

# Habitat value of tidally restored marshes for fish and macrocrustaceans: feedback from two study cases in the Gironde estuary

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Estuarine intertidal flats and marshes act as refuge, feeding and nursery grounds for fish and macrocrustaceans. Because of land claim, those habitats have greatly declined in Europe. However, an increasing number of former polders have been tidally restored since 1990. Tidal restoration raises concern about the ecological trajectories of restored sites and their functional equivalence with natural intertidal habitats.

In the Gironde estuary, two sites have been tidally restored since 1999 and 2010 respectively: the Mortagne marsh, a former polder of the mesohaline zone, and the northern part of the île Nouvelle, an island in the oligohaline zone. Both sites were monitored during 2011-2013.

Fish assemblages of the restored sites showed striking structural similarities with natural marshes and mudflats. Both sites were numerically dominated by *Pomatoschistus microps* whereas *Liza ramada* was the main contributor to biomass. The restored habitats seemed to act as feeding grounds for juveniles and adults or subadults of *P. microps*, *L. ramada*, *Anguilla anguilla* and *Platichthys flesus*. Juveniles of estuary-dependent marine species were seldom caught on the île Nouvelle but seasonally abundant in Mortagne marsh suggesting nursery function. In summer, 0-group *Dicentrarchus labrax* and *Sparus aurata* and 1-group *L. ramada* were shown to reside and grow in artificial ponds dug in the vicinity of Mortagne marsh.

Tidal restoration had a strong extinction effect on the exotic species which thrive in the ditches of the southern part of the île Nouvelle. Tidal restoration promoted species with recreational or commercial fishing interest. Nevertheless, no clear positive effect was observed for species threatened with extinction or protected by European regulation.

Mid-term feedback from the restoration of Mortagne marsh also reveals that its habitat value for aquatic organisms may have started to decline as a result of the natural filling dynamics and the development of extensive reed and cordgrass stands