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ANCHOR QEA

Memorandum

To: Wells, Rocky Reach, and Rock Island HCP Hatchery Committees and Priest Rapids Coordinating Committee Hatchery Subcommittee

Document Date: October 11, 2023

From: Tracy Hillman, HCP Hatchery Committees Chairman and PRCC Hatchery Subcommittee Facilitator

cc: Larissa Rohrbach, Anchor QEA, LLC

Re: Final Revised Minutes of the September 20, 2023, HCP Hatchery Committees and PRCC Hatchery Subcommittee Meetings

The Wells, Rocky Reach, and Rock Island Hydroelectric Projects Habitat Conservation Plan Hatchery Committees (HCP-HCs) and Priest Rapids Coordinating Committee's Hatchery Subcommittee (PRCC HSC) meetings were held in person at the Methow Fish Hatchery and virtually on Webex, on Wednesday, September 20, 2023, from 9:00 a.m. to 12:30 p.m. The meeting was followed by a field tour to Eightmile and Chewuch acclimation ponds on the Chewuch River, Twisp River Acclimation Pond, and Carlton Acclimation Facility.

Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

Long-Term

Joint HCP-HCs and PRCC HSC

- Keely Murdoch and Mike Tonseth will obtain estimates of pre-spawn mortality from Andrew Murdoch to update the retrospective analysis for Wenatchee spring Chinook Salmon (Item I-A). (*Note: This item is ongoing; expected completion date to be determined.)*
- Members of the HCP-HCs and PRCC HSC will provide feedback to the Washington Department of Fish and Wildlife (WDFW)-revised version of questions on recalculation for Policy Committees (Item I-A). (*Note: This item is ongoing.)*
- Chelan PUD, Grant PUD, and WDFW will develop recommendations for reducing stress and mortality from disease for individual rearing groups at Eastbank Hatchery. (Item I-A). (*Note: This item is ongoing.*)

Near-Term (to be completed by next meeting)

Joint HCP-HCs and PRCC HSC

- Catherine Willard will research feasibility questions around planning for potential emergency Okanogan Sockeye Salmon broodstock collection, including the following (Item I-A). *(Note: This item is ongoing.)*:
  - Capacity at Eastbank Hatchery for holding and isolation of adult Sockeye Salmon and eyed eggs
  - Permit requirements for transporting gametes or eyed eggs within the State of Washington
  - Quarantine requirements for transporting adult fish into Canada
  - Potential locations for Okanogan Sockeye Salmon broodstock collection in Washington
- All Committee members will review spring Chinook Salmon 10-Year Summary Report program-specific tables and inform authors of key concerns. (Item II-A). *(Note: This item is ongoing.)*
- Authors of spring Chinook Salmon 10-Year Summary Report program-specific tables will make revisions discussed in the meeting and develop brief narratives to explain the program description and monitoring results by October 4. (Item II-A).
- Tom Kahler will confirm with Kirk Truscott whether he approves of a plan to cull eggs from Methow Spring Chinook Salmon females with high levels of bacterial kidney disease (BKD), and inform the HCP-HCs of that decision. (Item II-B). (*Note: Truscott approved on September 26, 2023.)*

Decision Summary

- None

Agreements

- Pending approval by the Confederated Tribes of the Colville Reservation (CTCR), the other HCP-HC parties approved of culling the eggs from two spring Chinook Salmon females with high BKD levels and provided preemptive approval, pending test results, for additional culling of eggs from high BKD females, if these females represent fewer than 50% of the pending cases. (*Note: Kahler informed the Committees by email on September 28 of test results that indicated no additional batches of eggs would require culling.*)

Review Items

- The 10-Year Comprehensive Review Monitoring and Evaluation (M&E) Report chapters, compiled by species, were distributed on March 2, 2023.
- The version of the spring Chinook Salmon 10-Year Summary Report program-specific tables discussed in today's meeting were distributed on September 12, 2023.

- An updated working document for the 10-Year Comprehensive Summary Report prepared by the HCP-HCs and PRCC HSC was distributed on September 28, 2023, for review and contributions.
- The Douglas PUD's draft *2022 Annual Report for the M&E of the Wells Hatchery and Methow Hatchery Programs* was sent on September 6, with comments due by Friday, October 6, 2023.

