

Development of a salmonid validation monitoring program for Washington Department of Natural Resources on the Olympic Experimental State Forest.



OESF Riparian Validation Monitoring

Validation monitoring, used to evaluate **cause-and-effect relationships** between **habitat conditions** resulting from implementation of **conservation strategies** and the **salmonid** and northern spotted owl **populations** these strategies are intended to **benefit**. (HCP 1997)



What are we validating?

The “underlying hypothesis” or rather the conceptual basis for management in the OESF is that “It is possible to produce quality commercial timber and provide and protect ecological values in a managed forest by maintaining an arrangement of forest structure and stand diversity” (DNR 1997, p. IV.83).



2015 sampling of existing habitat sites



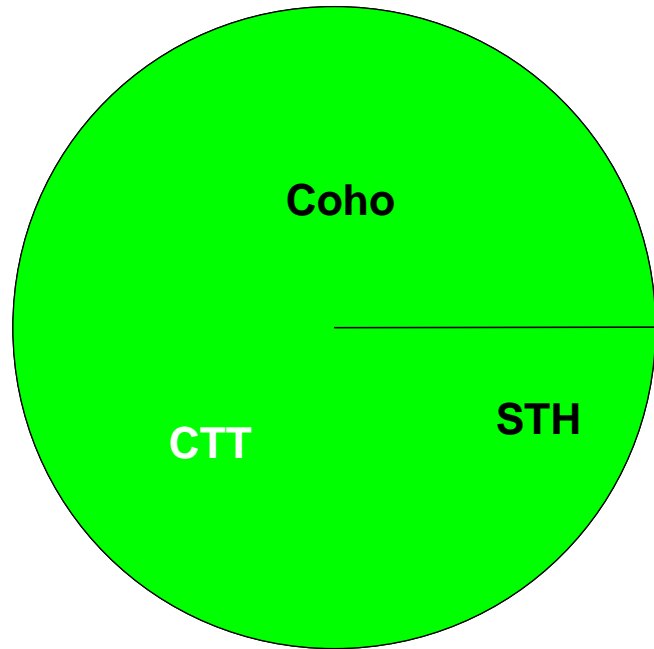
Backpack electrofishing

Crew: Kevin Alexander
Jason Michaud

Goal: 50 habitat monitoring sites
30 fish/site
up to 9 pool habitat units

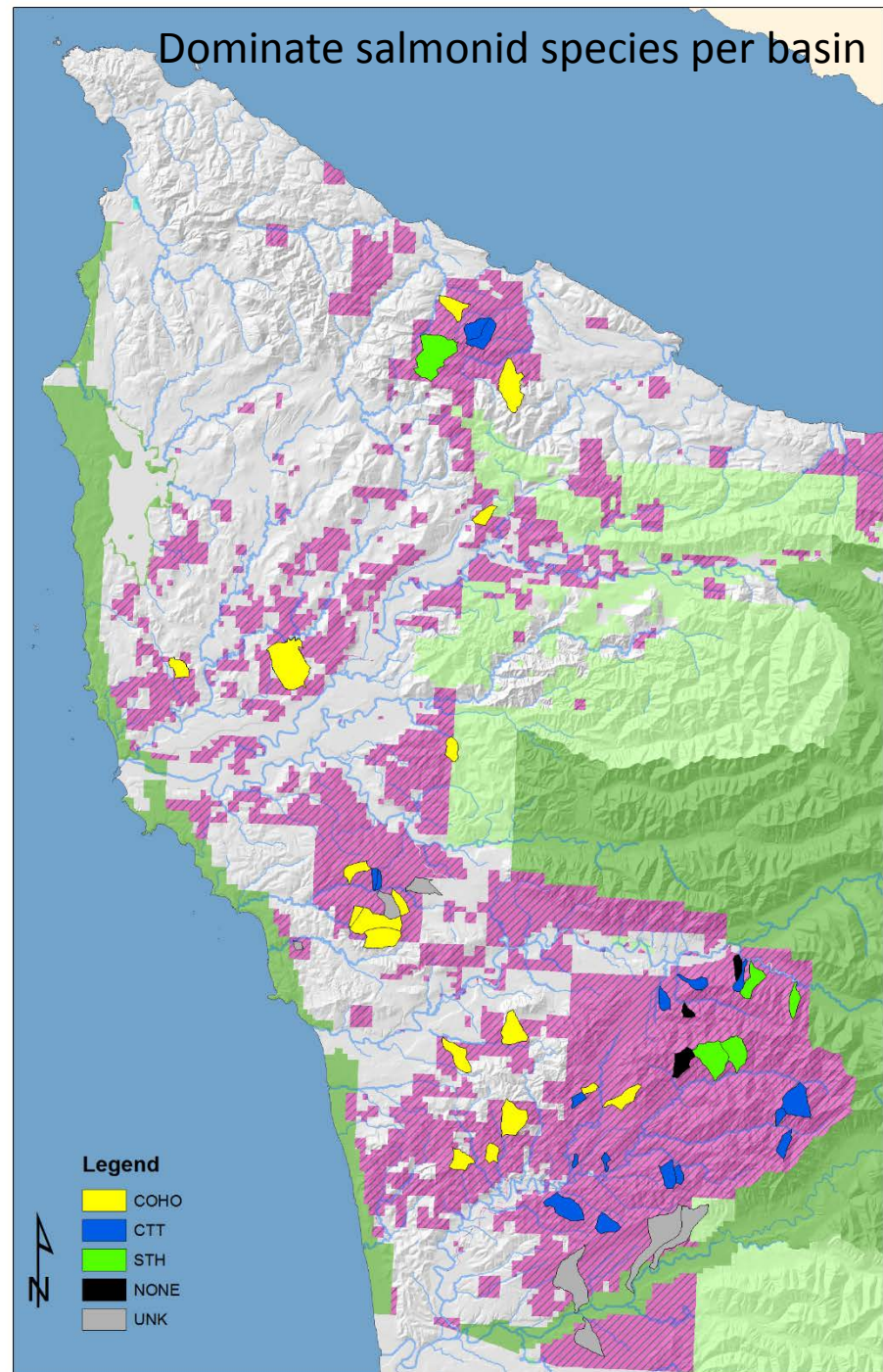


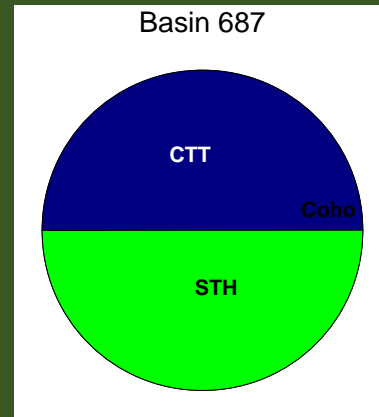
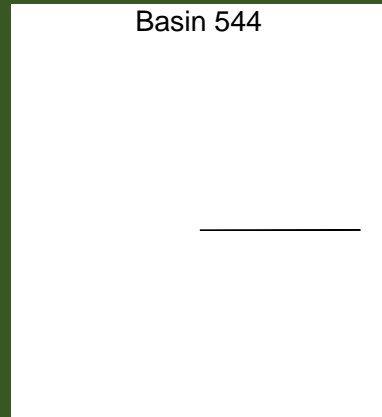
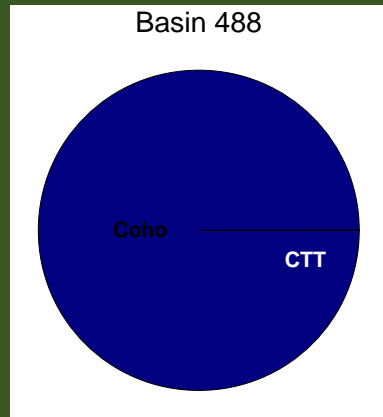
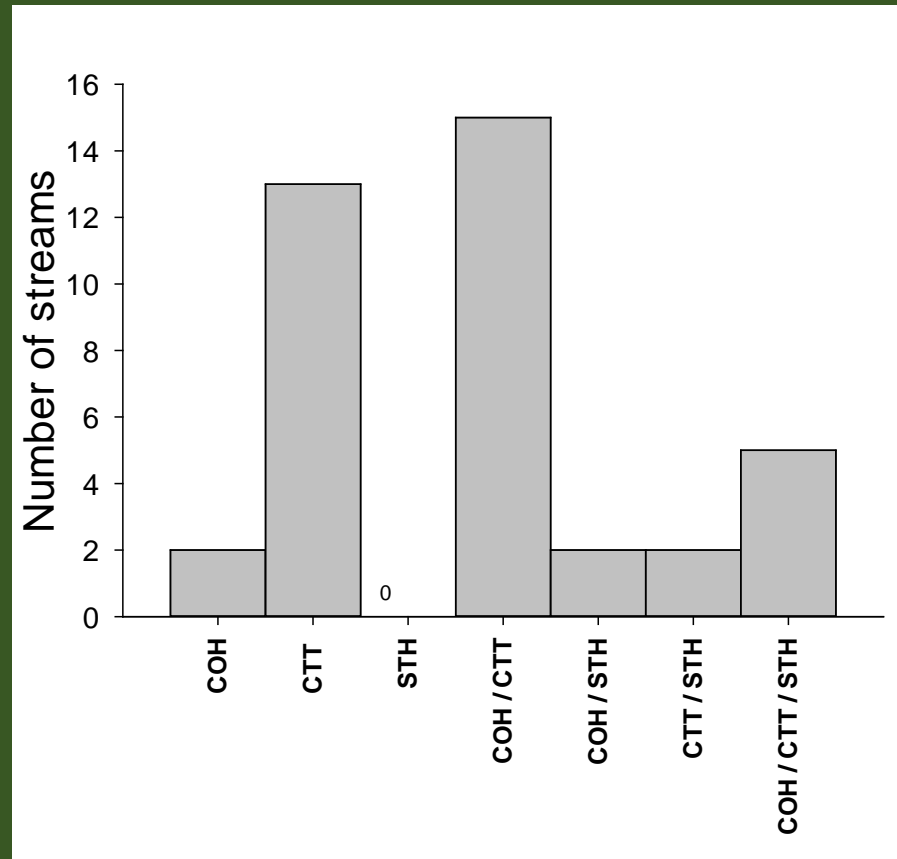
All Basins



