North West Wildlife Trusts

OZONE®

NCEA
Natural Capital and Ecosystem Assessment

Trialing Seagrass restoration in Cumbria

Part of the 3Cs funded Morecambe Bay Seascape Restoration project

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Zostera notlii - Lauren Hinchcliffe

Project aims

- Understand the state seagrass in the North West
- Trial seagrass restoration
- Upskill and engage local communities

Pressures and Drivers of Change

Management Interventions

Other Capital Inputs

Quality

Quantity

Location

Ecosystem Asset

Ecosystem Services

Benefits

Value

Habitat creation

Carbon storage

Nursery ground

Connection to nature

Sustainable ecosystems and populations

Equitable climate

Health and wellbeing

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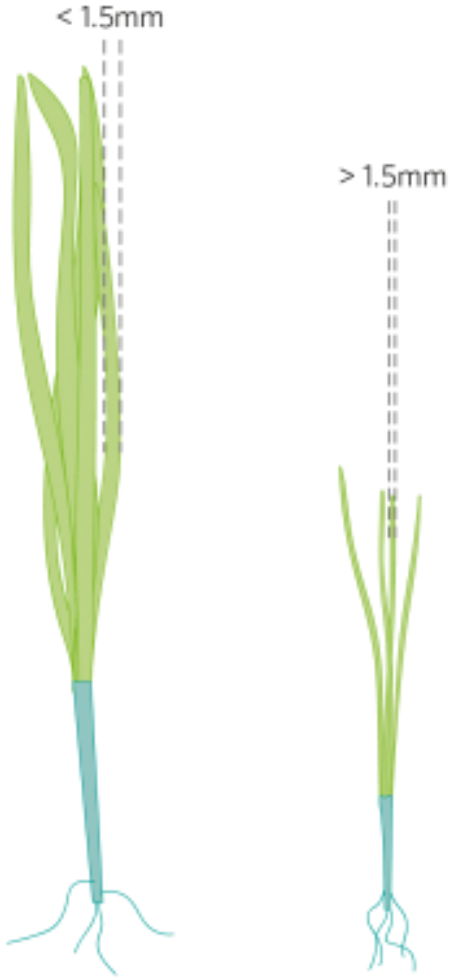
Species of UK Seagrass

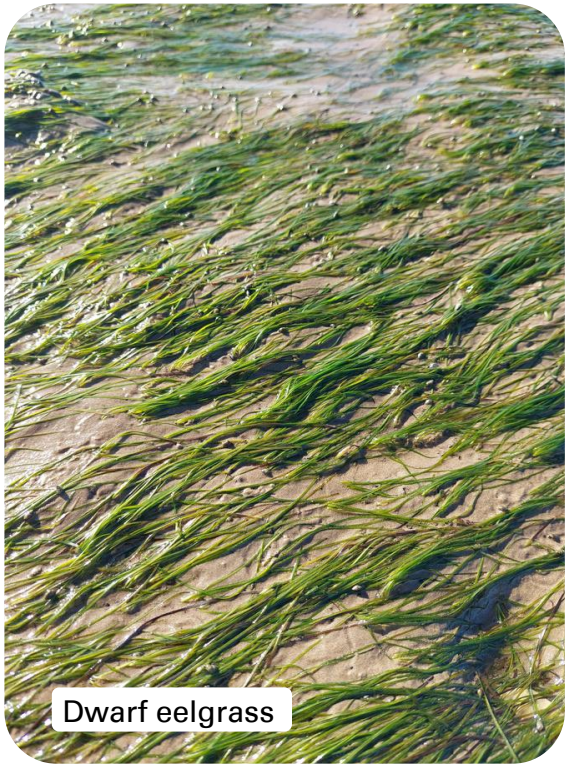
GENERALISED ILLUSTRATION OF *ZOSTERA* SPP. SHOWING PLANT STRUCTURE AND LEAF MORPHOLOGY

