

Memorandum

To: Wells, Rocky Reach, and Rock Island HCP Hatchery Committees and Priest Rapids Coordinating Committee Hatchery Subcommittee Document Date: July 30, 2024

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

cc: Natasha Winnacott, Anchor QEA

Re: Minutes of the June 20, 2024, HCP Hatchery Committees and PRCC Hatchery Subcommittee Meetings

The Wells, Rocky Reach, and Rock Island Hydroelectric Projects Habitat Conservation Plan Hatchery Committees (HCP-HCs) and Priest Rapids Coordinating Committee's Hatchery Subcommittee (PRCC HSC) meetings were held in person at the Douglas PUD Auditorium with members attending virtually as well on Thursday, June 20, 2024, from 10:00 a.m. to 2:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

Long-Term

Joint HCP-Hatchery Committees and PRCC Hatchery Subcommittee

- Keely Murdoch and Mike Tonseth will obtain estimates of pre-spawn mortality (PSM) from Andrew Murdoch to update the retrospective analysis for Wenatchee Spring Chinook Salmon (Item I-A). *(Note: This item is ongoing.)*
- Members of the HCP-HCs and PRCC HSC will provide feedback to the Washington Department of Fish and Wildlife (WDFW)-revised version of questions on recalculation for Policy Committees (Item I-A). *(Note: This item is ongoing.)*
- K. Murdoch will create a group to review the Wenatchee Spring Chinook Salmon sliding-scale Proportionate Natural Influence (PNI) targets using more recent escapement data (Item I-A). *(Note: This item is ongoing.)*

Near-Term (to be completed by next meeting)

Joint HCP-Hatchery Committees and PRCC Hatchery Subcommittee

- The HCP-HCs and PRCC HSC members will begin to draft language on rewriting objectives from the 10-Year Comprehensive Summary Report using recommendations that were agreed upon during today's meeting for further discussion during the July 17, 2024, meeting (Item IV-A).

- Keely Murdoch will edit Objective 1 in the Monitoring & Evaluation (M&E) Plan to include the number of adults removed for management purposes for further discussion at the July 17, 2024, meeting (Item IV-A).

Decision Summary

- None

Agreements

- HCP-HCs and PRCC HSC representatives agreed to Chelan PUD's pilot project for transporting approximately 100 female Okanogan Sockeye Salmon to the Penticton Hatchery, pending permitting approval, or to the U.S. portion of Lake Osoyoos (Item II-B).
- HCP-HCs and PRCC HSC representatives approved Douglas PUD's recommendation to meet broodstock collection targets for the Twisp Spring Chinook Salmon program using hatchery-origin fish collected at the Twisp River weir of Twisp program origin, passive integrated transponder (PIT)-tagged Twisp River-born fish, and fish collected elsewhere with high-level genetic assignment to the Twisp population (Item III-A).

Review Items

- Papers describing Integrated Population Modeling that were distributed on June 26 for review by HCP-HCs and PRCC and discussion in the July 17, 2024, meeting (Item IV-A).

Finalized Documents

- None

I. Welcome

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

Tracy Hillman welcomed the HCP-HCs and PRCC HSC and reviewed the agenda. Hillman asked for any additions or changes to the agenda. Catherine Willard requested that the order of topics for the agenda be changed to the following order: implementing measures to reduce stress at the Eastbank Hatchery, feasibility of alternative collection of Okanogan Sockeye Salmon, Hatchery Genetic Management Plan (HGMP) updates, Twisp Spring Chinook Salmon broodstock contingency plan, and the 10-Year Comprehensive Summary Report. HCP-HCs and PRCC HSC representatives approved of the revised agenda.

Rod O'Connor informed the PRCC HSC that after the early release for fish that were sick with *columnaris* in Pond E at the Priest Rapids Hatchery, all the remaining fall Chinook Salmon in Ponds D-A the Priest Rapids Hatchery remained healthy and were released on time, as discussed during the May 15, 2024, meeting (see May 15, 2024, meeting minutes for reference).

The revised meeting minutes from May 15, 2024, were reviewed and approved by Parties that attended that meeting.

