Subtidal seagrass restoration in South Portugal: 2007-2031

- Biomares 2007-2011 Life
- Inforbiomares 2018-2021 PoSeur
- Restorseas 2021-2025 Biodiversa
- Restorseagrass 2024 – 2031 Life

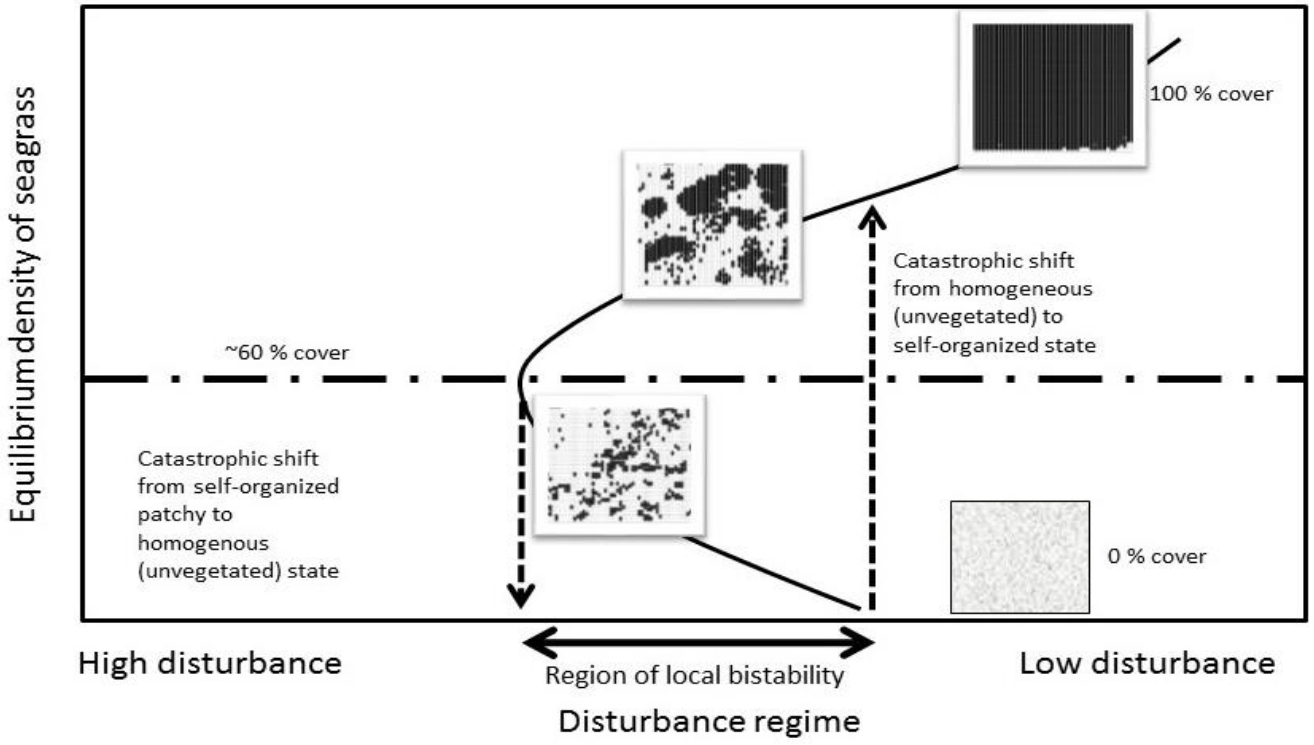
CCMAR
Centro de Ciências do Mar
Algarve

The problem

Shifting stable states

When key components are disturbed beyond a threshold ecosystem stable state is disrupted