Finalized Documents

- None

I. Welcome

A. Agenda, Approval of Past Minutes, Action Item Review

Tracy Hillman welcomed the HCP-HCs and PRCC HSC and reviewed the agenda.

Revised meeting minutes from August 16, 2023, were reviewed and approved by parties that attended that meeting. Kirk Truscott was absent from the August meeting and abstained.

Action items from the HCP-HCs and PRCC HSC meeting on August 16, 2023, were reviewed.
(Note: Italicized text below corresponds to action items from the previous meeting.)

Joint HCP-HCs and PRCC HSC

Long-Term

- *Keely Murdoch and Mike Tonseth will obtain estimates of pre-spawn mortality from Andrew Murdoch to update the retrospective analysis for Wenatchee spring Chinook Salmon (Item I-A). (Note: This item is ongoing; expected completion date to be determined.)*
  Tonseth said that Mike Hughes will present to this committee in November.
- *Members of the HCP-HCs and PRCC HSC will provide feedback to the WDFW-revised version of questions on recalculation for Policy Committees (Item I-A). (Note: This item is ongoing.)*
  Bill Gale suggested working toward revisions on a timeline toward the next policy meeting in June or July 2024.
- *Chelan PUD, Grant PUD, and WDFW will develop recommendations for reducing stress and mortality from disease for individual rearing groups at Eastbank Hatchery (Item I-A). (Note: This item is ongoing.)*
  Tonseth said that this item is ongoing.

Joint HCP-HCs and PRCC HSC

Near-Term (to be completed by next meeting)

- *Catherine Willard will research feasibility questions around planning for potential emergency Okanogan Sockeye Salmon broodstock collection, including the following (Item II-C):*

  - *Capacity at Eastbank Hatchery for holding and isolation of adult Sockeye Salmon and eyed eggs*
  - *Permit requirements for transporting gametes or eyed eggs within the State of Washington*
  - *Quarantine requirements for transporting adult fish into Canada*
  - *Potential locations for Okanogan Sockeye Salmon broodstock collection in Washington*

  Willard said that discussion is planned for the October meeting.
- *All Committee members will revise the executive summaries and program-specific review tables for compilation by Tracy Hillman and Larissa Rohrbach, focusing on completion of the spring Chinook Salmon 10-Year Summary Report by the September meeting (Item II-D). (Note: This item is ongoing.)*

  Except for revisions made by the PUDs, Tracy Hillman said no other revisions have been received. This topic will be discussed in today's meeting.

II. Joint HCP-HCs and PRCC HSC

A. 10-Year Comprehensive Review

The HCP-HCs and PRCC HSC continued their review of outcomes for each monitoring objective of their M&E Plan (updated in 2019). The Committee members reviewed revised program-specific summary tables distributed on September 12, 2023. Keely Murdoch provided comments on the Wenatchee spring Chinook Salmon program tables, which were the subject of today's discussion. Other members had reviewed the tables but had not yet provided written comments.

Chiwawa Spring Chinook Salmon Program

Keely Murdoch said that stating that total spawner conclusions were inconclusive due to the lack of information from in-basin reference streams implies that a recommendation for an in-basin reference stream is being made here, but that is not reflective of how we agreed to analyze the data in the M&E Plan. It is presumptuous to state that the lack of an in-basin reference stream is the reason it is inconclusive. Changes in natural origin spawners could still be inconclusive if productivity was limited across all the in-basin tributaries of the Upper Columbia or because of something other than the number adult spawners, like juvenile rearing habitat or migration corridors. Murdoch said that she would consider a statement about in-basin reference streams as part of the M&E Plan recommendations. She does not want to confuse the evaluation statements with next steps. Tom Kahler said that the productivity analysis results were conclusive, but he agreed that the interpretation of the result is inconclusive because there was not an in-basin reference. When the last draft was presented, the Committee had concerns about stating that results were conclusive because there was no in-basin reference. Bill Gale asked whether the table should summarize results or summarize conclusions. He suggested that the table should show a clear separation between results and the interpretation of the results. Tracy Hillman said this table is meant to answer the questions of each objective. For instance, to answer whether the supplementation program increased the number

of spawners on the spawning ground requires both giving the result and the conclusion. Rod O'Connor suggested that these tables focus on the technical findings, which might be different than the conclusions. O'Connor suggested keeping the management recommendations out of this document because that will be better served in discussions around the M&E Plan. Willard and Kahler agreed.

Hillman said that there is likely a need for some narrative around these tables to describe the program and key outcomes. Hillman suggested abandoning the approach of taking the executive summaries directly from the PUDs' Comprehensive Report chapters and pasting those into the Committees' report. Rather, the Committees can provide specific text related to each program in the Hatchery Committees' summary report. He agreed it would be helpful to better define the language used for met, unmet, and inconclusive.

Hillman said that Kirk Truscott also commented to him on the differences between the Upper Columbia populations and Snake River populations, which were used for references (e.g., differences in predation rates and hydrosystem operations). Hillman said that Truscott also struggled over the meaning of "convergence" and "divergence," especially when the multiple before-after control-impact (MBACI) results were not significant. Hillman noted that in many cases, both the Chiwawa and Nason programs increased less or declined more than the reference populations. Hillman reminded the Committees that the statistical tests provide one of the following three results: 1) no difference, meaning supplementation did not increase or decrease abundance or productivity relative to the reference populations; 2) a significant negative effect, indicating supplementation may have reduced the abundance or productivity of the supplemented populations, or 3) a significant positive effect, indicating supplementation increased the abundance or productivity of the supplemented populations. Truscott explained to Hillman that the conclusion that would cause him the most concern would be a significant negative effect. Hillman suggested that in the future, the Committees may consider bioequivalence testing, in which we formally evaluate the equivalency of the supplemented and reference populations. In this case, the null hypothesis is that the supplemented and reference populations are inequivalent. This works best if the reference population represents the standard or goal of the comparison. Hillman suggested wording the conclusions in the narrative so the reasons for the inconclusive term would be explained.

Willard said that the relevance of these tables is to easily and quickly know whether an objective was met or not. Willard said there are areas where members may not agree whether it was met or not or whether only some parts were met, which can be discussed. John Rohrback noted that not-significant results would be different than inconclusive. Murdoch said that they can be the same; we will not know whether the hatchery program failed its objective to increase the numbers or whether there are other bottlenecks that affect the fish after release. Kahler suggested also adding the context for why a conclusion was not met in narrative for the programs.

Gale supported standardizing the language in the tables. Begin with met, unmet, or inconclusive, and then add a statement for each that explains the technical conclusion. If necessary, footnotes can define what is meant by met, unmet, and inconclusive. The management direction could be included or not. Cory Kamphaus said that describing why it is inconclusive is a move toward defining the management direction. He supported moving the description of the possible reasons for the inconclusive result to the narrative.

O'Connor supported standardizing the statements. He said that the PUDs' goal is to get the Committees engaged with the information; if people want more information, they can go to the PUD reports.

Hillman revised the table in the meeting by adding a column with comments that explain inconclusive results. Murdoch said that she supports the additional column and then adding narrative text around the table describing the program and describing the results. She supported including a section on management recommendations.

Rohrback said that he is troubled by using the inconclusive term. The objective was to increase the number of total spawners; this result was not achieved, so the objective was not met. Gale countered that the problem may be in the statistics. The number of spawners may have increased or decreased, but we were unable to detect the change. Tonseth said that with a different analytical framework in the future, we might see a change. Kahler said that a change in analytical methods should be discussed when we review the M&E Plan.

Kahler projected the MBACI results for Twisp spring Chinook Salmon. Relative to the reference, the MBACI results showed a decrease in total adult abundance in the Twisp River. The objective was to see an increase in spawners, so we would state the objective was not met. Murdoch and Tonseth agreed. Hillman said Truscott also agreed that it was not met. Kahler then showed the Twisp natural-origin spawner abundance result, which was not significant, but the change was positive. He stated that the objective was met, and all agreed. Willard asked if a result were to show a decrease that was not significant, would the conclusion be not met or inconclusive? Cooper questioned whether a non-significant change would be attributed to the hatchery, so perhaps it would be inconclusive. Tonseth said that he agrees that it is inconclusive even if the change was positive. Willard and Cooper agreed. Tim Taylor said that the power of the test has not been addressed. Knowing the power will help interpret the results.

Hillman said that a fundamental assumption of BACI analysis is that any changes that occur within the supplemented populations will also occur in the reference populations (or vice versa) in the absence of supplementation. Although a longer time series generally provides more statistical power, it also can result in differential changes in populations over time that are independent of supplementation. Habitat conditions, the migration corridor, and predation rates, to name a few, may change independently among populations. Nevertheless, they do provide useful comparisons that

track large-scale factors such as ocean conditions, which should affect Snake River and Upper Columbia populations similarly.

Murdoch said that it is important to ensure that we are not harming the supplemented populations by operating hatchery programs. Ideally, abundance and productivity would increase by implementing all components of the HCP; however, to attribute that increase to only the hatchery program is not accurate. The objectives should not be dropped because a result is inconclusive but perhaps reframed as avoiding harm to the populations.

Tonseth said that in the past, language in the biological opinions (BiOps), as part of effects analysis, stated that the goal was to avoid a negative effect on the natural population but that a null effect or positive effect was acceptable. There is language in recent BiOps stating that the program needs to demonstrate a positive effect. What we measure and evaluate should be made consistent with the BiOp direction for these programs. It will be important for Brett Farman to weigh in when we develop new Hatchery and Genetic Monitoring Plans for permit renewal. Murdoch said that hatchery programs may have prevented a population crash, which would also be interpreted as a positive effect. Gale said that the context language will be sufficient; there should be a broad interpretation by the Services of what is meant by a positive effect.

Revisions for the Chiwawa River spring Chinook Salmon program table were completed in the meeting as an example for the other program tables to follow. It was agreed that the term "inconclusive" would be used to indicate a result that was not statistically significant, though it may not be a statement of biological insignificance. The original hypotheses statements and objectives were referenced to correctly answer whether objectives were met or not. Other comments about language and conclusions were then addressed.

Todd Pearsons noted that the removal of fish for adult management and broodstock is a cost of the hatchery program, so it is not necessary to comment on that as part of the context. Murdoch said that it is important to acknowledge that the programs are actually controlling the number of spawners based on escapement goals. The results for how the hatchery returns are contributing to the spawning grounds should be understood differently (e.g., a difference between total returns to the tributary versus total spawners). Pearsons responded that if all fish are allowed to spawn naturally, then you do not have a program anymore. Farman agreed to strike extra statements on "use of some returns for hatchery programs" because they imply there should be a discount for running a program; the metric accounts for subtracting those spawners by default.

Murdoch said that, regarding proportionate natural influence (PNI) and proportion of hatchery-origin spawners (pHOS), her revisions suggest showing the years when there was no PNI objective and years when there were PNI targets, which were determined using the sliding scale. We should not report that we did not meet PNI goals when we did not have PNI goals for those years—just report on years when it applies. O'Connor asked whether there is value in documenting what PNI was

before the adult management was in place. Murdoch agreed and suggested rephrasing to just report the PNI value for that time period before targets were determined.

Murdoch said that because pHOS is a population-level metric, she struck the use of pHOS as metric for evaluating reach-scale spawner distribution. Kahler agreed that pHOS is a population-level metric in the permits for which there is no requirement to report at smaller scales. Nevertheless, he said pHOS is a metric of estimating probability of wild-by-wild crosses, which varies by reach and thus reach-scale pHOS provides additional resolution on hatchery-wild overlap. He said that he is very interested in information forthcoming from the Relative Reproductive Success Study. Based on results from that study, we may need to re-evaluate the implications of pHOS. It will be up to the National Oceanic and Atmospheric Administration to decide how to continue using PNI as a metric.

Murdoch commented on Objective 9.1 and asked why release targets were focused on a small subset of years (2014 through 2020) for a metric that had annual targets and data. For consistency, the metric should be reported for similar periods across objectives. Willard said that she can easily add those numbers from earlier years. Tonseth said that there will always be changes to release numbers every 10 years because of recalculation. All agreed to using the entire time series, as appropriate, to make the report truly comprehensive.

Murdoch had a similar comment for the harvest rate and whether to include the period prior to Endangered Species Act listing. Tonseth said that the population level was relatively small. Harvest rates prior to listing would have been rather high because the population level was so low (in the single or double digits) that nearly all were harvested. Murdoch said that the context narrative should explain the reason is that this is not a harvest program. That will help inform why this harvest rate was so high prior to listing.

Murdoch thanked Willard and other PUD authors for preparing the initial drafts of these documents.

Nason Spring Chinook Salmon Program

O'Connor agreed to make revisions to the Nason spring Chinook Salmon program table consistent with changes that were made for the Chiwawa spring Chinook Salmon program table. O'Connor said that, regarding whether PNI targets were met, there is not a monitoring target for pHOS for Nason spring Chinook Salmon.

Murdoch commented on Objective 5.3 on spawner distribution that the objective was not to monitor the spawner distribution of strays from other donor populations (e.g., Chiwawa spring Chinook Salmon). O'Connor agreed; however, a statement was added about Chiwawa spring Chinook Salmon strays as being informative because there are a lot of hatchery-origin Chiwawa spring Chinook Salmon coming into the basin. Murdoch disagreed. She said that this table is meant to evaluate the Nason program, and the influence of Chiwawa strays is addressed by Objective 6 on recipient stray targets. Information on those stray fish is not going to help manage the Nason Creek program. The

redd distribution metric is intended to evaluate the redd distribution of the program being evaluated, not strays from other programs. Tonseth said that the caveat to this is if there are redd distribution data for hatchery-origin fish from the Nason captive brood program that operated for a few years. O'Connor asked whether other members thought mentioning the high numbers of strays is informative or confusing. Tonseth said that it is informative for managing the Chiwawa program. O'Connor said that he would feel comfortable striking this if it were agreed that it is being addressed in the Chiwawa program table. Willard agreed to make that clear in the Chiwawa section.

Next Steps

Gale noted that although we decided to categorize the conclusions as met, unmet, or inconclusive, it is not clear how or where those terms should be defined. Tonseth said that, through this conversation, it has proven to be more difficult to apply a consistent definition for each term; it is objective specific. Willard suggested using contextual comments to define why an objective was met, unmet, or inconclusive. It was agreed that the M&E objective questions need to accompany the results and conclusions statements to make it clear how the answer indicates whether an objective is met.

Hillman will distribute today's revisions to the Chiwawa program table to the group as an example for filling in the other table. Kahler and O'Connor agreed to make revisions to tables for other programs based on today's discussion. Hillman suggested working on the narrative for each of the spring Chinook Salmon programs while moving forward with completing the steelhead tables.

O'Connor said that management recommendations can be reserved for the next phase of M&E Plan revision discussions. Murdoch said that she sees management recommendations as separate from revisions to the M&E Plan revisions (e.g., changes to the objective questions and hypotheses). She suggested including management changes in the program summaries only if they pertain to the operation/implementation of hatchery programs.

All agreed that the PUD authors will revise program-specific tables and they will craft brief narratives to go with each table. The narrative will include a description of the program and explanation of results. They will strive to distribute this product 2 weeks ahead of the next meeting so that other Committee members will have time to comment on the tables and narratives. The Committees will decide later whether management recommendations should be included in this document.

B. Methow Spring Chinook Salmon Bacterial Kidney Disease

Tom Kahler noted that it has been a bad year for BKD. Matt Cooper said that there have been problems at both Winthrop National Fish Hatchery and Methow Hatchery, although it will not affect production.

Tom Kahler said that the Section 10 permits direct that decisions on culling eggs should be brought to the Committees if enzyme linked immunosorbent assay (ELISA) levels are greater than 0.12 optical

density unit. Language says that if practicable, the program should cull. The Broodstock Collection Protocols (BCPs) state that progeny of wild fish will not be culled unless ELISA levels indicate high BKD levels relative to identified thresholds. At the Methow Hatchery, four female spring Chinook Salmon with BKD were non-viable. Some fish did not have lesions; however, ELISA results showed that the eggs from three females had high levels of BKD by assay standards. One was extremely high; two that were less high were progeny of wild-by-wild crosses. Eggs from seven hatchery-origin spring Chinook Salmon females had low BKD levels. Betsy Bamberger, Douglas PUD's aquatic veterinarian, recommended that those eggs from females with high BKD levels be culled, and Douglas PUD asked the HC for approval.