Action items from the HCP-HCs and PRCC HSC May 15, 2024, meeting were reviewed.

(Note: Italicized text below corresponds to action items from the previous meeting.)

Long-Term

Joint HCP-Hatchery Committees and PRCC Hatchery Subcommittee

- *Keely Murdoch and Mike Tonseth will obtain estimates of PSM from Andrew Murdoch to update the retrospective analysis for Wenatchee Spring Chinook Salmon (Item I-A). (Note: Expected completion date to be determined.)*

This item is ongoing.

- *Members of the HCP-HCs and PRCC HSC will provide feedback to the WDFW-revised version of questions on recalculation for Policy Committees (Item I-A).*

This item is ongoing.

- *K. Murdoch will create a group to review the Wenatchee Spring Chinook Salmon sliding-scale PNI targets using more recent escapement data (Item I-A).*

K. Murdoch will not be able to begin to work on this until August. This item is ongoing.

Near-Term (to be completed by next meeting)

Joint HCP-Hatchery Committees and PRCC Hatchery Subcommittee

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

- *Flexibility around quarantine requirements for transporting adult fish into Canada.*
- *Minimum feasible program size under an emergency scenario.*

This item will be discussed during today's meeting. This item is complete.

- *The HCP-HCs and PRCC HSC parties will send management and monitoring recommendations to Tracy Hillman for compilation in the 10 Year Comprehensive Review by June 14, for discussion in the June 20, 2024, meeting (Item III-A).*

This item will be discussed during today's meeting. This item is complete.

- *Tracy Hillman will revise the 10-Year Comprehensive Review to include consensus recommendations and list all management and monitoring recommendations received from HCP-HCs and PRCC HSC members in an appendix (Item III-A).*

This item will be discussed during today's meeting. This item is complete.

II. Joint HCP-HCs and PRCC HSC

A. Update: Implementing Recommendations to Reduce Stress in Eastbank Hatchery's Wenatchee Summer Chinook Salmon

Clint Deason (WDFW) gave a talk summarizing the recommendations that have been implemented to reduce stress at the Eastbank Hatchery. He reminded the HCP-HC and PRCC HSC representatives about Megan Finley's (WDFW) presentation in January 2023 when she talked about bacterial kidney disease (BKD) as a concern at the Eastbank Hatchery. WDFW Fish Health, Eastbank Hatchery staff, Chelan PUD, and Grant PUD met to develop recommendations to reduce stress to limit BKD outbreaks. They compared the Methow summer and the Wenatchee summer Chinook Salmon programs. These two programs were chosen because they both include natural-origin brood and are early reared at Eastbank Hatchery. They found that ponding timing, acclimation, coded wire tagging, and PIT tagging can all be stressful and cause BKD outbreaks. To reduce the stress during crowding, oxygen was added, and levels were monitored during crowding resulting in maintaining oxygen levels during crowding. The plan for marking and coded wire tagging for brood year 2023 is to have two marking trailers at Eastbank for marking on August 19, 2024, rather than mid-September which is during the fall smolting period which can cause BKD outbreaks. Deason noted that Wenatchee summer Chinook Salmon last year in August were 106 fish per pound, which is small, but still within the target range for marking and coded wire tagging. The fish this year will be ponded into two super raceways, then will go into three ponds where they will be screened into sections. They will also plan to use the maximum flow in the ponds if possible. Growth sampling will only occur once a month, unless sampling needs to occur to adjust feeding.

Mike Tonseth said that marking of Wenatchee summer Chinook Salmon and other programs were put in one proposal, and the marking unit anticipates being able to meet the marking deadline. The only thing that could create a delay is staffing of both trailers, or if one trailer goes down and needs repairs.

Kirk Truscott asked whether fish previously being tagged in September corresponded to warmer weather. Tonseth said no, the issue with marking then is that the fish are smolting and it is not good to handle them during that time. Truscott asked whether they would be coded wire tagged and PIT tagged at a different time. Tonseth said yes. Truscott asked whether there are differences in survival of the PIT-tagged fish versus the non-PIT-tagged fish. Catherine Willard said that they have not

observed that in the past. Truscott asked what the current protocol was for prophylactic treatments for BKD. Tonseth said in the past, they used to inoculate all adult Chinook Salmon programs, but there has been a shift to move away from that, and they have, but there has been discussion to bring that back for Wenatchee summer Chinook Salmon. Truscott asked whether they have had a greater issue with BKD since that shift. Tonseth said that the literature does not support there being a correlation between inoculation and BKD in juveniles. There is literature to support that timing of inoculation might reduce BKD in juveniles. Truscott said that they are focusing on reducing stress on the juvenile side, but can they reduce stress on the adult side? Finley said that there are things that they do on the adult side to reduce stress, but in the past when they injected adults, there were still high cases of BKD in the juveniles. This is evidence that a prophylactic was not effective at reducing BKD in juveniles. It is all a timing game when you give injections to adults to provide vertical transmission protection to juveniles. The treatment can cause toxicity in eggs and increases handling to inject the adults which increases stress with handling. Finley is not sure that injecting the adults is worth the risk because they do not have great evidence that it is really helping juveniles.

Truscott said that when they have a bad BKD year, these recommendations might help slightly. Tonseth said that the key takeaway from this is that they are implementing recommendation measures that will not hurt, and the degree to which they will see benefits will vary from year to year. Deason said that these recommendations are the most cost effective, but there are other more expensive measures (e.g., decrease predation stress) that could be implemented. Willard said that in their Action Plan, Chelan PUD is conducting a hatchery modernization exercise which may result in making improvements at the Eastbank Hatchery.

B. Feasibility of Alternate Collection of Okanogan Sockeye Salmon Brood/Gametes

Catherine Willard stated that Chelan PUD, Grant PUD and the Okanogan Nation Alliance (ONA) have been working to determine what the permit requirements are to transfer adult Sockeye Salmon collected at Wells Dam across the Canadian border as an alternate brood collection option. They submitted an application to the Canadian Food Inspection Agency (CFIA) and are waiting to hear back to learn what the requirements will be. They cannot submit a U.S. Department of Agriculture (USDA) application until they hear back from the CFIA because they need a number from the Canadian permit to put on the USDA permit. In the short term, Willard proposed a pilot for the transport of Sockeye Salmon where Sockeye Salmon will be trapped at Wells Dam, loaded onto the Eastbank Hatchery truck, and if they get transfer permits in time, transport them to the hatchery in Penticton, British Columbia. If they cannot get the permit, they will release the fish on the U.S. side of Lake Osoyoos.

Kirk Truscott asked how many females will be transported. Willard said approximately 100. Truscott said to make sure they check the water temperatures in Lake Osoyoos before releasing fish because

it frequently has elevated temperatures. Mike Tonseth asked whether they are going to tag them so that they could be monitored and tracked. Catherine said yes. Keely Murdoch said that she likes the idea of the pilot, especially if they cannot get permits to take them to Canada. K. Murdoch worried about releasing fish into Lake Osoyoos because water temperatures are so high there. Maybe they could delay releasing fish until temperatures come down. Willard said that they have considered the issue with water temperatures and will not release fish if temperatures are too high. K. Murdoch said that as long as they provide more information about how they will handle elevated water temperatures, she approves of the overall concept. Willard said that if they do not get the transfer permit this year, they have the application in and they will be able to next year. Tracy Hillman noted that the real issue is the drastic change in temperature that the fish will experience in Lake Osoyoos. Perhaps those fish can be acclimated to reduce thermal shock. Tonseth asked whether those fish can quickly and efficiently find cold-water refugia in Lake Osoyoos before they die. Generally, fish moving through the Okanagan cannot move upstream of the thermal barrier, and if they are using Wells Dam as a collection location, the thermal barrier will already be in place and releasing them into Lake Osoyoos at least gets them past the thermal barrier. Tonseth said that WDFW is supportive of piloting either one.

Tom Kahler was concerned with temperature and handling stress that these fish will face given the literature on delayed mortality following handling when water temperatures are greater than 16 degrees. He thinks getting the fish to the Penticton Hatchery is the only viable option. Tonseth agreed. Tonseth said that the Penticton Hatchery gets eggs from females off the spawning grounds. If, for some reason, they cannot transport broodstock over the border, what options are left to secure adult spawners that could be used for broodstock? Getting them as close to Canada as possible may hopefully allow females to reach the spawning grounds. Truscott suggested monitoring the environmental conditions, and if temperatures are bad, then postpone a release.

John Rohrback asked whether they have considered collecting fish at Wells Dam and then releasing them upstream of Wells Dam. This would allow them to see how the fish do when experiencing minor handling. Tonseth said that they have trapped and transported fish from Wells Dam before and that they have been successful in doing that. He thinks that they have enough experience with collecting and transporting.

K. Murdoch asked whether, in addition to the pilot study, has there been any further thought about spawning the fish in the United States and then transferring the gametes to the Penticton Hatchery. She recalled that Ryan Benson (ONA) had said that transporting gametes across the border would be easier than transporting adults. Willard said they are looking into transferring gametes. They would hold the adults at Similkameen, spawn them, and ONA will come down and collect gametes.

K. Murdoch asked whether there would be any other fish held there. Willard said there would not be

other fish held there during the time the Sockeye Salmon were held there. K. Murdoch said that would be easier from a quarantine perspective. Tonseth asked how many adult Sockeye Salmon can be held a Similkameen. Willard said that they are still working that out.

Hillman asked about the potential issues associated with transferring adults across the border this year. Willard thought that the biggest hurdle would be getting the permit. Hillman asked who is responsible for getting the permit. Willard said both Chelan PUD and ONA. Truscott said that he is fine with the pilot but said that they need a good Plan B if they cannot transfer adults across the border into Canada.

K. Murdoch asked whether Jeff Fryer (CRITFC) would be conducting sampling at Wells Dam, and if so, are they coordinating with him? She does not know whether he would want to sample fish that get transported. Tonseth said that there will be coordination and that the collection of adults would be co-occurring with other activities that are ongoing. Tonseth said that given the low number of adults needed for the pilot, it should not be an issue.

HCP-HC and PRCC HSC representatives approved Chelan PUD's pilot study for transporting approximately 100 female Sockeye Salmon to the Penticton Hatchery, pending permitting approval, or to the U.S. portion of Lake Osoyoos, depending on lake water temperatures.

C. HGMP Updates

Mike Tonseth replied to Todd Pearson's comment about not making changes to the White River HGMP. He said that regardless of where they go with the White River hatchery program, there will be an M&E component. They can put the hatchery component on hold, but any M&E-related topics need to be worked on for the Wenatchee Spring Chinook Salmon HGMP to ensure that it is all covered in a new permit.

Tonseth said, using the White River as an example, that there will be portions of it that will not be completed until they have worked through the independent review. In regard to other Chinook Salmon programs, they need to get to the end of updating the 5-year plan to know whether there will be any changes that can affect permitting.

Hillman asked whether any of the HCP-HC and PRCC HSC representatives had started working on updating the HGMP. No one had. The HCP-HC and PRCC HSC representatives will continue to work on updating the current HGMP, with further discussion during the July 17, 2024, meeting.

III. Wells HC

A. Twisp Spring Chinook Salmon Broodstock Contingency Plan

John Rohrback reported that it is unlikely that Douglas PUD will be able to obtain seven males and seven females for use as broodstock for the Twisp River Spring Chinook Salmon program. The minimum requirement for the program is three pairs (3x3). Currently, Douglas PUD has three females and two males that genetically assign to the Twisp River. They also have two males that were PIT tagged as juveniles in the Twisp River, but who assign genetically to the Winthrop-Methow Composite (WinMetComp) stock. They also have a variety of hatchery and wild fish collected at the weir that do not assign genetically to the Twisp stock and are waiting for genetic assignments for other fish they are holding.

Rohrback said of the 174 wild spring Chinook Salmon that were collected at Wells Dam and genetically assigned, only 4 meet the confidence threshold that they are of Twisp River origin, and they handled about 30% of the natural-origin run. WDFW estimates that of the entire run at large of natural-origin spring Chinook Salmon at Wells Dam, there are about 12 natural-origin fish that assign genetically to the Twisp River stock, and 12 does not meet the program's broodstock requirement of 14 fish (seven male and seven female). Of all the fish they have handled and have taken fin clips from at the Twisp weir, they were mostly WinMetComp (non-Twisp River stock) fish in the Twisp River. Spawning grounds surveys conducted in 2022 on the Twisp River showed that of 18 carcasses recovered that had been previously genetic stock assigned and later released back to the wild, 8 were of Twisp River genetic stock. The genetic differentiation of the Twisp River population appears to be eroding rather quickly. Given the current shortfall of fish, despite the best efforts of trappers, Douglas PUD has an inability to capture what appears to be a very small component of natural-origin Twisp River stock fish. Rohrback noted that even hatchery-origin fish captured at the Twisp weir have not been Twisp Program hatchery-origin fish. Rohrback asked for guidance from the HCP-HC and PRCC HSC.

Keely Murdoch said that she would include three females and two males that have the highest likelihood of being of Twisp River origin. She would also include adults collected at the weir that were born in the Twisp River. She noted that from the Yakama Nation's (YN's) perspective, focusing on abundance should be a priority for this program. She does not know how beneficial the Twisp River signal is to the population as a whole given the rate at which it is eroding. Rohrback summarized that what K. Murdoch was proposing was to use fish that are genetically assigned to the Twisp River first, then use fish that have Twisp River as a top assignment, and lastly use fish that were born in the Twisp River regardless of who their parents were. K. Murdoch said the YN would support this. Mike Tonseth said that because this is a small effective population size, they should look at the relatedness of the broodstock. Generally, most spring Chinook Salmon that come back are 4 years

old, so the probability of them being related is high. Ben Goodman (WDFW) said that they look at a relatedness matrix before they spawn fish for this program and the analysis is done before spawning. Tonseth questioned whether the permit allows the inclusion on non-Twisp River fish into the program.

Tonseth said that the 10-Year Comprehensive Summary Report indicated that returnees from the Twisp River program had poor homing fidelity performance. This means that they are likely moving past the Twisp River and spawning elsewhere. He said that this defeats the purpose of maintaining a Twisp River program. If there is still concern about trying to have the Twisp River as a major spawning aggregate, they should focus on abundance first and diversity second, and the current actions do not support diversity. Rohrback said that they have a high donor stray rate from the Twisp River program to the Methow River, and a high recipient stray rate from Methow and Winthrop hatcheries to the Twisp River, as well as natural-origin spring Chinook that assign to the WinMetComp stock that spawn in the Twisp River. Tonseth said that hatchery fish from the Twisp River program spend most of their time as juveniles in the Methow River above the Twisp confluence, so it is not surprising that there is a homing fidelity problem.

Rohrback said that hatchery staff intend to begin treating fish collected at the Twisp weir with formalin, and do not recommend returning fish that have been treated with formalin back to the natural environment. Tonseth said that there is nothing that prevents formalin-treated fish from going back to the river. Rohrback said that it is their preference to not return fish to the river once they have been treated with formalin. Rohrback also added that they have been trapping at the Twisp weir and are planning on stopping the week of July 4, 2024, when the trapping rates drop.

K. Murdoch asked whether the HCP-HC and PRCC HSC representatives were opposed to using wild fish collected at the Twisp weir. Rohrback said that if the goal of the program is to produce genetically distinct Twisp River fish, and they collect fish at the weir that are not Twisp River fish, then they would not use them. K. Murdoch said that the YN has never been very supportive of preserving the genetics of Twisp River and White River fish. Rather, they take more of an increase abundance approach. Rohrback said, with regards to the release location, any shortfall in Twisp program broodstock will be offset by a similar increase in the Methow program, and Douglas PUD will keep genetically distinct Twisp River fish for the Twisp River program. K. Murdoch said that she would prefer to release more fish in the Twisp River.