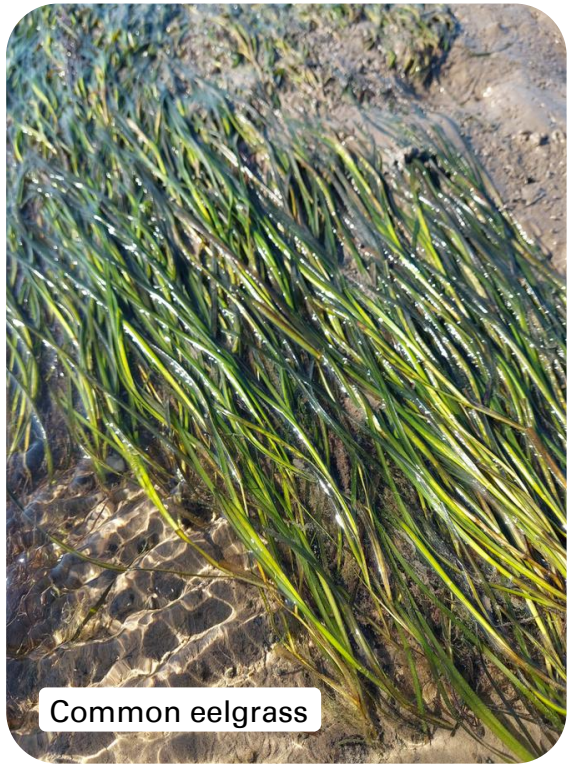


Common eelgrass
Zostera marina

Dwarf eelgrass
Zostera noltii

ZSL | LET'S WORK FOR WILDLIFE | UNIVERSITY OF PORTSMOUTH | Environment Agency


Dwarf eelgrass


Common eelgrass


Patches of dwarf eelgrass surrounded by common eelgrass


Dwarf eelgrass and common eelgrass side by side

Seagrass location, quantity and quality

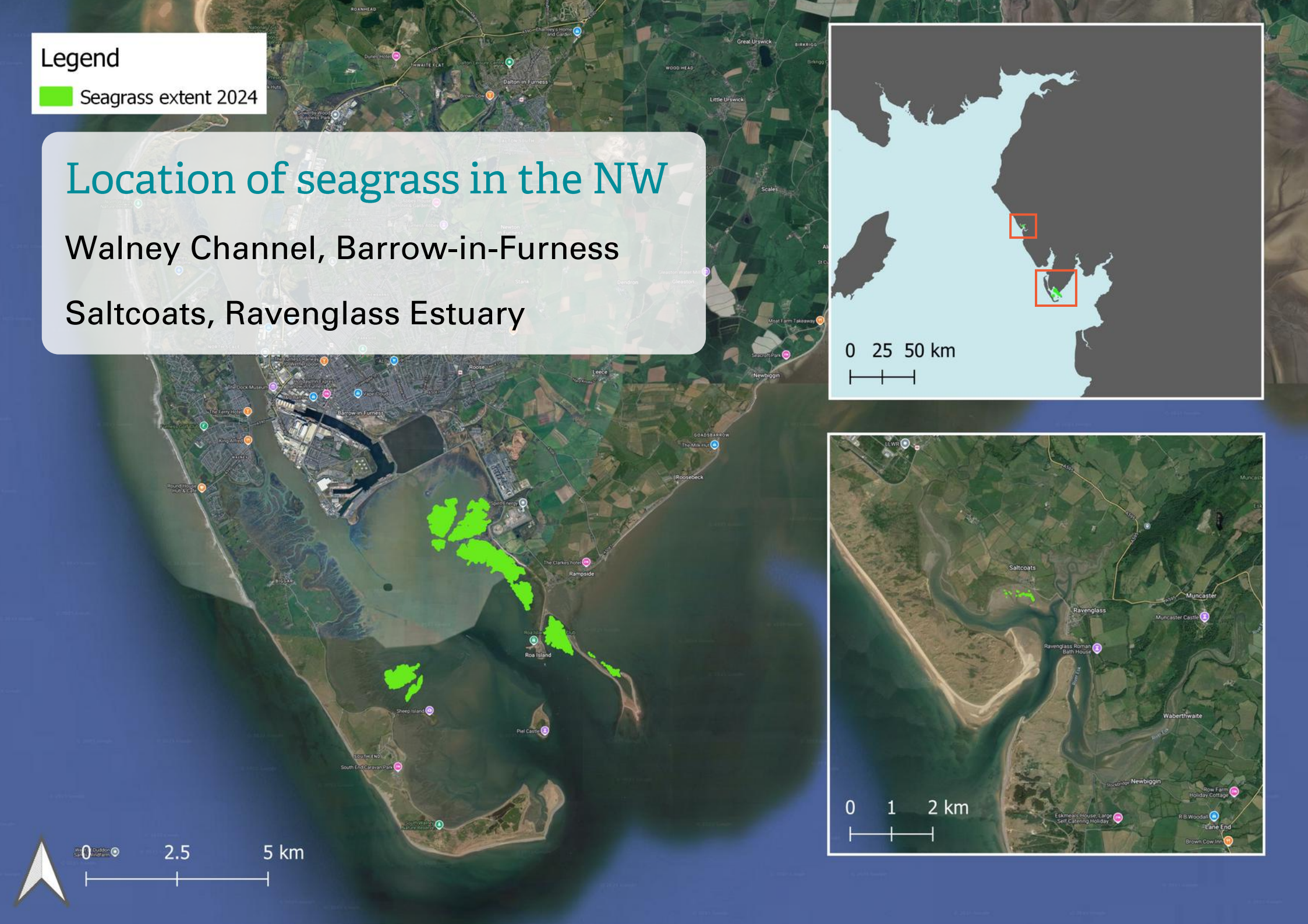
Extent mapping

Walking the perimetre of a patch of seagrass

Drone image used to map the extent of seagrass

Fully mapped the extent of known seagrass beds in the North West for the first time

