Visual Fish Transects

Purpose

To determine the abundance of selected fish species along the 100 m transect line

Materials

1 dive slate with pencil
1 underwater visual fish transect data sheet (Appendix K)
1 30 m tape with secchi disk attached
1 surge meter

Personnel

2 SCUBA equipped observers (one diver trained in methodology, identification and search image for fish (Table 8)transects and the other diver experienced in conducting video transects).

Methods

The diver swims along one side of the 100 m transect line counting and recording all the indicator fish species present within a 3 m tall x 2 m wide x 50 m long area in front of the diver. The diver will record any fish within this area as far out as the diver can see along the 50 m dimension. Each site is divided into four 50 m transects. Each transect should be swam in 2.5 minutes (shaded area in Figure 7). The diver will count the total number of fish per 50 m transect, using the snapshot method, and record that number in the appropriate column on the data sheet. The snapshot method is defined as counting a static volume of fish. The diver should only count fish observed in the transect and not count fish that swim in/through the area after having counted all fish within the transect. Counts are differentiated by species and by age class (adults or juveniles, with juveniles usually defined as less than 10 cm in length). After the first transect is completed, check the time to see if you are swimming at a pace of 2.5 minutes/50 m transect. If not, adjust your swimming speed accordingly. After completing the first two transects (100 m end), the diver should swim about 5 m beyond the end of the line before turning around to begin the next count. This procedure allows fish that often follow the divers to diffuse off of the line before the start of the third transect. During this protocol, a second diver will be performing video transects in close proximity to the fish observer. It is both divers' responsibility to keep track of each other along the transect line.

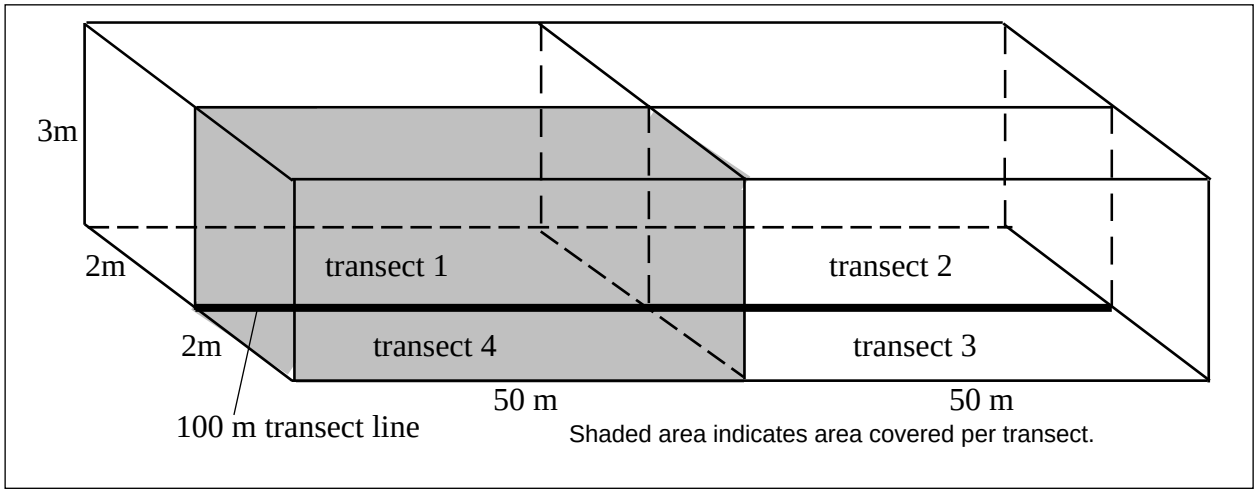

Figure 7. Area covered by visual fish transects.

After the four fish transects have been completed, visibility and surge are measured with the help of the second diver. Visibility is measured horizontally near the bottom with a 20 cm secchi disk. The secchi disk is always oriented to face the sun (i.e. to the east in the morning and to the west in the afternoon). One diver holds the secchi disk in place while kneeling on the bottom (Secci is approximately 1.3 meters off bottom), while the other diver holds the measuring tape and swims away (towards the sun) from the secchi disk. When the secchi disk just disappears, the diver with the reel notes the distance and then begins to rewind the tape noting the distance the secchi disc reappears. Visibility is recorded as the mean of the two distances. Surge is measured with a diver-held surge meter (Barlotti, 1980; Foster et al., 1985) and is recorded as the maximum degrees of movement of a #6 cork on a 30 cm long string attached to a protractor and placed parallel to the surge direction. Immediately following the dive, on the surface, observers should check data sheets to be sure all numbers are legible and totals for each species are accurate. Rinse the data sheets in fresh water, allow them to air dry, and store them in the completed data sheet notebook. Fish transects are conducted once or twice per summer at each site, as time allows, with a minimum of two weeks between sampling events.

Training Required

New divers conducting fish transects must be trained. Training includes conducting fish transects as described above with an experienced observer and comparing datasheets at the end of the dive (trainer and trainee are counting fish on the same side of the transect). When the project leader is convinced that the new observer can perform fish counts accurately the new observer's data will be included in the database. This training may take several dives or an entire summer depending on the experience of the diver in training. It is possible that some divers may not be qualified to conduct this protocol.

Time Required

15-20 minutes are required for fish transects.

Table 8. Organisms sampled on visual fish transects.

Species Name	Common Name	Juvenile Characteristics
Chromis punctipinnis	blacksmith	yellow tail coloration
Oxyjulis californica	señorita	<10 cm length
Sebastes mystinus	blue rockfish	<10 cm length
Sebastes serranoides	olive rockfish	<10 cm length
Sebastes atrovirens	kelp rockfish	<10 cm length
Paralabrax clathratus	kelp bass	<10 cm length
Semicossyphus pulcher (male, female and juvenile)	sheephead	<10 cm length AND white stripe*
Embiotoca jacksoni	black surfperch	<10 cm length
Embiotoca lateralis	stripped surfperch	<10 cm length
Damalichthys vacca	pile perch	<10 cm length
Hypsypops rubicundus	garibaldi	blue spots
Girella nigricans	opaleye	only found in intertidal zone
Halichoeres semicinctus (male, female and juvenile)	rock wrasse	<10 cm length AND white stripe**

*sheephead greater than 10 cm and displaying juvenile morphology are recorded as females.

**rock wrasse greater than 10 cm and displaying juvenile morphology are recorded as females.