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Salmonid early response to restored freshwater floodplain

Erin Morgan  
*Wetland Ecosystem Team, emorgan2@uw.edu*

Jeff Cordell  
*University of Washington*

Lauren Rich  
*Upper Skagit Indian Tribe of Washington*

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Morgan, Erin; Cordell, Jeff; and Rich, Lauren, "Salmonid early response to restored freshwater floodplain" (2014). *Salish Sea Ecosystem Conference*. 141.  
Salmonid Early Response to a Restored Freshwater Floodplain
GOAL: Reconnect wetland & floodplain to enhance salmonid spawning/rearing & increase production

How do off-channel habitats benefit salmon?

Denser prey resources = enhanced growth

Questions & Criteria

FOCUS: Evaluate function of main channel, wetland, and floodplain habitats w.r.t. rearing & foraging

1.) Evaluate prey resources
   (capacity to support production)
   - What is the quantity/composition across habitats?

2.) Evaluate fish density
   (opportunity to access capacity)
   - Can fish access restored capacity?
   - Is fish density related to prey resource availability?

3.) Evaluate diet composition & fish condition
   (realized function)
   - Is there a measurable physiological benefit (increased fitness) in any habitat?
Criteria 1: Prey resources

All reaches are similar in prey density and composition.
Criteria 2: Coho Density/ Abundance

Coho densities follow expected patterns across the project.

Coho can access floodplain & wetland capacity.
Criteria 3: Diet Composition/Fitness

Flies (Diptera), especially midge larvae, are dominant diet item.

Diet assemblage generally matches drift.

IR similar across sites/habitats.

No evidence of prey subsidy in off-channel habitats.
## Discussion

### How is the restoration doing?

#### Hansen Creek vs. Other Studies

**Capacity:** Prey resources are similar across all sites

- *Channel drift:* avg. ~ 6x denser (Wipfli and Gregovich 2002)
- *Floodplain abundance:* ~30x higher (pilot)

**Opportunity:** Coho are using habitats as expected across the site

- *Coho density:* avg. ~ 6-10x denser (pools, summer) (Nielsen 1992)

**Realized Function:** Diet composition as expected, no IR differences.

- *Diet composition:* dominated by midges, which other studies agree is most important diet item for coho fry (Higgs et al. 1995)
- *IR:* No difference between sites vs. significantly higher IR in FP
Conclusions & Recommendations

• Reference and restored sites are biologically similar after only 3 years.

• Prey resources may not be limiting coho salmon production.

• Floodplain habitat may still serve other important functions for salmon.

Where do we go from here?

• Changes in vegetation & hydrology will be ongoing...

• Monitor again in 5-10 years
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References


• Cloe, WW and GC Garman. 1996. The energetic importance of terrestrial arthropod inputs to three warm-water streams. *Freshwater Biology* 36: 105-114.


