May 1st, 10:30 AM - 12:00 PM

Salmonid early response to restored freshwater floodplain

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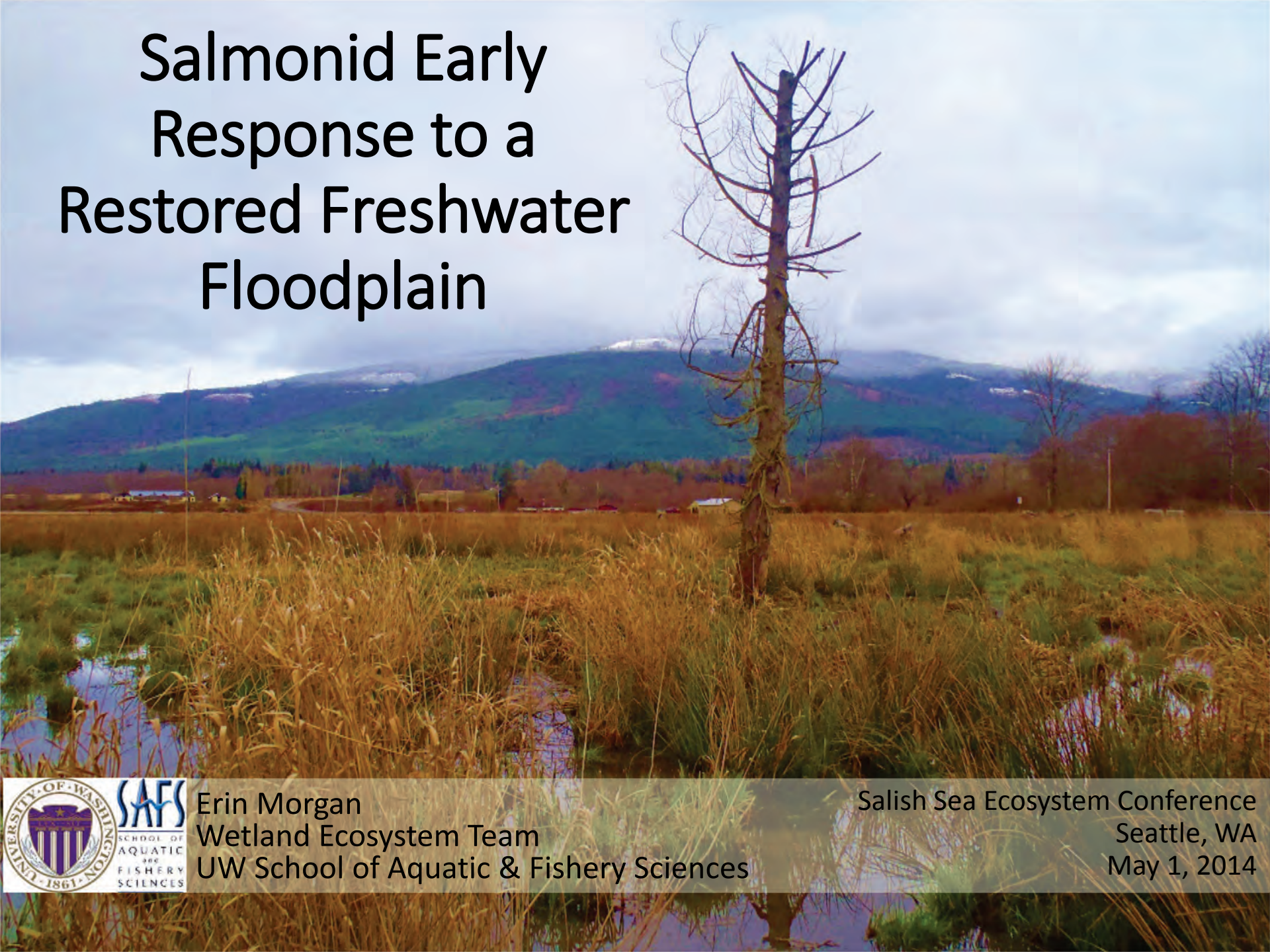
Salmonid Early Response to a Restored Freshwater Floodplain



