



At-sea distribution maps of seabird species

02/2022

Part of the C4 activity At-sea distribution of seabird species and spatio-temporal overlap with fisheries.

Comprehensive assessment of the target species at sea was conducted through individual tracking of "representatives" of the breeding population that reveal movement patterns at sea.

40 Scopoli's Shearwaters, 40 Yelkouan Shearwaters and 20 Audouin's Gulls were individually tracked with remote sensing equipment (nanoFix-GEO+RF GPS tag for shearwaters and OrnitTrack 10 3G and OrnitTrack 15 3G for gulls) during the period 2019-2021. Tracking data was complemented with extensive boat surveys 9 nm around SPA Lastovsko otočje following a standardized survey protocol (2019-2021, two seasons).

Tracking and transect data were analysed in order to develop distribution maps. This will also to be used to identify significant foraging and roosting areas at sea of the target species and well as to assess spatio-temporal overlap of seabirds activity and fisheries.

Distribution maps of each of the tracked seabird species will be made available on project site.



The project received funding from the LIFE Programme of the European Union. The project is co-financed by The Government Office for Cooperation with NGOs. The project is co-financed by The Environmental Protection and Energy Efficiency Fund.



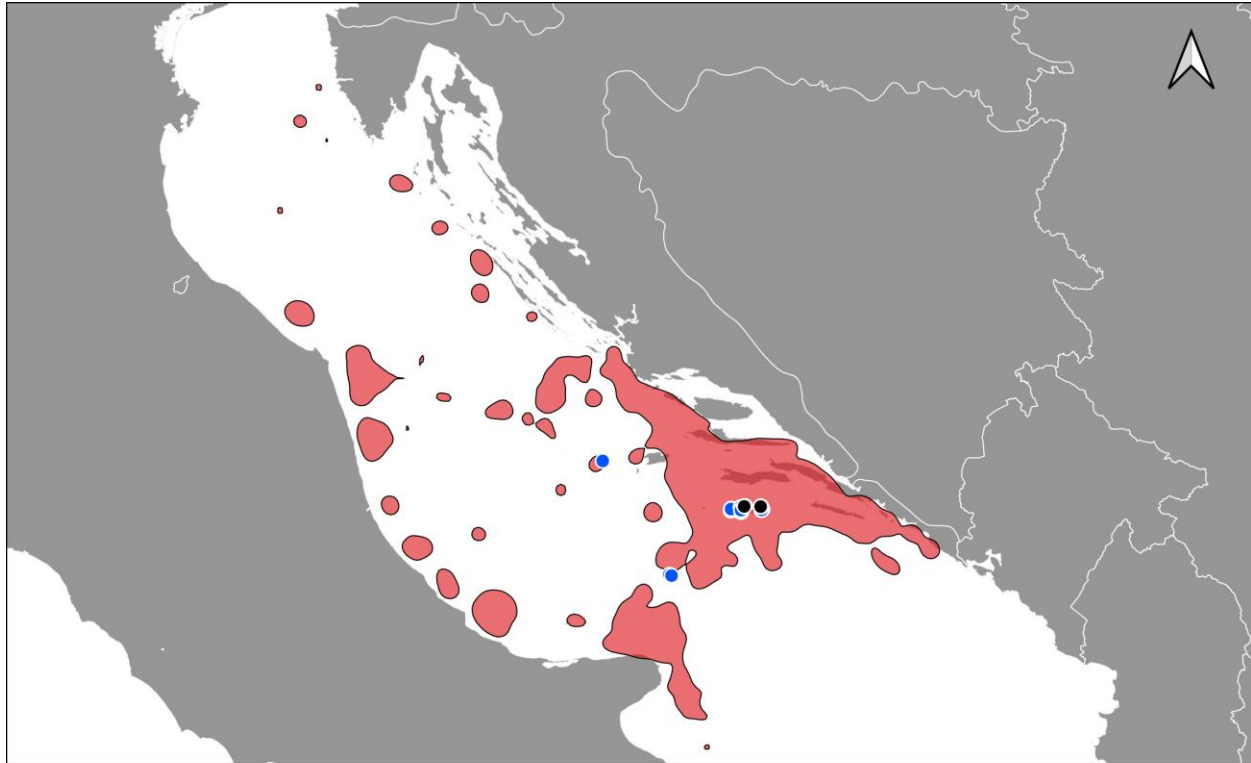
A distribution map for Yelkouan Shearwater (*Puffinus yelkouan*, Figure 1) and Scopoli's Shearwater (*Calonectris diomedea* Figure 2) were created by using KDE (Kernel Density Estimation) of uninterpolated GPS tracking data pooled by species. The 90% extrapolated density value was designated as the home range for the purpose of this preliminary analysis.

Figure 3 presents an overview of the spatial relation between seabird (Yelkouan and Scopoli's Shearwater) home ranges and the SPAs of the Natura 2000 (which is spatially identical to the IBA network in Croatia).

