

Broome Seagrass Monitoring Report

Community Report 2026: Roebuck Bay



Keeping Watch Over Roebuck Bay

This community report shares the latest insights from the seagrass meadows of Roebuck Bay and celebrates the ongoing commitment of the Broome community to monitoring and protecting our coastal environment.

For nearly two decades, volunteers, Traditional Owners, Rangers, researchers and community organisations have worked together to better understand the health of Roebuck Bay's seagrass ecosystems.

This report highlights:

- the current condition of seagrass meadows across Roebuck Bay
- long-term monitoring trends
- community participation and citizen science achievements
- research and training activities from the past year
- opportunities to get involved in future surveys.

2020-2026 snapshot

- Seagrass condition remained in a 'good' state across all monitoring sites.
- No long-term decline has been detected over 20 years of monitoring.
- Seed banks remain present across all sites, supporting recovery potential.
- Seasonal fluctuations continue to shape seagrass growth patterns.
- Community participation increased significantly during the past year.

Community impact totalled:



738

volunteer hours
contributed



234

volunteer
attendances



12

surveys
completed



4

long term
monitoring sites



180

genetic seagrass
samples collected



99

taxa recorded during the
Great Southern BioBlitz

All About Seagrass



An underwater powerhouse



What is seagrass?

- The only flowering plant that lives entirely underwater.
- Has roots, stems, leaves and flowers.
- Forms vast meadows stretching kilometres.



Global & local diversity

- Worldwide: 60-72 species.
- Western Australia has highest global diversity with 25 species.
- Kimberley region supports 12 known species.

Species we monitor

Narrow leaf seagrass (*Halodule uninervis*):

- persists year round
- foundation species for local meadows
- important for sediment stability and ecosystem health.



Spoon grass (*Halophila ovalis*):

- fast growing seasonal species
- more sensitive to environmental change
- important indicator for ecosystem variability.

Why seagrass matters

Seagrass meadows:

- provide nursery habitat for fish, crabs and invertebrates
- support coastal food webs
- are main food source for dugongs and green sea turtles
- capture and store carbon which reduces effects of climate change.



Seagrass helps to:

- stabilise sediment
- reduce coastal erosion
- filter pathogens
- improve water quality.



Early warning system



- Seagrass is highly sensitive to environmental change such as shifts in water quality, pollution, climate conditions.
- Used as a bioindicator: an early warning system to detect environmental stress before it spreads throughout the ecosystem.

Roebuck Bay

A place of cultural and ecological importance

Roebuck Bay is internationally recognised for its ecological significance and extraordinary biodiversity.

The bay supports one of the most diverse benthic invertebrate communities in the world. Benthic invertebrates are animals without backbones that live within or on the seafloor, including pippies and cockles (*molluscs*), mud crabs and lobsters (*crustaceans*) and marine worms (*polychaetes*).

Roebuck Bay is listed as a Ramsar Wetland of International Importance due to its ecological value and its role in supporting:

- more than 100,000 migratory shorebirds annually
- threatened species such as Australian snubfin dolphins and sawfish
- dugongs and turtles
- fish and crab populations.

Traditional Owners have cared for Country for thousands of years, and ongoing cultural management continues to protect the ecological health of the bay for future generations.



Did you know?

Roebuck Bay is estimated to support between 300–500 benthic species.



Our Monitoring Sites

Volunteers collect monitoring data from sites across Roebuck Bay three times each year.

Long-term monitoring sites include:

- Town Beach (R01)
- Port Slipway (R03)
- Demco Reserve (R02)
- Black Ledge (R04)

Town Beach, Demco Reserve and Port Slipway have been monitored since 2007.

Black Ledge was added in 2018 as part of the Yawuru Nagulagun Roebuck Bay Marine Park, and monitoring has been conducted tri-annually since it was declared part of the marine park.



Did you know?

Starting in 2007, Broome Seagrass is the longest running seagrass monitoring project in Western Australia!

