



LAIRD CREEK

Sample Date: October 2, 2020 and October 6, 2021

General Location: Tributary into the West Arm of Kootenay Lake, in the Balfour area of the north shore

Sampling location: 200 meters off of north side of Highway 3A (latitude = 49.62007, -116.99868)

Stream Order: 3

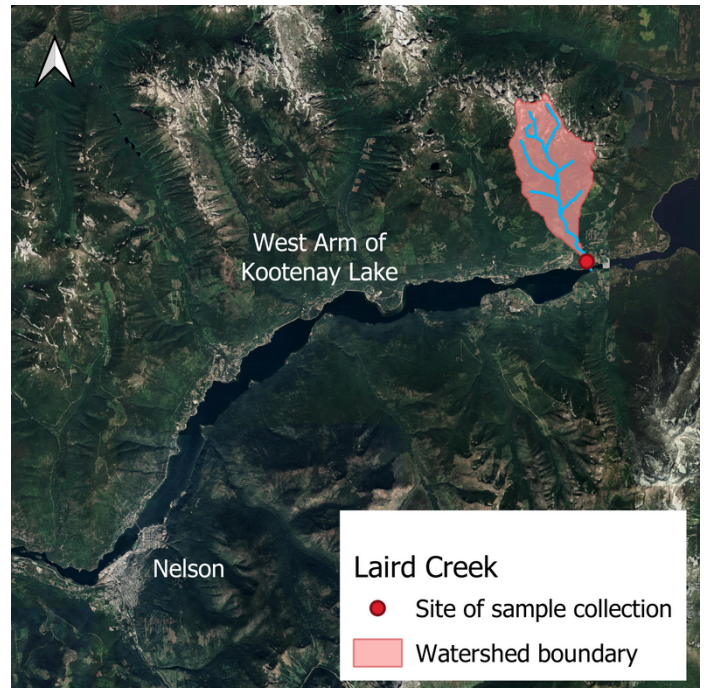
Introduction and Methods

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

Healthy (in both 2020 and 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 = **1.09** in 2020, and **1.26** in 2021, indicating that the site was in excellent condition in both years. 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

- Almost all metrics point to a stream that is as healthy or healthier than the median reference (healthy) stream in the Columbia Basin

The one exception was:

- % *Ephemeroptera* that are *Baetidae* was higher in Laird Creek than in the median reference (healthy) stream in fall 2021

3. Bray-Curtis Dissimilarity

- Value = **0.76** in 2020 and **0.60** in 2021, indicating an intermediate-high level of dissimilarity in 2020 and an intermediate level of dissimilarity in 2021 between Laird Creek and the median reference (healthy) stream (values close to 0 indicate identical communities; values close to 1 indicate completely different communities)
- Given that the RIVPACS and Metrics findings above indicate a healthy stream, the intermediate-high dissimilarity value in 2020 and the intermediate dissimilarity value in 2021 suggest that the stream community is different in a "good" way (i.e., it has even more diversity and intolerant species than the median reference (healthy) stream in the Columbia Basin).

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 metric that did not indicate a healthy stream could be due to the impacts of logging in the area as well as address and water license points and nearby roads. Further studies need to be conducted in order to determine the specific causes of impairment. Overall, this is a healthy stream, relative to the median reference (healthy) stream in the Columbia Basin.

Data and results are available on our [website](#).

Thank you to our funders:

