

## Exploring the Uncertainty in the British Columbia Instream Flow Methodology in a Steep-Mountain Stream



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**Rationale:** The predictions of habitat-based assessment methods that aim to determine instream flow requirements for aquatic biota are uncertain, but those uncertainties are often ignored by instream flow practitioners and managers.

**Description:** Two commonly recognized uncertainties arise from (1) the way in which physical habitat within a river changes with discharge, and (2) preferences of organisms for certain types of physical habitat within an aquatic ecosystem. In this study, I explore how these sources of uncertainty affect confidence in the results of the British Columbia Instream Flow Methodology (BCIFM), which is a commonly used assessment method for small-scale hydroelectric project water diversions in British Columbia, Canada. I also explore how these uncertainties create risks of habitat loss at different flows. I used a high-gradient reach of the North Alouette River, BC as a case study.

**Outcomes:** I found that uncertainty in habitat preferences of organisms generally dominated uncertainty in the results of the BCIFM when large numbers of transects were used. In contrast, with small numbers of transects (i.e. <10), variation in physical habitat among sampled transect was the major source uncertainty in the results of the BCIFM.

**Benefits from this research:** Presentations of results of the BCIFM in terms of probability of habitat loss for a given flow can help managers set instream flow requirements based on their risk tolerance for fish-habitat loss.



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