



Grant County
PUBLIC UTILITY DISTRICT
Excellence in Service and Leadership

Fall Chinook Work Group

Tuesday, 5 November 2013

Priest Rapids Dam

Mattawa, WA

Technical members

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
Pat McGuire, WDOE	John Clark, ADFG
Russell Langshaw, GCPUD	Todd Pearsons, GCPUD
Steve Hemstrom, CPUD	

Attendees: (*Denotes Technical member)

Russell Langshaw, GCPUD*	Pat McGuire, WDOE*
John Clark, ADFG* (phone)	Jeff Fryer, CRITFC*
Tom Kahler, DPUD*	Daniel Diedrich, NMFS (phone)
Suzie Rizer, Blue Leaf (phone)	Kyle Hatch, Blue Leaf (phone)
Andrew Gingerich, DPUD	Chas Kyger, DPUD
Tracy Hillman, Facilitator	

Action Items:

1. **Blue Leaf will provide the FCWG with a draft report on their evaluation of juvenile fall Chinook survival estimates from the Hanford Reach to McNary Dam by Friday, 8 November.**
2. **Paul Hoffarth will provide the FCWG with a table and memo on egg retention in the Hanford Reach by Friday, 29 November.**
3. **Russell Langshaw will provide the FCWG with a draft study plan for assessing density dependence in the Hanford Reach by the next FCWG meeting on Tuesday, 3 December.**

4. **The 2013 Stranding and Entrapment Report is due to the FCWG on Friday, 29 November.**
5. **Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work. The next update will be in February 2014.**

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 October Meeting Minutes were reviewed and approved.
- IV. **Review of Action Items** - Action items identified during the October meeting were discussed.
 - Blue Leaf will provide the FCWG with a draft report on their evaluation of juvenile fall Chinook survival estimates from the Hanford Reach to McNary Dam by Tuesday, 15 October. **Blue Leaf has been working with Grant PUD on the draft section. Tracy Hillman will send the draft to the FCWG by Friday, 8 November.**
 - Blue Leaf will provide the FCWG with updates on bioenergetics modeling during the next FCWG meeting on Tuesday, 5 November. **Ongoing.**
 - Paul Hoffarth will provide the FCWG with a table and memo on egg retention in the Hanford Reach by Thursday, 31 October. **Ongoing.**
 - Tracy Hillman will try to compile summer/fall Chinook egg retention data for the Wenatchee, Methow, and Okanogan systems. **Complete. Tracy provided Russell Langshaw and Paul Hoffarth with data and figures on mean egg retention of female summer/fall Chinook salmon in the three subbasins.**
 - Russell Langshaw will provide the FCWG with a draft study plan for assessing density dependence in the Hanford Reach by the next FCWG meeting on Tuesday, 5 November. **Ongoing.**
 - Tracy Hillman will send an email to the FCWG/HRWG asking if anyone would like to help with fall Chinook broodstock collection on 25, 26, and 27 October. **Complete.**
 - Russell Langshaw and Paul Hoffarth will coordinate a tour on the Hanford Reach during the afternoon of 5 November. **Complete. The FCWG will meet with the Yakama Nation for a tour of the Hatchery Facility and OLAFT, and then the FCWG will tour the Hanford Reach.**

- Russell Langshaw will conduct retrospective analysis on historical stranding and entrapment work and identify issues for discussion during the next FCWG meeting. **Ongoing; next update will be February 2014.**

V. Phase I Study Updates

- A. **Productivity Assessment** – The final productivity report is complete and has been posted to Box.net.
- B. **Egg to Fry Survival** – The final egg-to-fry study report is complete and has been posted to Box.net.
- C. **Dam Passage Fallback** – The final dam passage fallback report is complete and has been posted to Box.net.
- D. **Hydrodynamic Model** – The final hydrodynamics model report (methods and a catalogue of what is available) is complete and has been posted to Box.net.
- E. **Production Simulation Model** – Russell Langshaw indicated that there are no new updates on the production simulation model. Cedar Morton was unable to secure funding to support his use of the Production Simulation Model. He will revisit funding opportunities in spring 2014. He is also looking at PATH as a modeling tool.

VI. Phase II Study Plan

Predation Report – Suzie Rizer, Blue Leaf, reported that they intend to complete the bioenergetics section of the predation report by mid-November. Pending review by Grant PUD, the FCWG should have the report by the end of November. She indicated that the survival section of the predation report has been reviewed by Grant PUD, and Blue Leaf has addressed Grant's concerns. The survival section will be sent to the FCWG for review by the end of the week. The entire predation report will be sent to the FCWG by 15 December 2013 for their review. The FCWG will have 30 days to review the draft report. The final will be completed by 15 February 2014.

Kyle Hatch, Blue Leaf, described progress on the bioenergetics section of the predation report. He noted that he completed the modeling work and is currently writing the bioenergetics section of the report. He said that the base material has not changed too much. He found that the 1,000 fish populations, temperature, and time strata were not sensitive at the 10% change. In contrast, temperature was sensitive at 10% change. The revised analyses suggest that the three main predators (northern pikeminnow, smallmouth bass, and walleye) consume between 6.4 to 27 million juvenile fall Chinook. Smallmouth bass consumed the most, because of the large population size of bass in the project area.

John Clark asked if they compared their predator abundance estimates to one that is calculated by estimating how many predators are needed to consume the numbers of juvenile fall Chinook that are lost in the study area. Kyle indicated that they found that difficult to calculate. John recommended that they make the calculation using estimates of fish loss and consumption rates. Kyle said that they will try to make the calculation and describe the assumptions associated with the estimate.

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 is looking at relationships among growth, survival, and productivity. He is also trying to compile information on condition factors. Russell said that he will draw upon the work conducted by Connor et al. (2013).¹

Redd Superimposition – Russell Langshaw reported that he has not received from Paul Hoffarth the table identifying the number of eggs retained by fall Chinook in the Hanford Reach. Recall that Paul was going to provide a table that identifies the number of eggs retained by females in the Hanford Reach. He was also going to prepare a memo that describes egg retention across different escapement levels. Russell understood that Paul is still working on updating the table and writing the memo.

