

Memorandum

To: Wells, Rocky Reach, and Rock Island HCP Hatchery Committees, and Priest Rapids Coordinating Committee Hatchery Subcommittee Date: October 25, 2021

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

cc: Larissa Rohrbach, Anchor QEA, LLC

Re: Final Minutes of the September 15, 2021, 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 by conference call and web-share on Wednesday, September 15, 2021, from 9:00 a.m. to 12:40 p.m. Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

Joint HCP-HCs and PRCC HSC

Long-Term

- Mike Tonseth will distribute the analysis showing feasibility of the Methow Spring Chinook Salmon Outplanting plan based on historical run size data (Item I-A). *(Note: This item is ongoing; expected completion by November.)*
- Kirk Truscott will work with Colville Confederated Tribe staff to develop a model that addresses the probability of encountering natural-origin Okanogan River spring Chinook salmon at Wells Dam (Item I-A). *(Note: This item is ongoing; expected completion date to be determined.)*
- Kirk Truscott will determine the number of scales that should be collected from spring Chinook salmon at Wells Dam for elemental signature analysis to discern Okanogan River spring Chinook salmon from Methow River spring Chinook salmon (Item I-A). *(Note: This item is ongoing; completion depends on the outcome of the previous action item.)*
- 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.)*
- Mike Tonseth and Greg Mackey will solicit input from hatchery managers on effective methods to count surplus fish (Item I-A). *(Note: This item is ongoing; expected completion by November.)*

Near-Term (to be completed by next meeting)

- Larissa Rohrbach will file and distribute *10-year Comprehensive Review* chapters and comments to the Committees for review as they are completed. (Item I-A). *(Note: This item is ongoing.)*
- Grant PUD and Chelan PUD will distribute a final version of their responses to Yakama Nation comments on the draft Statements of Agreement on Sockeye Salmon Obligation (Item I-A). *(Note: This item is ongoing.)*
- Todd Pearsons and Catherine Willard will revise Grant and Chelan PUD's draft Statements of Agreement on Sockeye Salmon Obligation for approval in the September or October meeting (Item I-A). *(Note: This item is ongoing.)*
- Mike Tonseth will finalize a summary and convene the Joint Fisheries Parties to seek agreement on an approach for calculating natural-origin return and smolt-to-adult survival rates for use in the Biological Assessment and Management Plan calculation. Tonseth will inform Tracy Hillman of progress within the Joint Fisheries Parties and any need for an additional conference call with the HCP-HCs and PRCC HSC (Item III-A).
- Tracy Hillman will seek agreement from U.S. Fish and Wildlife Service representatives on moving forward to calculate steelhead mitigation obligations using passive integrated transponder tag (PIT)-based estimates of smolt-to-adult survival rates in the Biological Assessment and Management Plan calculation and sensitivity analysis (Item III-A).

Rock Island/Rocky Reach HCP-HCs

- Catherine Willard will prepare for the Rocky Reach Fish Forum and U.S. Fish and Wildlife Service biologists a written summary of past modifications to Tumwater Dam fish trapping operations to facilitate lamprey passage at night during the month of September and the proposed change to allow trapping at night to capture additional steelhead broodstock, with a summary of steelhead and lamprey counts to date. The summary will be distributed to Rock Island/Rocky Reach HCP-HC for approval of the change in operation no later than September 20, 2021 (Item II-B). *(Completed on September 17, 2021).*

Wells HCP-HC

- None.

PRCC HSC

- None.

Decision Summary

- The Rock Island/Rocky Reach HCP-HC approved a change in Tumwater Dam trapping operations to trap steelhead 24 hours/7days/week, manned or unmanned, to improve the collection of steelhead broodstock for the remainder of September 2021.

Agreements

- None.

Review Items

- The list of *10-year Comprehensive Review* chapters that are currently available for review was distributed by Larissa Rohrbach with an updated review schedule on September 15, 2021.

Finalized Documents

- None.

I. Welcome

A. Review Agenda, Announcements, Approve Past Meeting Minutes, Review Last Meeting Action Items

Tracy Hillman welcomed the HCP-HCs and PRCC HSC and read the list of attendees (shown in Attachment A). The meeting was held via conference call and web-share because of travel and group meeting restrictions resulting from the coronavirus disease 2019 (COVID-19) pandemic. Hillman reviewed the agenda and asked for any changes to the agenda. Catherine Willard added an agenda item on trapping at Tumwater Dam during the month of September 2021. All HCP-HCs and PRCC HSC representatives approved the revised agenda.

Revised minutes from the August 18, 2021, meeting were reviewed. Members of the HCP-HCs and PRCC HSC that were present approved the minutes. Kirk Truscott provided his approval by email following the meeting on September 22, 2021. U.S. Fish and Wildlife Service (USFWS) representatives were not present in today's meeting and provided their approval by email on October 8, 2021.

Action items from the HCP-HCs and PRCC HSC meeting on August 18, 2021, were reviewed and discussed (*Note: Italicized text below corresponds to action items from the previous meeting*).

