Percent cover standards

Coastal - low
Percent cover standards
Percent cover standards

Coastal - H. ovalis

2% 5%
7% 17%
25% 38%
60% 70%
**SEAGRASS SPECIES CODES**

**Zc**
*Zostera muelleri subsp. capricorni*
- leaf with 3-5 parallel veins
- cross-veins form boxes
- leaf tip smooth and rounded, may be dark point at tip
- rhizome usually brown or yellow in younger parts
- leaf grows straight from rhizome (no stem)

**Ho**
*Halophila ovalis*
- 8 or more cross veins
- no hairs on leaf surface
- leaf margins smooth
- leaf 5-20mm long

**Th**
*Thalassia hemprichii*
- ribbon-like, curved leaves 10-40cm long
- leaf tip rounded, slightly serrated
- short black tannin cells, 1-2mm long, in leaf blade
- thick rhizome with scars between shoots

**Hu**
*Halodule uninervis*
- trident leaf tip, not rounded
- 1 central vein
- Rhizome usually pale, with small black fibres at the nodes
- narrow leaf blades 0.25-5mm wide

**Cr**
*Cymodocea rotundata*
- rounded leaf tip
- narrow leaf blade (2-4mm wide)
- leaves 7-15 cm long
- 9-15 longitudinal veins
- well developed leaf sheath

**Cs**
*Cymodocea serrulata*
- serrated leaf tip
- wide leaf blade (5-9mm wide)
- leaves 6-15cm long
- 13-17 longitudinal veins
- robust/strong rhizome

**Si**
*Syringodium isoetifolium*
- narrow spaghetti-like leaves
- cylindrical in cross section, 1-2mm diameter
- leaves contain air cavities
- leaf tip tapers to a point
- leaves 7-30cm long

**Ea**
*Enhalus acoroides*
- very long (>30cm) ribbon-like leaves with inrolled leaf margins
- thick rhizome with long black bristles and cord-like roots

Compiled by Seagrass-Watch HQ June 2010

www.seagrasswatch.org
SEAGRASS SPECIES CODES

**Hm** Halophila minor
- less than 8 pairs of cross veins
- small oval leaf blade less than 5mm wide
- leaf margins smooth
- no leaf hairs

**Hd** Halophila decipiens
- small oval leaf blade 1-2.5cm long
- 6-8 cross veins
- leaf hairs on both sides
- found at subtidal depths

**Hs** Halophila spinulosa
- leaves arranged in opposite pairs
- leaf margin serrated
- erect shoot up to 15cm long
- 10-20 pairs of leaves per shoot
- thin rhizomes
- found at subtidal depths

**Ht** Halophila tricostata
- Leaves with 3 veins
- 2-3 leaves at each node
- Leaves “whorl” around stem
- Found at subtidal depths
- Erect shoots 8-18cm long

**Rm** Ruppia maritima
- leaves fine and thread-like
- pointed tip on leaves, sometimes serrated
- inflorescence on a long stalk, sometimes spiralled
- rhizome fragile
- semi-fresh or estuarine environments

**Tc** Thalassodendron ciliatum
- erect stem up to 65cm long bearing leaf cluster
- rhizome tough and woody
- ribbon-like, sickle-shaped leaves with ligule
- round, serrated leaf tip
- often found attached to rock or coral substrate

Compiled by Seagrass-Watch HQ
June 2010
www.seagrasswatch.org
Seagrass-Watch Protocols


Site layout

Pre-monitoring preparation

Make a Timetable
Create a timetable of times of departure and arrival back, and what the objective of the day is and what is to be achieved on the day. Give a copy of this to all volunteers involved in advance so they can make their arrangements to get to the site on time. List on this timetable what the volunteers need to do. One volunteer may need to bring.

Have a Contact Person
Arrange to have a reliable contact person to raise the alert if you and the team are not back at a specified or reasonable time.

Safety
- Assess the risks before monitoring - check weather, tides, time of day, etc.
- Use your instincts - if you do not feel safe then abandon sampling.
- Do not put yourself or others at risk.
- Wear appropriate clothing and footwear.
- Be sun-smart.
- Adult supervision is required if children are involved.
- Be aware of dangerous marine animals.
- Have a first aid kit on site or nearby.
- Take a mobile phone or marine radio.

Necessary equipment and materials

- 3x 50metre fibreglass measuring tapes
- 6x 50cm plastic tent pegs
- Compass
- 1x standard (50cm x 50cm) quadrate
- 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 quadrate labeller beside the quadrat and tape measure 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. Avoid having any shadows or patches of reflection off any water in the field of view. Check the photo taken box on datasheet for quadrat.