Tracy Hillman asked Brett Farman to weigh in on Tonseth's question about what is allowed within the permit. Farman said that there are not enough fish to keep this program going, but he does not have any strong opinions. Rohrback brought up Permit Condition 9,¹ which suggests they can use fish that

¹ Broodstock for the Twisp program will consist entirely of Twisp natural-origin fish and Twisp component hatchery-origin returnees.

are born in the Twisp River but not genetically Twisp River fish (i.e., their parents were not Twisp River fish), but using fish that are collected at the Twisp weir that are not of Twisp River origin would violate the permit. The specific question is whether they can use natural-origin fish captured at the Twisp weir that are not Twisp River fish genetically. Farman said that would counter the point of the program, which is to preserve the genetics of the Twisp River fish. Therefore, he said they should not use fish that are not of Twisp River origin. K. Murdoch said that her concern with this approach is that they would not be using natural-origin fish that are at the Twisp weir because they are not genetically Twisp River fish. Based on the information that Rohrback provided, the integrity of the Twisp River signal has declined, and it appears that they are perpetuating a very small population. If this trend continues into the future, then it is unlikely that they will be able to meet the requirements of the program. Rohrback agreed that if this trend continues, they will not be able to meet the requirements of the program. Hillman asked Farman whether they would be in violation of the permit if the committee agreed to include natural-origin fish that are not from the Twisp River. Farman replied that if the fish reared in the Twisp River, one could probably make the argument that the fish would eventually be part of the Twisp River population. For clarity, Hillman asked whether we need to stay within the bounds of the permit. Farman said yes. Hillman thanked Farman and said that the HCP-HC and PRCC HSC representatives need to be consistent with the language in the permit. The points raised by the Committees regarding the shrinking size of the gene pool, drift, and straying/homing issues can be addressed in the new HGMP. Farman agreed that they are trying to fit within the permit as it currently exists, but in the future, they should reevaluate these topics.

The HCP-HC and PRCC HSC representatives approved retaining genetically assigned Twisp River fish (three by two) and use Twisp River hatchery-origin fish collected at the weir and high-level assignment fish to supplement and meet the genetic requirements of the Twisp River program. K. Murdoch approved for 1 year, with continued discussion on this topic.

IV. Joint HCP-HCs and PRCC HSC

A. 10-Year Comprehensive Summary Report – Management and Monitoring Recommendations

Tracy Hillman compiled recommendations, organized by hatchery program, from HCP-HC and PRCC HSC representatives in an appendix at the end of the 10-Year Comprehensive Summary Report. Hillman also summarized recommendations by objective to reduce redundancy.

General Comments

- Kirk Truscott noted that it is important to continue to track objectives even if they have been answered, especially with climate change and a changing environment. Rod O'Connor agreed

and noted that next month it might be helpful for each representative to bring specific examples about what they meant by their comments.

Objective 1.0: 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.

- HCP-HC and PRCC HSC representatives agreed that for recommendations supported by all members, they will work together to edit the objective, and recommendations that do not have unanimous support will be retained in the appendix.

Recommendation 1: Re-write to reflect that increasing naturally produced adults is the cumulative goal of HCP implementation intended to be achieved through improved hydro survival through each project, habitat mitigation actions, and hatchery mitigation actions. Increasing natural origin abundance cannot be accomplished through hatchery mitigation alone. The objective currently reads as if hatchery mitigation alone should be able to do this (YN).

- Keely Murdoch commented that the objective currently reads as if hatchery mitigation alone should be able to increase the number of naturally spawning and naturally produced adults of the target population. To say that only the conservation program has done this is limiting because it makes it appear as though these programs fail and do not work, but it is not just the hatchery program, it is other programs as well that will achieve this objective. She noted that there is nothing wrong with determining whether natural-origin adults have returned, but this is not the main goal of the hatchery. Mike Tonseth said that they could rewrite this objective to determine whether there is an increase, then remove the conservation program. Hillman stated that if the objective is rewritten, as per the HCPs, the objective cannot require the measurement of habitat enhancement effects. K. Murdoch said that was not her intent, but rather she wanted to make sure that they are not harming or decreasing productivity. K. Murdoch wanted to make it clear that Objective 1.0 is not solely the responsibility of the hatchery programs. John Rohrback agreed that hatcheries are not solely responsible for recovery but noted that some hatchery programs have a conservation component and therefore should increase the number of natural-origin adults. Part of the conservation program should be to contribute to recovery. If they can determine this, it would be useful information. K. Murdoch replied that they will not be able to address that with this objective. Brett Farman commented that they need to identify that conservation programs contribute to an increase in natural-origin fish, and to indicate that it is part of a whole. K. Murdoch replied that she believes this could set up a situation for people to believe that hatchery conservation programs do not work. All they can do is put hatchery fish on the spawning grounds. This objective does not account for other factors that might affect