One of Tracy Hillman's action items was to provide egg retention data for summer/fall Chinook in the Okanogan, Methow, and Wenatchee subbasins. Tracy provided the data to Russell Langshaw and Paul Hoffarth on Wednesday, 30 October. Tracy shared with the FCWG some of the figures he generated from the egg retention data.

Tracy noted that in the Okanogan, there did not appear to be a relationship between mean egg retention and spawning escapement (where spawning escapement was estimated as the number of redds times a fish/redd ratio) (Figure 1). However, there was one year (2003) where most of the females died before spawning. Tracy thought that this was related to higher than normal water temperatures that year. However, even if that year was removed from the analysis, there still was no strong association between egg retention and spawning escapement (Figure 2).

¹ Connor, W. P., K. F. Tiffan, J. M. Plumb, and C. M. Moffitt. 2013. Evidence for density-dependent changes in growth, downstream movement, and size of Chinook salmon subyearlings in a large-river landscape. *Transactions of the American Fisheries Society* 142:1453-1468.

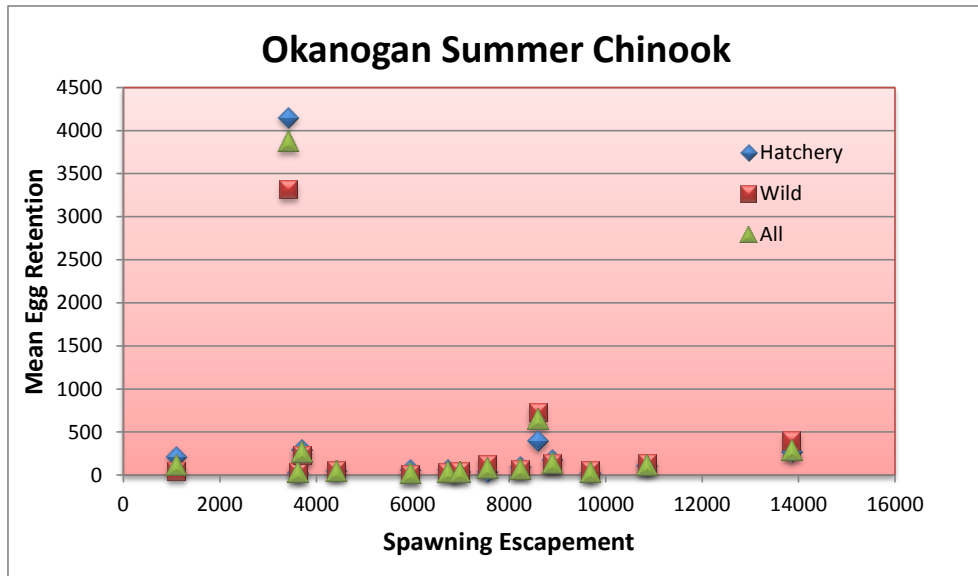


Figure 1. Relationship between spawning escapement and mean egg retention of summer/fall Chinook in the Okanogon River basin during 1998-2012.

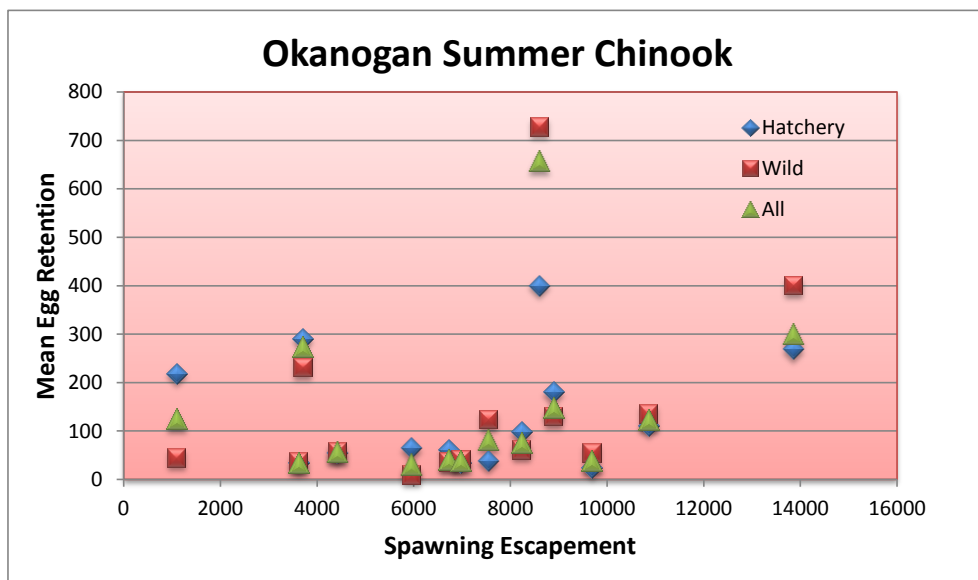


Figure 2. Relationship between spawning escapement and mean egg retention of summer/fall Chinook in the Okanogon River basin during 1998-2012, with the high pre-spawn loss during 2003 removed from the analysis.

Tracy noted that there was no relationship between mean egg retention of natural-origin summer/fall Chinook and spawning escapement in the Methow River basin, but there appeared to be one between hatchery fish and escapement (Figure 3). This is more easily seen in Figure 4.