Bill Gale asked whether the wild progeny is needed for production. Kahler estimated there were 275,000 eggs on station. Fecundity was estimated to be 3,500, so culling the progeny from the 3 high wild-by-wild female eggs would allow for 268,000 eggs, which would still meet production goals (220,000). There are wild-by-wild eggs from a couple of females with moderate levels of BKD, which do not need to be culled.

Gale asked whether the wild-by-wild progeny that are moderate and wild-by-hatchery progeny that are low can be isolated during rearing to limit effects to the rest of the production. Tonseth asked whether all families are being incubated individually until the eyed-egg stage. Kahler answered they are.

Douglas PUD is awaiting results on 10 more females. Douglas PUD also requested that the Committees pre-emptively approve of culling progeny from wild females shown to have high BKD levels in forthcoming results. Tonseth and Gale said that they support this path forward. Cory Kamphaus agreed; however, if the number of the final results with high BKD is more than half of the fish, culling should be discussed by the Committees.

Kahler will reach out to Kirk Truscott to obtain his support for the approach to culling. Douglas PUD will email this group with the final ELISA results.

III. PRCC HSC

A. Carlton Summer Chinook Salmon Juvenile Surplus

A notice from Mike Tonseth was distributed on Monday, September 18, 2023, documenting that fecundity was higher than expected in females collected for the Carlton summer Chinook Salmon broodstock last year, and egg-to-fry survival was good, resulting in an overage of juveniles counted at marking. An excess of 26,351 juveniles over 110% of the Carlton's program target were rehomed to Chief Joseph Hatchery (CJH) for the CTCR's Okanogan integrated summer Chinook Salmon program. Before the Methow summer Chinook Salmon program came online, there were fewer outlets for surplus fish; the CJH integrated program has consistently had capacity in recent years.

In small hatchery programs like this one, a small difference in fecundity can make a big difference in the final egg count. Program-specific assumptions about fecundity are made for determining the number of females that would be needed. Collection is recalibrated in-season based on estimates of fecundity by fish length; however, fecundity based on length can be miscalculated when fish are long but skinny. Staff have experimented with estimating fecundity by fish girth; however, this also changes over the course of the season as the eggs become hydrated and increase in size at later stages of maturation. Rod O'Connor recommended that WDFW provide earlier notification on these issues in the future.

IV. Administration

A. Next Meetings

The Committees members agreed to work toward approval of spring Chinook Salmon comprehensive summary report in October. Potential changes to BCPs and Methow summer Chinook Salmon collection locations will be discussed. Mike Tonseth said that there is currently only one hatchery genetic management plan (HGMP) for this program with an addendum. The permits indicate the east and west Wells Dam fish ladders can be used for collection. Tom Kahler noted that those permits provide relatively broad coverage for the programs to make some management determinations within those sideboards. Tonseth agreed, but there is not actually an HGMP for that Methow summer Chinook Salmon program. Tonseth said that he will prepare some recommendations on implementing a weekly collection curve for the program.

Tracy Hillman noted that the Committees will be busy in the future with completion of the 10-Year Comprehensive Summary Report and updates to the M&E Plan, BCPs, and HGMPs associated with permit renewals.

V. Attachments

Attachment A List of Attendees

Attachment A
List of Attendees

Name	Organization
Larissa Rohrbach	Anchor QEA, LLC
Tracy Hillman	BioAnalysts, Inc.
Catherine Willard*	Chelan PUD
Tom Kahler*	Douglas PUD
John Rohrback	Douglas PUD
Rod O'Connor‡	Grant PUD
Todd Pearsons‡º	Grant PUD
Tim Taylor	Grant PUD
Brett Farman*‡º	National Marine Fisheries Service
Mike Tonseth*‡	Washington Department of Fish and Wildlife
Bill Gale*‡	U.S. Fish and Wildlife Service
Keely Murdoch*‡	Yakama Nation
Cory Kamphaus*‡	Yakama Nation

Notes:
* Denotes HCP-HCs member or alternate
‡ Denotes PRCC HSC member or alternate
º Joined remotely