Coastal
Marine
Ecosystems
Research
Centre

SEAGRASS RESTORATION PROJECT

CQUniversity Australia
Reef Catchments
Coral Sea Academy
lendlease
Australian Government
Reef Trust
Queensland Government
Fitzgerald Family Foundation
Great Barrier Reef Foundation

The Mission

Restoring Seagrass Resilience in Pioneer Bay using Traditional Knowledge, Research Partnerships and Seagrass Nurseries

Director of Coastal Marine Ecosystems Research Centre - Emma Jackson

The Project

The project is focused on collecting, cultivating and germinating seagrass seeds to enhance the seagrass meadows in Pioneer Bay, the bay adjacent to the marina’s rock wall.

About Seagrass

- **They are unique:** They are the only flowering plants that can live in the ocean
- Seagrasses occupy 0.1% of the seafloor yet are responsible for 11% of the organic carbon buried in the ocean. Seagrass meadows, mangroves and coastal wetlands capture carbon at a rate greater than that of tropical forests
- They cycle nutrients and oxygenate the water – one hectare of seagrass can produce 10,000 litres of oxygen per day… One person uses about 550 litres per day!
- They combine sediment to prevent coastal erosion
- They have been shown to remove harmful pathogens, pollutants and microplastics from the water
- They are an important sediment filter between catchment run off and the ocean, helping to protect the Great Barrier Reef
- They are vital nursery and foraging habitats for fish and shellfish
- They are important turtle and dugong feeding grounds

14% of seagrass species are at an elevated risk of extinction

Seagrass meadows are vulnerable to many pressures - sediment run off, anchor and propeller damage, increased storm activity, as well as multiple years of a La Nina climate leading to the substantial longer-term loss of these habitats. Without intervention, the prognosis for recovery is poor

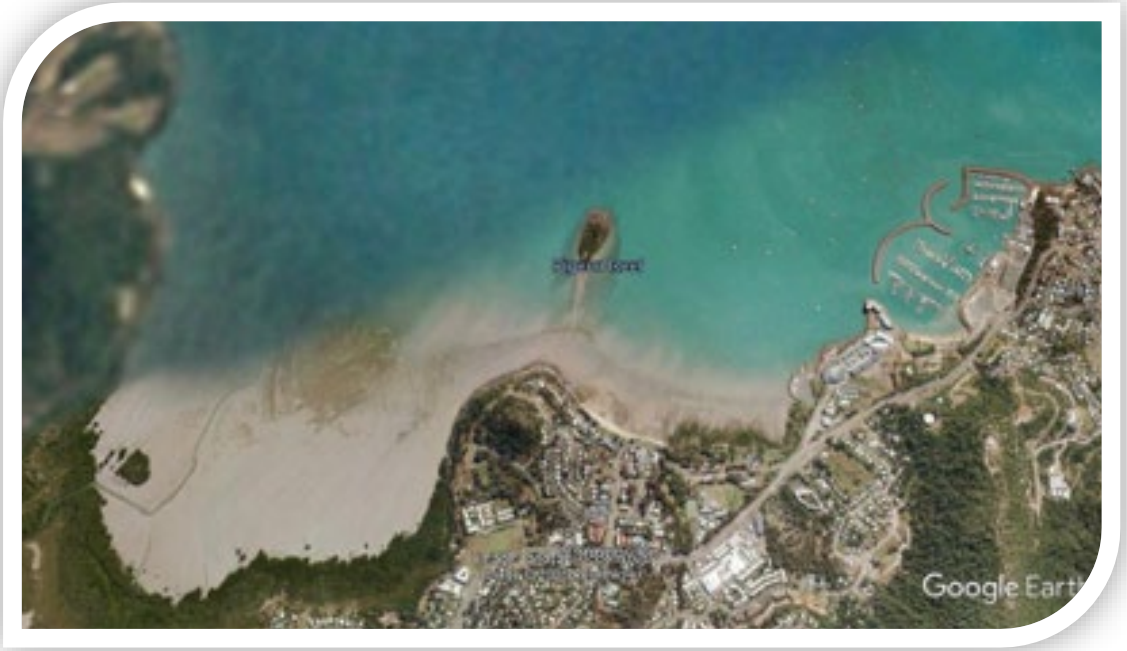
Why Pioneer Bay?

