

*Chris Maynard from the WA Department of Ecology has provided guidance regarding benthic surveys discussed at the Black Canyon Proposed Study Plans Meeting in Mill Creek, WA. He asked that this guidance be made available. See below:*

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### **Benthic Study guidance:**

**Purpose:** Obtain baseline information for benthic organisms immediately above, within and below the proposed project reach.

**Objectives:** Understand locations, life histories, ecology, abundance, and diversity of primarily benthic organisms that may be affected by diverting water from Black Canyon on the North Fork of the Snoqualmie River.

### **Methods:**

#### Periphyton sampling

Use protocols in *Washington Department of Ecology's Quality Assurance Monitoring Plan, Ambient Biological Monitoring in Rivers and Streams (The Monitoring Plan), appendix c-3 & c4. Publication no. 10-03-109.* [Ecology's QAMP for Ambient Monitoring in Rivers and Streams: Macroinvertebrate and Periphyton](#)

Sampling in deep bedrock pools will be difficult so some flexibility in procedure will be needed when this situation is encountered.

Use data to break into taxonomic analysis and density estimates.

#### In situ benthic sampling

Kick sampling in cobble. Use protocols in The Monitoring Plan, appendix C-1 & C-2.

For bedrock pool & boulder sampling, also see appendix C-1 & C-2. Scrub rocks

For more information, please refer to [Ecology's Macroinvertebrate collection SOP](#). Also see this [YouTube Video demonstrating moving and slack water macroinvertebrate sampling](#).

#### Fish stomach analysis (trout, suckers)

Send samples to the same taxonomic identification lab as used for benthic samples.

Drift sampling. For relative abundance, compare with benthic, stomach, and drift results. Use the drift portion of NOAA's protocol CHaMP ([http://cnr.usu.edu/streamrestoration/files/uploads/2011%20Resources/CHaMP\\_HabitatProtocol\\_v1.1\\_TopoExcerpt.pdf](http://cnr.usu.edu/streamrestoration/files/uploads/2011%20Resources/CHaMP_HabitatProtocol_v1.1_TopoExcerpt.pdf)). This should be done either from the lower reaches working upstream or waiting a few days between sample sites. Use the same sample lab for taxonomic identification.

Include mollusk identification: photo them and return them to their bed. Identify from photos, mark location (gps), habitat type, velocity, depth, and substrate.

Time sampling events during late season low flows the latter part of August and in September.

Sample sites:

1. Above intake
2. Below intake but above canyon
3. 2 samples in the canyon
4. One sample just above the return flow
5. One sample below the return flow but above the confluence with the main Snoqualmie River

A site is a reach from 150m to 2 k based on stream width (see monitoring plan) insects & periphyton. Divide each reach into eight transects to collect sample. The Monitoring Plan, table C-1.1.

See below You Tube video for more details:

[https://www.youtube.com/watch?v=IuNn4VqFtJI&playnext=1&list=PL0E0DAAE69E7386E2&feature=results\\_video](https://www.youtube.com/watch?v=IuNn4VqFtJI&playnext=1&list=PL0E0DAAE69E7386E2&feature=results_video)