

# Protocol: Seagrass Cover and Composition (Quadrats)

V 0.0.1

Last updated: 10 November 2018

## 1. Introduction

This protocol provides standardized data on seagrass *percent cover*, *species composition*, and *shoot density* using a common non-destructive method: the **quadrat**. The information from these variables helps characterize the quality and quantity of habitat that seagrasses provide, and is therefore closely linked with other seagrass sampling methods employed by MarineGEO.

Twelve (12) quadrats are deployed at random points along three 50-m transect lines at shallow, mid, and deep locations in the bed (total  $N = 36$ ).

Copies of this protocol, field datasheets, data entry templates, instructional videos, literature, and more can be found on the seagrass quadrat section of the MarineGEO protocol website:

<https://marinegeo.github.io/modules/seagrass-quadrats>.

## 2. Measured parameters

- Percent cover of each seagrass and macroalgae species (in 5% bins of  $0.25\text{ m}^2$ )
- Macroinvertebrate abundance (number  $0.25\text{ m}^2$ ) and approximate size (cm)
- Grazing scars (present/absent)
- Shoot density (number  $0.0625\text{ m}^{-2}$ )

## 3. Requirements

*Personnel:* 2 persons

*Time:*

*Preparation:* None.

*Fieldwork:* 2 persons  $\times$  0.5 days.

*Post-processing:* None.

*Data processing:* 1 person  $\times$  0.5 days.

*Replication:* 12 quadrats  $\times$  3 transects = 36 replicates

*Materials Checklist:*

- Hand-held GPS unit
- 1 (large) 50 cm-x-50 cm (0.25 m<sup>2</sup>) quadrat (PVC or other material)
- 1 (small) 25 cm-x-25 cm (0.0625 m<sup>2</sup>) quadrat
- 1 50-m transect tape with 1-m markers
- 3 sets of twelve randomly generated numbers for each transect survey
- 2 PVC marker poles (diameter and length as needed)
- 1 pencil
- Waterproof paper
- Clipboard
- OPTIONAL:* waterproof camera

## 4. Methods

Fully review this and any additional protocols necessary for the sampling excursion. Address any questions or concerns to [marinegeo@si.edu](mailto:marinegeo@si.edu) before beginning this protocol.

### 4.1. Preparation

1. Determine 12 random points along each of the three transects (shallow, middle, and deep)
2. Assemble field gear (see Materials checklist).
3. Print field data sheets on waterproof paper.

### 4.2. Fieldwork

1. Identify the positions of the three 50-m transects. Transects should be placed parallel to shore near the shallow edge, middle, and deep edges of the bed. Transects should intersect the meadow to ensure the maximum amount of habitat is captured.
2. Record the GPS coordinates (decimal format) of the beginning and end of each of the 3 transects ( $N = 6$  measurements).
3. Lay out the first transect line and anchor it using the PVC marker poles.
4. Move along each transect, stopping at each of the random values generated prior to arriving in the field.
5. At the first stop, lay down the 0.25-m<sup>2</sup> quadrat grid immediately adjacent to the transect lines.
6. Record the cover of each seagrass species as an estimated percentage (in 5% bins) of the total quadrat area (see *Appendix A – Seagrass Percentage Cover Photo Guide*). Also record the estimated cover of other sessile organisms, including macroalgae, sponges, etc. Be as specific as you can in identifying these organisms but do not guess if you are unsure (e.g., you can record ‘red sponge’). If multiple species are present in layers, percent cover may exceed 100%. Also record the percent cover of bare substratum, and the type of substratum (e.g., sand, mud, mixed).

7. Record the presence and approximate size of any larger (>1 cm) mobile benthic macroinvertebrates that fall within the quadrat (e.g., gastropods, urchins, sea cucumbers)
8. Record the presence of any conspicuous grazing scars (e.g., turtle, manatee, parrotfish) within or immediately adjacent to the quadrat.
9. Place the smaller (0.0625-m<sup>2</sup>) quadrat in the lower quadrant of the larger quadrat and count all shoots within the smaller quadrat.
10. If visibility is sufficient, record a photograph of the 0.25-m<sup>2</sup> transect using an underwater digital camera.
11. Repeat for the remaining points along the first transect.
12. Move PVC markers and repeat steps 2-11 for the second and third transects.

