

Evaluation of a resistance board weir for capture of lower Columbia River fall Chinook salmon (*Oncorhynchus tshawytscha*) for transport during the year of Condit Dam removal.



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Capture Transport and Reintroduction Planning

- Sediment impacts of dam removal will affect year class of ESA-listed LCR fall Chinook.
- Key conservation measure proposed by PacifiCorp and FERC – mitigate for lost brood year of LCR fall Chinook salmon.
- Several studies and long term data sets suggested natural production in lower White Salmon River downstream of Condit Dam.
- Conducted capture and transport study in 2008.



2008-Capture, Transport and Reintroduction



- Seines most effective, gillnets less effective, White Salmon Ponds poor.
- Brood stock collection ponds not efficient without a weir.
- Some release site fidelity observed for fish released upstream of Condit Dam.
- Transported fish were successful at building redds and we observed a ratio of 2.7 females/redd in 2008.
- Several Recommendations....
 - In addition to seining, explore weir operation at White Salmon Ponds.

2009 Study Objectives

- Determine the feasibility of weir and ponds for capture of adult LCR fall Chinook salmon during year of removal
- Estimate overall escapement of LCR fall Chinook salmon to the weir
- Document fish passage using video technology
- Explore how the weir may impede or affect migrating salmonids*.



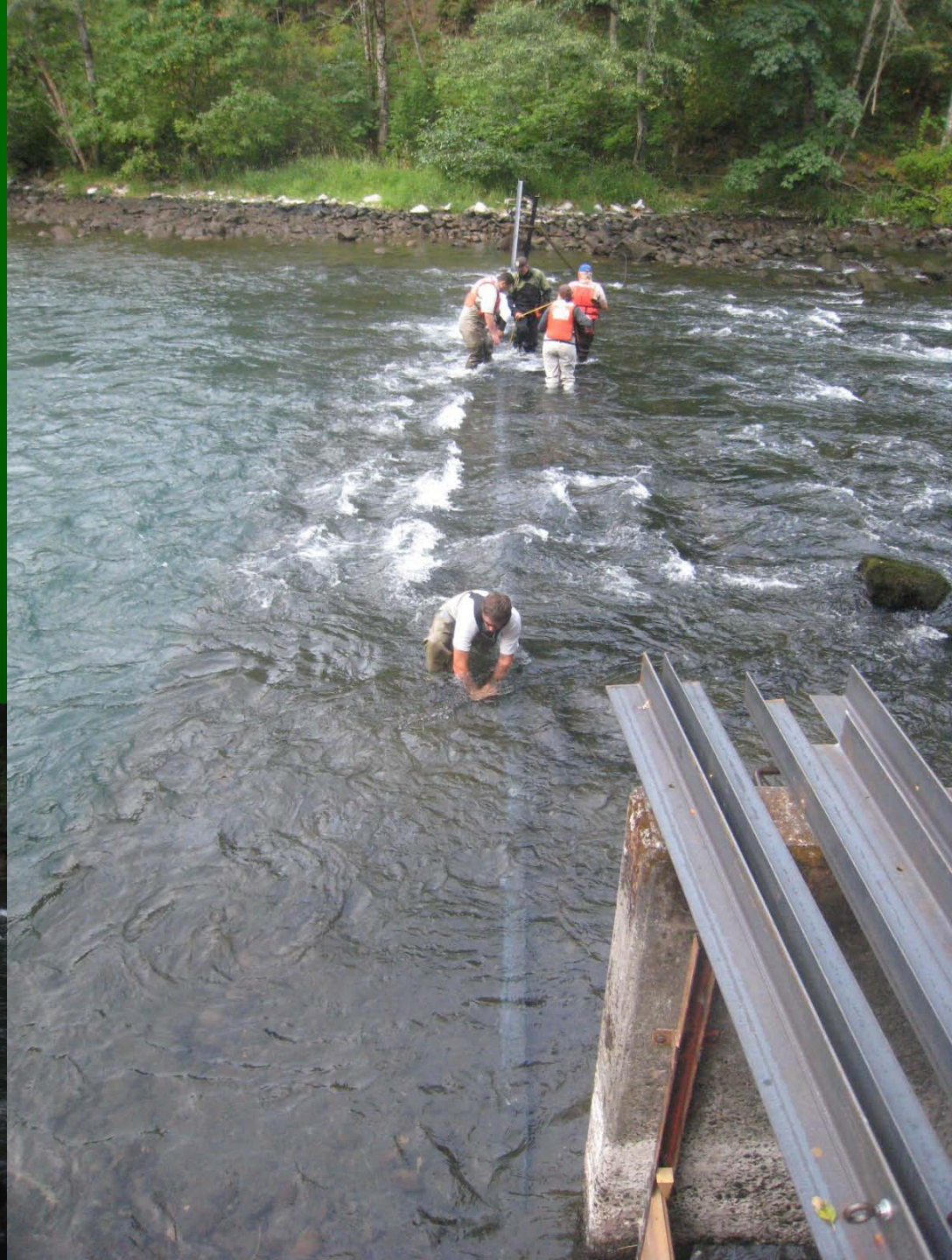
A photograph showing a wooden weir structure in a river. The weir is made of several parallel wooden beams supported by vertical posts. Two people are standing on the weir, one in the foreground and one further back. The water is turbulent and white with foam as it flows over the weir. The background is a dense green forest.