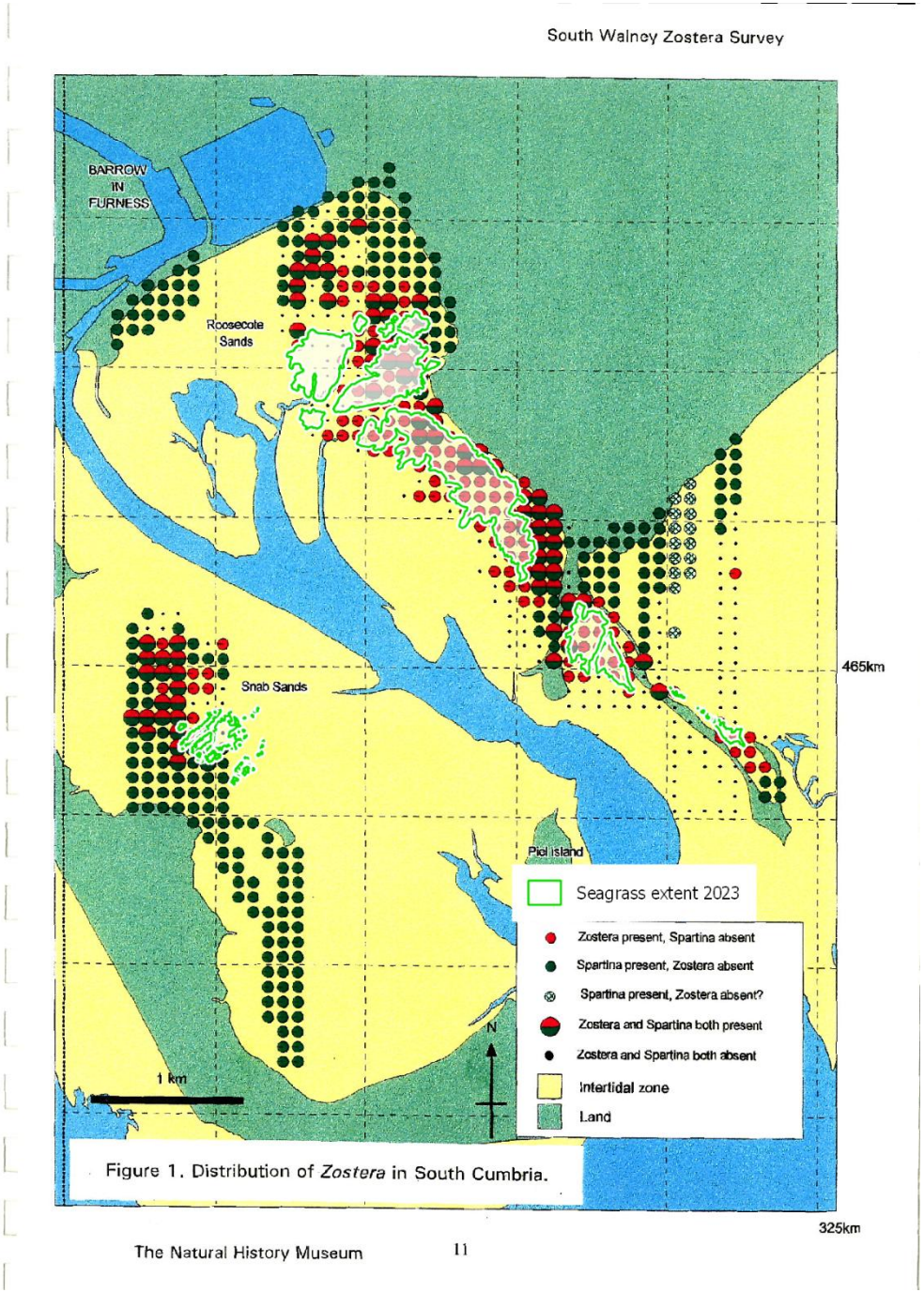
90ha 2024


Legend
Seagrass extent 2024
Location of seagrass in the NW
Walney Channel, Barrow-in-Furness
Saltcoats, Ravenglass Estuary
0 25 50 km
0 1 2 km
0 2.5 5 km

Quantity of seagrass

60%

224ha 1996 - 90ha 2024



Map of seagrass presence in the Walney Channel Tittley et al., 1998

Seagrass quality

Measure quality indicators in quadrat surveys (2021-24 CWT and EA)

- % cover
- leaf length
- epiphytic algal cover
- presence of wasting disease/blackening

% cover

Across whole bed area:

0 - 90%

Where seagrass was present:

39.4% av *Z.noltii*

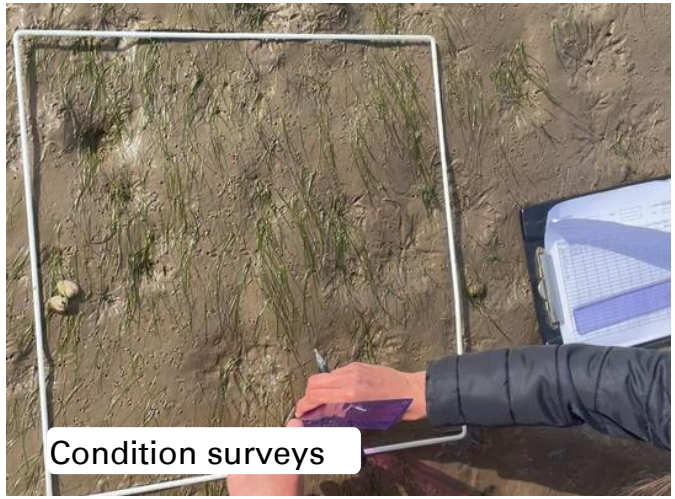
23.0% av *Z.marina*

Small amount of blackening observed

Only one quadrat had evidence of epiphytic algal cover


Measuring leaf length

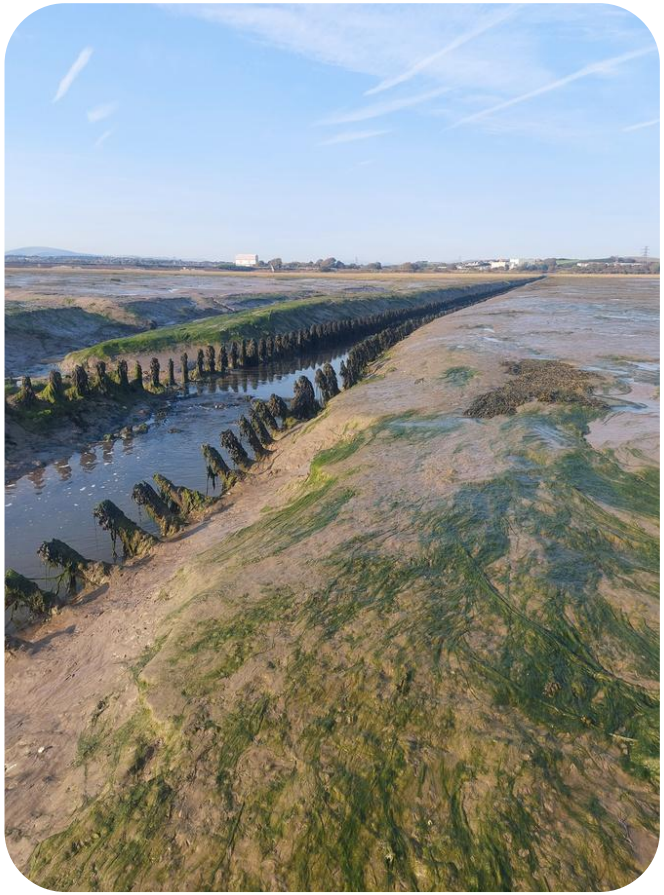

Blackened seagrass

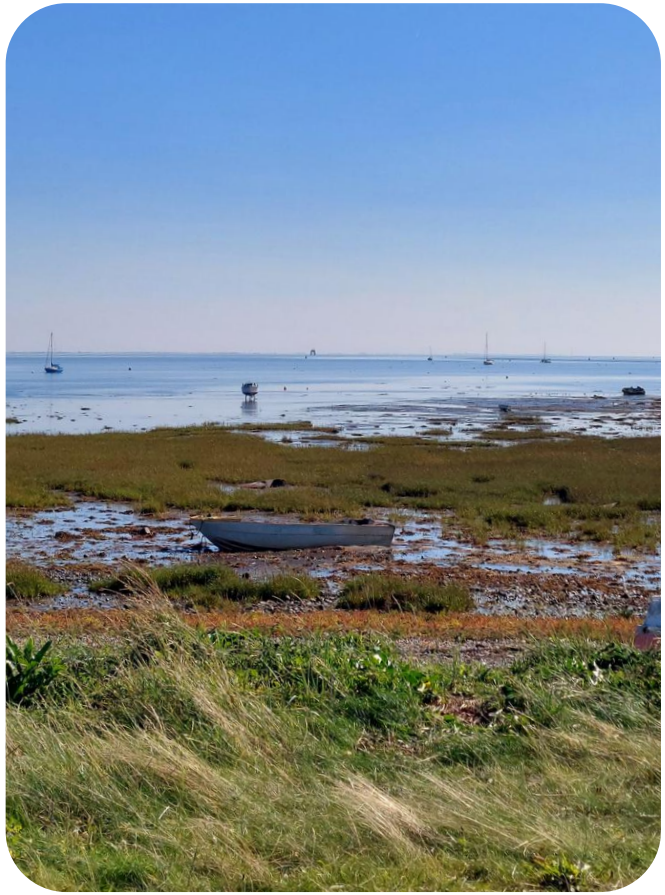

Condition surveys

Pressures and drivers of change

Why is seagrass no longer present?