Shift from vegetated to un-vegetated seafloor



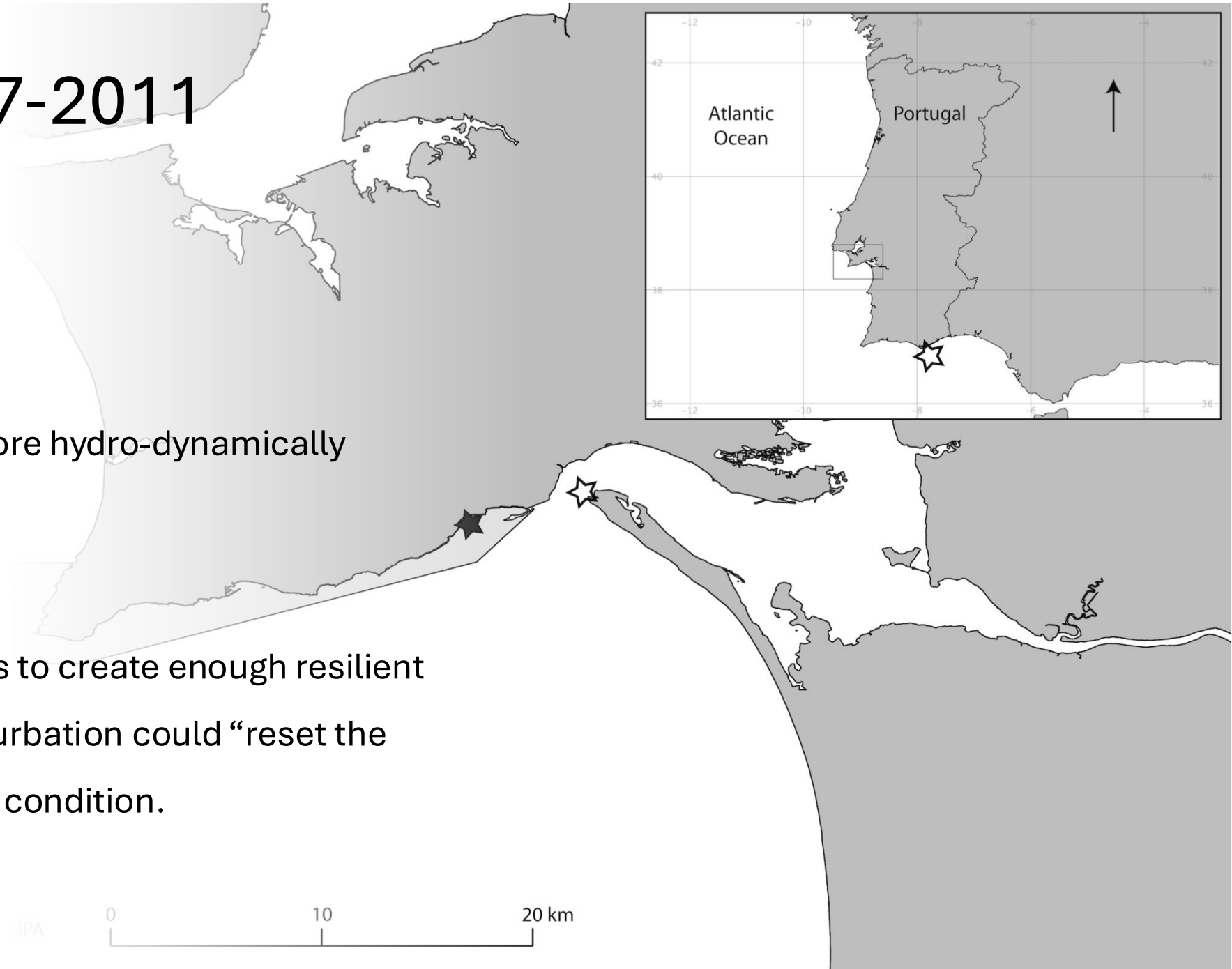
Few studies have linked disturbance regimes with seagrass meadow response on a landscape scale

Biomares 2007-2011

programa **biomares**
No mar da Arrábida desde 2007

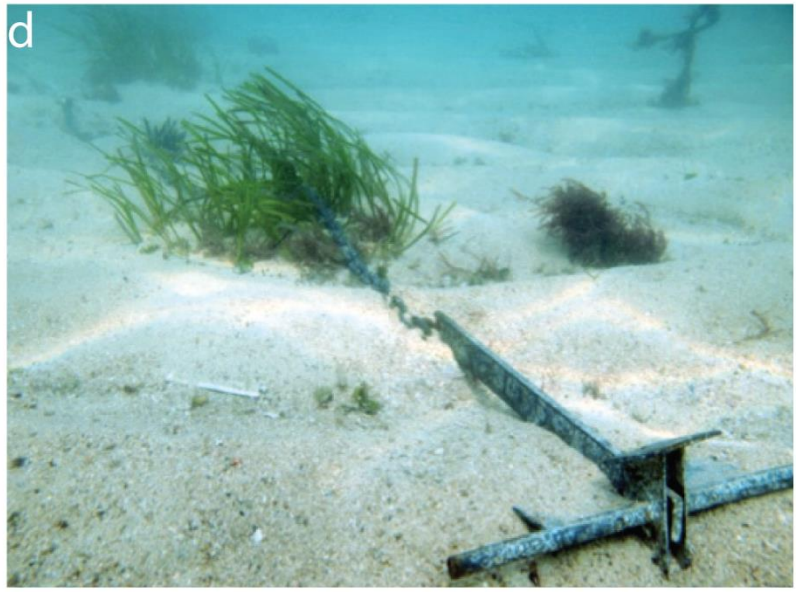
- Restoration attempts in more hydro-dynamically exposed coasts are few

