

PRCC Hatchery Subcommittee Meeting

Thursday, October 20, 2016

Via Conference Call

Meeting Summary

PRCC HSC Members

Matt Cooper, USFWS

Bill Gale, USFWS

Peter Graf, GPUD (alt)

Keely Murdoch, Yakama Nation

Todd Pearsons, GPUD

Mike Tonseth, WDFW

Justin Yeager, NOAA

Other Participants

Brian Lyon, WDFW

Deanne Pavlik-Kunkel, GPUD

Elizabeth McManus, Facilitator

Andy Chinn, Facilitator

Decisions

A. HSC members approved the September conference call summary.

Actions

1. GPUD will provide final formatting for the 2015-2016 Priest Rapids Hatchery Annual M&E Report and post the report to the GPUD external website. Ross Strategic will upload the final report to the HSC SharePoint site.
2. Keely will contact YN staff to notify them that use of Rolings Pond as a contingency transfer location for Nason fish is still an option and could require setting up the pond to receive fish on short notice.
3. WDFW will draft and circulate a Nason Creek Acclimation Facility emergency action plan for HSC review.
4. Ross Strategic will follow up with HSC member registration for GPUD's SharePoint site and troubleshoot SharePoint issues as needed (carried over from previous meeting).

I. Updates and Meeting Summary Review

- A. Fall Chinook Working Group** – The FCWG will meet on 11/1. The Hanford Reach spill program began 10/1. Spawning ground surveys have begun at Vernita Bar. Mike Lewis (WDFW) has expressed interest in potential earlier fish release from Priest Rapids Hatchery. Current release timing (approximately third week of June) is to facilitate CWT tagging in the Hanford Reach; however, combined with warmer recent years (and potential for continued warming in the future), an earlier release may be warranted. CRITFC is currently CWT tagging in the Hanford Reach so there is some consideration around how this will affect those activities. If the FCWG sees no issues with earlier releases from PRH this proposal may be brought before the HSC. PRH fish will still need to reach size at release targets.
- B. HCP-HC** – Please refer to the 10/19 HCP-HC meeting summary for joint HCP-HC and PRCCHSC discussions (Appendix A).

- C. **September Conference Call Summary** – HSC members approved the September conference call summary.

II. **Permit Updates**

- A. **NOAA/USFWS** – A consultation strategy meeting took place on October 11, during which interested parties discussed several issues. NOAA appreciated the comments received on the environmental assessment.

III. **Priest Rapids Hatchery**

- A. **Draft 2015-2016 Priest Rapids Hatchery Annual M&E Report** – There were no HSC comments on the draft report so the report is now final.
- B. **Next Steps**
 - GPUD will provide final formatting on the 2015-2016 Priest Rapids Hatchery Annual M&E Report and post the report to the GPUD external website. Ross Strategic will upload the final report to the HSC SharePoint site.

IV. **Nason Acclimation Facility**

- A. **Facility Status** – Electrical and water supplies for the primary intake are connected and full facility testing is scheduled to commence on 10/21. The boom hoist for the backup system has been delayed and may not be installed until the week of 11/21, which will result in a gap between full facility operations and availability of the backup system. GPUD engineers are working on options to deploy the backup system in the absence of the boom hoist.
 - WDFW noted the potential risk if there are issues with the main intake and the backup is not available, and the need for a contingency plan for the 120,000 Nason fish.
 - There is groundwater available at Nason but it is oxygen-poor and would require oxygenation or nearly 100% supplemental oxygen.
 - GPUD reminded HSC members that the intake screen was the only major component replaced at NCAF and therefore there is high confidence that the facility will operate as expected.
- B. **Next Steps**
 - Keely will contact YN staff to notify them that use of Rolfings Pond as a contingency transfer location for Nason fish is still an option and could require setting up the pond to receive fish on short notice.
 - WDFW will draft and circulate a Nason Creek Acclimation Facility emergency action plan for HSC review.

V. **Wrap Up and Next Steps**

- A. **USFWS Representation:** Matt Cooper will be the primary HSC representative and Bill Gale will be the alternate for the next six months or so.

