

Memorandum

To: Wells, Rocky Reach, and Rock Island HCP Hatchery Committees, and Priest Rapids Coordinating Committee Hatchery Subcommittee Date: July 21, 2021

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

cc: Larissa Rohrbach, Anchor QEA, LLC

Re: Final Minutes of the June 16, 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 Hatchery Subcommittee (PRCC HSC) meetings were held by conference call and web-share on Wednesday, June 16, 2021, from 9:00 a.m. to 1:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

Joint HCP-HCs and PRCC HSC

Long-Term

- Greg Mackey will work with Mike Tonseth to test a modeling approach and prepare a white paper on the method for determining a range for the number of females to be collected for a given broodstock in the upcoming year (Item I-A). (*Note: this item is ongoing; expected completion by August.*)
- Greg Mackey will prepare a plan for alternative mating strategies based on findings described in his previously distributed literature review (Item I-A). (*Note: this item is ongoing; expected completion by July.*)
- 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 September.*)
- 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 by September.*)
- 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 by August.)

Near-Term (to be completed by next meeting)

- 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.)
- Todd Pearsons and Rod O'Connor (Grant PUD) will compile data from 2011 through 2020 to be used for No Net Impact (NNI) recalculations, for distribution prior to the July meeting (Item II-B).
- Larissa Rohrbach will file 10-year Comprehensive Review chapters as they are completed by lead authors and distribute them to Committees for review in weekly batches (Item II-C).
- Brett Farman will contact Mike Haggerty and Craig Busack (National Marine Fisheries Service [NMFS]) for their responses to a set of prepared questions from the Committees and request their participation in a future meeting on the appropriateness of the existing Proportionate Natural Influence (PNI) Model for spring Chinook salmon programs in the Wenatchee Basin (Item II-D).
- Larissa Rohrbach will obtain past meeting minutes on discussions of the 2010 Statements of Agreement on PUD funding and mitigation credit for the Skaha and Okanagan Lakes sockeye salmon hatchery and reintroduction programs (Item II-E).
- Todd Pearsons will add to the background information of Grant and Chelan PUDs' draft Statements of Agreement on Sockeye Salmon Obligation to provide more context on original mitigation credit agreements (Item II-E).

Rock Island/Rocky Reach HCP-HCs

- None.

Wells HCP-HC

- None.

PRCC HSC

- None.

Decision Summary

- The updated *Statements of Agreement on No Net Impact Recalculation Methodology* were approved by the HCP-HCs and PRCC HSC in today's meeting.

Agreements

- The HCP-HCs and PRCC HSC agreed to use data from 2011 through 2020 as the basis for NNI recalculations.

Review Items

- The *Monitoring and Evaluation (M&E) of the Chelan and Grant County PUDs Hatchery Programs Draft 2020 Annual Report* was distributed by Larissa Rohrbach on June 18, 2021, for 30-day review, with comments and edits due to Tracy Hillman by July 15, 2021.

Finalized Documents

- The updated *Statements of Agreement on No Net Impact Recalculation Methodology* were finalized and distributed by Larissa Rohrbach on June 25, 2021 (*Note: A corrected final version of Chelan PUD's SOA was distributed by Kristi Geris on June 30, 2021.*)

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. 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 additions or changes to the agenda. All HCP-HCs and PRCC HSC representatives approved the agenda.

Revised minutes from the May 19, 2021, meeting were reviewed and approved by all members of the HCP-HCs and PRCC HSC.

Action items from the HCP-HCs and PRCC HSC meeting on May 19, 2021, were reviewed and discussed (*Note: italicized text below corresponds to action items from the previous meeting.*)

Joint HCP-HCs and PRCC HSC

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- *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 by August.)*

Near-Term (to be completed by next meeting)

- *Mike Tonseth and Greg Mackey will solicit input from hatchery managers on effective methods to count surplus fish (Item I-A).*
Tonseth said this item is ongoing.
- *Brett Farman will contact Mike Ford and Craig Busack (National Marine Fisheries Service [NMFS]) to receive input on the appropriateness of the existing Proportionate Natural Influence Model for spring Chinook salmon programs in the Wenatchee Basin (Item II-D).*
Farman said Mike Haggerty (NMFS)—not Mike Ford—and Busack will participate in a future meeting.
- *The Chelan, Douglas and Grant PUD representatives will update the original 2013 SOA on No Net Impact Recalculation Methodology for approval in next month's meeting (Item II-A).*
This item is complete and will be discussed for approval in today's meeting.
- *Todd Pearsons will draft a review schedule for the 10-year Comprehensive Monitoring and Evaluation Report for distribution prior to next month's meeting (Item II-C).*
This item is complete and will be discussed in today's meeting.
- *Douglas PUD and U.S Fish and Wildlife Service will document the logistics within the week for collection of spring Chinook salmon broodstock at Wells Dam and potential holding, spawning, identification, and disposition of eggs or juveniles for review by NMFS to ensure alignment with existing permits (Item I-A).*

This item is complete. Greg Mackey said the first 100 fish were collected without problems at Wells Dam and brought to the Winthrop National Fish Hatchery (WNFH). Upon further assessment of the run, an additional 50 hatchery-origin return (HOR) Chinook salmon with coded wire tags were collected at Wells Dam for a total of 150 that were transported to WNFH. For the Methow Hatchery, collection of natural-origin return (NOR) fish went well considering the poor projections. Currently, there are 94 NOR (52 females and 42 males) and 32 HOR (22 females and 10 males) for a total of 126 fish in the hatchery for broodstock. They are trying to pick up a few more Twisp-origin NOR. The status is good for broodstock collection for both Methow Hatchery and WNFH.

II. Joint HCP-HCs and PRCC HSC

A. DECISION: Hatchery Production Recalculation Methodology Statement of Agreement

Tracy Hillman projected the updated SOA that had been distributed by Larissa Rohrbach on June 3, 2021. Todd Pearsons reviewed the edits that were made to the SOA and said he received no comments during the review period.

