

Seagrass and macroalgae snapshot 2020-21

Bindjareb Djilba (Peel-Harvey estuary)

Through the Healthy Estuaries WA program, the condition and area of seagrass and macroalgae is being monitored in South West estuaries, including Peel-Harvey estuary. This report describes the distribution of seagrass and macroalgae in Bindjareb Djilba (Peel-Harvey estuary) in March 2021.

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 Western Australia. 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 the Healthy Estuaries WA program.



Seagrass snapshot

Several seagrass species occur in the Bindjareb Djilba (Peel-Harvey estuary). *Halophila ovalis* is often found in the Peel Inlet. *Ruppia megacarpa* is most common and is found along the edges of both basins. *Heterozostera polychlamys* and *Zostera muelleri* are difficult to distinguish without close examination, and are found in the northern Harvey Estuary and north-western shoreline of the Peel Inlet.



Halophila ovalis



Ruppia megacarpa



Heterozostera polychlamys

Seagrass over time¹

- 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

¹ Historically in the Peel-Harvey, different methods were used with surveys reporting on the biomass (dry weight) of seagrass and macroalgae by collecting samples across the estuary. The results of this snapshot are not directly comparable to historical reports.

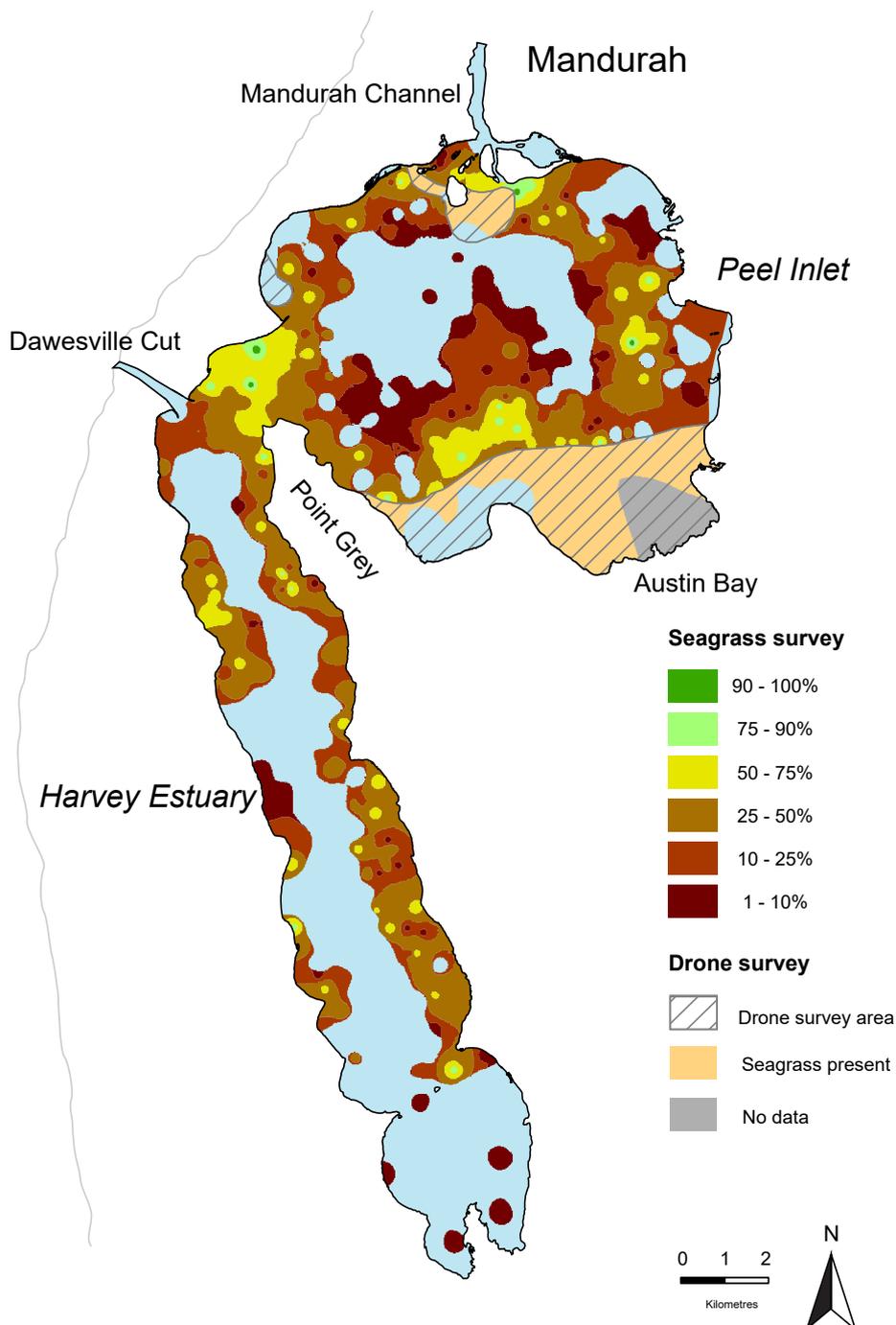


Seagrass distribution in March 2021

The Department of Water and Environmental Regulation monitored the extent and distribution of seagrass in March 2021, with a comprehensive survey of almost 500 observations.

