

Memorandum

To: Wells, Rocky Reach, and Rock Island HCPs Hatchery
Committees and Priest Rapids Coordinating
Committee Hatchery Subcommittee Date: January 15, 2020

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

cc: Larissa Rohrbach, Anchor QEA, LLC

**Re: Final Minutes of the November 20, 2019 HCP Hatchery Committees and PRCC
Hatchery Subcommittee Meetings**

The Wells, Rocky Reach, and Rock Island Hydroelectric Projects Habitat Conservation Plans (HCPs) Hatchery Committees (HCs) and Priest Rapids Coordinating Committee Hatchery Subcommittee (PRCC HSC) meetings were held in Wenatchee, Washington, on Wednesday, November 20, 2019, from 10:00 a.m. to 3:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

Joint HCP-HCs and PRCC HSC

- Mike Tonseth will coordinate with Andrew Murdoch (Washington Department of Fish and Wildlife [WDFW]) to present prespawn mortality modeling results for spring Chinook salmon at an upcoming HCP-HC meeting (Item I-A). *(Note: this item is ongoing)*
- Kirk Truscott will discuss with Colville Confederated Tribes (CCT) biologists whether elemental signature analysis could differentiate natural-origin Okanogan spring Chinook salmon from other natural-origin Chinook salmon during broodstock collection at Wells Dam for Methow Fish Hatchery programs (Item I-A). *(Note: this item is ongoing.)*
- Brett Farman will discuss with Charlene Hurst and Mike Tonseth the potential use of a multipopulation model for estimating proportionate natural influence (PNI) for the Nason and Chiwawa spring Chinook salmon programs (Item I-A). *(Note: this item is ongoing.)*
- 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).
- Greg Mackey will prepare a plan to test the feasibility of alternative mating strategies based on findings described in his previously distributed literature review (Item I-A).
- Mike Tonseth will confirm the completion date for an updated plan for Outplanting Surplus Methow Composite Spring Chinook salmon (Item II-A).

Wells Hatchery Committee

- Keely Murdoch will contact Melinda Goudy (YN) to determine if there is capacity to transfer surplus summer-fall Chinook salmon eggs to the Yakima Basin programs (Item III-A).

PRCC HSC

- Todd Pearsons will revise the 2020 Broodstock Collection Protocols to pilot test collecting all Priest Rapids Hatchery (PRH) Fall Chinook salmon in the Angler Broodstock Collection (ABC) fishery.

Decision Summary

- There were no decisions made in today's meeting.

Agreements

- There were no agreements made in today's meeting.

Review Items

- Larissa Rohrbach sent an email to the HCP-HCs and PRCC HSC on October 28, 2019, notifying them that the Draft "*Implementation of Comprehensive Monitoring and Evaluation of Wells Hatchery Complex Programs In 2020*" Plan was available for review with edits due by November 27, 2019.
- Larissa Rohrbach sent an email to the HCP-HCs and PRCC HSC on November 5, 2019, notifying them that the Draft 2020 Broodstock Collection Protocols appendices are available for review with edits due by Wednesday, December 4, 2019 (Item II-B).

Finalized Documents

- There were no documents finalized in today's meeting.

I. Welcome

A. Routine Safety Briefing

Grant PUD staff provided a routine safety briefing on emergency procedures for the meeting location. In case of emergency, Deanne Kunkel-Pavlik will call 911. Hillman reviewed the locations of the automated external defibrillator, the address for communicating with 911 written on the white board, and first-aid kits.

B. Review Agenda, Review Last Meeting Action Items, and Approve the October 16, 2019 Meeting Minutes (Tracy Hillman)

Tracy Hillman welcomed the HCP-HCs and PRCC HSC to the meeting.

Hillman informed the members that Steve Parker with the Yakima Nation (YN) will be retiring. Parker was the YN's representative to the HCP Policy Committee and frequently attended HCP meetings. The Committees agreed to send a congratulatory card.

