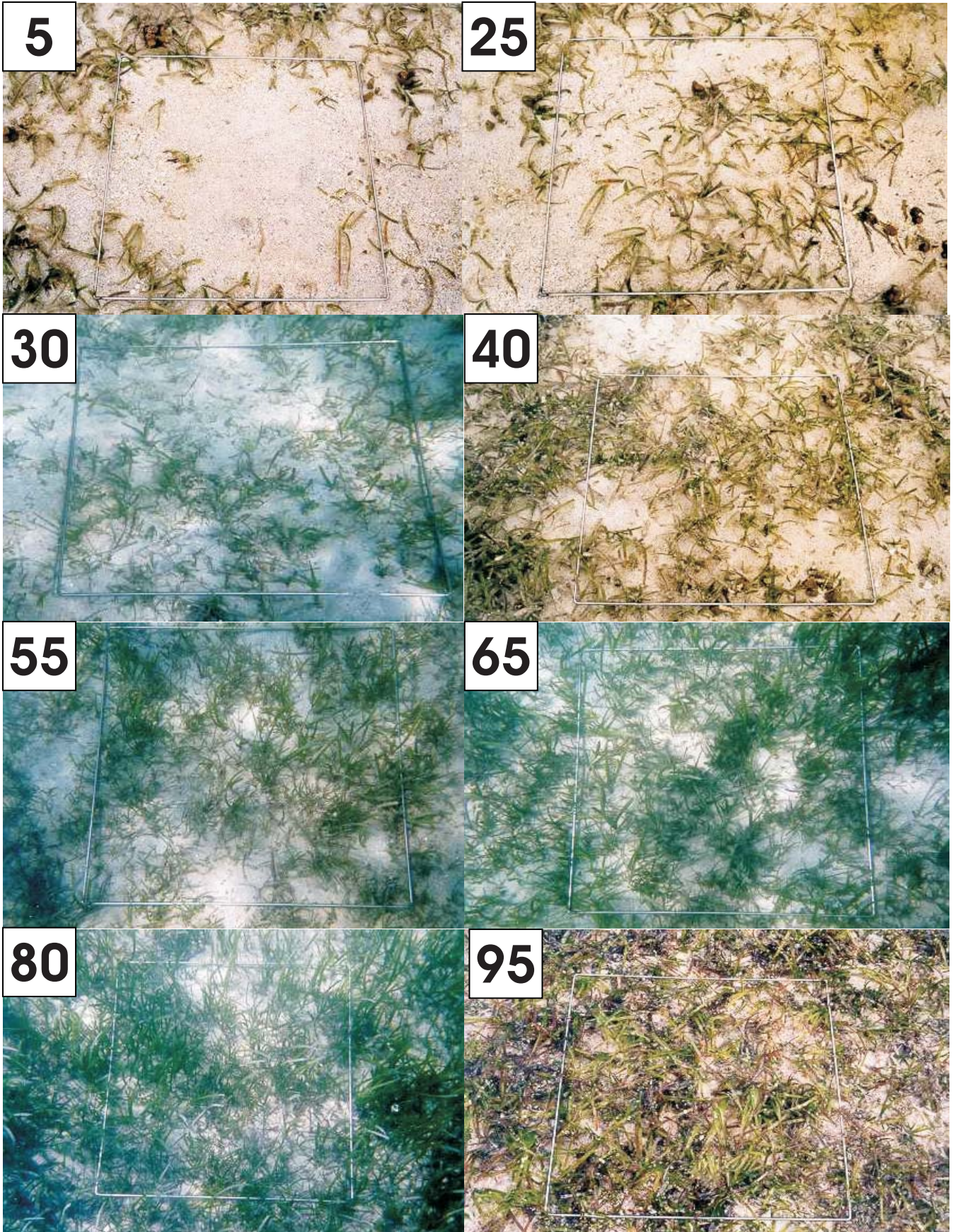


Seagrass Percentage Cover



SEAGRASS SPECIES CODES

Ho

Halophila ovalis

- 12 or more cross veins
- No hairs on leaf surface



Hm

Halophila minor

- Less than 12 pairs of cross veins
- Small oval leaf blade



Ea

Enhalus acoroides

- Very long ribbon-like leaves with inrolled leaf margins
- Thick rhizome with long black bristles and cord-like roots
- Leaves 30-150 cm long



Th

Thalassia hemprichii

- Short black bars of tannin cells on leaf
- Thick rhizome with scars between shoots
- "Sickle" shaped leaves
- Leaves 10-40 cm long



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



Si

Syringodium isoetifolium

- Cylindrical in cross section
- Leaf tip tapers to a point
- Leaves 7-30cm long



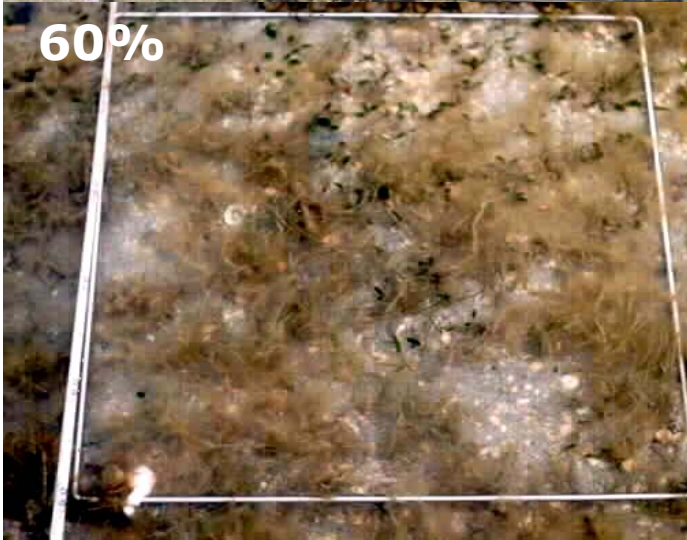
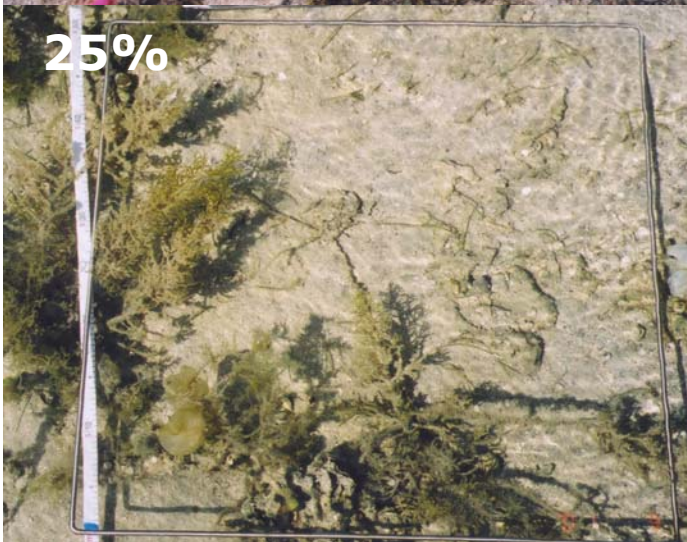
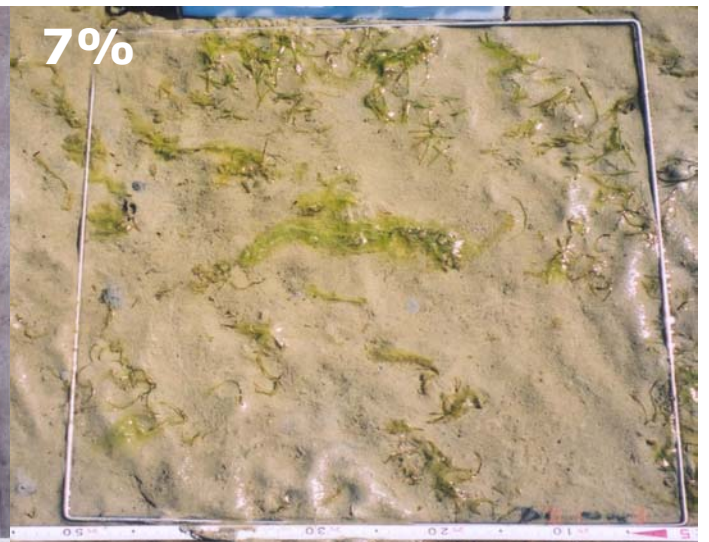
Tc