A total of ~667000 GPS fixes were used to produce the Audouin's gull (*Larus audouinii*, Figure 4) kernel density estimate. Only the data corresponding to the time when the birds are present at their breeding sites was considered (May-August).



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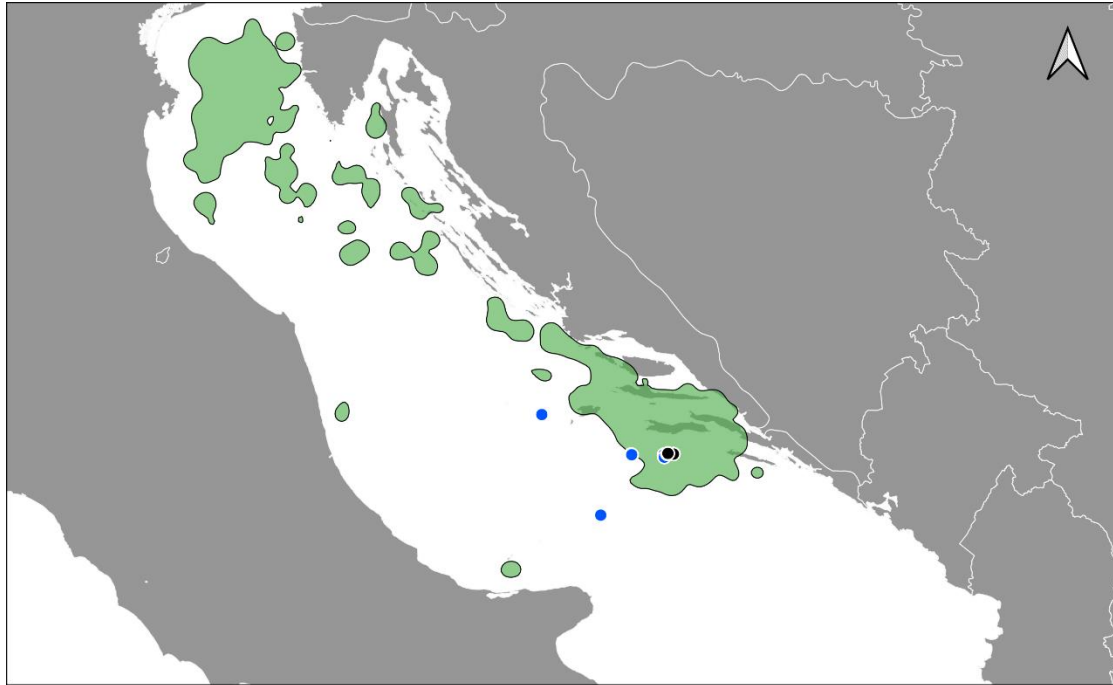


C. diomedea

- Known colonies (not tagged)
- GPS tagged colonies
- Home range (90% KDE)

0 100 200 km

Figure 1: Scopoli's Shearwater distribution (Home range)

