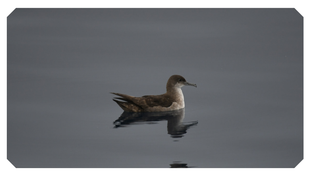
INTERACTION WITH HUMAN ACTIVITIES

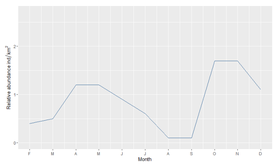
Pictures taken in the study area in 2014 and 2021.

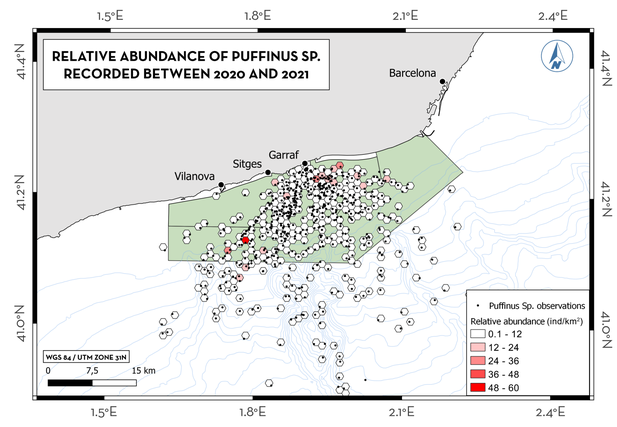
The project ***Plomes al Mar*** contributes and will contribute in the short, middle and long term to expanding our knowledge on the **ecologic requirements** of the **seabird species** present in one of the most important regions for their **conservation** in Catalunya.

RESULTS

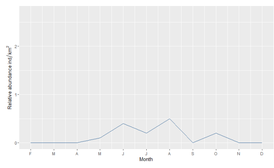
Mediterranean and Balearic shearwaters *(Puffinus sp.)*

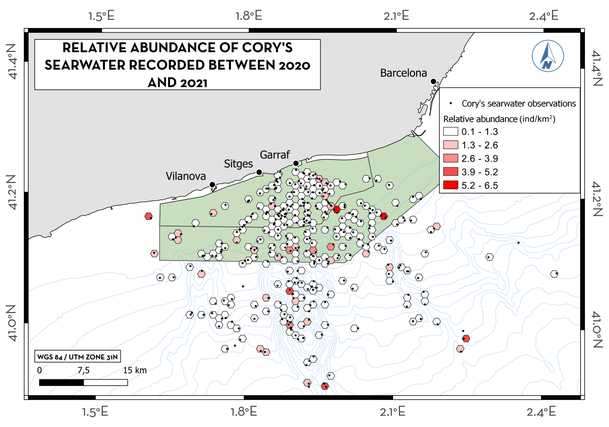




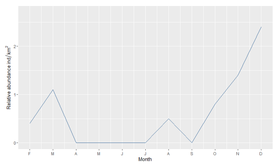


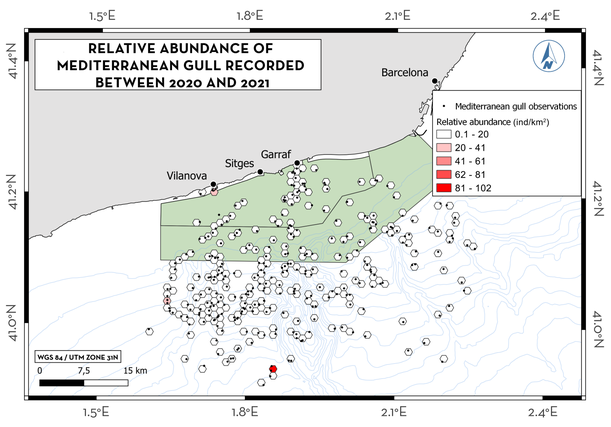
Cory's shearwater *(Calonectris diomedea)*



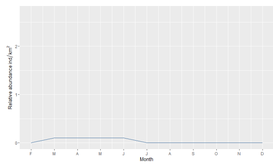


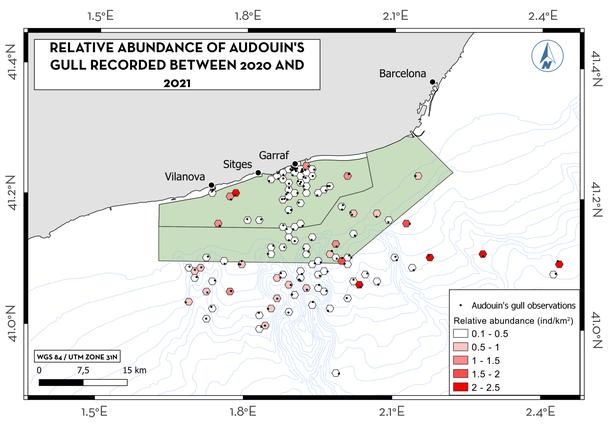
Mediterranean gull *(Ichyateus melanocephalus)*



