

# Fish Passage and Survival Assessment: Icicle & Peshastin Creeks

## 2015-2017 Icicle Workgroup **DRAFT** Funding Request

### **Principle Investigator**

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### **Total Estimated Cost**

\$116,829

### **Duration**

March 1<sup>st</sup> 2015 – June 30<sup>th</sup>, 2017

### **Summary**

The Washington State Department of Ecology, through the Office of Columbia River (OCR), are partnering with the Chelan County Natural Resources Department (County) to develop an integrated water resource management plan to improve flows and passage for fish, enhance habitat for aquatic and terrestrial species, and provide additional water for cities and irrigators. OCR and the County are currently working on gathering information to produce a Programmatic Environmental Impact Statement (PEIS) to serve as a framework for the Icicle Creek Water Resource Strategy that would lead to implementation of high-priority water resource projects.

The anticipated changes to fish migration barriers and water conveyance may affect the movement, survival, and distributions of multiple native fish species, including steelhead (*Oncorhynchus mykiss*) and bull trout (*Salvelinus confluentus*), which are listed as threatened under the Endangered Species Act (ESA). It is essential that potentially deleterious effects to either species are documented and projects designed to benefit fish are successful. In order to understand fish response to the integrated water resource management actions, it is vital to evaluate current conditions and monitor changes throughout the implementation phase(s) of the resource management plan.

### **Resource Goal**

Our goal is to evaluate the movement and survival of bull trout and steelhead in Icicle and Peshastin Creeks, as well as the life history variation (ie. proportion of migratory individuals) that may be altered through the suite of projects planned as part of the integrated planning process. Migratory bull trout and steelhead may benefit from improved passage conditions and instream flows, but they are vulnerable to water management strategies that select against migratory life history types, directly (ie. entrainment or mortality) or indirectly (altered flow regime). This goal supports local, state, and federal salmon recovery efforts and the objective of the Icicle Water Resource Strategy to improve conditions for fish in Icicle and Peshastin Creeks.

The spatial structure of habitat use and associated survival rates within foraging, overwintering, and migration habitats are critical uncertainties (NPCC 2013). Another critical uncertainty is the accuracy of evaluating limiting factors under current procedures, which are typically based on geomorphic assessments and habitat surveys (NPCC 2013).

### **Project Area**

The proposed study would occur in the Icicle and Peshastin Creek sub-basins with important monitoring infrastructure connections in the Wenatchee and Columbia Rivers (Figure 1).

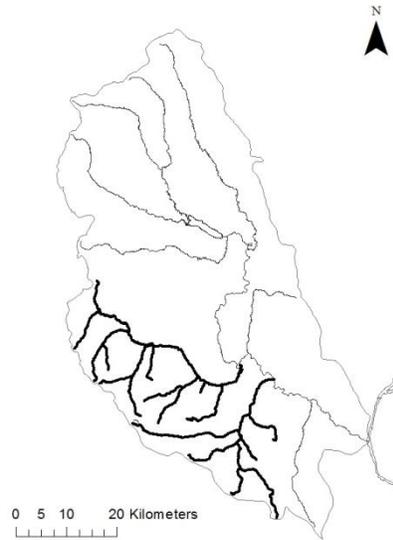


Figure 1. Study area showing the Icycle and Peshastin Creek watersheds within the Wenatchee River basin, Washington.

### Tasks

WDFW will perform the following tasks to achieve the objectives of this proposal and to meet the Icycle Workgroup’s Guiding Principle # 7 - ***Comply with state and federal law.*** Information collected will directly inform resource agencies<sup>1</sup>, tribes, NGOs, and stakeholder groups tasked with evaluating potential affects to bull trout and steelhead as a result of implementing elements of the Icycle Creek Water Resource Strategy.