Methods

- Used historical Spring Creek NFH brood stock collection ponds

Methods

Installation of Resistance Board Weir



Methods

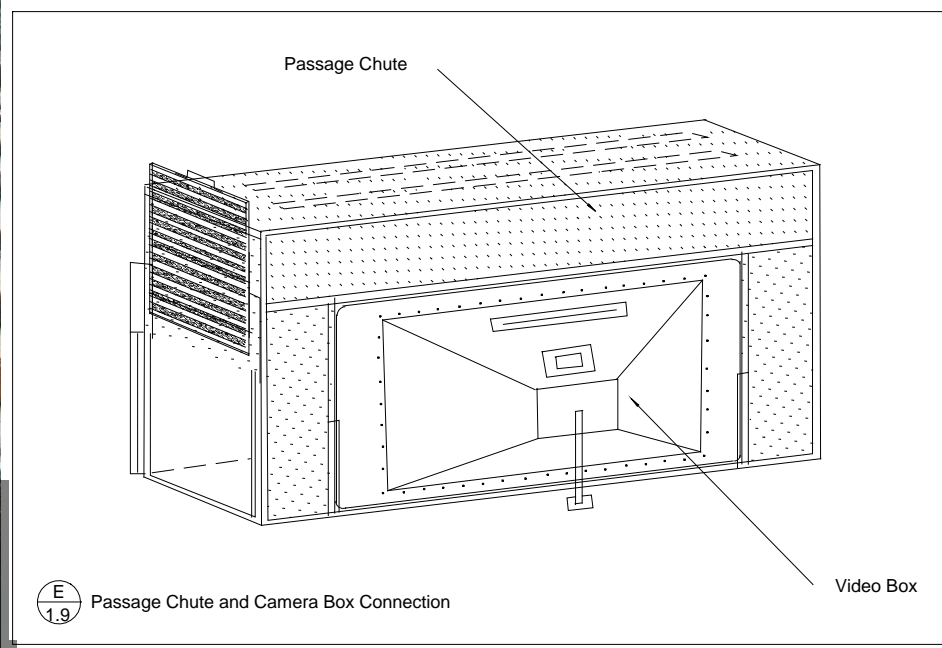
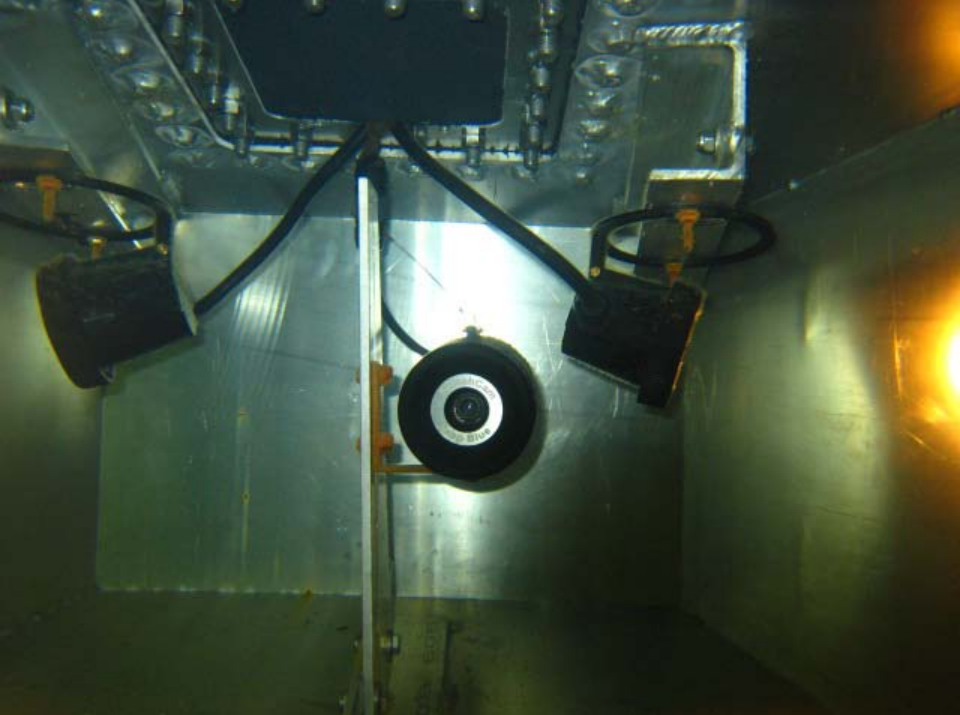
Installation of Resistance Board Weir