What We Measure

Seagrass cover

Seagrass cover indicates how much habitat and food is available in the ecosystem and reflects its ability to withstand disturbance, recover from damage, and maintain key functions such as supporting biodiversity, providing feeding habitat for threatened dugongs and turtles, stabilising sediments, and reducing coastal erosion.



Seed banks

Narrow leaf seagrass (*Halodule uninervis*) produces seeds that can remain dormant in the sediment for up to two years, waiting for the right conditions to germinate into new plants. The number of seeds in the sediment indicates the size of the seed bank, which provides a source of recovery following large-scale disturbances such as cyclones or heatwaves.



Species composition

We monitor how much of each meadow is made up of narrow leaf seagrass and spoon grass (*Halophila ovalis*). This helps us understand seasonal changes and environmental responses across different sites.

Seagrass height

Measuring seagrass height allows us to estimate food availability for threatened dugongs and turtles and understand seasonal growth patterns.

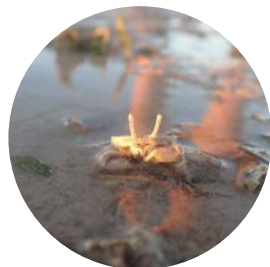
Algae

Algae both large (macroalgae e.g. seaweed) and small (epiphytes) provide food and habitat for an array of fauna. However, if they become too abundant, they can reduce light availability, limiting seagrass photosynthesis and growth, and can also change oxygen and nutrient conditions around the leaves, placing the plants under stress.



Invertebrate activity

Monitoring signs of crab, worm and snail activity within sediments is key as these animals play an important role in oxygenating the sediment and supporting overall ecosystem health. Too much activity can destabilise root systems!



Did you know?

Epiphytes are organisms like microalgae and bacteria that grow on seagrass leaves

2020-2026 Snapshot

Recent seagrass condition

Using methods developed by Seagrass –Watch, we can see a recent snapshot of how seagrass cover at each site compares to the expected seasonal ranges. It highlights short-term fluctuations in seagrass cover and shows how each site has responded to recent environmental conditions such as rainfall, temperature changes and water clarity.

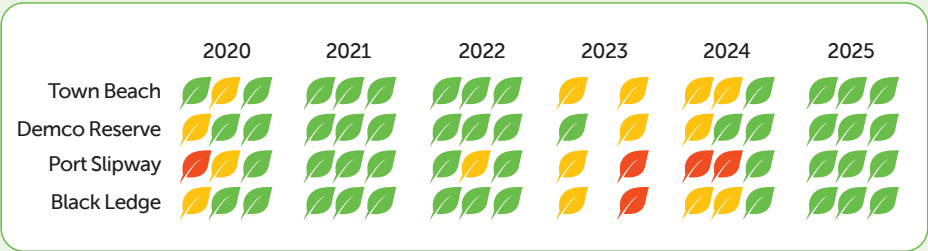
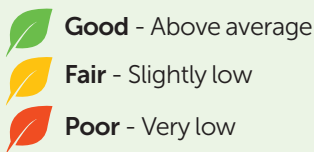
Observations:

- 2023 was a challenging year for seagrass meadows, with conditions declining to **‘fair’** across all sites.
- Black Ledge temporarily declined to **‘poor’** condition during late 2023.
- By late 2024 and early 2025, all sites had recovered to and remained at **‘good’** condition, despite a small seasonal dip in early 2025.
- Seasonal variability remains high across all sites.

This dip in 2023 & 2024 could be due to the above average rainfall experienced in 2023. These events are naturally occurring in the Kimberley, with the monitoring showing that our seagrass systems are resilient and can recover from these events. However, as the frequency of these events is expected to increase with the changing climate, this could be detrimental to the seagrass meadows.

Despite fluctuations between seasons and years, there is currently no long-term increasing or decreasing trend detected over the past 20 years.

This suggests the broader seagrass system in Roebuck Bay remains relatively stable.