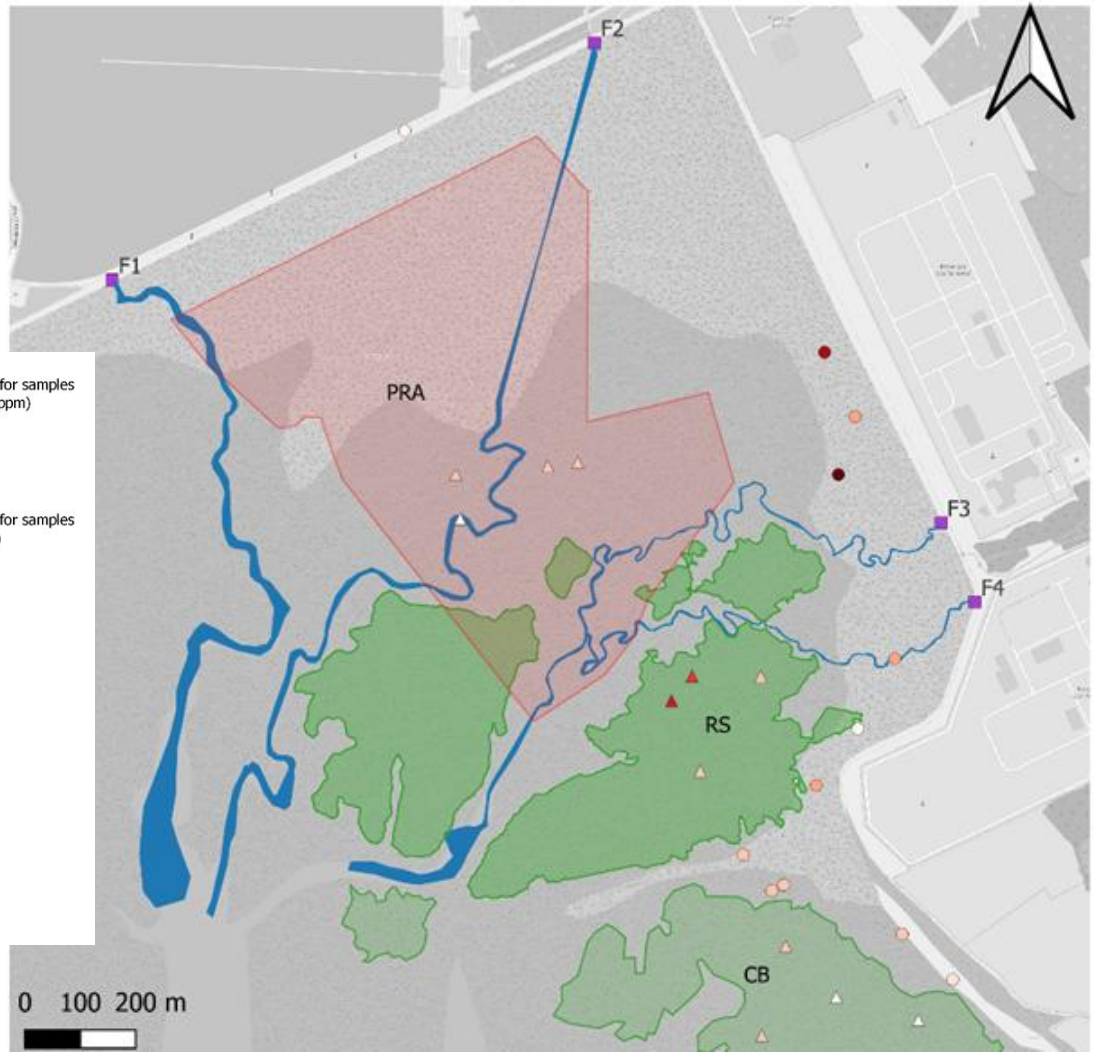
- Water quality
- Pipelines, development and coastal change -habitat is no longer suitable
- Boat moorings





Water quality assessment: feasibility study

- Feasibility of 2 methods trialed using handheld nutrient checkers -land and sea
- Freshwater inflows and sea water samples
- Flagged potential high phosphate and ammonia inputs
- Continue research with Lancaster University student - pore water



Sediment Analysis

Sediment composition

- particle size analysis
- seagrass beds vs. mudflats and pre-restoration site

Topography/elevation

- at all sampling points

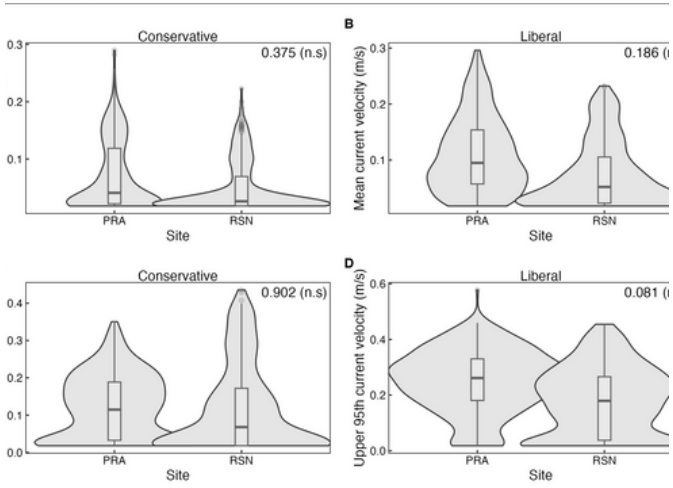
Manchester Metropolitan University

Lucy McMahon

Hydrology- Minibuoys

- Deployed on current seagrass bed and potential restoration area
- Monitored for 1 tidal cycle (May - June 2024 and Feb - Mar 2025)
- Measured tidal inundation, current strength and wave orbital velocity (turbidity)
- No significant differences noted between locations for any factor