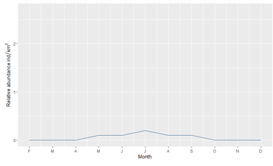


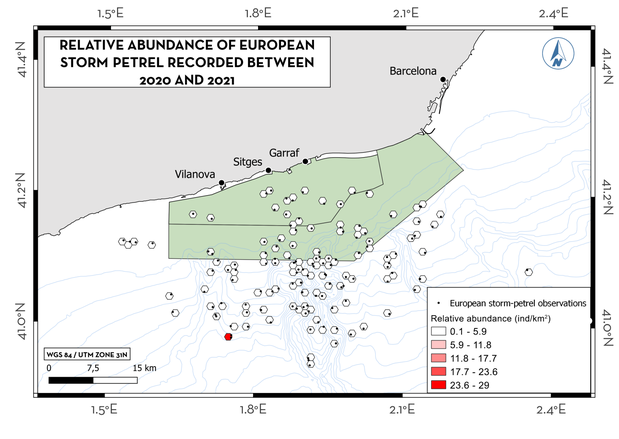
Audouin's gull *(Larus audouinii)*



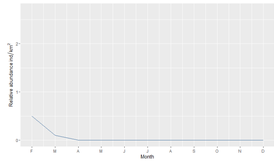


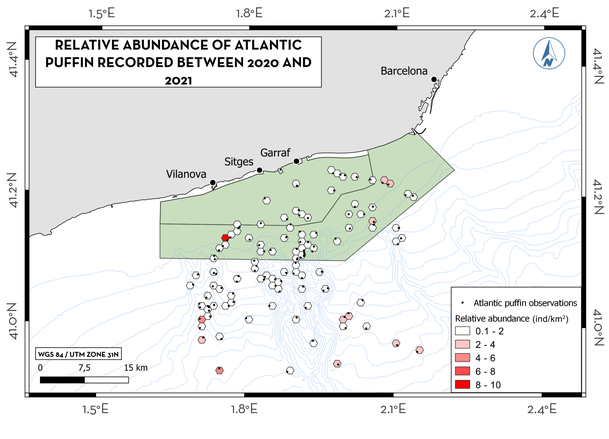
European Storm petrel *(Hydrobates pelagicus)*



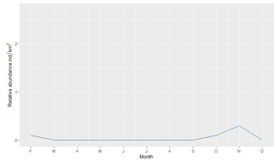


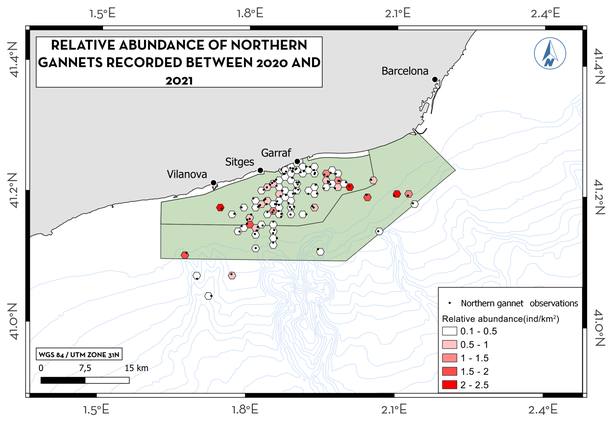
Atlantic puffin *(Fratercula arctica)*



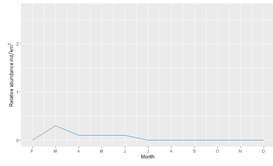


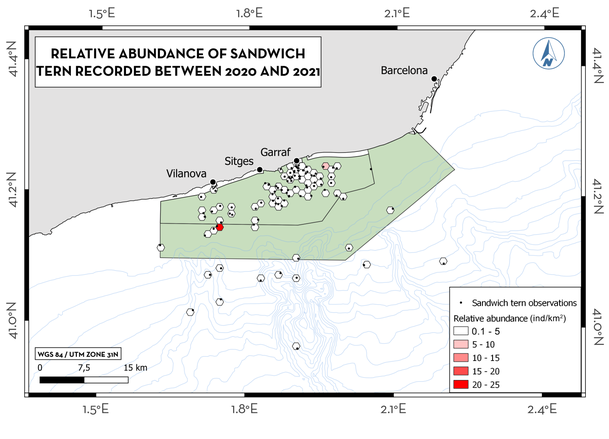
Northern gannet *(Morus bassanus)*





Sandwich tern *(Thalasseus sandvicensis)*





ACKNOWLEDGEMENTS

The present work would not have been possible without the contribution of all the volunteers currently involved in the project, who were crucial during data collection and validation process: Abel Tomás, Anna Conde, Bàrbara Roldán, Berta Muñoz, Blai Ruiz, Carlos Molina, David Jara, Eva Rizo, Fernando de Alvarado, Iris Anfruns, Jason A. Hale, Joan Giménez, Jorge Salamanca, Laura Almarcha, Marc Caballero, Montse Valls, Natàlia Fernández, Marc Rams, Sandra Turró and Sílvia Juncà.

All pictures were taken by some of Associació Cetàcea's photographers: Carlos Molina, Eva Rizo, Iris Anfruns, Oriol Giralt, Ricard Marcos and Sílvia Juncà.

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