Hood Canal Complex IMW – Accomplishment Report

Hood Canal Complex Intensively Monitored Watershed Overview

Focal Species: Coho salmon (summer chum and steelhead also expected to benefit)
Limiting factors: Lack of LWD; lack of hydrologic connectivity; fish passage barriers; altered sediment processes; riparian degradation
Restoration strategy: First restore connectivity, then restore complexity.

Experimental Design

Before-After-Control-Impact (BACI) design. BACI assumes treatment and reference.

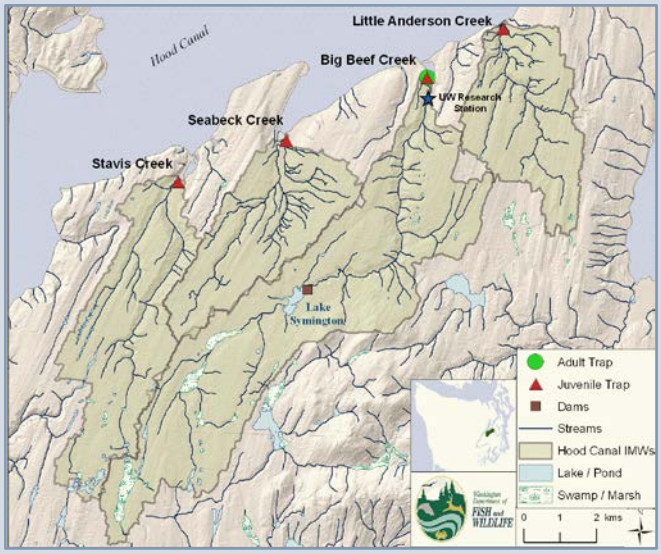
Reference stream with no restoration:

Stavis Creek

Treatment streams:

Seabeck Creek
Big Beef Creek
Little Anderson Creek

Conditions are dynamic but correlated. Monitoring ongoing since 2003, with restoration treatments occurring sporadically as funding is awarded on a treatment-by-treatment basis.



Monitoring Approach

Salmon:

Redd surveys covering known spawning distribution biweekly in all watersheds. Annual abundance of Coho parr estimated via mark-recapture - capture juvenile Coho and mark with adipose fin clip at 10 index sites per stream, all downstream migrants captured and examined for fin clip before release. Marine survival and harvest rate - Big Beef only. Smolts tagged with coded wire tags (CWT) upon entry to marine environment. All returning adults captured at Big Beef fish weir August - January and identified (species, sex, CWT) before release upstream.

Habitat variables:

Habitat data pertinent to reach-scale change collected at 20 locations within each watershed including thalweg depth, width:depth ratio, percent spawning gravel, frequency of instream LWD, pool frequency, and mean wetted width.

Restoration Approach

- Process-based, with focus on habitat formation and maintenance, ecosystem function.
- Restoring watershed resiliency along with quantity and quality of habitat likely to produce measurable response in salmon populations.
- Restore connectivity: remove barriers and constraints to flows of water, sediment, and fish.
- Increase complexity: restore stream roughness elements (LWD) and processes that will lead to future wood recruitment (riparian restoration and protection).

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Restoration Accomplishments

Big Beef:

1.0 miles of stream treated with 25 LWD structures in 2015-16; 11.4 acres of floodplain reconnected in 2016; 9500 cubic yards of imported fill removed from historic wetlands and floodplain in 2016; 15 LWD structures installed in restored wetland and floodplain area in 2016.

Little Anderson:

1.5 miles of stream treated with 10 LWD structures in 2009; 0.1 miles of tributary treated with 15 hand-built log jams in 2015; 1.0 miles of stream treated with 14 LWD structures in 2016; conceptual design for culvert replacement to reconnect headwater wetlands completed in 2015.

Seabeck Creek:

Design underway to replace partial barrier culvert near mouth and high priority LWD installation.

Fish Population Responses

- Smolt production in Little Anderson saw a significant increase following barrier culvert replacement near mouth in 2002.
- No significant change in Little Anderson following LWD treatment in 2009.

Habitat/Riparian Responses

- To date, no consistent, directional change in habitat measured at the watershed scale.
- Patterns of interannual variability reflected across watersheds.
- Recent treatments in Big Beef and Little Anderson completed in 2016 predicted to produce measurable habitat response over time.

Future Direction

- Project scale habitat analyses planned in Big Beef and Little Anderson Creeks to detect changes that occur directly within restoration treatment area.
- Description of habitat attributes that change rapidly in response to floods, and how restoration treatments interact with extreme flows and other disturbance events.
- Additional phase of LWD installation further upstream in Big Beef Creek planned in 2017, and several restoration treatments remain to be applied.
- Significant restoration in Big Beef including LWD installation and floodplain reconnection was completed in 2015-16; significant response expected in the coming years, especially once floodplain reaches new equilibrium.
- Another LWD treatment in Little Anderson was completed in summer 2016, greatly increasing the amount of woody material interacting with the stream bed. Response expected in the next one or two generations (3 - 6 years for Coho).