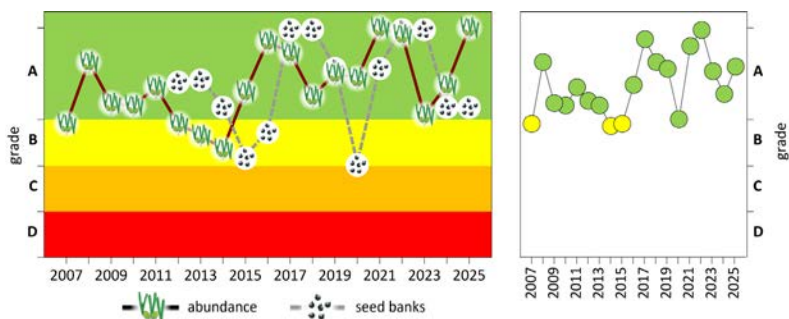


Long Term Trends

Report card 2007-2025

Looking at average seagrass cover and seed bank abundance across all monitoring sites, we can track changes in the health of Roebuck Bay's seagrass meadows since 2007. The results show that this ecosystem is naturally dynamic - not surprising in a region with one of the largest tidal ranges in the world!

Over the past two decades, seagrass condition has fluctuated between the years. Some years recorded high seagrass cover and abundant seed banks, while others showed high seagrass cover but lower seed reserves, or vice versa. These **patterns reflect the natural cycles** of seagrass growth, loss, seed production, and germination, which are influenced by changing environmental conditions.



Credit: Seagrass-Watch

By combining measures of both seagrass cover and seed bank abundance, we can assess the overall resilience of the meadows, which is the ability for the seagrass to withstand stress and periods of low growth. Encouragingly, Roebuck Bay's seagrass has remained in a 'good' state for the past 10 years.

Seagrass cover

Long term averages show seasonal changes

Seagrass meadows in Roebuck Bay naturally change throughout the year.

Wet season (Jan-Apr): Heavy rainfall and runoff increase sediment movement, and runoff into the bay, reducing water clarity. Lower light availability can reduce seagrass growth.

Early dry season (May-Aug): The effects of reduced growing conditions in wet season, coupled with cooler water temperatures mean seagrass cover is generally at its lowest.

Late dry season/early wet season (Sept-Dec): Several months without rain means the water clarity is high. This combined with warmer temperatures creates ideal growing conditions. Seagrass cover typically increases during this period.



Seasonal long-term mean $\pm$ standard error for seagrass cover between 2007-2025 for each site.

Species composition

Narrow leaf seagrass continues to be the foundational species monitored in meadows, **representing approximately 70%** of seagrass observed during surveys. This species also forms the tallest canopy, ranging from 1–10 cm in height.

Spoon grass is naturally more sensitive to environmental conditions and tends to decline during wetter periods when water clarity decreases.



Algae

Large algae, such as filamentous algae and cactus algae, and cyanobacteria *Lyngbya majuscula* remained **low** across all sites.

Epiphyte levels generally increased during the late dry season and early wet season (September–December) when there's **more daylight** and **higher temperatures**.

Seed banks

All monitoring sites contained significant numbers of narrow leaf seagrass seeds within sediments. This indicates **healthy recovery potential** following environmental disturbance.

Seed numbers varied considerably between sites and seasons, with **higher numbers generally recorded in the wet season** (December–May), following peak growing periods (August–December).



Our Seagrass Community



4

long term
monitoring sites



12

surveys
completed



178

volunteer
attendances



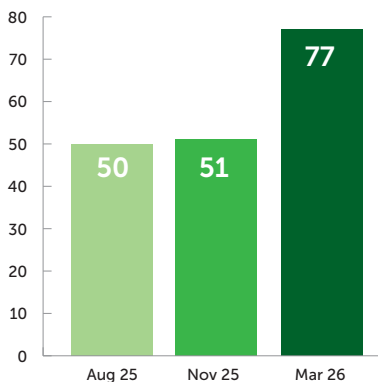
534

volunteer
hours



Community
participation in
seagrass monitoring
has increased

54%
over the past year



In the past year, we have had tremendous support from the community. This has included trained citizen scientists, families, students, tourists, DBCA Yawuru Rangers, DBCA Bardi Jawi trainee Rangers, DBCA Mayala trainee Rangers, the Broome Bird Observatory, Broome Circle and Kimberley Ports Authority.