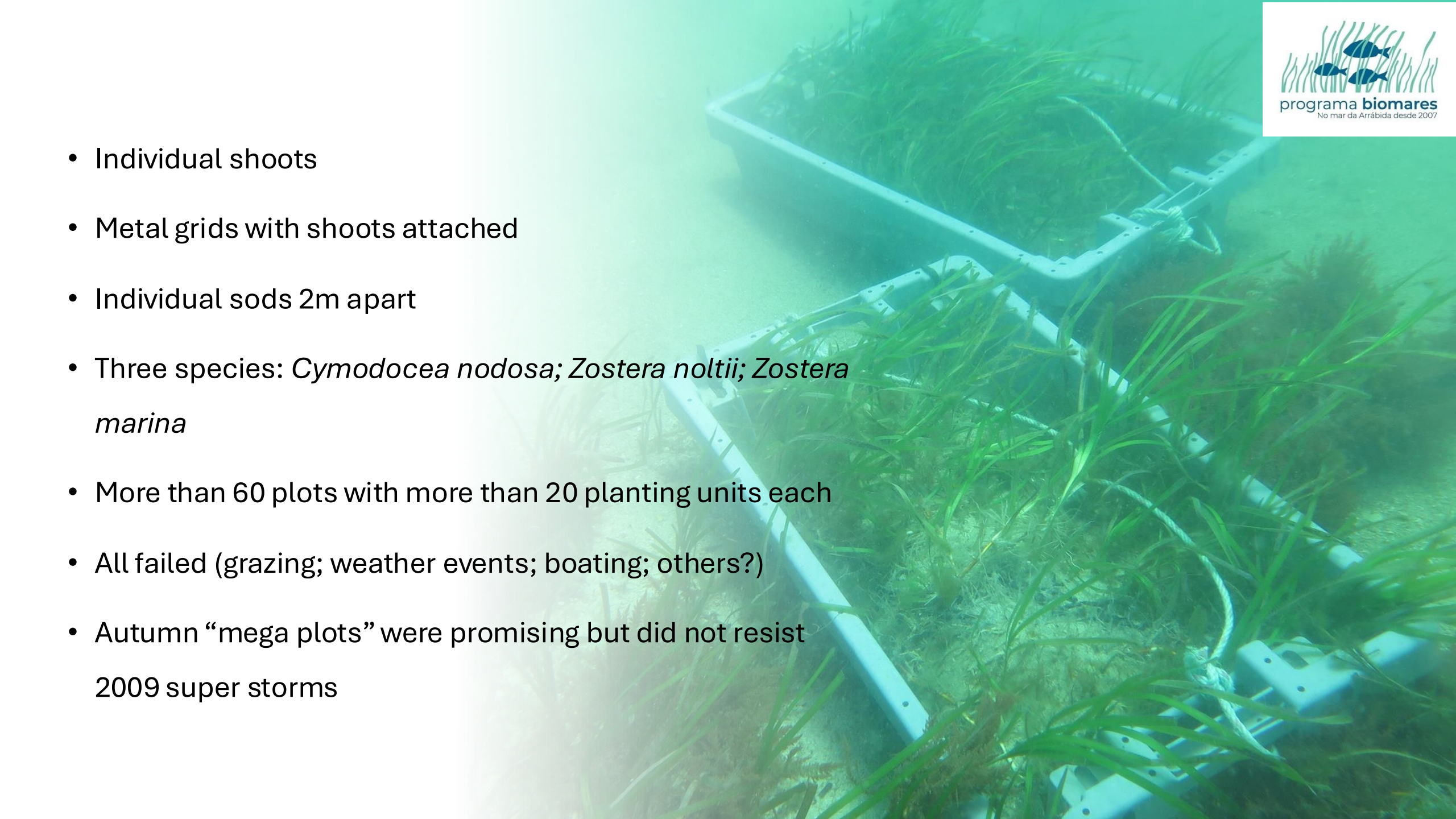
- One goal of the project was to create enough resilient seagrass habitat before perturbation could “reset the clock” back to the bare sand condition.



programa biomares
No mar da Arrábida desde 2007

Open coast site in a Marine Park lost all seagrass cover 30 ha by 2007





- Individual shoots
- Metal grids with shoots attached
- Individual sods 2m apart
- Three species: *Cymodocea nodosa; Zostera noltii; Zostera marina*
- More than 60 plots with more than 20 planting units each
- All failed (grazing; weather events; boating; others?)
- Autumn “mega plots” were promising but did not resist 2009 super storms

Biomares 2007-2011
+
Inforbiomares 2018-2021

- Transplants done in Spring 2010
- "Mega Plots" 10m^2 plots of continuous seagrass sods
- Species: *C. nodosa; Z. noltii; Z. marina*
- All survived for weeks and some for months
- Long term survival and growth (2010-2025)

