

# Broome Seagrass Monitoring Project: *June 2025 community report*



This community report card shares the latest data from the seagrass meadows of Roebuck Bay, collected by our valuable Broome community volunteers. These important ecological data help us document ecosystem trends, using seagrass as a powerful bioindicator, to identify risks in our coastal habitats and highlight future areas of research.



## Content:

- Summary of survey activity
- Data analysis: comparison of current seagrass abundance, species composition, canopy height and epiphyte abundance to the long-term average
- Seed collection: recent seed bank data
- Exciting finds: our favourite intertidal discoveries
- Plan: seagrass data summary, our next survey and an exciting training opportunity



Department of Biodiversity,  
Conservation and Attractions

**MU** Murdoch University

environs



# WHAT DID WE DO?



## WHEN:

29<sup>th</sup> March – 2<sup>nd</sup> April 2025

## WHERE:

Surveys were completed at our four monitoring sites: Town Beach, Demco Beach, Port Slipway and Black Ledge.

## WHAT:

Conducted surveys across a 50 x 50m area using a permanent transect method. Three parallel 50m transects are set up from precise GPS locations to ensure the transects are covering the same fixed area of seagrass meadow. Using 0.5m<sup>2</sup> quadrats set out every 5m along each transect, we observed the abundance of seagrass (percentage cover), the proportion of species present (species composition) the height of seagrass shoots (canopy height) and presence of macroalgae and epiphytes.

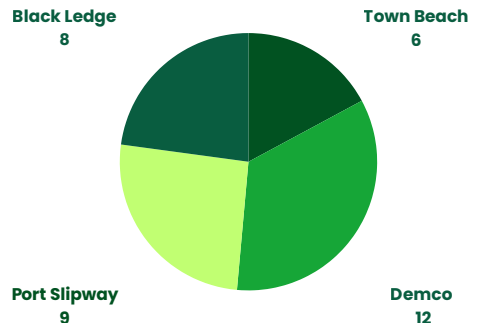
## WHO:

We were joined by a diverse range of community members, including experienced seagrass volunteers, first time attendees, Bardi Jawi trainee Rangers, DBCA staff and a Yawuru Ranger, Port Authority and Environs Kimberley staff.



0.5m<sup>2</sup> quadrat from Town Beach site (30/03/2025).

Demco was the most popular site, with 12 community members taking part in the survey



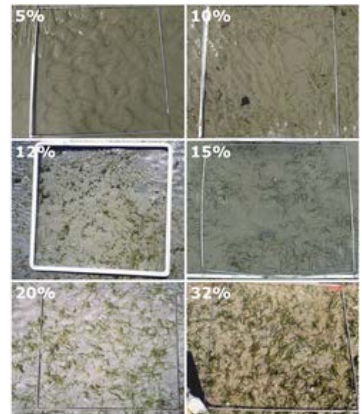
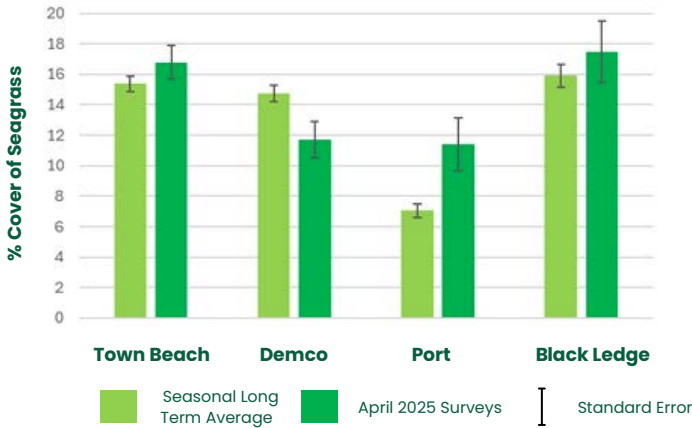
Volunteer attendance for each site.

# DATA ANALYSIS: SEAGRASS COVER



Measuring seagrass cover indicates the area available to support diverse ecological functions and health:

- Nursery habitat for juvenile fish species and invertebrates
- Stabilisation of sediment that can act as a buffer against coastal erosion
- Filtration capability to remove harmful pathogens and bacteria
- Food for dugong and green turtles whose diet is made up almost entirely of seagrass



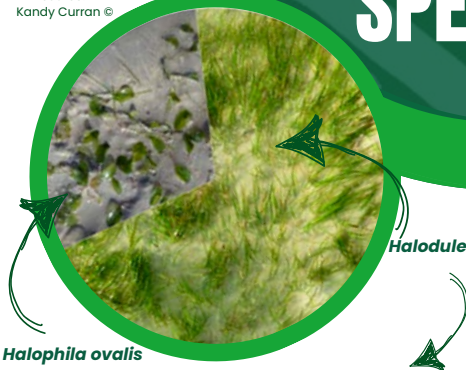
Example of the standardised calibration sheet used to determine percentage cover of seagrass. Produced by Seagrass-Watch HQ.

