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# Seagrass–Watch:

Manual for Mapping & Monitoring  
Seagrass Resources by Community  
(citizen) Volunteers.



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# Seagrass-Watch:

MANUAL FOR MAPPING &  
MONITORING SEAGRASS  
RESOURCES BY COMMUNITY  
(CITIZEN) VOLUNTEERS.

2<sup>ND</sup> EDITION

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The Department of Primary Industries seeks a better quality of life for all Queenslanders – a quality of life supported by innovative world-class food and fibre industries, by responsible and ecologically sustainable use of natural resources and by capable and self-reliant rural communities.

Our business is about:

- Innovative science and commercial uptake of new technology by food and fibre industries
- Sustainable use of natural resources
- Food safety and protection against imported pests and diseases
- Market-driven and ethical food and fibre production and
- Capable rural communities achieving prosperity and self-reliance through successful rural businesses.

This publication is designed to offer detailed information on how to map and monitor seagrass resources to citizens and other community/government stakeholders for seagrass conservation.

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# Overview

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Often governments are unable to protect and conserve seagrass meadows without the assistance of local communities (e.g., local residents, schools, non-government organisations). Seagrass-Watch is a community based monitoring program that brings citizens and governments together for seagrass conservation. It identifies areas important for seagrass species diversity and conservation. The information collected can be used to assist the management of coastal environments and to prevent significant areas and species being lost.

Monitoring seagrass resources is important for two reasons: it is a valuable tool for improving management practices; and it allows us to know whether resource status and condition is stable, improving or declining. Successful management of coastal environments (including seagrass resources) requires regular monitoring of the status and condition of natural resources.

Early detection of change allows coastal management agencies to adjust their management practices and/or take remedial action sooner for more successful results. Monitoring is important in improving our understanding of seagrass resources and to coastal management agencies for:

- Exposing coastal environmental problems before they become intractable,
- Developing benchmarks against which performance and effectiveness can be measured,
- Identifying and prioritising future requirements and initiatives,
- Determining the effectiveness of management practices being applied,
- Maintaining consistent records so that comparisons can be made over time,
- Developing within the community a better understanding of coastal issues,
- Developing a better understanding of cause and effect in land/catchment management practices,
- Assisting education and training, and helping to develop links between local communities, schools and government agencies, and
- Assessing new management practices

It is also important to realise that the reasons for monitoring will influence the monitoring plan and the methods used.

The Seagrass-Watch program originated from

- Community concerns about seagrass loss and habitat integrity
- Community interest in science, and
- Government objectives in long-term monitoring of critical fisheries habitats.

## Seagrass-Watch program Goals

The goals of the Seagrass-Watch program are:

- Partnerships between Government and non-government organisations,
- Community participation and ownership of marine resources,
- Long-term & broad-scale monitoring of habitat, seasonal patterns, condition and trend data,
- An early warning system of coastal environment changes,
- Community education on the importance of seagrass resources, and
- Community awareness of coastal management issues.
- To provide training to build the capacity of local communities to collect information useful for the ongoing management and protection of important marine resources.
- Integrate with existing education, government, non-government and scientific programs to raise community awareness and preserve these important marine ecosystems for the benefit of the community.

## How to use this manual

The following manual provides detailed information on how to map and monitor seagrass resource status and condition. Several alternative monitoring methods are detailed and the reader should decide which is appropriate to their needs. The manual is divided in chapters, which cover

- The monitoring process and how to start ([Chapter 2](#) & [Chapter 3](#));
- How to map the seagrass resource and how to design a monitoring plan ([Chapter 4](#)). Examples of monitoring designs (intertidal fixed transects site, intertidal fixed point site, subtidal fixed single transect, subtidal spots in defined area, depth transects across a meadow) are presented to assist the reader. This section also considers how often to monitor, pre-monitoring preparation and safety issues to consider.
- Having mapped the seagrass resource and chosen an appropriate design, [Chapter 5](#) then provides step by step methods for monitoring seagrass status from setting up & relocating a monitoring site to the measures within a quadrat;
- Finally [Chapter 6](#) discusses methods for monitoring seagrass condition & resilience. Methods for monitoring *Halodule* seed banks is presented and other advanced techniques are discussed.

