

Appendix 9.1 Rapid Ecological Assessment

Rapid ecological assessment (see ¹DeVantier *et al.*, 1998) is a two-tiered approach for underwater survey to assess the sub-littoral substrata and benthic organisms. This methodology has been modified to suit Hong Kong conditions and has become a standardised and widely adopted way to establish ecological baseline conditions. Two levels of information are to be recorded in a swathe ~2 m wide, 1 m on either side of each transect:

- Tier I will assess the relative cover of major benthic groups and substrata
- Tier II will provide an inventory of sedentary/ sessile benthic taxa, which are also ranked in terms of their abundance in the community at the survey site.

Self-evidently, data have to be recorded by an expert who is experienced in field identification of sedentary/ sessile benthic taxa, particularly corals.

Tier I Categorisation of benthic cover

For each transect, ecological and substratum attributes should be categorised and ranked. The required attributes are detailed as follows:

Table 1 Tier I Benthic Attribute Categories

Ecological Attributes	Substratum Attributes
Hard Corals	Hard substrata
Octocorals (soft corals and gorgonians)	Bedrock / continuous pavement
Black corals	Boulder blocks (diam. >50cm)
Dead Standing Corals	Boulder blocks (diam. <50cm)
	Rubble
	Other
	Soft substrata
	Sand
	Mud/Silt

Table 2 Tier I Ordinal Ranks of Percentage Cover of Benthic Attributes

Rank*	Percentage Cover
0	None recorded
0.5	1-5%
1	6-10%
2	11-30%
3	31-50%
4	51-75%
5	76-100%

*Note: For substratum attributes, it is preferable to record actual estimates of cover. The percentage of hard substrata vs soft substrata can be provided (e.g. 80% and 20% respectively). The percentage cover of the types of hard or soft substrata could also then be presented (e.g. bedrock pavement 60%, rubble 20%, sand 15%, and mud/silt 5%). Similarly, recording and presenting actual estimates of, for instance, hard and soft coral cover may be more informative (e.g. <1%) and is also an approach adopted by similar recent survey reports.

¹ DeVantier, L.M., G. De'ath, T.J. Done and Turak, E. (1998). Ecological Assessment of a Complex Natural System: A Case Study from the Great Barrier Reef. *Ecological Applications*.1, 8:480-496.

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Tier II Taxonomic inventories to define types of benthic communities

An inventory of benthic taxa along each transect should be compiled during the survey. The taxa should be defined in situ to at least the following levels:

Table 3 Taxonomic Inventory Identification

Type of Benthos	Level of Taxa
Hard corals	Species level, wherever possible
Octocorals	Genus level
Black Corals	Genus level

For each transect, each taxon in the inventory should be ranked in terms of abundance in the community.

Table 4 Ordinal Ranks of Taxon Abundance

Taxon Abundance Rank	Abundance
0	Absent
1	Rare
2	Uncommon
3	Common
4	Abundant
5	Dominant

The taxon categories should be ranked in terms of relative abundance of individuals, rather than the contribution to benthic cover along each transect. The ranks are visual assessments of abundance, rather than quantitative counts of each taxon. Representative photos of organisms should be taken.