Step 2. Describe sediment composition
- 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. Describe other features and ID/count of macrofauna
- Note and count any other features which may be of interest (e.g., number of shellfish, sea cucumbers, sea urchins, evidence of turtle feeding) within the comments column.

Quadrat code = site + transect+quadrat
e.g., PI1225 = Pigeon ls. site 1, transect 2, 25m quadrat
Step 4. **Estimate seagrass percent cover**
- Estimate the total % cover of seagrass within the quadrat — use the percent cover photo standards as a guide.

Step 5. **Estimate seagrass species composition**
- Identify the species of seagrass within the quadrat and determine the percent contribution of each species to the cover. Use seagrass species identification keys provided.

Step 6. **Measure canopy height**
- Measure canopy height of the dominant strap-like seagrass species ignoring the tallest 20% of leaves. Measure from the sediment to the leaf tip of at least 3 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”. Write within the comments section whether the algae is overlying the seagrass or is rooted within the quadrat.

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%).
- Epifauna are sessile animals attached to seagrass blades — please record % cover in the comments or an unused/blank column – do not add to epiphyte cover.

Step 9. **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 names or number of other observers and the start and finish times.

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**
- Data can be entered into the MS-Excel file downloadable from [www.seagrasswatch.org](http://www.seagrasswatch.org). Email completed files to hq@seagrasswatch.org
- Mail original datasheets, photos and herbarium sheets.
# SEAGRASS-WATCH MONITORING

ONE OF THESE SHEETS IS TO BE FILLED OUT FOR EACH TRANSECT YOU SURVEY

START of transect (GPS reading)

<table>
<thead>
<tr>
<th>Quadrat (metres from transect origin)</th>
<th>Sediment</th>
<th>Comments (eg, mud/sand/shell)</th>
<th>% Seagrass coverage</th>
<th>% Seagrass species composition</th>
<th>Canopy height (cm)</th>
<th>% Algae cover</th>
<th>% Epi-cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (0m)</td>
<td>Sand</td>
<td>Sc x 3</td>
<td>40</td>
<td>H0</td>
<td>5.1±17</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>2 (5m)</td>
<td>S</td>
<td>Gas x 3</td>
<td>33</td>
<td>10</td>
<td>10.1±8</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>3 (10m)</td>
<td>mud/sand</td>
<td>worm x 1</td>
<td>18</td>
<td>20</td>
<td>6.8±5</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td>4 (15m)</td>
<td>m/s</td>
<td>DFT x 1</td>
<td>0</td>
<td>17</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5 (20m)</td>
<td>m/s/shell</td>
<td>HC x 3</td>
<td>36</td>
<td>1cm</td>
<td>9.7±5</td>
<td>12</td>
<td>57</td>
</tr>
<tr>
<td>6 (25m)</td>
<td>m/s/sh</td>
<td>-</td>
<td>48</td>
<td>1cm</td>
<td>NA</td>
<td>1</td>
<td>96</td>
</tr>
<tr>
<td>7 (30m)</td>
<td>Fine Sand</td>
<td>Turtle cropping</td>
<td>0</td>
<td>15cm</td>
<td>0</td>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>8 (35m)</td>
<td>FS</td>
<td>sc x 2</td>
<td>9.7</td>
<td>2cm</td>
<td>17±1.7</td>
<td>18</td>
<td>31</td>
</tr>
<tr>
<td>9 (40m)</td>
<td>s/m</td>
<td>CH x 3</td>
<td>9.7</td>
<td>2cm</td>
<td>2.1±1.6</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>10 (45m)</td>
<td>m</td>
<td>Mud core x 2</td>
<td>4.7</td>
<td>2cm</td>
<td>5.5±1.6</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>11 (50m)</td>
<td>m/s</td>
<td>HC x 1</td>
<td>16</td>
<td>2cm</td>
<td>7.1±17</td>
<td>38</td>
<td>6</td>
</tr>
</tbody>
</table>

END of transect (GPS reading)

**SC = Sea Cucumber**  
**HC = Hermit Crab**  
**Gas = Gastropod**  
**CH = Crab Hole**  
**DFT = Dugong Feeding trail**

**Observer:** Bev Citizen  
**Date:** 17/12/09  
**Location:** Bunum Heads  
**Site code:** BHI  
**TRANSECT no.:** 1  
**Start Time:** 08:4  
**End Time:** 09:40