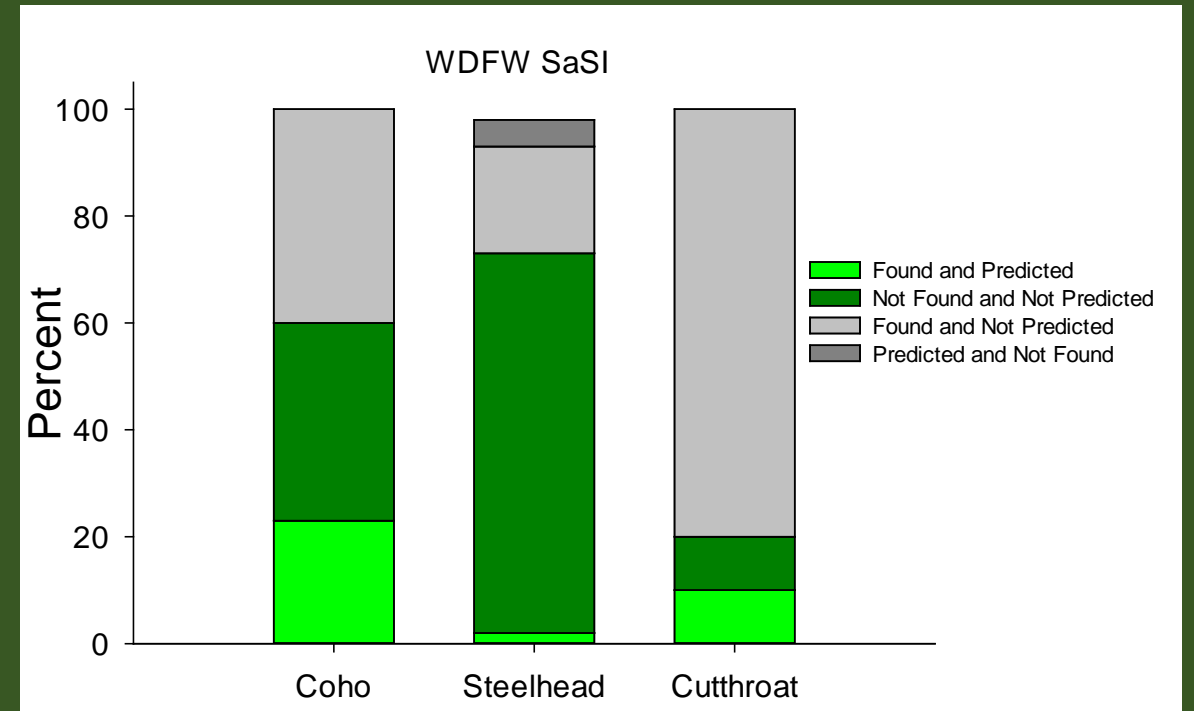
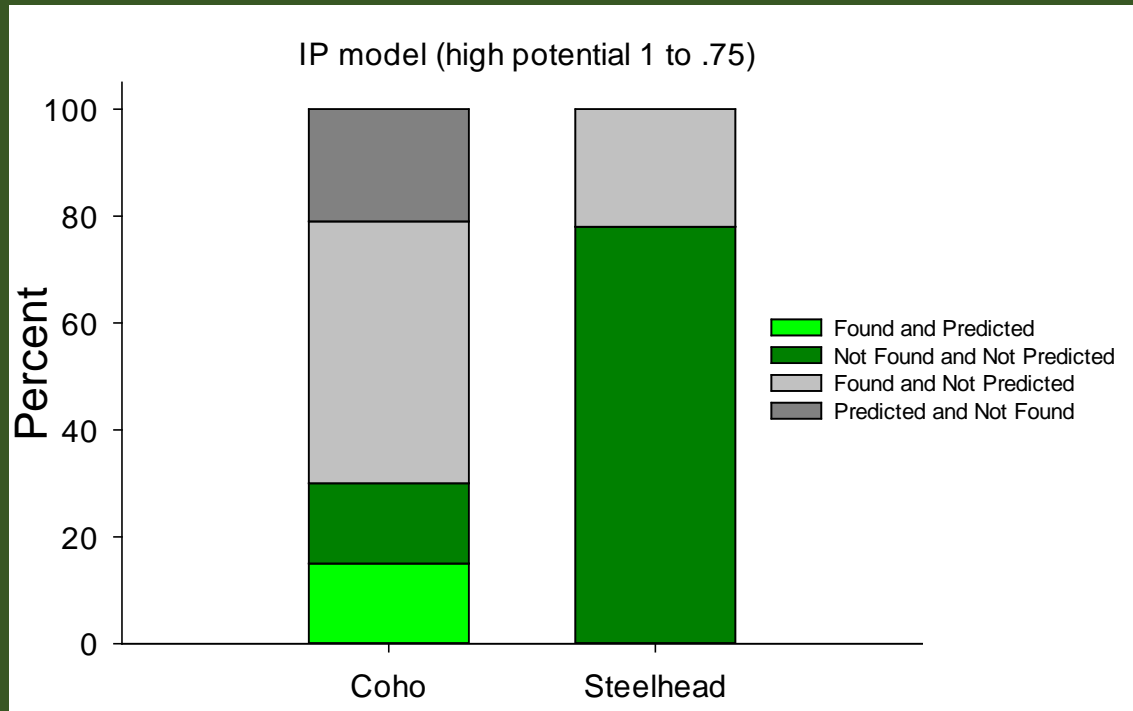
Species	% of basins
Cutthroat	82%
Coho	62%
Steelhead	23%

