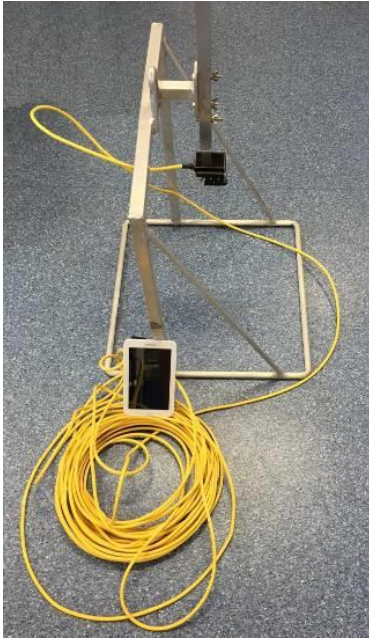


# Spot-check using Drop-Camera

Prepared by Len McKenzie (Seagrass-Watch HQ)



## Equipment and materials

- GoPro® HERO8 + dive housing
- 0.25m<sup>2</sup> drop-cam frame
- 38m WiFi Extension cable
- Tablet (or SmartPhone)
- waterproof pouch for Tablet
- Van Veen grab sampler + rope
- butcher's tray
- mapping datasheets
- clipboard, pencils
- handheld GPS
- drawing slate
- waterproof camera

## Each sampling event

**Aim:** to conduct spot-checks for subtidal seagrass meadows (1-25m water depth)

**Time:** 5-10 minutes for each mapping point

**Personal:** 2-3 people (including boat driver/skipper)

**Sampling design:** A number of designated points are selected within an area to map subtidal seagrass. To account for spatial heterogeneity, 3 drops are conducted at each point. A subtidal point is defined as an area of 5m radius.

**Methodology:** At each point, a GoPro® drop-camera assembly (incl. frame with 0.25m<sup>2</sup> quadrat in field of view) is used to visually assess the seabed and the footage recorded for post-field analysis. Best conducted in slight sea state, when winds <15kts.

## Prepare the GoPro®

- Remove GoPro® Hero8 from dive housing.
- Turn GoPro® on by pressing the Mode button (on the side) for 2 sec.
- Set mode to VIDEO by pressing the Mode button to scroll.
- Check display and ensure video setting is Standard 4K 4:3 | 30 | Wide. If not, connect to GoPro Quik App on Tablet and select settings.
- Turn on the Tablet, open the Quik app icon. Tap GoPro icon on bottom right of screen, tap GoPro icon top right of screen to search and select camera. Tap "Control Your GoPro" and Enable Preview. You should now see a live feed of the GoPro® on the Tablet, and control the GoPro® remotely from the tablet.
- Check capture settings at bottom centre of screen, tap to change, select pencil icon, set Resolution to 4K 4:3, Frames Per Second to 30, Lens to Wide, Hypersmooth to Off.

*Note: Keep tablet in waterproof pouch to avoid contact with water. Recommended to view live feed on Tablet in shaded position, e.g. under a towel.*

## Attach GoPro® to drop-cam frame

- Insert GoPro® into the dive housing and click closed.
- Attach GoPro® dive housing (with WiFi Extension Cable) to drop-cam frame (tighten to ensure camera stability)
- At the dry end of the WiFi Extension Cable, attach the WiFi extension interface to the back of the Tablet using velcro or double sided removable mounting squares.
- Adjust height of GoPro® to ensure 0.25m<sup>2</sup> quadrat in field of view. The field of view will change when camera is immersed, so place camera and frame in water and inspect image on Tablet. Adjust height as required.

## Conducting the spot-check camera drops

- Step 1. Fill in details at top of datasheet (recorder, vessel, date).
- Step 2. Position vessel at the mapping point.
- Step 3. Mark a waypoint on the GPS and enter waypoint number (Point#), location, position (lat and long), and time (24hr format) onto datasheet.
- Step 4. Activate GoPro® camera by pressing record button or using Quik app, and start recording.
- Step 5. Disengage propeller/s and let the vessel drift.
- Step 6. Place slate with Point# written on it, within GoPro® camera field of view and record details.

- Step 7.** Lower the drop-cam frame (assembly) over side of vessel into the water using the rope, and control the decent of the frame to the seabed, ensuring it sits vertically (i.e. GoPro® looking down)
- Step 8.** Once on the seabed, allow the frame to sit for at least 2-5 seconds to capture a clear and steady image of the seabed within the 0.25m<sup>2</sup> field of view (beware of stirring up sediment). Image is continually being recorded on GoPro® and viewed on Tablet simultaneously.
- Step 9.** On the datasheet, enter seagrass percent cover and seagrass species composition.
- Step 10.** When a suitable image has been captured, lift the frame off the seabed (only a metre or so is sufficient) and hold for 3-5 seconds (depending on drift speed), before dropping back to the seabed.
- Step 11.** Repeat Steps 7 to 10, raising and lowering the frame to record clear images of the seabed for 2 more drops. Each camera drop needs to be separated by 1-2m.
- Note: The faster the vessel drifts, the more difficult it is to obtain a clear image of the seabed. Also, watch the distance between the vessel and the waypoint, and do not drift >10m from the waypoint.*
- Step 12.** When the last camera drop has been completed, estimate the water depth and record on datasheet.
- Step 13.** Return drop-cam to vessel and stop recording. Check GoPro® has recorded the drops and turn GoPro® off.
- Step 14.** Use van Veen grab (see below) to verify seagrass presence and sample sediment (NB: samples do not need to be retained). You may need to do several grabs to verify.
- Step 15.** Verify the seagrass species using the guides provided and photograph a clean/washed specimen (showing leaves, rhizomes and roots) on the sheet provided.
- Step 16.** Describe sediment in order of dominance (e.g. Sand, Fine sand, Fine sand/Mud) using the visual / tactile assessment. Record sediment description on datasheet.
- Step 17.** Relocate to next mapping point and repeat steps 2 to 16.

### **Verifying seagrass and sampling sediment using Van Veen grab**

- Open the clamshell bucket of the grab by spreading the metal levers
- Lock the grab into open position by securing hook in the opposing hole
- Lower the grab into the water, making sure it stays open in the lock position
- Control the decent of the grab to the seabed – when it hits the seabed, the lock should release
- Pull the grab back to the surface and onto the vessel
- Empty the contents of the grab into the butcher's tray
- Inspect the sample for seagrass and assess the sediment

### **Take a seagrass voucher specimen if required**

- Place seagrass samples in a labelled plastic bag with a little seawater and a waterproof label. Select a representative specimen of the species and ensure that you have all the plant parts including the rhizomes and roots. Collect plants with fruits and flowers structures if possible.

## **At completion of mapping**

### **Step 1. Wash & pack gear**

- Rinse all gear with freshwater and let dry.

### **Step 2. Press any voucher seagrass specimens if collected**

- The voucher specimen should be pressed as soon as possible. Do not refrigerate longer than 2 days.
- Wash specimen in freshwater and layout on a clean sheet of white paper (include label)
- Lay another sheet of paper over specimen and place within several sheets of newspaper
- Place assemblage of specimen + paper within two sheets of cardboard and then into plant press
- Allow to dry in press for a minimum of two weeks. For best results, replace the newspaper after 2-3 days.

### **Step 3. Submit all data**

- Mail original datasheets and herbarium sheets to Seagrass-Watch HQ
- Upload GoPro® files and GPS files to a file hosting service or similar (contact Seagrass-Watch HQ via email for details).

Seagrass-Watch HQ  
PO Box 4  
Clifton Beach QLD 4879 AUSTRALIA  
Email: [admin@seagrasswatch.org](mailto:admin@seagrasswatch.org)

# SEAGRASS SPECIES CODES

**Ea**

*Enhalus acoroides*



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

**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

**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

**Ho**

*Halophila ovalis*



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

**Hd**

*Halophila decipiens*



- oval leaf, slightly pointed
- leaf hairs on both sides
- 6-8 cross veins
- leaf margins finely serrated

**Hu**

*Halodule uninervis*



- trident leaf tip
- 1 central vein
- pale rhizome, with clean black leaf scars

**Hs**

*Halophila spinulosa*



- fern like
- leaves arranged in opposite pairs
- leaves flat & serrated
- erect shoot to 15cm long
- found at subtidal depths

**Si**

*Syringodium isoetifolium*



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

**Tc**

*Thalassodendron ciliatum*



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

Illustrations not to scale  
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# SEAGRASS-WATCH MAPPING - SPOT-CHECKS



Recorder: John Citizen GPS#/Vessel: MV Deep Blue Date: 15/12/02

Point#: 036 Location: Louisles-west  In situ observation  Drop-camera  Grab

Lat 16.383926 S Long 145.558607 E

Time 10:13 hrs Depth: 5 m Observer: James

Sediment: Sand/Mud Algae (%): 6

Algae (spp./comp): Green macro

Comments: .....

% cover	Species / % composition of cover
11	HU / 100
14	HU / 100
13	HU / 90 HO / 10

Point#: 037 Location: Louis west  In situ observation  Drop-camera  Grab

Lat 16.38347 S Long 145.56266 E

Time 10:20 hrs Depth: 4.7 m Observer: James

Sediment: s/m/sh Algae (%): 0

Algae (spp./comp): -

Comments: Dugong grazing trail  
S = Sand m = mud  
sh = shell

% cover	Species / % composition of cover
13	HO / 80 HU / 20
26	HO / 80 HU / 20
18	HO / 50 HU / 50

Point#: 038 Location: Louis-west  In situ observation  Drop-camera  Grab

Lat 16.38299 S Long 145.56265 E

Time 10:20 hrs Depth: 6.2 m Observer: James

Sediment: Sand Algae (%): 13

Algae (spp./comp): Green Filamentous

Comments: Green turtle

% cover	Species / % composition of cover
17	HO / 90 HU / 10
21	HO / 10 HU / 90
15	HO / 50 HU / 50

Point#: 039 Location: Louis-west  In situ observation  Drop-camera  Grab

Lat 16.38266 S Long 145.56124 E

Time 10:42 hrs Depth: 7.6 m Observer: James

Sediment: Sand Algae (%): 5

Algae (spp./comp): Caulerpa sertulariodes

Comments: Isolated patches  
\*Caulerpa sertulariodes

% cover	Species / % composition of cover
0	
0	
13	HS / 100

Point#: 040 Location: Louis-west  In situ observation  Drop-camera  Grab

Lat 16.38412 S Long 145.55655 E

Time 10:58 hrs Depth: 10.3 m Observer: James

Sediment: Sand/shell Algae (%): 6

Algae (spp./comp): Caulerpa sertulariodes

Comments: .....

% cover	Species / % composition of cover
18	HO / 10 HS / 90
16	HO / 10 HS / 90
3	HO / 10 HS / 90

Point#: 041 Location: Louis-west  In situ observation  Drop-camera  Grab

Lat 16.38597 S Long 145.55458 E

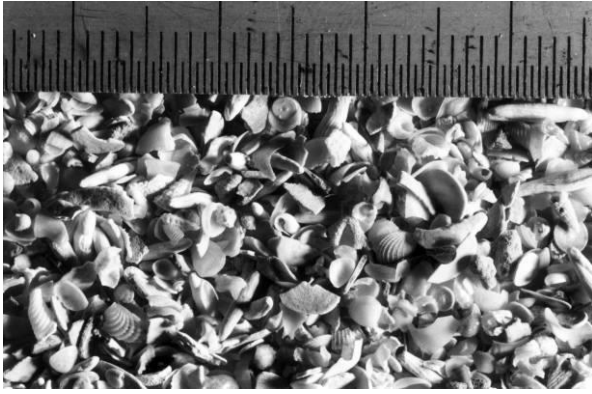
Time 11:20 hrs Depth: 9.7 m Observer: James

Sediment: s/m/sh Algae (%): 0

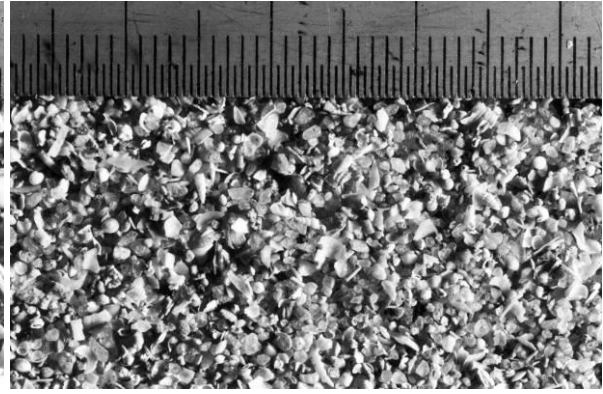
Algae (spp./comp): -

Comments: lots of burrows  
S = Sand m = mud  
sh = shell

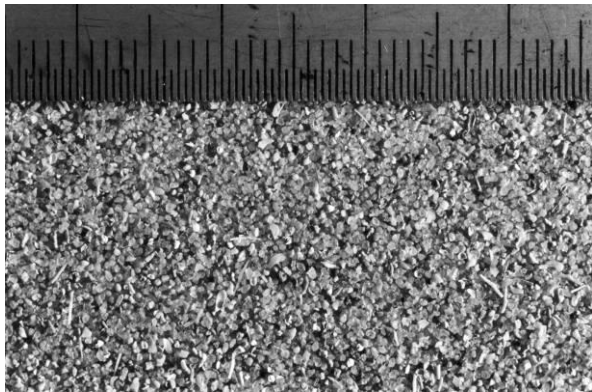
% cover	Species / % composition of cover
0	
0	
0	NO GRASS



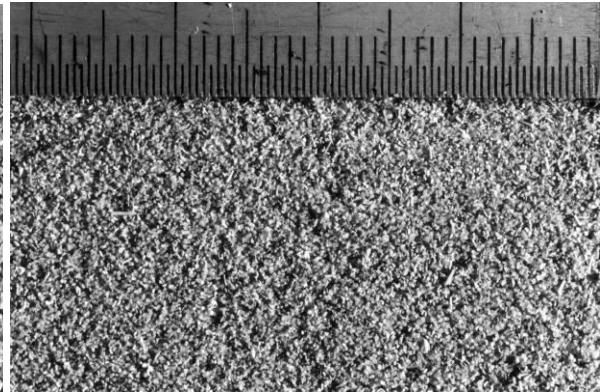
gravel (>2mm)



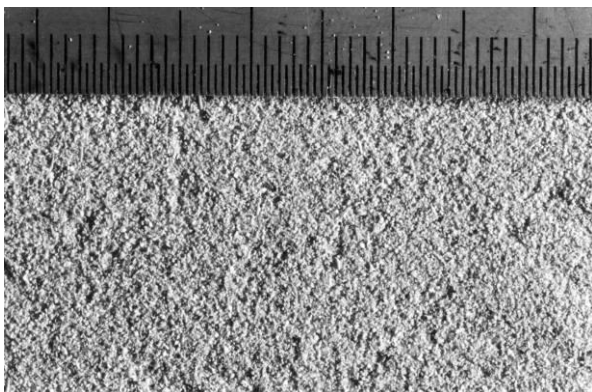
very coarse sand (1 – 2 mm)



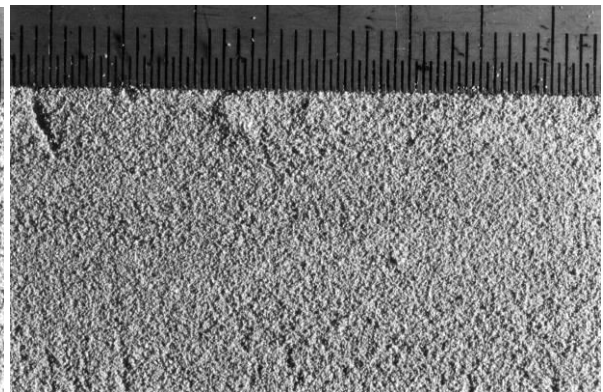
coarse sand (0.5 – 1 mm)



medium sand (0.25 – 0.5 mm)



fine sand (0.125 – 0.25 mm)



very fine sand (0.063 – 0.125mm)

Sediment is assessed by visual/tactile estimation method using **Primary Descriptors** relating to the size of the sediment grains: gravel (>2000 $\mu$ m); coarse sand (>500  $\mu$ m); sand (>250  $\mu$ m); fine sand (>63  $\mu$ m); and mud (<63  $\mu$ m). Primary descriptors are written down from left to right in decreasing order of abundance: e.g. Mud/Sand is mud with sand, where mud is determined as the dominant constituent (by volume).

- mud**            *has a smooth and sticky texture.*
- fine sand**      *fairly smooth texture with some roughness just detectable. Not sticky in nature.*
- sand**            *rough grainy texture, particles clearly distinguishable.*
- coarse sand**   *coarse texture, particles loose.*
- gravel**          *very coarse texture, with some small stones.*

Sediment type **Modifiers** are also commonly used, including: coral, shell, shell grit, forams, diatoms, etc.

Mapping Point:..... Date:.....

