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Abstract

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Abstract

Fish Communities in the Lower Tagus Inland Wetlands: From Anthropogenic Pressures to Conservation Management [†]

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Abstract: Inland wetlands are important biodiversity hotspots and amongst the most impacted ecosystems worldwide. Conservation management and restoration actions in wetlands are thus urgently needed to reverse trends in species loss and habitat degradation, particularly in regions harbouring already endangered endemic species. Inland wetlands may play an important role in supporting endemic endangered fishes in the Lower Tagus basin, where anthropogenic pressures have been increasing, but there is a lack of studies on fish communities, and few areas are identified as inland wetlands. Here, we aim to identify small inland wetlands in the Lower Tagus River and their potential role in supporting fish species, constituting the first study to identify and evaluate the most important fish communities. Inland wetlands were identified through the usage of remote sensing techniques and the calculation of a Normalized Difference Water Index (NDWI) with Sentinel-2 imagery for the Lower Tagus region. From a total of 486 locations identified, 31 were recognized as wetlands as having potential to host fish communities, with 11 being selected for sampling after in loco assessment. Fish sampling was conducted between 6 May and 11 June 2021. Furthermore, for each wetland, we evaluated anthropogenic stressors and land use changes between 2007 and 2018, using national land use data (i.e., Carta de Uso e Ocupação do Solo). A total of 7727 fishes from eight non-native and five native species were captured. Overall, fish communities were dominated by non-native species (97% catches), but both European eel (*Anguilla anguilla*) and Lisbon arched-mouth nase (*Iberochondrostoma olisiponense*), which are globally classified as critically endangered (CR), were found in at least two wetlands. Our results suggest that, over the last 10 years, intensive agriculture decreased (on average $\approx 3\%$) in the areas surrounding these wetlands, being replaced by extensive agriculture or natural uses. Despite non-native fish prevalence, some wetlands may act as refuge habitats for CR fish species. These results are important for guiding the restoration of inland wetlands and promoting conservation management actions to help reverse fish diversity loss.

Keywords: remote sensing; aquatic habitats; endangered fish species; invasive species; freshwater biodiversity

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