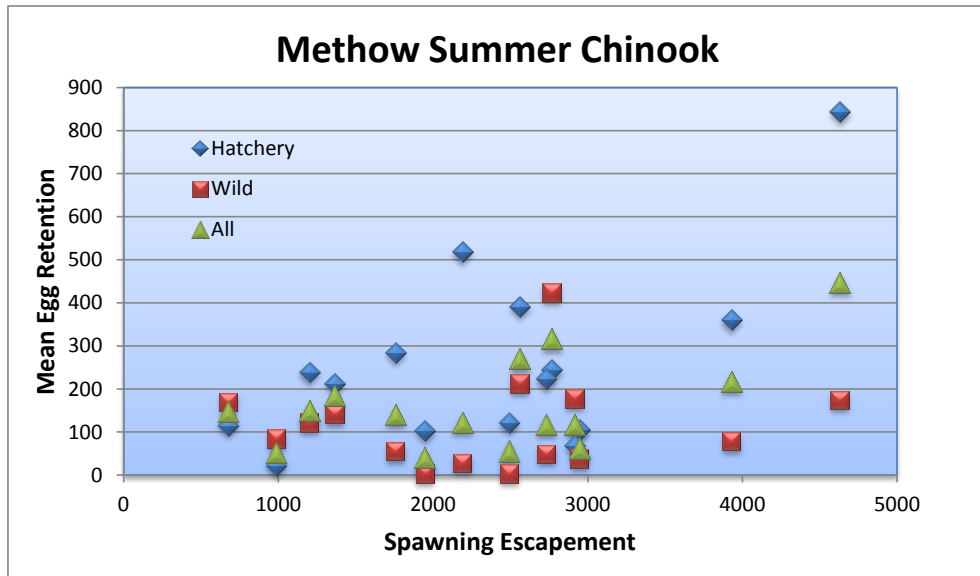


Figure 3. Relationship between spawning escapement and mean egg retention of summer/fall Chinook in the Methow River basin during 1998-2012.

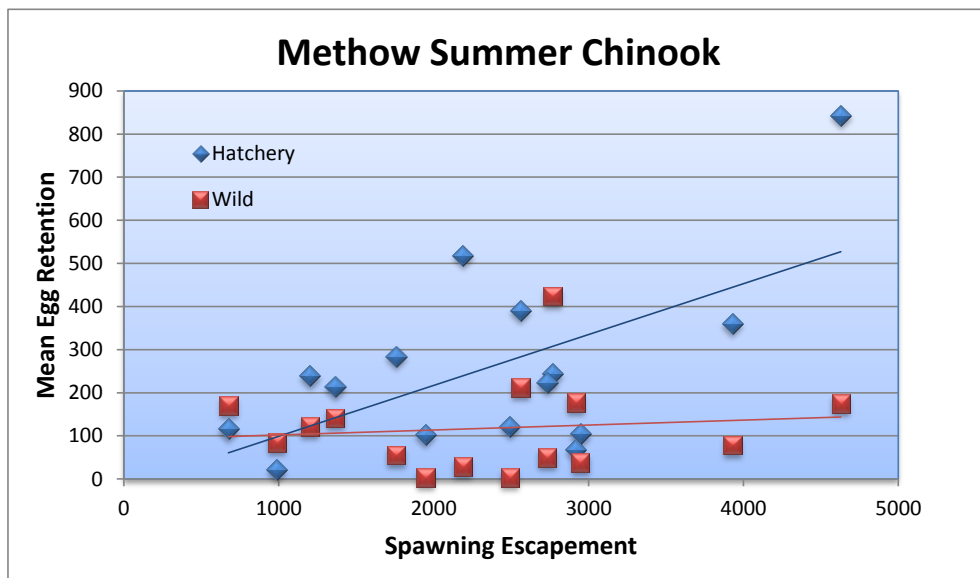


Figure 4. Relationship between spawning escapement and mean egg retention of natural-origin and hatchery summer/fall Chinook in the Methow River basin during 1998-2012.

As with the Methow, mean egg retention of natural-origin summer/fall Chinook was not related to spawning escapement in the Wenatchee River basin; however, egg retention of hatchery fish was related to escapement (Figure 5). Figure 6 shows these relationships clearly.

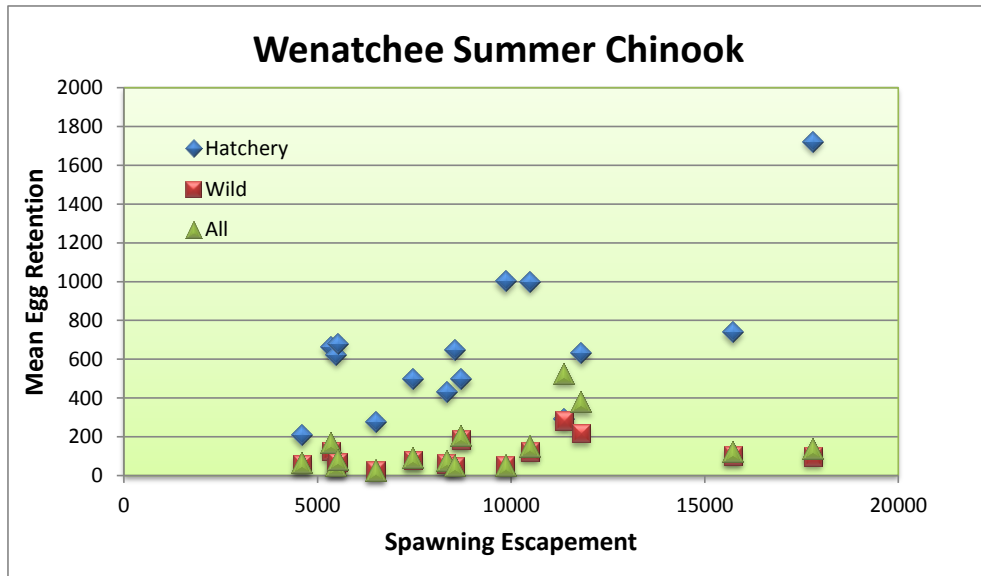


Figure 5. Relationship between spawning escapement and mean egg retention of summer/fall Chinook in the Wenatchee River basin during 1998-2012.

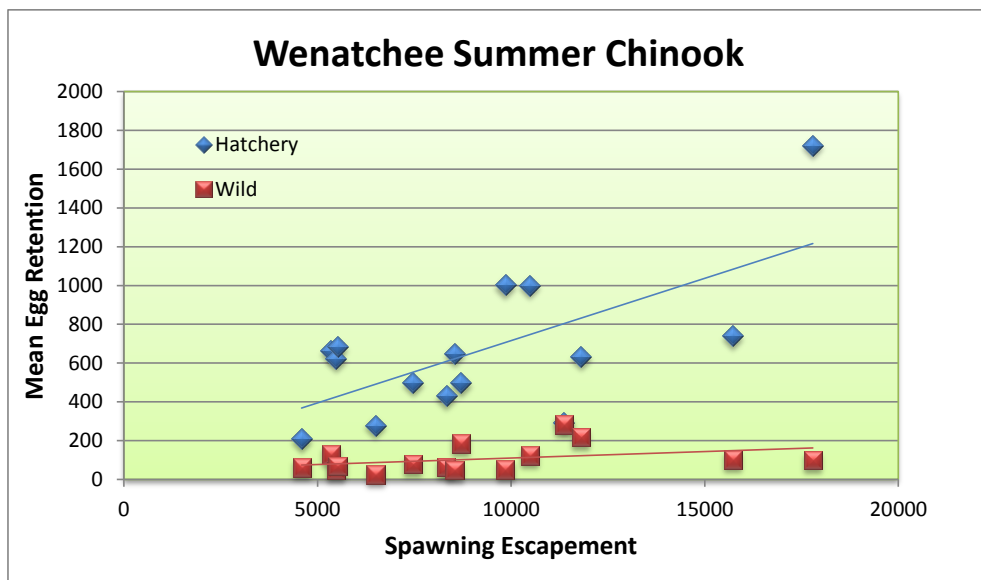


Figure 6. Relationship between spawning escapement and mean egg retention of natural-origin and hatchery summer/fall Chinook in the Wenatchee River basin during 1998-2012.

The reason for the differences between hatchery and natural-origin Chinook are unknown, but may be related to the quality of the spawning habitat in which the different stocks spawn. Because of the location of the hatchery acclimation sites, hatchery fish tend to spawn lower in the Methow and Wenatchee rivers where water temperatures are warmer and spawning habitat is generally in poor condition.

Natural-origin fish tend to spawn in upstream locations where temperatures are cooler and habitat conditions are better.

Paul Hoffarth will continue to compile information on egg retention of fall Chinook in the Hanford Reach. He will also prepare a memo that describes egg retention across different escapement levels. The final report (memo) on egg retention is due March 2014.

VII. HRWG Activities

Stranding and Entrapment Analysis and Reporting – Russell Langshaw said that WDFW, Battelle, the U.S. Fish and Wildlife Service, and GPUD have been working on data analysis and report writing. He stated that Battelle has completed estimates for the number of fish stranded and calculated the number of entrapments formed. Russell noted that roughly 250,000 Chinook fry were stranded in 2013 (95% CI of about 150,000 to 300,000). The U.S. Fish and Wildlife Service is still calculating the number of fish entrapped. The FCWG is scheduled to receive the draft annual report by the end of November. They will have a 30-day comment period. The final report is due to FERC on 15 January 2014.

Fall Chinook Tagging Study – Jeff Fryer gave a presentation on the 2013 Hanford Chinook tagging study (see Attachment 1). Jeff noted that the project came close to its coded wire tagging and PIT tagging goals; however, mortality was too high to achieve the goals. He said the project was hampered by high flows and low abundance on the Reach, and that mortality increased when they started capturing fish downstream at North Richland. He also noted that high temperatures likely contributed to CWT mortality and that high temperatures, crude facilities, poor fish condition, and an inexperienced crew were factors in PIT-tag mortality.

Jeff identified several changes to 2014 tagging activities. He noted that additional PSC funding (for 2014 only) will allow an additional crew, plus an additional day, which should mean a much better opportunity to reach the goal and decrease the pressure to maximize fishing. He said that Battelle has offered the use of two recovery troughs, which should allow for better holding conditions for tagged fish as well as less handling. They will also be able to hold all fish for nearly 24 hours to better estimate 24-hour mortality. This will be a large improvement over past conditions, which may have exaggerated 24-hour mortality. He will also extend the hoses in the river to access deeper water, and will use a chiller or ice for anesthetic. He intends to hire an experienced tagger and will not conduct double tagging in the same day.

Hanford Reach Tour – The FCWG joined the Yakama Nation for a tour of the hatchery facility and the OLAFT. The FCWG then toured the Hanford Reach and observed fall Chinook spawning in the Reach.

VIII. Next Meeting: Tuesday morning, 3 December 2013 at Grant PUD in Ephrata, WA.

Attachment 1

2013 Hanford Chinook Tagging Project

Presentation by: Jeff Fryer, CRITFC

2013 Hanford Chinook Tagging Project

Jeffrey K. Fryer

Columbia River Inter-Tribal Fish Commission
Portland, OR



Hanford Reach Fall Chinook Tagging Project

- Since 1987 CRITFC has coordinated a project to ad-clip and coded wire tag 200,000 juvenile upriver bright fall Chinook salmon on the Hanford Reach.
- CWT project has met goal 14 out of 27 years
- Concurrent PIT tagging programs have tagged Chinook in 18 out of 23 years between 1991-2013. (Exceptions of 2000-2002 and 2006.) In only six of these 18 years has there been any significant funding dedicated to PIT tagging.



Capture Gear

Stick seines are typically 11.0 to 18.3 m long and 1.8m deep

Beach seines are typically 36.6 m long and 3.0 m deep

For both, mesh size is 4.8 mm (3/4").





