



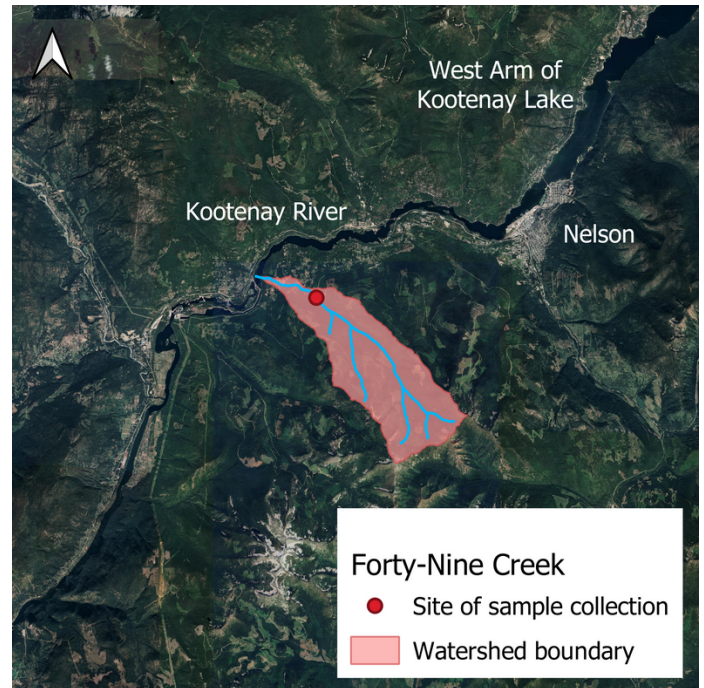
# 49 CREEK

**Sample Date:** September 25, 2021 and September 21, 2021

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

**Sampling location:** Off of Shasheen Road (latitude = 49.461765, longitude = -117.428075)

**Stream Order:** 3



## Introduction and Methods

Forty-Nine Creek was discovered in the 1860s and was mined for gold.

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](#))

**RIVPACS O:E Ratio** – River Invertebrate Prediction and Classification System ratio of observed taxa to expected taxa

**Metrics** – Various richness measures, numbers of individual taxa, compositional measures, and functional measures

**Bray-Curtis Dissimilarity** – Community structure similarity between test stream and healthy Columbia Basin streams

# Results

## Summary of Findings

Slightly 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 = **0.84** in 2020 and **1.19** in 2021, indicating that the site was in good condition in 2020 and 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

- Most values point to a stream that is as healthy or healthier than the median reference (healthy) stream in the Columbia Basin with some exceptions in 2020.

The three exceptions were:

- % *Trichoptera that are Hydropsychida* was higher in Forty-Nine Creek than in the median reference (healthy) stream in fall 2020
- *Total No. of Taxa* was lower in Forty-Nine Creek than in the median reference (healthy) stream in fall 2020
- % *Ephemeroptera that are Baetidae* was higher in Forty-Nine than in the median reference (healthy) stream in fall 2020

### 3. Bray-Curtis Dissimilarity

- Value = **0.88** in 2020 and **0.74** in 2021, indicating a high level of dissimilarity in 2020 and an intermediate-high value in 2021 between Forty-Nine Creek and the median reference (healthy) stream (values close to 0 indicate identical communities; values close to 1 indicate completely different communities)
- The high level of dissimilarity suggests the stream could be slightly impaired in 2020 and in good condition in 2021

# 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. Further studies need to be conducted in order to determine the specific causes of impairment. Overall, this stream was slightly impaired in 2020 and healthy in 2021 relative to the median reference (healthy) stream in the Columbia Basin.

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

Thank you to our funders:

