Reef Watch Fish Survey Manual

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Background

The aim of the fish survey is to observe which species of fish are present on a particular reef and to record how many of them are seen over a given area. The fish survey technique used by Reef Watch divers is known as a 50m 'belt transect' survey and is very similar to that commonly used by scientific divers in South Australia and other southern states.

Uses

This provides a general indication of fish species present, and their abundance on the reef on the day of your dive. The method is repeatable and therefore useful for measuring change over time.

Skill

Requires basic diving proficiency and the completion of the PADI Project AWARE Fish Identification Adventure Dive and PADI Reef Watch Survey Diver fish survey dive, or the equivalent training program for snorkelers (this training can be provided by Reef Watch).

Time

A single fish survey can generally be completed within 15 minutes.

Equipment

- Standard dive equipment, including knife (in the unlikely but possible event of entanglement)
- Tape measure or hand spool containing 50m of line
- Fish identification slate
- Pencil (sharpened at both ends and slotted into the tubing attached to the slate).

Method

In addition to the procedures discussed in this section, you should carry out appropriate dive planning and follow standard safety procedures during your dive.

Prior to getting into the water, your pre-dive preparation and planning should include the following:

1. Ensure that you have all of the necessary equipment.
2. Decide the depth and location for your transect lines, referring to the Reef Watch Site Manual.
3. Decide how many surveys can be practically completed within the dive, giving consideration to both non-decompression limits and air consumption.
4. Decide which of you will be performing which roles on the survey. Although both divers may be involved in spotting fish, confirming identification or estimating the size of a school, a single diver should be responsible for the recording and reporting of data for a 50m transect. Divers can switch roles for subsequent transects.
    - Diver 1 is responsible for observing, counting and recording fish
    - Diver 2 is responsible for laying out and then rewinding the transect line and acts as a second set of eyes to: observe distinguishing features to help identify fish; watch for fish that circle back in front of Diver 1 and get recounted; and to confirm estimates of the number of fish in larger schools.

Once at the first transect position, divers should:

1. Record the name or initials of Diver 1, the necessary site/transect position details, the time of the survey, estimated visibility and the water movement. The notes are can be used for general habitat notes or to clarify any details (e.g. Diver 1, transect position) that change between surveys if there is insufficient room to record them in the designated areas.

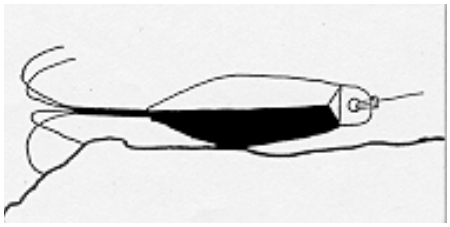

Figure 1. – Using the anchor sinker.

2. Diver 2 should carefully secure the measuring line to the reef surface with the sinker. This has a wire anchor which you simply bend into shape. (Figure 1) and which will also hold if anchored into a sand patch. However, care should be taken to ensure that the wire anchor does not damage anything living on the reef. Both divers should swim at a constant depth and speed along the transect with about half walking pace being ideal. While dispensing the line from the hand spool, Diver 2 should be positioned slightly below and behind Diver 1 so as not to interrupt her/his vision or to disturb fish before they are counted (Figure 2).

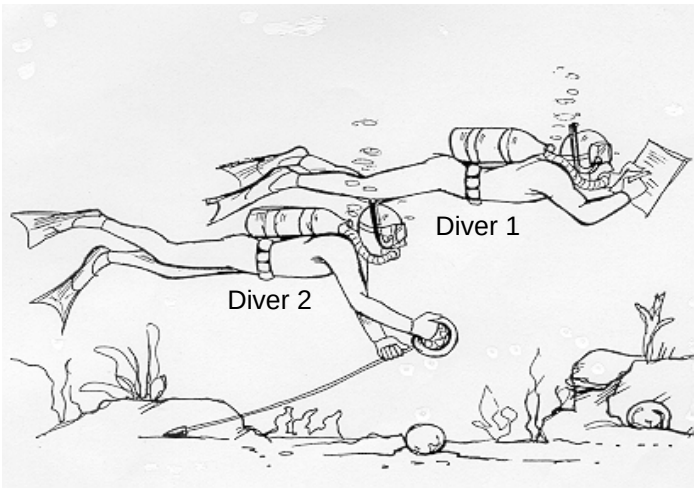

Figure 2. Position of divers in relation to each other.

3. While Diver 2 lays out the transect line, Diver 1 swims in front, maintaining a constant depth about 1-2m above the reef, and records the fish that are readily visible within a belt of 2.5m either side of the transect line see Figure 3).

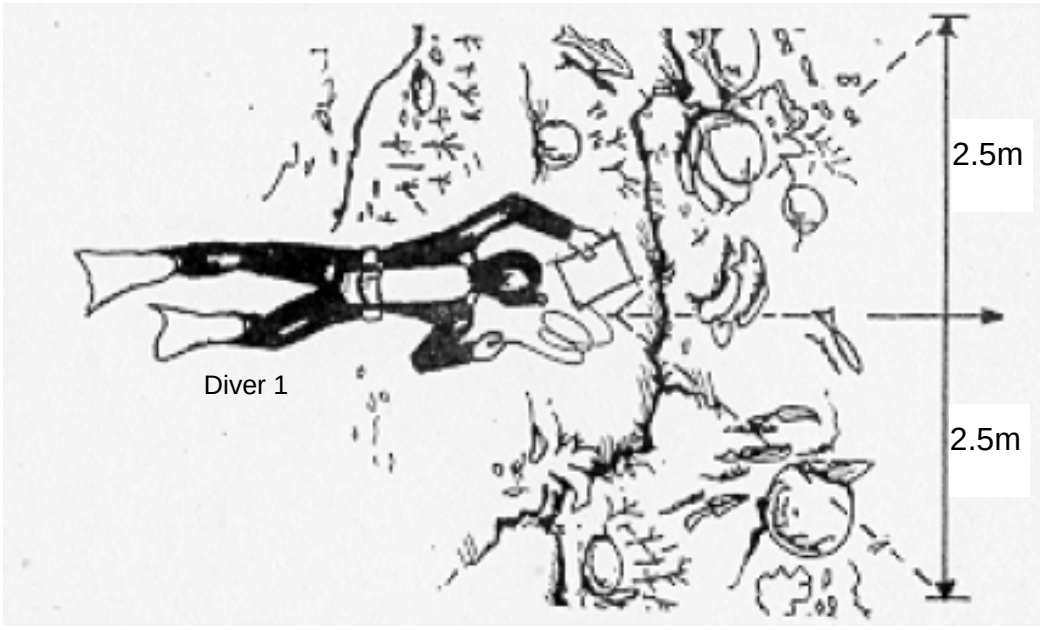

Figure 3. Fish count using a 5m wide, 'belt transect'.

4. When 50m of transect line has been laid, divers will either leave the transect line in place for an invertebrate or benthic survey, or will retrieve it. During retrieval, t is important to take care not to damage any plants or animals if the line becomes snagged. To prevent this, Diver 1 can swim ahead a few metres and ensure that the line is free while Diver 2 winds in.

Diver 1 should simply record the count each species on the slate by using tally marks in the spaces that are provided below to the picture of the fish on the slate (see Figure 4). The left hand box is used for the first transect, and the right hand box for a second transect. If more than two transects are performed, a continuation line can be drawn as shown to provide an area for recording the third and fourth transects.

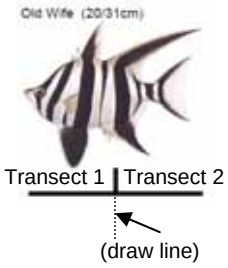

Figure 4. Recording the data on the slate.

When large schools of fish occur on the transect it is OK to estimate the number – and after the dive you can consult with Diver 2 and reach a consensus or take an average. A useful technique is to count off ten or twenty fish from a corner of the school, and from the size of that sub-school estimate the size of the overall school.

There may be cases where a species of fish is not listed on the form. A space has been provided to list 'other' species along with the number observed. For some families, for example wrasses and leatherjackets, you can enter the number observed in a dedicated 'other' pair of boxes. If you can't identify a fish species, draw it and write down a description of it's appearance. If you have described it well someone may be able to help you with identification after the dive, or you can look it up in a reference book such as:

- Edgar, G., 2000. *Australian Marine Life – the Plants and Animals of Temperate Waters*. Reed Books
- Hutchins, B. & Swainston, R., 1999. *Sea Fishes of Southern Australia*. Garry Allen Pty Ltd.

It is important to record only those fish observed within the 5m wide transect belt and not those that occurred adjacent to the belt, or that swam over the transect after the survey was completed. The idea is to obtain a snapshot of the fish that were present at the time of the survey. However, you can make a note of species that were not within the survey area and return this with your survey information as a note.

Debriefing

At the end of the dive, always conduct a brief review of your data, discuss any issues that arose, and compare notes on species identifications and counts. This will improve the quality of the data and enhance your experience for future dives.

Although the diving component of the survey constitutes most of the work, if your data is not reported then you may as well not have done the survey! The best way to report your data is via the Reef Watch website:

www.reefwatch.asn.au.

Click on the "Enter Survey Data" quick link on the home page to get started. If you have sighted any of the "In Peril" species (Blue Groper or other the four species on the *Feral or In Peril* slate) then you should also report them using the quick link from the Reef Watch home page.

Other ways to return your results:

- Email to: info@reefwatch.asn.au
- Photocopy your slate then fax it to: 8232 4782
- Mail your datasheet to 120 Wakefield St, Adelaide SA 5000