CWT trailer operations

- Technicians visually cull out injured fish as well as Chinook that are too large (>80mm) and too small for tagging (typically <48mm):
- After tagging, fish are held and released after 15-120 minutes. A small group is held to estimate 24 hour mortality. Fish are released on site.



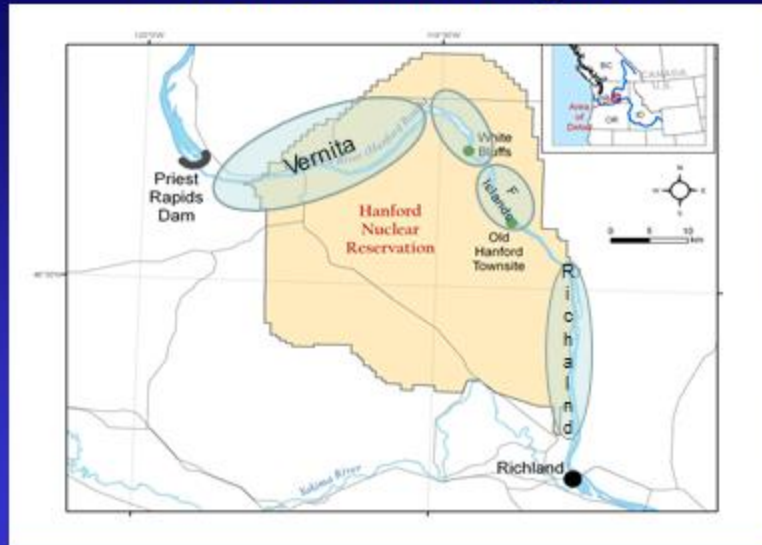
2013 Coded Wire Tagging

- 11 day, 2 tagging crew project from May 30-June 9.
- PIT tag output: 178,426
- Sorts (mostly too small): 38,251
- Taggable (48-80 mm): 82.3%
- QC: 0.2% with no tag
- Sort and pre-tag mortalities: 5.8% (of all processed)
- Immediate post-tag mortality: 2.8%
- 24 hour (possibly biased) mortality: 12.6%

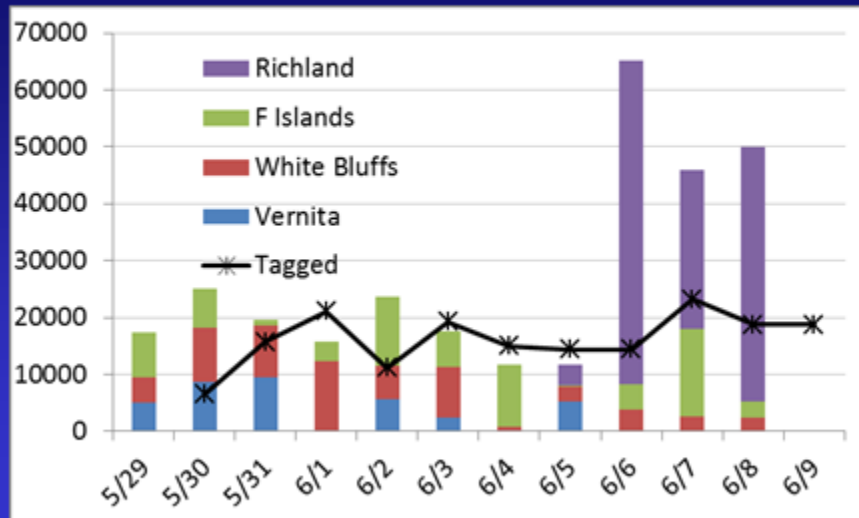
Factors contributing to failure to meet goal

- One fewer day and crew than many years
- High flows. (Project has hit goal 10 of 13 years when mean June 1-15 PRD flow <160 kcfs, failed 10 out of 14 years above 160 kcfs.)
- Possibly a bit late in starting project (% taggable=82.3%).
- Tough fishing, which contributed to mortality

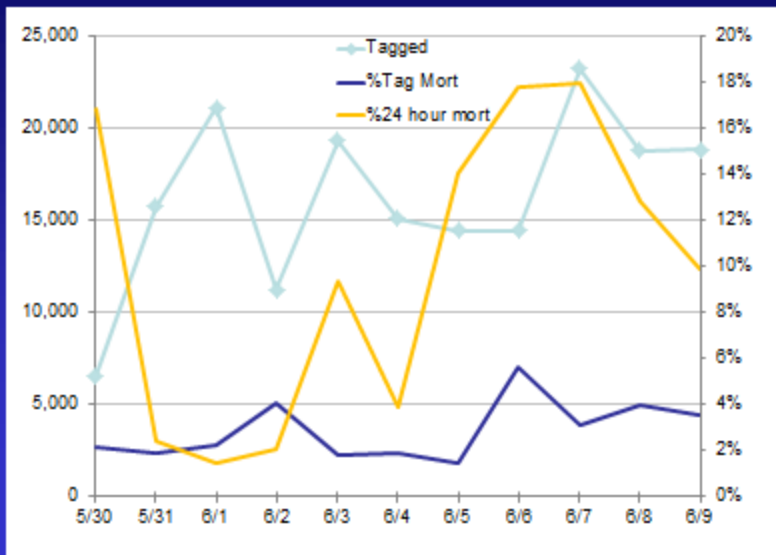
Hanford Reach and fishing areas



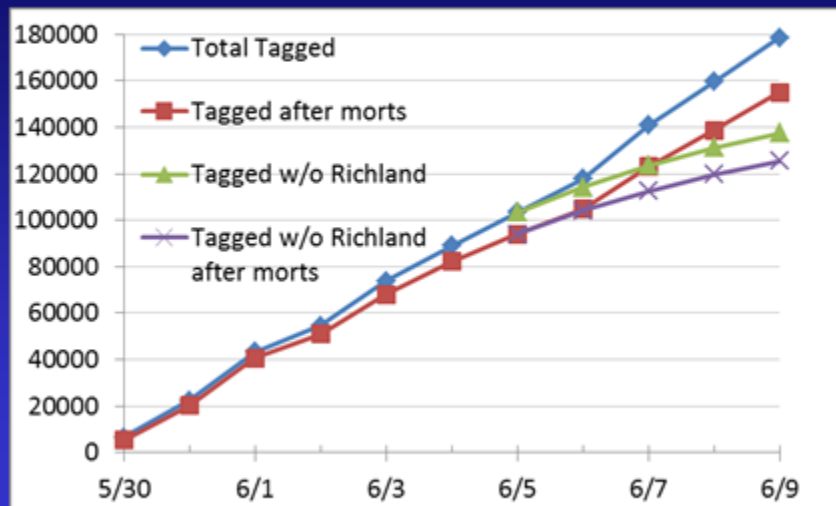
Number of fish tagged and captured by area by day