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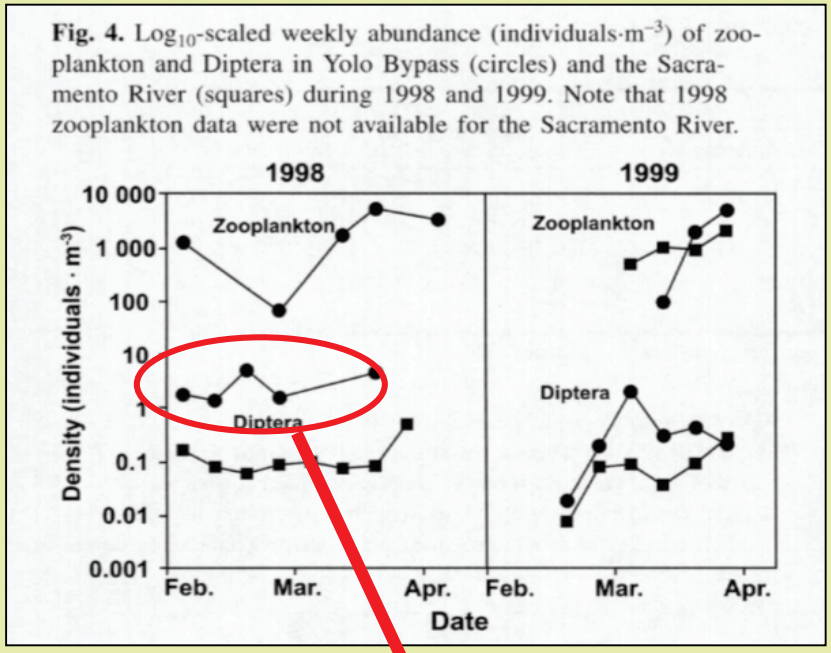
Seattle, WA
May 1, 2014

Introduction

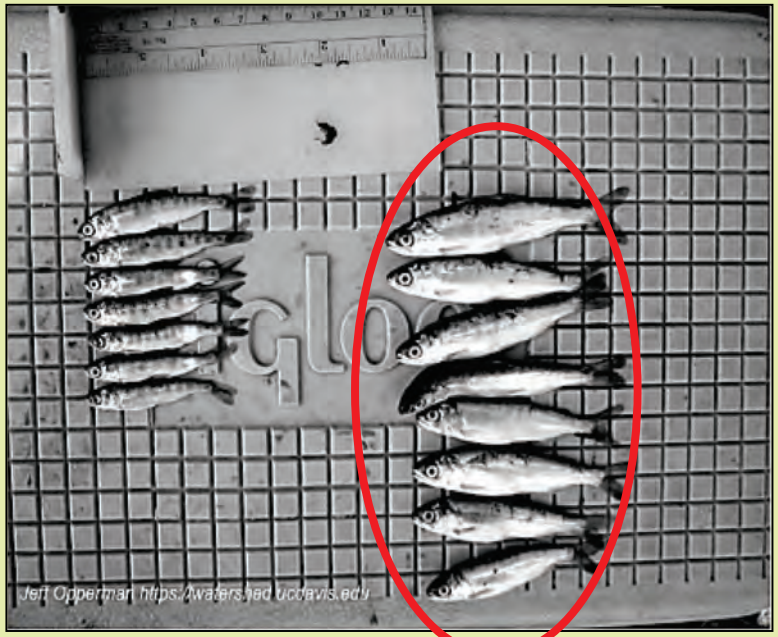
GOAL: Reconnect wetland & floodplain to enhance salmonid spawning/rearing & increase production

How do off-channel habitats benefit salmon?

Sommer et al. 2001, p. 330



Jeffres et al. 2008, p. 455
http://californiawaterblog.com/2011/06/02/frolicking-fat-floodplain-fish-feeding-furiously/



Denser prey resources = enhanced growth

Sommer et al. 2001, Jeffres et al. 2008, Limm & Marchetti 2009, Bellmore et al. 2012

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?

