EAGLE CREEK

Sample Date: September 25, 2020 and September 23, 2021

General Location: Tributary into Kootenay River in the Blewitt area of the south shore

Sampling location: Near trail off of Bedford Road (latitude = 49.4835083, longitude = -117.3946417)

Stream Order: 2

Eagle Creek
- Site of sample collection (red dot)
- Watershed boundary (pink area)

Introduction and Methods

We used a nationally standardized protocol for measuring freshwater ecosystem health called the Canadian Aquatic Biomonitoring Network (CABIN) protocol (find the full protocol here).

It focuses on benthic macroinvertebrates, which are aquatic animals without backbones that live on the bottom of waterbodies and are visible to the naked eye. Counts of benthic macroinvertebrates are indicators of water quality and overall stream health in part because these organisms are sensitive to disturbance (more about the science of aquatic biomonitoring here).

We assessed stream health by summarizing the macroinvertebrate communities of sampled streams. We calculated the following standard measures of stream health and compared them to the values we should observe in healthy streams in the Columbia Basin (based on the Columbia Basin Reference Model)

1. **RIVPACS O:E Ratio** – River Invertebrate Prediction and Classification System ratio of observed taxa to expected taxa
2. **Metrics** – Various richness measures, numbers of individual taxa, compositional measures, and functional measures
3. **Bray-Curtis Dissimilarity** – Community structure similarity between test stream and healthy Columbia Basin streams
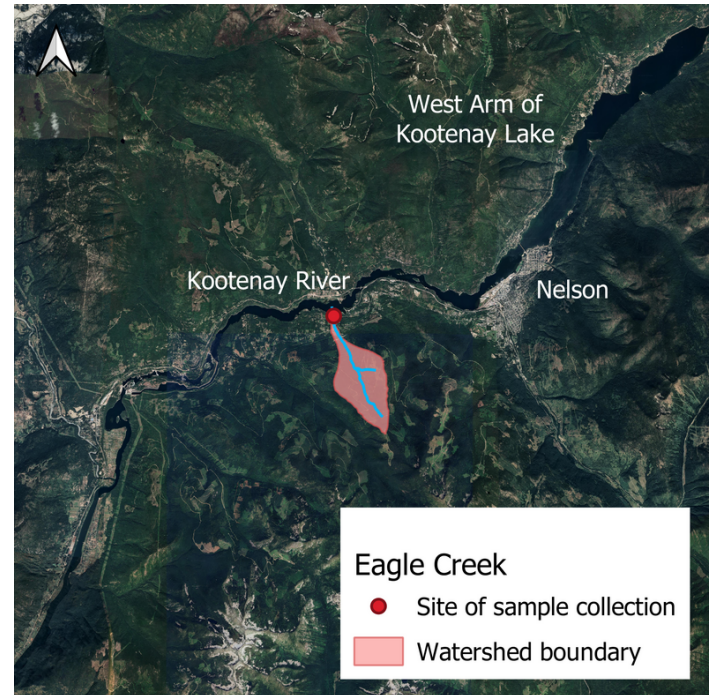
Results

Summary of Findings

Impaired in 2020, and healthy in 2021 relative to the median reference (healthy) stream in the Columbia Basin. *Median definition: Denoting the middle value of a series arranged in order of magnitude.*

Detailed Findings

1. *RIVPACS*
- Value = **0.68** in 2020 and **1.09** in 2021 indicating that the site was impaired in 2020 and in excellent condition in 2021. Generally, sites with O:E ratios close to 1 are in good condition, sites with O:E ratios above 1 indicate enriched communities, and sites with low O:E ratios are in poor condition.

2. *Metrics*
- Eagle Creek appeared somewhat impaired in fall 2020. Only 5 out of 10 metrics suggested a healthy stream compared to the median reference (healthy) stream in the Columbia Basin.

Values that suggested impairment in 2020 included:
- *% Ephemeroptera that are Baetidae* was higher in Eagle Creek than the median reference (healthy) stream
- *% Trichoptera that are Hydropsychida* was higher in Eagle Creek than the median reference (healthy) stream
- *EPT taxa (no)* was lower in Eagle Creek than the median reference (healthy) stream
- *No. Clinger Taxa* was lower in Eagle Creek than median reference (healthy) stream
- *Total No. of Taxa* was lower in Eagle Creek than the median reference (healthy) stream

But by the fall of 2021 it appeared healthy, with 10 out of 10 metrics suggesting a healthy stream.

3. *Bray-Curtis Dissimilarity*
- Value = **0.89** in 2020 and **0.62** in 2021 indicating a high level of dissimilarity in 2020 and an intermediate level of dissimilarity in 2021 between Eagle Creek and the median reference (healthy)
- The high level of dissimilarity suggests the site was impaired in 2020 and the intermediate level suggests that the site was healthy in 2021 (values close to 0 indicate identical communities; values close to 1 indicate completely different communities)

Discussion

The information gathered serves as a baseline to compare future stream health assessments to, to assess the impact of climate change and other future impacts to the watershed.

The results suggest a disturbance prior to the fall of 2020 that the stream recovered from by the fall of 2021. New logging or water intakes are potential one-time events that could have caused this result but that we could not find a conclusive explanation for this result.

Data and results are available on our website.

Thank you to our funders:

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