Department of **Water and Environmental Regulation**
Department of **Primary Industries and Regional Development**
GOVERNMENT OF WESTERN AUSTRALIA

HEALTHY ESTUARIES WA

Seagrass and macroalgae snapshot: Bindjareb Djilba (Peel-Harvey estuary) 2024-25

Through the State Government's Healthy Estuaries WA program, the Department of Water and Environmental Regulation (the department) monitors the condition and area of seagrass and macroalgae in five estuaries in south-west Western Australia (WA), including Peel-Harvey estuary. This report describes the distribution of seagrass and macroalgae in Peel-Harvey estuary in February 2025. It updates information from previous years available at estuaries.dwer.wa.gov.au/seagrass.

Understanding seagrass condition and macroalgae presence helps to guide how we manage our estuaries

Seagrasses are flowering plants with leaves, roots and rhizomes. They require good water and sediment quality to thrive and are a valuable indicator of estuary health. Seagrass meadows provide food and habitat for animals and produce oxygen, making them an important part of the estuary ecosystem. Macroalgae are aquatic plants that can be free-floating, attached to solid surfaces or can grow from sediments. Macroalgae are an important part of the food chain; however, an over-abundance indicates an imbalance in the ecosystem, usually caused by excess nutrients. Some species of macroalgae can respond rapidly to increased nutrients, resulting in prolific growth which can smother seagrass, clog waterways and accumulate as smelly wrack along the shoreline.

Bindjareb Djilba (Peel-Harvey estuary)

The Bindjareb Djilba (Peel-Harvey estuary) is the largest inland waterbody in southern WA. The estuary consists of two shallow basins – the Peel Inlet and the Harvey Estuary. It is permanently opened to the ocean by the artificially modified Mandurah Channel and the Dawesville Cut. There have been signs of declining estuary health and eutrophication since the 1890s. Sustained periods of poor estuary conditions continued until the estuary's ecological collapse in the 1970-80s. Since the opening of the Dawesville Cut in 1994, there has been an increase in seagrass habitat, as well as a decline in macroalgae.

This snapshot focuses on the extent and distribution of seagrass and macroalgae determined by underwater camera and drone observations, aligning with monitoring methods for other estuaries in Healthy Estuaries WA.

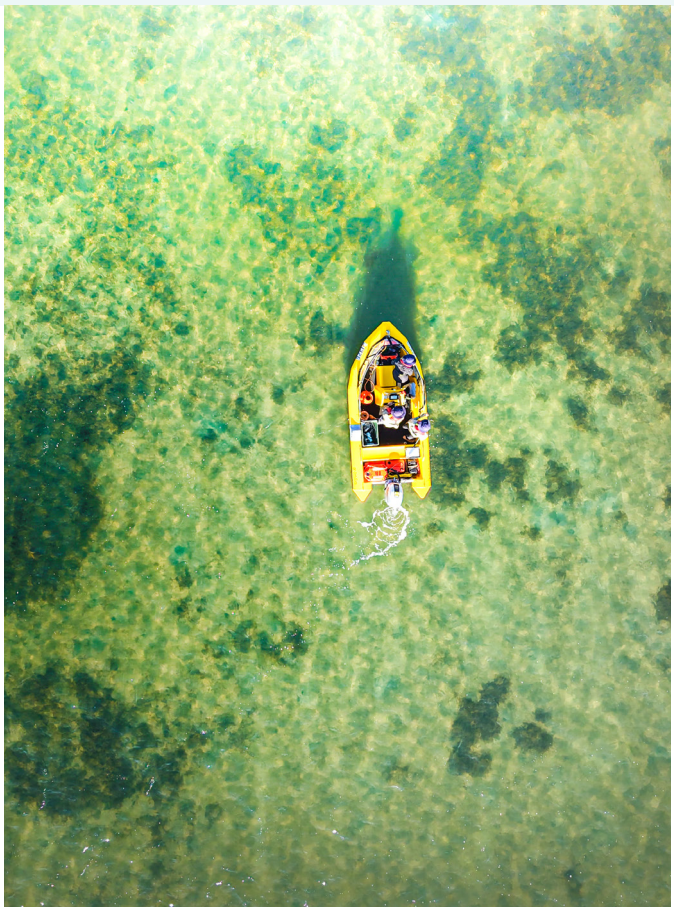


Seagrass snapshot

Several seagrass species are present within the Bindjareb Djilba (Peel–Harvey Estuary). *Ruppia megacarpa* (left image) is the most widespread species, typically occurring along the margins of both basins. *Halophila ovalis* (centre image) is common throughout the Peel Inlet, particularly in sheltered shallow waters. *Heterozostera polychlamys* (right image) and *Zostera muelleri* were combined in this study as they are morphologically[1] similar and typically co-occur along the northern Harvey Estuary and the north-western shoreline of the Peel Inlet. In addition, anecdotal observations of *Posidonia spp.* and *Amphibolis spp.* have been recorded in recent years.

Seagrass over time[1]

- Anecdotal reports suggest that seagrass was abundant in the early 1960s
- Widespread loss of seagrass occurred in the 1970s-1980s due to smothering from macroalgal blooms
- Seagrass all but disappeared in the southern Harvey Estuary after the mid-1980s
- There was an increase in the abundance of seagrass, particularly within the Peel Inlet, after the Dawesville Cut was opened in 1994
- In 2017 and 2018, seagrass was more abundant than macroalgae for the first time since the late 1970s
- In 2021, seagrass covered 55 per cent of the estuary, though remained relatively absent in the southern Harvey Estuary, suggesting little to no recovery had occurred in this area

