



Grant County  
**PUBLIC UTILITY DISTRICT**  
*Excellence in Service and Leadership*

## Fall Chinook Work Group

Tuesday, 1 April 2014

Grant PUD (USBOR Building)

Ephrata, WA

### Technical members

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Paul Wagner, NMFS	Joe Skalicky/Don Anglin, USFWS
Jeff Fryer, CRITFC	Paul Ward/Bob Rose, YN
Holly Harwood, BPA	Brett Swift, American Rivers
Keith Truscott, CPUD	Tom Kahler, DPUD
Bill Tweit, WDFW	Paul Hoffarth, WDFW
Patrick McGuire, WDOE	John Clark, ADFG
Russell Langshaw, GCPUD	Todd Pearsons, GCPUD
Steve Hemstrom, CPUD	

### Attendees: (\*Denotes Technical member)

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Russell Langshaw, GCPUD*	Tom Dresser, GCPUD
John Clark, ADFG* (Phone)	Paul Wagner, NMFS* (Phone)
Paul Hoffarth, WDFW* (Phone)	Tom Kahler, DPUD*
Jeff Fryer, CRITFC* (Phone)	Tracy Hillman, Facilitator

### Action Items:

1. Russell Langshaw will send his comments on the Predation Report to Blue Leaf.
2. Russell Langshaw will provide the FCWG with a draft study plan for assessing density dependence in the Hanford Reach.
3. Paul Hoffarth will prepare a final memo that describes egg retention of fall Chinook in the Hanford Reach through 2013 by mid-April.
4. Russell Langshaw will prepare a summary report on Phase II studies.
5. Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work.

# Meeting Minutes

- I. **Welcome and Introductions** – Tracy Hillman welcomed attendees to the meeting. Attendees introduced themselves.
- II. **Agenda Review** – The agenda was reviewed and approved.
- III. **Approval of Meeting Minutes**
  - The March Meeting Minutes were reviewed and approved with edits.
- IV. **Review of Action Items** - Action items identified during the March meeting were discussed.
  - Tracy Hillman will distribute the Harnish et al. 2014 publication on Hanford Reach fall Chinook salmon productivity to the FCWG. **Complete.**
  - Russell Langshaw will provide the FCWG with a draft study plan for assessing density dependence in the Hanford Reach. **Ongoing.**
  - Paul Hoffarth will prepare a final memo that describes egg retention of fall Chinook in the Hanford Reach through 2013. **Ongoing; the report should be available by mid-April.**
  - Russell Langshaw will prepare a summary report on Phase II studies. **Ongoing.**
  - Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work. **Ongoing.**
- V. **Wanapum Dam Spillway Issues**

Tom Dresser, Grant PUD, gave a presentation on the current status of Wanapum Dam issues (see Attachment 1). Tom noted that monolith pier #4 experienced the fracture. The horizontal fracture was 65 feet in length and opened about two inches on the upstream side of the dam. Thus, the monolith tilted downstream. Lowering the reservoir to about 545 feet elevation caused the fracture to close. Normal reservoir elevation is about 571 feet. The intermediate goal is to raise the reservoir elevation to 562 feet. Tom noted that Grant PUD is still able to maintain required protection flows in the Hanford Reach.

Tom said that on 22 February, FERC issued a letter requiring Grant PUD to set up an Independent Board of Consultants. Before Grant PUD can move from one step to the next, they must seek approval from the Board of Consultants. In short, FERC and the Board of Consultants are “calling the shots.” Tom noted that three independent consulting teams are running three independent models.

Investigators are drilling into the pier to try and determine the geometry of the fracture. The plan is to drill 24 holes; although, it may not be

necessary to drill all 24 holes. Drilling has been slowed because of weather and wind. Drilling should be completed by the end of April. The current plan is to use tendons and pins to anchor the structure to bedrock.

Tom discussed the current operational plan for fish passage. By 15 April, Grant PUD will install weir boxes into the left and right fishways at Wanapum Dam. Electric pumps will water the boxes with 35 cfs going down the ladders and 5 cfs going down the flumes (if the flumes do not work as planned, the PUD will install a chute). Under normal operations, about 70 cfs waters the upper fishways. In addition, Grant PUD will add steep lamprey ramps on both sides of the weir boxes.

In addition to the installation of the weir boxes, Grant PUD will operate a trap-and-haul program at the OLAFT at Priest Rapids Dam. There may be sorting capabilities along with PIT tagging capabilities. There are currently eight fish-transport trucks that will each transport about 82-83 adult spring Chinook. Release location will depend on passage at Rock Island Dam and conditions at Wanapum.

Grant PUD has identified several different monitoring strategies to assess passage and survival of adult and juvenile fish. In addition, they have a robust design for sampling the stranding of benthic organisms along the entire length of Wanapum Reservoir (i.e., Rock Island to Wanapum Dam). Finally, they will be sampling water quality at several sites throughout the reservoir.

Tom concluded the presentation by stating that several PUD employees (>100 employees) and consultants/contractors (35-40) are working on this issue. Paul Wagner asked if the PUD is going to share information on the operational plans with people outside the Priest Rapids Coordinating Committee. Tom responded that the priority is to report to FERC, NOAA, and the USFWS. However, anyone is welcome to participate on the weekly update calls and Grant PUD is doing all they can do to reach out to the public, including meeting with different groups requesting information. Tom asked that individuals contact him directly if they feel they are not receiving adequate information.

## **VI. Phase I Study Updates**

**Production Simulation Model** – Russell Langshaw indicated that there are no new updates on the production simulation model. Cedar Morton will revisit funding opportunities in spring 2014. Cedar is also looking at PATH as a modeling tool.

## **VII. Phase II Study Plan Updates**

**Predation Report** – Tracy Hillman indicated that he received an email from Blue Leaf stating that they are waiting on comments from Russell Langshaw. Once they have his comments, they will finalize the report.

Russell indicated that he will send his comments as soon as possible. The issues with Wanapum Dam have consumed all his time.

**Density Dependence** – Russell Langshaw said that he is still working on a study plan to address the density dependence that was identified in the productivity assessment. He shared with the group some slides that showed relationships between numbers of pre-smolts or pre-smolt productivity and numbers of eggs (see Attachment 2). He noted that relationships between pre-smolts and egg abundance are mostly linear, indicating density independent effects. Russell indicated that he will try and provide the FCWG with a draft study plan in May or June 2014.

Russell reported that the density dependence symposium at the AFS meeting in Vancouver, WA, was a success. He said that several presenters described the presence of density dependence in fish populations and the importance of carrying capacity in the management of fish species.

**Redd Superimposition** – Paul Hoffarth said that he will provide a final memo to the FCWG that identifies the number of eggs retained by fall Chinook in the Hanford Reach through 2013. The final memo should be complete around mid-April 2014. This work will satisfy the egg-retention objective of Phase II studies. Egg retention work will continue in the future and the results will be reported in the annual Priest Rapids Hatchery Monitoring and Evaluation reports.

## VIII. Phase III Studies

Tracy Hillman asked if the FCWG had given additional thought to Phase III studies. No one identified any additional studies. The current list includes: (1) fall Chinook productivity modeling every five years, (2) ongoing egg retention sampling to address density dependence effects, and (3) updating the models used in stranding and entrapment assessments. Russell said that he still plans to prepare a summary report on Phase II studies (similar to the Phase I summary document). The FCWG agreed to continue to discuss Phase III studies.