Dominate salmonid species per basin





Existing Knowledge?



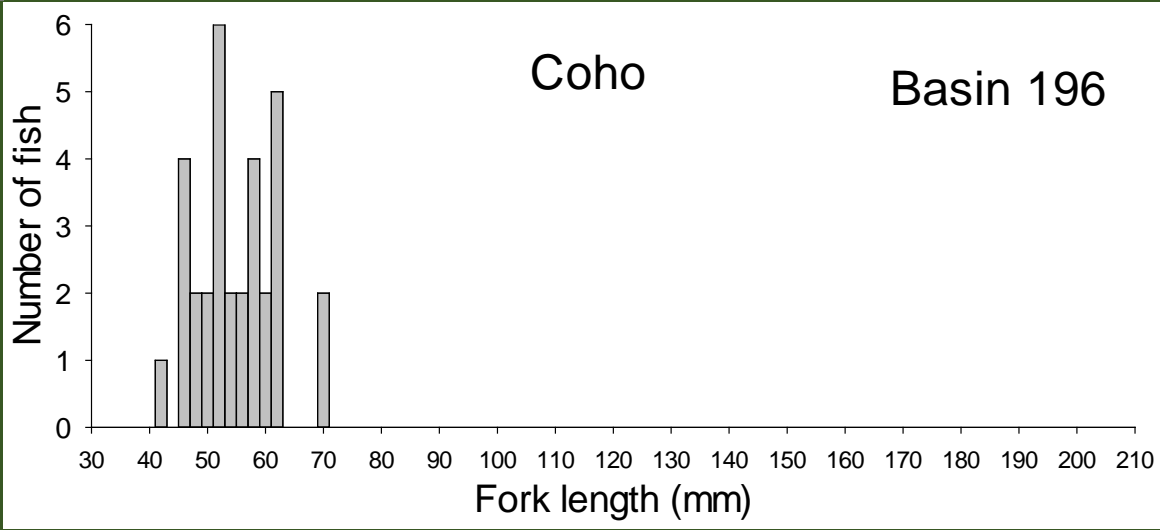
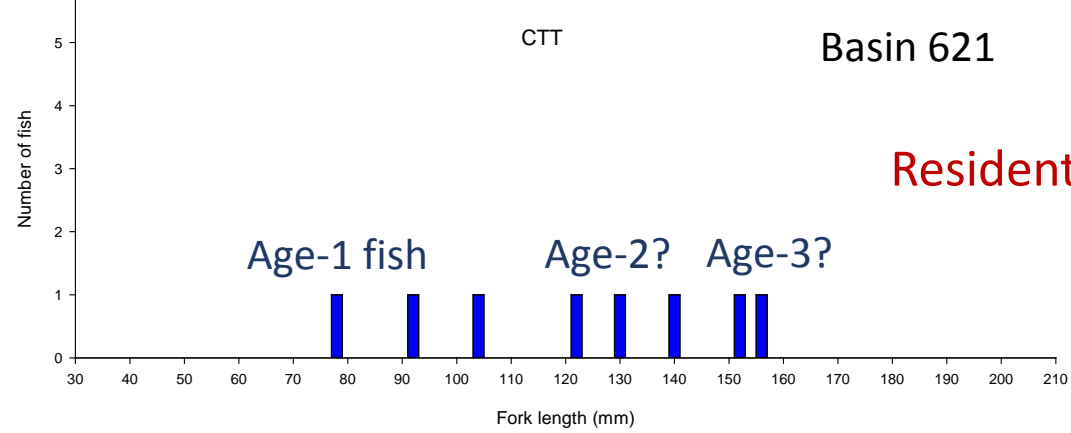
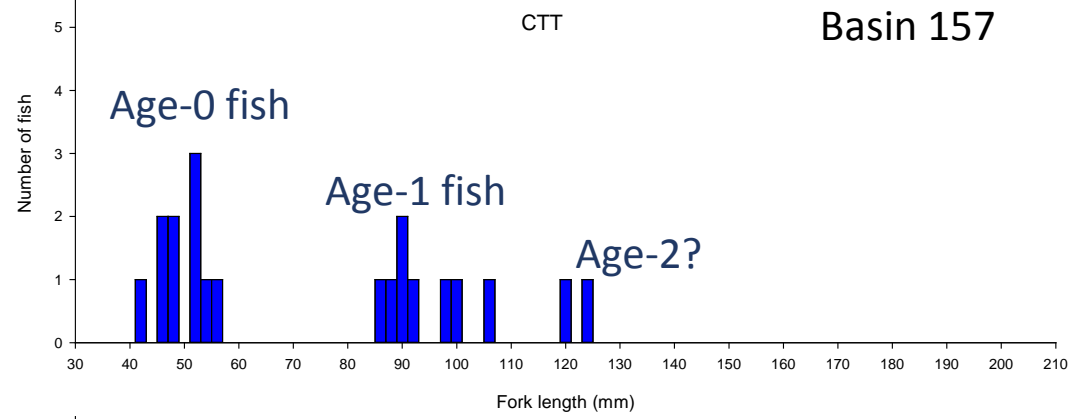
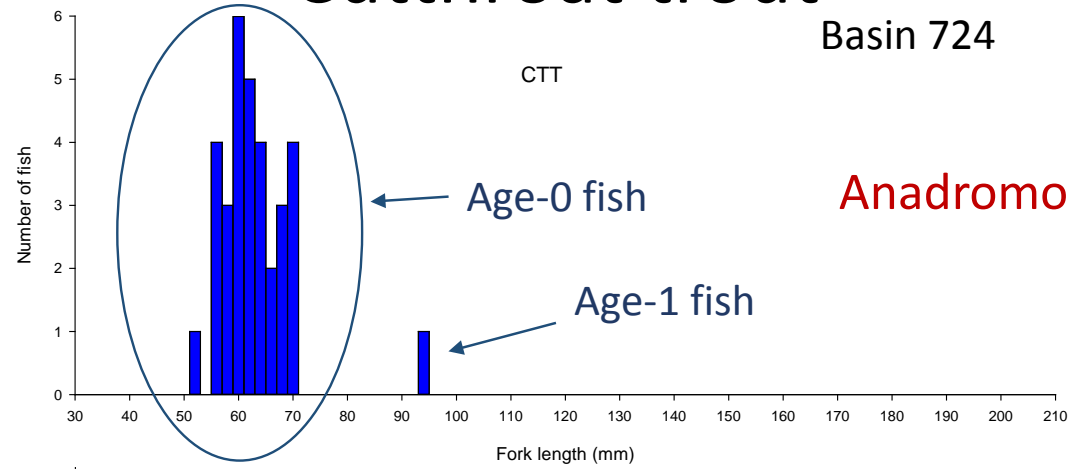