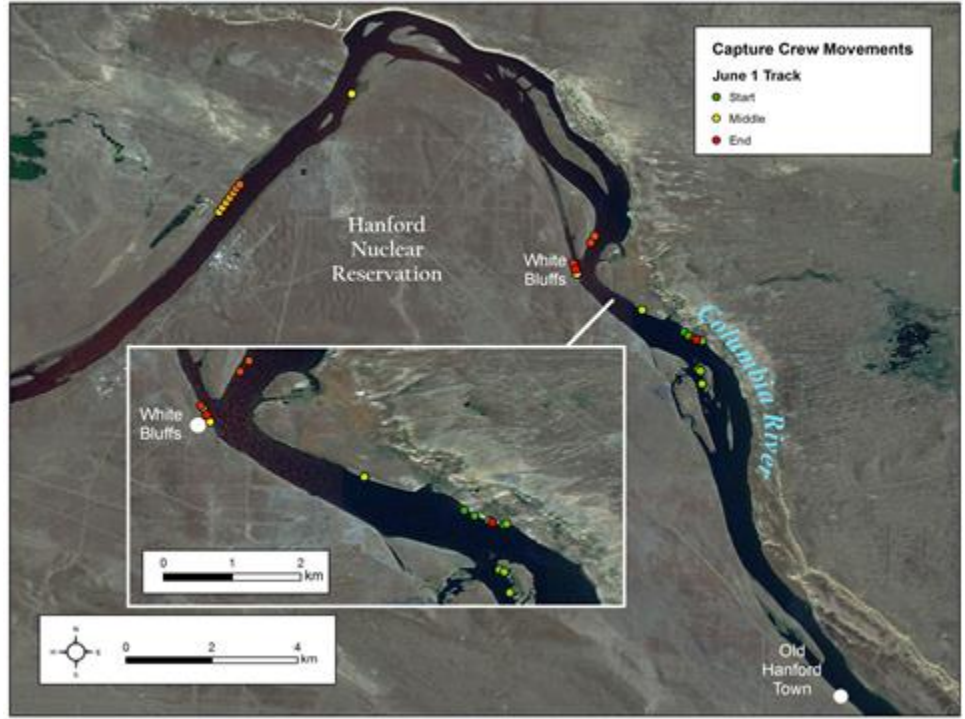
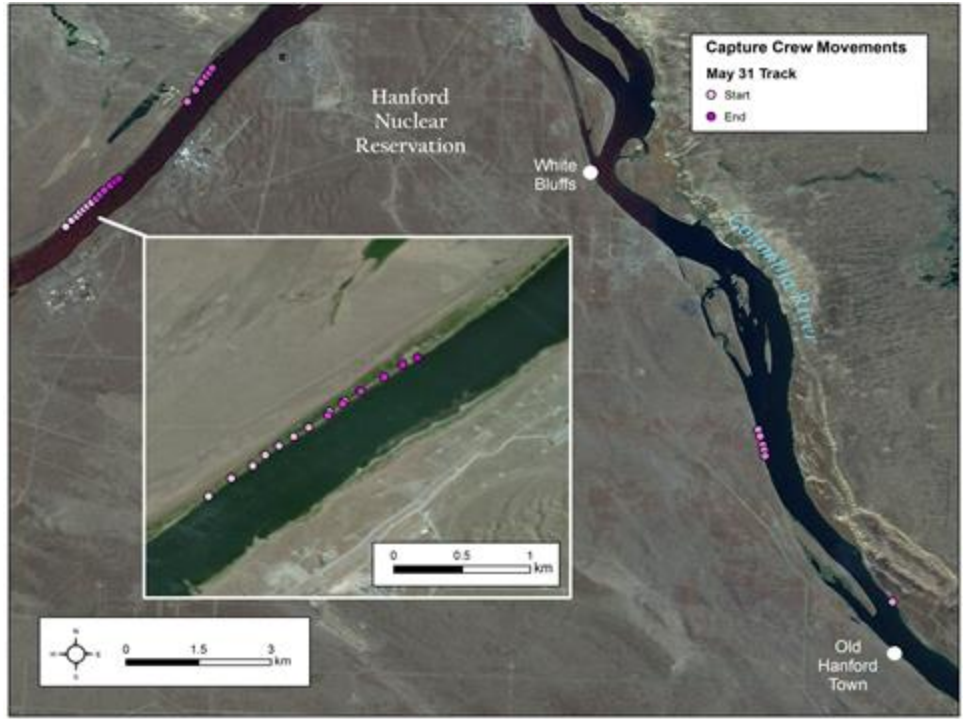