Z. marina

RestoreSeas 2022-2025

RESTORESEAS

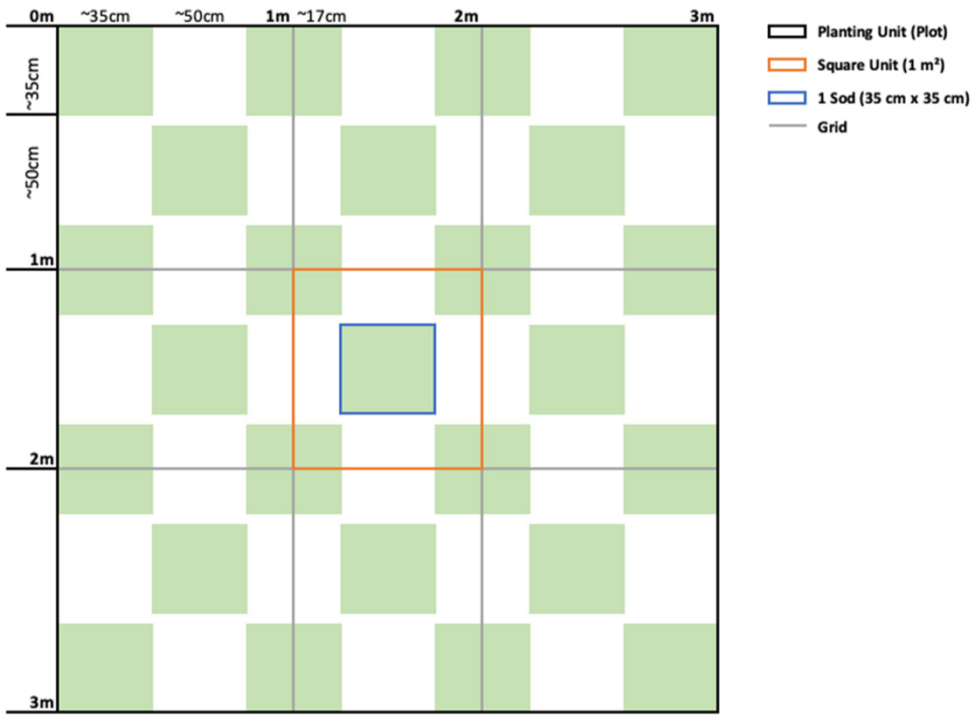
Water JPI

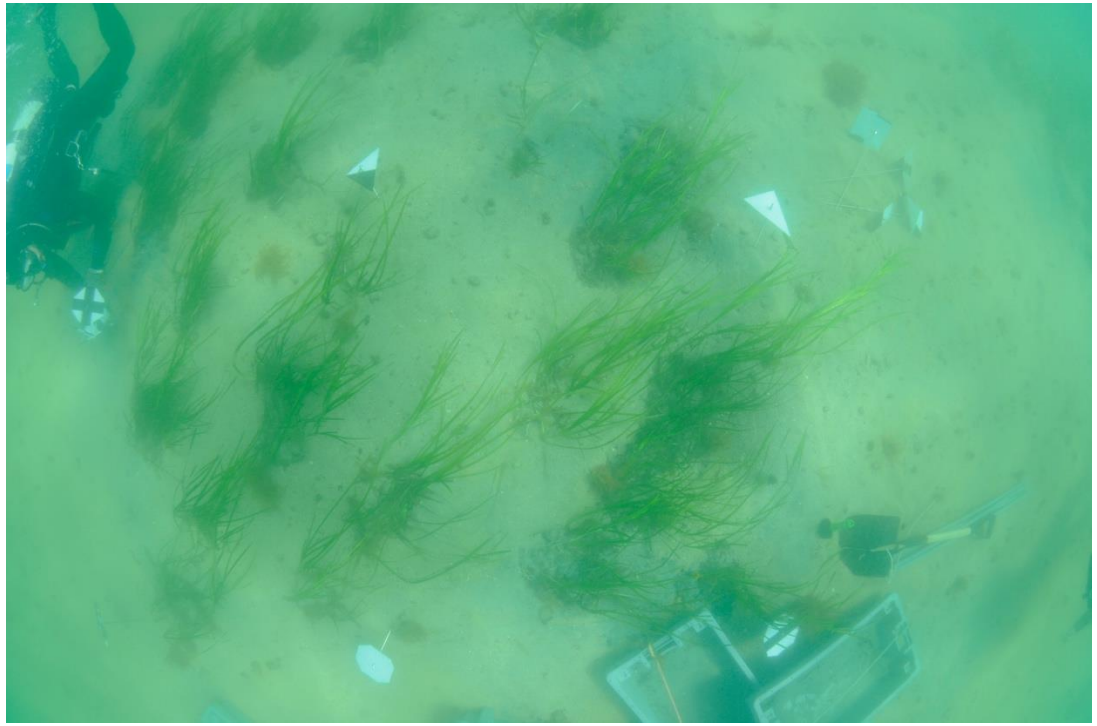
biodiversa

Objective:

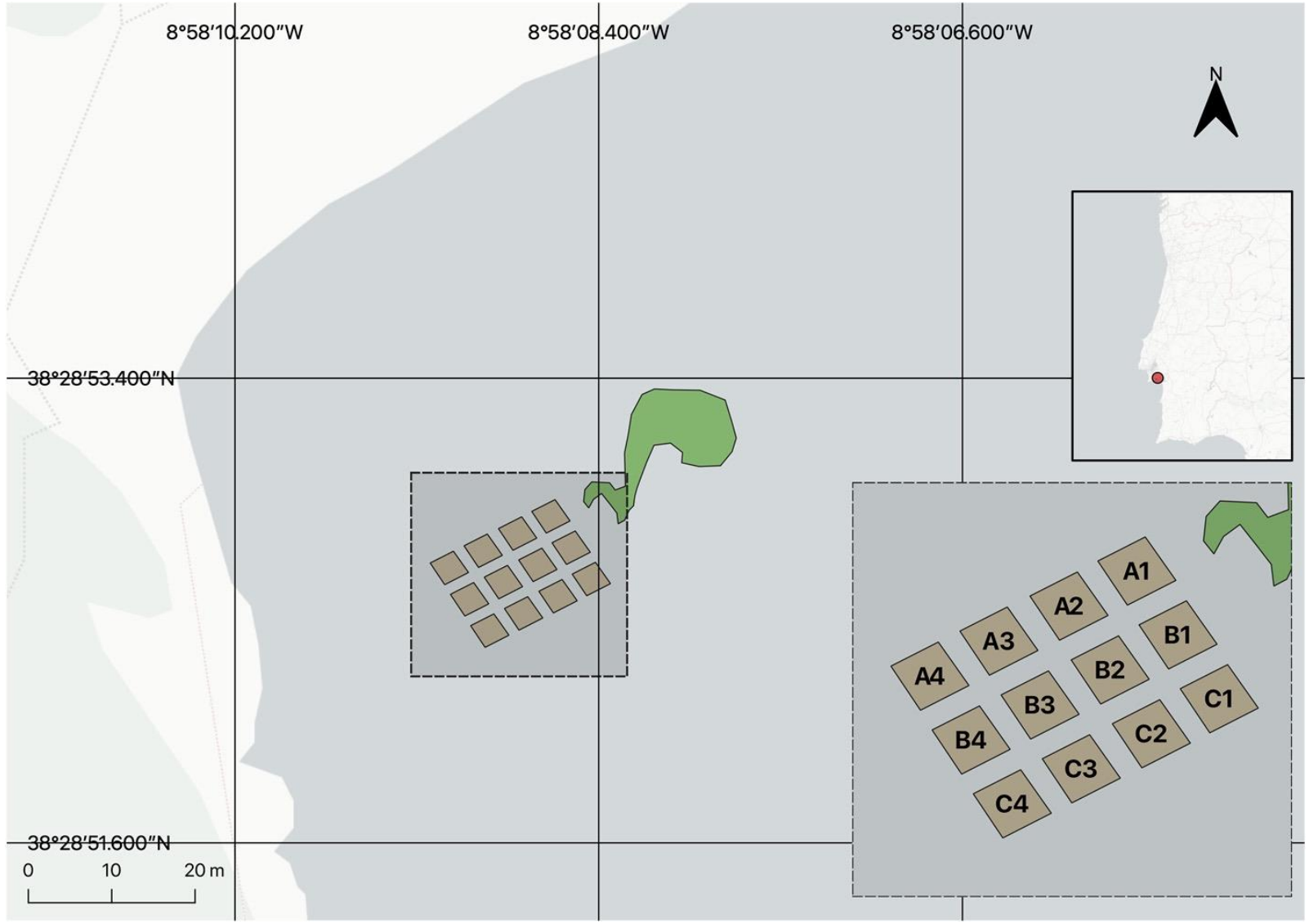
Testing minimum biomass transplants for subtidal *Z. marina* and *Z. noltii*

RESTORESEAS





RESTORESEAS



RESTORESEAS

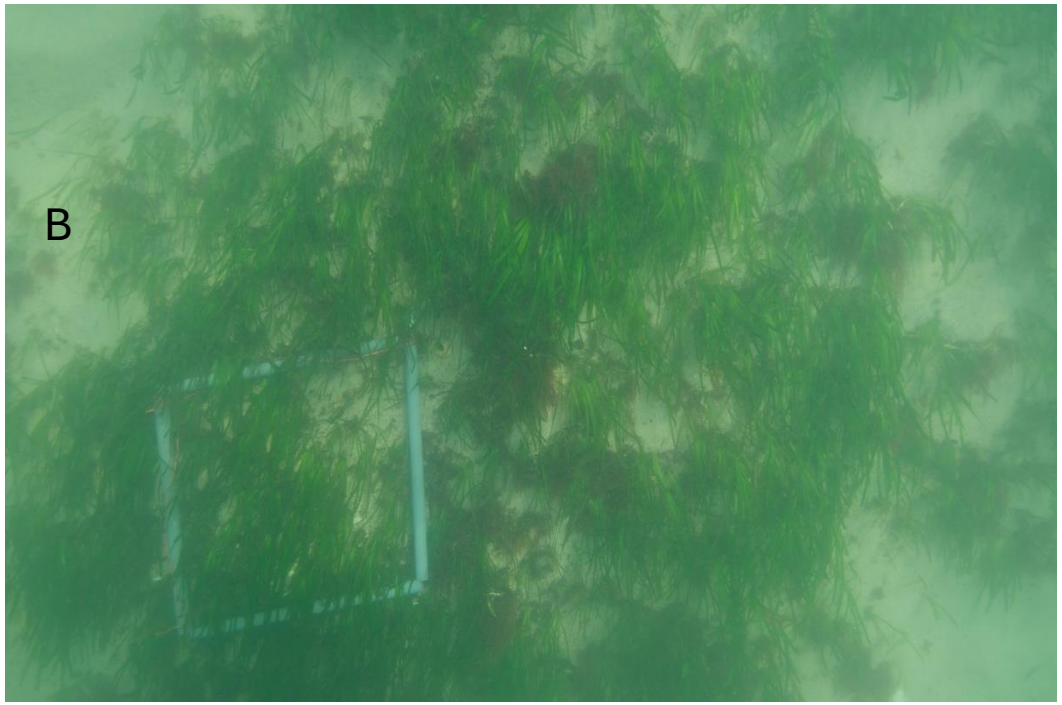


Image A
Zostera noltii after 6 months of transplant

Image B
Zostera marina after 6 months of transplant

- Successful method for *Z. marina*
- Sedimentation buried the most exposed plots
- Coalesced with the 2010
- Resulting in 1000 m^2 seagrass habitat restored with additional transplants

Open Access Article

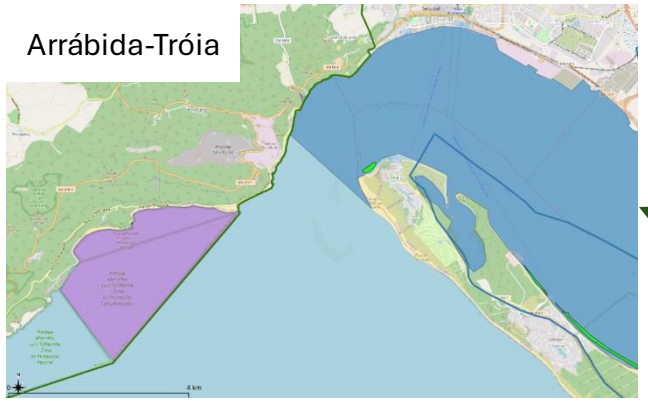
Less Is More: Seagrass Restoration Success Using Less Vegetation per Area

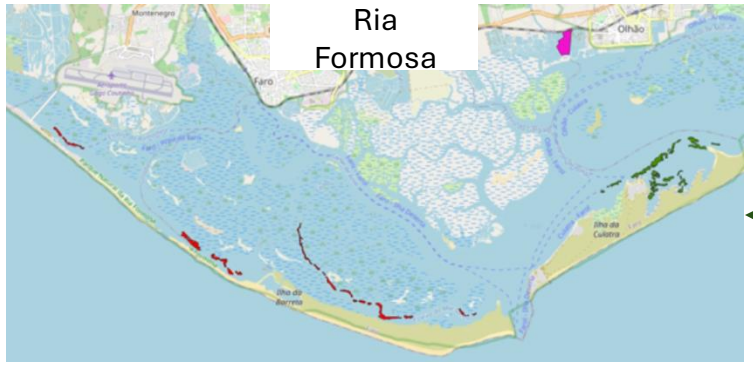
by Carolina V. Mourato [1], Nuno Padrão [1], Ester A. Serrão [2] and Diogo Paulo [1,*]

Large-scale conservation and restoration of critically threatened seagrass habitat on Atlantic infralittoral sand and coastal lagoons

LIFE23 Nature

DURATION: 2024 2031





55 ha of subtidal seagrass meadows lost over 12 years in Ria Formosa (21%)