Using 18 years of historical data from our community monitoring project, we calculated a **long-term average** of seagrass cover for each site. The large spread of data incorporates a wide range of environmental changes, which we have used to compare our future survey data. This long-term average was grouped by months to capture the change in seasonal seagrass growth. Here we compare data collected from January – April between 2007 and 2024 to the recent survey data. It's important to note that this long-term average combines a range of seagrass condition over the years, and the extent to which past development may have influenced these results is not yet understood.

Seagrass cover in April 2025 ranged from 17% at Black Ledge to 11% at Port Slipway. Seagrass cover at Town Beach and Black Ledge was very similar to historic levels, suggesting a stable level of seagrass condition. Cover at Port Slipway was 4% higher than the average. Percentage cover at Demco was 5.8% lower in April 2025 than to the seasonal average of 17.5%, which could indicate disturbance to the meadow or less advantageous growing conditions.

*H. uninervis* photo  
source:  
Kandy Curran ©

# SPECIES COMPOSITION



*Halophila ovalis*

*Halodule uninervis*

Species composition tells us the quantity of different species within a meadow ecosystem and the proportion that each species represents.

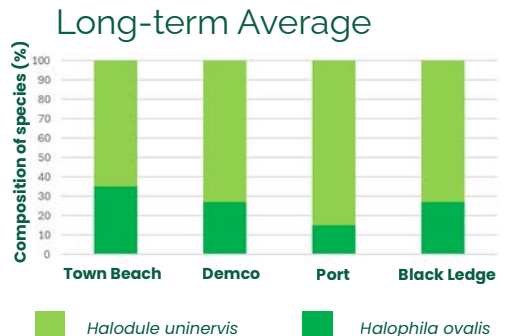
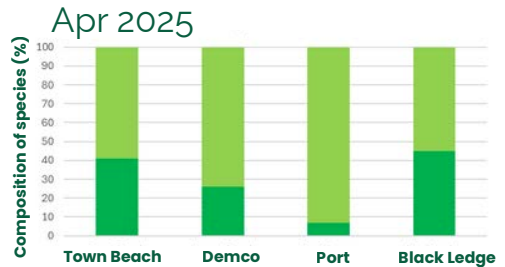
Our seagrass meadows are composed of two main species: *Halodule uninervis* and *Halophila ovalis*. On average they have 70/30% contribution, but this varies between seasons and sites.

Illustrations from Seagrass-Watch



*H. uninervis* is the **foundational species**, possessing a more extensive root system, giving this species more structure when stabilising the sediment. Larger root systems are used to store sugars that can be accessed all year round and when growing conditions are unfavourable. This makes *H. uninervis* more resistant to disturbance.

*H. ovalis* is the **colonising species**: it is a seasonal coloniser of the seagrass meadow, with lower abundance in the wet season. A greater proportion of energy is invested in leaf compared to root growth, so that this species has a large surface area to capture available light and convert into photosynthetic growth. The smaller root system makes *H. ovalis* less resistant to disturbance, however the fast growth rate allows for rapid recovery afterwards.



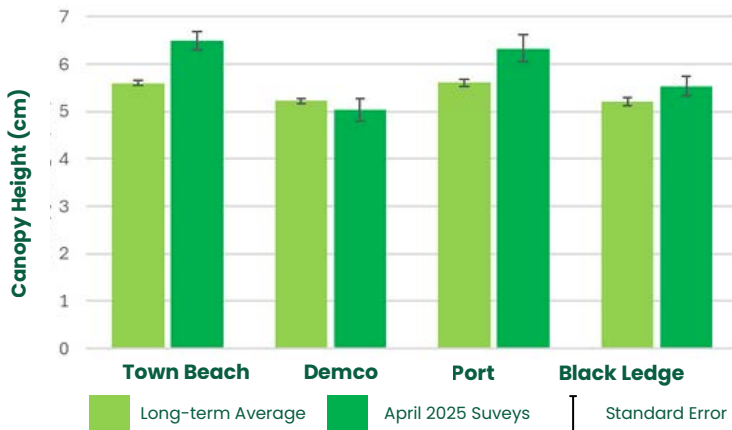
The Jan-Apr baseline average shows us that there is an approximate 70% *H. uninervis* and 30% *H. ovalis* composition for Town Beach, Demco and Black Ledge. Composition at Port Slipway is 85% *H. uninervis* and 15% *H. ovalis*. The April 2025 survey showed shifts in species composition, with *H. ovalis* increasing by 17% at Black Ledge and decreasing by 8% at Port Slipway.