Photo from pacificrivers.org



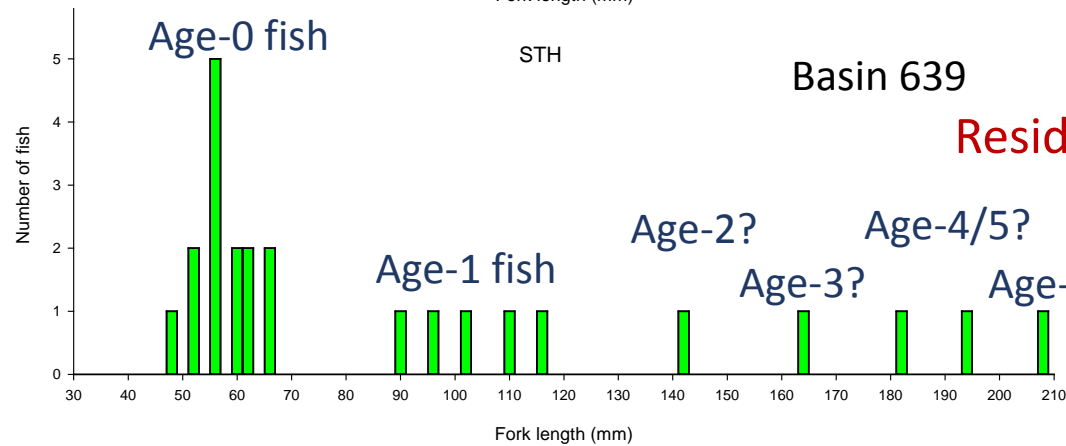
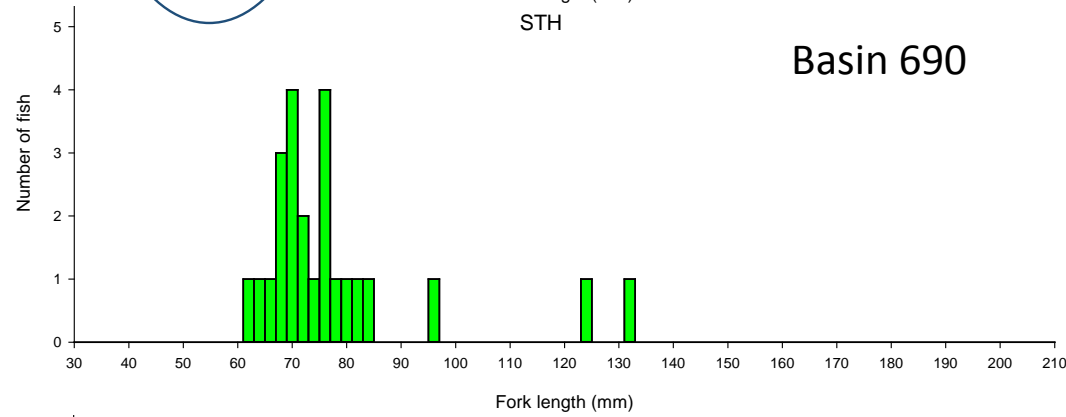
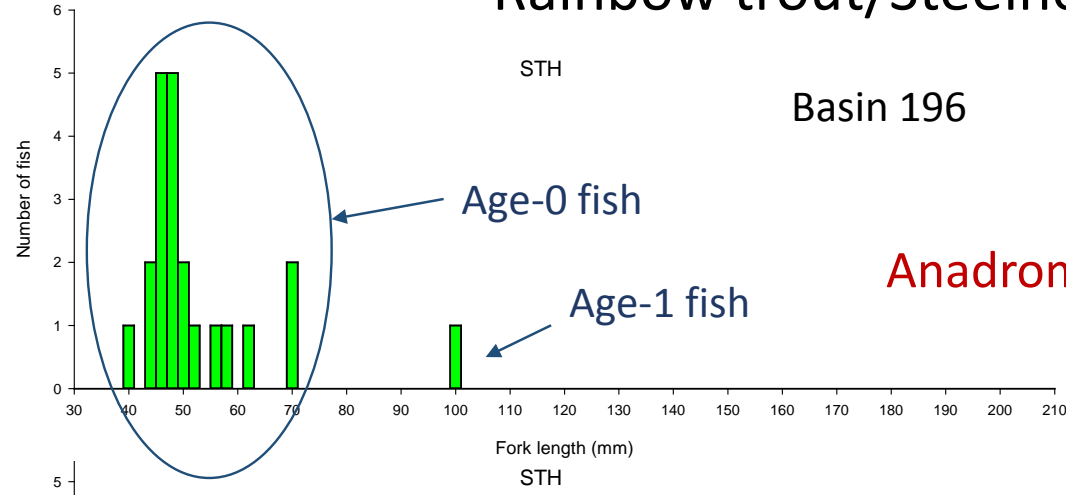


Cutthroat trout





Rainbow trout/Steelhead



Initial thoughts on monitoring

Study plan - (2016)



with a little help from our friends



Initial ideas for a sampling plan (starting in 2016)

- 50 existing habitat sites (20 annual and 30 rotating sites*)
- Evaluation of reach vs whole stream sampling (2016 and 2017)
- Snorkel surveys (Type -1 and Type-2 basins in the Clearwater)
- Redd surveys (fall)
- Winter sampling on 20 annual sites (if funded)
- PIT tagging in 20 annual sites (2,000-3,000 fish per year; if funded)

* Rotating panel to start after 2017 and 2018 testing.



Sampling design

50 sites