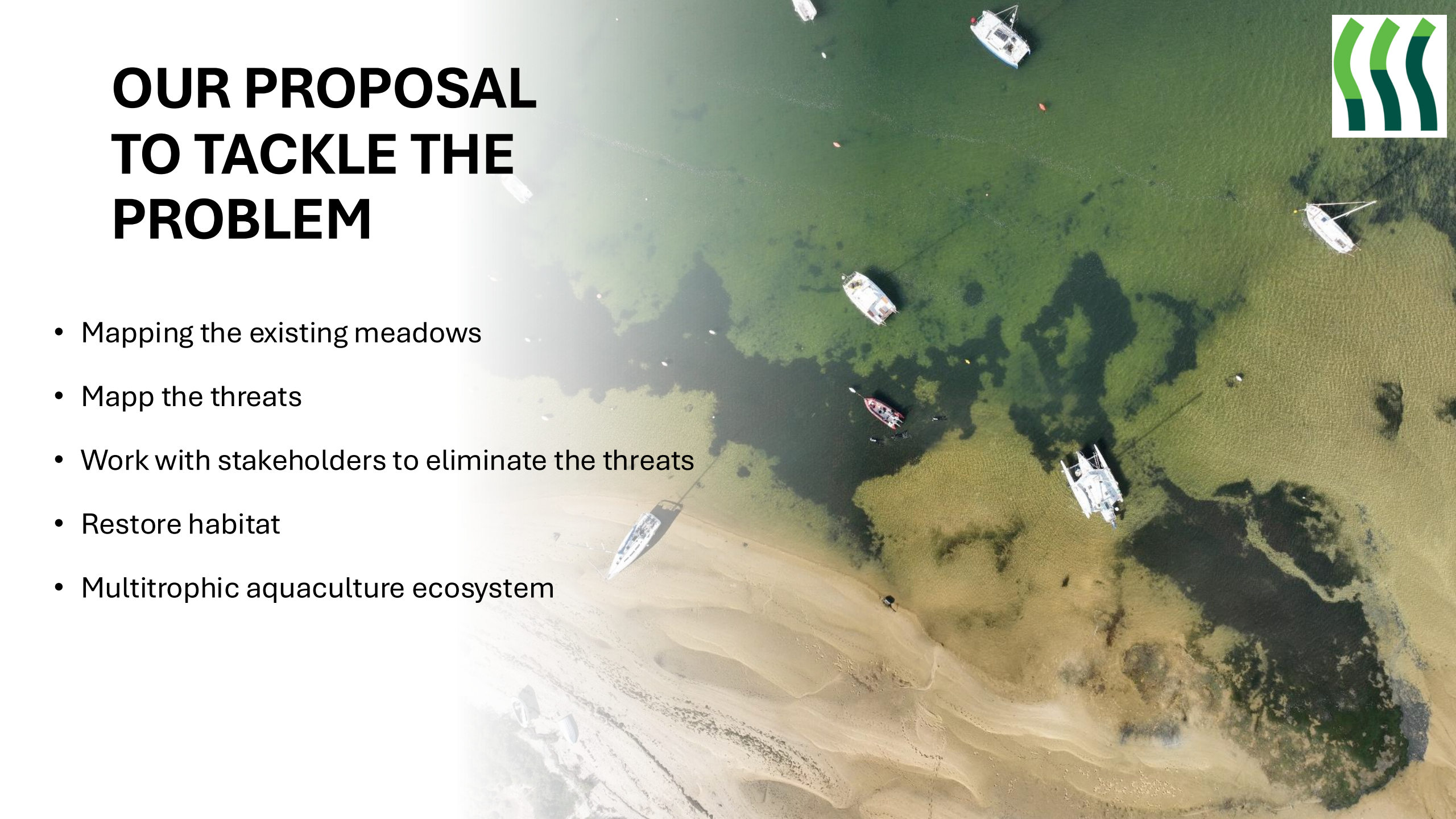
Seagrass habitat loss.
mechanical threats, invasives

2007-2011, LIFE-BIOMARES
reintroduced locally extinct seagrass.

Need to upscale (more area, more sites) solutions to the loss of priority habitats:

Contributes to:
- EU Nature and Biodiversity legislation in the EU Birds and Habitats Directive (incl. Natura2000) + Regulation 1143/2014 on Invasive Alien Species
- EU Biodiversity Strategy 2030 - the EU Restoration Plan