# CANOPY HEIGHT



Another difference in physical traits between our seagrasses, is that *H. uninervis* is a leaf-replacing species and *H. ovalis* is non leaf-replacing species. *H. ovalis* leaves emerge fully formed and old leaves are not lost. *H. uninervis* continually produces new leaf tissue, replacing old shoots with new ones. This means we can measure growth of *H. uninervis* by measuring the changes in height of the seagrass leaf from the base of the rhizome (root structure) to the tip of the frond.

Canopy height is a useful tool as it can be combined with percentage, to determine how much biomass is available for foraging species such as dugongs and green turtles. Greater canopy heights ensures more food is available for these important and protected species.

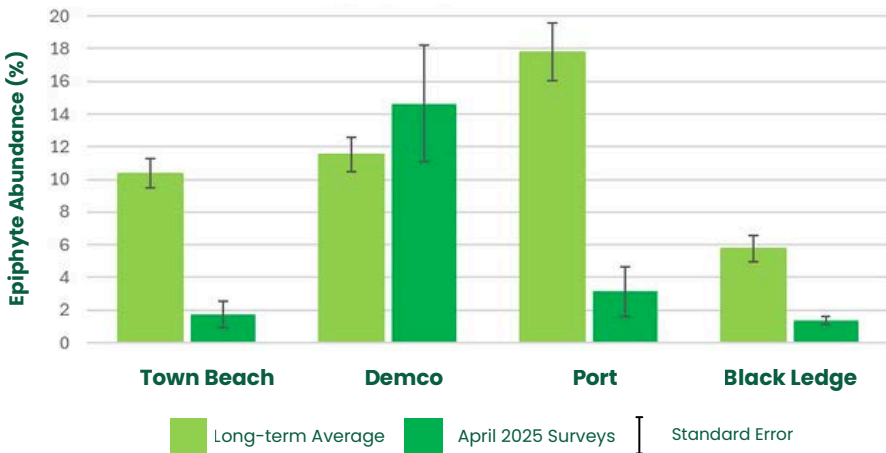


During our surveys, we randomly selected three individual shoots of *H. uninervis* from each 0.5m<sup>2</sup> quadrat and combined these to calculate an average canopy height (cm). Individual shoot measurements ranged from 2.8-11cm in the March/April 2025 survey. Town Beach, Demco and Port Slipway in April showed an increase in canopy height compared to the baseline average, which is a sign of advantageous growing conditions. Demco average canopy height was within the range of the baseline.

# EPIPHYTE COVER



Epiphytes are micro organisms that grow on plants. This occurs naturally in the marine environment; however, excess nutrients discharged into the Bay from coastal run off can cause an excess of algal growth. If epiphyte abundance exceeds the normal amount, more of the leaf surface area will be covered in these encrusting organisms. This reduces the amount of accessible light and therefore the ability for the plant to photosynthesize and grow. This can cause increased stress in seagrass which may mean the plants are more vulnerable to other impacts such as extreme weather or disease.

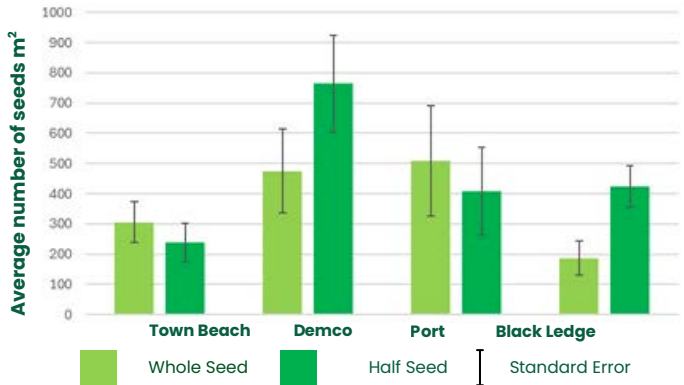


Epiphyte abundance at Town Beach, Port Slipway and Black Ledge sites in April 2025 was significantly lower than the long-term average. Demco showed a higher average abundance of epiphytes in our recent survey, although this was not significantly different from the long-term average. Low epiphyte cover means there is less competition for light and nutrients, which supports the narrative of a healthy seagrass condition in our Roebuck Bay sites.

# SEED BANK



*H. uninervis* produces small spherical seeds that are approximately 2mm wide. These seeds can lie dormant in the sediment for several years, which provides the seagrass with a back-up plan following disturbance events. Events such as cyclones can cause a great loss in seagrass cover as the plants are stripped from the sediment, so having a persistent **seed bank** means new plants can be recruited into the meadow when needed.