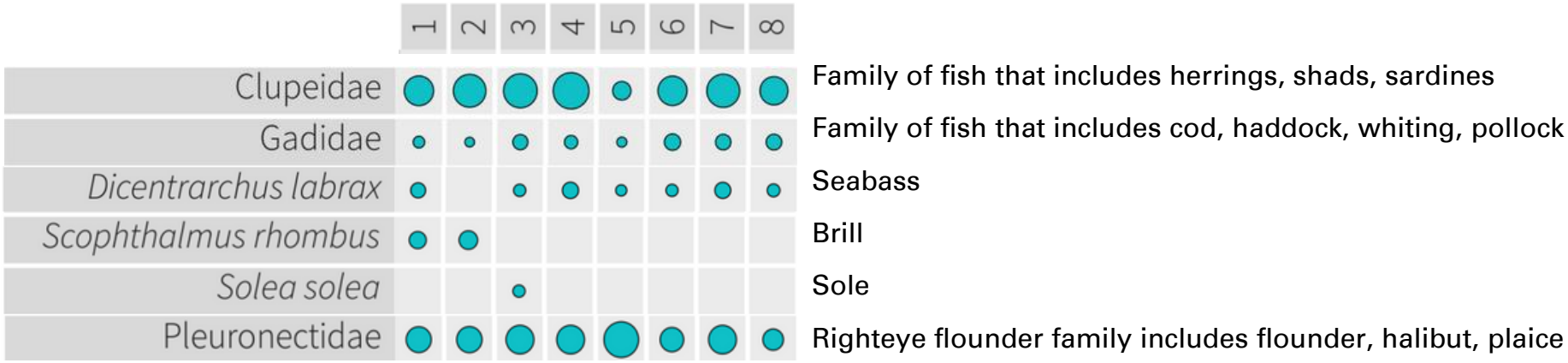
Swansea University
Prifysgol Abertawe



Ecosystem services and benefits

Biodiversity - eDNA

- 235 species detected from 8 samples across 17ha of seagrass
- Critically endangered European eel (4/8)
- 22 species of fish incl. 3 pipefish sp. and commercially important sp.



Family of fish that includes herrings, shads, sardines

Family of fish that includes cod, haddock, whiting, pollock

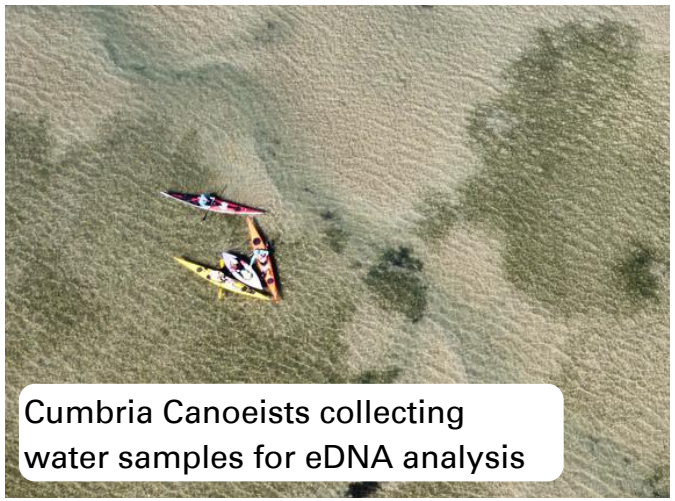
Seabass

Brill

Sole

Righteye flounder family includes flounder, halibut, plaice

Nudibranch on Concle Bank



Cumbria Canoeists collecting water samples for eDNA analysis

Juvenile fish above seagrass bed (BRUV footage)

Biodiversity- Baited Remote Underwater Video Surveys (BRUVS)