Keely Murdoch said one issue not resolved in the last recalculation (in 2011) was a lack of agreement on which hatchery programs should be subject to NNI compensation and which ones should not, which led to the sensitivity analysis and negotiation on the final agreement. It is assumed we are committed to the same sensitivity analysis process as an extension of the existing methods, but the SOA does not explicitly state that. Murdoch suggested adding language to acknowledge the lack of agreement and an intent to perform the same sensitivity analysis to resolve differences in agreement. Pearsons and Catherine Willard agreed the text is a bit vague but assumed the topic of which hatcheries would be subject to NNI calculation would be agreed upon later. Murdoch said the difference is this time we know there is likely not going to be agreement on this and that the sensitivity analysis will be needed to support a negotiated approach; last time it was not known what methodology would be used to resolve this disagreement. Tom Kahler asked why the language needs to state that there are subject hatcheries that have been "agreed to." Murdoch said the issue in the existing sentence is the term "agreed to" and perhaps also "subject hatcheries" but would also want language about including a sensitivity analysis. Hillman said the intent of this SOA was in effect to use the same approach as last time, including the use of the sensitivity analysis. He suggested adding language so that the term "sensitivity analysis" can be included somewhere in this SOA. Murdoch noted the sensitivity analysis was not a perfect solution, but we have no other method to propose at this time. Willard agreed it makes sense to add this language because it is known at this time that this method will be used, whereas it was not known last time. Greg Mackey agreed the sensitivity analysis method was developed later in the process and that it was not a perfect solution,

but it did provide choices to create a path for agreement. Hillman made revisions to the SOA during the meeting to capture the lack of consensus on which hatchery programs are subject to NNI, and flexibility to introduce a different, agreed to method for determining which hatcheries are subject to NNI.

Murdoch suggested including the time frame and number of years used in the Biological Assessment and Management Plan calculations. Pearsons said it becomes complicated to specify a number of years because of variability in the data. There will be some deviations on specific years of data used for different species based on the quality of the smolt-to-adult return (SAR) data. Murdoch said she is not totally convinced that the numbers counted at the dam need to match up with SARs. The Biological Assessment and Management Plan calculations assume lower juvenile mortality leads to an increase in the number of adult equivalents; it is the SARs from the hatchery that are used to estimate adult equivalents. If a program has a truncated dataset for SARs, there may be additional years for adults returning to the dam. Pearsons suggested adding qualitative language that states more generally the number of years of SARs or adult returns to be used, not necessarily the specific years of data in case there are issues with data from a specific year. Mike Tonseth suggested this language may be better reserved for the subsequent SOA describing the datasets to be used in recalculation. Murdoch and Pearsons agreed with that suggestion.

Hillman asked for a vote to approve the SOA and reminded the Committees that approval of the PRCC HSC version would also apply to the HCP-HCs versions to be distributed later. All HCP-HCs and PRCC HSC members present approved of the SOA. Kirk Truscott was not in attendance but approved via email on June 22, 2021.

B. Hatchery Production Recalculation: Data Sources Review

Rod O'Connor gave a presentation on which data sources, in concept, will be included in the recalculation effort (Attachment B). He stated he is representing all the PUDs with his presentation and that questions can be directed at Catherine Willard and Greg Mackey where appropriate for their programs. It was noted that some questions or topics will require further discussion beyond today's meeting.

Keely Murdoch noted the current implementation period ranges from 2014 to 2023. In the last recalculation the datasets for SARs and adult counts were not the same for different dams, and the last recalculation dataset time period was stopped in 2010. For the current recalculation effort, data should be included starting from when the last recalculation left off, starting with 2011. Murdoch referred to notes from the last recalculation for reference, distributed by Rohrbach after the meeting on June 22, 2021.

O'Connor presented information on data to be included for adult return years, NORs, hatchery releases, SARs, project survival/unavoidable project mortality, and tributary NOR spawner distribution. Regarding estimating adult returns at Priest Rapids Dam (PRD), steelhead window counts exist though not for as many years as the other dams, and the final method and data to be used have not been finalized yet, although it will align with the language in the approved SOA (similarly for spring Chinook salmon at PRD). Murdoch said they used steelhead counts at PRD last time because estimates of origin were available based on scale patterns, likely from stock assessment sampling at PRD.

At the end of his presentation, O'Connor asked for questions. Murdoch said she questions the years that should be included in the data. The previous recalculation was for 2001 to 2010. It makes sense now to include 2011 to 2020. The graphs presented showed data through 2023, but the implementation plan needs to be completed in 2021. Although the previous recalculation period ended in 2013, it makes sense to not skip years of data, but rather to start the datasets in 2011 and go forward to 2020.

Murdoch said, regarding differentiating HOR and NOR fish at the dams, at this time there are more unclipped HOR spring Chinook salmon returning to dams than in the past. Last time it was dealt with by adjusting for unclipped adult returns to hatcheries, although how that actually worked is a bit unclear.

Murdoch also noted that for steelhead, and maybe also for summer Chinook salmon, there is a question of how to adjust for overshoot at all facilities, but probably most acutely at PRD. It appears those fish may suffer high mortality passing through multiple dams. PRD provides open passage to allow for overshoots moving downstream, but this is not done at all dams. Excluding overshoots and fallbacks from datasets takes them out of the mitigation calculations, but perhaps they should be mitigated for, which was probably not considered in the last recalculation. Overshoot and fallback may increase with climate change as fish seek temperature refugia upstream and move back downstream. O'Connor said there are some new M&E results and other work that were not available to reference in the last recalculation, and we would want to use the best resources available to address adult counts. Todd Pearsons said the purpose of this presentation is to outline the best approach to generating the information that should be in the dataset, to focus and narrow the scope to the most accurate estimate of the number of fish passing over PRD. The specifics of overshoot and fallback would be contained within a given dataset. It makes sense that one would not count a fish twice if it passes through the dam twice. Murdoch asked if an overshoot fish that moved up and was never detected again would be included in the dataset. Tom Kahler said, in the case of Wells Dam, these numbers are calculated by Washington Department of Fish and Wildlife (WDFW) and currently included in the M&E reports. Willard said for Rock Island and Rocky Reach dams, they will rely on Dr.

John Skalski's (University of Washington, Columbia Basin Research) annual estimates that account for overshoot and fall backs.

Pearsons requested additional discussion from the Committees on the years of data that should be used and any other questions that require resolution to move on with assembling data during the next month. O'Connor said adult counts from 2011 to 2014 could be included after the data are quality checked and SARs are re-evaluated. Pearsons asked whether the analysis should build off of the existing dataset starting in 2011, which occurs during the last recalculation period, versus starting the dataset in 2014 with the current recalculation period. Murdoch said the last recalculation period started in 2014, but it was agreed during the last effort that this was for fish released in 2014 (from brood year 2012). The next period will begin with releases in 2024 (from brood year 2022). It makes sense that the data used should begin in 2011 and end in 2020 so that fish can be collected and broodstock adjusted by 2022 for release in 2024. The mitigation obligation will not be able to be calculated out to 2023, because the calculations need to be done this year to direct the amount of broodstock to be collected next year. Murdoch said first, a complete continuous dataset should be captured in 10-year increments and no part of the dataset should be skipped. Second, last time there was an effort to define what recalculation was, whether it was to calculate the number of adults collected for broodstock or for juveniles released, and it was agreed that the change was for the number of juveniles released.

Tracy Hillman asked whether all agree to the dates for analysis from 2011 and 2020. Mackey agreed it makes sense to start the dataset in 2011 for Wells Dam and confirmed the last year that can be incorporated will be 2020 to meet broodstock collection timeline for release year 2022. Willard said she agrees for Rock Island Dam and Rocky Reach Dam. Mike Tonseth agreed to be consistent with using as much of a 10-year dataset as possible, because the alternative is to agree to a using a time series that is less than 10 years. Brett Farman, Matt Cooper, and Pearsons agreed. Kirk Truscott responded in agreement via email on June 22, 2021.

Tonseth asked, regarding summer/fall Chinook salmon NOR data, why adjustments for broodstock collection at PRD are not being incorporated given there have been substantial broodstock collections at the Off-Ladder Adult Fish Trap (OLAFT). Pearsons said last time, for fall Chinook salmon NNI recalculation, the counts were taken from Rock Island Dam because the Priest Rapids Project area was already mitigated with fish from the full inundation area. Also, counts at Rock Island would already take into account fish removed at the OLAFT for broodstock and account for harvest. Murdoch said there were issues last time with the PRD counts for multiple species being lower than the Rock Island Dam counts, and Rock Island Dam counts were used as a surrogate for PRD counts, which were not trusted. Pearsons said this is one reason the method has not been confirmed yet and there needs to be a comparison between those two locations.

Pearsons and O'Connor and the PUDs will work to compile and share the data to be used for NNI recalculation for agreement by the Committees in the July meeting.

C. Comprehensive Monitoring and Evaluation Report: Reviewer Plan and Schedule

Todd Pearsons said the review process will be similar to a journal review process. The chapters will be provided as PDFs with line numbers. Commenters will provide their comments in a Word file with the line number and the comment. Larissa Rohrbach will receive those comments and assemble them into a combined document and send it to the lead author, who will address and respond to the comments. A schedule for the suggested sequence of chapter reviews was presented by Pearsons (Attachment D). The chapters will be made available on Douglas PUDs HCP-HC extranet site, with most of them uploaded by July 1. Rohrbach will distribute chapters via email at the beginning of the suggested review periods for the given chapters. This will impart some discipline on the process to ensure the review of this major information occurs on time. The first four objectives address productivity and abundance, and addressing comments on these metrics within the month of July will be critical for the lead authors to move on with the complete report. Murdoch said she appreciates the approach of dividing the report into manageable chunks.

D. Proportionate Natural Influence Modeling for the Wenatchee Basin

Brett Farman asked how to initiate a meeting with Craig Busack and Mike Haggerty. Haggerty has worked with NMFS for some time and has a strong background in modeling, including the PNI model. It was agreed in the last meeting that some material should be brought to Busack and Haggerty before scheduling a meeting with them, and perhaps the meeting should include only a subset of the people in this group.

Based on discussions last month, Tracy Hillman said the first question is whether a multi-population PNI model is appropriate or needed for upper Wenatchee spring Chinook salmon. If a multi-population model is necessary, the second question is which populations would be included in the model. Todd Pearsons said another specific question that should also be addressed is whether strays should be included in the calculation. Keely Murdoch said she agrees with Farman's original direction that we should identify the question we are trying to ask and issues we are trying to resolve before scheduling this type of meeting. Farman agreed, stating that a model can be built around a targeted approach for the question we are trying to answer.

Pearsons said another question is, "What is the most appropriate index of domestication selection above Tumwater Dam or in the tributaries for spawning aggregates of the Upper Wenatchee?" Greg Mackey said he thought there was only one selection parameter in the original model, but in the new model (described briefly by Farman) it sounded like unique selection parameters could be applied to each hatchery population.

Farman asked what the next steps should be. Pearsons said three to five questions have been identified for the NMFS experts and suggested the next step would be to distribute these questions to the experts and ask them to provide written responses or a presentation to the Committees. Willard agreed with this approach.

Bill Gale said a question for NMFS specifically is, "How does this metric inform recovery?" Farman said the additional information is more for finer-scale management and needs of operators; in terms of recovery, the delineation is for the whole Wenatchee population. He will talk to Busack about that. Gale agreed. NMFS typically presents PNI numbers by evolutionarily significant unit and at the population level. If NMFS intends to calculate PNI at the level of the Wenatchee population, the question is whether the two-population PNI model is an appropriate way to express PNI given the way things are being managed in the Wenatchee Basin. It does not seem to be appropriate to do a two-population PNI calculation given the way the populations are managed in the basin.

Farman will draft these questions, and Rohrbach will distribute them to the Committees for review by the end of this week, requesting responses by next Wednesday. The questions will be shared with Busack and Haggerty with a request that they call into the July, August, or September meeting so all members of the Committees can hear their responses. Pearsons asked that NMFS provide an informal set of written answers to help the discussion in a future meeting.

Pearsons noted that the next few months will be filled with working sessions on recalculation and is concerned about allocating time in meetings to the more time-sensitive topics. Hillman agreed we need to focus our time on recalculation and report review; however, we do not want to lose focus on PNI modeling for the Wenatchee Basin, especially if Busack intends to fully retire soon.

E. Okanagan Sockeye Salmon Obligation Statement of Agreement

Catherine Willard provided background on the draft SOA that was distributed by Larissa Rohrbach on June 11, 2021, with the intent to seek revisions and approval in the next meeting. Willard said Chelan PUD is requesting agreement that compensation for Lake Osoyoos will be met by naturally produced sockeye salmon smolts from Skaha Lake and Okanagan Lake and hatchery production from the Okanagan Nation Alliance's (ONA) sockeye salmon hatchery. The agreement for Grant PUD would apply to Lake Osoyoos and Lake Wenatchee. The agreement will be met by the PUDs providing funding and possibly capital upgrades to the ONA hatchery programs. The PUDs agree to fully fund M&E associated with the ONA sockeye salmon program. The only difference between the two agreements is the Grant PUD obligation for Lake Wenatchee and Osoyoos Lake is fully met by this program, whereas only Chelan PUD's Osoyoos Lake obligation is fully met by this agreement.

Tracy Hillman asked if the draft SOA has been reviewed and discussed with ONA and if it is consistent with their expectations. Willard confirmed that they have monthly update meetings with

the ONA, who are interested to learn when approval will be granted to continue funding of the program.

Keely Murdoch said she supports continued funding of the Canadian Okanagan sockeye salmon program. She has not had time to talk internally with the Yakama Nation (YN) and will do that this month. Preliminarily, the YN will probably not support language stating that Chelan PUD and Grant PUD receive hatchery credit for naturally produced smolts. It is a reintroduction, so it is somewhat unique, but somewhat similar to the coho salmon reintroduction where hatchery credit is not received for natural production. The Wells Tributary Committee and the PRCC Habitat Subcommittee have funded substantial habitat improvements, including barrier removal to tributaries and lakes, and at least some of the naturally produced fish are a product of these habitat improvements. One could potentially see funding something out of the habitat or tributary fund that creates hatchery credit for that production, which sets a bad precedent. Willard asked, if the SOA was revised by removing the natural production language, would you agree that we would be meeting our mitigation requirement by fully funding the hatchery program? Murdoch said she is uncertain until she has internal conversations within the YN.

Todd Pearsons said his understanding is that one of the key reasons Grant PUD got involved in funding this program was because that investment would result in credit for natural production. That was a key underpinning of the investment and risk originally taken and was stated in the original SOA. Willard added that Chelan PUD also entered the agreement with the understanding that they would receive credit for the natural production as written in the original SOA. Murdoch said she would take the time to review the meeting minutes from the discussion around the original SOA to better understand the context of the SOA. When this was agreed to before, there were no data to calculate any survival rates, and this was a big risk for all Committee members. Now there is much more certainty about the productivity gained from this program. Murdoch asked if Grant PUD foresees getting credit for NOR production forever, or for the 10-year period of the SOA? Pearsons said his interpretation of the SOA was that the PUDs would receive credit for all future natural production in Skaha and Okanogan lakes. The idea was that the hatchery would be used to restart the production, the hurdles and risks were understood, and big up-front investments were made to be able to reap a big reward after these populations were able to re-establish and start producing large numbers of fish. Some of the risks to the PUDs included making investments in another country and for a facility that it would not own. The question before the Committees at that time was whether to support sockeye salmon hatchery production or alternatively fund a project that could greatly increase natural production beyond the amount that would be a part of a hatchery program. In essence, it was a question of whether the committee wanted sustained hatchery production or potentially a greater number of naturally produced fish.

Dave Duvall said ONA views this as the second part of the reintroduction program because of their interest in repopulating Lake Okanagan. It is basically a new reintroduction program to Lake Okanagan, a larger lake, with new tributaries and new monitoring efforts.

Hillman asked if Pearsons could add important context to the background information. Pearsons said adding more information may not fundamentally change a disagreement on this. Murdoch said the addition of more background would help her recall all of the conversations around the original SOA. Mike Tonseth said he has not had internal discussions regarding the SOA and was not present during the original SOA development and approval. He will have to rely on the written record for WDFW's position at that time, especially regarding the longevity of the credit for natural production moving forward. Matt Cooper and Brett Farman said they also need to review some of the context.

Pearsons read from the 2010 SOA that presents the issue that was agreed to. Statement number four of the 2010 SOA states: "In the event reintroduction is successful, Grant PUD will receive NNI credit for the Priest Rapids Project from (1) fry produced by the PUD-funded hatchery and (2) natural-origin smolts emigrating from Skaha and Okanagan lakes." Tonseth said the confusion may be whether that credit applied for the duration of the SOA (10 years) or in perpetuity. Pearsons said, speaking for Grant PUD, there would not have been many years in the 10-year time period when natural production would have occurred, and this would not have been an adequate return on the significant investment made and risk taken, so the assumption by Grant PUD is that this would be a longer-term credit.

Murdoch asked about the second bullet of the current draft SOA, which indicates that the PUDs agree to fund an M&E Plan. Willard said it was developed with the Canadian Okanagan Basin Technical Working Group and was distributed with a large number of documents at the end of last year with the program review. Murdoch suggested citing the M&E Plan in the SOA.

Pearsons agreed to review meeting minutes leading up to the original 2010 SOA and add more context from those discussions to the background information to explain the natural production credit, for approval in the next meeting.

F. Update on Spring Chinook Salmon Tagging at the Priest Rapids Dam Off-Ladder Adult Fish Trap

Mike Tonseth provided an update in an email that was distributed by Larissa Rohrbach on June 16, 2021. Tonseth said email updates on OLAFT sampling are similar in format to those provided in past years for steelhead. Over the past couple of weeks, the number of spring Chinook salmon sampled has increased; approximately 560 fish have been sampled and they are likely near the end of the run.

Catherine Willard asked how long spring Chinook salmon will be sampled. Tonseth said through the end of June to avoid impacts of trapping on sockeye salmon and summer Chinook salmon.

G. 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.

- Kirk Truscott was not present in today's meeting and provided no updates over email from CCT.
- Mike Tonseth said there is no new guidance on in-person meetings from WDFW but that may change with new openings for the State of Washington at the end of June per an order from the Governor.
- Brett Farman had no new updates from NMFS. Allowable activities will depend on regional status across the United States with no plans for re-entering the office.
- Keely Murdoch had no additional reopening updates from the YN.
- Matt Cooper said guidance from the Department of the Interior and U.S. Fish and Wildlife Service is forthcoming on a phased return to work program, perhaps by the end of the month.
- Todd Pearsons had no new updates from Grant PUD.
- Greg Mackey had no new updates from Douglas PUD.
- Catherine Willard had no new updates from Chelan PUD.

H. Administrative Items

A. Next Meetings

Tracy Hillman informed the HCP-HCs and PRCC HSC that Johnny Buck will serve as the Wanapum representative on the PRCC HSC going forward.

The next HCP-HCs and PRCC HSC meetings will be Wednesday July 21, 2021; Wednesday August 18, 2021; and Wednesday September 15, 2021, held by conference call and web-share until further notice.

III. List of Attachments

Attachment A List of Attendees

Attachment B Data Sources for 2021 Recalculation

Attachment C Notes on Mid-Columbia PUD Recalculation Data

Attachment D Schedule for Review of Comprehensive Report

**Attachment A
List of Attendees**

Name	Organization
Larissa Rohrbach	Anchor QEA, LLC
Tracy Hillman	BioAnalysts, Inc.
Scott Hopkins*	Chelan PUD
Catherine Willard*	Chelan PUD
Tom Kahler*	Douglas PUD
Greg Mackey*	Douglas PUD
Dave Duvall	Grant 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
Matt Cooper*‡	U.S. Fish and Wildlife Service
Bill Gale*‡	U.S. Fish and Wildlife Service
Mike Tonseth*‡	Washington Department of Fish and Wildlife
Katy Shelby	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
Data Sources for 2021 Recalculation

Data Sources for 2021 Recalculation

June 16, 2021

Presentation to the Wells, Rocky Reach and Rock Island HCPs Hatchery Committees
and
Priest Rapids Hatchery Committee

Outline

- Adult Return Years
- Natural Origin Adult Returns
- Hatchery Releases
- Smolt to Adult Return (SAR)
- Project Survival/Unavoidable Project Mortality (UPM)
- Tributary Natural Origin Spawner Distribution

Adult Return Years

- Data include returns from 2014-present
- Covers implementation period of 2013 recalculation (2014-2023)
- Provides overlap with relevant brood years for SAR calculations

Adult Return Years

(Spring Chinook Example)

2013 Recalculation Implementation Period

Brood Year	Return Year																					
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2005	SP		R	A3	A4	A5																
2006		SP		R	A3	A4	A5															
2007			SP		R	A3	A4	A5														
2008				SP		R	A3	A4	A5													
2009					SP		R	A3	A4	A5												
2010						SP		R	A3	A4	A5											
2011							SP		R	A3	A4	A5										
2012								SP		R	A3	A4	A5									
2013									SP		R	A3	A4	A5								
2014										SP		R	A3	A4	A5							
2015											SP		R	A3	A4	A5						
2016												SP		R	A3	A4	A5					
2017													SP		R	A3	A4	A5				
2018														SP		R	A3	A4	A5			
2019															SP		R	A3	A4	A5		
2020																SP		R	A3	A4	A5	
2021																	SP		R	A3	A4	