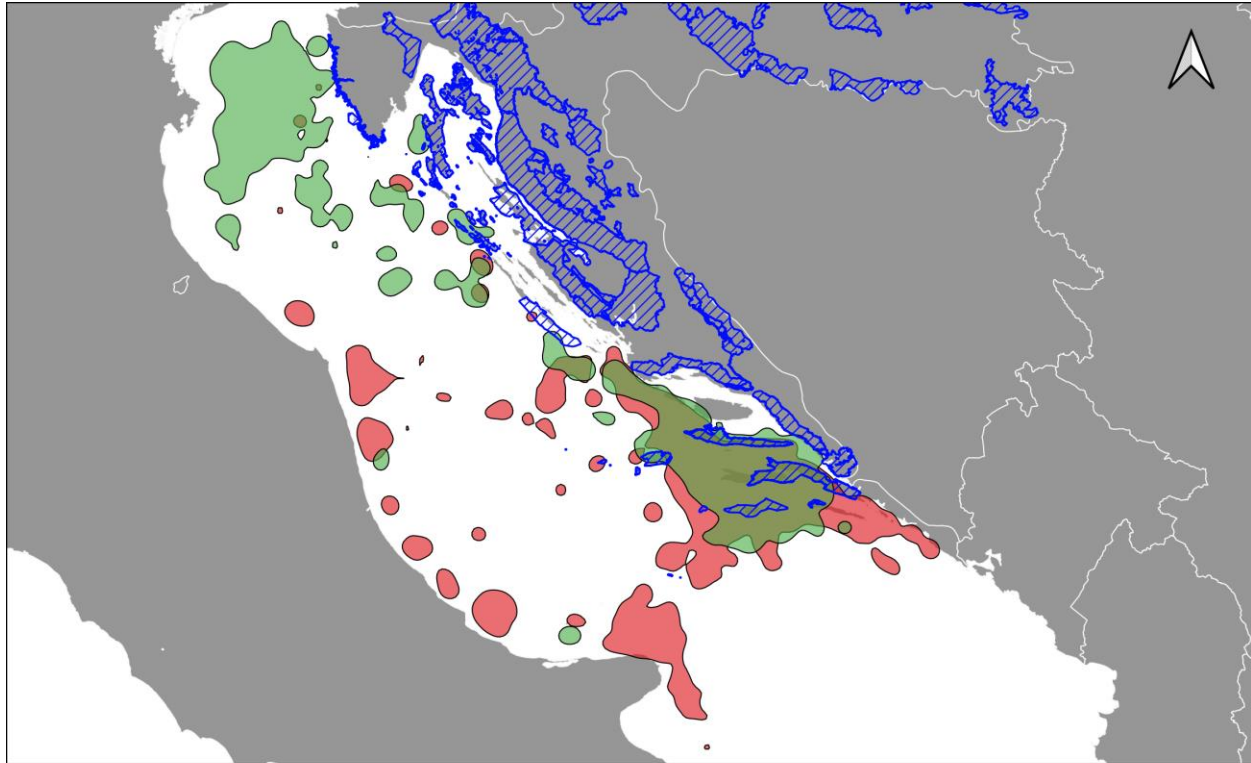


P. yelkouan

- Known colonies (not tagged)
- GPS tagged colonies
- Home range (90% KDE)

0 100 200 km

Figure 2: *Yelkouan Shearwater* distribution (Home range)

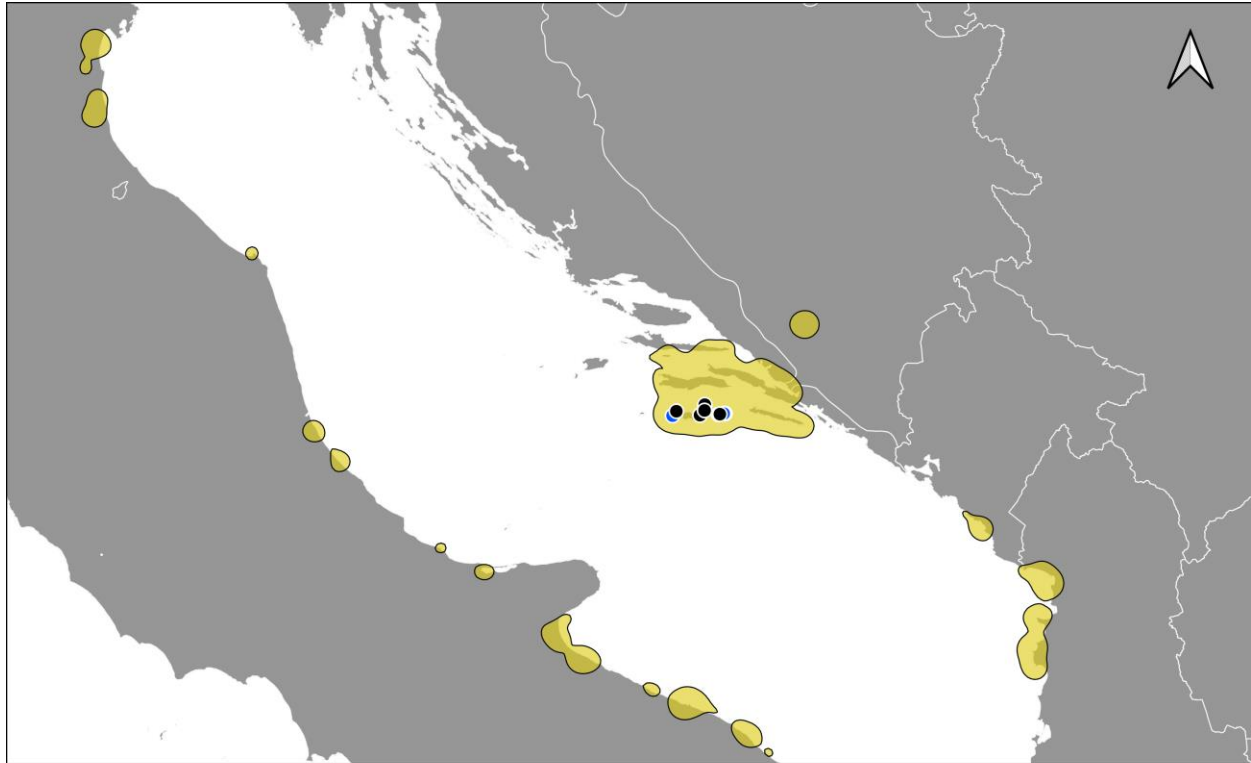


Seabird home range & SPA/IBA overlap

■ C. diomedea home range
 Natura 2000 SPA / IBA
■ P. yelkouan home range

0 100 200 km

Figure 3: Seabird home range & SPA/IBA overlap



L. audouinii

- Known colonies (not tagged)
- GPS tagged colonies
- Home range (90% KDE)

0 100 200 km

Figure 4: Audouin's Gull distribution (Home range)