Seagrass was estimated to spread across 7,360 hectares, which is about 55 per cent of the estuary area. Seagrass density was typically low with a few high-density meadows near the Dawesville Cut and in the northern and eastern margins of the Peel Inlet. Seagrass was rarely observed in the southern Harvey Estuary, suggesting little to no recovery has occurred in this area.

Ruppia remains the dominant seagrass species occurring throughout the Peel Inlet and along the western and eastern shorelines of the Harvey Estuary. *Halophila* occurred in the Harvey Estuary along both shorelines, near the Dawesville Cut and in the northern and eastern regions of the Peel Inlet. *Heterozostera/Zostera* was observed in the northern Harvey Estuary and north-western shoreline of the Peel Inlet with greatest abundance close to the Dawesville Cut and Point Grey, where salinity is more marine. The 2021 survey also identified *Posidonia australis* near the Dawesville Cut, where salinity is more stable. The department observed the abundance of small organisms growing on the seagrass leaves (epiphytes), which can reduce light availability and impact seagrass growth. Epiphyte cover was medium on average across the estuary, but notably high near the Dawesville Cut.



Macroalgae snapshot – Bindjareb Djilba (Peel-Harvey estuary) 2021

Macroalgae species are divided into green, red and brown types. Green macroalgae, particularly *Chaetomorpha linum* (see image) and *Willella bradchyclados* (formerly *Cladophora montagneana*), are most abundant in the Bindjareb Djilba (Peel-Harvey estuary).

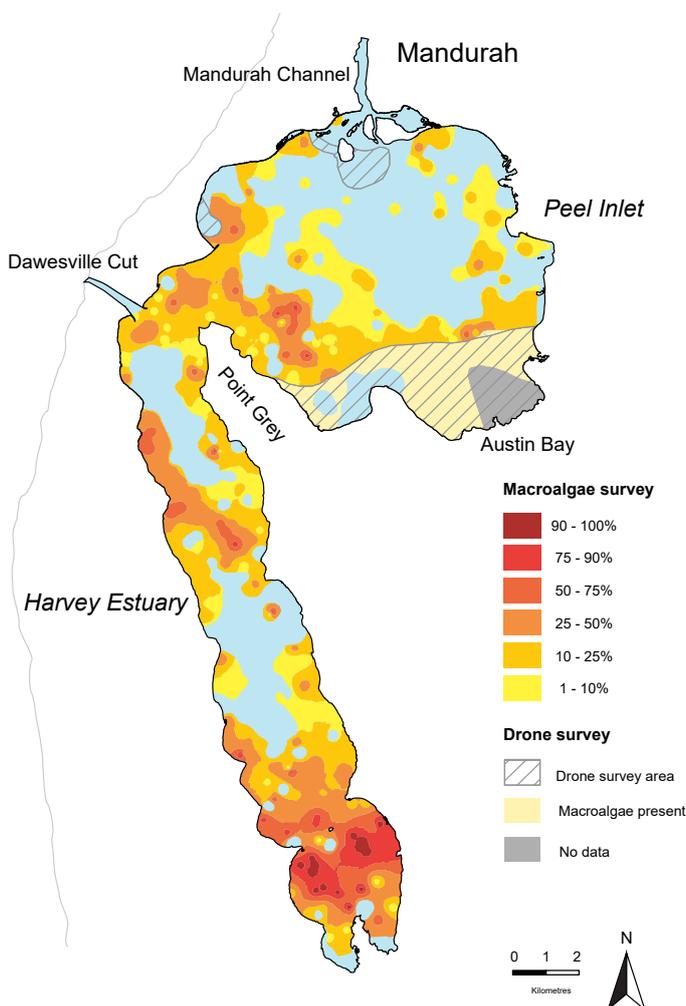


Macroalgae over time

- 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 March 2021

In March 2021, the department estimated that macroalgae were present across 7,766 hectares of the Peel-Harvey estuary, or 58 per cent of the estuary area. Macroalgal cover across the estuary was low on average. The highest densities of macroalgae were in the southern Harvey Estuary.



Green macroalgae, particularly *Chaetomorpha linum* and *Caulerpa taxifolia*, were the dominant macroalgae (5,109 hectares). They were present through most of the Peel Inlet but absent around the Dawesville Cut and in the eastern part of the basin. Green macroalgae were observed throughout the entire Harvey Estuary, with very high cover recorded in the southern Harvey Estuary.

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