Methods

Pond Collection





Methods

- Video Passage

VPS and Ponds Operation

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Methods - Escapement Estimation

- Pond Captures – Two days a week x 5 weeks
- Video Passage System (VPS) – all other time
 - Study occurred August 25th – October 9th
- Two methods for estimating escapement.

- Catch-per-unit-effort,

- Upstream migrants and pond captures

$$\text{Escapement above weir} = \frac{\text{Catch}}{\text{Effort}} \times \text{Study Duration}$$

- Area-under-the-curve using trapezoidal approximation (Hilborn et al. 1999)

- Upstream migrants and captures, we had the entire season of interest.

- Counts by species, sex, origin (adipose fin) for the pond and VPS captures.

Results

- LCR fall Chinook salmon escapement (Ponds + VPS = 43 days)

- CPUE = 725 (321)

- AUC = 777 (317)

- Ponds Operation (Ponds = 10 days)

- Hatch. Orig. = 46

- Natural Orig. = 36



Results

- Summer Steelhead
 - CPUE = 329 (71)
 - AUC = 294 (66)
- Ponds Operation (10 days)
 - Hatch. Orig. = 22
 - Natural Orig. = 6
- Other species CPUE
 - Coho = 93 (78)
 - Spring Chinook = 93 (0)
 - Upriver bright FCS = 93 (60)



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Recommendations During Year of Removal

1. Both seining (RM 0.6 – 1.1) and White Salmon Ponds with weir be used in year of removal.
2. Earlier installation of weir, flow permitting
3. Sport fishing closure river mile 1.0 upstream (after weir placement).
4. Sliding scale for number of hatchery fish that might have to be transported (in lieu of natural origin fish).
5. Incidental species transport or surplusing program that accounts for both hatchery and natural origin fish.



Both 2008 and 2009 reports available here
www.fws.gov/columbiariver

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Confederated Tribes of the Warm Spring Reservation – Hood River

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White Salmon Working Group

- Semi-Monthly discussions between the following entities since 2006.
 - Yakama-Klickitat Fisheries Program
 - Washington Department of Fish and Wildlife
 - U.S. Geological Survey
 - PacifiCorp
 - National Marine Fisheries Service
 - U.S. Forest Service



Discussions related to:

- Pre and post Condit Dam removal monitoring
- Opportunities to work cooperatively with partners on fisheries and habitat restoration in the basin.
- Update of White Salmon River Restoration Plan (CBFWA 1995)
- Information sharing and identification of our role (Service NFH program) in the identified salvage effort of LCR Fall Chinook salmon.
- Through work with partners, monitoring and evaluation as well as coordination of removal process and recovery goals are discussion topics.