survival like habitat, predation, and other bottlenecks. Tom Kahler asked why they originally decided that they needed this objective. Hillman said this objective originally came from the A. Murdoch and Peven (2005)² report and was modified slightly by the Hatchery Evaluation Technical Team (HETT). Hillman said that although it is a logical question to ask of a conservation program, no matter the results of the analysis, those results will be assigned to the hatchery program. Currently, we are not able to tease out causation, and results, whether good or bad, are currently assigned to the hatchery programs. Tonseth commented that in the past, a disclaimer of benefits and risks of a particular analysis has been included; maybe that disclaimer could be used here. An increase in natural spawners may identified but cannot be assigned to any one program. An all-encompassing report could be written where the results from all of the objectives are used, and that this could potentially be put into a flow chart. Hillman noted that A. Murdoch and Peven provided flow charts in their 2005 report. Hillman asked whether the HCP-HC and PRCC HSC representatives agreed to modify this objective. O'Connor said no because he wants to have more discussion about the methods used for each objective and if they can be improved before he agrees to change an objective.

Recommendation 2: Total Spawners objective should be modified to consider the number of adults removed for management purposes (PNI targets and spawning escapement goals). With adult management, as NORs increase the number of HORs removed and not allowed to spawn will also increase, with reduced contributions to total spawners (YN).

- K. Murdoch said she wrote this recommendation hoping to reword the objective to include adults removed as a result of adult management. This comment is more focused on the Wenatchee basin where they have spawning targets. K. Murdoch commented that they may have different ways of managing fish in the Wenatchee versus Methow, in which case there might be basin- or program-specific ways of looking at things. Rohrback agrees that they want to be able to measure hatchery adults that return, but they also want to keep track of total spawners. K. Murdoch said we need to think through what information we want to get out of this objective. Truscott said that they could potentially create another objective that looks specifically at that. Hillman recommended that Murdoch provide a draft rewrite of the objective for committee review. Katy Shelby recommended that not only fish removed as part of adult management be included in the objective, but also fish harvested. Hillman indicated that harvest is accounted for.

Recommendation 3: Findings related to total spawners, natural-origin spawners, adjusted productivity, and natural-origin recruits were inconclusive. Evaluate the utility of the BACI analyses and explore alternate statistical analyses to evaluate Objective 1. If the BACI analyses

² Murdoch, A., and C Peven, 2005. *Conceptual Approach to Monitoring and Evaluating the Chelan County Public Utility District Hatchery Programs*. Report prepared for the Chelan PUD Habitat Conservation Plan's Hatchery Committee.

are determined to be the best method to evaluate Objective 1, add in-basin reference streams (e.g., Entiat) to provide contrast for future BACI analyses and improve scientific certainty of conclusions (CPUD).