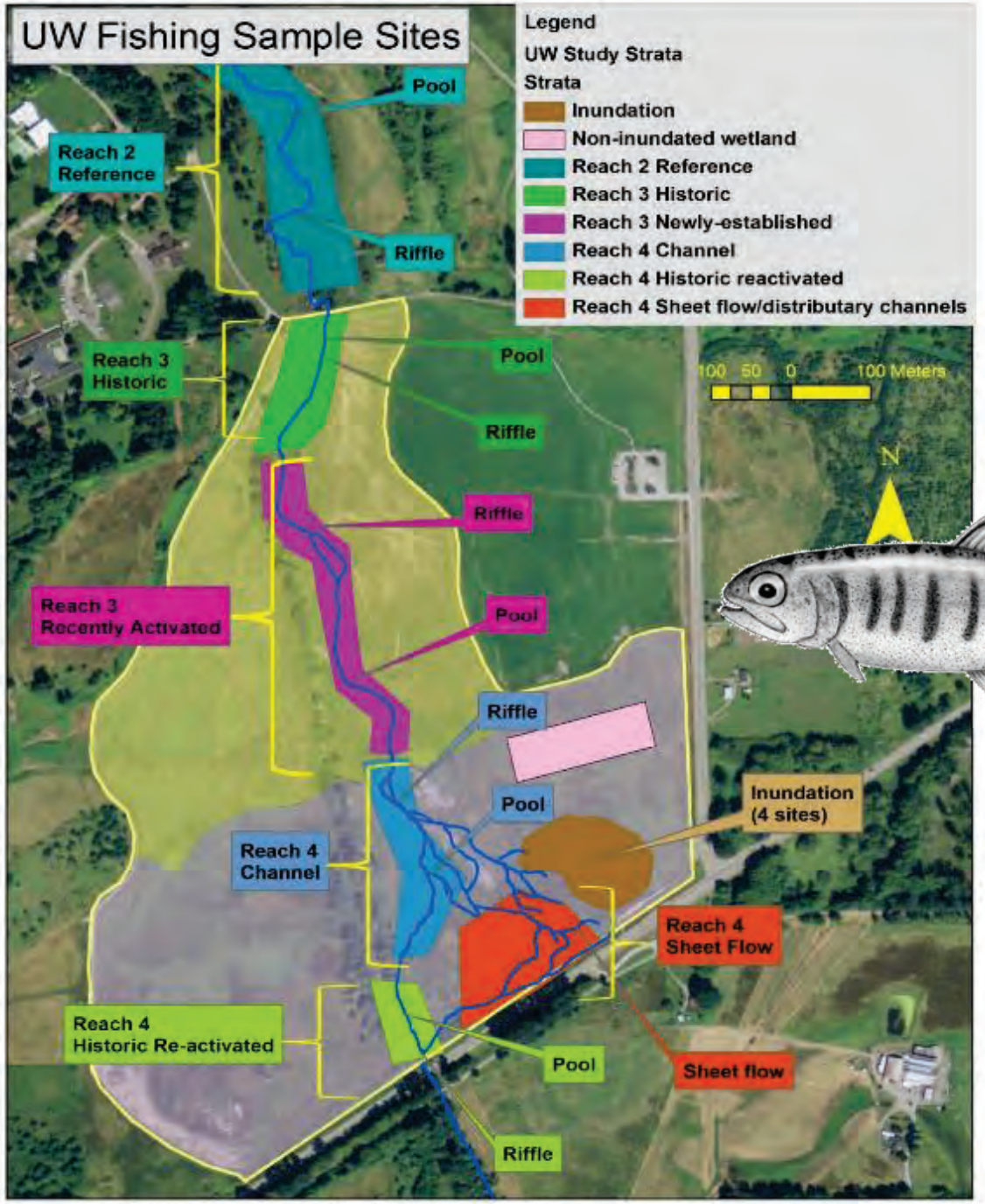
2.) Evaluate fish density

(opportunity to access capacity)

Can fish access restored capacity?
Is fish density related to prey resource availability?

