EGU23-15449, updated on 21 Feb 2024
https://doi.org/10.5194/egusphere-egu23-15449
EGU General Assembly 2023

Preliminary results of salt marsh transplants in rewilded coastal wetlands

Inês Carneiro[1], A. Rita Carrasco[1], Karin Didderen[2], and Ana I. Sousa[3]
[1]University of Algarve, Centre for Marine and Environmental Research (CIMA), Portugal (ines.catarina.duarte.carneiro@imbrsea.eu, azarcos@ualg.pt)
[2]BESE - Waardenburg Ecology, Varkensmarkt 9, 4101 CK Culemborg, The Netherlands (k.didderen@bese-products.com)
[3]CESAM – Centre for Environmental and Marine Studies, Department of Biology, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal (anaisousa@ua.pt)

The loss of coastal wetlands in the last decades has been dominated by human-induced pressures and sea-level rise. Still, wetlands restoration has gained political momentum (e.g., the UN Decade on Ecosystem Restoration 2021-2030) as means of coastal protection, while supporting nature values and its biodiversity, addressing causes and consequences of climate change and securing ecosystem services for human well-being. Assessing the success of ecological restoration projects is thus critical to support the use of restoration actions as a natural enhancement of ecosystem health and to improve current restoration practices. Though there is plenty of information about seagrass transplant and restoration, less is known about salt marsh restoration.

We conducted a salt marsh vegetation transplant experiment in a rewilded wetland in the Ria Formosa coastal lagoon (South Portugal). This study aimed to (1) advance knowledge on the facilitation of pioneer salt marsh species colonization and development in rewilded wetlands, and (2) monitor the evolution of flora biodiversity and phytosociology over time. Two pioneer and perennial halophyte species, the *Spartina maritima* and the *Sarcocornia perennis*, were transplanted from a natural donor place into a rewilded marsh. Biodegradable 3D BESE-elements® were implemented to facilitate the salt marsh plant establishment, sedimentation process, and natural recovery process. Data collected include ecological datasets, sediment characteristics, and hydrodynamics.

Early results from the transplant experiment show that, four months later, *S. maritima* has successfully adapted to the restored area, while several transplants of *S. perennis* did not survive after this period. *S. maritima* leaves length increased on average >30% since the transplant was implemented. The elevation gradient, sediment geochemistry in the transplanted area, and probably the timing of the transplants were found to be determinants for *S. perennis* survival. The preliminary results of this study highlight the importance of considering the bio-physical interactions in salt marsh restoration projects, and the use of environmental indicators to evaluate wetland-based solutions performances.