Hillman reviewed the agenda and asked for any additions or changes to the agenda. The following two items were added to the agenda:

- Greg Mackey added an item to the Wells HC portion of the meeting to notify the Committee of summer Chinook salmon egg surpluses (Item III-A).
- Todd Pearsons added an item to the PRCC HSC portion of the meeting to provide an update on Nason Creek program spring Chinook salmon transfers and Carlton program summer Chinook salmon (Item IV-D).

The HCP-HCs and PRCC HSC members approved the revised agenda.

The HCP-HCs and PRCC HSC representatives reviewed the revised October 16, 2019 meeting minutes. The HCP-HCs and PRCC HSC members approved the meeting minutes as revised.

Action items from the HCP-HCs and PRCC HSC meeting on October 16, 2019, were reviewed, and follow-up discussions were addressed (*note: italicized text below corresponds to agenda items from the meetings on October 16, 2019*):

Joint HCP-HCs and PRCC HSC

- Mike Tonseth will coordinate with Andrew Murdoch (WDFW) to present prespawn mortality modeling results for spring Chinook salmon at an upcoming HCP-HC meeting (Item I-A).
Tonseth said this item is ongoing.
- Kirk Truscott will discuss with CCT biologists whether elemental signature analysis could differentiate natural-origin Okanogan spring Chinook salmon from other natural-origin Chinook salmon during broodstock collection at Wells Dam for Methow Fish Hatchery programs (Item I-A).
Hillman said he talked to Truscott and this item is ongoing.
- Brett Farman will discuss with Charlene Hurst and Mike Tonseth the potential use of a multipopulation model for estimating PNI for the Nason and Chiwawa spring Chinook salmon programs (Item I-A).
Farman was not in attendance. Tonseth said he and Farman have located key information and are now making progress. Tonseth said this item is ongoing.

- 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 II-C).
Mackey said this item is ongoing.
- Brett Farman will confer with Charlene Hurst and confirm whether transfer of surplus spring Chinook salmon eyed-eggs from Methow Fish Hatchery to the Colville Confederated Tribes' 10j program is consistent with the intent of the 10j permit (Item II-D).
Hillman confirmed that the transfer was not consistent with the 10j permit. This item is complete.
- Bill Gale will confirm whether Winthrop National Fish Hatchery (WNFH) can receive surplus spring Chinook salmon eyed-eggs from Methow Fish Hatchery (Item II-D).
Matt Cooper confirmed that WNFH cannot receive the eggs. This item is complete.
- Mike Tonseth will prepare, and Larissa Rohrbach will distribute the appendices to the Broodstock Collection Protocols for editing by the relevant parties that were identified in the October 16, 2019 meeting (Item II-E).
The appendices were distributed by Rohrbach on November 5, 2019, requesting that Committees members return edits to her by December 5, 2019, to be compiled in revised versions of the appendices. This item is complete.

II. Joint HCP-HCs and PRCC HSC

A. Outplanting Surplus Methow Composite Spring Chinook Salmon Adults

Mike said he spoke with Michael Humling (USFWS) and Charlie Snow (WDFW) regarding desired updates to the existing outplanting plan that was developed in 2017. Humling reviewed an analysis he had done earlier in the year to determine the potential outcomes depending on different outplanting scenarios, in terms of the effects on PNI. Many scenarios were being tested, such as outplanting only hatchery females and prioritizing MFH males for use as a safety-net brood. This would minimize the creation of HxH progeny in the wild and help insure out-year effects to PNI are reduced.

Keely Murdoch asked what will be done with the results of Humling's analysis. Tonseth said the results of the analysis will be incorporated into the outplanting plan and presented to the Committees as a revised outplanting plan for review and approval.

Murdoch asked if PNI would be calculated by reach. Tonseth said that's part of the discussion and scenarios being tested; whether to focus the outplanting on areas that would benefit most by those activities as indicated by PNI. Murdoch said the decision on where and how to outplant could depend on habitat quality. Tonseth agreed and said Charlie Snow is looking at the effects of some factors such as habitat capacity and the existing density of spawners. Murdoch said the reason for

asking is that in years when there are low returns, it may be beneficial to outplant in areas that have low densities and this benefit would not be reflected by looking solely at PNI. Tonseth said his recollection was that the 2017 version of the outplanting plan was initially prepared to test the approach. This objective is still relevant to test the approach before fully implementing outplanting based on productivity metrics.

Murdoch said the conflict is that outplanting hasn't been carried out yet because of low run sizes and prioritization of broodstock for the hatchery programs, but it is in low run years when this plan may be more beneficial, and this presents conflicting fish uses. Murdoch said another conflict exists in deciding which adults should be outplanted. Tonseth said the adults chosen for outplanting are part of the scenarios that Humling is testing; for example, outplanting surplus Methow spring Chinook salmon versus WNFH spring Chinook salmon. Murdoch said the analyses presented test both sides of that issue, for instance reserving conservation program males versus outplanting. Hillman asked if the Committees need to reconsider outplanting during low return years. Tonseth said that for Methow spring Chinook salmon, at low run sizes, below 500 spawners, the permit requires management for escapement rather than PNI to allow a certain number of spawners to return to the basin.

Tonseth said they are bound by PNI requirements in the permit, but in order to test this method, they may need to work outside the PNI requirements and would need agreement from National Marine Fisheries Service (NMFS) that a given year would not be included in 5-year PNI calculations. Pearsons said in previous years Broodstock Collection Protocols (BCPs) noted that the priority was for fish to go to WNFH, because the spawning outcome at WNFH is known whereas productivity after outplanting is unknown. Pearsons asked if that logic is being challenged now with an alternative perspective. Tonseth said it's not necessarily a challenge, but a method for allowing for multiple choices during broodstock collection. For instance, Humling tested retaining only Methow Component males and using females for outplanting. This practice would reduce pNOB slightly but allows wild males to pair up with Methow Component hatchery females to spawn naturally.

Murdoch asked if the Committees will be able to review the plan in time for incorporation into the 2020 BCPs. Tonseth said the outplanting plan is not likely to be ready by December and suggested maintaining the plan as a stand-alone document until the method is proven in the future. Tonseth said their expectation is to prepare the plan in time for collection of 2020 spring Chinook salmon broodstock. Tonseth said they are restructuring the document with a suite of options to allow the Committees to decide on the optimal approach(es) depending on multiple metrics. Tonseth said he, Humling, and Snow will be discussing the analysis next week. The plan will be provided in 2020 for Committee review.

Mackey said the 2017 outplanting plan has detailed methods for meeting permit conditions using the multi-population PNI model for the Methow Basin.

Mackey said one other option is to outplant eggs. After natural spawning occurs, additional eggs can be outplanted in areas where spawning has not occurred to target areas with low densities. Mackey said it is also another way to make use of surplus eggs. Tonseth said it is challenging to measure success of egg outplanting and it is challenging to construct artificial redds. Murdoch said it may actually be more difficult to document success of outplanting adults because it is difficult to track spawning after adults have been moved into an area, but the advantage of outplanting adults is that it reduces any domestication selection on eggs in the hatchery. Tonseth said outplanting adults reduces but does not eliminate all domestication selection because the hatchery staff are selecting which fish to outplant. Mackey said it would be more difficult to know whether outplanted adults have spawned in areas with low densities. Mackey said it would be relatively easy to electroshock juveniles to confirm that the productivity was the result of outplanted eggs. Tom Kahler said a Parentage Based Tagging genetic analysis could be performed on offspring as well to confirm parentage. Tonseth said they would need to ensure NMFS agrees that outplanting of eggs was consistent with the permit, and how NMFS would view outplanting eggs in terms of calculating PNI. Graf said he researched some backpack pump units that blow the gravel clean and then inject eggs. Mackey said this pump technique is capable of rapidly outplanting hundreds of thousands of eggs.

Tonseth said he will confirm the completion date of the outplanting plan.

B. Broodstock Collection Protocols Progress Update

Hillman reviewed the 2020 BCP topics for discussion. Hillman asked whether there were questions about editing the BCP appendices (Table 1). Tonseth reminded the Committees that some appendices won't be ready for December because they depend on run forecasts. Tonseth said the Technical Advisory Committee (TAC) forecast is typically available in late December for estimating returns. Tonseth said this information will be added to the appendices as the information comes in. Larissa Rohrbach requested that edits be sent to her for compilation by December 4.

Pearsons asked if the goal was to simply update the numbers in the appendices. Tonseth said yes, and the data provided in the appendices will be used to draft the body of the BCPs. Tonseth said most of the appendices simply require review, for instance to confirm that site-specific plans are still accurate.

Tonseth noted that Appendix K on the YN coho salmon program is to be completed by the YN. Murdoch confirmed that she will strive to make Appendix K available by the end of January. Tonseth said the goal would be for it to be distributed with the February draft BCPs.

Tonseth said USFWS should be responsible for Leavenworth National Fish Hatchery (LNFH) and WNFH forecasts. Matt Cooper said those also tier from the TAC forecasts.

Table 1
2020 Broodstock Collection Protocols Assignments

| Appendix | Title | Assigned Parties | Notes |
|----------|--|--|---|
| A | 2019 BY Biological Assumptions for Upper Columbia River Spring, Summer, and Fall Chinook salmon and 2020 BY Summer Steelhead Hatchery Programs | WDFW and PUDs | |
| B | Current Brood Year Juvenile Production Targets, Marking Methods, Release Locations | All | |
| C | Return Year Adult Management Plans | WDFW lead | Contingent on run forecast available in Jan/Feb 2020 |
| D | Site-Specific Trapping Operation Plans | PUDs and M&E staff YN to review | Identify plans and ensure they are still accurate |
| E | Columbia River TAC Forecast | WDFW | Forecast available in late Dec 2019/early Jan 2020 |
| F | Annual Chelan, Douglas, and Grant County PUD M&E Implementation Plans | PUDs | Provide links |
| G | DRAFT Hatchery Production Management Plan | All | |
| H | DRAFT Preferred Alternative for 2020 BY and Beyond, Methow Sub-basin Conservation Steelhead Programs | Revisit after completion of 2019/2020 steelhead return | Pending discussion by Joint Fisheries Parties; concern about acquiring broodstock in the spring |
| I | Program Specific Rearing and Release Descriptions | PUDs and M&E staff | Staged release at Priest Rapids Hatchery to be addressed |
| J | 2019 BY Spring and Summer Chinook Disease Management Plans | CPUD M&E staff and WDFW veterinarian (Megan Finley) | |
| K | 2020 YN Coho Broodstock Collection Plans | YN | |
| General | Species-Specific Run Forecasts | WDFW, USFWS (LNFH, WNFH) | |

Notes:

M&E: Monitoring and Evaluation

C. NMFS Consultation Update

Representatives of the CCT and NMFS were not in attendance. Committees members noted that the recurring agenda item for a NMFS Consultation Update is no longer necessary because all permits have been finalized.

Tonseth said a recalculation in 2021/2022 could force re-consultation. Tonseth said 2024 would be the first release year of offspring after recalculation. He added that consultation discussions should start at about the same time as recalculation discussions in 2020.

D. Annual Skaha Lake and Okanogan Lake Sockeye Reintroduction Update

Hillman introduced Ryan Benson (Okanagan Nation Alliance), who gave a presentation entitled, "*Skaha Lake Sockeye Re-introduction Program Update*" (Attachment B).

Slide 2: Benson provided an annual summary of hatchery operations. Benson said that 2015 was affected by massive fish kills in the lower Okanogan River due to warm temperatures. In 2019, mean egg take was low (1,650 average eggs per female) because many of the females collected were half-spent already. The numbers in 2019 also reflect the effects of poor returns in 2015; however, improvement from 2015 shows growth of the cohort. In 2019, all females to be used for broodstock were retained instead of returning females that were not ripe to the river. They are now held in the hatchery until becoming reproductively mature.

Each year milt from a proportion of the males is cryo-stored as a contingency in case of a population crash. Managers typically use milt from previous years to test the viability of the frozen sperm and to fertilize a small number of sample eggs; however, this was not done in 2019 due to low run sizes, but milt was archived in 2019.

Starting in 2016, the release strategy has been to match peak emergence of fry because temperatures that vary by 5 to 10 degrees year to year in spring can shift emergence timing considerably. The program releases early, mid, and late release groups in March, April, and May, respectively. No differences in survival between release groups have been detected yet, but managers are continuing to monitor. The advantage is a reduction in hatchery operational costs when fish are released early.

Pearsons asked about the fate of the males used for the milt cryopreservation program. Benson said the milt is collected from a male and that male is returned to the river. Pearsons asked if a male could be spawned in one year and milt used in later years. Benson said the males used for cryopreservation are not spawned in the year in which they were collected.

Mackey asked what the egg take goal is. Benson said it is based on the escapement estimate, a target of 30,000 adults. Hillman asked what the capacity of the hatchery is. Benson said 5 million eggs.

Slide 3: Benson said in 2019 there were a high number of 3-year-olds, mostly jacks, and some jills. To augment the collection in 2019, approximately 32 females (6.2% of total egg take) were collected from Penticton Channel. Jacks and jills were also collected from an effluent pipe from the hatchery that was protected by bars that were spaced so that only smaller adults passed through. Benson said they are improving practices in order to streamline operations for the large return expected in 2020.

Hillman asked if 3-year-olds are spawned. Benson said yes for females. This reflects natural processes as 3-year-old females are observed on the spawning ground. Pearsons asked about the origin of fish that return to the Penticton Channel and the hatchery effluent pipe. Benson said they haven't finished the analysis of otoliths but suspect they are mostly hatchery-origin fish.

Slide 4: Benson said in 2019, all fry were released in Lake Okanagan for the first time. Otolith thermal marks were used to mark three different groups for release into three different sites in the lake.

Slide 5: Benson presented estimates of survival and travel time to Bonneville Dam for BY 2017 juveniles. Travel time and survival was lower in 2019 compared to past years. Benson suspects it is related to lower flows in 2019. Survival in the lake is monitored by purse seining, which has been more successful than other methods, though it can be difficult to catch the fish if they are located near the bottom of the lake. To minimize handling during passive integrated transponder tagging, fish are tagged directly on the purse seiner during collection rather than transporting fish to a separate tagging location.

Willard asked why travel time from Skaha Lake looks faster than travel time from Osoyoos Lake, which is farther downstream. Benson said it's likely because Skaha Lake sockeye are a bit larger than the wild fish from Osoyoos Lake. Willard asked about release times and detection sites. Benson said there is one detection point near the release point; however, the detection probability is better at Bonneville Dam. Benson said survival and travel time are calculated from the time they are released after tagging into the lake to redetections at downstream sites. At this time, tagging can be done within 2 to 3 days so there is less lag time between tagging and release into the lake than in the past.

Slide 6: Skaha Lake Natural Production. In 2011, high water levels allowed adult sockeye to enter Skaha Lake and spawn naturally. Fish may move upstream via the Skaha Dam fishway. Many fish pass over an outflow gate when water levels are high. There was no need to stock any fry into Skaha lake due to a naturally high escapement in 2018.

Slide 7: In-lake monitoring. Hatchery-origin fry in Skaha Lake had a lower survival rate than natural-origin fry monitored in Lake Osoyoos. Benson said the release site experiment is an attempt to improve upon survival rates. Mackey asked if fry are fed before release. Benson said yes.

Benson said there is potentially an optimum loading density for hatchery fry in Skaha Lake, indicated by suppressed growth in 2018. Various factors affect productivity in Skaha Lake, in particular discharge rate through the lake and natural pelagic fish community dynamics of sockeye, kokanee, and whitefish. Whitefish show a boom and bust pattern. Benson said there may be a need to calculate the optimum release numbers each year.