Volunteer Spotlight

This year, we would like to celebrate Dianne Bennett, who has been part of the Broome Community Seagrass Monitoring Project for 14 years. Dianne attends every seagrass survey she can - unless she is off searching for new dinosaur tracks!

Here are some of Dianne's highlights from her time with the project:

What motivates you to explore the mudflats with us?

"The chance to learn about a whole system I didn't know existed before. Also, to participate in a program that is helping to check the health of Roebuck Bay alongside other motivated people - and watching the sun rise out in the mud."

What is the biggest thing you have learned?

"How there's a huge amount of creatures that live above, below and in the seagrass and mud."

What advice would you give someone who is thinking about joining the Broome Community Seagrass Monitoring Project (BCSMP)?

"Just come along and have a go! It's a lot of fun, and you get to do lots of things you would never think of trying before."



Training and Research

Seagrass-Watch training - August 2025

In August 2025, Seagrass-Watch lead scientists, Len McKenzie and Rudi Yoshida, travelled to Broome to deliver Level 1 Seagrass-Watch training to local community members. Len and Rudi play a key role in supporting our program through developing monitoring methods, providing quality assurance for our data, and contributing ongoing scientific support. Over three days, 14 participants completed training in seagrass monitoring techniques, learning how to accurately assess seagrass meadows and collect ecological data.

Participants who completed the course are now equipped to support and lead future community monitoring activities alongside community volunteers. The training has strengthened the long-term delivery of seagrass monitoring in Roebuck Bay while also building valuable environmental monitoring skills in the local community.



Genetic sampling - November 2025

In November 2025, we joined DBCA Yawuru Rangers, Mick Fong and Jason Richardson, together with seagrass researcher Dr. Ankje Frouws, to undertake genetic sampling of seagrass meadows in southern Roebuck Bay. The fieldwork formed part of Dr. Frouws' genetic research project with Edith Cowan University, who along with many of our incredibly dedicated volunteers including Melissa Mair, Dianne Bennett, Nadja Takacs, Amalia Takacs and Sandra Eid, successfully collected and processed 180 genetic samples of narrow leaf seagrass.

Guided by Yawuru traditional knowledge, sampling sites were carefully selected to better understand how connected seagrass meadows are across Roebuck Bay. We thank Dr. Frouws for the opportunity to assess the genetic diversity of the seagrass populations and improve our understanding of the resilience of these ecosystems, as well as all her efforts in the field. We look forward to the results later this year!



10

volunteer
attendances



30

volunteer
hours



Learning Together

More fun in the mud!

Great Southern BioBlitz - October 2025

As part of the Great Southern BioBlitz global citizen science initiative, community volunteers ventured across Town Beach's mudflats to document as many different species we could find before the tide came back in.

A total of 246 observations were uploaded to iNaturalist, documenting 99 different taxa and contributing valuable biodiversity records for intertidal invertebrates.



10

volunteer
attendances



30

volunteer
hours



Mangrove Tour - April 2026

Cultural Tour Guide, Bart Pigram, invited community members on an adventure through the mangroves, sharing stories on the connection to Yawuru culture, local history, and biodiversity. We learned about the traditional uses of mangroves for food and resource production, the strong connections between Aboriginal groups and the pearling industry in Broome, and the rich diversity of life supported by mangrove ecosystems. We thank Bart for generously sharing his knowledge and connection to Country with the community.

Benthic Sampling Workshop - May 2026

Community members joined in on a hands-on exploration of Roebuck Bay's remarkable benthic diversity. Participants learned how to collect mud samples and sort fauna into different taxonomic groups, guided by researcher Grace Maglio, citizen scientists Dianne Bennett, Taryn Ryan and Sharmaine Donnelly, as well as wardens Jamie and Sebastian van Jones from the Broome Bird Observatory. Held within the spectacular Yawuru Nagulagun Roebuck Bay Marine Park, the workshop was an afternoon filled with knee-high mud, marine critters, and stories about the hidden life beneath the bay's surface.



