Entiat IMW—Accomplishments Report

Overview

Focal Species: Upper Columbia spring Chinook and steelhead.

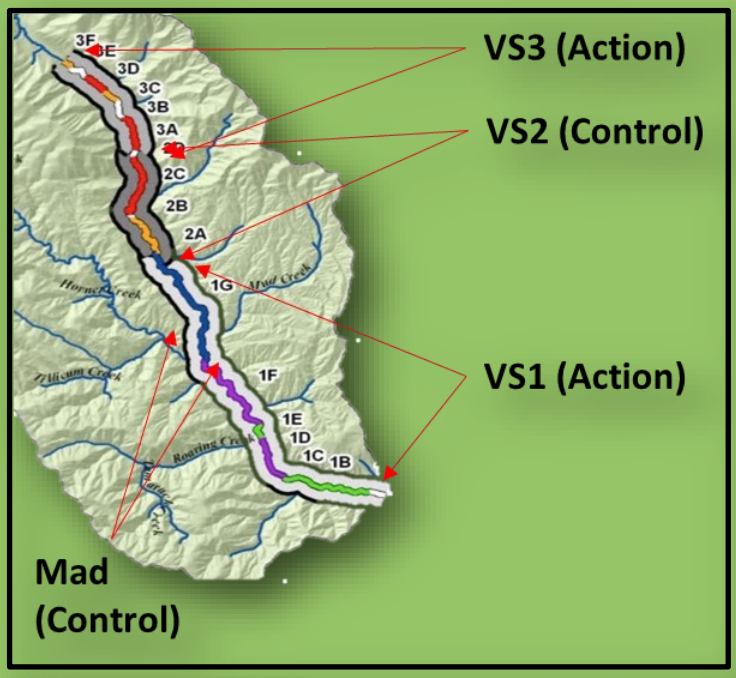
Limiting Factors: As is typical of many watersheds across the Columbia River Basin, the Entiat River subbasin is characterized by simplified instream habitat complexity due to impacts from logging, flood control, and agriculture.

Restoration Strategy: Restoration actions include large wood structures and boulder placement, side channel connection/enhancement, and levy breaching, and are designed to increase the complexity of instream habitat and access to side channel habitat and the floodplain in order to improve rearing and overwinter habitat. Actions in the Entiat were implemented in 2012 and 2014, but actions planned for the third and largest round of habitat improvement actions in 2017 have been delayed until 2019. This has prompted a reduction in monitoring for 2017 but analysis continues.

Experimental Design

Hybrid hierarchical staircase design focused on the lower 34 km of the mainstem Entiat River.

- Robust and flexible
- Spatial redundancy
- Reveal multi-scale mechanisms (e.g. effects of action types, geomorphic reaches, landuse)
- Mad River biological reference for steelhead
- Chiwawa, White, Little Wenatchee biological references for Chinook
- Habitat improvement actions implemented in pulses in space (lower versus upper river delineated by geomorphically distinct valley segments) and time (2—3 years apart).



Monitoring Approach

•Summer habitat surveys using the CHaMP protocol

•Summer/winter fish mark-recapture surveys

•Redd surveys

•Smolt trapping

•Instream PIT Tag Interrogation

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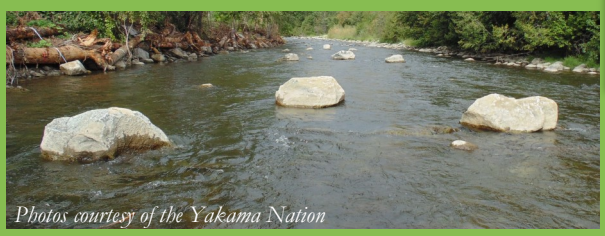
Analysis

Before-After-Control-Impact: for habitat and fish metrics, including spring Chinook and steelhead survival, growth and abundance at different spatial scales where data are sufficient.

Life-cycle Model: Data are used in species-specific life-cycle models to predict the effect of restoration, climate change, and other factors.

Results

To date we have seen an increase in juvenile steelhead survival, a decrease in growth rate, and no change in abundance. We have not detected a positive response in Chinook for either abundance or survival, but there has also been a decrease in Chinook growth rate. The amount of wood in the river has increased significantly, but absent large channel-changing floods since projects were implemented, we have not detected much change in other habitat metrics known to be important for fish rearing, such as the number or frequency of pools. Long-term benefits still need to be quantified as the impact of the habitat improvement actions take time to mature and be fully realized, and for the fish populations to respond.



Photos courtesy of the Yakama Nation

Restoration improvement actions such as the wood and boulders shown here added by project sponsors into the mainstem Entiat River have resulted in significant increases in steelhead survival.

Challenges and Lessons Learned

Long timeframe = danger of IMW fatigue • Competing needs for available funding so coordinated funding across region probably essential • Adaptable experimental design • Coordination effort requires continual nurturing • Working on private land especially challenging for both project implementation and monitoring • Scale of habitat improvement actions limited by risk, community needs, funding • External controls hard to find • Defining and agreeing on just what is success for an IMW?

Funding

Bonneville Power Administration Integrated Status and Effectiveness Monitoring Program (ISEMP; Project No. 2003-017-00)

Collaborators

Upper Columbia Salmon Recovery Board † Upper Columbia Regional Technical Team † U.S. Fish and Wildlife Service † Cascade Conservation District † Entiat Watershed Planning Unit † U.S. Bureau of Reclamation † Chelan County Department of Natural Resources † Yakama Nation