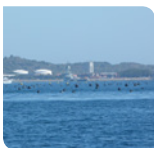
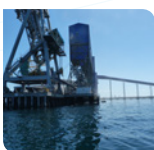


SEAGRASS MONITORING

COCKBURN SOUND

Background



Seagrasses are specialised marine plants that grow in soft sediments in the shallow waters of nearshore coastal ecosystems. Seagrasses provide habitat for fish and other aquatic organisms, contribute to improving water quality through nutrient cycling and sediment retention, and represent an important source of organic matter. Seagrass communities are an important part of the Cockburn Sound ecosystem and their health is an indicator of the overall health of Cockburn Sound.

Seagrass meadows originally occupied about 3,900 hectares (ha) in Cockburn Sound, covering most of the seabed at depths of 10 metres (m) or less. By the late 1960s and early 1970s, the area of seagrass in the Sound had been greatly reduced. Seagrass occupied an area of approximately 660 ha in 1999, a reduction of about 80 per cent. This loss was attributed to an increase in nutrients in Cockburn Sound which stimulated the growth of phytoplankton¹ and epiphytes², which in turn reduced the amount of light reaching the seagrass.

Following these changes to Cockburn Sound, the Western Australian Government released the State Environmental (Cockburn Sound) Policy in 2005. A revised policy was released in December 2015. The overall objective of the State Environmental (Cockburn Sound) Policy 2015, is to ensure that water quality in Cockburn Sound is maintained and, where possible, improved so that there is no further net loss, and preferably a net gain, in seagrass areas and that other values and uses are maintained.

Annual monitoring of seagrass health in Cockburn Sound has been undertaken since 1998. The monitoring focuses on *Posidonia sinuosa*, which is the major meadow-forming seagrass species in Cockburn and Warnbro Sounds. The methods for collection and analysis of seagrass data are in accordance with the *Standard Operating Procedures* for environmental monitoring in Cockburn Sound.³

The Cockburn Sound Management Council (CSMC) oversees the annual program of seagrass monitoring in Cockburn Sound. Funding is provided by the Department of Environment Regulation.

- 1 Single-celled plants and other photosynthetic organisms (including cyanobacteria, diatoms and dinoflagellates) that live in the water column.
- 2 Algae that grow on seagrass leaves.
- 3 Environmental Protection Authority (2005). *Manual of Standard Operating Procedures for Environmental Monitoring against the Cockburn Sound Environmental Quality Criteria (2003-2004)*.



Figure 1: Location of seagrass monitoring sites in and around Cockburn Sound

Posidonia sinuosa shoot density is monitored at 11 sites in Cockburn Sound, five sites outside Cockburn Sound and five reference sites in Warnbro Sound (Figure 1), which is in the Shoalwater Islands Marine Park. The numbers of shoots and canopy height are recorded in each of 24 fixed 20 centimetre (cm) x 20 cm quadrats, located along four 10 m long transects at each site (Figure 2).

Posidonia sinuosa lower depth limits are monitored at two sites in Cockburn Sound, one site outside Cockburn Sound and one site in Warnbro Sound (Figure 1). At each depth limit site, seagrass shoot density and canopy height are measured in quadrats located every two metres along three 20 m transects which extend down the depth gradient. The lower depth limit of seagrass growth is also recorded on each transect. This is the maximum distance and greatest depth where seagrass shoots are found.

In addition, at each site 10 photographs are taken along each transect to provide a permanent record of seagrass cover. Photographs are taken one metre above the seafloor and at one metre intervals along the transect.

What is the Purpose of the Seagrass Monitoring?

- To determine whether the environmental quality objectives set out in the State Environmental (Cockburn Sound) Policy 2015 are being met and the environmental values identified for the Cockburn Sound marine area are being protected and maintained.
- To identify changes and trends in *Posidonia sinuosa* shoot densities and lower depth limits over time.

What Seagrass Data are Collected?

Data collected during the seagrass monitoring include:

Shoot density	A measure of seagrass abundance. Shoot density is a key indicator of seagrass health.
Canopy height	Provides an indication of the structural role of seagrass in the ecosystem and a measure of biomass or standing stock of seagrass in conjunction with density.
Lower depth limit	The maximum depth where seagrass occurs.

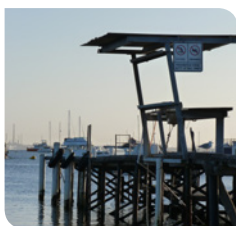
When, Where and How are the Seagrass Data Collected?

Seagrass monitoring is undertaken in summer (generally January–February) each year. The monitoring is undertaken by researchers from the University of Western Australia and the Department of Parks and Wildlife, through the Western Australian Marine Science Institution.



(Source: University of Western Australia)

Figure 2: Diver measuring seagrass shoot densities in Cockburn Sound



Environmental Quality Criteria

The *Environmental Quality Criteria Reference Document for Cockburn Sound*⁴ details the environmental quality criteria for protecting Cockburn Sound from the effects of physical and chemical stressors. The data collected through the seagrass monitoring program are assessed against these criteria in accordance with the Reference Document.

Reporting on the Results of Seagrass Monitoring

The CSMC reports annually to the Minister for Environment and the community on the results of seagrass monitoring in Cockburn Sound. The full report and the Report Card can be found on the [CSMC's website](#).

Seagrass monitoring data are available on request from the CSMC.



For more information please contact the Cockburn Sound Management Council:

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Email: CSMC@der.wa.gov.au

Or visit the Cockburn Sound Management Council's website: www.der.wa.gov.au/about-us/csmc

4 Environmental Protection Authority (2017). *Environmental Quality Criteria Reference Document for Cockburn Sound. A supporting document to the State Environmental (Cockburn Sound) Policy 2015*.