

Extensive organic grazing on rear Atlantic coastal meadows: a solution to compensate losses of intertidal wetland ecological functions in the context of global changes?

Raphaël Musseau^{1,2,3*} & Sonia Beslic^{1,2,3}

¹BioSphère Environnement, 52 quai de l'Estuaire, 17120 Mortagne-sur-Gironde, France (biosphere-environnement@orange.fr).

²Groupement d'Intérêt Scientifique « Atlantic Flyway Network » (<http://atlanticflyway.org>).

³Réseau Français d'Ornithologie (RFO), BP 10008, 17120 Cozes, France (www.reseau-francais-ornithologie.fr).

*Corresponding author, e-mail: r.musseau@biosphere-environnement.com.

Abstract:

Each year, the East-Atlantic European coast hosts millions of birds, migrating from their breeding areas to their wintering areas in Southern Europe or in Africa. As an example, in summer, probably all young Aquatic Warblers (*Acrocephalus paludicola* - an endangered species breeding in Central Europe and wintering in West Africa) migrate by the East-Atlantic coastline and stop in France to refuel [1]. A genetic memory, built all along the evolutionary history of the species, allowing a migration route through dense webs of wetlands to optimize survival probabilities of birds, probably explains such a route [2]. The most important French stopover sites identified for the species are intertidal wetlands of the Bay of Biscay [3] where birds particularly exploit low vegetation of the lowest part of the shores to refuel [4]. Recently in this area, the right bank's shore of the Gironde estuary has been identified as a major stopover site for the Aquatic Warbler [5]. Since 1970, this estuary is exposed to an erosive dynamic [6] and shore's gentle slopes tend to turn into steep slopes with the loss of the lowest intertidal wetlands colonized by specific vegetation exploited by species such as the Aquatic Warbler. In addition to local erosion issues noted in areas such as the Gironde estuary, the global rising sea level (26 - 82 cm expected by the end of the century [7]) raises the question of the future of ecological functions ensured by a large part of Atlantic intertidal wetlands which have no possibilities to migrate naturally inland because of human settlements (dikes, roads, and other infrastructures blocking their migration possibilities). Today, three solutions to maintain ecological functions of intertidal wetlands along the Atlantic coastline appear interesting to consider: 1) locally, the given back of reclaimed lands (depolderization) 2) the creation of new wetlands behind dikes of agricultural polders; 3) the development of wetlands in reclaimed lands through agri-environmental measures encouraging, for instance, extensive organic grazing on rear coastal meadows. The last alternative suggested, can offer the possibility to develop large wet vegetated ditches between agricultural parcels, connected to marine waters and partially or fully submitted to tidal influence. Such management in rear coastal areas could guarantee a long-term conservation of an important part of trophic webs threatened by global changes affecting the lowest intertidal lands. This solution, allowing the maintenance and development of a specific agricultural sector with high added value products and the development of ecosystem services provided by wetlands (like water purification), is probably the alternative to compensate intertidal wetland losses able to gain more easily large public acceptance. This management option highlights the key role of farming policies on rear coastal areas to prepare the future of intertidal wetlands given global changes that are under way. It also reveals the joint key role and the responsibilities of environmental and agricultural governance for the conservation of habitats threatened by global changes.

Key words: agri-environmental measures, climate change, environmental and farming governance, erosion, habitat management, rising sea level.

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