

GIS MAPPING OF SEABIRD DISTRIBUTION - A PAN-MEDITERRANEAN PERSPECTIVE

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Abstract

Seabird distribution in the Mediterranean sea was mapped in GIS format in a 10x10-km grid. The resulting cells were weighed according to the conservation value of the species present. This allowed for numerical calculations and direct comparisons. A network of offshore protected areas is recommended to protect seabird biodiversity in Mediterranean offshore waters, as promoted by UNEP RAC/SPA.

Keywords: *Gis, Birds, Marine Parks, Biogeography*

The Mediterranean region is home to several species of seabird of high conservation value in global terms (1), with several endemic taxa and some additionally in decline. The protection of the key sites for their survival is an essential tool to ensure their long-term conservation. The UNEP Regional Activity Centre for Specially Protected Areas (RAC/SPA) in compliance with the Mediterranean SPA/BD Protocol undertook an initiative to promote the establishment of a Specially Protected Areas of Mediterranean Importance (SPAMIs) network, including seabirds in Areas Beyond National Jurisdiction (ABNJs). Species' known distribution (both breeding and wintering ranges) were obtained from various sources: published references, consultation to experts, data from censuses at sea and satellite telemetry (2, 3; see 4 for full reference list), plus own data. The information was compiled and mapped in GIS format in a 10x10-km grid following the recommendations of the EEA (5). The resulting cells were assigned a numerical value based on the number of species present and their conservation value (endemic and/or in decline). Treatment of the data allowed for graphic representation and for some geographical calculations, as well as for further analysis along with environmental variables.

(cat. 5-7) in terms of priority bird species present; these were assigned 'priority A'. Priority A areas are found within the limits of priority B zones in all cases. Characteristically, they are found on the continental shelf, around breeding islands or where key oceanographic features (fronts, upwellings) occur. Also, outstandingly, in the Strait of Gibraltar Information on seabird distribution can be further completed and updated from other sources (telemetry GIS, GLS, PTT) as it becomes available, and used to provide quantitative evidence of use of the [pre]selected areas. Using GIS, seabird distribution can be analyzed against environmental and oceanographic variables, with several examples being provided. This exercise represents an initial step towards the selection of protected areas for seabirds at pan-Mediterranean scale and has been developed in the framework of the activities of UNEP RAC/SPA.

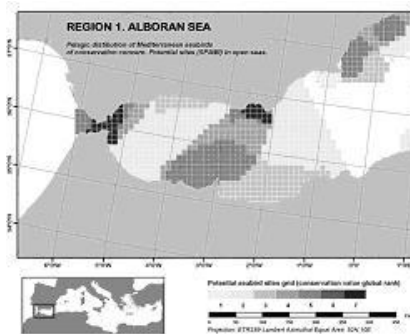


Fig. 1. Sample map of Region 1-Alboran Sea

The following trends were observed:

- the Mediterranean Sea revealed quite heterogeneous in terms of seabird distribution
- nearly two-thirds (59.32%) of the sum of cells had insignificant presence of priority species (cat. 0-1) and large areas of the ocean had relatively low value –with the available information. ‘Poor’ areas concentrated mostly in the eastern Mediterranean basin, particularly the southern latitudes. Also, in general terms, deep-water areas were poorer in their presence of pelagic birds.
- inversely, priority bird species were present in only about one-third (40.68%) of the total cells
- priority bird species were somewhat dispersed over the areas where they were present; no single cells had a value >7, when the highest possible value was 11
- nearly one-fourth (29.04%) of the sum of cells corresponded to cat. 2-4; these were assigned ‘priority B’. The distribution of priority B areas marked the influence of large-scale ocean graphical features (increased productivity, mixing of waters, bathymetric zone) and revealed as a general indicator of areas of conservation interest for seabirds. Given the paucity of data for some species and regions, priority B areas were taken as ‘good areas’ for the development of a network of marine protected areas for the conservation of seabirds
- less than 10% (11.64%) of the total sum of cells had the highest importance

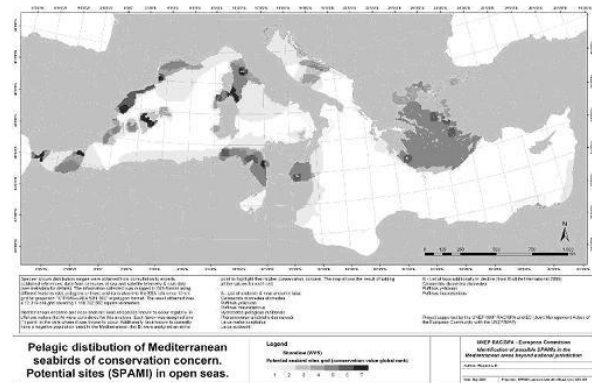


Fig. 2. General map of Mediterranean “Pelagic distribution of Mediterranean seabirds of conservation concern. Potential sites (SPAMI) in open seas”

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