Using a sediment corer, we collected samples of the mud alongside our transects and sieved any seeds present. The number of **whole seeds** (seed bank) recorded in our April 2025 survey ranged from 0 to 9 seeds per sediment corer. When this figure is multiplied to get an average density (number of seeds per  $m^2$ ) the seed bank appears to be lowest at Black Ledge. Presence of seeds across all sites shows evidence of a **persistent seed bank**, which gives the meadows a better chance of recovery if plants are disturbed or lost.

Once a seed has successfully germinated (begins to grow), the hard cap surrounding the seed breaks open, and you can find these remaining **half seeds** in the sediment. Germinated seed count in our recent survey ranged from 0-8 per sediment corer. When looking at density, we found the highest average of germinated seeds was found at Demco.

*H. uninervis* seed production is known to be highly varied, meaning further scientific analysis is needed to assess how we can use these data against a long-term average. It is important we continue to monitor seed abundances in order to better our understanding of the relationship between seed banks and seagrass health.

# EXCITING FINDS



## **Pink Warty Sea Cucumber (*Cercodemus anceps*)**

Named for its bright pink colouration and rough textured appearance, this common invertebrate stands out on the mud. The bright colour appears to act as a defence mechanism against predators. If this doesn't work, sea cucumbers are known to exhibit evisceration; an additional defense mechanism which involves the excretion of their digestive organs when handled. Here you can see their feathery buccal tube-feet, which are extended to sift through the sediment and capture food particles from the water column, which is how they feed.

## **Ghost Shrimp (Family: Callissanidae)**

Spotted by our experienced seagrass surveyor, Dianne Bennett, Ghost Shrimp are named for their pale, often white appearance. They are known to form extensive burrows throughout the sediment, which makes this crustacean a very important bioturbator: helping to recycle nutrients in the sediment. Ghost Shrimps can also be identified by their large and unevenly-sized front pincers (chaelae), one of which has unfortunately detached from this individual.



## **Northwestern Mangrove Snake (*Ephalophis greyae*)**

Reaching up to 1.5m in length, this coastal dwelling reptile is found mostly in mangrove systems and can often be seen traversing the mudflats. Endemic to Northwestern Australia, this species is 1 of 22 found in the Kimberley region. We are lucky to live in a sea snake biodiversity hotspot, home to over one third of all sea snake species found globally. On this occasion, we had the pleasure of enjoying this snake hunt the shallow tidal pools and catch a fish.



# FUTURE PLAN: SURVEYS & TRAINING



Seagrasses are extremely sensitive to changes in the environment, which is what make them the ideal early warning systems for management policies. The recent data collection indicates that sites are in range of the long-term average. Percentage cover at Demco determined to be lower than the average in our recent survey. This may indicate a level of stress, so we will focus our next surveys on identifying potential impacts at this site. Our plan is to continue this powerful community-run project to monitor the health of the Bay and continue to assess potential threats to the ecosystem.

## Join us for our next round of surveys!

Tuesday 26<sup>th</sup> August 2025: Demco @ 5:15am

Wednesday 27<sup>th</sup> August 2025: Port Slipway @ 5:15am

Thursday 28<sup>th</sup> August 2025: Black Ledge @ 5:30am

Our seagrass meadows are only revealed below a 1.7m tide, therefore we have specific windows when we can monitor. To sign up, visit our website or you can contact us directly with any queries.

## Seagrass-Watch Training Event



Seagrass Watch is a global monitoring organisation that set out the surveying methodology of this project and run robust scientific analysis of the data produced. Representatives will be coming to Broome 22nd - 24th August 2025 to run a **FREE** training event for those interested in enhancing their skills and knowledge surrounding seagrass monitoring. Please email us to register your interest or visit our website for more information.



# ACKNOWLEDGEMENTS

We want to extend our gratitude for the dedication of all those who contributed to the Broome Seagrass Community Monitoring Project:

- The volunteers who brought their passion and enthusiasm on to the mudflats of Roebuck Bay: we couldn't have done it without you!
- Seagrass-Watch HQ for their robust scientific skill and commitment, establishing the project methodology and their continuous support and quality assessment of the data collected
- The funders and partners who make this project possible: Yawuru, Rangelands NRM, Kimberley Ports Authority, Australian Government, Wettenhall Environment Trust, Murdoch University, Roebuck Bay Working Group and Department of Biodiversity, Conservation and Attractions.

## **Contact us if you would like to get involved!**

Website: [www.environskimberley.org.au/events](http://www.environskimberley.org.au/events)

Email: [seagrass@environskimberley.org.au](mailto:seagrass@environskimberley.org.au)

Phone: 08 9192 1922

# THANK YOU!





# SEE YOU NEXT SURVEY!

