

PRCC Hatchery Subcommittee Meeting

Thursday, July 24, 2014
Wenatchee, Washington
Meeting Summary

PRCC HSC Members

Bill Gale, USFWS
Peter Graf, GPUD
Lynn Hatcher, NMFS
Keely Murdoch, Yakama Nation
Todd Pearsons, GPUD
Mike Tonseth, WDFW
Kirk Truscott, CCT

Other Participants

Mike Ford, NOAA*

Elizabeth McManus, Facilitator
Andy Chinn, Facilitator

* For agenda items II and III only

Decisions

- A. Approved the May meeting summary and June conference call summary.
- B. Approved the 2014-2015 Priest Rapids Hatchery M&E implementation plan.
- C. The following reports were finalized: Wenatchee M&E report, NTTOC report, Screw trap reports

Actions

1. GPUD will present both the gene flow based pNOB and conventional pNOB calculations in the Priest Rapids Hatchery Monitoring and Evaluation Report.
2. GPUD will discuss a pilot mating strategy for this year with NOAA and will develop a proposal for HSC consideration in September.
3. HSC members will provide comments on the Mike Ford et al. draft manuscript on estimating rates of straying of wild salmon using parentage based tagging.
4. YN will consider whether to elevate the draft SOA on composite on Nason Creek composite broodstock collection to the PRCC through the dispute resolution process.
5. GPUD will instruct tangle netting crews to begin keeping record of number of fish that escape during netting.
6. GPUD will discuss internal staffing capacity to convene or participate in a smolt trap meeting.
7. GPUD will draft an SOA on the NTTOC report to fulfill Objective 10 of the M&E plan.
8. HSC members will provide comments on the draft 2015 Wenatchee M&E implementation plan by 8/21.
9. GPUD will circulate the draft 2015 White River acclimation plan with the HSC.
10. CCT will circulate its Chief Joseph hatchery program workshop report with the HSC (status: carried over from April meeting summary).
11. GPUD will look into options for HSC document storage and access (status: in progress).

HSC Meeting Summary

I. Updates and Meeting Summary Review

- A. **PAC Update** – ACOE is working on a letter in response to GPUD and CCT questions about John Day and Dalles mitigation.
- B. **PRCC Update** – The PRCC decided to dismantle and remove the release pipe and infrastructure at Rocky Coulee, so that the smaller holding pond can be used to hold for NORs and fish collected through hook and line. Given this year's passage of spring Chinook, sockeye, and summer Chinook, the PRCC does not anticipate a need for trap and haul operations around Wanapum Dam.
- C. **Fall Chinook Working Group** – Peter Graf is the new GPUD lead for the Fall Chinook Working group.
- D. **Meeting Summary Review** – HSC approved the May meeting summary and June conference call summary.

II. Priest Rapids Hatchery

- A. **Alternative Mating Strategies** – GPUD requested feedback on two central questions to inform alternative mating strategies. These questions and background information about the need for balancing genetic risks at Priest Rapids Hatchery were distributed to the HSC and their respective geneticists. The questions are listed below, and comments specifically related to each question are listed below the question.

Is the gene flow based Proportion of Natural Brood (pNOB) metric described in this document a better metric than the conventional pNOB for inclusion in the calculation and reporting of PNI for Priest Rapids Hatchery?

- NOAA commented that using gene flow based pNOB sounds like a reasonable approach. However, if the mating strategy focuses on wild by hatchery mating then there will be two matings, with the possibility for epigenetic environmental paternal or maternal effects that could vary depending on the directionality of the cross; if the strategy will be based on a single direction with respect to the sex of the fish, GPUD should note this.
- YN stated that based on YN geneticists review, gene flow based pNOB appears to be a valid alternative pNOB calculation. Whether it is a better calculation is difficult to determine.

What ratio of natural origin male to hatchery origin female spawners (e.g., 1:1, 1:2, 1:4, 1:6, 1:10) would pose the best balance of genetic risks at Priest Rapids Hatchery (e.g., domestication, effective population size, Ryman-Laikre, other) when access to natural origin spawners is limited?

- NOAA commented that it was not possible to answer this question at this time. Based on available data for wild populations where PBT has been used to look at

mating patterns, a 1:10 has not been observed. Normally both males and females mate with multiple partners; a female might mate with up to 6 males. In terms of emulating what is happening in the wild, it is best to avoid high ratios as this would quickly result in loss of effective population size.

