9.12 PROTOCOL FOR SAMPLING INVERTEBRATES IN SOFT SEDIMENTS

Overview		Open water benthic invertebrate sampling involves the collection of invertebrates that inhabit the upper sediment layers and the sediment surface. Typically macroinvertebrates are sampled with some meiofauna including early insect instars. Meiofauna is defined as microscopic animals that pass through 500 μ m screen but are retained by a 64 μ m screen. The mesh size used to collect/process the invertebrate sample determines the composition of the benthic invertebrate sample collected. Some depositional areas in rivers and streams as well as lakes and reservoirs are most suited to the use of Ponar or Ekman grab samplers for sediment collection. Ponar grab samplers are most efficient at sampling harder sediments while Ekman grab samplers are most efficient in softer sediments. Open water benthic invertebrate sampling programs are usually conducted in early spring or late fall when benthic communities tend to be the most stable. It is also important to maintain consistency of time of sample collection within and between years.
Sources		Alberta Environment (2006 a), Ontario Ministry of the Environment (2005), Environment Canada (1999)
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	info to be noted do not allow sampler to free fall criteria for acceptable sample	 Label the sample containers with site identification, sample type, sampling method, sampler ID, and the date of collection. Take a photograph of the site. Note the following site information in the field sheet/book: target and actual sampling location (GPS), date and time of sample collection, overlying water depth (m), ambient weather conditions, grab penetration depth, depth sub-sampled, sampling personnel, and any deviations from the field sampling procedure (FSP), macrophyte growth. Ensure that the dredge jaws open and close properly. Lock the dredge jaws in the open position and lower in a controlled fashion to the lake bottom. Do not allow the sampler to "free fall" The sampler should be in contact with the substrate or positioned just above it Drop the messenger (if applicable) and first slowly then quickly raise the dredge to the surface. The sample is deemed acceptable if the desired depth of penetration has been achieved, the sampler has completely closed and was not inserted on an angle or tilted upon retrieval. If the sample does not meet these criteria the sample should be retaken close to the original sampling location. The rejected

sample should be discarded in such a way that it will not affect subsequent sampling efforts.

7 Place a container/bucket beneath the sampler just as it breaks the water surface.

8 Open the grab sampler over a 250 or 210 μ m mesh sieve box. If substrate materials are predominately fines, gently wash the sample using the sieve box to release the fine sediment and transfer the contents retained on the sieve to pre-labeled 1 L plastic jar(s). Use more than one jar if the sample is large.

9 If substrates include significant amounts of coarse material or organic debris, on-site sieving may be impractical. In this case, samples may be double-bagged, labeled, kept cool, and transported to a laboratory for sieving (i.e., with the aid of pressurized water). If samples can be kept cool and processed in a laboratory within a few days they may be preserved after sieving, otherwise the samples should be preserved at the time of collection.

10 Add buffered formalin to the sample(s) to achieve a final concentration of 10%. If the sample contains a large amount of organic matter, algae, and invertebrates, add approximately 1/5 the sample volume of buffered formalin.

11 Add a waterproof label with the sample ID to each sample jar (in addition to an external label) and securely cap the jar(s). Agitate the jar(s) to ensure the formalin is evenly distributed throughout the sample(s).

12 Rinse the grab sampler and the sieve in lake water to thoroughly remove residual sediment, invertebrates, or plant material.

13 Site photographs may be taken if they aid in site characterization (e.g., near-shore sites or sites with aquatic plant growth). In addition, supporting data must also be collected to characterize the benthic habitat at that site.

B. C. WLAP (2003), EMAN (Undated c), Environment Canada (Undated b)

on-site sieving

Other sources



Figure 20. Samplers used for soft sediments (Source: British Columbia WLAP (2003))