## IX. HRWG Activities

**Update on Protection Flows** – Russell Langshaw said that all temperature and flow data are displayed in the Fixed Site Monitoring – Monthly Summary files on the Grant PUD Water Quality Website (<http://www.gcpud.org/naturalResources/fishWaterWildlife/waterqualityMonitoring.html>). The temperature unit tracking spreadsheet is found under “Fixed Site Monitoring – Monthly Summary.”

Russell reported that emergence occurred on 23 March. Peak emergence should occur around the third week of April. There were no violations in protection flows during the incubation period. Even with

the issues at Wanapum Dam, Russell stated that Grant PUD should be able to maintain protection flows in the Hanford Reach.

**Stranding and Entrapment Retrospective Analysis** – Russell Langshaw reported that he did not have time to work on the retrospective analysis in March. He said that he may not have time to work on this assignment until later this spring or early summer. He intends to explore the use of hurdle models. The hurdle model is a two part process. The first part models the presence/absence of Chinook within entrapment sites. This is usually accomplished with multiple logistics regression or discriminant analysis. If a pattern is found (successfully jumped the first hurdle), then the second part is to model the numbers of fish entrapped in sites with fish presence. This could be accomplished with regression techniques. The hurdle model may be a simpler and more easily explainable approach than the zero-inflated negative binomial distribution model.

- X. **Next Meeting:** Tuesday morning, 6 May 2014 at Grant PUD in Ephrata, WA.

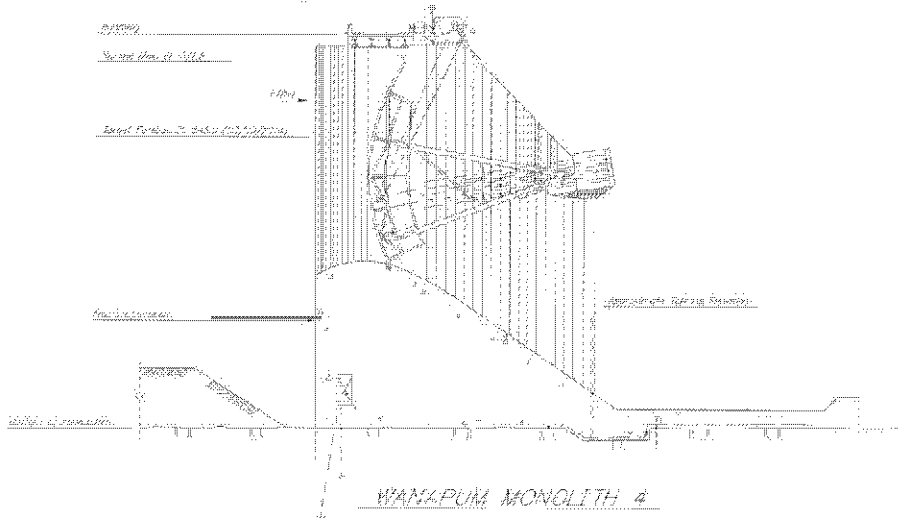
# Attachment 1

## Presentation by Tom Dresser on Wanapum Dam Interim Fish Passage Operation Plan and Reservoir Surveys





# Wanapum Dam



The fracture was found below the water level on the forebay side of the dam.



## **Stabilize Spillway Monolith 4**

- **Goal Completed**
  - Monolith has settled into a safe position; crack essentially closed
  - Continue to operate with a forebay level of 541-545' (25-30' below normal)
  - Remain under Emergency Action Plan – Condition C
  - Monolith inspections continues
- Will be revisited once we have determined the exact fracture location

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## **Investigate Root Cause**

- Independent Board of Consultants
- Required responses to 3 bullets – reservoir level remains until following completed;
  1. Define failure
  2. Can event develop on the other piers
  3. Plan to rehab 4 and other piers as necessary.
- Independent Forensic Investigation Team (FIT)
- BOC and FIT has required a series of data and reports to be submitted (~17 reports in development).

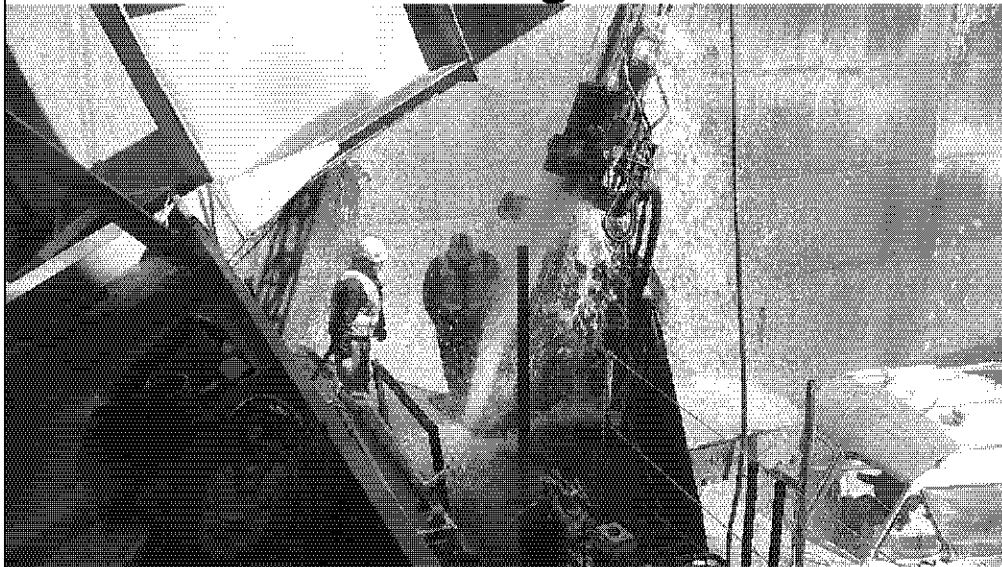
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## Pier Drilling