#### ***Task 1: Bull trout and steelhead tagging***

In order to evaluate life-stage-specific survival, fish movement and habitat use, and potential implications of the integrated water resources process for bull trout and steelhead, WDFW will implement spatially stratified electrofishing and angling surveys to capture fish and deploy passive integrated transponder (PIT) tags (Miller et al. 2008). Tagging will occur from late summer to early fall using a spatially balanced design, including spatially continuous sampling in Peshastin Creek and a stratified approach in Icycle Creek. We plan on deploying a maximum of 3,000 PIT tags for each species, but probably far fewer bull trout will be encountered. This approach will result in a spatially balanced study and sufficient tags deployed to quantify survival within habitats throughout the survey extent, movement of individuals into the Wenatchee River and elsewhere, and changes in growth rates or emigration patterns over time.

By fall of 2014 there will be three permanent passive integrated transponder arrays (PIA) in Icycle Creek and one in lower Peshastin Creek. These will be sufficient for detecting juvenile movements during low flow periods (WDFW, unpublished data). Additional arrays become available seasonally as temporary arrays are deployed to evaluate steelhead spawning distribution. Peshastin Creek, and Icycle Creek once the boulder field passage project is completed, are priorities for temporary array deployment to further our understanding of steelhead distribution. Tagged individuals may be passively detected at permanent and temporary arrays and recaptured at smolt traps, dams, or via remote sampling. There is a robust infrastructure for sampling migratory fish in the Wenatchee River that fish tagged via this study will experience. Active or passive detections of individual fish are useful for evaluating survival and movement patterns.

***Survey Methods:*** Electroshocking and angling with PIT tagging.

<sup>1</sup> If funded, WDFW would work directly with NOAA and the USFWS to ensure information collected will assist with future ESA consultation needs required to implement elements of the Icycle Creek Water Resource Plan.

**Estimated Cost: \$116, 829**

**Deliverable:** Annual progress report. Data will also be used to build life-cycle or survival models, but they will require multiple years of data before reporting. Information about fish impacts or project benefits (ie. steelhead passage at boulder field) will be conveyed as it becomes available.

**Budget**

TASK	Salaries & Benefits	Goods & Services	Travel	Total	Indirect	TOTAL
Task 1A	\$78,157	\$17,555	\$468	\$80,160	\$20,649	\$116,829
<b>TOTAL</b>	<b>\$78,157</b>	<b>\$17,555</b>	<b>\$468</b>	<b>\$80,160</b>	<b>\$20,649</b>	<b>\$116,829</b>

**Tasks**

**1) Cost-shares**

This proposal is intended to make individual bull trout and steelhead detectable such that existing infrastructure can be used to detect them. These represent substantial cost shares in the form of PIAs, smolt traps, mainstem Wenatchee River surveys, and adult steelhead monitoring.

**2) Project Deliverables**

This project will deliver the following actions or products by the conclusion of the contract:

- 2015-2017 Draft Scope of Work and Budget – ***Due March 1<sup>st</sup>, 2015***
- A summary of fish tagged by location – ***Due May 31<sup>st</sup>, 2017***
- Evaluation of movement, survival, and of changes that may be associated with the water management plan or habitat restoration projects (ie. Icicle Creek boulder field) – ***Due May 31<sup>st</sup>, 2017***
- Draft Final Report documenting results and analyses submitted for review – ***Due May 31<sup>st</sup>, 2017***
- Final Report documenting results and analyses – ***Due June 31<sup>st</sup>, 2017***

**References**

NPCC. 2013. Columbia River basin research plan. Northwest Power and Conservation Council.

Miller, T., C. Snow, A. Murdoch, C. Peven, D. Beardsley, T. Jackson, M. Cooper, M. Cotter, R. Dasher, and M. Collins. 2008. A Field Manual of Scientific Protocols for Capture, Handling, and Tagging of Wild Salmonids in the Upper Columbia River Basin using Passive Integrated Transponder (PIT) Tags within the Upper Columbia Monitoring Strategy. Wauconda, WA.