- GPUD noted that most of the reproductive success literature has been on spring Chinook, which might have different dynamics than the mass spawning that occurs in the Hanford Reach. GPUD has run preliminary estimates of effective population size and it is massive, which is why the risk balance comes into play; for a “normal” spring Chinook program size, a high spawner ratio would not be considered. GPUD is interested in the genetic risks associated with high spawner ratios.
- NOAA commented that balancing genetic risks would be difficult to quantify. For effective size, one approach is to determine the spawner ratio needed to meet PNI goals and estimate the consequence on effective size. If there is little effect, it is probably worth implementing in order to increase PNI.
- YN stated that based on experience with parentage studies, wild males will mate with multiple females. YN could support a 1:4 spawner ratio but not 1:10. YN suggested looking into a factorial mating scheme to increase the number of genetic combinations.
- GPUD is considering an operational pilot implementation of using a higher spawning ratio. During 2014 there will be a real-time pilot of otolith reading at the hatchery for one week during peak spawning, so the pilot could be concurrent with that activity.
- CCT noted that, with an integrated program, the running average PNI in the Hanford Reach should be higher than 0.5, on the assumption that for any number above 0.5, wild genes are driving gene flow. However, it is difficult to quantify how much “better” a PNI of 0.8 is (for example) than 0.5. Also, factorial spawning can be extremely difficult, especially given the large numbers of fish observed at Priest Rapids.
- NOAA commented that in theory it is more advantageous to maximize the number of wild fish in a broodstock; the problem is that there is no molecular genetic marker to differentiate wild from domesticated genes.

B. 2014-2015 M&E Implementation Plan – After further discussion with GPUD, CCT is satisfied with the M&E plan as written, provided that GPUD includes the 100 otolith samples from Chief Joseph with sufficient time to sort any natural origin Priest Rapids fall Chinook. GPUD will provide a table that identifies mark and tag combinations by brood year so that CCT can notify staff on the spawning grounds and at the Chief Joseph ladder.

C. Path Forward and Next Steps

- GPUD will present both the gene flow based pNOB and conventional pNOB calculations in the Priest Rapids Hatchery M&E report.
- GPUD will discuss a pilot mating strategy for this year with NOAA and will develop a

proposal for HSC consideration in September.

III. Composite Broodstock Collection

A. Draft Straying Manuscript – Mike Ford provided a presentation on a draft manuscript on estimating rates of straying of wild salmon using parentage based tagging. Key points included:

- Every natural origin stray in the study had at least one hatchery origin parent.
- Out of 170 inferred wild by wild crosses in the study, all of the fish returned to their natal spawning area.
- Stray rates among spawning areas are highly variable (1% - 100% depending on area). This could be due to factors such as habitat quality or proportion of hatchery fish.
- Natural offspring of hatchery parents strayed more than second generation natural fish. Potential causes include spawning location effects and epigenetic effects.
- There is consistency between direct and indirect estimates of gene flow.
- The study did not examine the statistical interaction between parental origin and spawning tributary, as there was not enough data for that analysis.
- Heritability of homing is not known and there is likely not enough data to compare differences in homing and straying rates among families.
- Strays from Nason Creek tended to stray to the Chiwawa more than any other area, but this could be simply due to geography.
- Chiwawa hatchery fish stray at a significantly higher rate than natural origin Chiwawa fish, but they stray almost entirely to Nason Creek.
- The straying analysis is a side project to the overall goal of evaluating reproductive success of natural versus wild fish. The next question to address is whether there is a fitness cost to straying. NOAA and others are working on that and will develop a manuscript analyzing factors influencing relative reproductive success and whether a fish is a stray or not. There will also be more detailed information on the effect of habitat and density on reproductive success.

B. Discussion

- YN commented that size and age at which fish leave their spawning tributary could be a factor; fish that spawn near the mouth of a river may leave earlier than fish farther upstream.
- GPUD asked whether the samples were analyzed to see if patterns remained consistent across years or if the pattern was being driven by a single anomalous year. NOAA replied that this was not done but could be statistically calculated with the available information.
- GPUD noted that during the Grand Coulee fish maintenance project, all fish were spawned in Nason Creek; this would imply that all other spring Chinook in the upper Wenatchee are strays and the Nason Creek fish should have the highest homing fidelity.

- WDFW noted that in 2014 the Chiwawa weir is operating under a schedule of 24 hours up, 24 hours down, so the maximum potential delay for any individual fish is about 24 hours. It appears that wild fish will wait for the weir to drop, while hatchery fish appear to have much lower tolerance for a barrier to be up. This could be a result of imprinting, where hatchery origin fish might need stronger imprinting cues to improve fidelity.
- USFWS commented that the manuscript does not discuss concerns with hatchery fish straying into small receiving populations.

C. SOA on Nason Creek Composite Broodstock Collection – HSC members voted on the most recent version of the draft SOA on Nason Creek composite broodstock collection.

- CCT, YN and USFWS voted to approve.
- NOAA voted to approve and also noted that the final Section 10 permit could be highly prescriptive.
- WDFW reiterated concerns that the SOA lacked language indicating that all efforts to minimize impacts to other spawning aggregates would be made, if compositing were to move forward. WDFW voted against approving the SOA.
- YN noted that adding language as WDFW indicated would limit the options that NOAA could evaluate, and NOAA’s intent is to look at the populations as a whole.
- GPUD commented that it is still seeking clarity as to whether compositing will be automatically implemented if found permissible by NOAA, or if further HSC discussion would be required. GPUD chose to abstain from voting on the SOA.