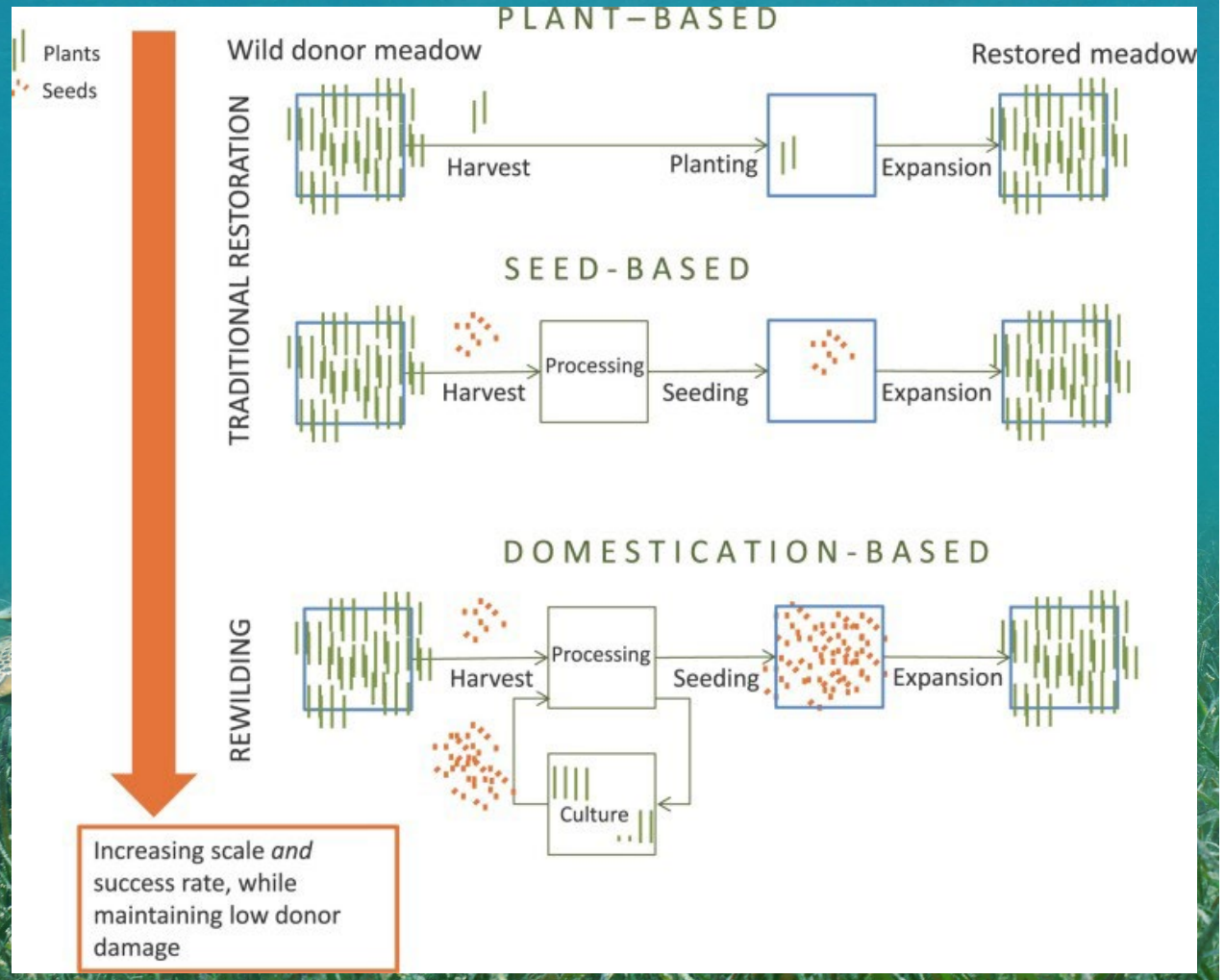
In 2019, CQU undertook a prioritisation project for restoration analysis for the whole of the region. They looked at which meadows were at risk from being lost or degraded and how well that meadow might recover naturally if they were lost.

The Pioneer Bay site came out as a moderate priority.

However, for a restoration trial site it has a lot going for it – including access, location and the opportunity to get the local community involved. It also is located in an area that will positively affect other neighbouring meadows both north and south.

