

CALIBRATION

Corals

Prior to conducting a benthic transect survey, a surveyor should be proficient in: coral identification of all major reef building coral species on the AGRRA list, distinguishing colony boundaries, estimating diameter and heights, and estimating partial mortality. In addition, they should be familiar with different types of condition (e.g., bleaching, disease, predation) on the Disease and Predation Identification Cards (Bruckner and Bruckner 1998). To maintain and quantify accuracy and consistency between benthic observers during the survey, the surveyors should calibrate standards every other day of the survey or as many times as necessary to attain >90% accuracy.

Standard calibration for benthic transects:

- 1) Using a set transect line or pre-identified coral colonies, have each observer estimate and record the following for at least 5 different coral colonies:
 - Species Identification
 - Maximum diameter and height
 - % recent and old mortality
- 2) To calibrate between observers, the following should be maintained
 - Species identification should be consistent and accurate between all observers
 - Maximum diameter and height measurements should be within 10 cm
 - % recent and old mortality estimates should be within 5-10% for each.
- 3) Compare results after the calibration and discuss differences (if any) and variations between observers while still at the site.
- 4) Assess additional coral colonies if necessary to maintain >90% accuracy.

Algae

Prior to conducting algal quadrats, surveyors should be proficient in: identifying the main functional algal groups (crustose coral, fleshy macro-, and calcareous macroalgae), estimating % abundance of each, and measuring algal height of fleshy- and calcareous macroalgae. In addition, they should be familiar with recognizing small corals (<2cm). To maintain and quantify accuracy and consistency between algal observers during the survey, the surveyors should conduct standards every other day of the survey or as many times as necessary to attain >90% accuracy.

Standard calibration for algae:

- 1) Have observers assess the same five (5) algal quadrats.
 - % absolute abundance of crustose coralline
 - % absolute abundance of fleshy macroalgae
 - Average height (cm) of fleshy macroalgae
 - % absolute abundance of calcareous macroalgae
 - Average height (cm) of calcareous macroalgae
- 2) To calibrate between observers, the following should be maintained:
 - % abundance of algae estimates between observers should be within 5-10%
 - Algal height measurements between observers should be within 2 cm of each other
- 3) Compare results after the calibration and discuss differences (if any) and variations between observers while still at the site.
- 4) Conduct additional algal quadrats if necessary to maintain >90% accuracy.

Fish

Prior to conducting a fish belt transect survey, a surveyor should be proficient in: fish identification of all species on the AGRRA list; visualizing a 2 m belt transect, and be able to attain >95% accuracy in estimating observed fish lengths compared to actual measurements. To maintain and quantify accuracy of fish lengths during the survey, have the fish surveyor (s) conduct at least 10 standards every other day of the survey or as many times is needed to attain 95% accuracy.

Standard calibration for estimating fish lengths:

- 1) Find 10 immobile objects (e.g., pieces of coral, sessile invertebrates, or fish models, etc)
- 2) Estimate and record the length of each object using the fish size categories (0-5 cm 6-10 etc) staying at least 2 m from the object. Use the t-bar for estimating measurements.
- 3) Then measure the actual size of the object and record length.
- 4) Compare the differences between actual and observed.
- 5) Continue to collect standards until estimation accuracy is at least 95% or greater.
- 6) Include this data as part of your final report.