## Pier Drilling Video

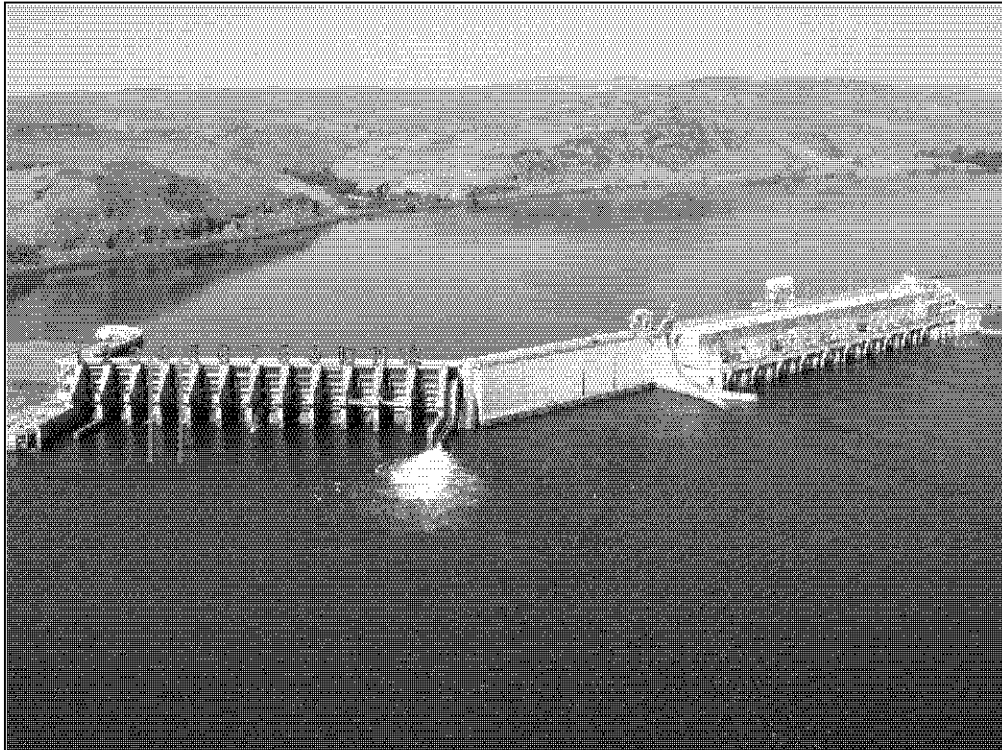


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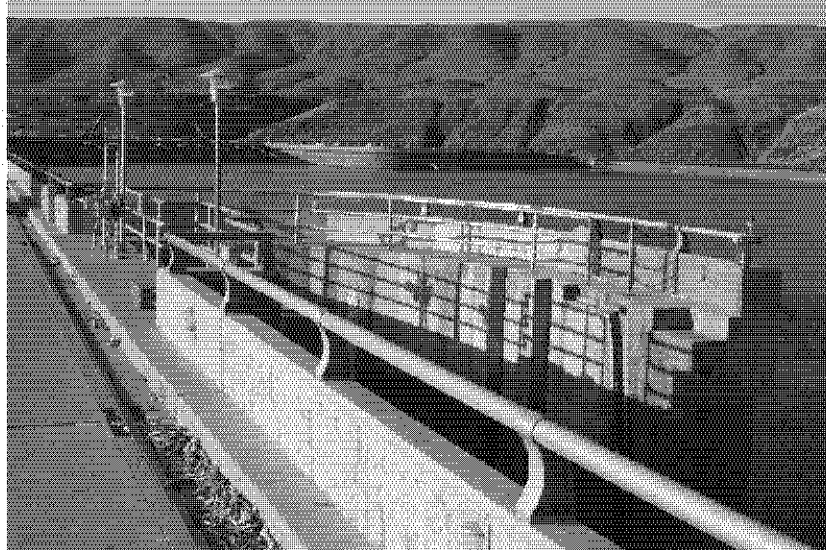
## Intermediate Pool Raise

- Major focus in place for partial restoration of forebay level to at least minimum operating levels (562').
- Board of Consultants require additional information prior to any pool raise
- Draft Repair Plan

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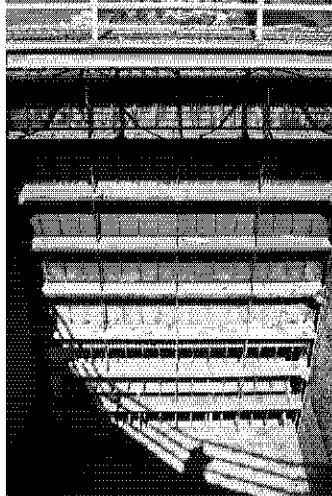
## Wanapum Left Bank Fish Ladder



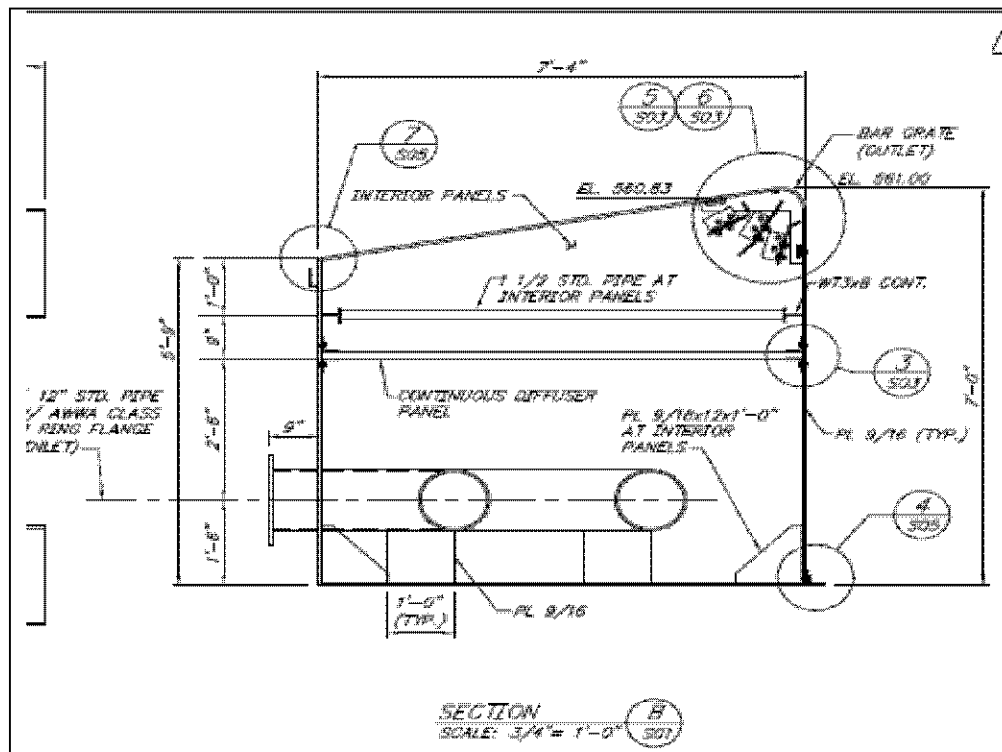
## Wanapum Left Bank Fish Ladder

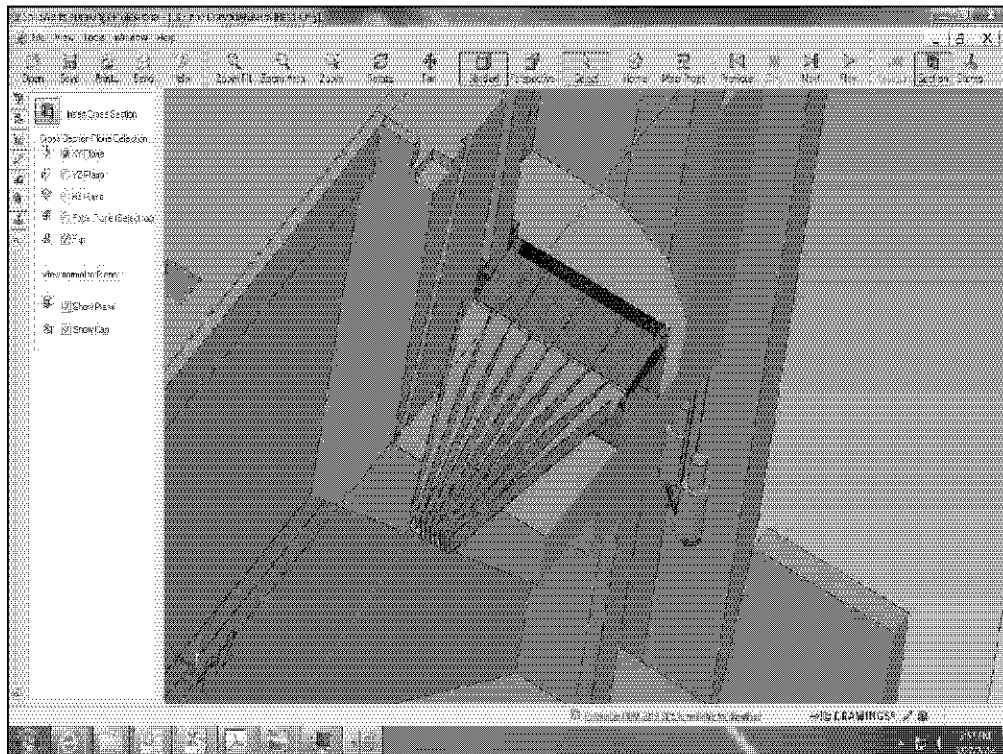
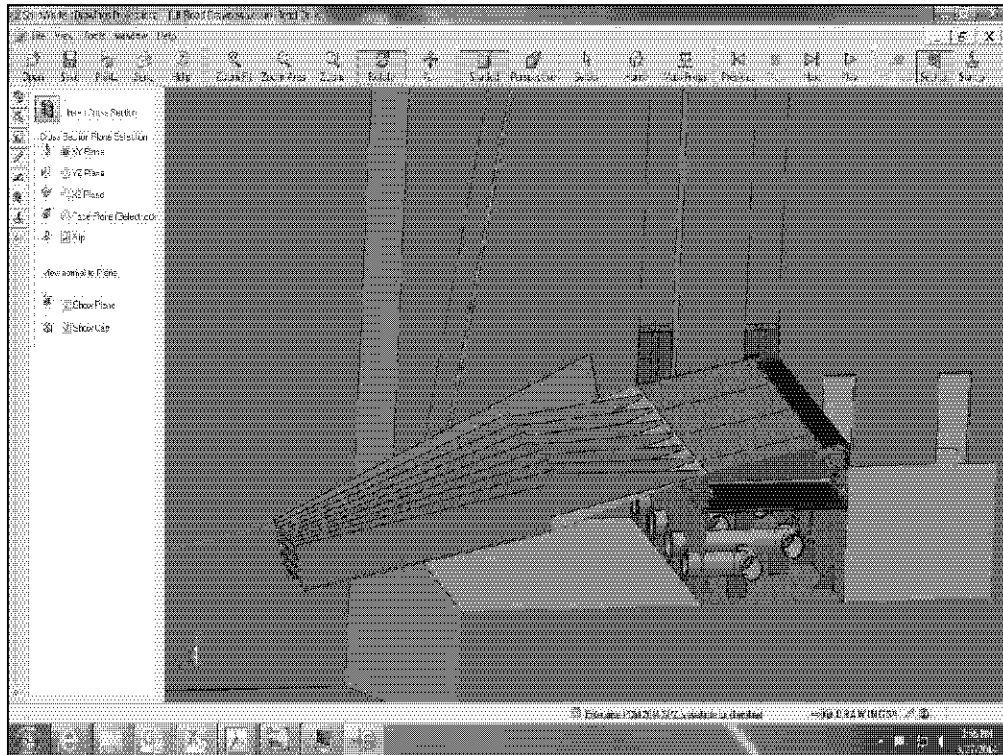


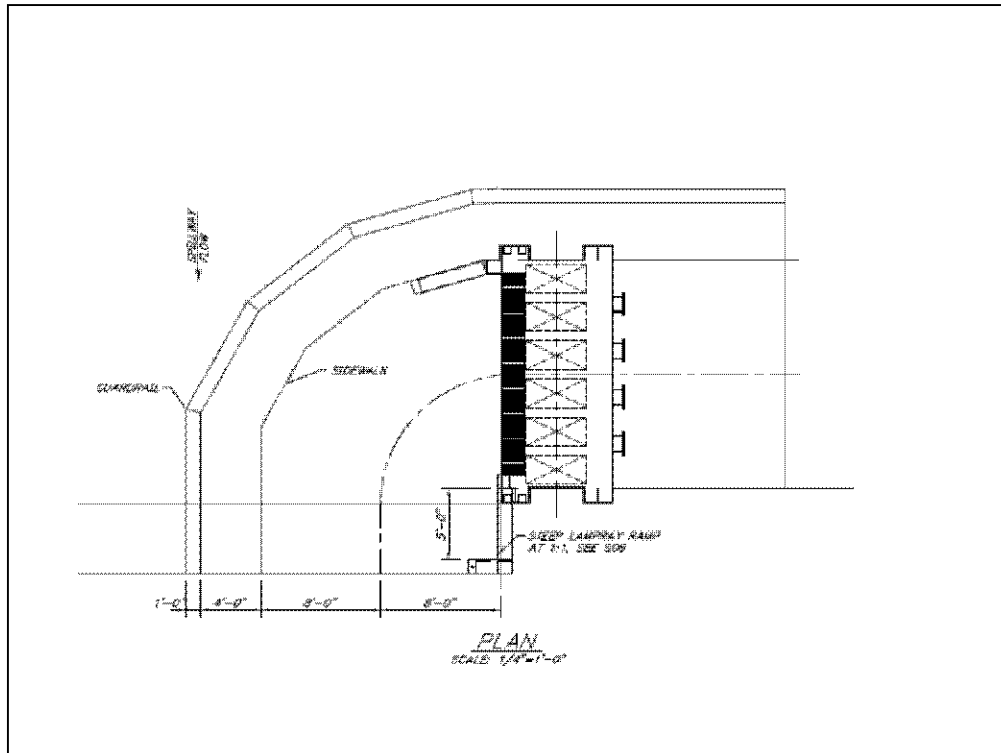
# Wanapum Left Bank Fish Ladder



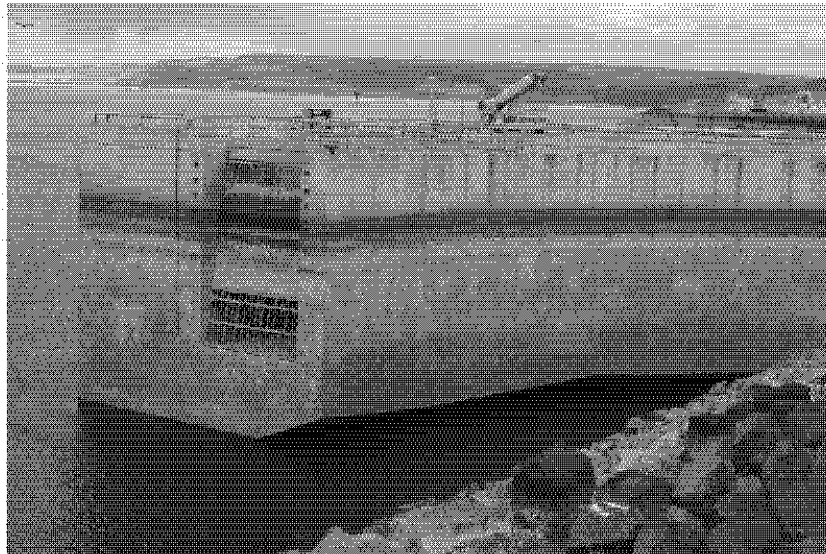
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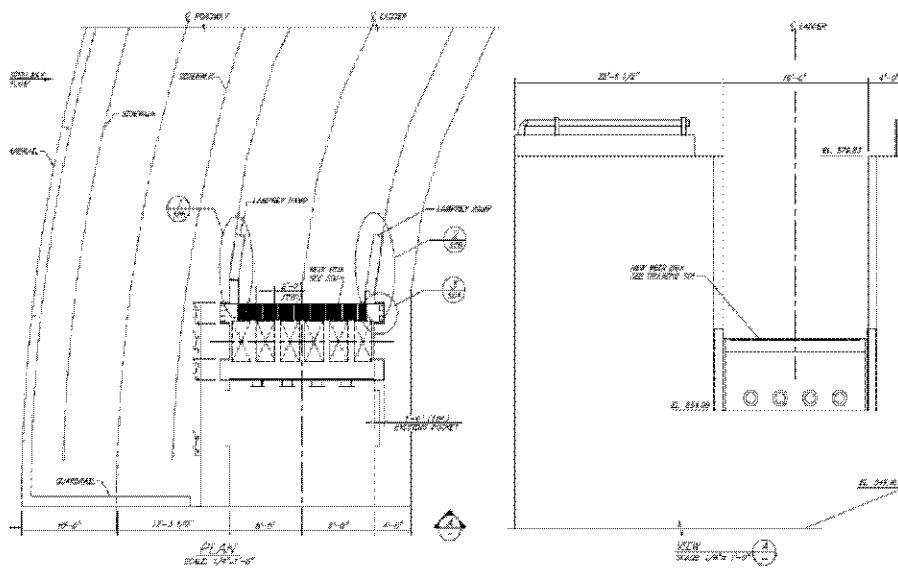
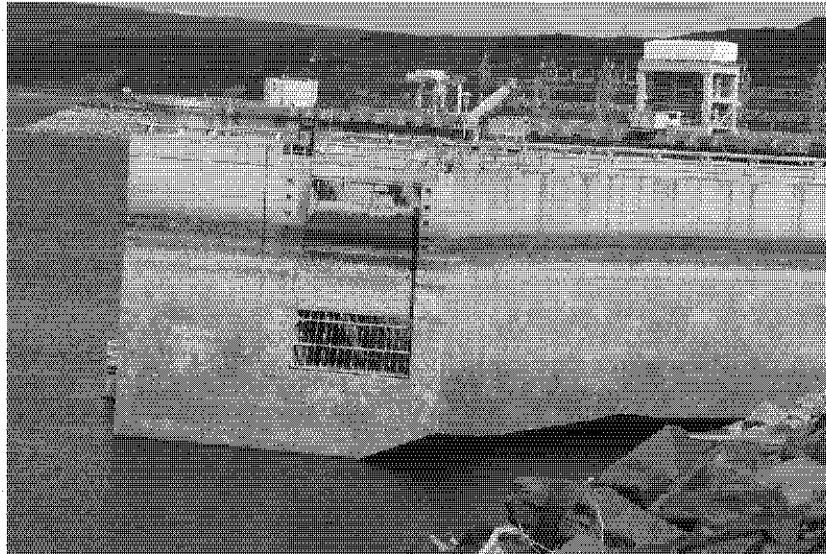