B. Next Meeting: Thursday, November 17, 2016

C. Potential October Meeting Agenda Items:

- Sockeye presentation from ONA
- 2016 NCAF spring Chinook acclimation facility status
- Precocious male evaluation

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– Meeting Materials

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

- September meeting summary
- September PUD hatchery progress report
- September PRH update
- September White River rotary trap summary □ September Nason Creek rotary trap summary

[adjourned]

Appendix A: Joint Item Discussion Summary from September 2016 HCP Hatchery Committee Meeting

II. Joint HCP-HC/PRCC HSC

A. USFWS Consultation Update (Bill Gale)

Bill Gale said he does not have any updates specific to USFWS consultation. He said he has an update on USFWS Hatchery Committees representation. Gale said regional USFWS leadership has asked him to be available to work on a 10-year implementation plan. For that reason, he and Matt Cooper are switching roles on the Hatchery Committees for approximately 6 months. He said he will be the alternate and Cooper will now be the representative. This change will be recorded in a letter from USFWS to the HCP Hatchery and Coordinating Committees.

Gale asked Tracy Hillman and Sarah Montgomery to add Michael Humling to the Hatchery Committees cc: email distribution list. Montgomery said she will check on the requirements for providing access to Humling and follow up with Gale and Humling.

Gale asked the Hatchery Committees if the USFWS Consultation Update should continue to be a standing agenda item for Hatchery Committees meetings. Hatchery Committees representatives present responded yes. Hillman added he provides updates to the Coordinating Committees regarding Hatchery Committees discussions, and he believes the consultation updates are helpful to the Coordinating Committees.

B. NMFS Consultation Update (Justin Yeager)

Regarding the Methow spring Chinook salmon consultation, Justin Yeager said NMFS received comments on the draft Environmental Assessment, and Yeager thanked the Hatchery Committees for their input.

C. Embryonic Imprinting (Keely Murdoch)

Todd Pearsons said he is still working to confirm why the third year of data for the Issaquah Fish Hatchery (FH) embryonic imprinting study were not reliable, and he suspects it is related to unclear otolith signatures. Keely Murdoch said representatives should discuss today whether to move forward with a plan to test embryonic imprinting, or develop a plan to test sequential imprinting, which may depend on the Wells Fish Hatchery rebuilding. She said having the full dataset from the Issaquah FH study would be helpful, but the Hatchery Committees can still move forward with what they know. Pearsons said he did find a short draft progress report for the Issaquah FH study; however, no interpretation of the third year of results was offered in the report.

Pearsons recalled that Murdoch had drafted a pre-proposal that Hatchery Committees members provided feedback on, and said that document might be useful to look at for this discussion. Catherine Willard shared the latest version of Murdoch's proposal "Draft Chewuch Homing Study Proposal (Grant PUD comments)," which Montgomery distributed to the Hatchery Committees on April 20, 2016 (Attachment B). Pearsons said the Hatchery Committees already have a version of a homing study—the Goat Wall Acclimation Study. Greg Mackey said it would take a minimum of 5 brood years to see results from a homing study, and a power analysis would be required to see how large a sample size would be required to produce meaningful results. He said, because the best means of monitoring homing is through coded-wire tags, results will also depend on rates of carcass recovery. In addition, many years of data are necessary because stray rates vary annually and studies must wait for entire cohorts to return. Pearsons asked if there are enough available fish to perform the Goat Wall Acclimation Study and a second imprinting study for a long enough time period for both studies. Murdoch said the Goat Wall Acclimation Study includes only 25,000 fish from the Methow FH release, and the study would be consistent with the sequential imprinting theory in that fish spawned and reared at Methow FH are final acclimated further upstream in the same tributary and released. She said she also thinks a group of fish outplanted in the Chewuch River would make sense for studying embryonic imprinting. Bill Gale said the Goat Wall release is only 25,000 fish, which may be too small of a release to return enough adults to assess a level of difference between groups.

Willard asked if the Goat Wall study was designed to specifically address spawning distribution and not homing fidelity. Mackey said they could be studied simultaneously because both metrics are about fish seeking natal areas, as long as the cutoff point for homing is defined. Murdoch said incorporating the Goat Wall study into assessing homing fidelity has potential. Tracy Hillman said some of the earlier discussions Hatchery Committees members had in 2016 focused on embryonic or sequential imprinting, the equipment needed to conduct a study, which fish to use, and the timeline related to the Wells FH remodel. Mike Tonseth added that Hatchery Committees members should also consider statistical and biological meaningfulness and whether appropriate escapement objectives should be considered. Mackey said, regarding biological significance, there is always a chance of type II error, which is failing to reject the null hypothesis when it is in fact false. Having a large enough sample size will help avoid type II errors. Hillman said Mackey has previously conducted power analyses and found the sample size or sampling intensity must be high.

Pearsons asked the Hatchery Committees what their objectives are for studying homing and straying. He said the embryonic imprinting results from the Issaquah FH study are not very satisfying (note: Issaquah results from year 1: 85% homing, year 2: 42% homing, and year 3: no

results); therefore, it is necessary to consider program objectives and desired homing rates, or the desired number of fish spawning in the Chewuch River. Mackey said the defined straying and homing objectives are merely a way to ensure sufficient fish return to spawning grounds. Justin Yeager said the recovery plan defines the number of fish that should return to spawning grounds for each major spawning group. Based on the recovery standards, there should be a minimum of 20 redds from natural-origin crosses in the Chewuch River, or there should be at least 5% of the total number of redds in the population. Hillman read the Methow spring Chinook salmon criteria from the recovery plan stating, "Naturally produced spring Chinook salmon spawning will occur within the Twisp, Chewuch, and Upper Methow major spawning areas. The minimum number of naturally produced spring Chinook salmon redds within each major spawning area will be either 5% of the total number of redds within the Methow subbasin or at least 20 redds within each major area, whichever is greater." Mackey asked if there is a spawner escapement target for the Methow population. Yeager responded the target is 2,000 natural-origin spawners for the Methow population, and Tonseth pointed out that 20 redds or 5% of the total number of redds does not match up well with 2,000 total spawners in the basin. Pearsons said 20 redds or 5% of the total number of redds is a minimum threshold, which contributes to the spatial distribution of the population, not a threshold for abundance and accounting for recovery at the basin-scale. Kahler added that the probability of natural-origin fish spawning with hatchery-origin fish is high when pHOS is high, and asked whether the redds are called "natural-origin" if they only have a natural-origin female spawner rather than both parents of natural origin.

Gale said the Hatchery Committees know the number of natural-origin spawners in the population in previous years and expected number in a current year. He said combining that information with the allowable number of hatchery fish derived from pHOS targets would drive calculations of the number of adult hatchery fish to release and proportionate natural influence (PNI). He said it is important to start calculations at known values instead of back-calculating from goals. Murdoch said YN wishes to see conservation fish spawning in areas where they will be productive and return natural-origin fish. She said releasing fish directly from hatcheries does not help to reach abundance goals for natural-origin spawners. She said the first step should be determining how many hatchery-origin fish can be put in areas such as the Chewuch River, then using the best available science to acclimate those fish. She said she suspects the number of allowable hatchery-origin fish in spawning areas such as the Chewuch River based on PNI and pHOS goals will not be high enough to perform an analysis using imprinting technology.

Mackey said another option that might achieve the same goal reliably would be to truck-plant hatchery origin adults removed during gene flow management into the Chewuch River. He said fish behavior could be studied with radio tags, and this study would produce results faster, with

greater control and reliability, than other methods proposed. He said Douglas PUD is interested in the scientific concept of improving homing by imprinting on natal water, but conducting basic science is not in the mission of the PUDs and prefers to implement established science instead of testing it. Murdoch recalled that Andrew Dittman (National Oceanic and Atmospheric Administration [NOAA]) doubted how well embryonic imprinting would work with the Methow program because of its geography. She said she thinks testing sequential imprinting is more likely to produce meaningful results.

Tonseth said Mackey's idea of adult outplanting in the Chewuch River instead of acclimating juveniles is an easy and relatively inexpensive way to put hatchery spawners on spawning grounds. Murdoch said, in 2010, YN tested adult outplanting of coho salmon in Nason Creek and took genetic samples of juveniles. She said 35% of coho salmon juveniles in Nason Creek from that brood year genotyped back to the outplanted adults, which was higher than they expected. She said it appeared the outplanted adults spawned in Nason Creek. Hillman asked where adults for outplanting in the Chewuch River would be captured. Mackey said these fish could be adults that swim into the Methow FH and would otherwise be adult-managed. Murdoch suggested adding a genetic analysis component to the study. Mackey said a visible tag, such as a Floy tag, could also be used because M&E staff conduct spawner surveys in these areas on a weekly (or more frequent) basis. Willard said there are also passive integrated transponder (PIT)-tag arrays in the Chewuch River. Murdoch advised that spring Chinook salmon hold longer than other fish before spawning, so they should not be placed on the spawning grounds too early in case they return to the hatchery instead of staying to spawn.

Gale asked if this group of fish would have to be held separately at the Methow FH. Tonseth said he thinks staff are able to keep the fish separate, which may be necessary in order to perform broodstock checks. He cautioned there are limits to tagging, drugging, and releasing fish, so those factors must be considered.

Willard volunteered to convene a subgroup made up of interested representatives to draft a study plan in November. Kahler said the draft study plan will be modulated by the pHOS issue Gale described earlier; therefore, the plan will change in-season with information about the number of natural-origin fish returning to the Chewuch River.

Kirk Truscott said the homing fidelity of Chewuch-released fish returning to the Chewuch River is highly variable. He said staff cannot genetically differentiate natural-origin returns between the Chewuch and Methow rivers. He asked how they plan to calculate the number of fish to outplant in order to still meet pHOS targets. Tonseth said the number of PIT-tagged hatchery-origin fish

from the Chewuch River returning is known starting at Priest Rapids Dam. In addition, PIT-tag arrays in the Chewuch River mean that they can calculate the number of fish to outplant very close to spawning time. He said, for natural-origin fish, proportions change frequently, but historical numbers can be referenced. Kahler added that the study plan could also involve waiting until spawning starts, and outplanting in areas that are not being utilized.

D. Genetic Sampling for HCP Program Species Timeline (Mclain Johnson)

Mclain Johnson said Objective 7 of the 2013 M&E Plan for PUD Hatchery Programs lists three monitoring questions that ask if hatchery programs have genetic impacts on natural stocks. He said he was tasked with locating and comparing samples that will help address these questions. He said his team inventoried the WDFW and NOAA genetics laboratories, then compiled all data into a spreadsheet, which he displayed on screen and said he will later distribute to the Hatchery Committees. He said the spreadsheet he developed starts with data from 1979 when some of the hatchery programs began. He showed Hatchery Committees members the contents of the spreadsheet, and they provided feedback and asked questions.

Todd Pearsons asked if fall Chinook salmon would be included in the spreadsheets. Tonseth said fall Chinook salmon samples are collected as part of the CRITFC sampling. Keely Murdoch volunteered to research who is leading CRITFC's parentage-based tagging effort and coordinate with Johnson. Mike Tonseth added that for any WDFW-operated programs, samples are stored at the WDFW laboratory and shared with the CRITFC laboratory by splitting the sample in most cases.

Johnson said they also assembled available genetic reports for each stock. He said the purpose of making this spreadsheet was to organize available data and to identify where different programs are in the 10-year genetic analysis cycle. He said this will help coordinate analysis efforts, help decide whether to upgrade some microsatellite marker analysis methods to single nucleotide polymorphisms (SNP) analysis methods, and help stagger analyses and reporting years within the 10-year framework.

Greg Mackey said genetic analyses were scheduled for every 5 years in the original M&E Plan. The Hatchery Committee decided to extend this interval to every 10 years during the updated of the M&E plan in 2013 because the 5-year interval was thought to be too short to detect any meaningful changes in population genetics metrics. Tonseth said it has also been discussed that three generations (approximately 15 years) may be a more appropriate analysis interval, but it would likely depend on the size of the program. He said, for small programs such as Endangered Species

Act (ESA)-listed stocks and recovery programs, genetic change could occur more frequently. Regarding the analysis methodology, Tonseth said a lot of baseline genetic information for these programs is based on microsatellite analyses. The options are to continue running microsatellite analyses, switch to SNP analysis, or switch to SNP analyses and also rerun old samples with SNP analyses. Johnson said SNP analyses produce panels with a lot of information, and would be more likely to finding small genetic effects. Pearsons asked about the abundance of past tissue samples. Tonseth replied there is plenty of fish tissue to perform many analyses on older samples. Mackey added that the DNA can also be saved between analyses. Johnson said rerunning past samples with SNP analyses may change the timeline for conducting genetic analysis, so he will revise the timeline before distributing it to the Hatchery Committees for review. Bill Gale said he is interested in aligning these sampling efforts with genetic monitoring work at Winthrop FH, and he would also like to include the USFWS Abernathy Fish Technology Center so the same panels can be run in the same years.

Johnson summarized that in relation to the M&E Plan; one genetic analysis panel answers all three questions under Objective 7. Mackey said regional coordination is also required by Question 7.2.1. He said, in order to estimate genetic distance among populations, analyses are conducted on a set of populations within a region. In addition, an outgroup is also normally used to anchor the genetic distances within the region. He said it would make sense to perform sampling and analyses regionally to address populations that are potentially affected by the various hatchery programs.