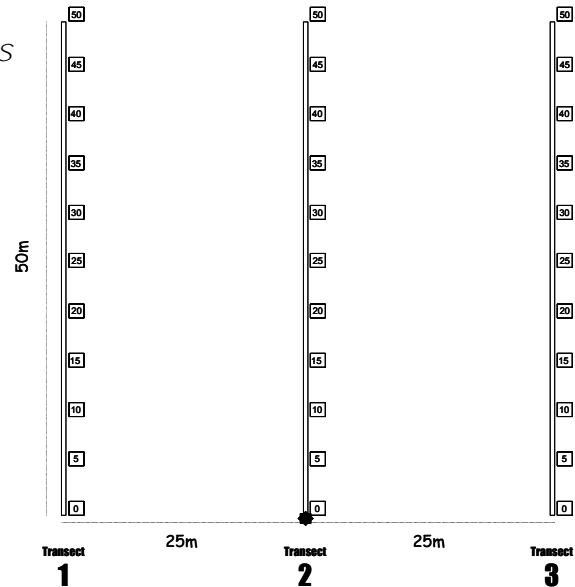
This manual also contains several appendices including field datasheets, percent cover standards, identification sheets and what to include in a monitoring kit.

# Seagrass-Watch Monitoring Summary

The following is a step-by-step summary of the most popular protocol used in Seagrass-Watch for monitoring intertidal seagrass habitats (see Appendix I, page 80 for an example of a completed datasheet).

## Necessary equipment and materials

- ❑ 3x 50metre fibreglass measuring tapes
- ❑ 6x 50cm plastic tent pegs
- ❑ compass
- ❑ 1x standard (50cm x 50cm) quadrat
- ❑ Magnifying glass
- ❑ 3x Monitoring datasheets
- ❑ Clipboard, pencils & 30 cm ruler
- ❑ Camera & film
- ❑ Quadrat photo labeller
- ❑ Percent cover standard sheet
- ❑ Seagrass identification sheets



## Quarterly sampling

Within the 50m by 50m site, lay out the three 50 transects parallel to each other, 25m apart and perpendicular to shore (see site layout). Within each of the quadrats placed for sampling, complete the following steps:

### Step 1. Take a Photograph of the quadrat

- Photographs are usually taken at the 5m, 25m and 45m quadrats along each transect, or of quadrats of particular interest. First place the photo quadrat labeller beside the quadrat with the correct code on it.
- Take the photograph from an angle as **vertical** as possible, which includes the entire quadrat frame, quadrat label and tape measure. Try to avoid having any shadows or patches of reflection off any water in the field of view. Check the photo taken box on the datasheet for that quadrat.

### Step 2. Describe sediment composition

- To assess the sediment, dig your fingers into the top centimetre of the substrate and feel the texture. Describe the sediment, by noting the grain size in order of dominance (e.g., Sand, Fine sand, Fine sand/Mud).

### Step 3. Estimate seagrass percent cover

- Estimate the total % cover of seagrass within the quadrat – use the percent cover photo standards as a guide.

### Step 4. Estimate seagrass species composition

- Identify the species of seagrass within the quadrat and determine the percent contribution of each species to the cover (must total 100%). Use seagrass species identification keys provided.

**Step 5. Measure canopy height**

- Measure canopy height of the seagrass ignoring the tallest 20% of leaves. Measure from the sediment to the leaf tip of at least 5 shoots.

**Step 7. Estimate algae percent cover**

- Estimate % cover of algae in the quadrat. Algae are seaweeds that may cover or overlie the seagrass blades. Use "Algal percentage cover photo guide".

**Step 8. Estimate epiphyte percent cover**

- Epiphytes are algae attached to seagrass blades and often give the blade a furry appearance. First estimate how much of the blade surface is covered, and then how many of the blades in the quadrat are covered (e.g., if 20% of the blades are each 50% covered by epiphytes, then quadrat epiphyte cover is 10%).

**Step 9. Describe other features and ID/count of macrofauna**

- Note and count any other features which may be of interest (eg. number of shellfish, sea cucumbers, sea urchins, evidence of turtle feeding).

**Step 10. Take a voucher seagrass specimen if required**

- Seagrass samples should be placed inside a labelled plastic bag with seawater and a waterproof label. Select a representative specimen of the species and ensure that you have all the plant part including the rhizomes and roots. Collect plants with fruits and flowers structures if possible.

## At completion of monitoring

**Step 1. Check data sheets are filled in fully.**

- Ensure that your name, the date and site/quadrat details are clearly recorded on the datasheet. Also record the number of other observers assisting.

**Step 2. Remove equipment from site**

- Remove all tent pegs and roll up the tape measures. If the tape measures are covered in sand or mud, roll them back up in water.

**Step 3. Wash & pack gear**

- Rinse all tapes, pegs and quadrats with freshwater and let them dry.
- Review supplies for next quarterly sampling and request new materials
- Store gear for next quarterly sampling

**Step 4. Press any voucher seagrass specimens if collected**

- The voucher specimen should be pressed as soon as possible after collection. Do not refrigerate longer than 2 days, press the sample as soon as possible.
- Allow to dry in a dry/warm/dark place for a minimum of two weeks. For best results, replace the newspaper after 2-3 days.

**Step 5. Submit all data**

- Mail original datasheets, photos and herbarium sheets

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