

## 11.4 PROTOCOL FOR LINE INTERCEPT MACROPHYTE SURVEYS

### Overview

The Line Intercept method uses a system of transects that representatively encompass all aquatic macrophyte community types within a water body to derive a qualitative description of those communities. Use the survey data to identify and describe plant communities or bed types. Use a study area reconnaissance in combination with a number of representative survey transects to facilitate a reasonable qualitative description and delineation of bed types and distribution. The end products for a qualitative Line Intercept survey include a map showing the distribution of plant bed types plus a list of species for each plant bed type and the water body or study area as a whole. Transects are generally laid out perpendicular to the shore. Line Intercept surveys are most effective where plants are readily visible from a boat, generally less than 1-2 m of depth.

If the littoral zone extends to greater depths Line Intercept surveys may be conducted using a snorkeler or diver, although such surveys are more difficult to conduct. If divers are used, they should be familiar with *in-situ* identification of aquatic macrophytes.

### Sources

British Columbia MWLAP (2003), Alberta Environment (2006 a), Développement durable, Environnement et Parcs, Gouvernement du Québec (2007)

### Special safety concerns

Divers must be certified (e.g., PADI, NAUI, or equivalent) and familiar with accepted safe diving practices and any employer policy.

### At a glance

*identify all  
vegetated  
littoral  
areas*

#### Qualitative surveys

**1** Conduct a preliminary reconnaissance survey (e.g., Surface Inventory) to identify and delineate all vegetated littoral areas within the water body or study area. The number of transects required will vary from site to site and will be according to study design. Stratified sampling designs are usually suitable.

**2** Prepare a transect line marked at 1 m intervals with fluorescent flagging tape. Use of alternate colours at the 5 m and 10 m intervals simplifies tracking along the transect line. The transect line should be of a set length (e.g., 100 m), appropriate for the size of the water body or plant beds likely to be encountered. The line length may also equal the distance between end points in studies with permanent transects.

**3** Secure the transect line at both ends by attaching to poles or to anchor lines.

**4** Conduct surveys by navigating the boat along a transect line and recording all species occurring along individual line segments. Plants are deemed present if they intersect the vertical

plane between the transect line and the bottom.

**5** Wading is an option in very shallow near-shore waters. Use an underwater viewer in deeper or murkier water, or where the top canopy of plants obscures plants at lower levels. Use rake sampling to collect samples for observation or reference collection.

**6** Record water depth at each end of the transect line and at interval markers, record GPS waypoints, Secchi depth, turbidity, and bottom light level (if equipment is available) at each end of the transect line and at intervals along the line (e.g., at important transitions). Record water temperature or profiles at several shallow and deep sites within the study area.

*information  
to record*

**7** Identify plants on-site or retain them for identity verification at a later time. Place collected plants in sealable plastic bags along with a label providing all pertinent information. Record sample collections in a note book or on field sheets, along with a sample number, all pertinent site information, and GPS location.

**8** Properly preserve samples in a plant press. Samples will be archived and/or included in reference collections.

### Semi-quantitative surveys

**1** Select transect locations on a stratified-random basis, ensuring that all strata (i.e., bed types or geomorphically similar units) are equitably represented.

**2** Conducting semi-quantitative sampling at 1 m intervals is likely to be time consuming. Select larger intervals (e.g., 5 m or 10 m), or base sampling site selection on changes in bed type or a geomorphic characteristic(s) such as depth or substrate type.

**3** Conduct sampling at each sampling site in a consistent manner and with a consistent level of effort. Use the same number of rake drags or rake tosses and, if possible, sample an equivalent area with each drag or toss.

**4** Determine and record at each site the relative robustness of plant growth. Use descriptors such as Dense, Moderate, Sparse and Trace.

**5** Identify the species present and estimate the relative proportion of each species in the sample for each rake sample. Record species present in very small amounts, perhaps only as fragments, as 'present' or 'trace' only.