36

volunteer
attendances



144

volunteer
hours

Species Spotlight

Beaded sea anemone (*Heteractis aurora*)

A common find on the mudflats, but one deserving of a species spotlight! While many anemones prefer calm waters, the beaded sea anemone thrives in strong currents, making the rapid tidal movements of Roebuck Bay the perfect place to call home.

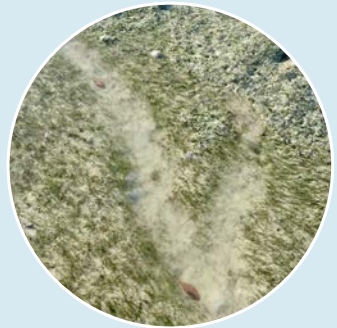
This carnivorous animal uses tentacles armed with stinging cells called nematocysts to capture prey. Its bright fluorescent colours also help protect it from intense UV exposure during low tide, acting like a natural sunscreen.



Dugong (*Dugong dugong*)

We may not often see dugongs at low tide, but we do see where they have been! Dugongs have poor eyesight and rely on sensitive bristles on their upper lips to locate seagrass meadows beneath the water.

Once they find seagrass, dugongs use their strong muscular lips to uproot the entire plant, leaving winding feeding trails through the meadow. The two seagrass species monitored in Roebuck Bay are a favourite food source because their roots and rhizomes are easier to digest than those of many other seagrasses.



Did you know?

Rhizomes are horizontal stems that grow underground which allow the plant to spread and grow new shoots.

Sea squirt (*Ascidian*)

Is it a worm or an egg? Neither! This is an ascidian, commonly known as a sea squirt due to its habit of squirting jets of water when disturbed. What appears to be a worm inside the jelly-like body is actually the stomach. This filter-feeding organism helps to clean the water by removing plankton, which in turn supports healthy seagrass growth.

Ascidians come in an incredible variety of shapes and sizes. Some live as solitary individuals, while others form colourful colonies made up of many tiny animals joined together.



What's Next?

Join us for the next round of surveys!

See our upcoming seagrass survey schedule below. To sign up, visit our events page below, we advertise one month prior and spots fill up quick! You can also sign up to our mailing list from our website and follow our social media for updates and more community events.

JULY 2026

15/07/2026	3.45pm	Town Beach
17/07/2026	5.15am	Demco
18/07/2026	5.30am	Black Ledge
19/07/2026	5.45am	Port

OCTOBER 2026

10/10/2026	2.45pm	Black Ledge
11/10/2026	3.15pm	Port
14/10/2026	5.15am	Town Beach
15/10/2026	5.30am	Demco

Contact us if you would like to get involved!

www.environskimberley.org.au/events
Email: seagrass@environskimberley.org.au
Phone: 08 9192 1922



 Environs Kimberley

 [environskimberley](https://www.instagram.com/environskimberley)

 Broome Seagrass

Acknowledgements

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

- the community volunteers who brought their passion and enthusiasm on to the mudflats - we couldn't do it without you!
- DBCA Yawuru Rangers and Nyamba Buru Yawuru for your continued support and guidance on the mud and in the bay
- Seagrass-Watch HQ for your scientific skill, commitment and quality assessment of the data collected
- the funders and partners who make this project possible: Rangelands NRM, Kimberley Ports Authority, Coastwest, Department of Biodiversity, Conservation and Attractions, Australian Government, Broome Bird Observatory, Murdoch University, Roebuck Bay Working Group and Edith Cowan University.

Resources and Acknowledgments

Seagrass-Watch

Visit the Seagrass-Watch website to learn more about the analysis of our monitoring project, to access an array of seagrass resources, and to learn about seagrass monitoring efforts around the globe.



Seagrass Heatwave Collective

Visit Edith Cowan University's newly launched website for updates and resources on how to protect WA's seagrasses in the event of marine heatwaves.



See You Next Survey!







Contact us if you would like to get involved!

www.environskimberley.org.au/events

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Phone: 08 9192 1922