Lower Columbia IMW – 2020 Accomplishment Report

Overview

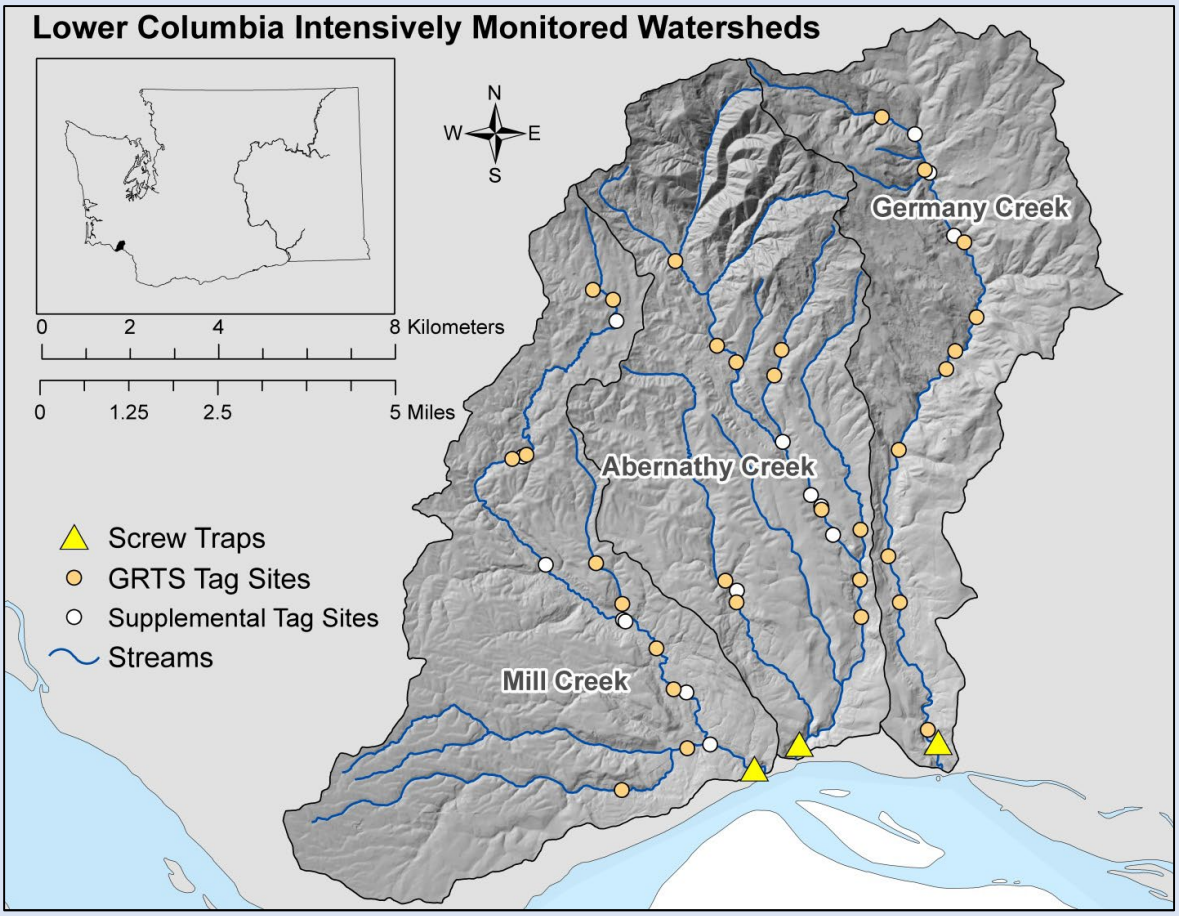
Focal Species: coho and fall Chinook salmon, steelhead trout
Limiting Factors: watershed processes have been impacted by historical land use that has disrupted sediment transport processes and disconnected the riparian and instream ecosystems (channel complexity, connectivity between instream channels and off-channel areas, and habitat accessibility)
Restoration Strategy: restore sediment transport processes, complete projects in contiguous reaches rather than separate segments of stream channel, combine fish passage and instream treatment in major tributaries of Abernathy Creek, and plan for adaptive management based on post-treatment monitoring results.

Experimental Design

Objectives: Do habitat restoration actions result in measurable increases in freshwater survival, diversity, and production of salmon and steelhead?

Reference Stream: Mill Creek (75 km^2 watershed)

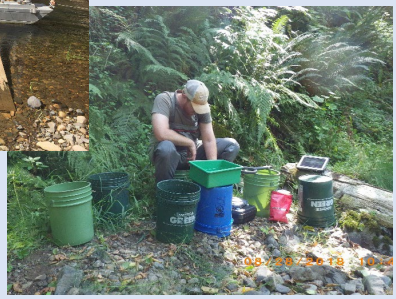
Treatment Streams: Abernathy Creek (75 km^2) and Germany Creek (59 km^2). The majority of restoration actions have occurred in Abernathy Creek, focused on instream habitat treatments such as large wood structures. In Germany Creek, projects have focused on both nutrient enhancement and instream habitat complexity.



