

Appendix I. WPC Macroinvertebrate Field Protocol

Field Sampling Procedure Section

1.0 Scope and Applicability

The purpose of the SOP is to describe the procedure by which macroinvertebrate organisms are collected in the most applicable way in order to integrate the data to existing statewide data sets. The goals of the macroinvertebrate field sampling are to: 1) determine a list of taxa identified to the genus level, and 2) determine relative abundance of each taxa per site.

2.0 Summary of Method

This SOP describes the methodology by which macroinvertebrates are collected in the field based on several existing methods. It also describes the method by which samples are preserved in the field and potential cautions about field sampling precision.

3.0 Definitions

- Reach: The reach is the length of the sample area, 100 meters, based on RPB methods (Barbour et al.1999). EMAP data is based on 40x the stream width for the habitat assessment.
- RPB: Rapid Bioassessment Protocol (Barbour et al. 1999)
- Sample: The sample includes the collected macroinvertebrates and the substrate removed during collection.

4.0 Health and Safety Warnings

Biologists for each organization should follow the regulations set forth by their respective organization.

5.0 Cautions

The sampling should be standardized according to the procedure described below. Best professional judgment should be used in a situation in which modifications to this protocol need to be made. All equipment should be properly maintained and cleaned after each sampling site.

Consider the gradient and substrate of the stream reach before proceeding with kick-net sampling. In some cases of low gradient, marsh-like systems, jabs may be more sufficient for certain habitats. If the methods are modified, please note this on the field sheet for the site.

6.0 Personnel Qualifications

Each field crew should be trained in these methods by a biologist in either organization. In most cases, the presence of the trained biologist will aid in quality of field collection.

7.0 Apparatus and Materials

- D-frame aquatic net, 500 µm mesh, 0.5 meter width
- Sieve bucket, 500 µm mesh
- 95 percent ethanol
- Sample containers
- Forceps
- Field Sheets/IPAQ/Field notebook
- Labels for samples
- Sharpie pens/pencils
- Neoprene gloves
- First Aid Kit

8.0 Instrument or Method Calibration

Not applicable.

9.0 Sample Collection

Samples should be taken and stored in whirl-pak sterilized bags or plastic containers with lids. This SOP slightly modifies the RBP multi-habitat approach (Barbour et al. 1999).

1. The sample reach (considered the sampling site) should extend 100 meters in a stream habitat in which there are no major tributaries entering the sampling area. The sample reach should be located a significant distance from road crossings or bridges. When bridges are in the immediate area, the sample reach should extend upstream of the bridge or road crossing. The reach length (100 meters) should be recorded on the sampling sheet.
2. The reach should be evaluated before conducting the collection in order to assess habitat and substrate of the reach.
3. The relative proportion of each type of habitat should be assessed. This will dictate the number of kick samples to be taken in each habitat throughout the entire reach, with a total number of kicks equal to 20.
4. Collection using the d-frame net is conducted downstream to upstream in all habitats, however, sampling of the riffle habitats should be conducted first, then individually cleaned and stored before other habitats have been sampled. All other habitats may be pooled into the sieve bucket during collection.
5. Place the d-frame net securely on the streambed and perpendicular to the downstream flow.
6. Kick vigorously 0.5-meters upstream of the d-frame net until the substrate is adequately disturbed (usually around 5 vigorous kicks).
7. Any large debris in the d-frame net should be removed and searched for clinging organisms. If present, these organisms should be removed from the debris and placed in the net. Remove any large rocks, branches, or other debris from the net before transferring it to the sieve bucket.
8. Rinse any remaining debris from the d-frame net into the sieve bucket. Rinse several times to ensure removal of all organisms. Inspect the d-frame net for any remaining organisms and rinse well with stream water.

9. Continue sampling throughout the habitats until 20 kick samples have been taken from the entire reach.
10. Once the debris has been collected in the sieve bucket, the debris should be transferred to whirl-paks or sampling bottles for storage until the samples can be picked.

10.0 Labeling of Samples

Each sample should be labeled with the sampling site code, date, and number of the sample taken from the site (i.e. 1 of 5).

11.0 Sample Handling and Preservation

The samples in the field should be preserved with 95% ethanol. The samples should be transferred to the laboratory facilities for each organization to wait to be processed.

12.0 Data Management and Records Management

All samples should be tracked from collection to processing by their site code. The biologist will track the samples collected from each organization internally.

<QUALITY CONTROL PROTOCOLS?>

References

Standard Operating Procedure (SOP) for Macroinvertebrate Single Habitat Sampling using a 0.5 Meter Dip Net. USEPA Wheeling, WV. July 2001.

Barbour, M.T., Gerritsen, J., Snyder, B.D., and J.B. Stribling. 1999. Rapid bioassessment protocols for use in wadeable streams and rivers: periphyton, benthic macroinvertebrates, and fish. Second edition. EPA 841-B-99-002