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



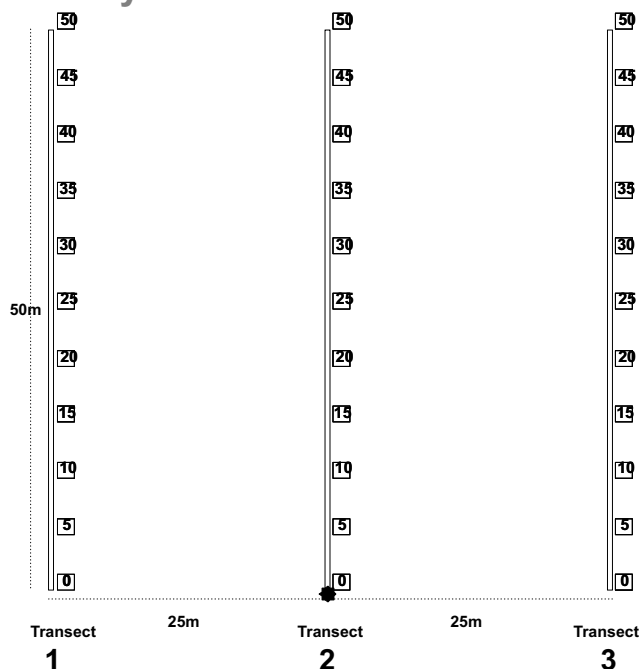
Algal percent cover standards



Seagrass-Watch Monitoring Methods: Summary

Extract from: McKenzie, L.J. & Campbell, S.J. (2002) *Seagrass-Watch: Manual for Community (citizen) monitoring of seagrass habitat - western Pacific edition*. (QFS, NFC, Cairns) 43pp

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 participants involved in advance so they can make their arrangements to get to the site on time. List on this timetable what the participants 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 if available
- Keep your site clean, remove any rubbish

Quadrat code = site + transect+quadrat
e.g., NN1225 = Nadroga Navosa site 1, transect 2, 25m

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 50m 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 the 5m, 25m and 45m quadrats along each transect, and in quadrats of particular interest. First place the photo quadrat labeller beside the quadrat with the correct code.

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. Tick 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 total cover. 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. 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 9. Take a voucher seagrass specimen if seagrass ID uncertain

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 completely filled in.

Ensure that your name, the date and site/quadrat details are clearly recorded on the datasheet. Also record the number of other observers assisting and your 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. Send dry specimens to Seagrass-Watch Coordinator.

Step 5. Submit all original datasheets to Seagrass-Watch Coordinator

(keep a copy for your own records)

**Seagrass-Watch
Northern Fisheries Centre
PO Box 5396
Cairns Qld 4870
AUSTRALIA
Email: seagrass@dpi.qld.gov.au**

SEAGRASS-WATCH WP MONITORING

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

START of transect (GPS reading)

Latitude:° 'S Longitude:° 'E

OBSERVER: JOE BLAKE DATE: 12 / 5 / 02
 LOCATION (Country): AUSTRALIA
 SITE no.: QL2 TRANSECT no: 3
 Start TIME: 3.04 pm End TIME: 3.35 pm

Quadrat (metres from transect origin)	Sediment (eg. mud/sand/shell)	Comments (eg 10x mud wheelks, 4x sea cucumbers)	Canopy height (cm)	Total % Seagrass coverage	% cover of each species				Total % cover Algae
					EA	CR	TH	HU	
1 (0m)	M/S	SEA CUCUMBER X 1	3,4,2	20	10	10			10
2 (5m)	M/S	SHELLFISH X 2	5,4,1,5	15	5	10			2
3 (10m)	M	RIPPLES	2,5,4,3	12	5	5	2		1
4 (15m)	M	SEA CUCUMBER X 2	6,6,6	2	1		1		3
5 (20m)	M/S	SEA URCHIN X 3	7,6,5	28	20	2	6		16
6 (25m)	S/M	MOLUSC X 5	4,5,4	45	10	5	10	20	25
7 (30m)	S/M	WORM X 4 SHELLFISH X 2	3,7,2	57	5	40	5	7	30
8 (35m)	M	TURTLE GRAZING	5,7,8	43	3	20	20		4
9 (40m)	FS	RHIZOMES EXPOSED	6,5,5	65	5	50		10	5
10 (45m)	FS	WORM HOLES	4,5,5	32	10	18	2	2	45
11 (50m)	FS/M	DUGONG FEEDING TRAILS	4,4,3	25				25	16

END of transect (GPS reading)

Latitude:° 'S Longitude:° 'E



UNIVERSITY of NEW HAMPSHIRE