

Appendix A: Fish Survey Methods

Once in the field, the boat captain navigates to previously selected sites using a handheld GPS unit. On-site, divers are deployed and maintain visual contact with each other throughout the entire census. One diver is responsible for collecting data on the fish communities utilizing the belt-transect visual census technique over an area of 100 m² (25 m length x 4 m width). The belt-transect diver obtains a random compass heading for the transect prior to entering the water and records the compass bearing (0-360°) on the data sheet. Visibility at each site must be sufficient to allow for identification of fish at a minimum of 2 m away. Once reasonable visibility is ascertained, the diver attaches a tape measure to the substrate and allows it to roll out for 25 m while they are collecting data.

Although the habitat should not be altered in any manner by lifting or moving structure, the observer should record fish seen in holes, under ledges and in the water column. To identify, enumerate or locate new individuals, divers may move off the centerline of the transect as long as they stay within the 4 m transect width and do not look back along area already covered. The diver is allowed to look forward toward the end of the transect for the distance remaining (i.e., if the diver is at meter 15, he can look 10 m distant, but if he is at meter 23, he can only look 2 m ahead).

On-site, no attempt to avoid structural features within a habitat such as a sand patch or an anchor should be made as these features affect fish communities and are “real” features of the habitats. The only instance where the transect should deviate from the designated path is to stay above 33.5 m (110 ft). The transect should take 15 minutes regardless of habitat type or number of animals present. This allows more mobile animals the opportunity to swim through the transect, thus standardizing the samples collected to allow for comparisons.

Data are collected on the following:

- 1) Identification - as the tape rolls out at a relatively constant speed, the diver records all fish species to the lowest taxonomic level possible that come within 2 m of either side of the transect and towards the end of the transect. To decrease the total time spent writing, four letter codes are used that consist of the first two letters of the genus name followed by the first two letters of the species name. In the rare case that two species have the same four-letter code, letters are added to the species name until a difference occurs. If the fish can only be identified to the family or genus level then this is all that is recorded. If the fish cannot be identified to the family level then no entry is necessary. Individuals too difficult to identify or unique in some manner may be photographed for later clarification.
- 2) Abundance and size - the number of individuals per species is tallied in 5 cm size class increments up to 35 cm using visual estimation of fork length. If an individual is greater than 35 cm, then an estimate of the actual fork length is recorded.
- 3) Logistic information - diver name, dive buddy, date, time of survey, site code, transect bearing.

A PDF version of the datasheet utilized to collect the above data is available at: http://ccma.nos.noaa.gov/ecosystems/sanctuaries/fgb_nms.html.