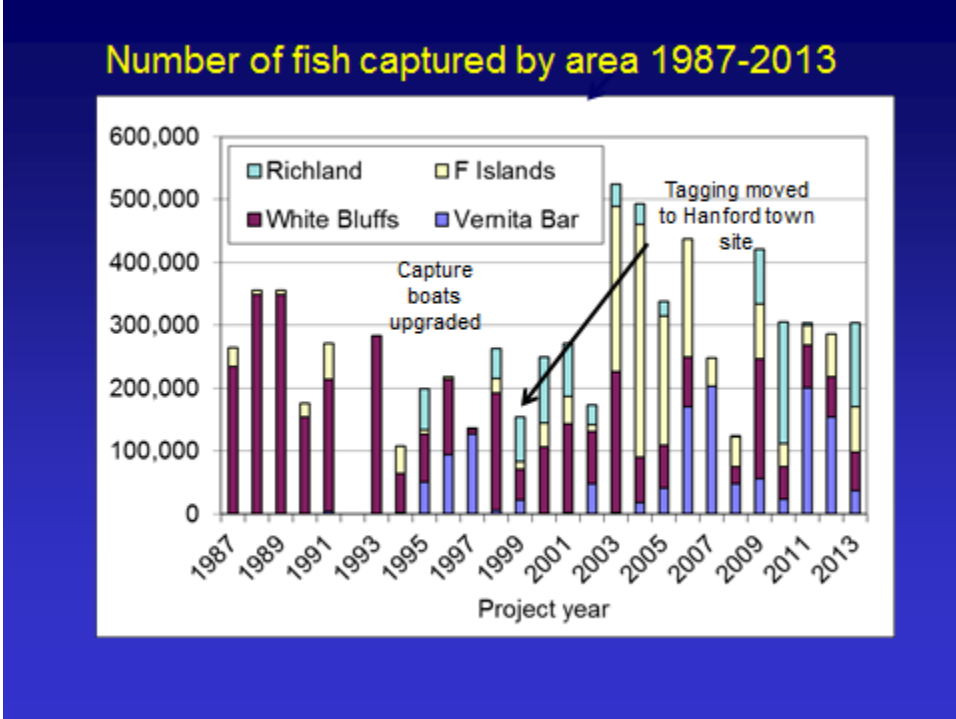
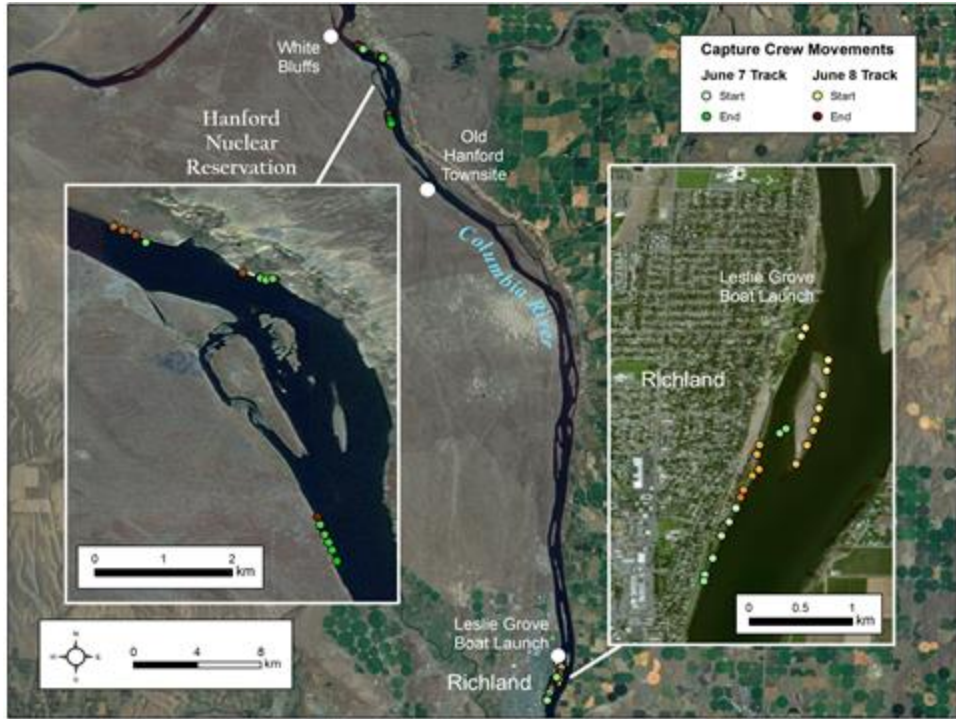
Daily 2013 tag output and mortality



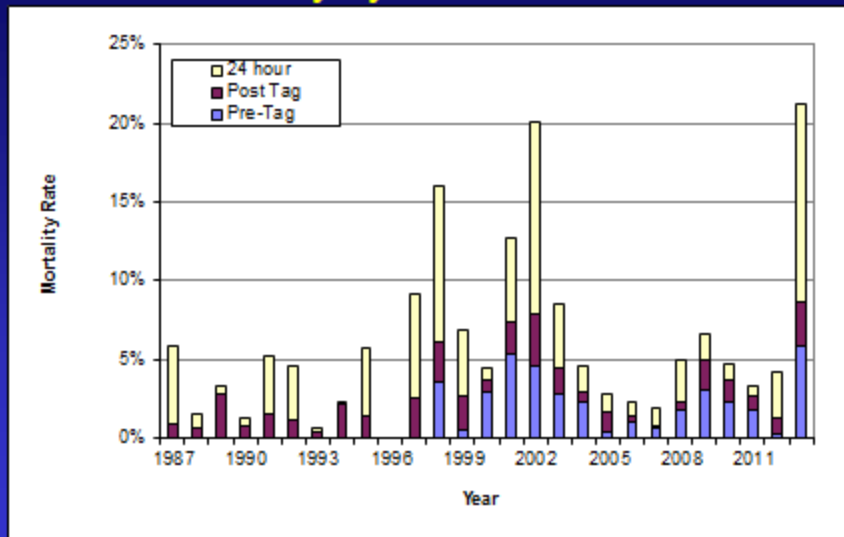
Number of Fish Tagged under two scenarios