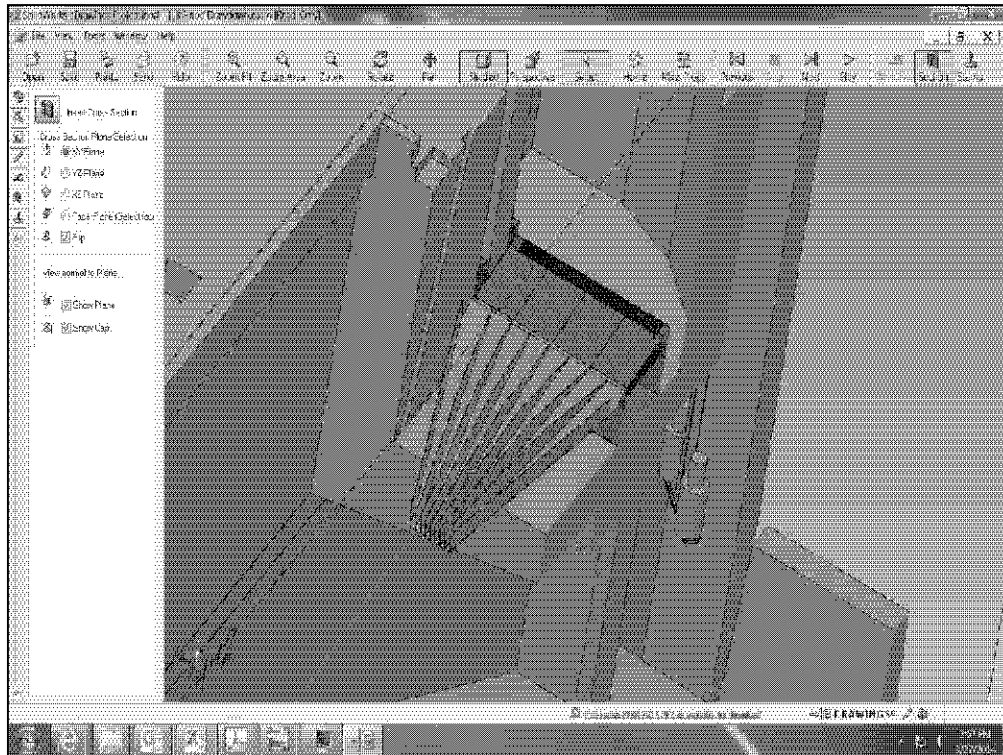


## Wanapum Right Bank Fish Ladder



# Wanapum Right Bank Fish Ladder

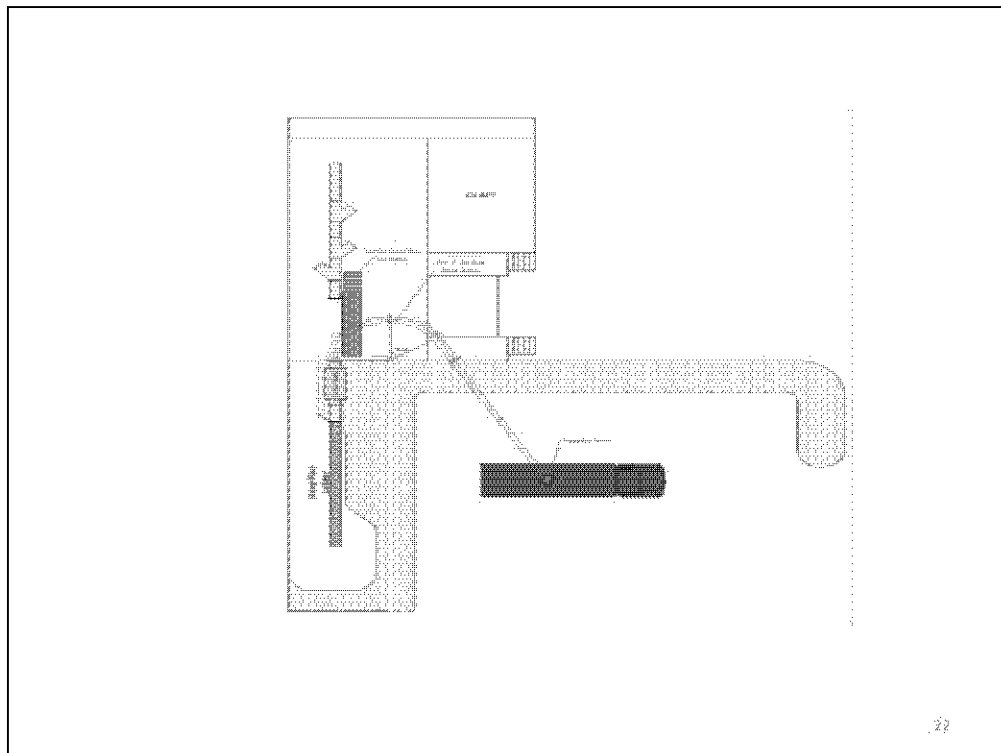




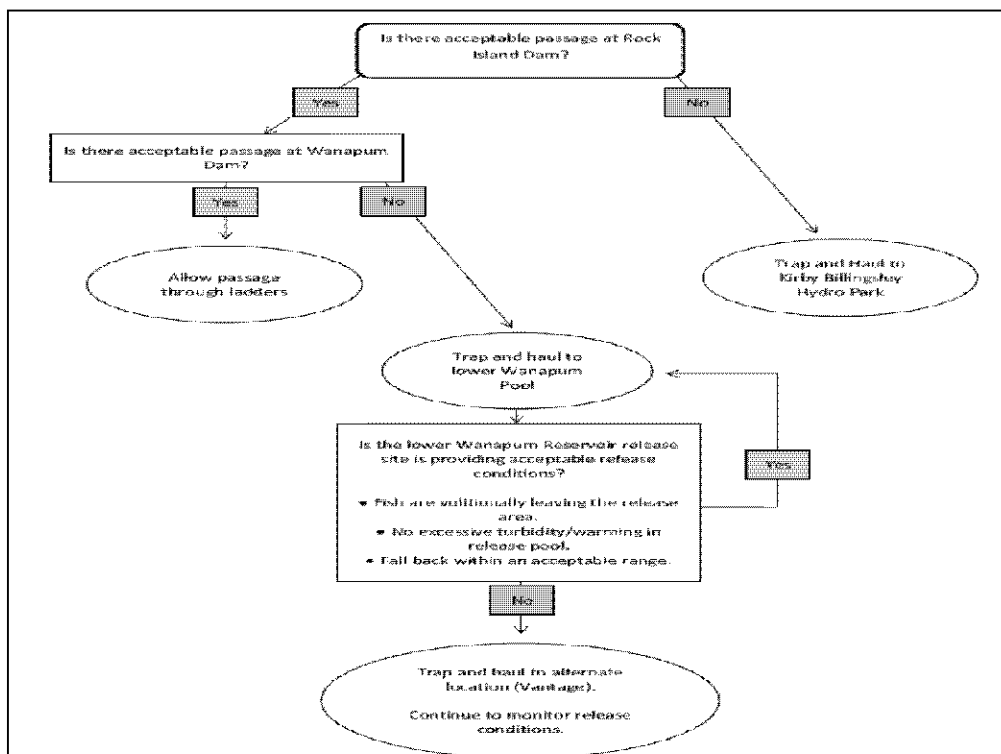
## Priest Rapids Off Ladder Adult Fish Trap







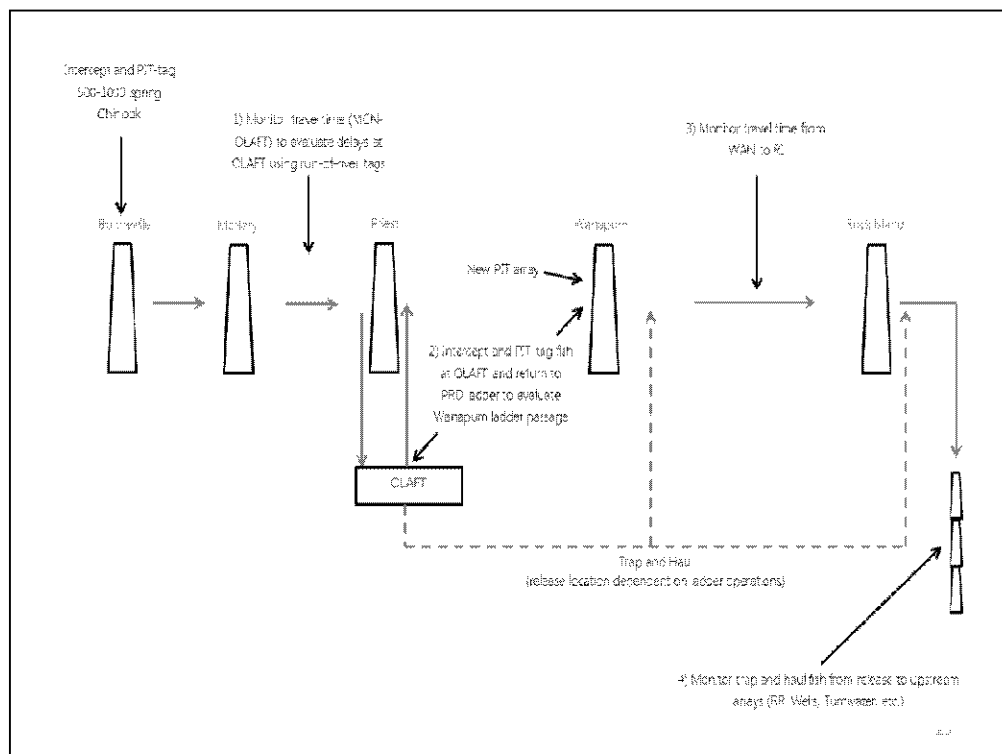
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## Adult Salmonid Passage Monitoring

- Detection Infrastructure
  - Priest Rapids Dam right & left bank fishways
  - Priest Rapids off ladder adult fish trap (OLAFT)
  - Temporary systems at Wanapum (right & left fishways)
  - Rock Island Dam
  - Other upstream locations
  - Additional PIT Tags applied at Bonneville
  - Additional PIT Tags applied at OLAFT
  - Stuehrenberg et al. (1995), Bjornn et al. 1997; Peery et al. 1998, English et al. 1999

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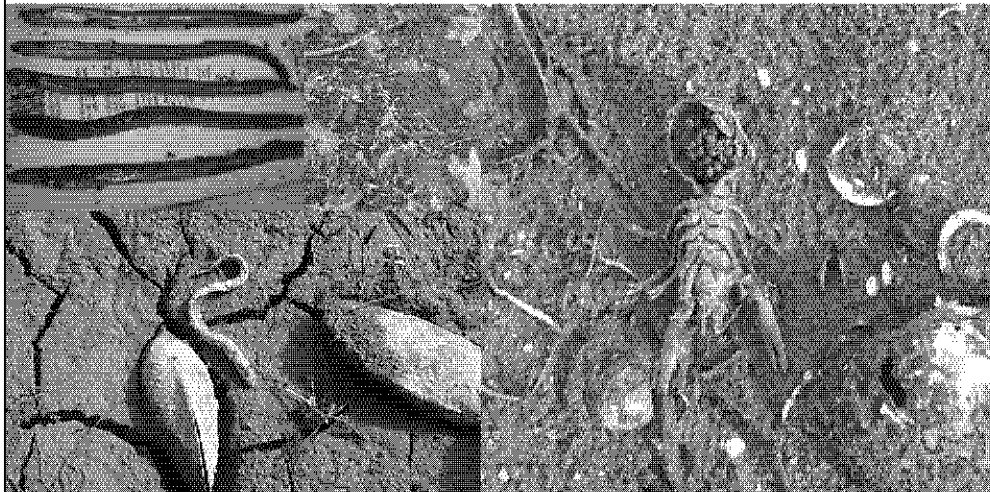