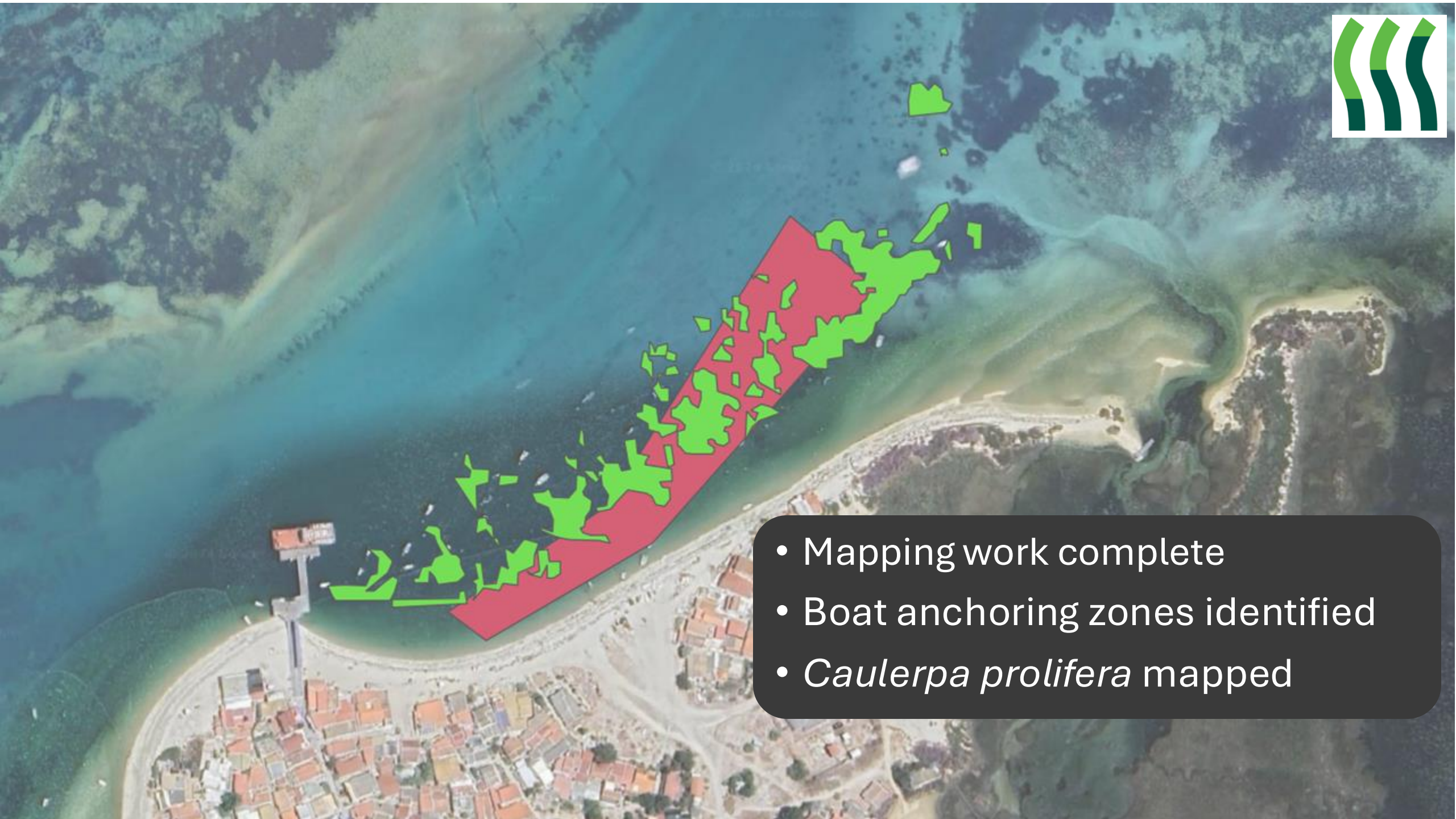
OUR PROPOSAL TO TACKLE THE PROBLEM



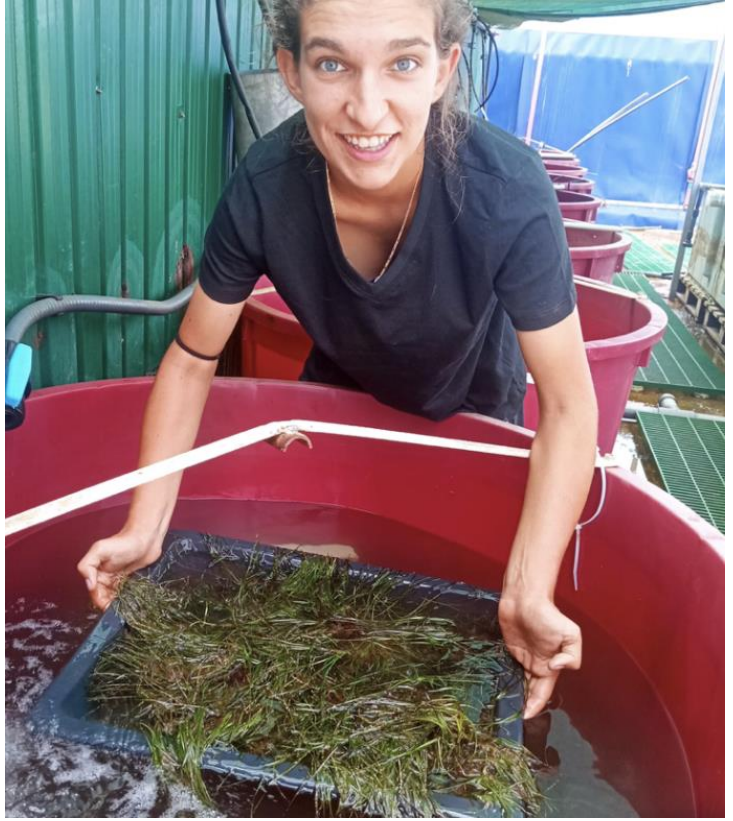
- Mapping the existing meadows
- Mapp the threats
- Work with stakeholders to eliminate the threats
- Restore habitat
- Multitrophic aquaculture ecosystem

WHAT WE EXPECT TO ACHIEVE

- 185 ha of seagrass loss prevented
- 7 ha of seagrass planted
- Saltpans re-shaped to plant seagrass
- Problem solving with stakeholders
- Society base approach with ADOPT program


• Mapping work complete
• Boat anchoring zones identified
• *Caulerpa prolifera* mapped

Multitrophic aquaculture ecosystem



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Co-financiado por:

Parceiros: