

Seagrass-Watch

Global Seagrass Observing Network

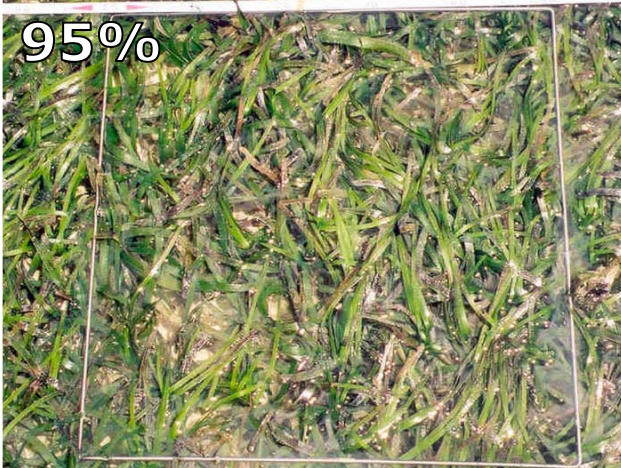
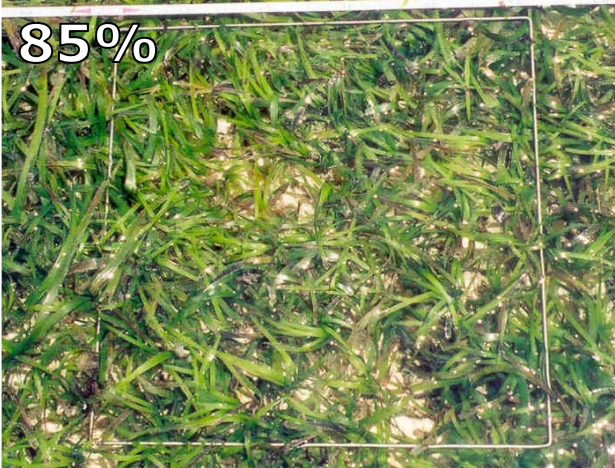
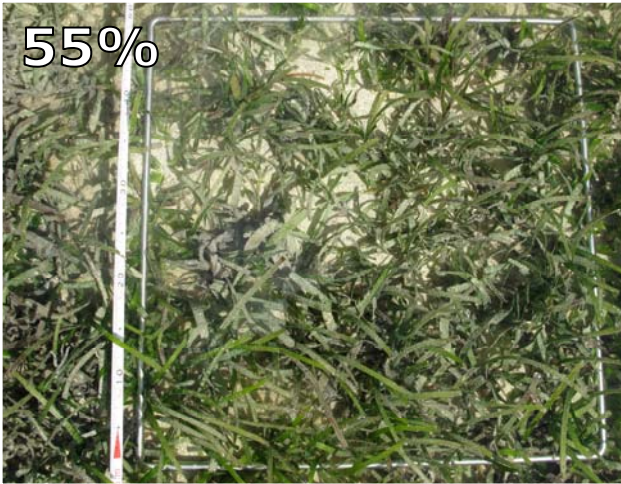
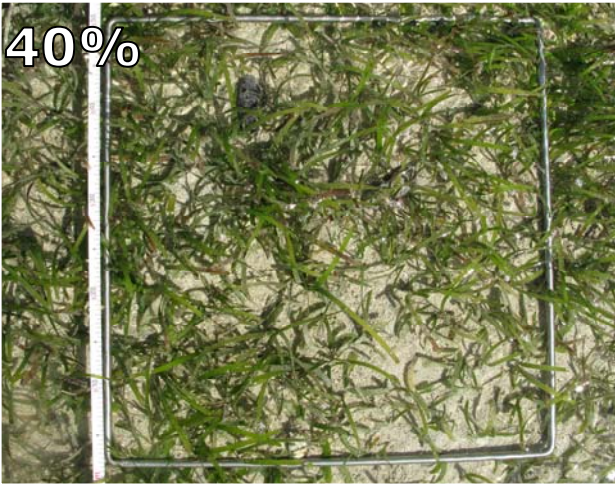
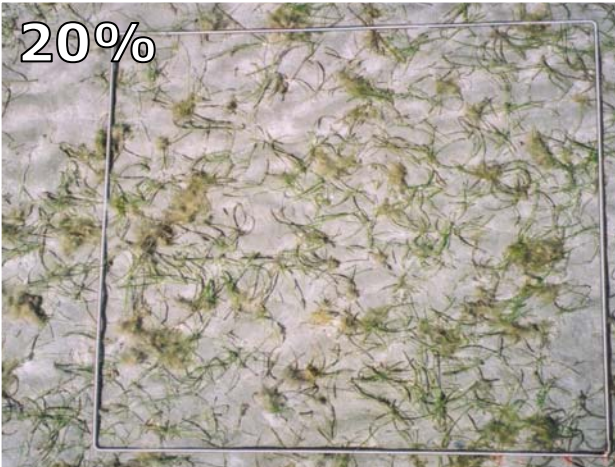


SEAGRASS-WATCH

PHILIPPINES FIELD BOOKLET



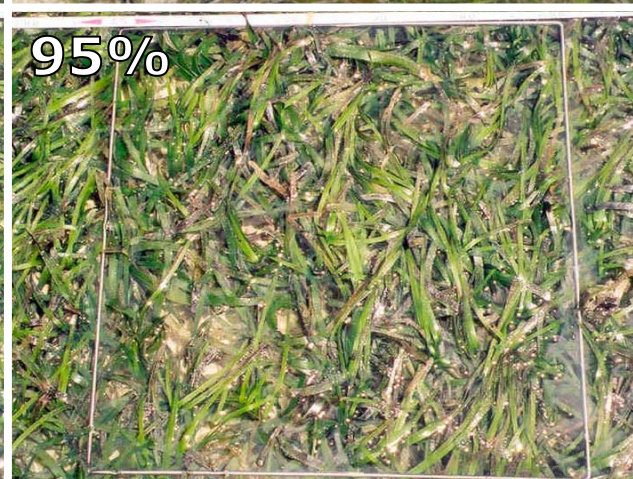
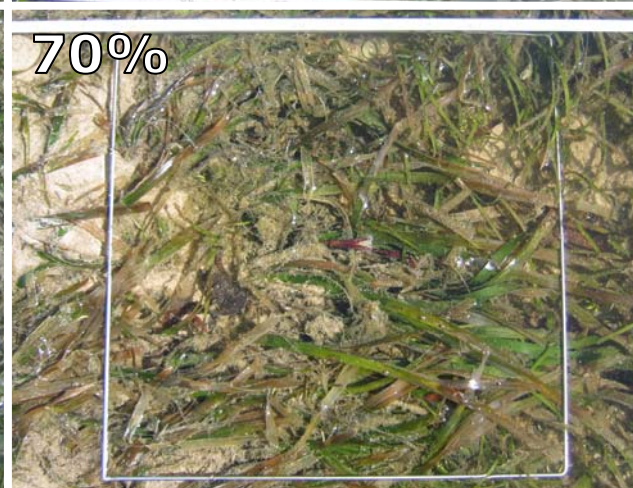
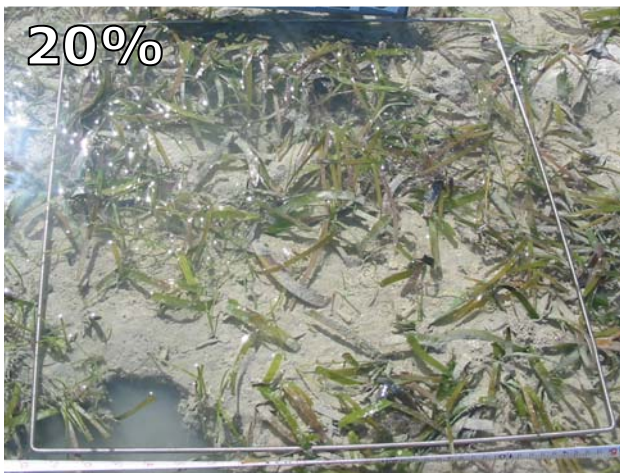
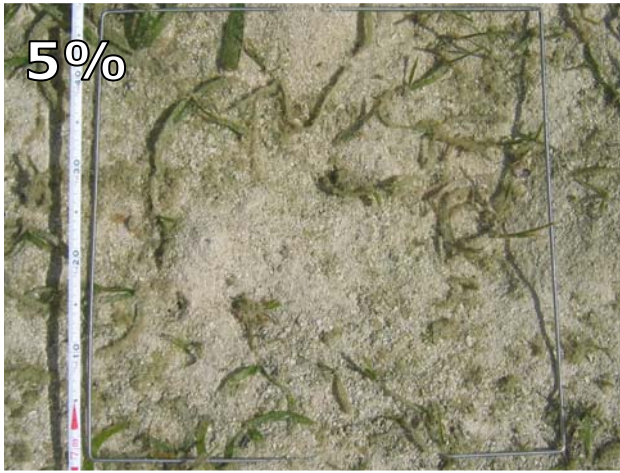
Percent cover standards



Reeftop – *Cymodocea/Halodule*



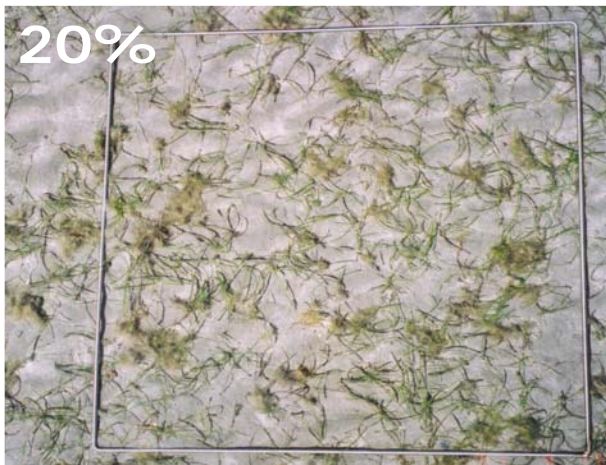
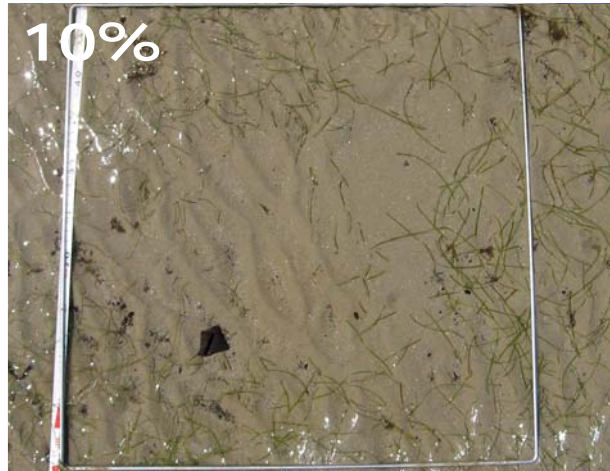
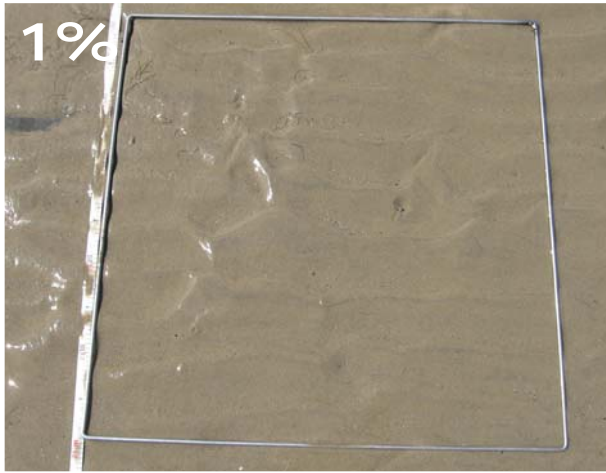
Percent cover standards



Reeftop – mixed *Thalassia/Cymodocea/Enhalus*



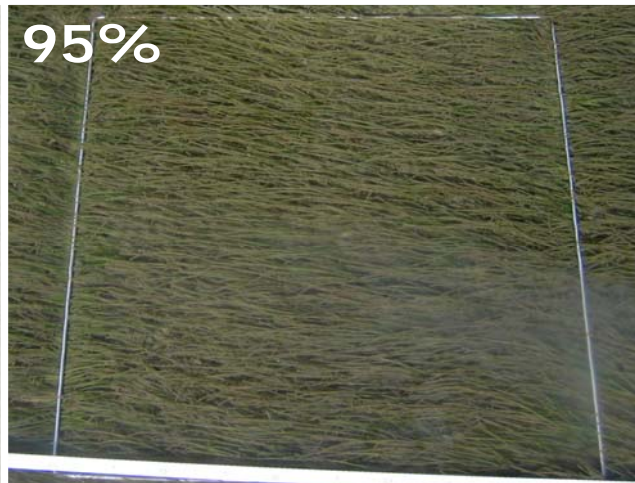
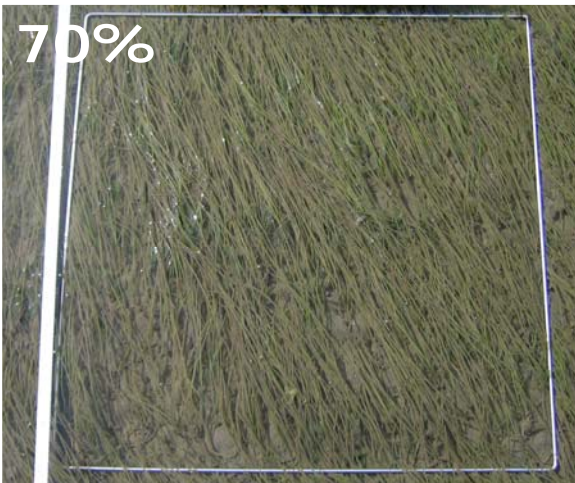
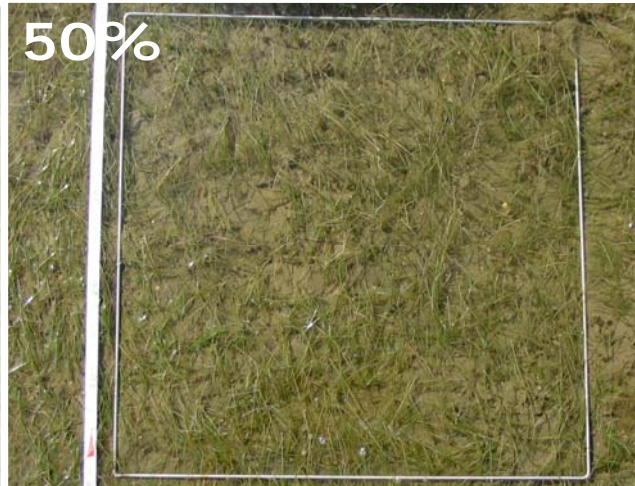
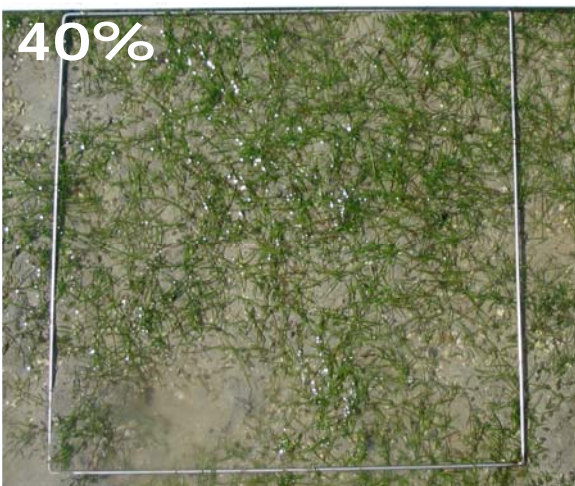
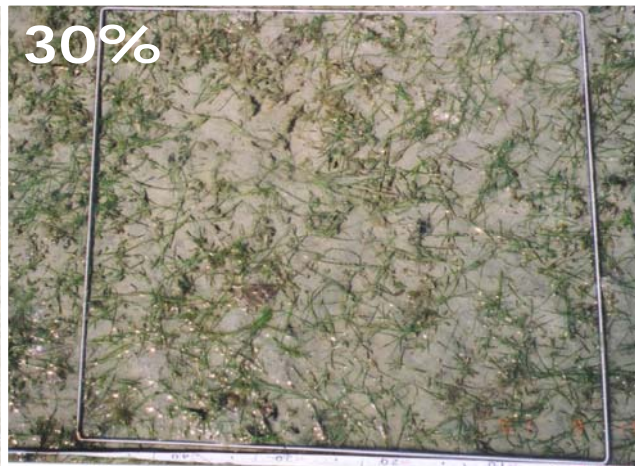
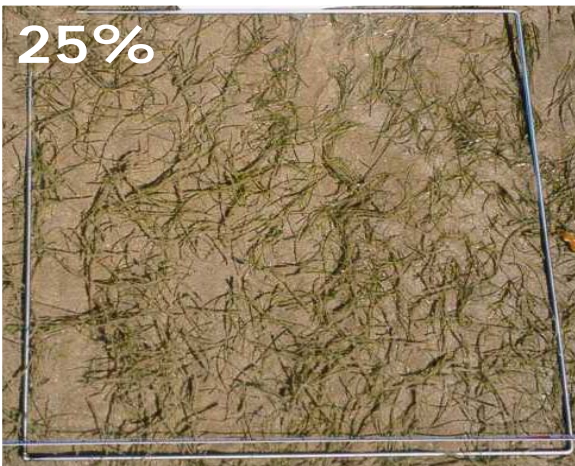
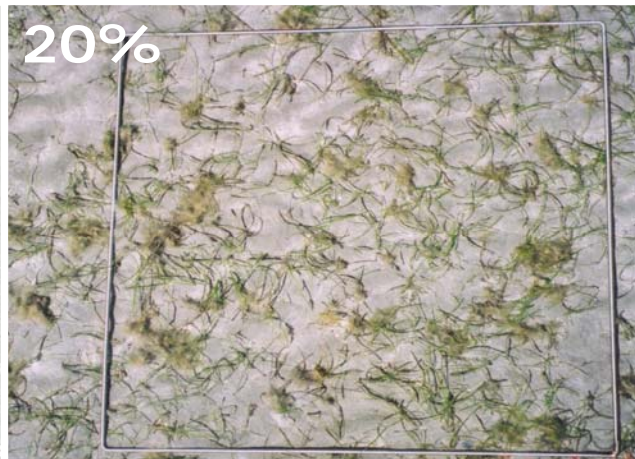
Percent cover standards



Coastal - low



Percent cover standards



Coastal - high

Percent cover standards

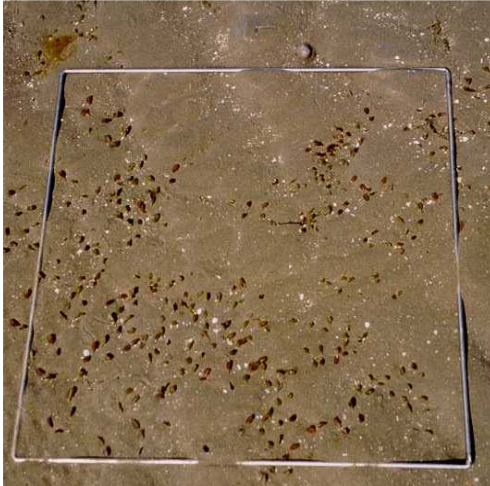
2%



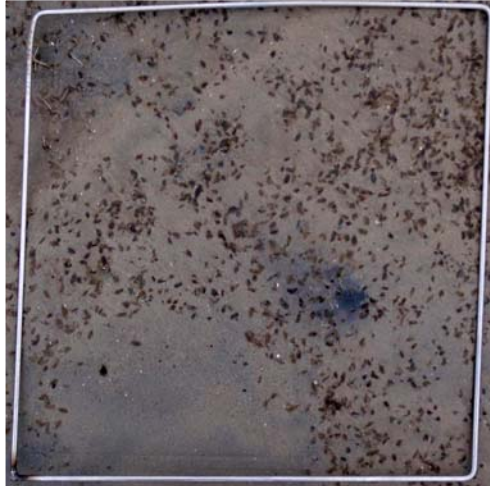
5%



7%



17%



25%



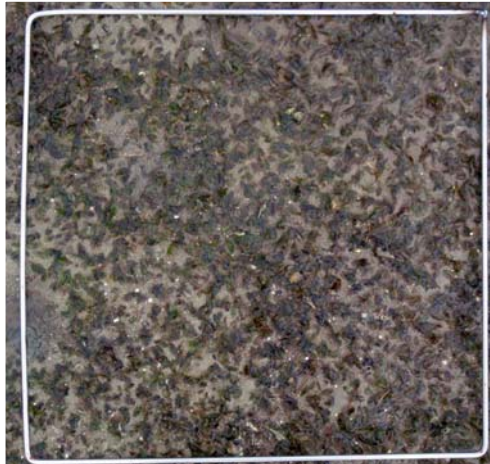
38%



60%



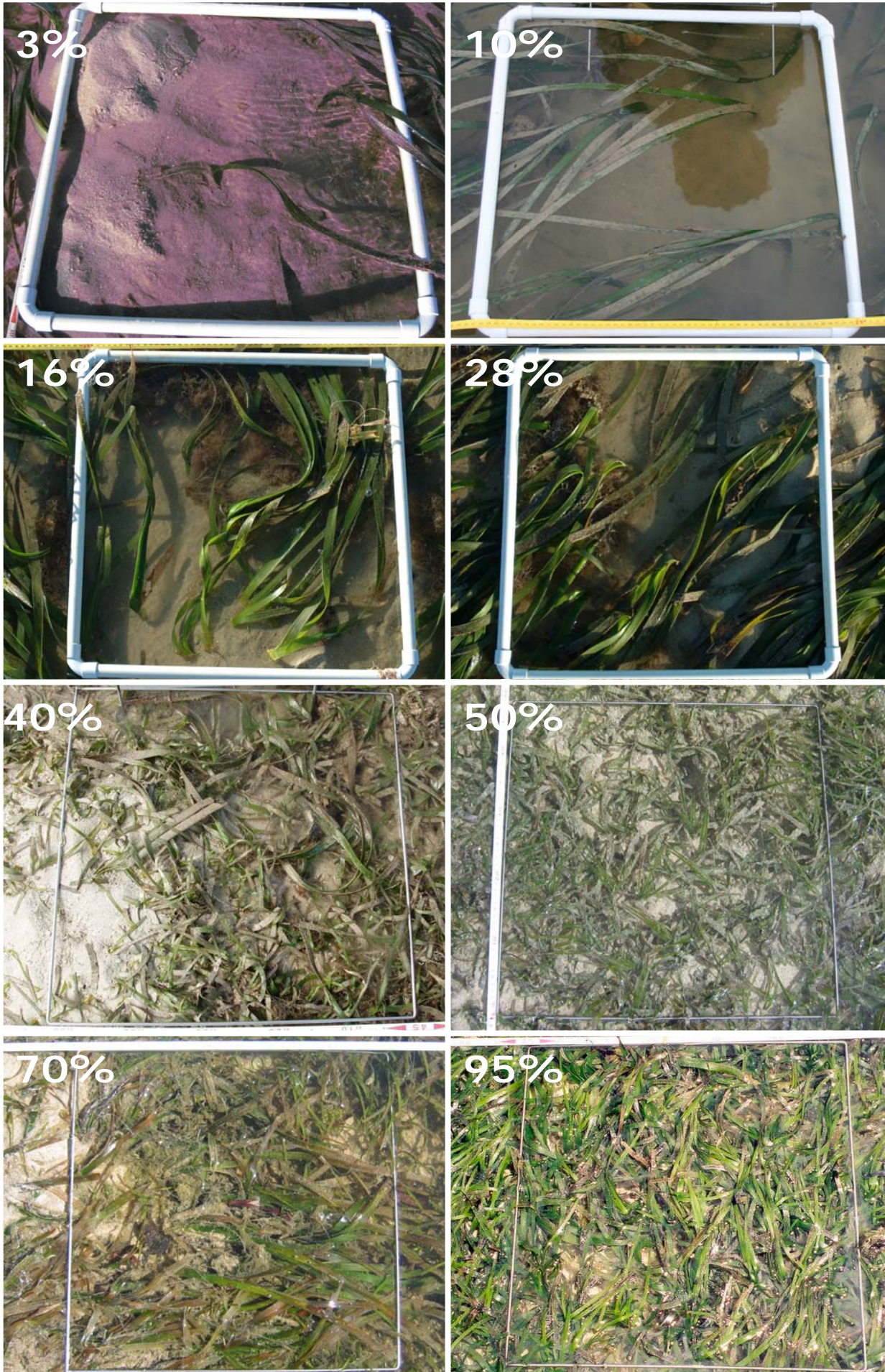
70%



Coastal – *H. ovalis*



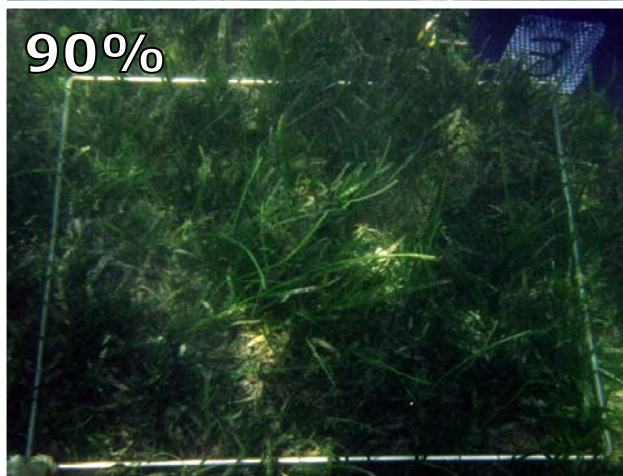
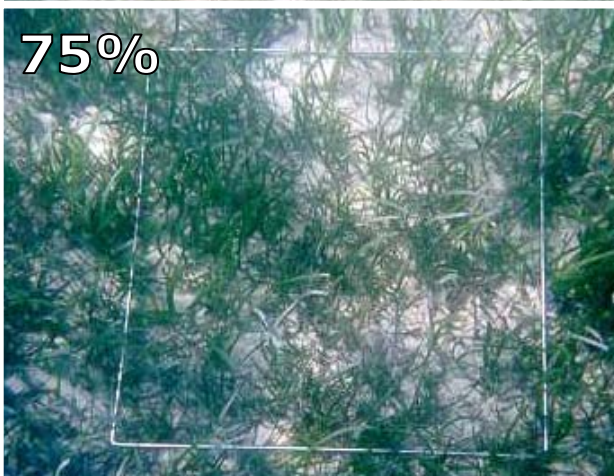
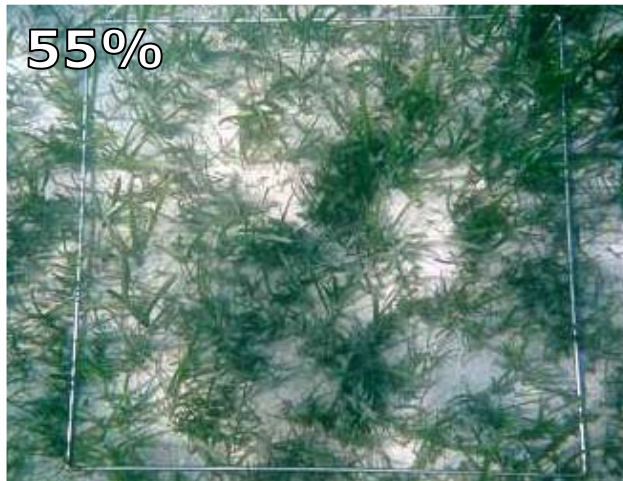
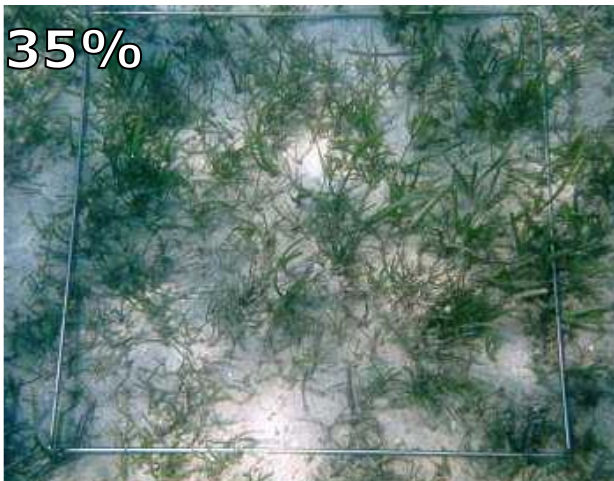
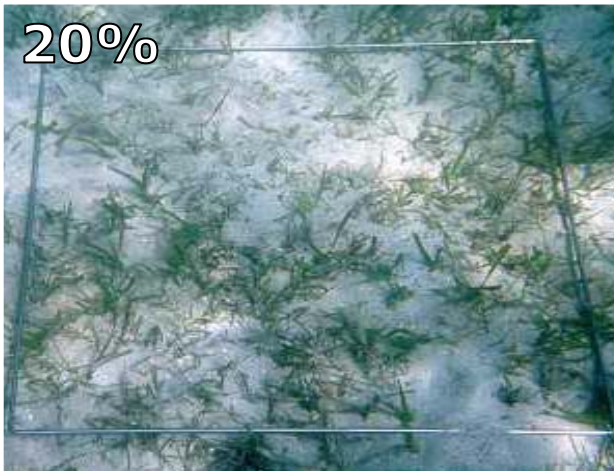
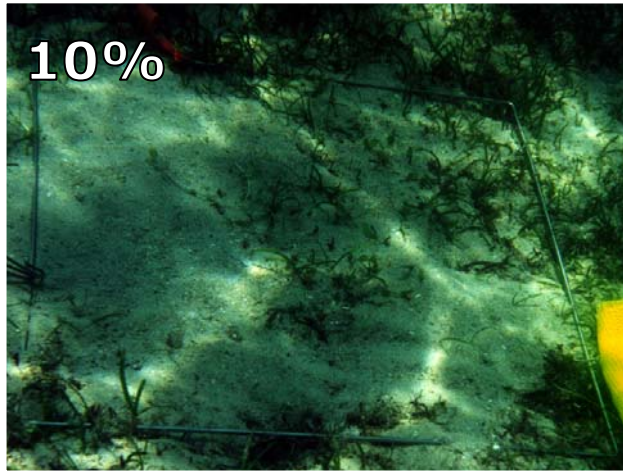
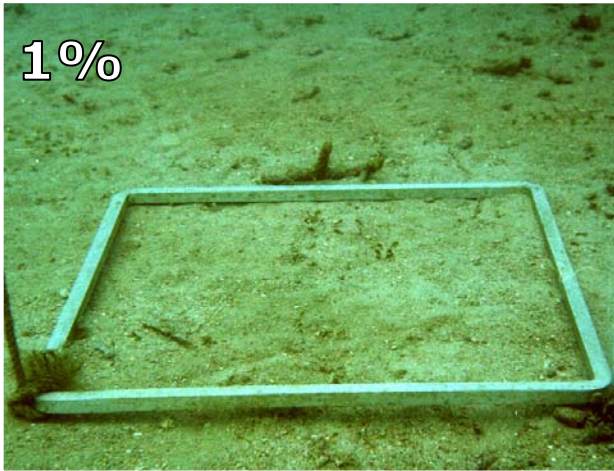
Percent cover standards



Reeftop – *Enhalus*



Percent cover standards



Subtidal



SEAGRASS SPECIES CODES

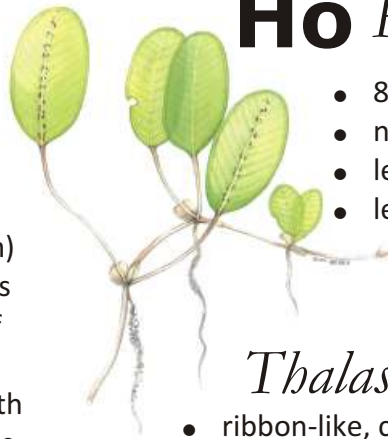
Ea

Enhalus acoroides



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

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

Hp

Halodule pinifolia



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

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

Hm

Halophila minor

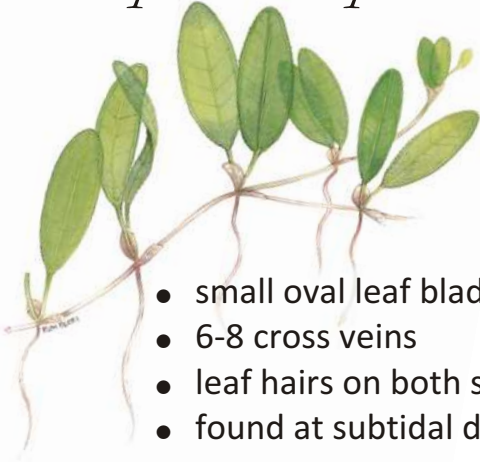


- less than 8 pairs of cross veins
- small oval leaf blade less than 5mm wide
- leaf margins smooth
- no leaf hairs

SEAGRASS SPECIES CODES

Hd

Halophila decipiens

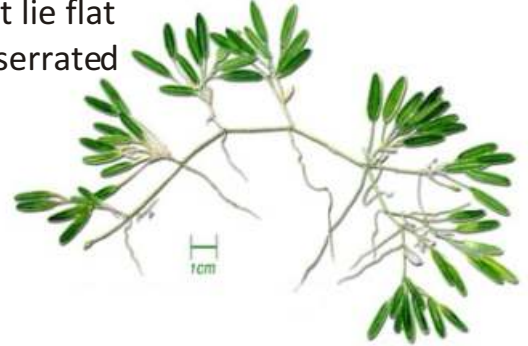


- small oval leaf blade 1-2.5cm long
- 6-8 cross veins
- leaf hairs on both sides
- found at subtidal depths

Halophila beccarii

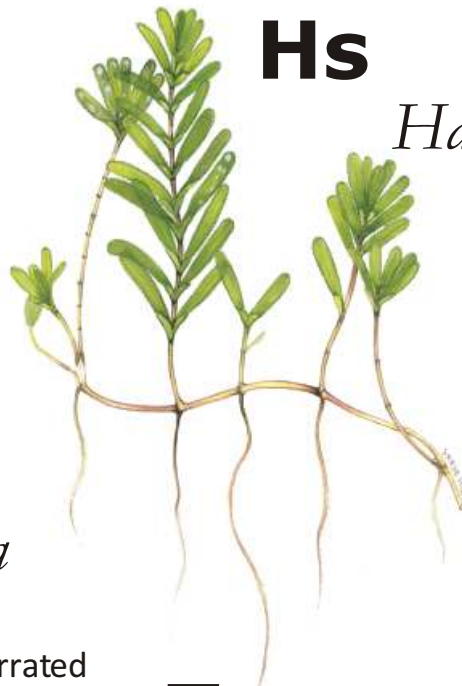
Hb

- leaves arranged in clusters of 5-10 on vertical stem
- leaves elongate, no obvious cross-veins
- short vertical stem between clusters
- leaf clusters do not lie flat
- leaf margin finely serrated



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

Rm

Ruppia maritima

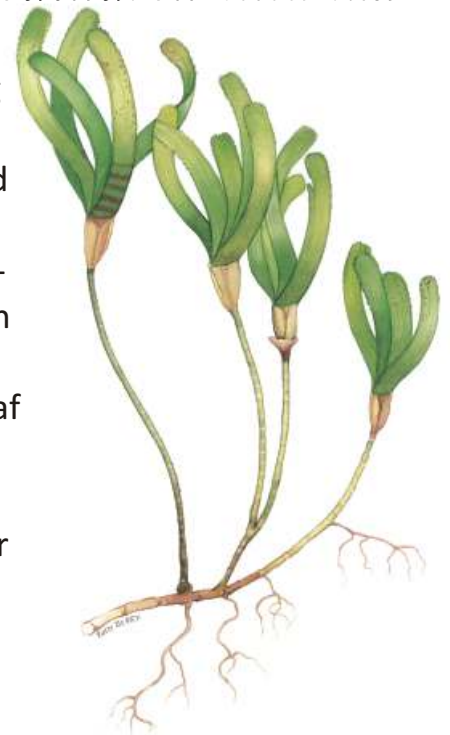
- leaves fine and thread-like
- pointed tip on leaves, sometimes serrated
- inflorescence on a long stalk, sometimes spiralled
- rhizome fragile
- semi-fresh or estuarine environments



Tc

Thalassodendron ciliatum

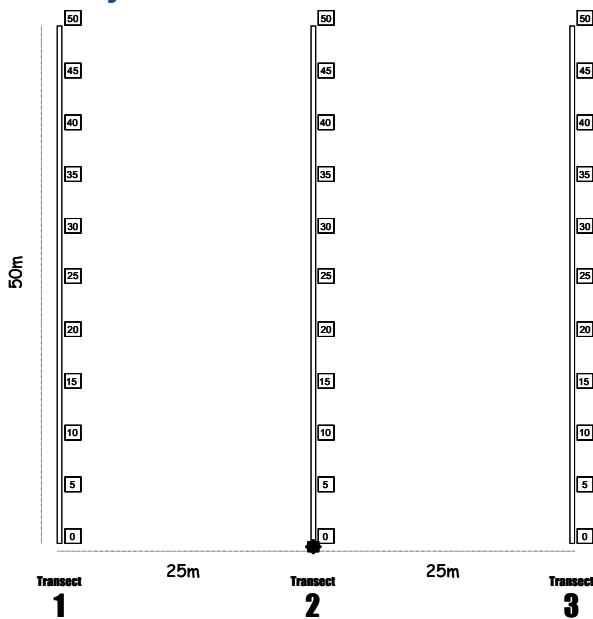
- erect stem up to 65cm long bearing leaf cluster
- rhizome tough and woody
- ribbon-like, sickle-shaped leaves with ligule
- round, serrated leaf tip
- often found attached to rock or coral substrate



Seagrass-Watch Protocols

Source: www.seagrasswatch.org/manuals.html)

Site layout



Quadrat code = site + transect+quadrat

e.g., P11225 = Pigeon Is. site 1, transect 2, 25m quadrat

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 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) 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 taken at **every quadrat** along each transect, or of quadrats of particular interest. First place the photo quadrat labeller beside the quadrat & 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., Fine sand/Mud).

Step 3. Describe other features and ID/count of macrofauna

- Note and count (whole numbers - never use < or > symbols) any features which may be of interest (e.g. gastropods, hermit crabs, turtle feeding, water depth in cm) within the comments column.



Step 4. Estimate seagrass percent cover

- Looking down on the quadrat from above, estimate the total percentage of the seabed (substrate) within the quadrat covered by seagrass. Estimate the footprint/shadow provided by the seagrass shoots.
- Always use the percent cover photo standards (calibration sheets) as your guide, estimating cover as accurate as possible, e.g. 27%, 61%
- If cover is below 3%, you can count the seagrass shoots and calculate percent cover using the rule of 1 shoot = 0.1% (for small shoots).

Step 5. Estimate seagrass species composition

- Identify the species of seagrass within the quadrat and determine the percentage contribution of each species (starting with least abundant, total composition must equal 100%)
- Use seagrass species identification keys provided and use more than 1 feature to identify the species

Step 6. Measure seagrass canopy height

- Measure canopy height (in centimetres) of the dominant strap-leaf species, ignoring the tallest 20%.
- Measure from the sediment to the leaf tip of 3 shoots, entering all 3 measures onto datasheet

Step 7. Estimate algae percent cover

- Looking down on the quadrat from above, estimate the total percentage of the seabed (substrate) within the quadrat covered by macroalgae (independent of seagrass cover)
- Macroalgae is not attached to seagrass leaves and may be attached to rocks, shells or may be drift

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 an average seagrass leaf surface is covered, and then how many of the leaves in the quadrat are covered. For example, if 20% of the blades are each 50% covered by epiphytes, then quadrat epiphyte cover is 10%. Use the epiphyte matrix to assist you.
- Do not include epifauna with epiphytes. Epifauna are sessile animals attached to seagrass blades – record % cover of epifauna in the comments or an unused/blank column – do not add to epiphyte cover.

Step 9. Take a voucher seagrass 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.

Step 10. Move to next quadrat

- Repeat steps 1 to 8 for the remaining 32 quadrats

Step 11. At completion of monitoring

- Check data sheets are filled in fully.
- Remove equipment from site (e.g., non-permanent pegs)

At completion of monitoring

Step 1. 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 2. 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 3. Submit all data

- Data can be entered into the MS-Excel file downloadable from www.seagrasswatch.org. Email completed files to admin@seagrasswatch.org
- Mail original datasheets, photos and herbarium sheets

Seagrass-Watch HQ
PO BOX 4
Clifton Beach QLD 4879
AUSTRALIA



SEAGRASS-WATCH MONITORING



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

START of transect (GPS reading)

Latitude: Longitude:

OBSERVER: Dev Citizen DATE: 17 / 2 / 09
 LOCATION: Burnum Heads
 SITE code: BH1 TRANSECT no.: 2
 START TIME: 13:04 END TIME: 13:40

Quadrat (metres from transect origin)	Sediment (eg. mud/sand/shell)	Comments (eg 10x gastropods, 4x crab holes, digging, feeding trails, herbarium specimen taken)	Seagrass coverage (%)	% Seagrass species composition			Canopy height (cm)	% Algae cover	% Epi- cover
				HO	HTO	ZC			
1 (0m)	Sand	SC x 3 HC x 1	40	30	70	0	5.4, 1.7	5	33
2 (5m)	S	GAS x 3	33	50	50	0	10.1, 7.8	10	18
3 (10m)	mud/sand	worm x 1	18	70	20	10	6.1, 8.5	0	48
4 (15m)	m s	DFT x 1	0	0	0	0	0	17	0
5 (20m)	m s shell	HC x 3	36	5	90	5	9.1, 7.5	12	57
6 (25m)	m s sh	-	48	100	0	0	NA.	2	96
7 (30m)	Fine Sand	Turtle cropping	0.7	0	100	0	1.5cm	23	0
8 (35m)	FS	SC x 2 CH x 3	23	96	4	0	2cm	18	31
9 (40m)	S m	Mud w/ shell x 2 HC x 1	41	2	95	3	2cm	6	17
10 (45m)	m		16	3	7	90	2cm	3	21
11 (50m)	m s						2cm	38	6

END of transect (GPS reading) Longitude:
 Latitude: Longitude:
 SC = SEA Cucum ber HC = Hermit Crab.
 GAS = Gastropod. CH = Crab Hole.
 DFT = Dugong feeding trail.