20 sites annually (starting 2016)

30 sites sampled on a rotating basin (starting 2018)
2 year (15 sites per year) or 3 year (10 sites per year)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Annual panel (20 sites)	x	x	x	x	x	x	x	x	x	x	x
2 year panel a (15 sites)			x		x		x		x		x
2 year panel b (15 sites)				x		x		x		x	
or											
3 year panel a (10 sites)			x			x			x		
3 year panel b (10 sites)				x			x			x	
3 year panel c (10 sites)					x			x			x



Juvenile salmonid sampling technique evaluation (2016 and 2017)

Higher precision or more coverage?

<u>Survey type</u>	<u>Survey Length</u>	<u>Precision</u>
Reach	20 BFW (at least 100m)	high
Continuous survey	fish bearing distribution of stream	low to med



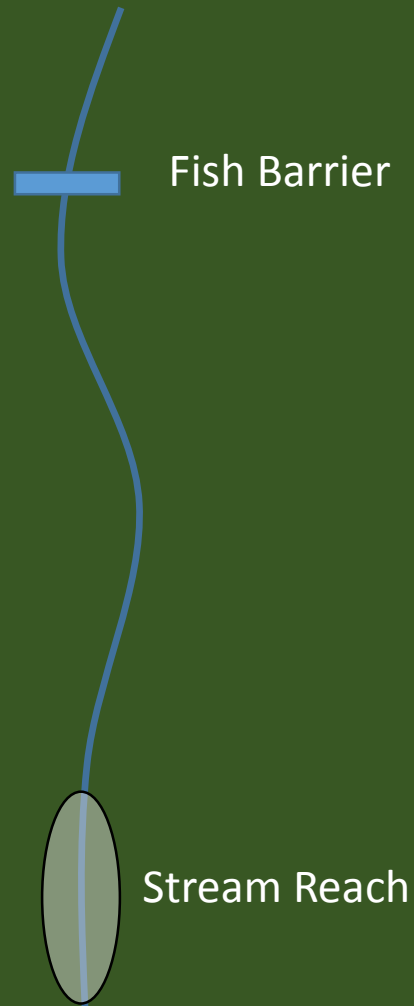
Higher precision or more coverage?

Why?

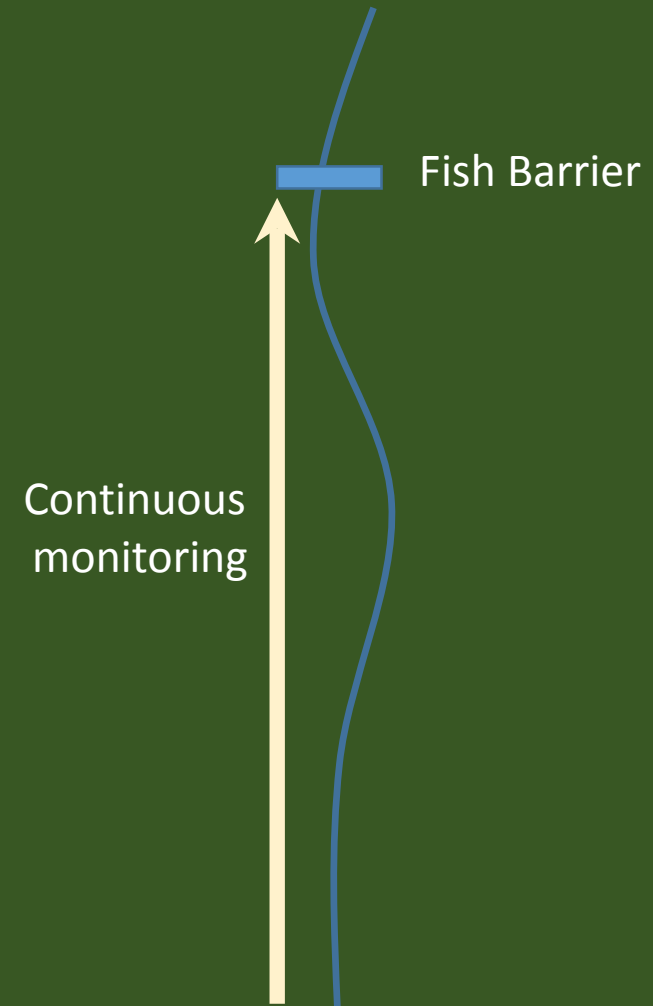
How well does habitat reach represent the fish bearing distribution in the basin?

Can reach scale monitoring be used to calibrate and improve the precision of continuous monitoring?

Reach level estimate



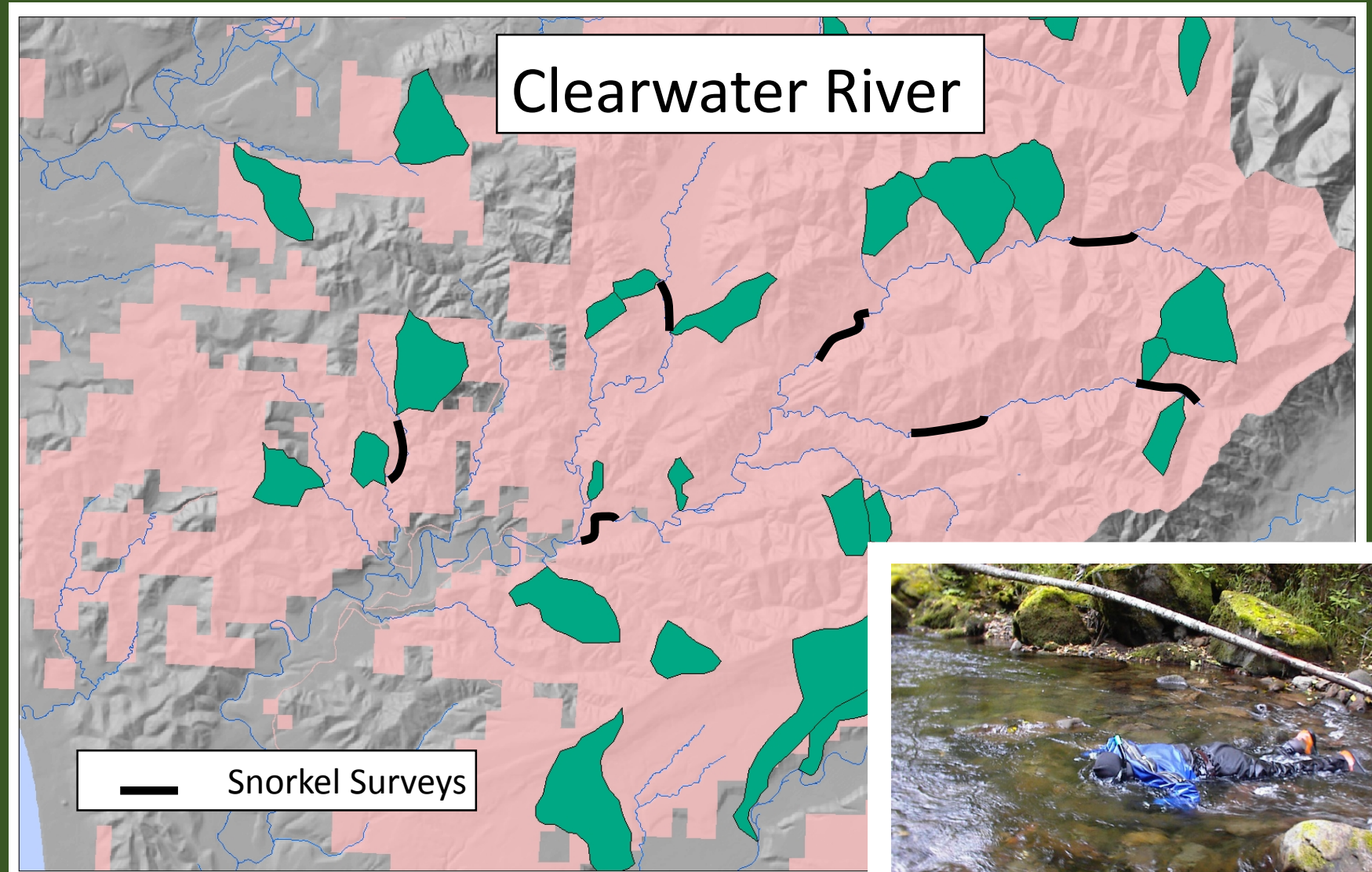
Continuous estimate



Larger stream sampling (DNR Type 1 and Type 2)

Snorkel surveys

- Clearwater River
- 1 week
- Species assemblage
- Fish use
- Index of population size
- Connection with type-3 basins

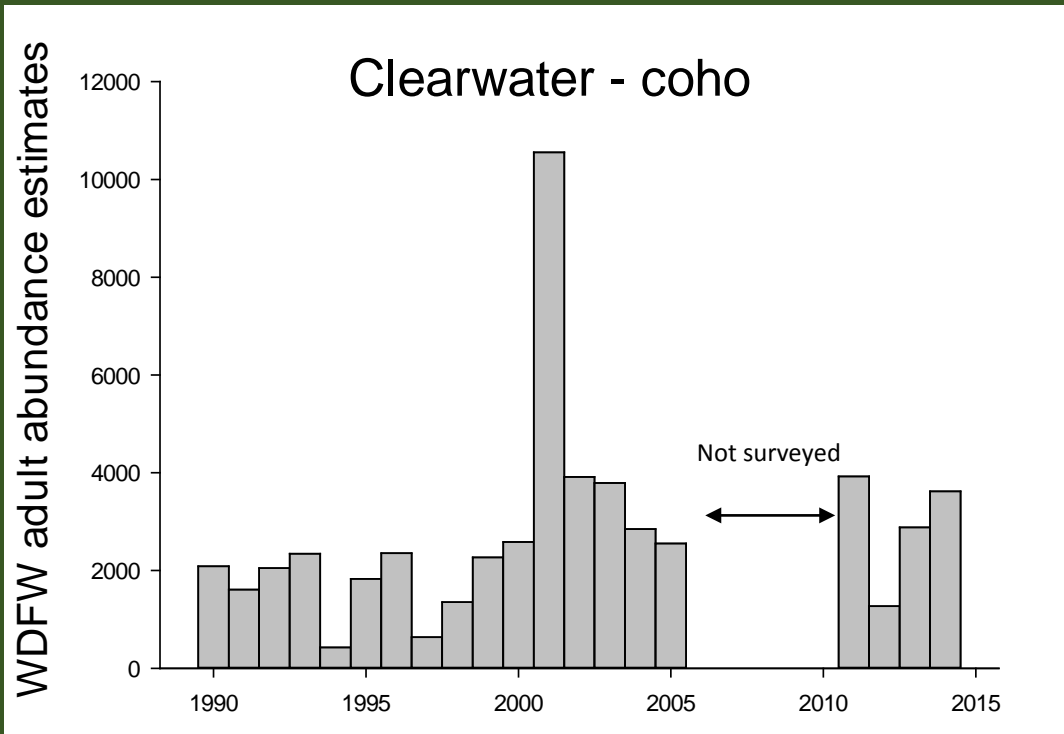


Adult Surveys

DNR redd surveys within 50 basins
Coho only (November to January)



WDFW abundance estimates
(Steelhead, Coho, and Chinook)



Adaptive management

Salmonids