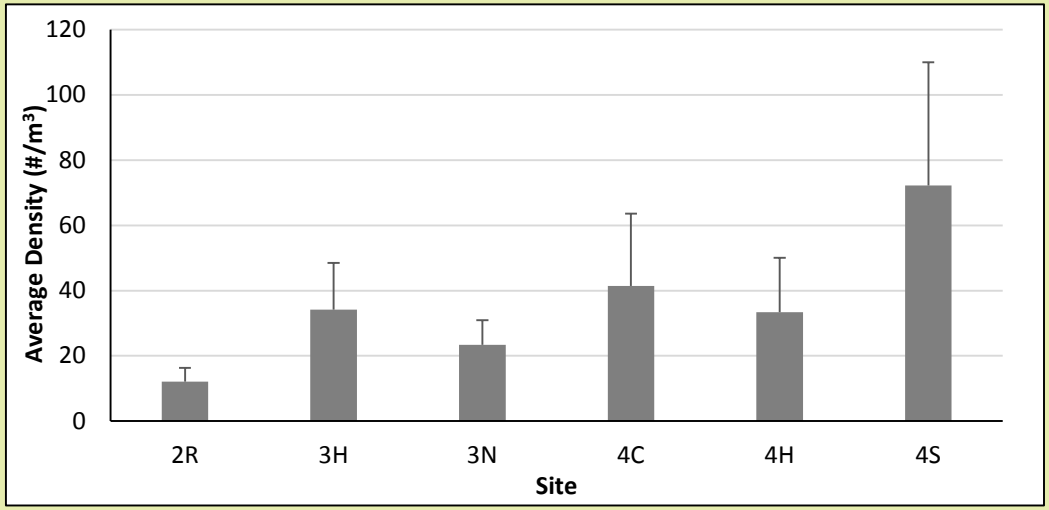
3.) Evaluate diet composition & fish condition (realized function)

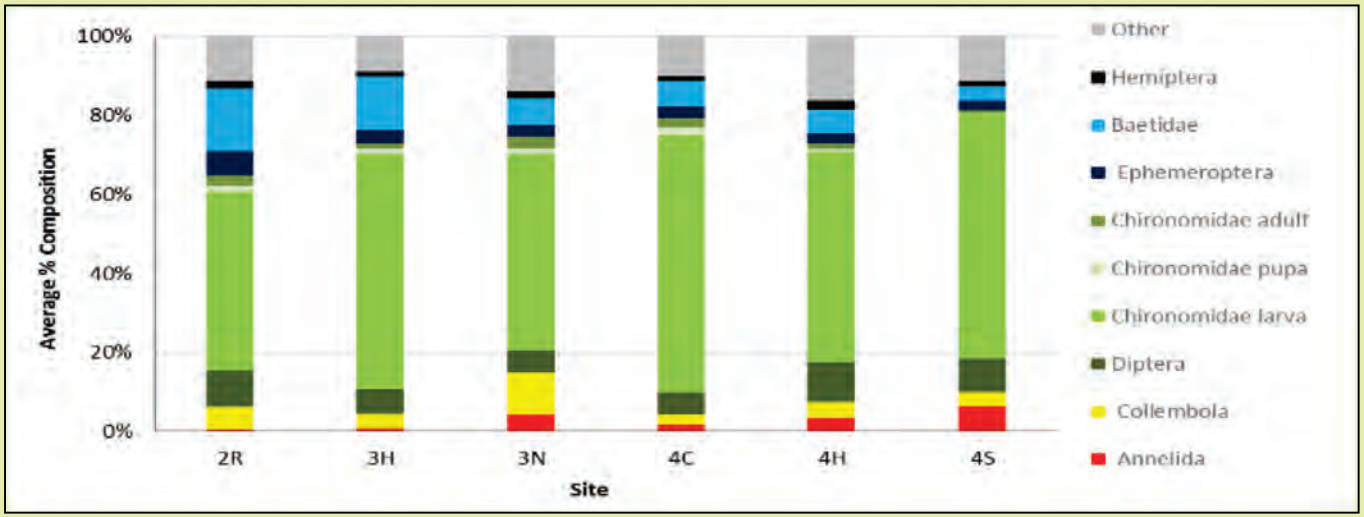
Is there a measureable physiological benefit (increased fitness) in any habitat?



