

# Methow River Demonstration IMW – Accomplishment Report

**Location:** Methow River watershed in the Eastern Cascades of north central Washington, with focus of RM&E efforts on the eight miles of stream in the Middle Methow (M2) Reach.

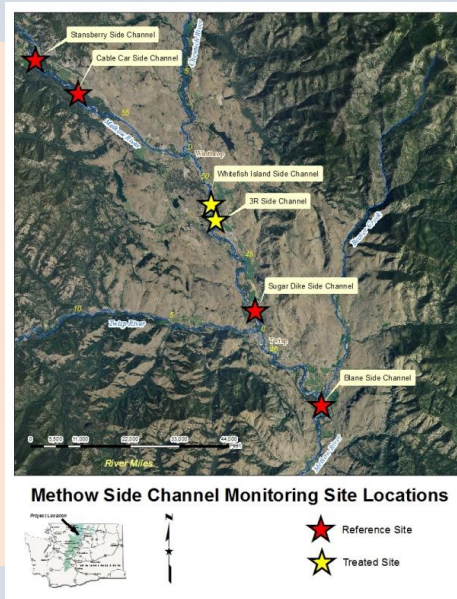
**Focal Species:** Upper Columbia spring Chinook (endangered) and summer steelhead (threatened).

**Primary Ecological Concerns:** Channel Structure and Form, Peripheral and Transitional Habitat, Decreased Water Quantity, Riparian Condition.

## IMW Description

The Methow Demonstration Intensively Monitored Watershed aims to evaluate the effectiveness of salmon and steelhead habitat recovery measures, provide a scientific basis for the implementation of future habitat enhancement projects and adaptive management actions, and to ensure efficient species recovery efforts are being accomplished.

To achieve its goals this project relies on a combination of modeling, field data collection, and PIT tag analyses to evaluate the growth and survival of target species. In combination with other research and monitoring efforts in the Methow, this approach allows for evaluations and predictions of fish population response to habitat enhancement actions at the reach and project scales.



## Experimental Design

### Before-After-Control-Impact (BACI) Study:

The BACI study consists of three years of pre-treatment (2009-2012) and three years of post-treatment (2015-2018) fish population and habitat monitoring in both treatment and reference side channels. Fish species composition, abundance, and density and individual fish growth and survival are examined through tri-annual fish capture and tagging events conducted in March, August, and November. PIT tag interrogation analyses are used monitor fish movement and survival in treatment and reference reaches and downstream through the Columbia River.

### Food Web Modeling:

Stream metabolism dynamics are used to examine aquatic productivity and the response of food webs to habitat enhancement. Estimates of instream metabolism establish the total amount of energy produced within different river segments and, consequently, capacity of these segments to support fish production. When applied to treatment stream segments, this Aquatic Trophic Productivity (ATP) model developed by USGS can simulate the effects of project influence on fish production.

## Habitat Enhancement Approach

- Process-based actions aimed at improving hydrological and ecological connectivity between off-channel habitats and the mainstem Methow River.
- Increasing quality, extent, and complexity of juvenile rearing habitat through additions of large wood.

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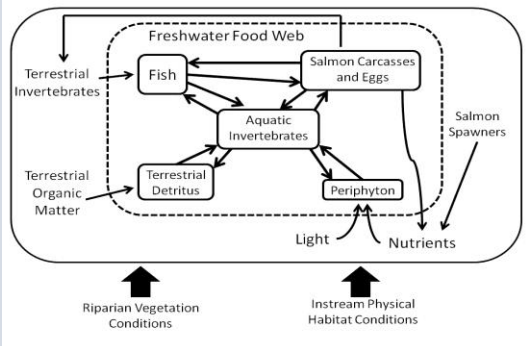


## Habitat Enhancement Accomplishments

**Whitefish Island:** 0.3 miles treated with 26 LWD structures and a 270' long log crib habitat structure in 2012. Project created nine perennial pools and reconnected a 1700' long side channel.

**River Rock:** Enhanced habitat along 0.5 miles of mainstem in 2014. The project built three main channel LWD habitat structures, and improved the connection and habitat complexity within 2.7 acres of wetland and backwater alcove habitat.

**WDFW Floodplain:** Enhanced habitat along 0.7 miles of mainstem in 2013. Removed 0.2 miles of levee to reconnect 38 acres of floodplain, built 24 LWD habitat structures, removed remnants of an abandoned irrigation dam, and constructed two culverts to reconnect a nine acre wetland to the mainstem. Planted 6.6 acres of floodplain to reestablish native riparian vegetation.



## Results to Date

- Year one of post-treatment fish monitoring shows a significant increase in target species abundance at Whitefish Island side channel.
- Very high growth, but low survival, for target species in disconnected side channels.
- Methow mainstem and side channels appear to have enough food to support greater salmonid populations, but productivity is nonetheless low.
- Potential causes of low production are food competition with resident species, loss of floodplain inundation, and lack of cover.
- ATP model runs to support restoration alternative development in Middle Methow.

## Future Directions

- The full BACI analysis will be completed in spring 2018 after post-treatment monitoring.
- Examine relationships between food availability and contribution to salmonid growth rates.
- Radio tracking of juvenile fish movement in Methow River and tributaries.
- Refinement of integration between RM&E efforts and restoration project design and adaptive management.