

O45.2**Innovative solutions for estuarine salt marshes restoration – An experimental study.**

Carlos Gonçalves^{1,2}, Bárbara Camarão^{3,2,4}, Paulo Venda Oliveira^{3,5,6}, Bernardo Duarte^{1,2}, Isabel Caçador^{1,2}, Helena Veríssimo^{3,2,4}, Zara Teixeira^{3,2,4}, Tiago Verdelhos^{3,2,4}

¹University of Lisbon, Portugal. ²MARE - Marine and Environmental Sciences Centre, Portugal.

³University of Coimbra, Portugal. ⁴UC - Department of Life Sciences, Portugal. ⁵ISISE - Institute for Sustainability and Innovation in Structural Engineering, Portugal. ⁶UC - Department of the Civil Engineering, Portugal

Abstract

The project ReSEt – Restoration of Estuarine Salt marshes Towards Sustainability is an ongoing pilot study in the Mondego estuary (Portugal), aiming to develop innovative solutions for the protection and restoration of estuarine habitats and biodiversity. Its main goal is to test and validate applicable, sustainable and environmentally friendly techniques, assessing their application potential in management programmes. Thereby, three operational objectives were defined: 1) to test eco-engineering techniques to promote protection and long-term elevation of saltmarsh habitats – for which an experimental assay, with 5 treatments, was installed: a) control (no plants or structures); b) with plant; c) wooden palisade; d) geotextile blanket; e) geotextile bags with sand; 2) to evaluate the efficacy of plant transplantation techniques – which includes the transplantation of autochthonous macrophytes species (e.g. *Halimione portulacoides*, *Bolboschoenus maritimus*, *Zostera noltii*) from natural patches to an experimental unvegetated site using: a) direct transplantation; b) laboratorial grown cuttings; c) plant seeds. To assess the effectiveness of these techniques, ecological response was evaluated, through regular monitoring of both the experimental sites and the natural ecosystem, determining: a) sedimentation rate; b) sediment characteristics; c) water quality; d) plant coverage, density and biomass; f) diversity, abundance and biomass of macrobenthic community;. On the other hand, installation costs, technical requirements and impacts will be evaluated and estimated for future management plans implementation, considering possible “scale-up” needs. Preliminary results indicate that the tested eco-engineering solutions are increasing sedimentation and elevation of the saltmarsh, with positive impacts on the associated macrofauna. Close collaboration of multidisciplinary scientific teams with engineering companies was essential in this project, and is certainly required for the successful implementation of restoration programmes.

Keywords

restoration, estuarine salt marshes, eco-engineering, macrophytes transplants