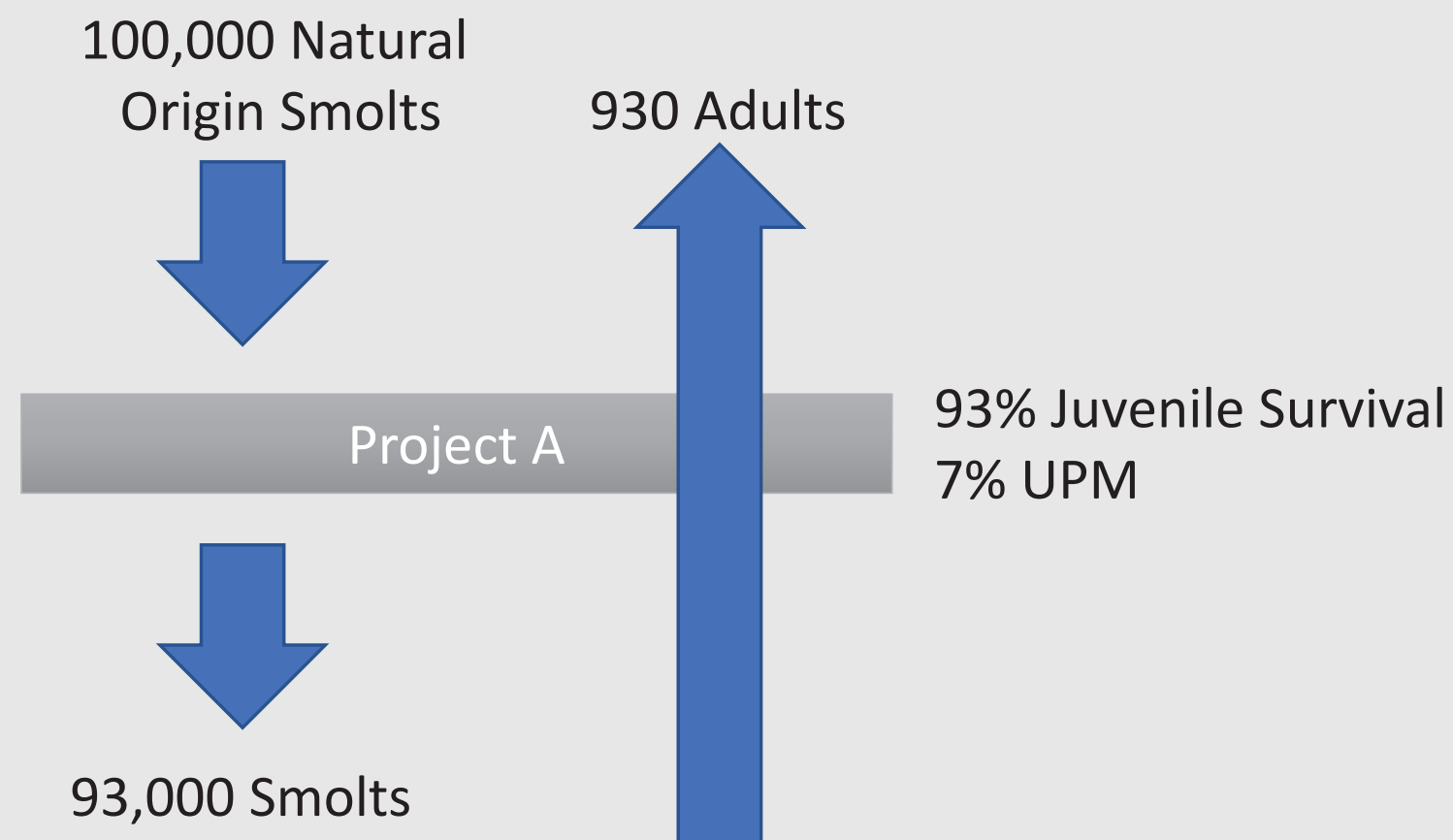
Contributing Brood Years/
Relevant SARs

SP = Spawning
R = Release
A = Age at return

Natural Origin Adult Returns

- Used in BAMP calculation to convert adult equivalents into smolt numbers
- Calculate hatchery compensation based on unavoidable project mortality and hatchery SARs

Example



- Calculate natural-origin adults expected to return in absence of UPM:

$$930 \text{ Adults} / 93\% \text{ Survival} = 1,000 \text{ Adults}$$

- Calculate difference between expected and observed:

$$1,000 \text{ Adults} - 930 \text{ Adults} = 70 \text{ Adults}$$

- Convert adult equivalents into juvenile hatchery compensation requirement:

$$70 \text{ Adults} / \text{Hatchery SAR} = \text{Smolt Number}$$

Natural Origin Adult Return Data Sources: Summer/Fall Chinook

Wells

WDFW stock assessment (*adjusted for fallback, re-ascension, broodstock*) adjusted by nadir date

Rocky Reach

DART Chinook counts adjusted by nadir dates, fallback, NOR fish proportion

Rock Island

DART Chinook counts adjusted by nadir dates, fallback, NOR fish proportion

Priest Rapids

DART Chinook counts adjusted by nadir dates, fallback, overshoot, NOR fish proportion (Summer Chinook)

*DART Chinook counts **at Rock Island** adjusted by nadir dates, fallback, overshoot, NOR fish proportion (Fall Chinook)*

Natural Origin Adult Return Data Sources: Steelhead

Wells

WDFW Wells stock assessment (adjusted for fallback, re-ascension, broodstock)

Rocky Reach

RR DART counts adjusted for fallback, natural origin proportion from Wells WDFW stock assessment, and Entiat natural origin returns

Rock Island

RI DART counts adjusted for fallback, natural origin proportion from Tumwater stock assessment (Wenatchee origin only), and RR counts expanded by PIT conversion from RI to RR

Priest Rapids

TBD

Natural Origin Adult Return Data Sources: Spring Chinook

Wells

WDFW Wells stock assessment (adjusted for fallback, re-ascension, broodstock)

Rocky Reach

Sum of 1) Wells stock assessment expanded by PIT conversion rate from RR to Wells and 2) Entiat returns

Rock Island

Sum of 1) M&E-based run reconstruction for Wenatchee, and 2) RR count based on expanded by PIT conversion rate from RI to RR.

Priest Rapids

TBD

Natural Origin Adult Return Data Sources: Sockeye

Wells

Fish Water Management Tool

Rocky Reach

SOA in discussion

Rock Island

SOA in discussion + RI DART counts adjusted for fallback and Wenatchee origin

Priest Rapids

SOA in discussion

Natural Origin Adult Return Data Sources:

Coho

Wells

Wells Dam count adjusted for fallback

Rocky Reach

DART RR counts adjusted by percent natural-origin from YN M&E report

Rock Island

DART RI counts adjusted by percent natural-origin from YN M&E report

Priest Rapids

Funding agreement. SOA 2018-01 “The PRCC agrees that Grant PUD shall provide coho hatchery compensation for the Upper Columbia at a rate equivalent to 14% (7% per project) to meet Grant PUD’s No-Net-Impact coho hatchery obligation. Fourteen percent (14%) will be the mortality rate through the 2032 recalculation.”

Hatchery Releases

- Unavoidable project mortality applied to smolt release targets

Hatchery Program	Species
WNFH	Spring Chinook
WNFH	Steelhead
ENFH	Summer Chinook
LNFH	Spring Chinook
YN	Coho

Smolt to Adult Return (SAR) Data Sources

- **CWT data from M&E plan & RMIS**
 - + Does account for harvest
 - Relevant SAR brood years are limited because of lag time reading CWTs (i.e., brood years after 2013 are suspect)
 - Does not take geography into account (end point is spawning location)
 - Does not account for pre-spawn mortality
- **PIT data from M&E plan or PTAGIS**
 - + Easily accessible and up to date...allows for more recent/relevant SAR calculations
 - + Takes geography into account (can be tailored to individual Projects)
 - Does not account for harvest
- **Hybrid PIT and CWT**
 - + More complete accounting of returns
 - Limited by availability of recent/relevant CWT data
- **Which method to use depends on species and facility M&E**

Smolt to Adult Return (SAR) Data Sources

Tradeoffs between PIT and CWT data

- Available brood years
- Relevance of returns to current recalculation

Brood Year	Return Year																					
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
2005	SP		R	A3	A4	A5																
2006		SP		R	A3	A4	A5															
2007			SP		R	A3	A4	A5														
2008				SP		R	A3	A4	A5													
2009					SP		R	A3	A4	A5												
2010						SP		R	A3	A4	A5											
2011							SP		R	A3	A4	A5										
2012								SP		R	A3	A4	A5									
2013									SP		R	A3	A4	A5								
2014										SP		R	A3	A4	A5							
2015											SP		R	A3	A4	A5						
2016												SP		R	A3	A4	A5					
2017													SP		R	A3	A4	A5				
2018														SP		R	A3	A4	A5			
2019															SP		R	A3	A4	A5		
2020																SP		R	A3	A4	A5	
2021																	SP		R	A3	A4	

CWT PIT

CWT
PIT

SP = Spawning
R = Release
A = Age at return

Project Survival/Unavoidable Project Mortality (UPM)

- Similar to previous years with new survival data from Wells and PRD and RI (forthcoming)
- Updated survival data will influence compensation levels
- GPUD FERC Progress and Implementation Report contains PRCC-approved survival numbers for Grant PUD

Tributary Natural Origin Spawner Distribution

- Provides tool for aligning hatchery production with natural origin distribution
- Values used in consideration of distribution of hatchery production in the BAMP calculation
- Estimate proportions of stocks/species returning to tributaries upstream of Rock Island
- Data from WDFW stock assessment and M&E reports

Attachment C
Notes on Mid-Columbia PUD Recalculation Data

Notes on Mid-Columbia PUD Recalculation Data

July 11th, 2011

Unavoidable Project Mortality

1. Survival and resulting compensation levels are determined through the HCP Coordinating Committee(s) and hatchery production levels, except for inundation, are subject to adjustments upon completion of survival studies. For example, the Rock Island HCP states: "*Juvenile Project Survival estimates, when available, will be used to adjust hatchery based compensation programs*" (pg. 22).
2. Methow-Okanogan, Entiat, and Wenatchee combined survival probabilities are based on the product of survival at each project that fish produced in these basins would experience during the downstream migration.

Adult Returns

1. Wells

- a. Spring Chinook counts reflect the best run estimates at Wells Dam (data provided by Charles Frady, WDFW). WDFW adjusts the returns for broodstock removal (broodstock removed at Wells Dam/Hatchery are included in the return), fallback, and double counts. Spring Chinook and summer Chinook counts were separated using video records at Wells Dam. Biologists used body morphology, color, and spotting patterns to discern spring versus summer Chinook, where spring Chinook tend to be more slender, darker in color, and have fewer spots, and summer Chinook tend to be more stout, bright, and more heavily spotted. Origin of spring Chinook (natural or hatchery) was determined through marks and tags and scale reading of fish collected for broodstock at Wells Dam, which occurs throughout the run (Charles Frady, personal communication).
- b. Steelhead counts reflect the best run estimates at Wells Dam (2010 draft Douglas M&E Report, Chapter 4, Appendix A). Total count at Wells Dam includes passage from 15 June (run year) to 14 June (spawn year) for brood years 2003 to present; total Wells Dam count for previous years includes the total reported for the run year (prior to spawn). Ladder counts are based on DCPUD raw data for brood years 2000-2010. For brood years 2007-2009, proportion of hatchery and wild fish at Wells Dam was estimated through run-at-large sampling; in previous years, proportions were calculated from broodstock trapping records. Estimated double counts and fallback were based on expanded PIT tag interrogation data. Fish origin was determined through marks and tags, and by scale reading.
- c. Summer Chinook counts are based on the fish counts at Wells Dam, with fish removed as broodstock at Wells Dam and hatchery accounted for. The total summer Chinook counts were obtained by subtracting the annual number of spring Chinook (see Spring Chinook section, above) from the total annual Chinook count (spring and summer combined). Douglas PUD maintains adipose clipped and un-clipped Chinook data. The annual ratio of clipped to unclipped provided an estimate of hatchery versus natural origin fish. This ratio was applied to the summer Chinook returns to obtain the natural- and hatchery-origin returns.

2. Rock Island and Rocky Reach

- a. Clipped and unclipped adult enumeration data are only available beginning in 2002.
- b. The calendar division between spring- and summer-run Chinook salmon is June 7th at Rock Island, and June 12th at Rocky Reach. These dates are different from those used on DART and FPC, but more accurately reflect the run distribution at Rock Island and Rocky Reach. These dates are the last day of each year that adult returns will be assigned to the spring-run of Chinook for recalculation purposes.

- c. Summer Chinook counts are determined by clipped (hatchery-origin) and unclipped (natural-origin) observations. Unclipped hatchery-origin fish, including a small number of adults released as sub-yearlings from Turtle Rock Island and a potentially significant number (i.e., thousands) of adults released as sub-yearlings from Priest Rapids Hatchery, are included in the natural-origin totals.
- d. Spring Chinook and steelhead counts are determined by clipped (hatchery-origin) and unclipped (natural-origin) observations, adjusted for unclipped hatchery adults identified in stock assessment at Wells and Priest Rapids, respectively.
- e. Sockeye counts are determined by clipped (hatchery-origin) and unclipped (wild-origin) observations. The difference between enumeration totals at Rock Island and Rocky Reach are assumed to represent the Wenatchee River totals. Tumwater counts may be used in future recalculations and are more representative of spawning escapement of Wenatchee River sockeye; however, clipped and unclipped enumeration would be required at Tumwater.

3. Priest Rapids

- a. Spring, summer, and fall Chinook counts between 2007 and 2010 were used because 2007 was the first year that fish were characterized as clipped or unclipped. A cumulative nadir using Chinook count data (adults and jacks) between 2007-2010 was used to split run timing of Chinook salmon into spring, summer, and fall races.
- b. Steelhead counts between 2001-2010 were used at Priest Rapids Dam because estimates of origin were available during this time period. Steelhead was identified to origin based on scale patterns.
- c. Wild spring Chinook salmon were estimated as unclipped fish at Priest Rapids Dam minus unclipped hatchery fish at Wells adjusted by conversion rates between Priest Rapids Dam and Wells Dam.
- d. Summer and fall Chinook salmon adults are expressed as clipped or unclipped. There are varying degrees of unclipped hatchery fish in the unclipped fish category. As such the unclipped fish counts are overestimates of wild fish abundance.