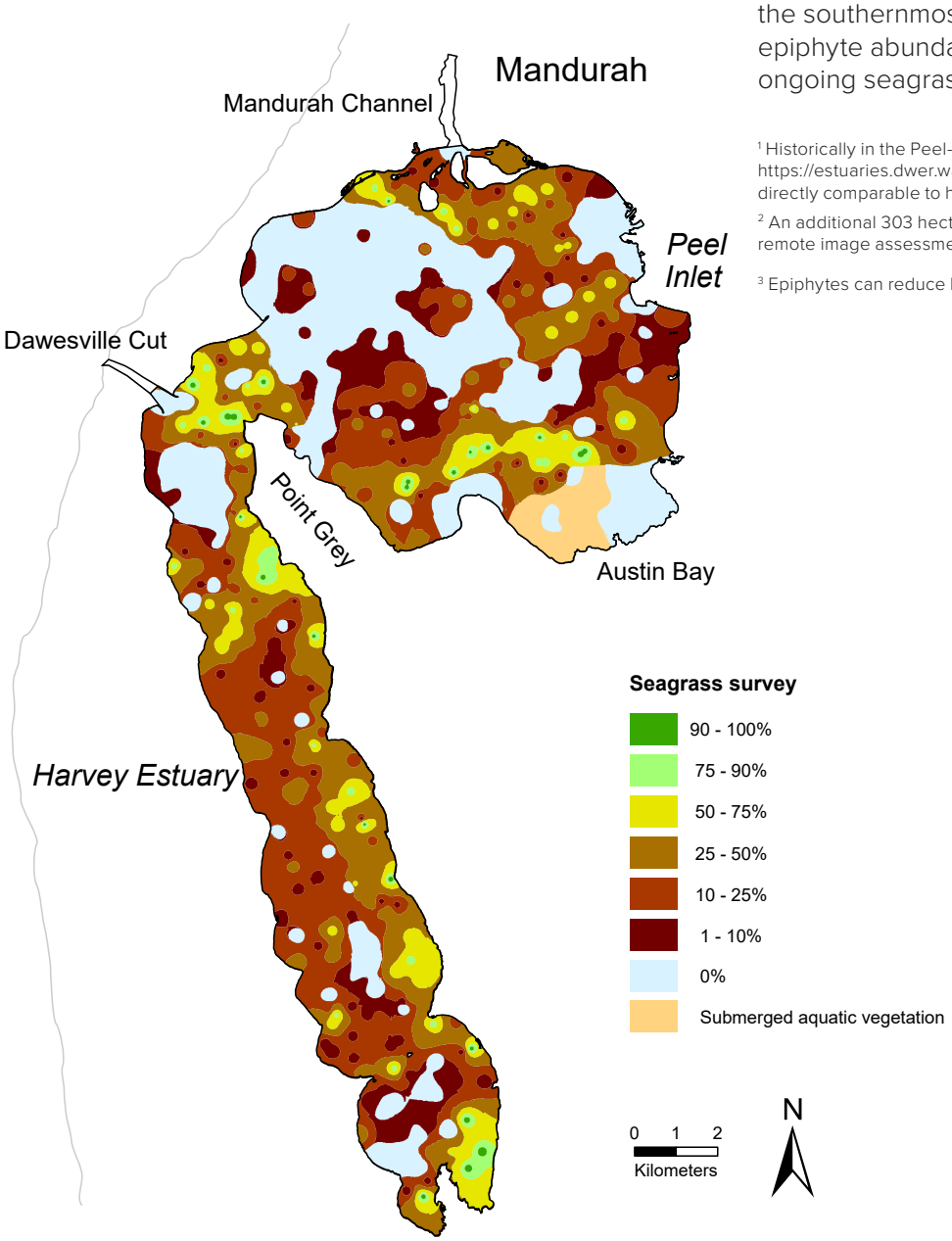


[1] Morphological traits are those that are associated with appearance, such as shape, colour, structure, and size

Seagrass distribution in February 2025

The department monitored the extent and distribution of seagrass in February 2025, with a comprehensive survey of almost 500 observations.

Seagrass covered an estimated 9,279 hectares [1], representing approximately 71 per cent of the total estuary area. Compared to 2021, total seagrass extent increased by 16 per cent, driven largely by expansion within the Harvey Estuary. Notably, the southern basin of the Harvey Estuary—previously supporting only sparse or minimal seagrass cover—now contains dense meadows, indicating a substantial increase since the 2021 survey. Overall seagrass density was low, with moderate to high-density meadows confined mainly to areas near the Dawesville Cut and along the eastern and southern margins of the Peel Inlet and Harvey Estuary.



Ruppia continues to be the dominant seagrass species within the Bindjareb Djilba (Peel–Harvey Estuary), with recent expansion in the southernmost Harvey Estuary forming large single species meadows. Halophila was recorded extensively across the central Harvey Estuary, and throughout the northern Peel Inlet. Heterozostera/Zostera was observed in the northern Harvey Estuary and along the northwestern shoreline of the Peel Inlet, showing highest abundance near the Dawesville Cut and Point Grey, where salinity is more marine. The 2025 survey also confirmed continued presence of Posidonia australis in shallow areas adjacent to the Dawesville Cut, where salinity conditions are more stable.

Overall, the abundance of small organisms growing on seagrass leaves (epiphytes [3]) was high, which can negatively affect seagrass health. However, in the southernmost Harvey Estuary, low to moderate epiphyte abundance suggests a reduced risk to ongoing seagrass establishment.

[1] Historically in the Peel-Harvey, different methods were used with surveys (see https://estuaries.dwer.wa.gov.au/wst-91). The results of this snapshot are not directly comparable to historical reports prior to 2021

[2] An additional 303 hectares of submerged aquatic vegetation was inferred from remote image assessment