mini BRUV set up for intertidal surveys

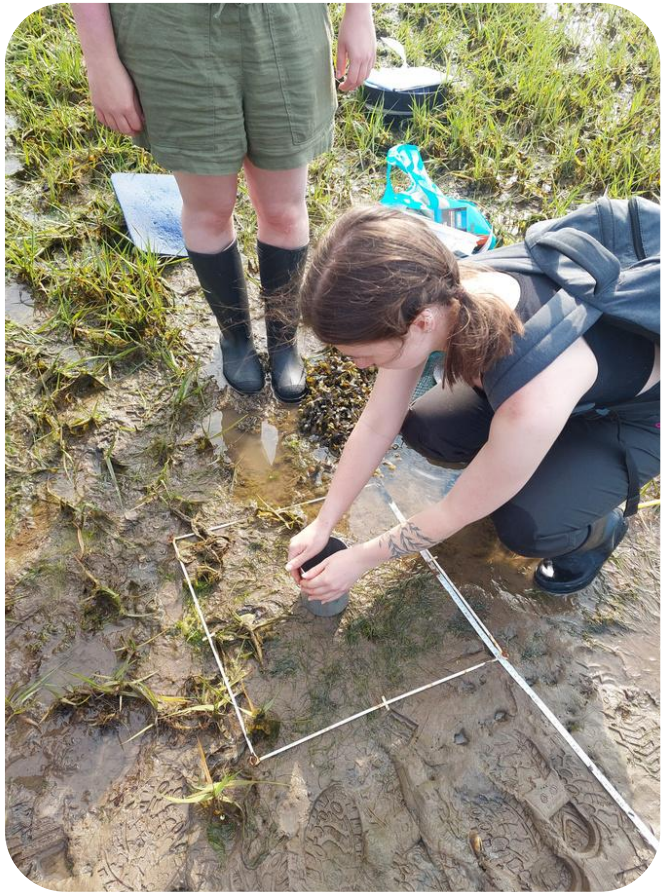
Flatfish on edge of seagrass bed

Upsided BRUV in seagrass bed

Biodiversity- Quadrat and core surveys

- Faunal communities are typical of UK *Z. noltii* beds
- Larger burrowing infauna preferred areas without *Z. noltii*
- Fish species and free-moving fauna were more diverse when *Z. noltii* was present
- Biodiversity was highest in the site with greater habitat diversity/patchiness i.e. seagrass interspersed with seaweed, shingle/shells

Lancaster University



Periwinkle in seagrass bed

Mussel attached to seagrass blade

Credit: Lauren Hinchcliffe

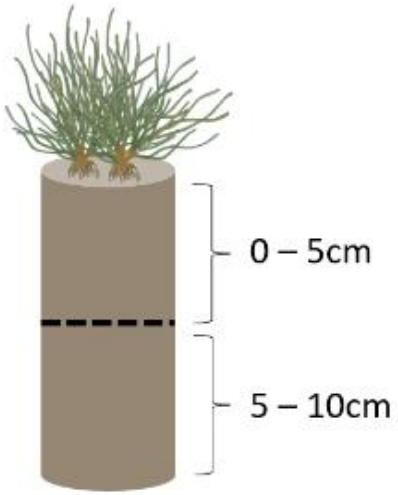
Sediment Analysis

Manchester Metropolitan University

Lucy McMahon

Carbon cores

- dry bulk density, total C content, Inorganic C content, organic carbon density
- seagrass beds vs. mudflats and pre-restoration site



Cultural values

- Unknown
- Reconnect and raise awareness
- Survey planned for summer 25 - Heidi McIlvenny PhD Student, Queen's University Belfast

?

Community engagement

Raising the profile of seagrass in Cumbria

- Events
- Presentations
- Working with The Bay project
- Radio and TV
- On-site information board

Irish Sea Day seagrass activity stall

Display board


Seagrass bracelets

Upskilling and empowering people

Since the project began we have supported and trained:

- 4 Marine Futures Interns
- 7 Lancaster University Students through their dissertation projects
- 21 volunteers
- 10 Marine Champions

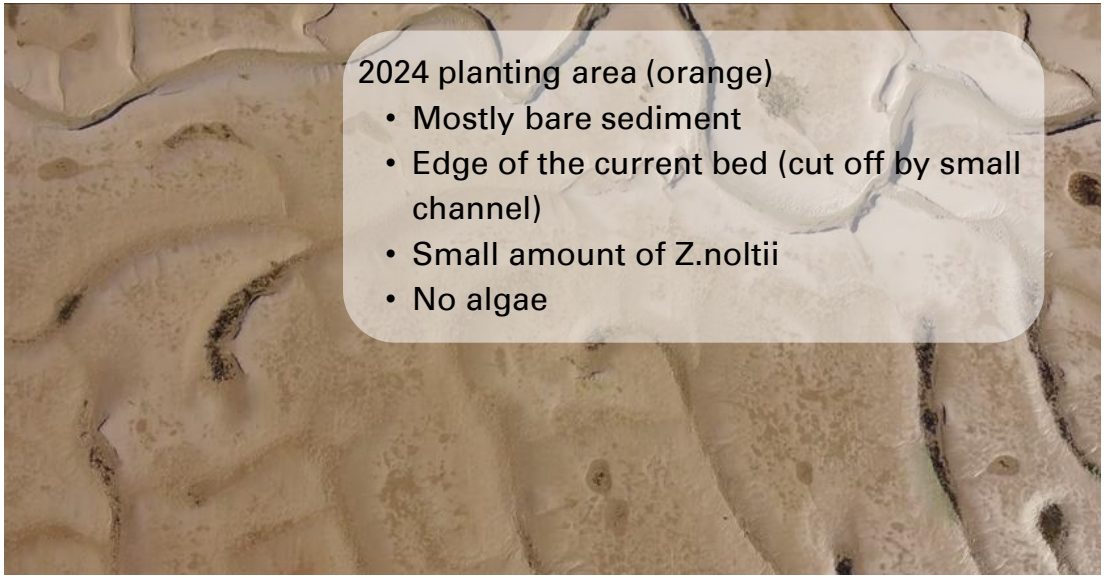
Volunteers helping with seed collection

Marine Futures Interns 2023

Marine Champion Training

Trialing restoration

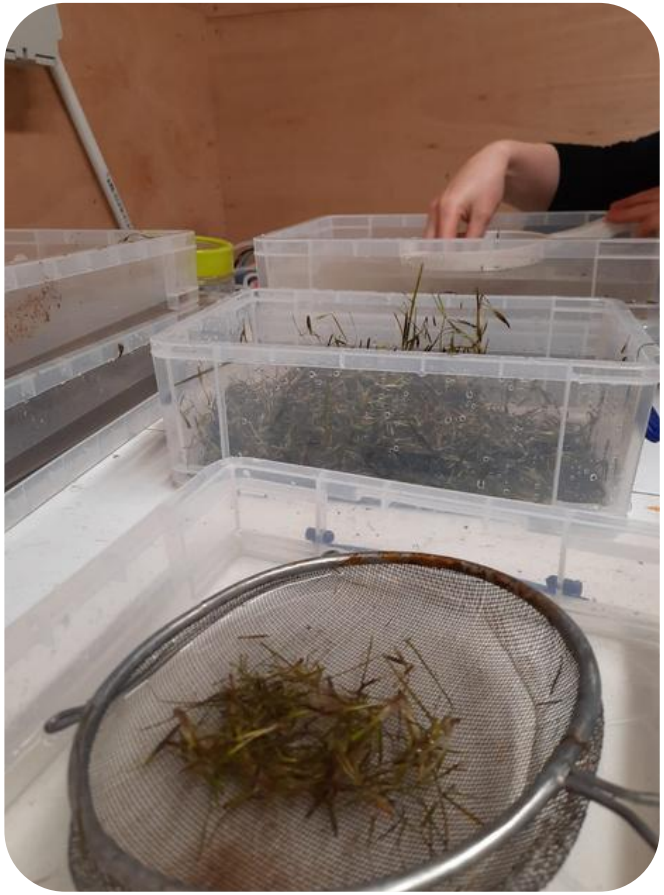
Restoration area



Seed collection

~10,000

Seed storage and “rotting out” process



Seagrass planting

Hessian seed parcels

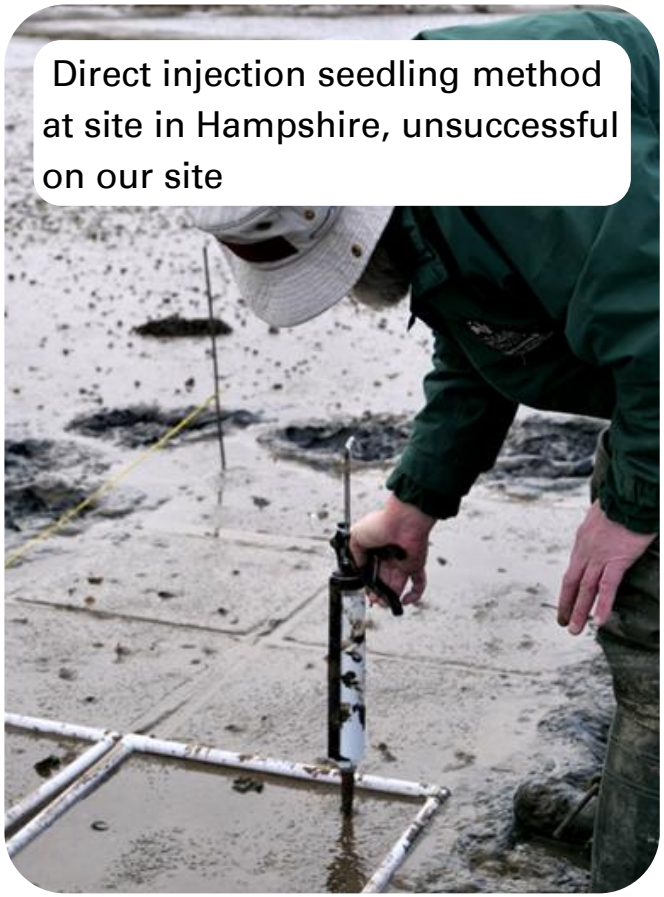
Directly planting seeds

Hessian seed pillows

Challenges

Fungus growth on seagrass seeds

Frozen saltwater in seed storage



Direct injection seedling method at site in Hampshire, unsuccessful on our site

Future plans

- Planting in April
- Monitoring germination and growth
- Updating seed storage
- Evaluation and lessons learnt
- New funding and staff (Our Future Coasts)
- Habitat suitability and scoping
- Continue engagement and building volunteers