SARs

1. Wells

- a. Steelhead SAR (2010 draft Douglas M&E Report, Chapter 1, Appendix B): The total number of adult hatchery fish by brood year originating from Wells Hatchery releases is calculated by applying mark rate and age data collected during run sampling or spawning of adult fish to the total passage of steelhead at Wells Dam on an annual basis as listed on the Fish Passage Center or CR DART websites. The number of juvenile steelhead released was divided by the sum of returning adult fish from that brood to derive the SAR ratio. Wild fish and known stray fish were excluded. Hatchery steelhead typically return as 1-salt or 2-salt fish, so the SAR would be calculated as:

$$\text{Juveniles released} / (1\text{-salt returns (year X)} + 2\text{-salt returns (year Y)})$$

Some steelhead from other programs were released upstream of Wells Dam release fish with an identical mark as Wells Hatchery fish (i.e., Winthrop NFH; ad-clip), and SAR calculations include these fish. Steelhead programs releasing fish upstream of Wells Dam with a unique hatchery mark (i.e., Colville Tribe; peduncle CWT) were excluded from SAR calculations.

- a. Spring Chinook SAR (2010 draft Douglas M&E Report, Chapter 1, Appendix B): The SAR for each brood of spring Chinook released from Methow Hatchery was calculated for each release site (typically Methow, Twisp, and Chewuch releases) using coded wire tag data available from the RMIS database (www.rmipc.org). The number of adult fish for each release site was determined by summing the number of fish in the RMIS database for each specific tagcode, then expanding that number by the tagcode-specific mark rate determined prior to release through routine QC sampling at the hatchery. Because Methow Hatchery fish are not adipose fin-clipped, they cannot be retained in selective fisheries that target adipose fin-clipped fish. However, some mortality occurs on fish released in selective fisheries, and the number of returning adults from the RMIS database was then expanded to account for fishery-related mortality using the exploitation rate of a surrogate stock (e.g., Leavenworth NFH, or Chiwawa Hatchery). For example: If 20% of the adult return an adipose fin-clipped surrogate stock of spring Chinook is harvested in selective fisheries, and the mortality rate for released fish is estimated at 10%, we would assume that 20% of the returning adult Methow Hatchery spring Chinook from the same brood year were also captured in the fishery, and we would increase the estimated adult return of MH fish by the hooking mortality rate associated with that fishery:

$MH \text{ adult fish in RMIS} + (MH \text{ adult fish in RMIS} \times \text{surrogate stock harvest rate} \times \text{hooking mortality rate})$

SAR proportion was calculated as the number of juvenile fish released for that tagcode divided by the expanded adult returns. We typically included only anadromous lineage fish (i.e., exclude captive brood progeny) in these calculations so that comparisons across years are similar.

The SARs presented here are an amalgamation of the Twisp, Chewuch, and Methow release groups and associated CWT recoveries to represent an SAR for Methow Hatchery releases as a whole.

Attachment D
Schedule for Review of Comprehensive Report

Schedule for Review of Comprehensive Report

The review period for chapters that address each objective are presented below. Reviewers can review chapters earlier if they want, but they should provide their review no later than the specified review period.

Comments for each chapter will be provided by reviewers in a Word document with a citation to the line number in the chapter.

Objective	Objective Description	Review Period
1	Determine if conservation programs have increased the number of naturally spawning and naturally produced adults of the target population and if the program has reduced the natural replacement rate (NRR) of the supplemented population. (SPC, SUC, FAC, STH = 4 chapters)	First 30 days 7/1/21–7/31/21
2	Determine if the proportion of hatchery fish on the spawning grounds affects the freshwater productivity of supplemented stocks. (SPC/SUC/STH, FAC covered in Objective 1 = 1 chapter)	First 30 days 7/1/21–7/31/21
3	Determine if the hatchery adult-to-adult survival (i.e., hatchery replacement rate, HRR) is greater than the natural adult-to-adult survival (i.e., natural replacement rate, NRR) and the target hatchery survival rate. (addressed in Objective 1 = 0 chapters)	First 30 days 7/1/21–7/31/21
4	Determine if the proportion of hatchery-origin spawners (pHOS or PNI) is meeting the management target. (FAC, All other; 2 chapters)	First 30 days 7/1/21–7/31/21
5	Determine if the run timing, spawn timing, and spawning distribution of the hatchery component is similar to the natural component of the target population or is meeting program-specific objectives. (SPC/SUC, STH, 2 FAC = 4 chapters)	Second 30 days 8/1/21–8/31/21
6	Determine if the stray rate of hatchery fish is below the acceptable levels to maintain genetic variation among stocks. (SPC/SUC/FAC/STH = 3 chapters)	Second 30 days 8/1/21–8/31/21
7	Determine if genetic diversity, population structure, and effective population size have changed in natural spawning populations as a result of the hatchery program. (SPC, SUC/FAC, STH = 3 chapters)	Third 30 days 9/1/21–9/31/21

8	Determine if hatchery programs have caused changes in phenotypic characteristics of natural populations. (SPC/SUC, FAC, STH = 3 chapters)	Second 30 days 8/1/21–8/31/21
9	Determine if hatchery fish were released at the programmed size and number. (SPC/SUC/STH, FAC = 2 chapters)	Third 30 days 9/1/21–9/31/21
10	Determine if appropriate harvest rates have been applied to conservation, safety-net, and segregated harvest augmentation programs to meet the HCP/SSSA goal of providing harvest opportunities while also contributing to population management and minimizing risk to natural populations. (SPC/SUC/FAC/STH = 1 chapter)	Third 30 days 9/1/21–9/31/21
	Executive Summaries for each taxa (SPC, SUC, FAC, STH = 4 chapters)	Third 30 days 9/1/21–9/31/21
	Bonus chapters (FAC CWT bias, FAC carcass recovery bias = 2 chapters)	Third 30 days 9/1/21–9/31/21
Entire Sockeye Report	Relevant objectives	Third 30 days 9/1/21–9/31/21
Entire set of comprehensive Reports Approval	Authors respond to comments and finalize report.	Fourth 30 days 10/1/21–10/31/21