Protocol: Seagrass Quadrats

V 0.0.1

Last updated: 9 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 foundational 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).

Additional 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 species (in 5% bins of 0.25 m^2)
- Macroinvertebrate abundance (number 0.25 m^{-2}) and approximate size (cm)
- Grazing scars (present/absent)
- Shoot density (number 0.0625 m^{-2})

3. Requirements

Personnel: 2 persons

Time:
Preparation: None.
Fieldwork: 2 persons *x* 0.5 days.
Post-processing: None.
Data processing: 1 person *x* 0.5 days.

Replication: 12 quadrats *x* 3 transects = 36 replicates

Materials Checklist:

- ☐ 1 (large) 50 cm-*x*-50 cm (0.25-m^2) quadrat (PVC or other material)
- ☐ 1 (small) 25 cm-*x*-25 cm (0.0625 m^2) 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 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. Lay out the first transect line and anchor using the PCV marker poles.
3. Move along each transect stopping at the random values generated prior to arriving in the field.
4. At the first stop, lay down the 0.25-m^2 quadrat grid immediately adjacent to the transect lines.
5. Record the approximate percent cover (in 5% bins) of the total area by each species, including other sessile organisms such as sponges (see *Appendix A – Seagrass Percentage Cover Photo Guide*). Percent cover can include drift (i.e., unrooted) macroalgae, in which case total cover may exceed 100%. Also record the type of any bare substrate (e.g., sand, mud, mixed).
6. Record the presence and approximate size of any mobile benthic macroinvertebrates that fall within the quadrat (e.g., gastropods, urchins, sea cucumbers)
7. Record the presence of any grazing scars (e.g., turtle, manatee) within or immediately adjacent to the quadrat.
8. Place the smaller 25 cm-x-25 cm quadrat in the lower quadrant of the larger quadrat and count all shoots within the smaller quadrat.
9. If sufficient visibility, take a photograph of the 0.25-m^2 transect using an underwater digital camera.

10. Repeat for the remaining points along the first transect.
11. Move PVC markers and repeat steps 4-10 for the second and third transects.

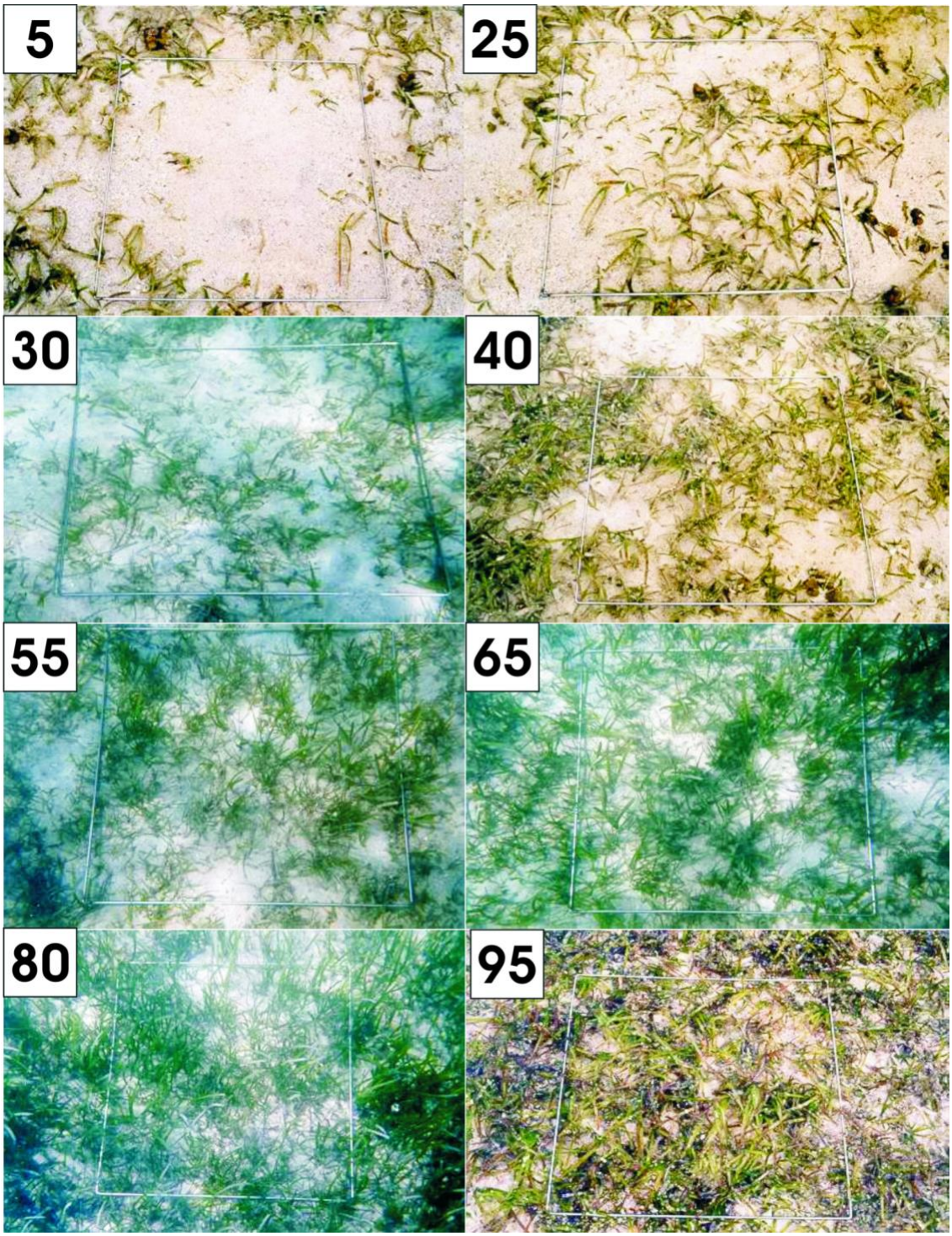
4.3. Post-processing

There is no post-processing necessary for quadrat samples.

4.1 Data Submission

1. Enter data into provided data entry templates.
2. Scan field data sheets.
3. E-mail data entry file, photos and scanned field data sheets to: marinegeo-data@si.edu

Appendix A – Seagrass Percentage Cover Photo Guide



Courtesy: SeagrassNet