http://lewseportfolio.wordpress.com/fry-parr-the-elective-courses/

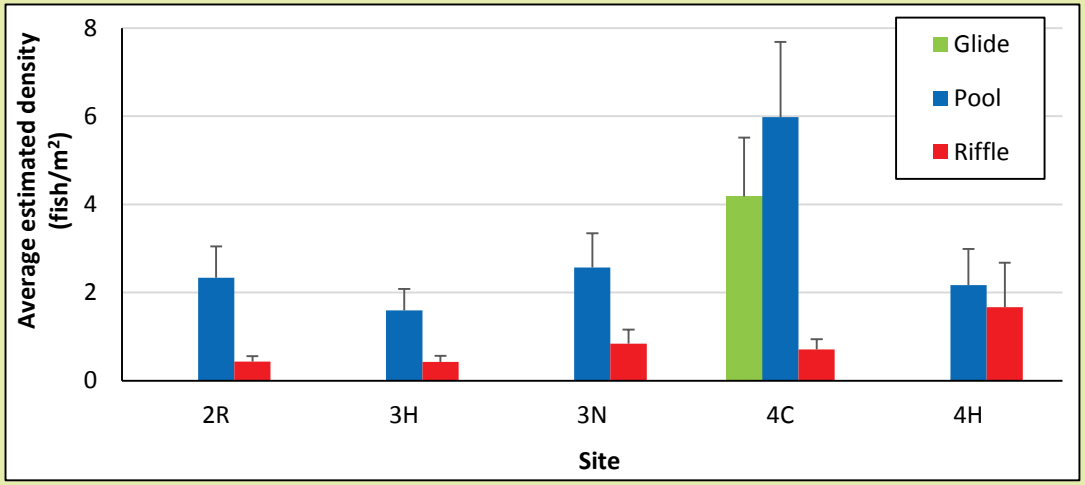
Criteria 1: Prey resources



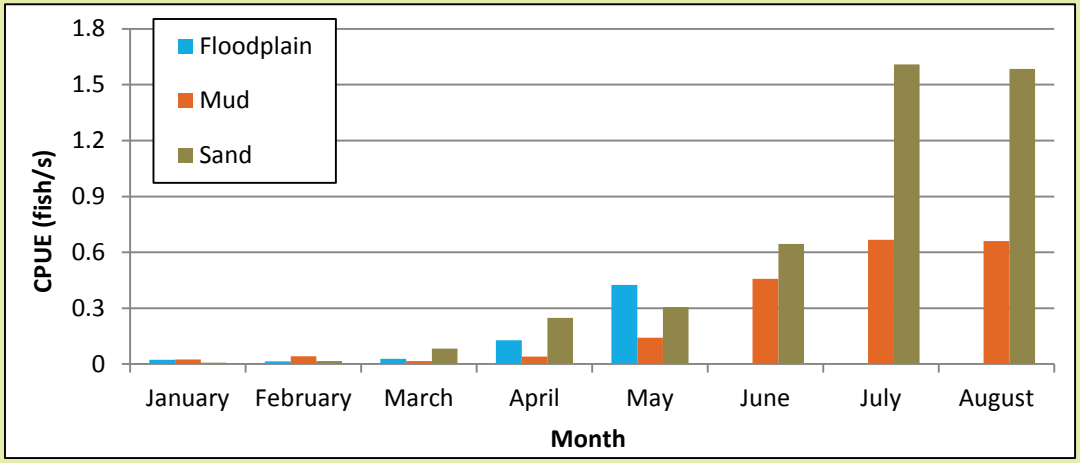


All reaches are similar in prey density and composition.

