PLANNING FOR CONSERVATION IN THE MEDITERRANEAN SEA: AN ECOREGIONAL APPROACH

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Abstract

Our study demonstrates that setting conservation targets for each Mediterranean ecoregion, can lead to outcomes more comprehensive in the representation of the Mediterranean biodiversity overcoming the great variability in availability of biodiversity and socioeconomic data among countries.

Keywords: Biodiversity, Conservation, Coastal management, North Adriatic Sea, Aegean Sea

Despite the agreement by most Mediterranean countries to conserve 10% of the sea by 2020 under the Convention on Biological Diversity, only 4.6% of the Mediterranean Sea is currently included in Marine Protected Areas (MPAs). Furthermore, there is a striking imbalance in MPA distribution, as 96% is located in the northern basin [1]. Consequently, current MPAs only partially protect the Mediterranean biodiversity in terms of functional and phylogenic diversity [2].

Tyrrhenian Sea, 4. Tunisian Plateau/Gulf of Sidra, 5. Adriatic Sea, 6. Ionian Sea, 7. Aegean Sea, and 8. Levantine Sea.

We identified priority areas throughout the Mediterranean Sea for the conservation of *Posidonia oceanica* meadows, coralligenous formations, and marine caves. To achieve this goal, we set conservation targets on the critical habitats, according to EU guidelines (60% of their distribution), as well as for each Mediterranean ecoregion (10% of the planning area) as defined by Notarbartolo di Sciara and Agardy [3], and used the prioritization software Marxan. The socioeconomic data included in the analyses, contained information on opportunity cost for fishing and aquaculture across the Mediterranean Sea.

While the spatial distribution of priority areas changed after setting ecoregional targets, the Adriatic and Aegean Seas remained high priority areas for conservation (Figs. 1a, b). The more even distribution of priority areas in our proposed network, in comparison to a whole-basin approach ignoring ecoregion representation, makes this plan more representative of the functional diversity across the basin. Moreover, it increases the resilience of the ecosystems to ongoing environmental and biological changes in the Mediterranean Sea, such as climate change and the introduction of invasive species.

References

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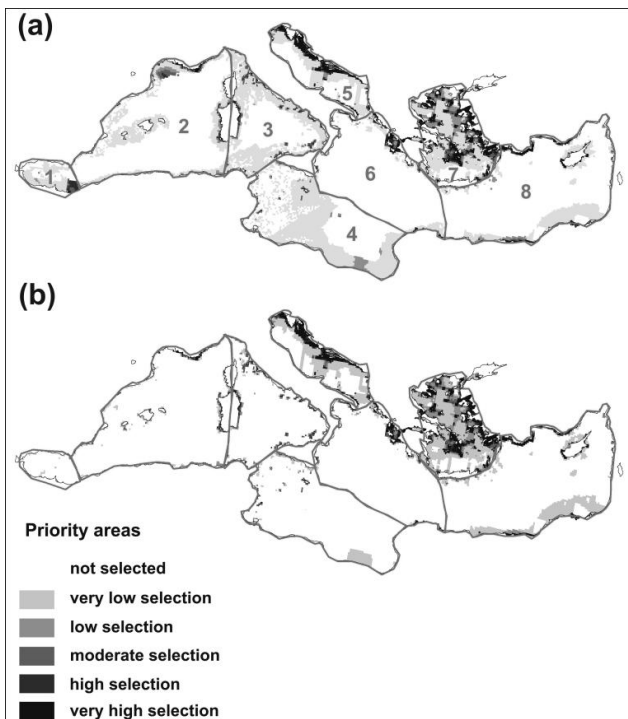
Fig. 1. Priority areas for *P. oceanica*, coralligenous formations and marine caves in the Mediterranean Sea: a) with ecoregion targets; b) without ecoregion targets. Planning units depicted in darker shades present higher selection frequency and therefore are of higher priority. The red polygons correspond to the 8 Mediterranean Ecoregions: 1. Alboran Sea, 2. Algero-Provencal Basin, 3.