Joint HCP-HCs and PRCC HSC

Long-Term

- *Mike Tonseth will distribute the analysis showing feasibility of the Methow Spring Chinook Salmon Outplanting plan based on historical run size data (Item I-A). (Note: This item is ongoing; expected completion by November.)*
- *Kirk Truscott will work with Colville Confederated Tribe (CCT) staff to develop a model that addresses the probability of encountering natural-origin Okanogan River spring Chinook salmon at Wells Dam (Item I-A). (Note: This item is ongoing; expected completion to be determined.)*

- *Kirk Truscott will determine the number of scales that should be collected from spring Chinook salmon at Wells Dam for elemental signature analysis to discern Okanogan River spring Chinook salmon from Methow River spring Chinook salmon (Item I-A). (Note: This item is ongoing; completion depends on the outcome of the previous action item.)*
- *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: expected completion to be determined.)*
Murdoch noted this analysis may need to be redone after recalculation if production numbers change in any appreciable manner.
- *Mike Tonseth and Greg Mackey will solicit input from hatchery managers on effective methods to count surplus fish (Item I-A). (Note: This item is ongoing; expected completion by November.)*

Near-Term (to be completed by next meeting)

- *Larissa Rohrbach will file and distribute 10-year Comprehensive Review chapters and comments to the Committees for review as they are completed (Item II-E).*
This item is ongoing.
- *The 2024–2033 Recalculation Data Summary will be further discussed with representatives in a conference call on August 31, 2021, and revised by the PUDs for approval in the September 15, 2021, meeting. The following topics will be discussed further (Item II-B):*
 - *Keely Murdoch will create a flow diagram showing mitigation calculations using smolt-to-adult returns values observed at hydroprojects compared to smolt-to-adult returns values observed at natal tributaries.*
 - *Catherine Willard and Scott Hopkins will confirm whether Tumwater Dam counts were used as the basis for calculating Rock Island spring Chinook salmon natural-origin spawning escapement.*

This task is complete. USFWS was not in attendance and approval of data sources will not occur in today's meeting.
- *Grant PUD and Chelan PUD will distribute a final version of their responses to Yakama Nation comments on the draft Statements of Agreement on Sockeye Salmon Obligation (Item II-C).*
This item is ongoing. Catherine Willard and Todd Pearsons said they will finalize their comments when the revised draft Statement of Agreement (SOA) is prepared.
- *Todd Pearsons and Catherine Willard will revise Grant and Chelan PUD's draft Statements of Agreement on Sockeye Salmon Obligation for approval in the September or October meeting (Item II-C).*
This item is ongoing.

II. Rock Island/Rocky Reach HC

A. Chelan PUD's 2022 Hatchery Monitoring and Evaluation Implementation Plan

The draft *2022 Chelan PUD Hatchery Monitoring and Evaluation Implementation Plan* was distributed by Larissa Rohrbach on September 14, 2021. Catherine Willard said updates from last year's plan include revised dates and the addition of the 2021 to 2023 Steelhead Release Plan as Appendix A in the Plan.

B. Trapping at Tumwater Dam

Catherine Willard explained that the protocol for trapping at Tumwater Dam in September was adjusted in the 2017 Broodstock Collection Protocols (BCPs) to allow for potential lamprey movement at night. The Yakama Nation (YN) had translocated adult lamprey to the Wenatchee River below Tumwater Dam in the years 2016 through 2019. Since 2017, the trap has not been operated September 1 to September 30, from 10 p.m. to 6 a.m., to facilitate lamprey passage via the fishway at night. From 2017 through 2020, no lamprey have passed through the fishway after September 6. No lamprey have been observed this September in video monitoring or trapping. Tracy Hillman noted that at this time there is no adult lamprey translocation work going on to the upper Wenatchee River below the dam. Lower numbers of steelhead were also observed in those years and the program has struggled to collect the target number of steelhead for broodstock. Chelan PUD is also working with USFWS to install a temporary lamprey passage system at Tumwater Dam, for use in 2022.

At this time, Chelan PUD is proposing to change the protocol to operate the trap around the clock for the rest of September 2021 to obtain sufficient steelhead broodstock. Chelan PUD is seeking approval from the Rock Island/Rocky Reach HCP-HC to change operations at night as soon as possible.

Keely Murdoch said this seems like the correct decision for steelhead, but said she is not prepared to make a decision on how this would affect lamprey. Hillman suggested informing the Rocky Reach Fish Forum (RRFF) about proposed changes to trap operations in September. This change to trapping was approved in the 2017 BCPs by the HCs and it is uncertain if the RRFF is even aware of the practice. Hillman confirmed that this topic was not previously discussed in the RRFF when the trap operation decisions were made as part of the BCPs.

Kirk Truscott asked if there have been meaningful numbers of steelhead using the Tumwater fishway so far this year. Willard said she would check the latest updates from the video monitoring. (In an email request to approve this action [sent on Friday, September 17, 2021], Willard wrote, "Based on video count data for the hours from 10 p.m. to 6 a.m., from September 1 to September 15, five steelhead have ascended the fishway versus being available for trapping.") Mike Tonseth said 24-hour operation will not allow for a significant increase in steelhead numbers, but any additional fish can make a difference for broodstock collection.

He is comfortable approving the action now, but requests that Chelan PUD provide notice to the RRF to obtain their feedback. Murdoch agreed with that approach. Willard will prepare a written document to show these data to the RRF. Hillman suggested reaching out to Jim Craig at USFWS for his input [USFWS representatives to the HCP-HCs are out of office this week.].

Larissa Rohrbach will distribute a summary of fish passage numbers from Willard to the Rock Island/Rocky Reach HCP-HCs to allow representatives to confirm their approval of this change in operations by September 20, 2021.

III. Joint HCP-HCs and PRCC HSC

A. Hatchery Production Recalculation: Data Sources

Tracy Hillman summarized progress on this topic since the August 31, 2021, meeting. The Joint Fisheries Parties (JFP) met and are preparing a document responding to the issue of where adult returns should be counted to calculate smolt-to-adult return (SAR) values for use in the Biological Assessment and Management Plan (BAMP)¹ calculation. The summary document will be distributed to the HCP-HCs and PRCC HSC, pending feedback from all the JFP parties.

Mike Tonseth summarized outcomes of the JFP's discussion. The JFP concluded this is a technical issue to be addressed by the HCP-HCs and PRCC HSC, and even if elevated to the PRCC, the HCP Coordinating Committee, or the HCP Policy Committee, the issue would likely be returned to the HCs/HSC with technical questions, resulting in unnecessary delays. A key point is that these calculations should capture all project effects (including dams and reservoirs), regardless of how marginal those effects may be after fish pass through the dams. If the full project effects are not captured, the terms of the agreements are not being fulfilled. Regarding use of data from PIT-tag detections versus coded wire tag (CWT) recoveries for SAR estimates, the JFP are still convinced the CWTs provide the best estimates of adult returns, especially for Chinook salmon. The CWT estimates were the estimates that were used in the BAMP. Steelhead are a notable exception because CWTs are not recovered in harvest or spawning surveys. Other technology (e.g., PIT tags) must be relied upon to inform the steelhead SAR estimates.

Todd Pearsons noted that SARs based on PIT-tag detections at Bonneville Dam are presented in annual reports, which are reviewed and approved by the Committees. Tonseth agreed but said those values don't suffice to create a SAR to manage the Upper Columbia program.

Catherine Willard said the annual report contains incomplete CWT-based SAR values up to brood year 2014, and PIT-tag-based SAR values up to 2020, are available in annual reports. In the last recalculation (in 2011), a combination of CWT-based and PIT-tag-based SAR values were used to

¹HCP-HC and PRCC HSC, Mid-Columbia River Fishery Co-manager, and Mid-Columbia PUDs, 1998. *Biological Assessment and Management Plan*. Mid-Columbia Hatchery Program. April 1998.

resolve lack of CWT data in the most recent years. Tonseth said there may now be more complete CWT data through at least brood year 2014 for Chinook salmon programs, recognizing there is some slow reporting of CWT recoveries. Tonseth said, at this time, there is no agreement within the Committees for changing the way SARs are calculated; there is no agreed-to methodology for use of PIT tags. If PIT-tag-based SAR estimates are to be used, an agreement on the methods must be made in sufficient time for the current recalculation schedule. It needs to be considered for steelhead. For Chinook salmon, the uncertainties associated with PIT tags can be clarified (e.g., ensuring sample sizes are sufficient to provide the necessary confidence in the SAR). Willard agreed there is a need to address these issues to be able to use PIT-based SAR values to allow the data to be used to complete the dataset. Tonseth said, for instance, using PIT-tag detections to Rock Island Dam in some years versus CWT recoveries in others would encompass other mortalities such as harvest, spawning, and pre-spawn mortality. Keely Murdoch said the previous recalculation dataset was adjusted for CWT harvest recovery, so waiting on additional CWT recoveries would not result in additional useful data. Willard said that for the most recent years, adjustments would not be possible for CWTs. She is asking for the use of PIT tags to be used at least for the most recent years.

Pearsons said the CWT estimates come from the annual monitoring and evaluation (M&E) reports and the PIT-tag estimates are likely linked back to the project; those data are in the working draft of the *2024-2033 Recalculation Data Summary* (most recent version distributed by Larissa Rohrbach on August 10, 2021). The more recent returns estimated from CWT recoveries are biased low; they would also bias the CWT-adjusted PIT-tag estimates too low. Over time, additional CWT data trickle in, which increases SAR numbers over time. Greg Mackey said the previous data sources are reported in Appendix F in the review of the past recalculation effort². Tonseth said that may have been an error in the past approach if the intent is to select natural-origin return (NOR) and SAR estimates from the same locations. Including spawning ground recoveries would inflate the SAR estimate because they occur beyond the point at which NOR returns are estimated. Whether PIT-tag-based or CWT-based estimates are used, the adult returns should be counted at comparable locations. The PUDs' position is that these would be measured at the same location and most members of the JFP do not necessarily disagree, but there needs to be clarification on where those locations should occur.

Murdoch said she does not fully agree with Tonseth's statements. The YN believes the BAMP is used to calculate complete life cycle mitigation and the CWTs used in the original BAMP calculation are the appropriate data to be used. The SOA signed when initiating this current recalculation states that. The last sentence of the last paragraph of the SOA states "hatchery-specific smolt-to-adult returns (SARs)" and that is reported in annual reports from each hatchery. The YN believes that the SAR from the individual locations of return published in the annual reports are the SAR that should

² HCP-HCs and PRCC HSC, 2011. *Recalculation of Mid-Columbia River Public Utility District Hatchery Production, 2014-2023*.

be used in the BAMP calculation for full replacement of returning adults. That is the mitigation that every party agreed to when all parties agreed to using the BAMP.

Pearsons said Grant PUD agreed to the BAMP formula, but the data that would be in that formula would be discussed and agreed to during these discussions after finalizing the SOA. Willard and Mackey agreed that is the understanding of the other PUDs, and the background in the SOA reflects this position. Mackey said the Committees were aware of the mismatch between NOR and SAR in the last recalculation effort; it was a fairly complicated process, and it was understood that the methods were imperfect. When agreeing to the overall methodology, it was intended that some of those data sources would be revisited. Pearsons said unfortunately we don't have all the data necessary for recalculation included in the annual reports, such as NOR back to the projects. Murdoch agreed it would make some things a lot easier to have a running dataset for use in future recalculation. Mackey agreed that would be helpful if there can be consensus on the data to be used.

Hillman said the annual reports do include tributary estimates of NORs and SARs for each program. Murdoch said she does not agree that the numerator and denominator are in question, the mortality occurs as smolts at the project. However, the replacement needs to occur for the full life cycle throughout the basin. During the last recalculation, PIT-tag data did exist, but CWT data were used because they are the appropriate method. Other adjustments to the calculation were appropriate to adjust for direct mortality to adults by removing hatchery fish returning to the dams. Pearsons said that PIT tag SAR data were used back to the project where the data existed. It can be seen in the 2013 hatchery recalculation SAR dataset that the estimates in the earlier years were based on CWTs and estimates in the most recent years were based on PIT-tags.

Hillman noted that this discussion indicates that there is no agreement within the Committees or within the JFP. Brett Farman said he has not shifted his position from previous meetings on the interpretation of the HCPs. National Marine Fisheries Service (NMFS) is not comfortable calling for full life cycle replacement but is supportive of mitigation for full project mortality to the mouths of tributaries. The decision point for using PIT tags versus CWT recoveries is not clear; he would not want to agree as a group to a method that must remain the same into the future for every report or every effort. NMFS' position is to find some estimate based on SARs to a point somewhere between the dam and hatcheries, potentially at the mouth of the tributary, to include mortality of the full project, but not mortality that may occur beyond the boundary of the project. Conversion rates between projects may be a way to estimate this, or some other PIT-tag detection point using other arrays in tributaries. There may be some mortality after fish reach the tributary that could be associated with project effects, but there is no good way to estimate this delayed effect at this time.

Tonseth said conceptually, the CWT data could be decomposed to reflect CWT recoveries up to the mouth of the tributary to obtain the NOR back to the mouth of the tributary (excluding recoveries that occur later from the spawning ground, broodstock collection, and tributary harvest). The point at

which the mitigation begins is when a NOR smolt enters the project. It depends on the project where that entry point occurs. For instance, for a Chiwawa spring Chinook smolt, the mitigation begins at the inundation zone at the mouth of the Wenatchee River. Where the returning adults reach that point is where NOR is measured, but it would be difficult to map that out. Hillman asked if instead of using CWTs and working backward, could one use PIT tags and work forward using conversion rates of upstream PIT-tag detections? This would be consistent with Farman's position. Tonseth said it is a similar line of thinking, in most cases the effects are created by passage through the dams, reservoirs, and the inundation zones at the mouths of tributaries, and the detections should be estimated at the end of that effect. Farman said NMFS is open to considering different methods for estimating this same endpoint at the edge of project effects.

Pearsons said Grant PUD could agree to different tag datasets as long as the data are of good quality, whether PIT or CWT data. Grant PUD maintains that NORs and SARs should be estimated at the same point, but some locations are better for obtaining those measurements, which was the reason for using data from the dams. The PUDs would like to use the data source that is as accurate as possible and with as many years of relevant data that correspond to each other (e.g., NORs and SARs from respective years) as possible. Willard said Chelan PUD and Mackey said the Douglas PUD agree with Pearsons.

Kirk Truscott said the JFP discussion of the issue and review of materials to be provided by Tonseth is leading the parties toward agreement. When reading the third paragraph of the SOA about the BAMP methodology using the average hatchery-specific SAR, he interpreted that to mean SAR estimates from the annual reports based on CWTs. From a procedural standpoint, we are now at a point where a substantive departure from the proposed method is being proposed by using PIT tags. Hillman noted that in the last recalculation, it was understood the BAMP formula was correct, but members made some efforts to improve upon the data used in the formula.

Tonseth said he would distribute a summary of these concepts to the JFP early next week for review, then schedule another conference call with the JFP or manage comments by email. This summary document could be made available to the Committees for review in 2 to 3 weeks.

Murdoch said she strongly disagrees that the NOR and SAR data need to be measured at the same location. The matching needs to occur in the equations between the adults and juveniles in the calculation of mitigation. The YN did not agree with the use of returns to the projects in the BAMP in the last recalculation 10 years ago either. If there truly was a matter of not having the data to calculate SAR back to the tributaries, that could have been stated. Murdoch said the BAMP equation tells where those things should be measured; adults should be measured at the dam and the SAR should be calculated at the hatcheries. In Section 1.3.2 of the BAMP, the second bulleted item directs programs to use the five-year rolling average of the CWT-based SAR from hatcheries.

Pearsons said there are several places where we have deviated from the exact calculation methods provided by the BAMP but have taken approaches as envisioned in the BAMP. In the HCP and Priest Rapids Project Salmon and Steelhead Settlement Agreement there is language about using better technology as data sets improve and there have been improvements in the data collection efforts. We have presented the algebraic difficulties of describing what the number represents when the NOR and SAR are calculated at different locations. Hopefully, we can make this better and more accurate. From Grant's perspective, we are striving for accurate estimation of project effects. The equation presented by Grant PUD in the August 31, 2021, meeting attempts to mitigate for the project effects for No Net Impact mitigation programs.

Murdoch said that calculating SAR at projects fundamentally changes what mitigation is being agreed to. For instance, when it was agreed to remove the hatchery fish from that calculation, they were still being replaced for their full life cycle 1:1. Willard asked if the YN is supporting mitigation for mortality outside of the project? Murdoch said no, YN is supporting mitigation using the BAMP formula as it is written.

Hillman said there is a question about whether using PIT tags at the dam is covering full life cycle mitigation, as shown in a flow chart shared by Grant PUD and distributed by Rohrbach on September 7, 2021. Peter Graf showed calculation of the BAMP equation in this flow chart using NOR and SAR to the dam versus NOR and SAR to the tributaries (Attachment B). As long as NORs and SARs are estimated at the same location, you should arrive at the same number of smolts for mitigation regardless of the location used. Hillman noted that the BAMP approach blends the NORs measured at projects with the SARs measured in the tributaries. Graf said that approach includes mortality outside of the project area in the tributaries. Graf asked if Murdoch agrees that by calculating NORs at the dams and SARs at the hatcheries whether this includes mortality in the tributaries. Murdoch said indirectly, because this also includes harvest that can occur in a lot of places including the mainstem reservoirs, but this is the way the BAMP intended to replace those fish. Murdoch said we don't know what amount of pre-spawn mortality may be attributable to passage through the dams and reservoirs, for instance, due to high water temperatures and high total dissolved gas within the project boundaries. Murdoch said she disagrees that the BAMP has to be calculated using matching locations for NORs and SARs. The BAMP states the SARs to be used are from the hatcheries, which was based on CWT recoveries at the time it was written.

Farman said regarding Graf's flow chart, project-related effects between the dam and the tributaries are important to account for conceptually. Graf agreed that the SARs could be moved to the tributary mouth, but in that case the NORs should also be moved to the mouth. Grant PUD's position is that the dams are good points to obtain those data.

Farman said he understands the YN position, but at this time there are a lot of newer data that could be used to tease apart some of these effects, and he is uncomfortable deferring to the past approach

agreed to at a time when those newer data were not available. That does not move the programs forward.

Murdoch said the YN are not prepared to set a precedent that measures NORs and SARs at the same locations, nor prepared to set the precedent of not replacing fish for the full life cycle. The YN always relies heavily on what was previously agreed to, unless there are strong reasons to deviate from them.

Truscott asked if the PIT tags used in the dataset are the only PIT tags that were released from hatcheries in common with the general production. For instance, are returning adults that were PIT-tagged as part of a survival study, where fish were reared separately, excluded or included? Mackey read through the data that were used for the previous recalculation effort. Graf said it is important to use the hatchery PIT tags released for use in calculating SARs for mitigation because there are differences between hatcheries due to location, fish health, and other biological factors. Truscott said that's part of it but asked if fish PIT-tagged for other purposes (e.g., the 2010 and 2020 survival studies) were raised in common or subject to the same release locations as production fish. Not all hatchery origin PIT tags released (e.g., at downstream sites for survival studies) are subject to the same out-migration conditions, and hatchery-specific SARs need to be calculated with PIT tags released in production fish only. Tom Kahler said that could be the case for some production raised at different hatchery sites (e.g., for summer Chinook salmon, using SAR from Wells Hatchery or Chief Joseph Hatchery). Truscott said he wants to ensure PIT tags are not used from fish that had a survival advantage over the production population at large. Pearsons said they can confirm that that approach has been taken. Murdoch said the tag code could be included as well as size information. Kahler said PIT tagging has usually been conducted in late October and November, and the average fish size always exceeded the size threshold for tagging, so there is no evidence of "high-grading" to tag larger fish. Fish tagged are representative of the population. Rod O'Connor said they have typically started with the M&E reports to identify the dates and locations to determine which tag files are gleaned from the PIT-Tag Information System.

Tonseth said the SOA on recalculation methods (paragraph four, line four) refers to "adults that would have returned to each project," but HCPs state "through each project." Mackey said that word "to" doesn't necessarily restrict the data to returns to the dam. If the data are available for estimating returns to the tributaries at the boundary of the inundation zone of the project, that would be a good way to estimate NORs and SARs.

Tonseth will finalize a document for further discussion by the JFP. Tonseth will inform Hillman of progress within the JFP and, if deemed productive, may recommend an additional conference call with the Committees. Murdoch agreed to this path forward and noted it would be important to hear the position of USFWS representatives in a conference call. Hillman said he is hopeful the data

sources can be approved in October so the implementation plan can be completed by the end of the year. Hillman asked that additional thoughts and materials continue to be shared by email.

Other Recalculation Data Needs:

- The PUDs said they have been focused on finding agreement on the data sources and have not made progress on the sensitivity analysis. Mackey noted the assumption is that the sensitivity analysis would default to the method used in the last recalculation effort, but the recalculation methodology SOA allowed for room to use new approaches.
- Murdoch said one other issue to resolve is the discrepancy at times between adult counts at Priest Rapids Dam and Rock Island dams.
- Tonseth asked whether progress can be made for steelhead and asked if there is agreement that the best tool available for estimating SARs for steelhead at this time is PIT-tag detections. Murdoch asked that they be assessed for SARs to tributary locations. Willard said they could look into that, but Kevin See's (Biomark) estimates of tributary returns only included returning adult fish PIT-tagged at the Off-Ladder Adult Fish Trap. Murdoch agreed but said there is a lot of data with high detection efficiencies. All parties in attendance agreed to moving forward with calculations for steelhead using PIT-tag detections for NORs and SARs. Hillman will confirm with USFWS whether they are also in agreement.

B. Wenatchee Subbasin Multi-population Proportionate Natural Influence Approach

Brett Farman said more thought and discussion is needed on whether to adjust the proportionate natural influence (PNI) calculation and reporting approach for Wenatchee spring Chinook salmon. Farman proposed to reserve this topic for a future meeting as it is a lower priority than other ongoing topics.

Tracy Hillman reminded the Committees that Craig Busack (NMFS) provided a matrix for a multi-population PNI model, and it should be decided which hatchery production populations should be included in the model matrix. Keely Murdoch said when this topic is discussed again, the matrix should be revisited to determine whether it should be used as is or modified. It should be agreed to whether the multi-population PNI model would be used for information only or for reopening consultation within the terms of the existing permits. Todd Pearsons said this should be discussed again when it is necessary to understand how it should be included in the M&E report. First, it should be determined what PNI value NMFS wants reported, and second, what should be calculated for additional information. Farman said, to clarify, NMFS is not suggesting two separate reports to meet the permit requirements.

Hillman said for inclusion in the 2021 Annual M&E Report, the Committees would need to agree on what production areas to include in the matrix by January or February of 2022. All Parties present agreed to delay the discussion until December 2021.

C. 10-Year Comprehensive Monitoring and Evaluation Report: Review Check-in

Todd Pearsons said several chapters are owed to the Committees for review. Drafts of the genetics chapters are likely to be available in October, and the review period would be pushed out to the month of November. Catherine Willard is preparing the sockeye salmon report. In the last meeting, it was decided that a separate summary report that utilizes and expands upon the Executive Summaries from the PUD reports (e.g., including committee supported recommendations) for each stock will be prepared by the Committees as HCP-HC and PRCC HSC documents.

D. Coronavirus Disease 2019 and Monitoring and Evaluation Activities

Tracy Hillman asked Committees' members to provide their monthly updates on impacts of COVID-19 restrictions on M&E activities. Delta variant cases continue to increase in the region.

- Brett Farman said there is still no planned return to office. There is now a vaccine mandate for federal employees with exemptions for routine testing, but implementation of that mandate is unclear. NMFS is moving to the Bonneville Power Administration Fish and Wildlife Complex building next fall.
- Mike Tonseth said the Governor's mandate that requires State employees to be vaccinated will have negligible impact on fall and winter M&E activities in the Upper Columbia. The State has lifted the requirement for State contractors and volunteers to be vaccinated (other than those associated with medical facilities), so the mandate will not affect volunteers with the Angler Broodstock Collection fishery for collecting Priest Rapids Hatchery fall-run Chinook salmon broodstock in the Hanford Reach. All 80 positions were filled online for that fishery within 15 minutes, even assuming there would be a vaccine mandate.
- Keely Murdoch said the YN has adopted a phased approach to COVID-19 reopening. The YN has reverted back to Phase 2 and is facing a partial closure of all YN government offices other than for essential employees. Fisheries are considered essential activities, so fisheries staff presence in the workplace will be allowed as necessary. Field work such as screw trap operations is expected to continue with safety measures in place. Closures of YN government offices may slow down some administrative workings.
- Kirk Truscott said there are no changes for the CCT at this time.
- Greg Mackey said there are no changes at Douglas PUD.
- Todd Pearsons said there are no changes at Grant PUD.
- Catherine Willard said there are no changes at Chelan PUD.

IV. Administrative Items

A. Next Meetings

The next regular HCP-HCs and PRCC HSC meetings will be Wednesday, October 20, 2021; Wednesday November 17, 2021; and December 15, 2021; held by conference call and web-share until further notice.

Mike Tonseth announced that on September 8, 2021, a presumed wild male adult pink salmon was trapped at Dryden Dam adult fish trap.

V. List of Attachments

Attachment A List of Attendees

Attachment B Grant PUD's Recalculation Follow-up Discussion Email and SAR Calculations

Attachment A
List of Attendees

Name	Organization
Larissa Rohrbach	Anchor QEA, LLC
Tracy Hillman	BioAnalysts, Inc.
Scott Hopkins*	Chelan PUD
Catherine Willard*	Chelan PUD
Kirk Truscott*‡	Colville Confederated Tribes
Tom Kahler*	Douglas PUD
Greg Mackey*	Douglas PUD
Peter Graf‡	Grant PUD
Rod O'Connor	Grant PUD
Deanne Pavlik-Kunkel	Grant PUD
Todd Pearsons‡	Grant PUD
Brett Farman*‡	National Marine Fisheries Service
Katy Shelby	Washington Department of Fish and Wildlife
Mike Tonseth**	Washington Department of Fish and Wildlife
Keely Murdoch*‡	Yakama Nation

Notes:

* Denotes HCP-HCs member or alternate

‡ Denotes PRCC HSC member or alternate

Attachment B
Grant PUD's Recalculation Follow-up Discussion Email and SAR Calculations

Leah Libow

From: Peter Graf <Pgraf@gcpud.org>
Sent: Saturday, September 4, 2021 9:06 AM
To: Larissa Rohrbach
Cc: Todd Pearsons; Deanne Pavlik-Kunkel; Tracy Hillman; Catherine Willard; Scott Hopkins; 'Greg Mackey'; Tom Kahler; Rolland O'Connor
Subject: Recalc follow up discussion
Attachments: SAR Calcs.xlsx

Follow Up Flag: Follow up
Flag Status: Completed

CAUTION – EXTERNAL EMAIL: This email originated from outside of Anchor QEA. Please exercise caution with links and attachments.

Larissa,

When you have the time, would you distribute the email below to the HC/HSC committee members and the attached excel spreadsheet. Thanks!

HC and HSC Committee Members,

Thanks for the email Keely and agreed, great discussion at Tuesday's meeting. To keep things rolling we are providing a response and follow-up on a few topics that we think are key to our position.

First, we have no issues with the BAMP equation and its framework for mitigating for natural-origin fish and we believe that the method we have proposed is consistent with that equation and framework. Our intention is to fully mitigate for project-related juvenile mortality at all life-stages after smolts pass through the dams. We want to be clear that on this point, there are no philosophical differences. We believe that the main point of disagreement is the data that are used to calculate that mitigation.

Our key point is this: in the BAMP formula the 'adult' in the adult return count number and the 'adult' in the hatchery smolt-to-adult calculation should be *adults counted at the same location to ensure we are achieving full life cycle mitigation*. By calculating the mitigation in this way, we are making all life-stages whole after smolts pass through our dams. These data could be collected via CWT, PITs, census counts, etc. and at any location post-dam impacts (dams, forebays, tributaries, hatcheries, spawning ground, etc.). In all cases, the framework of the BAMP formula works when we keep the location of the adult count and the smolt survival end point the same.

As an example, imagine we could count the number of natural-origin smolts at the tailrace of a dam. We could still use the box flow chart that Keely created, but the first box would now be 'NORs at the tailrace'. From there, we could still calculate the number of smolts missing due to the dam (assume 7% for example purposes), and then ask, how many smolts does the PUD need to release to make up for that loss? To calculate that number, we would use the survival rate from a hatchery release *to the tailrace of the dam*. By releasing that calculated number, we would deliver the missing 7% to the tailrace of the dam and by doing so we have made the natural-origin cohort whole, at the tailrace.

This same framework could be applied at any location. Again, using the flow chart, we could count NOR adults on the spawning ground. We would again calculate the adults missing because of unavoidable juvenile project mortality (7%), and then release a sufficient number of smolts so that the missing 7% survive to the spawning grounds. All life-stages post-project mortality are made whole, from the tailrace of the dam to the spawning grounds.

In all cases the framework remains consistent; count how many are there, calculate how many are missing because of unavoidable juvenile project mortality, and then release enough smolts to ensure *enough survive to that location to make up for the loss*. The key is that the count location, and the hatchery smolt-to-fill in the blank survival location are the same.

Regarding the discussion of 'PUD responsibility', the selection of the dams as the point where we count NORs and calculate SARs has nothing to do with where PUDs mitigation starts or ends. We may have made this issue way more complex than it needs to be by raising that issue. Instead, we are using the dam counts because we believe it is the most parsimonious location to estimate NORs and calculate hatchery smolt-to-adult survival rates and thereby ensure we are delivering the correct number of smolts to make up for project related juvenile losses. Again, the location is not as important as the fact the location is consistent between the adult count and SAR calculation.

The BAMP established the initial production numbers and was a starting point for our agreements on hatchery compensation and used the data that were available at the time. The HCPs state that hatchery production levels will be adjusted every 10 years considering methods described in the BAMP. Since the BAMP, we have developed data sources that are able to provide a more accurate estimate of mitigation levels while maintaining the NOR equation and principle of full lifecycle mitigation for unavoidable juvenile project losses. We used those data sources when available at the previous recalculation and in the 2017 coho recalculation. The variables in the BAMP equation are adult counts and hatchery smolt-to-adult survival. Those variables have not changed.

