

## Aquatic macrophytes, collecting data along a belt transect

### 1 Purpose and scope

Macrophyte data can be collected by establishing belt transects and/or quadrats at a site. This document describes how to collect aquatic macrophyte data in the field using a belt transect.

This method is difficult to employ in water that is highly turbid. Additionally, the method may not be appropriate for collecting macrophyte data from deep sections of water, although the likelihood of macrophytes growing in deep sections may be low.

### 2 Associated documents

*Sampling design and preparation:*

- *Permits and approvals*
- *Record keeping, including taking field photographs and videos*

*Biological assessment: Background to aquatic macrophytes, collecting samples along a belt transect*

### 3 Health and safety

Before following the methods contained in this document, a detailed risk management process (identification, assessment, control and review of the hazards and risks) must be undertaken. All work carried out must comply with the Queensland Work Health and Safety legislative obligations.

### 4 Permits and approvals

Permits and approvals may be required to conduct activities involving animals, plants and/or in protected areas (for example National Park/Regional Park, State Forest or State Marine Park). See *Permits and approvals* document for more information on requirements.

### 5 Skills, training and experience

At least one staff member must have experience in identifying aquatic macrophytes.

### 6 Equipment

See Appendix 1 for example equipment checklist.

## 7 Procedure

### 7.1 Locating the belt transect

A belt transect is a defined area, usually a rectangle, of specified size within which aquatic macrophyte data can be recorded. The dimensions of the belt transect are defined by the objectives of the monitoring program. The boundary of the belt transect can be defined with a tape measure, or visually using a range finder. The edges of the river can define two of the edges of the belt transect.

Data can be collected from:

- a location where a specific habitat is present
- a number of belt transect positions used to represent a site. These may encompass a number of different flow, substrate and depth combinations. For example, four 10m belt transects could be established across the channel width within a 100m reach of stream, with each belt transect separated by 20m (Figure 1). The number of belt transects used and the distances between each will depend upon the monitoring objectives.

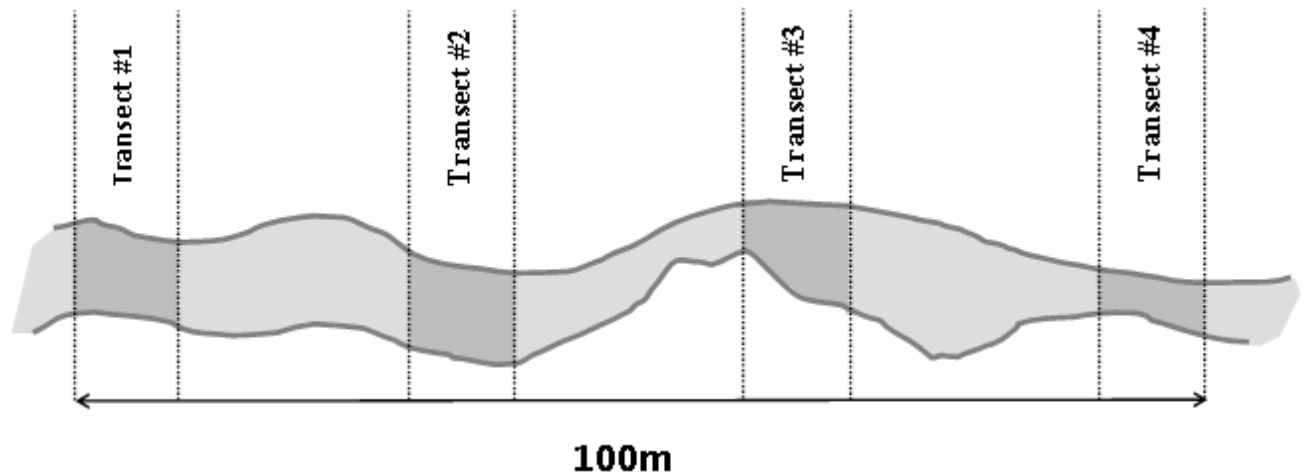


Figure 1: Example of a belt transect placement

### 7.2 Data collection

Macrophyte presence and relative abundance should be estimated along each transect. Macrophyte relative abundance can be recorded as the per cent cover of plant material per species above the substrate when viewed from above. The per cent cover for each taxon can be scored using either numerical (Table 1) or descriptive (Table 2) notation. The total per cent cover for all aquatic macrophyte taxa in a belt transect can equal more than 100 per cent, because macrophyte species from different growth forms can occur in the same location but at different depths. For example, floating and submerged macrophyte species can occur at the same position along the belt transect. In order to collect the data along a transect:

1. Position the belt transect within the sampling reach using a tape measure or rangefinder.
2. Work from the most downstream belt transect to the most upstream belt transect in order to avoid obscuring the view into the water by stirring up sediment and debris.
3. Wade into the water to the location of the belt transect.
4. Wade along the length of the belt transect, looking down into the water from above at the macrophytes present.
5. At the end of the belt transect record the required data (e.g. macrophyte species presence and relative abundance) onto a field sheet (Appendix 2).
6. Repeat the process for other belt transects.

**Table 1: Macrophyte cover as a numerical score**

Category	Per cent cover of macrophyte taxon
1	0%
2	1–5%
3	6–25%
4	26–50%
5	51–75%
6	76–95%
7	96–100%

**Table 2: Macrophyte cover as a descriptive category**

Category	Per cent cover of macrophyte taxon
Absent (A)	0%
Isolated (I)	1–5%
Scattered (S)	6–20%
Beds/Stands (B)	21–50%
Overgrowing/Filling Channel (O)	51–100%

### 7.3 Confirmation of species identification

Representative samples of aquatic macrophytes that cannot be identified in the field should be collected and pressed<sup>1</sup> for later identification using appropriate keys. Plants should be identified to species level where possible, and a reference herbarium can be maintained. Where a specimen cannot be identified to the species level, it should be lodged with the Queensland Herbarium for formal identification. Specimen collection and vouchering should be done in accordance with the Queensland Herbarium procedures<sup>1</sup>.

<sup>1</sup> Queensland Herbarium (2013) Collection and preserving plant specimens, a manual. Department of Science, Information Technology, Innovation and the Arts. <https://www.qld.gov.au/environment/assets/documents/plants-animals/herbarium/collecting-manual.pdf>

## 8 References and additional reading

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# Appendix 1

Table 1: Equipment checklist

Equipment	✓
Tape measure or range finder.	
Plant press and paper.	
Aquatic macrophyte identification field guides	
Field sheets	
Camera, charger	
GPS	
Spare batteries	
Waders	
First aid kit	

