

Standard Operating Procedure: Benthic Macroinvertebrate Communities, Version 1.0

Arctic Inventory and Monitoring Network Stream Communities and Ecosystems Monitoring Protocol

Jonathan A. O'Donnell

National Park Service
240 W. 5th Avenue
Anchorage, Alaska 99501

September 2018

U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science
Fort Collins, Colorado

Please cite this Standard Operating Procedure as:

O'Donnell, J. A. 2018. Standard Operating Procedure: Benthic Macroinvertebrate Communities, Version 1.0. Stream Communities and Ecosystems Monitoring Protocols, Arctic Inventory and Monitoring Network. National Park Service, Fairbanks, Alaska. Available online at <https://irma.nps.gov/DataStore/Reference/Profile/2255976>.

The main Narrative for the Protocol for monitoring Stream Communities and Ecosystems for the National Park Service's (NPS) Arctic Inventory and Monitoring Network (ARCN) is available from the NPS ARCN website (<http://science.nature.nps.gov/im/units/arcn>).

SOP: Benthic Macroinvertebrate Communities, Version 1.0

Version 1.0 (September 2018)

Version No.	Revision Date	Author	Changes Made	Reason for Change

Contents

	Page
Introduction.....	4
Sampling Collection.....	4
Sample Submission.....	4
Literature Cited	5

Introduction

This Standard Operating Procedure (SOP) describes the methods for collection and analysis benthic macroinvertebrates samples from wade-able streams. This SOP is a component of the Stream Communities and Ecosystems Monitoring Protocol (O'Donnell and Miller 2018). Tasks associated with this SOP include (1) sample collection, (2) sample preservation, and (3) sample submission to the invertebrate lab. This protocol is adapted from the Bureau of Land Management's (BLM) National Aquatic Monitoring Framework (BLM 2017).

Sampling Collection

1. In most stream reaches with riffle habitat, the targeted-riffle sampling approach should be used.
2. Collect samples from 8 randomly selected riffles or runs along the stream reach of interest.
3. Begin sampling at the furthest downstream location, and continuing sampling in the upstream direction.
4. Using a kicknet, hold the net firmly on the bottom of the stream so that the mouth of the net is facing upstream.
5. Stand upstream of the net, and use your feet to disturb the sediment in an area roughly 30 x 30 cm.
6. Remove the net from the water, pulling straight up so that any invertebrates and debris move downward in the net.
7. Repeat steps 4-6 at all sampling locations (n = 8).
8. After sample collection has been completed at all locations in a stream, empty the contents of the net into a wash tub or tray with a squirt bottle.
9. Transfer the composite sample into a 500-mL sampling jar using a spoon or spatula.
10. Fill the remainder of the jar with 95% ethanol.

Sample Submission

1. All benthic macroinvertebrate samples should be submitted the BLM/Utah State University National Aquatic Monitoring Center (<https://www.usu.edu/buglab/>).
2. Prior to submitting samples, be sure to label all samples on the inside and outside of sample containers. For internal label, right sample ID on waterproof paper. For external labels, use sharpening and labeling tape.
3. Follow instructions for sample submission using the online tool: <https://www.usu.edu/buglab/SampleProcessing/SampleSubmission/>

4. All samples will be sorted and species will be identified using standard taxonomic approaches.
5. Following data entry by lab personnel, a report will be delivered to NPS with broad suite of metrics, including species richness, dominance, tolerance indices, functional feeding group information, and other compositional metrics.

Literature Cited

- Bureau of Land Management. 2017. AIM National Aquatic Monitoring Framework: Field Protocol for Wadeable Lotic Systems. Tech Ref 1735-2. U. S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.
- O'Donnell, J. A., and S. D. Miller. 2018. Stream communities and ecosystems monitoring protocol for the Arctic Network, Alaska. Natural Resource Report NPS/ARC/NRR-2017/XXX. National Park Service. Fort Collins, Colorado.

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS XXXXXX, Month Year

National Park Service
U.S. Department of the Interior



Natural Resource Stewardship and Science
1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525

www.nature.nps.gov