Conservation and restoration of coastal reed beds in the context of global change: risk of habitat fragmentation for specialist marshland passerines

Raphaël Musseau*, Malaury Crépin*, Chloé Brugulat* and Christian Kerbiriou

a BioSphère Environnement, 52 quai de l'Estuaire, 17120 Mortagne-sur-Gironde, France
b Centre d’Ecologie et des Sciences de la Conservation (CESCO), UMR7204 MNHN-CNRS-UPMC-Sorbonne Université, 55 Rue Buffon, 75005 Paris, France
c Station de Biologie Marine, Place de la croix, 29900 Concarneau, France

*Corresponding author. ORCID n°: 0000-0003-3825-6418.
E-mail: r.musseau@biosphere-environnement.com

Abstract

In the context of coastal marshland reduction due to sea level rise, we evaluated the interest of fragmented reed beds (FRB) located within agricultural polders for the conservation of habitats exploited by marshland passerines characterised by different ecological requirements. On the North bank of the Gironde estuary (France), we studied trophic potentialities and the occupancy level of marshland passerines, comparing results obtained for FRB with results obtained for large uniform reed beds (URB). Analysing relative densities, body condition and the diet of breeding birds during the breeding period as well as the number, the local inter-daily survival rate and the body mass evolution of birds during the post-breeding period, we demonstrate that fragmented reed beds within inland meadows can: (i) present an obvious trophic interest for marshland passerines; (ii) generate habitats significantly exploited by species with a large ecological plasticity, such as the Reed Warbler that could benefit from edge effects of habitat fragmentation; (iii) offer low attractiveness for specialised migratory species such as the Aquatic Warbler, species apparently very sensitive to the effects of reed bed fragmentation. In the context of sea level rise, these results illustrate that the arrangement of inland meadows with hydraulic management policy allowing the development of reed bed patches can constitute an interesting trade-off between maintaining agricultural activities and maintaining ecological functionalities provided by coastal wetlands. Nevertheless, in order to ensure the ecological functionalities of habitats for species particularly sensitive to the vegetation structure, independently of their biological richness, these results also reveal the risk of habitat fragmentation effects that must be taken into account in wetland restoration plans.

Keywords: Aquatic Warbler, coastal marshes, Reed Warbler, sea level rise, wetland conservation