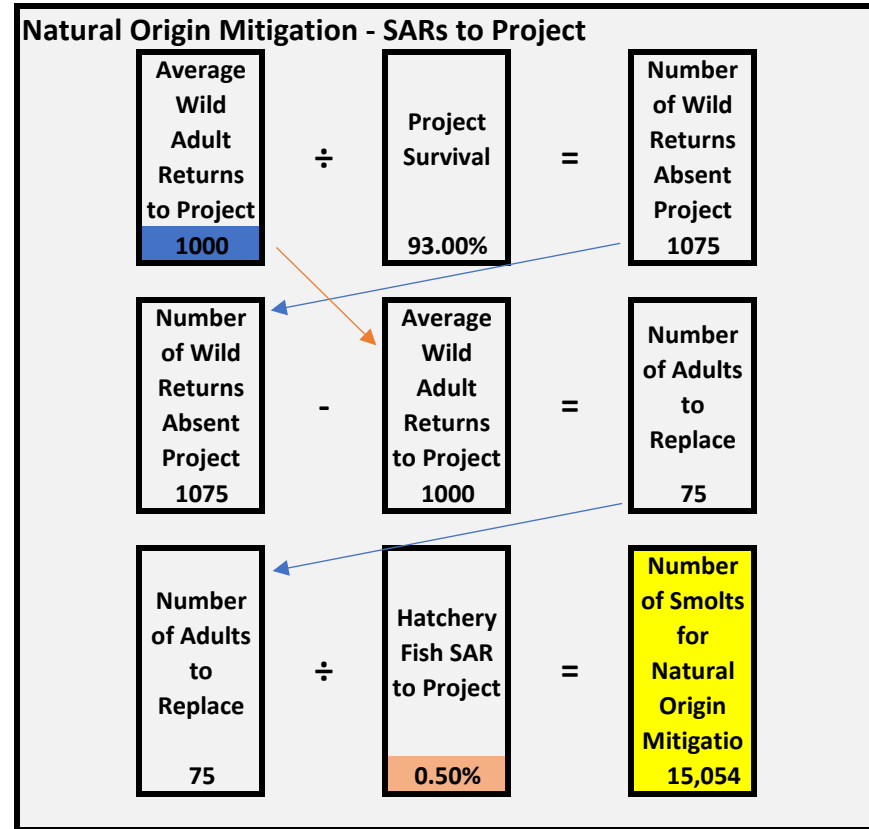
Lastly, we believe that debate on CWTs vs PITs is secondary to the issue described above. For calculating SARs both have biases (likely low for both), and in the absence of PITs, CWTs may be the only option and can work suitably well as 'plug numbers' and conversely in the absence of CWTs (i.e., for the most recent years used for the recalc dataset and for steelhead) PITs may be the only option. Either way, before we tackle CWTs vs. PITs let's try to resolve the issue above.

We too encourage the review of the relevant documents, and hopefully this email will help put into perspective how we are interpreting those documents. We also would encourage a careful review of the document that was distributed on Tuesday where a lot of the detail behind our thinking is described. Finally, we have attached a simple spreadsheet tool that uses the BAMP equation and shows how a linkage between the count location and SAR location results in the same mitigation number.

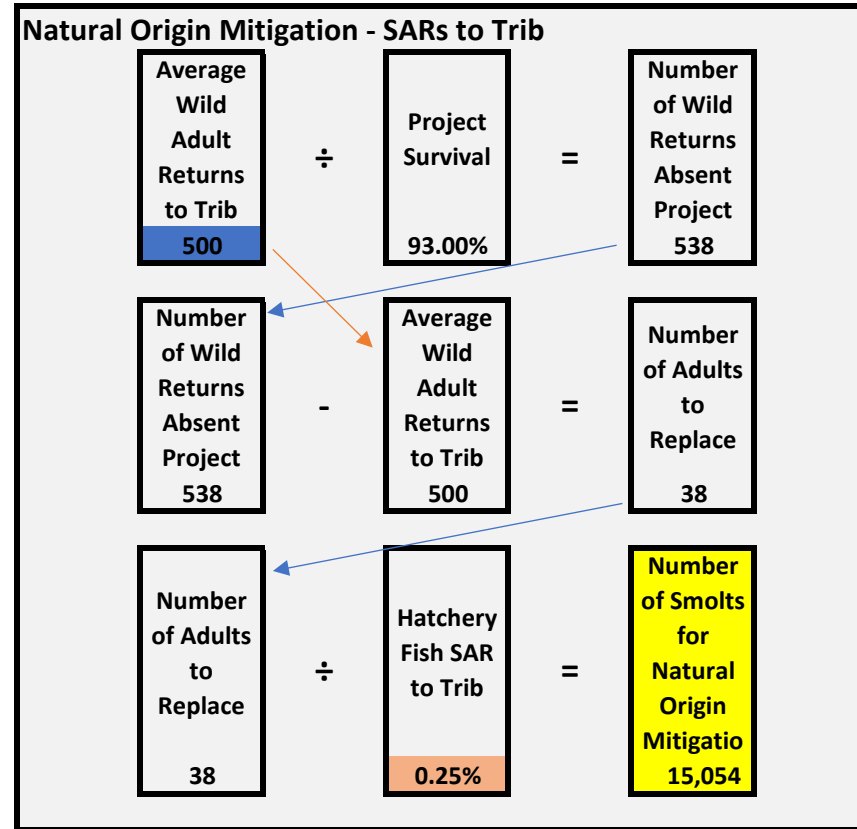
Talk to you all soon,

PUD committee members

Dam as adult count and SAR measuring point



Assume mortality from Dam to Trib is 50%



*In this scenario, the number of adults counted and the number of adults needed to replace is less. But because the SAR rate is also lower and matches the adult count location, the resulting number of smolts to release