- Hillman noted that the intent of the Before-After Control-Impact (BACI) design is to address spatial and temporal aspects of the data. If the controls/reference streams are eliminated, they may be left with making simple before/after comparison; however, with climate change, habitat changes, and other changes occurring over the period of analysis, it is difficult to draw strong conclusions based only on before/after comparisons. If we cannot use spatial or temporal reference conditions, managers will need to identify and justify appropriate target values. The HETT originally came up with the BACI design because they knew it would be difficult to identify management targets. O'Connor commented that they could have in-basin versus out-of-basin references, provided that the in-basin references allow for spatial autocorrelation (i.e., they are similar to supplemented streams but are not themselves supplemented). Hillman said that maintaining out-of-basin reference areas is difficult because there will be differences during the supplementation period that are not related to supplementation, and this will influence the analysis. Having in-basin references would certainly help. K. Murdoch said that she supports the first part of this recommendation, to explore whether there is an alternative to the BACI analysis. She thinks that it is worthwhile to have the conversation. Truscott questioned the use of the Entiat River as an in-basin reference stream and said that the U.S. Fish and Wildlife Service currently has a summer Chinook Salmon hatchery program and a long history of spring Chinook Salmon propagation in the Entiat River. What is the risk of using the Entiat as a reference stream? For other in-basin reference streams, if they are a component of adult supplemental programs and they remove that then they will have hatchery programs, as the other spawning aggregates are being relied on more heavily to meet the production goal. This could have a negative side effect on the population as a whole. K. Murdoch said that there are implications for it with the Entiat because they would have to have an in-basin reference stream, though she is open to exploring other options as well. Hillman reminded the group that Carl Schwarz did not have an issue with the BACI design. Rather, he recommended transforming the data, including all reference streams in one analysis, and reducing the number of statistical analyses in selecting appropriate reference streams. Some of the analyses are redundant. Hillman said there may be other statistical tools that can be used but they will likely include complex modeling. Willard asked whether they do a BACI analysis for summer Chinook Salmon. Hillman said yes. Hillman said that when they analyzed the data, they did compare supplemented streams in the Upper Columbia to the Little Wenatchee and the Entiat and found little difference between supplemented and reference streams. That is, there was no evidence of a supplementation effect. Hillman summarized the discussion and said that the HCP-HC and PRCC HSC representatives will

evaluate the utility of the BACI design and determine whether the use of in-basin reference streams is possible.

- Other recommendations brought forth by the committee referred to the BACI analysis, and K. Murdoch identified that the overarching theme of the recommendation was whether they should continue using the BACI analysis, and if they chose to continue using the BACI analysis, what should they use as reference streams.

Recommendation 4: Use Integrated Population Models to evaluate how hatchery spawners affect NOR abundance and productivity and identify life stages that are limiting population growth (WDFW).

- Tonseth said that it would be beneficial to start to look at life-history effects on a more universal scale and consider hydro, predation, and oceanic effects. Hillman noted that these models require a lot of data. K. Murdoch said that they have a lot of data. Hillman said that he would send out papers that describe Integrated Population Models for the HCP-HC and PRCC HSC representatives to review and become more familiar with. This recommendation will continue to be explored.

HCP-HC and PRCC HSC representatives finished working through recommendations for Objective 1.0. HCP-HC and PRCC HSC representatives will begin to draft language around recommendations that everyone can support.

V. Administration

A. Next Meetings

The next meetings of the HCP-HCs and PRCC HSC will be held on July 17, August 21, and September 18, 2024. Meetings are in person and will be held at Douglas PUD.

VI. Attachments

Attachment A List of Attendees

Attachment A
List of Meeting Attendees

Name	Organization
Natasha Winnacott	Anchor QEA
Tracy Hillman	BioAnalysts, Inc.
Ross Renick	Chelan PUD
Catherine Willard*	Chelan PUD
Ian Adams ^o	Chelan PUD
Tom Kahler*	Douglas PUD
John Rohrback*	Douglas PUD
Brandon Kilmer ^o	Douglas PUD
Rod O'Connor‡	Grant PUD
Tim Taylor	Grant PUD
Nathan Buck ^o	Wanapum
Benjamin Goodman ^o	Washington Department of Fish and Wildlife
Katy Shelby ^o	Washington Department of Fish and Wildlife
Mike Tonseth**	Washington Department of Fish and Wildlife
Megan Finley ^o	Washington Department of Fish and Wildlife
Clint Deason ^o	Washington Department of Fish and Wildlife
Matthew Maxey*‡ ^o	U.S. Fish and Wildlife Service
Brett Farman*‡ ^o	National Marine Fisheries Service
Keely Murdoch**	Yakama Nation
Cory Kamphaus*‡ ^o	Yakama Nation
Kirk Truscott**	Confederated Tribes of the Colville Reservation

Notes:

* Denotes HCP-HCs member or alternate

‡ Denotes PRCC HSC member or alternate

^o Joined remotely