D. Path Forward and Next Steps

- HSC members will provide comments on the Mike Ford et al. draft manuscript on estimating rates of straying of wild salmon using parentage based tagging.
- YN will consider whether to elevate the draft SOA on Nason Creek composite broodstock collection to the PRCC through the dispute resolution process.

IV. Fall Chinook Permit Coverage

- A. ACOE Fall Chinook Production at PR Hatchery** – A final NMFS letter confirming permit coverage should be issued during the week of 7/28.

V. Nason Creek Tangle Netting

- A. Update on Activities** – GPUD is generally tangle netting on Mondays, Tuesdays, and Thursdays and will notify HSC members if the schedule changes.

- YN commented that Chewuch tangle netting seemed to be relatively harmless, with some de-scaling and a small amount of time in nets. However, some fish escaped and there is the possibility of harassing the same fish if tangle netting is performed in the same pools.

B. Path Forward and Next Steps

- GPUD will instruct tangle netting crews to begin keeping record of number of fish that escape during netting.

VI. Wenatchee M&E Plan Report

- A. Report Status** – The schedule for the Wenatchee M&E Plan Report was clarified via e-mail with HSC members prior to the meeting, additional time for review was provided, no comments were received, and the report is now final.

VII. Rotary Trap Reports

- A. Report Status** – There were no comments on the 2013 rotary trap reports, so they are now considered final.
- YN noted that there is still interest in convening a smolt trap meeting to discuss additional analysis that can be performed to fill data gaps.
 - CCT commented that tribal staff would also benefit from participation in a smolt trap meeting.
 - YN commented that the Nason Creek trap was relocated downstream on 6/25 and the number of fish trapped increased dramatically; a direct efficiency comparison should be possible by fall 2014.
- B. Path Forward and Next Steps**
- GPUD will discuss internal staffing capacity to convene or participate in a smolt trap meeting.

VIII. NTTOC Report

- A. Report Approval** – **The HSC approved the NTTOC report that was previously approved by the HCP committees.**
- B. Schedule for SOA Approval** – GPUD would prefer a parallel approval path with the HCP for approving an SOA about fulfilling objective 10 of the hatchery M&E plan; the report was approved by the HCP and CPUD will draft an SOA stating that the report fulfills objective 10, subject to change if new information or analysis warrants. A similar SOA will be prepared for the HSC.
- USFWS requested that the background section of the GPUD SOA note that cutthroat and lamprey were not fully evaluated as NTTOC due to lack of information.
 - GPUD agreed to the addition from USFWS and noted that risks for cutthroat are low and cutthroat have been demonstrated to be within the containment objective.
- C. Path Forward and Next Steps**
- GPUD will draft an SOA on the NTTOC report fulfilling objective 10.

IX. Wenatchee Implementation Plan

- A. Schedule for Report Approval** – The draft 2015 Wenatchee implementation plan was circulated to the HSC on 7/24. The primary difference between the 2014 plan and the 2015 plan is inclusion of Methow summer Chinook. HSC members agreed to a slightly less than 30 day approval schedule for the plan in order for final approval to coincide with the August HSC meeting.

B. Path Forward and Next Steps

- HSC members will provide comments on the draft 2015 Wenatchee implementation plan by 8/21.

X. White River Acclimation

A. Draft 2015 Acclimation Plan – The draft 2015 White River acclimation plan is under development. Survival estimates from the previous year indicate 95,000 smolts on hand, 34,000 of which are in the low titer group. All of the low titer group will serve as part of the size target study and be placed in tanks at the Bridge site; the remaining high BKD fish will be placed in four net pens in Lake Wenatchee. The acclimation plan will include a table detailing PIT tag distribution among these groups.

B. Path Forward and Next Steps

- GPUD will circulate the draft 2015 White River acclimation plan with the HSC.

XI. Wanapum Dam

A. Status of Fish Passage – Summer Chinook appear to be doing well. 580,000 sockeye have passed over Priest Rapids and 525,000 at Rock Island Dam. GPUD was concerned that the large number of sockeye, combined with summer Chinook passage, would lead to a stack up of fish at the modified ladders, but this did not occur. Lamprey have been using the ramps; some slid down and some attached to the ramp. GPUD tagged and released some lamprey in the Wanapum ladder and GPUD is also trapping and hauling lamprey from Priest Rapids and Wanapum, and hauling them above Rock Island Dam.

XII. Wrap Up and Next Steps

A. Next Meeting: Thursday, August 21, 2014

B. Potential August Meeting Agenda Items

- Composite broodstock collection
- Nason Creek tangle netting
- Wenatchee implementation report
- NTTOC report SOA
- White River 2015 acclimation plan
- Wanapum Dam update

Meeting Materials

The following documents were provided to HSC members in advance of this meeting:

- July meeting agenda
- Revised Nason Creek SOA
- Draft 2015 Hatchery M&E Implementation Plan
- Appendix G for draft 2013 Hatchery M&E Report
- Draft manuscript: “Using parentage analysis to evaluate factors influencing rates of straying and

homing in Chinook salmon

- June Nason Creek rotary trap summary
- June White River rotary trap summary
- June PRH M&E update