

Washington State Department of Ecology

Environmental Assessment Program

Standard Operating Procedures for Bedload Collection and Processing

Version 1.0

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Signatures on File

Please note that the Washington State Department of Ecology's Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical and administrative experts. Their primary purpose is for internal Ecology use, although sampling and administrative SOPs may have a wider utility. Our SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

Any reference to specific equipment, manufacturer, or supplies is for descriptive purposes only and does not constitute an endorsement of a particular product or service by the author or by the Department of Ecology.

Although Ecology follows the SOP in most instances, there may be instances in which Ecology uses an alternative methodology, procedure, or process.

SOP Revision History

Revision Date	Rev number	Summary of changes	Sections	Reviser(s)

Environmental Assessment Program

Standard Operating Procedure for Bedload Collection and Processing

1.0 Purpose and Scope

- 1.1 This document is for the Environmental Assessment Program Standard Operating Procedure (SOP) for collecting and processing bedload samples.
- 1.2 Bedload sampling uses a bedload trap deployed at a specified point in a stream over a specified period of time to collect bedload transported downstream. Sampling typically occurs over a 1-hour period. Bedload sampling may be used to quantify bedload export from a stream over time or in response to ecosystem disturbances.

2.0 Applicability

- 2.1 This document was developed as a bedload collection and processing procedure for the Type N Experimental Buffer Treatment (Type N) Study. The procedure may be applicable for other studies assessing bedload transport in freshwater streams.
- 2.2 Bedload transport rate calculations are based on the volume of water sampled during bedload trap deployment. For this study, estimates of stream flow through the bedload trap are based on hydrological measuring devices installed in the study basins. If such devices are not available for other studies, the investigator will have to use another means with which to sample stream flow.

3.0 Definitions

- 3.1 Bedload: stream substrate transported downstream through temporary entrainment in the water column.
- 3.2 Type N: perennial and seasonal non fish-bearing streams under Washington State's current stream typing system (WAC 222-16-030).

4.0 Personnel Qualifications/Responsibilities

- 4.1 Knowledge of the contents of this SOP.

5.0 Equipment, Reagents, and Supplies

- 5.1 Bedload trap—Bunte et al. (2004); see Appendix A for construction materials and methods
- 5.2 Watch
- 5.3 Waterproof datasheets or data book
- 5.4 Pencil
- 5.5 Plastic bags—Ziploc bags or equivalent; large enough to contain the sample

- 5.6 Labels
- 5.7 Permanent marker
- 5.8 Scale—Mettler or equivalent; 0.1 mg resolution

6.0 Summary of Procedure

6.1 Equipment Preparation

- 6.1.1 Construct a bedload trap according to the description in Bunte et al. (2004).

6.2 Sample Collection

- 6.2.1 Install the bedload trap at the downstream end of the study area according to the procedure in Bunte et al. (2004).
- 6.2.2 Record the date and time of trap installation onto a waterproof datasheet or data book using a pencil. Note the percent flow volume sampled by the bedload trap.
- 6.2.3 Avoid walking upstream of the bedload trap during deployment.
- 6.2.4 Remove the bedload trap after one hour. Record the date and time of trap removal.
- 6.2.5 Empty the contents of the bedload trap net into a freezer bag. Label the bag with the study name, site identifier, and sample collection date and time using a permanent marker.
- 6.2.6 Repeat the sampling procedure as dictated by the experimental design.

6.3 Sample Processing

- 6.3.1 Allow the sample to air dry for a couple of days.
- 6.3.2 Carefully inspect the sample for particles concealed among organic debris.
- 6.3.3 Weigh the particles and record the weight in grams.

7.0 Records Management

- 7.1 Enter data into Excel. Sample collection data and processing data should be contained in separate worksheets.

8.0 Quality Control and Quality Assurance

- 8.1 Avoid wading or conducting other measurements upstream of the bedload trap during deployment.
- 8.2 Ensure that datasheets are completely filled out in the field.
- 8.3 Ensure that sample collection bags are closed and correctly labeled.
- 8.4 Check all data entered into the database for accuracy and completeness.

9.0 Safety

- 9.1 File a field work plan before commencing field activities.
- 9.2 Use a CB radio to communicate with other traffic on one-way logging roads.
- 9.3 Learn how to deal with animals and people encountered in remote areas.

10.0 References

- 10.1 Bunte, K., S. R. Abt, J. P. Potyondy, and S. E. Ryan. 2004. Measurement of coarse gravel and cobble transport using portable bedload traps. *Journal of Hydraulic Engineering* 130: 879-893.

11.0 Appendix A. Bunte et al. 2004