Criteria 2: Coho Density/ Abundance

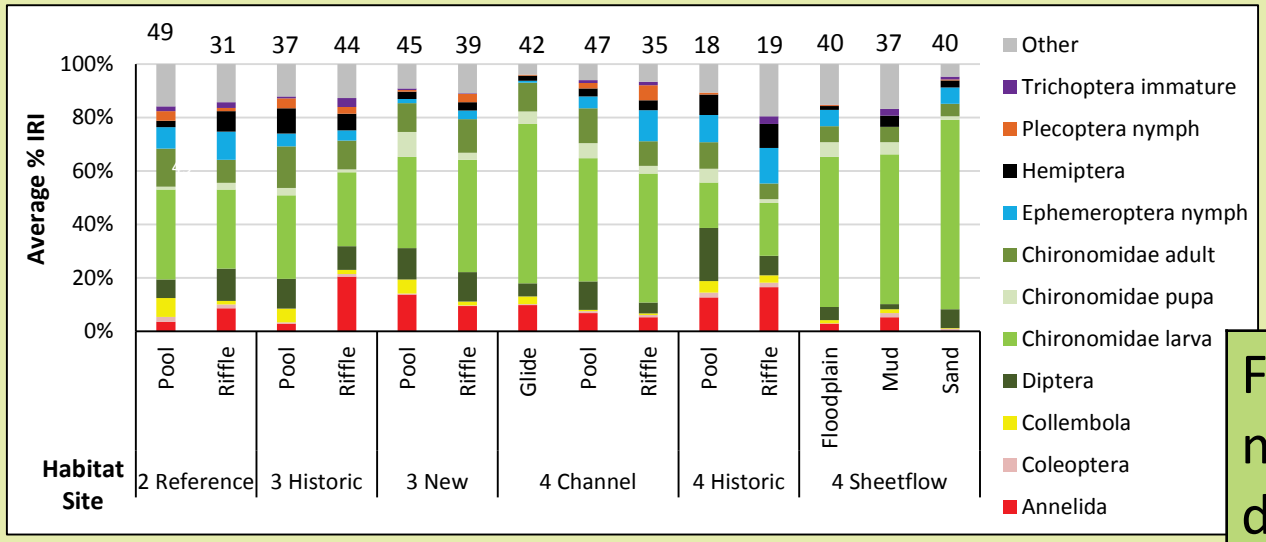


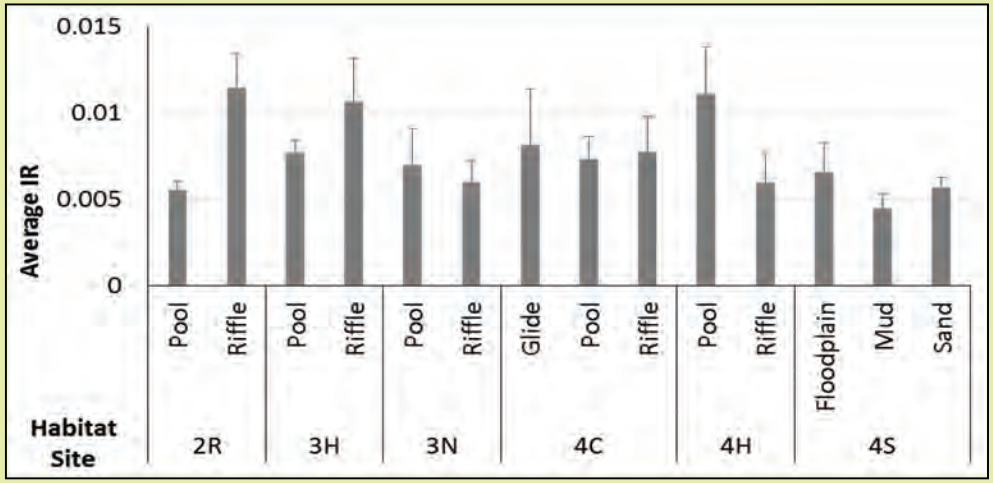
Coho densities follow expected patterns across the project.



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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Wetland Ecosystem Team

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