Tom Kahler said Okanogan Nation Alliance has genetic samples for Okanogan sockeye salmon related to the Skaha Lake reintroduction program. Kirk Truscott said Okanogan summer Chinook salmon broodstock samples from 2013 are available from CRITFC.

Pearsons asked how the coordination between WDFW and CRITFC works with sampling and analysis. Johnson said WDFW and CRITFC share the same panel analysis structure.

Pearsons asked if there is a technical way to determine sampling intervals based on population size, the observed level of variation, the desired detection level, and the concern for potential genetic change. Johnson said all of the sampling intervals are currently set at 10 years. Pearsons said perhaps geneticists can provide technically defensible reasons for sampling intervals, similar to a power analysis; and requested that Johnson ask the geneticists to provide a biologically based sampling interval based upon variation in historic data. Gale said the interval would depend on the minimum genetic distance intended for measurement. Tonseth said he would ask WDFW geneticists about rationale behind 10-year sampling intervals.

Sarah Montgomery said she will send Johnson's revised timeline to the Hatchery Committees for review when she receives it. Hatchery Committees members will review the timeline and send feedback or additional questions to Johnson.

E. Review Draft Hatchery M&E Plan Appendix 5 (All)

Appendix 5 – Stray Rate Objectives

Tracy Hillman said Keely Murdoch, during the last meeting, brought up the idea that definitions and criteria stated in Appendix 5 are already included in the M&E Plan for PUD Hatchery Programs (2013 Update). He said he checked the M&E Plan, and it indeed contains criteria and definitions. He said the background for material currently included in the draft Appendix 5 stems from a table (showing allowable stray percentages) Greg Mackey put together, which was discussed in the Hatchery Evaluation Technical Team (HETT). He said it was decided in the HETT that not every program can make up 5% of strays in a population because the recipient population could then have a large percentage of stray hatchery fish. Murdoch said the purpose of the draft Appendix 5 then switched to defining management versus genetic strays, which Willard stated is defined in the M&E Plan and also in the Wenatchee annual report. Hillman said it is important to be clear about recipient populations and management strays, but he thinks this is adequately discussed in the M&E Plan. Hatchery Committees members present agreed that Appendix 5 is redundant and should be removed from the plan. Hillman said he and Sarah Montgomery will renumber the other appendices and append the final versions to the final M&E Plan.

Todd Pearsons said there is also a statement in the M&E Plan about revising brood year stray rates (currently set at 5% for strays into an independent [non-target] population, 5% brood stray rate, and 10% strays to non-target areas within a population) when new information becomes available. Pearsons said a 2015 paper by Mike Ford and others indicates a natural stray rate of up to 17.5% for Chinook salmon, and the Hatchery Committees should discuss this paper and target stray rates at an upcoming meeting.¹ Pearsons said he would send the Ford et al. paper to Montgomery for distribution to the Hatchery Committees.

Hillman summarized that the Hatchery Committees have completed reviewing all Hatchery M&E Plan appendices except for Appendix 1, and he and Montgomery will leave a placeholder for it when appending the other final appendices.

¹ Ford, M., A. Murdoch, and M. Hughes, 2015. Using parentage analysis to estimate rates of straying and homing in Chinook salmon (*Oncorhynchus tshawytscha*). *Molecular Ecology* 24:1109-1121.

F. Draft Summary of Hatchery M&E Report Review (Catherine Willard)

Catherine Willard shared a document titled “Draft Summary of Hatchery M&E Report Review,” which Sarah Montgomery distributed to the Hatchery Committees on October 13, 2016 (Attachment C).

Willard said she and Sarah Montgomery compiled meetings notes applicable to the review of the Hatchery M&E Report, including all relevant documents, presentations, or other materials as attachments, organized by objective and by date. Hillman suggested adding a summary table, which Willard said she and Montgomery will add to the document. Willard summarized that the document consists only of approved Hatchery Committees meeting minutes and related documents and summaries, which may be useful as a tool for the Hatchery Committees in the future. Murdoch said it will also be important to document that Hatchery Committees responsibilities have been fulfilled in regards to the Hatchery Committees Statement of Agreement “Evaluation of Hatchery Programs Funded by Douglas County PUD 5-Year Report 2006-2010” (approved March 27, 2015).