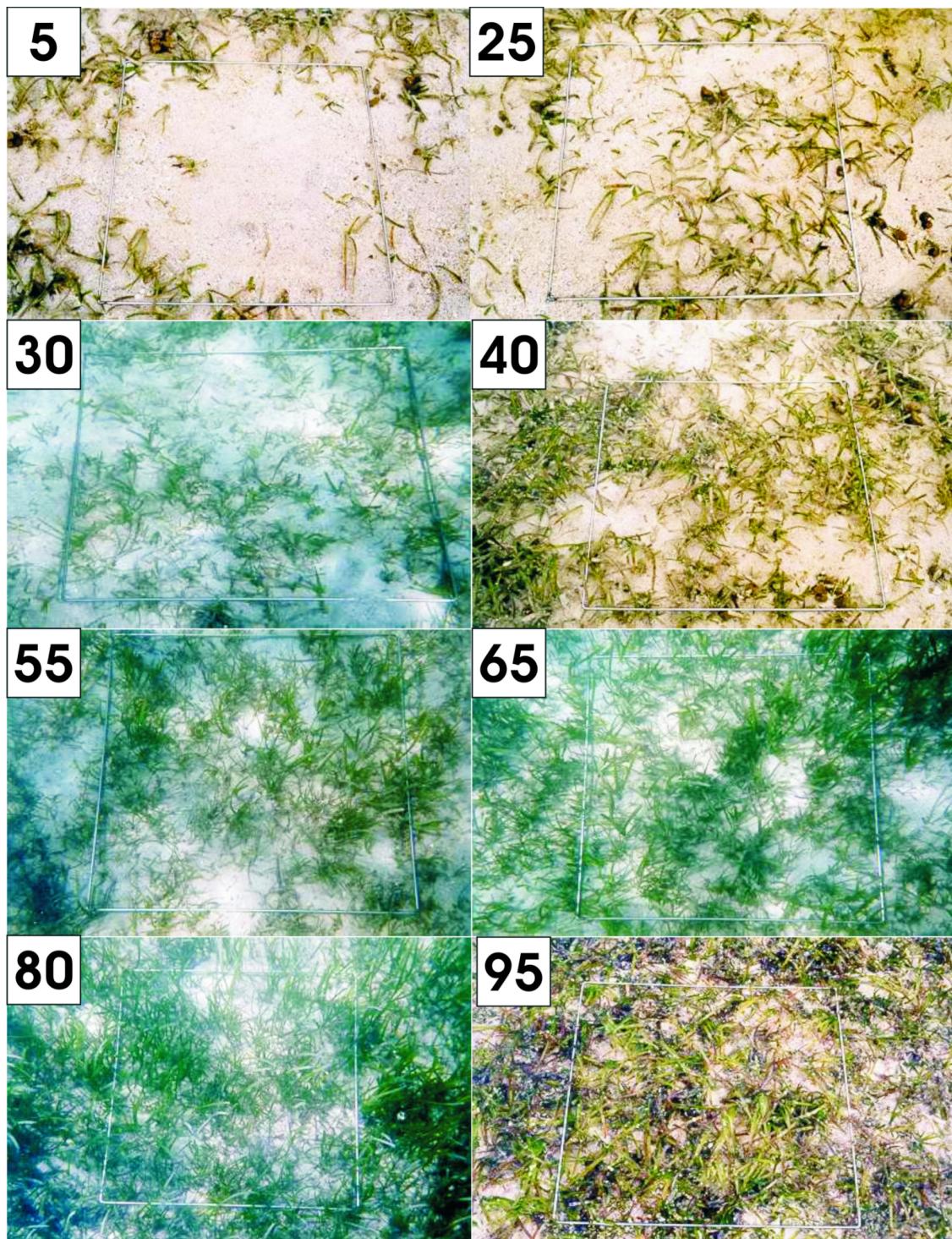
#### *4.3. Post-processing*

There is no post-processing necessary for quadrat samples.

#### *4.1 Data Submission*

1. Enter data into data entry template (<https://marinegeo.github.io/modules/seagrass-quadrats>).
2. Scan the completed lab data sheets and save both paper and electronic versions.
3. E-mail data entry file, photos and scanned field data sheets to: [marinegeo-data@si.edu](mailto:marinegeo-data@si.edu)

*Appendix A – Seagrass Percentage Cover Photo Guide*



Courtesy: SeagrassNet