

Bio Ilhas Project: Science, Education, and Awareness for River Conservation

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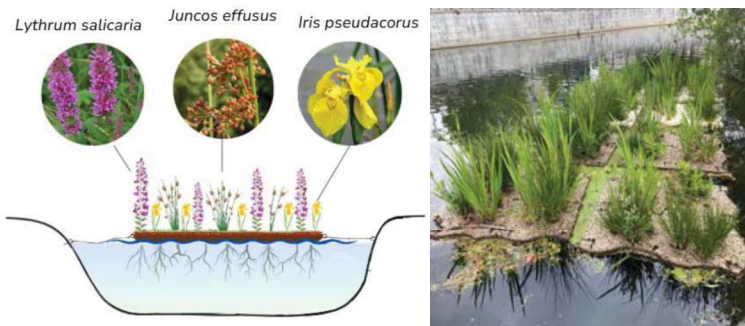
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INTRODUCTION & AIM

Floating Treatment Wetlands (FTWs) are nature-based solutions (NbS) that have gained increasing attention over the past decades for their effectiveness, low cost, and minimal maintenance requirements in improving water quality across diverse aquatic environments [1]. One of the key ecosystem services provided by FTWs is the promotion of biodiversity, especially in environments degraded by human activity, creating habitats, refuges and nursery areas for diverse aquatic and terrestrial organisms [2]. In this context, the present project aims to implement innovative natural engineering solutions to mitigate the effects of anthropogenic pressure and promote greater biodiversity within aquatic ecosystems. Additionally, it demand to enhance the valorization of local ecosystems and ensure equitable access to scientific knowledge.

METHOD

Two **vegetated floating islands** (4m² each) were installed in the **Fervença River** (Bragança, Portugal). The islands were constructed using cork agglomerate and recycled expanded polystyrene (EPS) as buoyant materials and vegetated with three plants species to enhance ecological performance.



The monitoring of the Bio Islands was structured around four main components:

1. Water Quality Monitoring:

- In situ: pH, conductivity, dissolved O₂, temperature, TDS.
- Laboratory: nutrients (P, N forms), COD, BOD₅, coliforms, *E. coli*.

2. Plant Performance:

Periodic assessment of the growth, adaptation, and coverage of the selected).

3. Associated Biodiversity:

- Sampling of macroinvertebrate communities in the root zone and river margins for comparative analysis.
- Photographic and video recording of the colonization of the islands by macrofauna and other organisms, complemented by evidence of presence.

4. Biofilm:

Collection and laboratory analysis of the biofilm formed on plant roots, comparing its development between different substrate types).

PRELIMINARY RESULTS

Fauna Observation

The *Bio Ilhas* were successfully colonized by various fauna groups, indicating habitat creation and ecosystem connectivity.

Birds: *Motacilla alba*, *Motacilla cinerea*, *Gallinula chloropus*.

Amphibians: *Pelophylax perezi*, *Rana iberica*.

Reptiles: *Mauremys leprosa*, *Natrix sp.*

Insects: bees, dragonflies, caterpillars, and other species linked to aquatic and riparian habitats.

Evidence of presence: droppings, exoskeletons, and footprints, including traces suggesting the presence of a Mustelids captured by camera trap.



Environmental Education

- Installation of *Bio Ilhas* with **local students & Erasmus participants**
- **Educational materials:** info boards, leaflets, project webpage (QR code access)
- **Science cafés & community walks** – promoting NBS awareness
- **Citizen science:** National Butterfly Census & *Projeto Rios*
- **Interactive module at Casa da Seda** – visitors can design their own *digital Bio Ilhas*.



REFERENCES

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