

9.10 PROTOCOL FOR SAMPLING INVERTEBRATES WITH ARTIFICIAL SUBSTRATES

Overview

Artificial substrates are placed in the stream so it is colonized by the organisms in the stream then removed later and analyzed. These types of samplers are best suited for upstream/ downstream studies or to test for changes over time. They do not necessarily provide a representative sample of the actual community that is living in the stream. Advantages and disadvantages are:

Advantages with artificial substrates:

- Access to areas that can't be sampled because of substrate or depth,
- Reduced variability,
- Non-destructive sampling of a location, and
- Flexibility in sampling design.

Disadvantages with artificial substrates:

- Colonization rates differ from site to site,
- Species in sampler may be different than stream bottom,
- Long incubation/exposure times (6-10 weeks), and
- Vulnerability of samplers to vandalism.

The most frequently used artificial substrate sampler is the "barbecue basket" sampler which is made by filling a basket (available in a number of variations from hardware stores) with gravel (2.5 to 7.5 cm diameter) that is then placed in the stream bottom. The substrate becomes colonized and is removed after some predetermined length of time.

Sources

British Columbia MWLAP (2003)

Special safety concerns

Formalin is used as a preservative and has been identified as a suspected carcinogen. Formalin should be used with extreme care and the MSDS should be read.

At a glance

*be careful
not to
dislodge
organisms*

- 1** Place the basket sampler in the stream and anchor if necessary. Leave in place for the necessary colonization time.
- 2** When the samplers are removed, take particular care not to dislodge organisms from the sampler. A general technique is to carefully place the basket sampler in a plastic bag underneath the water before it is lifted out.
- 3** Record time, any site related data such as flow, temperature, and pH (see the Ambient Freshwater and Effluent Sampling chapter), and any data about the appearance and condition of the basket sampler in the **field logbook**.
- 4** In the laboratory, remove the organisms from the sampler by carefully washing each rock into a sieve. Transfer the organisms into pre-labeled sample bottles. Preserve with 70% ethanol and place in cooler. Initial fixation may be done with 10% formalin before transfer to ethanol for longer term storage.

**Other
sources**

Environment Canada (2007), Alberta Environment (2003 a),
Ontario Ministry of the Environment (2005), Environment
Canada (1999), EMAN (Undated c)