Did you know... One seagrass flower can produce 10 - 15 seeds



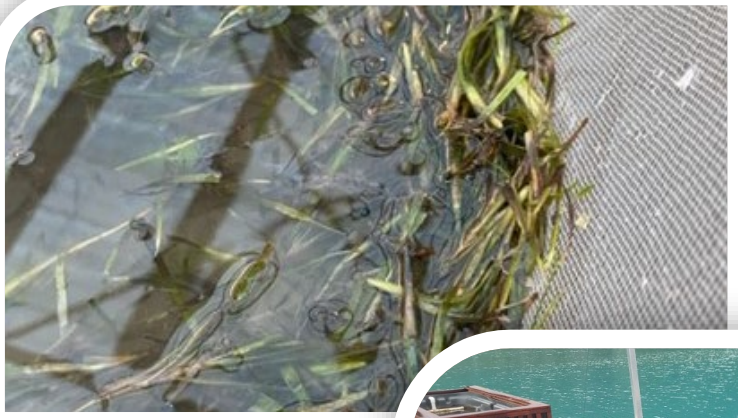


The Research

- Traditionally seagrass restoration was through transplants – This was very time consuming and often risked damage to the donor meadow.
- Activities then moved to seed-based restoration where flowers and seeds were collected and then processed. This system produces less damage to the donor meadows, greater genetic diversity and allowed for greater expansion on larger scales.
- The next step in CMERC's research is to look further into how the seeds are stored and then germinated (the "Culture phase"), and then dispersed, so that the restorations can be scaled up even further and to continue with minimal impact to the meadows.
- It also means that in the event of a completely lost seagrass meadow, one could be recreated through the harvested seeds (thanks to the vast quantity of additional seeds stored due to the new culture phase process).

The Process - Cycle

Collection and Storage

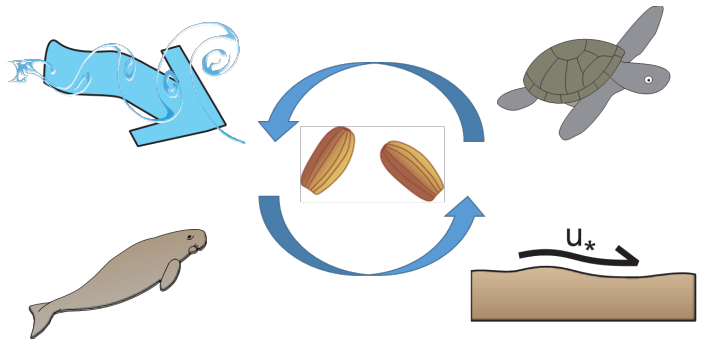


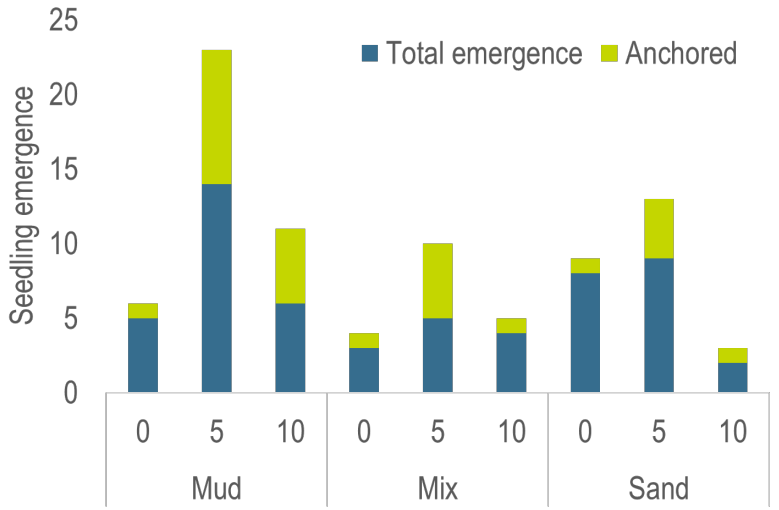
Step 1: Collect the Flowers in nets (above) and transport to the Seagrass Nursery (right).

Step 2: Wait for the seeds to drop off (above) and store until ready for distribution (right).

The tubes on the right aerate the seeds so that they keep at the right temperature and do not germinate.

Germination and Replanting





Germination:

CMERC researched and decided to “Learn from Nature”.

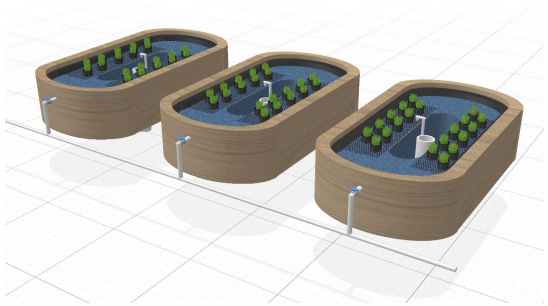
With germination, the best way to germinate a seed is to replicate the stomach of a Dugong. The right temperature, the right acidity, etc.

Planting:

They found the best way for dispersal is to ‘plant’ the seeds into sticky yet nutritious mud balls for planting in the meadows.

There is also a certain depth that a seed should be planted in and a certain type of sediment – Around 5cm. Too deep it will not grow. Too shallow and it will float away.

The Vision for the Seagrass Nurseries at Coral Sea Marina



Flower Collection Volunteering – WE NEED YOU!

CORAL SEA

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