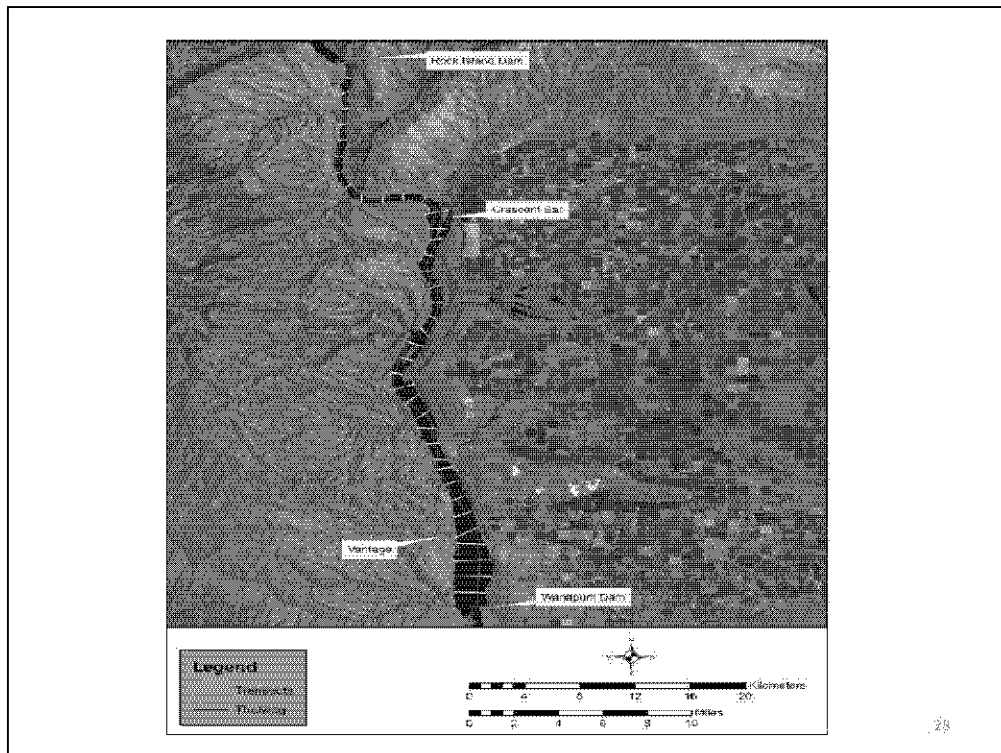
## Potential Additional Work Priorities

- Adult Salmonid Counting – starting April 1 at Priest Rapids Dam
- Wanapum Dam Temporary PIT Tag array
- Adult Salmonid Passage – PR – WAN- RI – Other
  - Review of previous adult passage study information
- Additional PIT Tags at Bonneville Dam (1-2K)
- Additional PIT Tags at PR OLAFT
- Fall back at Wanapum via PIT Tag
- Review of modeling data for WFUB
- Review of hill curve data for Wanapum turbines
- Review of Wanapum spillway information
- Juvenile salmonid run-of-river PIT Tag
  - OSU/Realtime Research 5,500 yearling Chinook; 5,500 juvenile steelhead
- Stranding of Benthic Fauna
- Water Quality Transect Monitoring
- Aerial Mapping

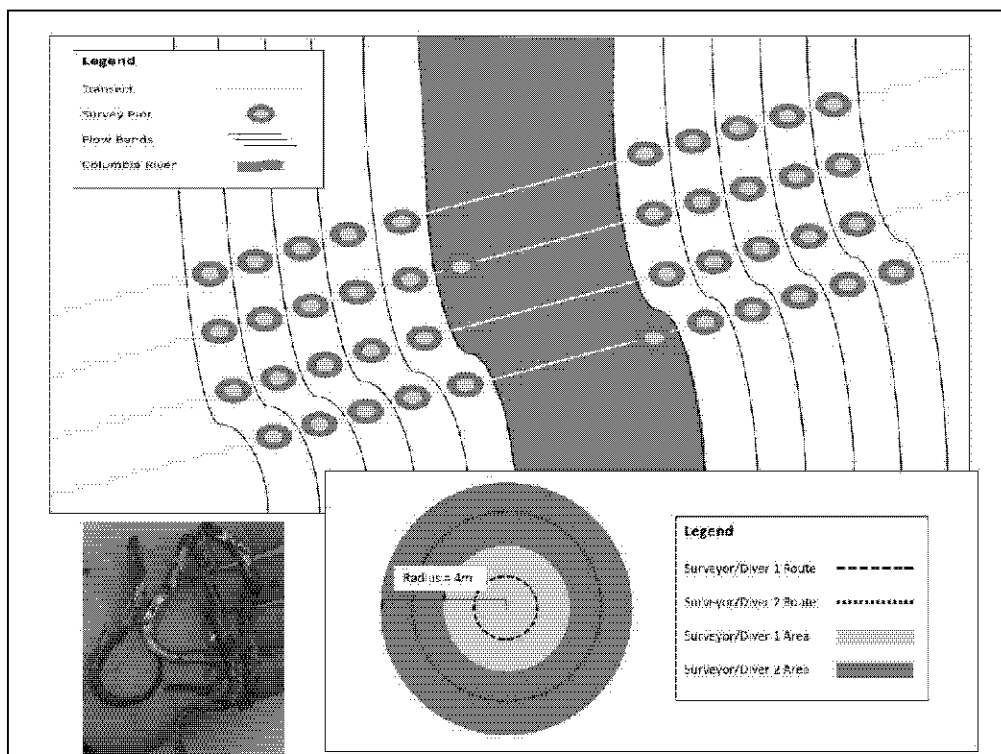
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## Stranding of Benthic Fauna & other Organisms





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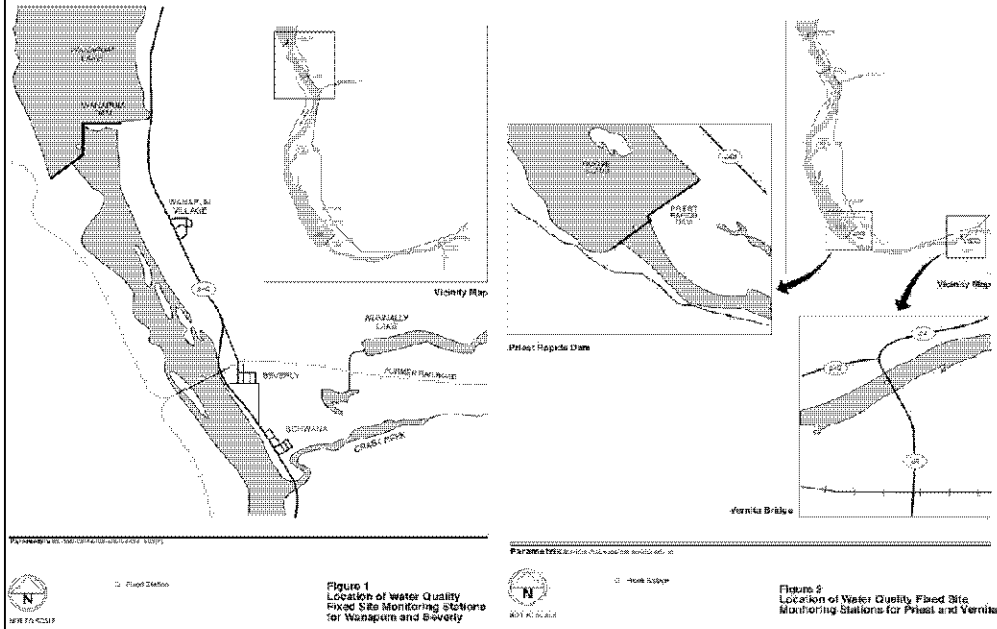


