

Abstract

Identifying Priority Conservation Areas for Iberian Freshwater Fish: National vs. Transboundary Approach [†]

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Abstract

Introduction: Freshwater habitats underpin global biodiversity and provide an array of essential ecosystem services to humans. However, threat hotspots like the Iberian Peninsula combine severe anthropogenic impacts (habitat degradation, climate change, and biological invasions, among others) with a high number of endemic range-restricted freshwater species. Despite the urgency, current conservation actions fall short of providing adequate protection. The irreplaceability index has been proposed as a useful assessment tool to focus limited efforts on areas that provide the highest benefit for threatened species. However, the transboundary nature of many rivers in the Iberian Peninsula can be a source of inefficiencies in protection if prioritisation efforts are conducted at a national rather than a peninsular scale. **Objective:** The aim of this study is to identify priority conservation basins for threatened native freshwater fish in the Iberian Peninsula and to evaluate the impact of national versus transboundary management strategies on the spatial protection afforded to these species. **Methodology:** The irreplaceability index was calculated for each basin by integrating basin richness, species rarity and their IUCN Red List conservation status. First, we modelled the species' probability of presence using field observations recorded since 2000. Rarity was then calculated as the ratio between the modelled probability and the total number of basins within the species' theoretical natural distribution. We then weighted each species' rarity by its IUCN Red List conservation status, with higher weights to threatened species. We then calculated the basin irreplaceability index as the sum across all the species present in the basin of their conservation status-weighted rarity and ranked them according to this index. We replicated this approach considering Spain and Portugal independently, and both countries as one conservation planning unit. **Results and Conclusions:** The most irreplaceable basins were those harbouring a high density of threatened, narrow-range endemics. The priorities in each country differ depending on whether management strategies adopt a national or a broader geographical approach. Therefore, effective conservation requires transboundary planification to safeguard the shared biodiversity across countries.

Keywords: irreplaceability; Iberian Peninsula; transboundary management; biodiversity hotspots



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