Mortality by Year at Hanford



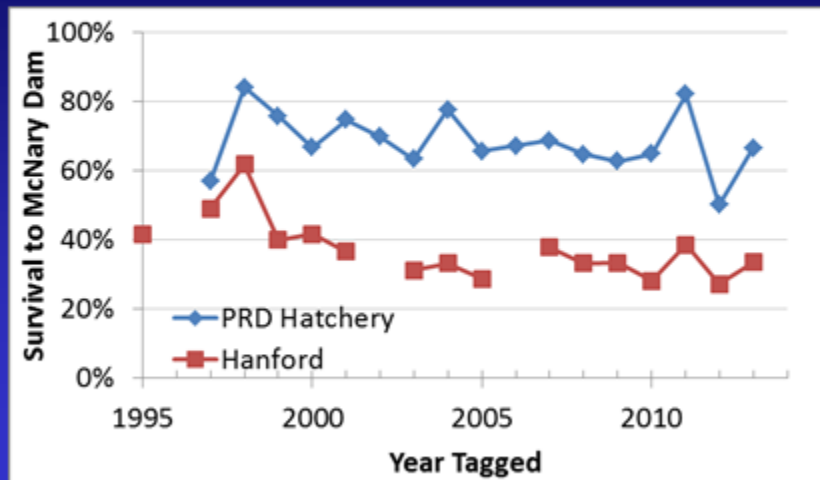
2013 PIT tagging

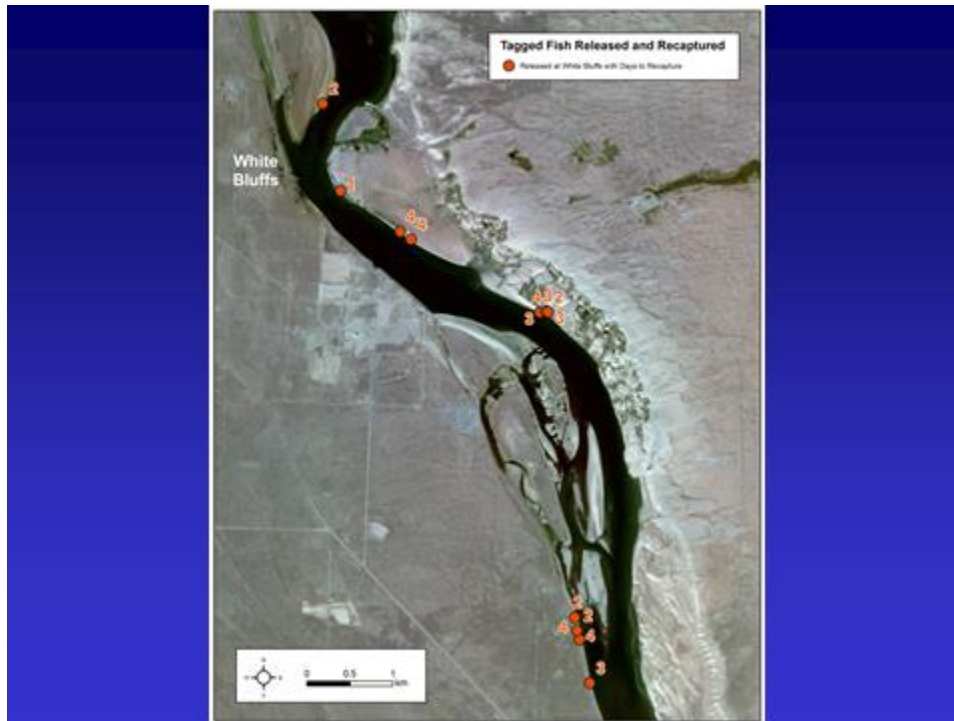
- Tags and some funding provided by Grant PUD
- Dave Marvin had some training from Biomark, but otherwise no experienced taggers. (Paul Hoffarth and Steve Richards from WDFW)
- Chinook were coded wire tagged, held overnight and PIT tagged
- PIT tagged Chinook were released at White Bluffs and Hanford townsites.

2013 PIT tagging Results (preliminary)

- Total Tagged: 5,509
- Mortality Rate: 24.8% (excluding last day, 15.7%)
 - Compares to 3.2% in 2012 and 1.5% in 2011
- Total Released:
 - Hanford: 3,027
 - White Bluffs: 1,114
- Survival to McNary:
 - All releases: 33.5% (66.4% PRDH)
 - Hanford: 33.4%
 - White Bluffs: 34.3%
- Harmonic Mean Travel Time
 - To McNary 29.0 days (15.6 PRDH)
 - To John Day: 31.4 days (18.6 PRDH)
 - To Bonneville: 34.8 days (21.4 PRDH)

Survival to McNary Dam of juvenile Chinook tagged at Hanford and PRDH







Conclusions

- Project came close to coded wire tagging and PIT tagging goals, however mortality was way too high.
- Project hampered by high flows and low abundance on the Reach.
- Mortality increased when we started capturing fish downstream in North Richland due to low abundance.
- High temperatures were likely a contributing factor for CWT mortality
- Could ferrying fish have contributed to high mortality?
- High temperatures, crude facilities, poor fish condition, and an inexperienced crew were factors in PIT tag mortality.

2014 CWT Project Changes

- Additional PSC funding (for 2014 only) will allow an additional crew plus additional day which should mean a much better opportunity to reach the goal and decrease the pressure to maximize fishing, to the detriment of the fish.
- Batelle has offered the use of two recovery troughs which should allow for better holding conditions for tagged fish as well as less handling. We'll also be able to hold all fish for nearly 24 hours to better estimate 24 hour mortality. This will be a big improvement over past conditions which may exaggerate 24 hour mortality.
- Extend hoses in river to access deeper water.
- Use a chiller or ice for anesthetic

2014 PIT tagging (funds/tags permitting)

- Hire an experienced PIT tagger (Biomark?)
- Plumb in water supply from trailer for holding, either use ice or a chiller for anesthetic.
- No double tagging in same day; reconsider issue of double tagging in general.