The Lower Columbia IMW, including smolt screw trap locations and summer fish and habitat sampling sites. Sample sites are spatially distributed throughout the watersheds (GRTS and supplemental Tag sites). Map by Washington Department of Fish and Wildlife (WDFW).

Monitoring Approach

Salmon and Steelhead: PIT-tagged coho and steelhead summer parr are captured and monitored to estimate seasonal abundance, density, growth, and survival; smolt production and outmigration and spawn timing are monitored for all three species with screw traps and spawner surveys.
Habitat: Flow and water quality is measured daily at stream mouth gages and summer low flow instream habitat conditions (substrate size, large wood, etc.) are measured at random, spatially distributed sites throughout the watershed.



Photos courtesy of WDFW

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Restoration Accomplishments

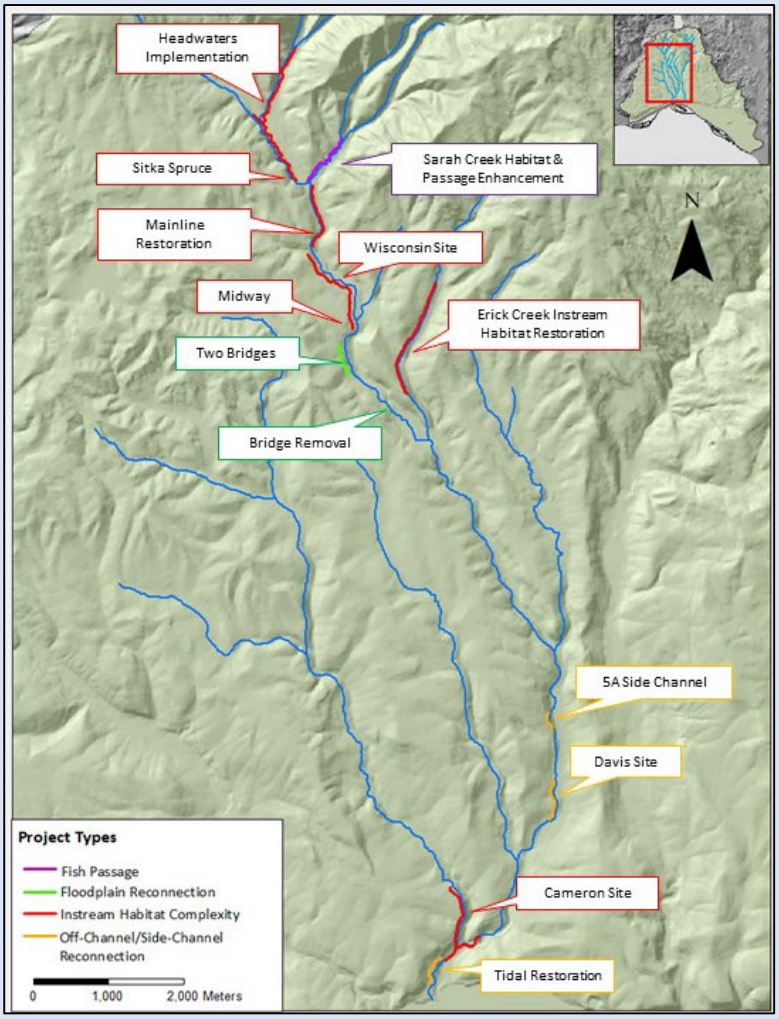
Abernathy Creek:

- 12 of 14 projects constructed through 2020
- 11.8 km of stream length treated (27% of habitat)
- 1.3 km of off-channel and side-channel habitat treated, 0.19 km^2 of riparian area, and 2.7 km of improved fish passage

Germany Creek:

- 3 of 5 projects constructed through 2020
- 5.9 km of stream length treated
- 0.5 km of side-channel and off-channel habitat treated and 0.2 km^2 of riparian habitat

Time series of smolt abundance in Mill, Abernathy, and Germany creeks, 2001-2020. Data are the best available annual estimates and 95% confidence intervals. Horizontal line is the geometric mean.



Habitat treatment projects in Abernathy Creek. Lines represent approximate treatment location. Line color indicates the primary treatment type for each project.

Fish Population Responses

- Habitat is limiting freshwater productivity in summer and winter across all three watersheds
- Since 2012, coho parr survival has increased in treatment watersheds and smolt abundance has increased in Abernathy Cr.
- Chinook fry outmigrants are the most common life history type
- Nutrient treatments in spring provided a short-term response in productivity for coho, Chinook, and steelhead.

Sarah Creek Habitat & Passage Enhancement

Baseline Monitoring and Treatment Plan (2004 – 2011/2012)	Project Implementation and Treatment (2011 – 2022)	Post-Project Monitoring (10 – 15 years)

Future Directions

The remaining projects are expected to be completed by 2022 and result in continued measurable coho population responses in Abernathy Creek. Analysis of temporal trends in summer rearing habitat metrics is ongoing.

Key partners: Columbia Land Trust, Cowlitz Conservation District, Cowlitz County, Cowlitz Indian Tribe, Lower Columbia Fish Enhancement Group, Washington Department of Ecology, Department of Natural Resources, WDFW, and Weyerhaeuser Company