# Water Quality Monitoring

Location	Northing	Easting
RI Right Bank	47.34035	-120.080
RI Left Bank	47.34135	-120.080
RI Thalweg	47.34084	-120.089
CBAR Thalweg	47.20514	-120.062
CBAR Right Bank	47.20587	-120.066
CBAR Left Bank	47.20526	-120.060
Scammon Thalweg	47.04157	-120.015
Scammon Right Bank	47.04016	-120.020
Scammon Left Bank	47.04169	-120.012
Wan Forebay Right Bank	46.85675	-119.977
Wan Forebay Thalweg	46.88723	-119.966
Wan Forebay Left Bank	46.86738	-119.962

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## Fixed Site Monitors



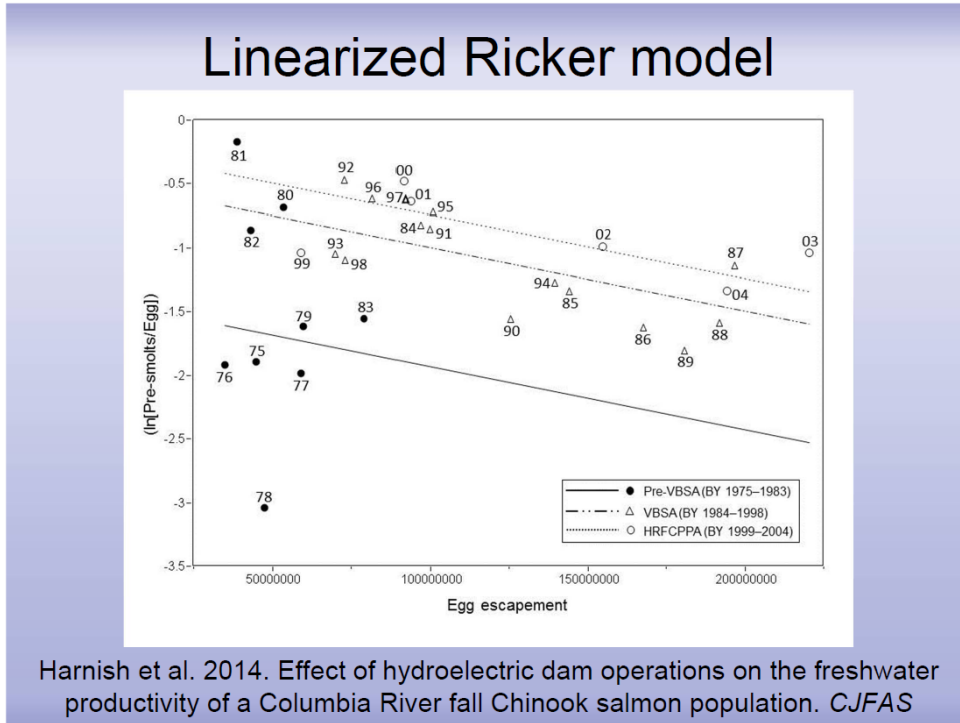
## Summary

- A lot of people are working on this issue.
- Over 100 District employees involved
- 35-40 Consultants / Contractors representing an estimated 100 people

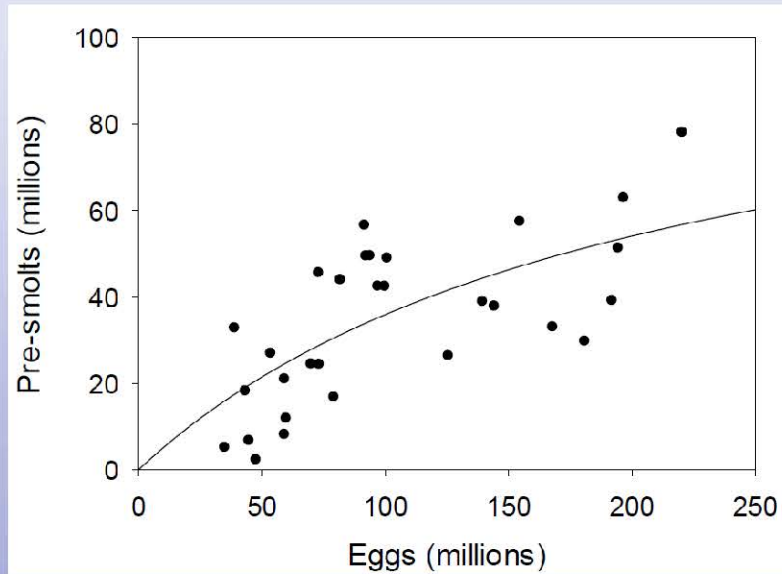
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# Attachment 2

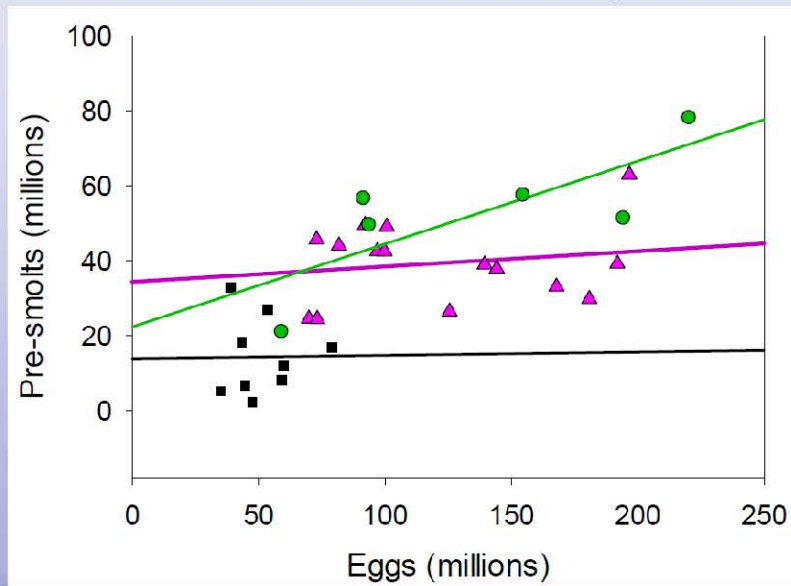
## Presentation by Russell Langshaw on Density Dependence



## Beverton-Holt model Cohort reconstruction BY 1975-2004

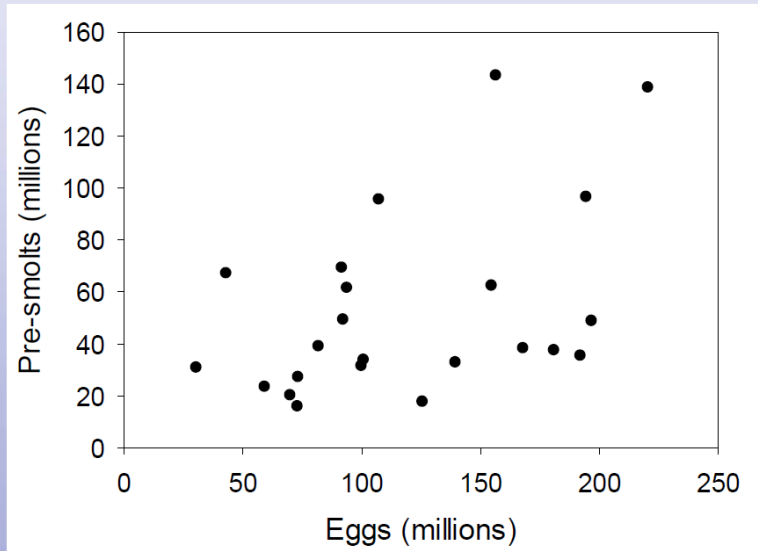


## Linear model Cohort reconstruction by era





## Mark-recapture BY 1986-2008



## Linear model Mark-recapture by era