[3] Epiphytes can reduce light availability and affect seagrass growth

Macroalgae snapshot

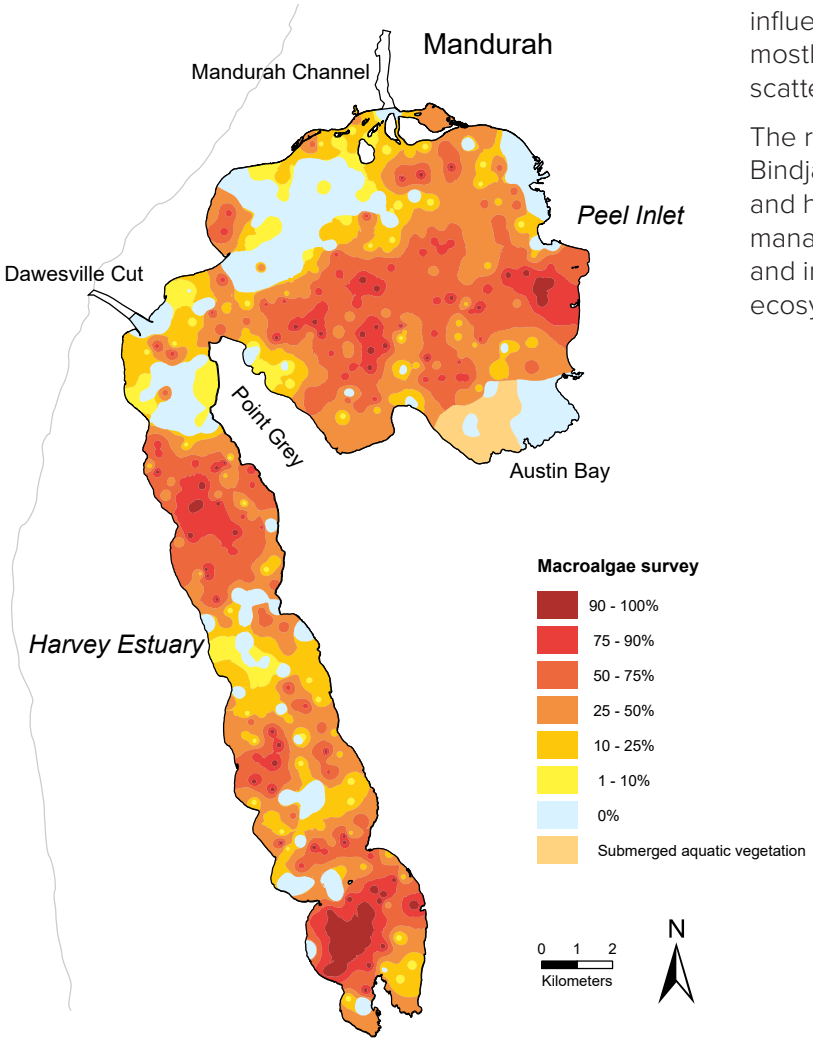
Macroalgae are broadly classified into three groups: green, red, and brown macroalgae. In the Bindjareb Djilba (Peel-Harvey Estuary), green macroalgae are typically the most abundant, and have historically been dominated by *Chaetomorpha linum* (see image) and *Willella bradchyclados* (formerly *Cladophora montagneana*).

Macroalgae over time

- Macroalgal blooms in the estuary began to occur in the 1940s, which formed floating mats and washed up on the shore
- Macroalgae were so prolific by the 1970s that harvesters were used to remove accumulations. An estimated 120,000 tonnes of rotting algae were removed over about 20 years
- Green macroalgae drastically declined following the opening of the Dawesville Cut in 1994
- In recent years, green macroalgae have increased in the southern Harvey Estuary and in Austin Bay

Macroalgae distribution in February 2025

Macroalgae covered an estimated 10,726 hectares, about 82 per cent of the total estuary area. Overall macroalgal density was moderate, with the highest concentrations observed in the southern Harvey Estuary. Since 2021, total macroalgae extent has increased by 24 per cent, reflecting similar gains observed in seagrass extent.



Green macroalgae dominated the Bindjareb Djilba (Peel-Harvey estuary), occupying 9,279 hectares, about 71 per cent of the total estuary area. The dominant species were *Chaetomorpha linum* and *Caulerpa taxifolia*. Green macroalgae were the only algal group observed in the southernmost basin of the Harvey Estuary, but were largely absent between the Dawesville Cut and Mandurah Channel where marine influence is greater. Red and brown macroalgae were mostly confined to the southern Peel Inlet, with a scattered presence in the Harvey Estuary.

The recent increase of macroalgae observed in the Bindjareb Djilba (Peel-Harvey estuary) is of concern and highlights the importance of continuing catchment management to reduce nutrient inputs to the estuary and improve water quality to support a healthy ecosystem.

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