Historically, there was a concern that the Skaha Lake kokanee population could crash due to competition with mysid shrimp and reintroduced sockeye. Results show the kokanee stock has increased in recent years based on number of spawners and biomass in the lake. Skaha Lake does not appear to have a problem with competition. The main grazers of zooplankton are 2 to 3-year-old kokanee; the grazing impact of sockeye fry is minimal compared to kokanee.

Slide 8: Lab development. Lab tests include the following:

- qPCR
- Chinook salmon biosampling of carcasses
- Northern pike
- Water quality
- Macroinvertebrates

Tests that use qPCR are used to screen for disease (Infection Hematopoietic Necrosis and Bacterial Kidney Disease), environmental DNA (eDNA) for other species of concern, and for invasive species. Benson said they expect to expand lab work with recent funding from the Province of British Columbia.

Slide 9: Okanagan Basin Salmon Restoration Sub-Committee. Benson said there is a new mandate that directs reintroduction in the entire basin, including Skaha Lake. The mandate also addresses invasive species and other endangered species and uses an ecosystem approach including habitat initiatives. Benson said there is a Draft Okanagan Lake Recovery Plan and they will eventually move on to recovery planning for other lakes upstream. There was recent approval and support for release of 4.2 million fry into Okanagan Lake. One concern to address in the future is sockeye residualization and hybridization between kokanee and sockeye.

Slide 10: Okanagan Lake Program. The Department of Fisheries and Oceans, Canada, has approved a long-term hatchery outplanting program contingent on monitoring and evaluation program planning and implementation. There is a technical sub-committee overseeing the draft plans. The groups are working toward activating the fishway over Penticton Dam at the outlet to Okanagan

Lake and to tag and plant 100 adults to track their movement in Okanagan Lake. Ceremonial stocking has been done since 2016. Benson said productivity is lower in Lake Okanagan compared to Skaha per unit area; however, the potential productivity could be larger than other lakes like Skaha due to the size of Okanagan Lake.

Dave Duvall (Grant PUD) asked what the lake productivity estimates are based on. Benson said it is based mainly on the limnetic characteristics of the lake and not a formal analysis. Benson said this does not take into account spawning in natural tributaries. Restoration and passage monitoring into tributary creeks may improve natural spawning.

Benson said the Okanagan River Restoration Initiative has expanded restoration actions. The latest actions are to add spawning gravels to Penticton Channel.

Pearsons asked if fish that get to Okanagan Lake can access lakes farther upstream. Benson said he did not know but that he thinks the potential is there and it would not be a major task to expand the distribution of sockeye into those lakes. Pearsons asked whether upstream lakes are sockeye-producing lakes. Benson said he thought so; however, the accessibility to tributaries is unknown.

Slide 11: The Penticton Dam fishway at the outlet of Okanagan Lake was activated in 2019 allowing the first fish passage since 1953. Benson said in the past, fish passage was blocked at points downstream so there was no reason to open the Penticton Dam fishway. Flows and boards were adjusted in 2019 to test feasibility. No sockeye were observed in the fishway. Benson said they may have missed the migration window by the time the fishway was running and some fish that were spaghetti tagged at the fishway were observed spawning downstream. Block nets are used to capture fish at the upstream end of the fishway. Benson said they were able to identify improvements to the 1950s engineering for future funding, such as an automated gate that adjusts along with lake levels that can fluctuate up to 1 meter each year, an improved capture platform instead of the block net, and a passive integrated transponder antenna. Benson said there is community support for fish passage into Lake Okanagan. Early returns from the 600,000 fry outplanted to the lake could appear next year.

Pearsons asked what the expectation of a large run in 2020 is based on. Benson said it is based on the number of fry outplanted in 2018. The purpose of activating the fishway this year was to work out the challenges prior to next year's run.

Pearsons congratulated Benson on achieving fish passage into Okanagan Lake. Benson said the perspective of the British Columbia Provincial government has changed completely as a result of a directive that the Province must follow to the letter The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). The relationship between Okanagan Nation Alliance and the Province has changed completely and now they share the same perspective in terms of taking an ecosystem

management approach. Benson said there is also a mandate for the Province to manage for resident fish. Results show that improving conditions for anadromous fish are improving the productivity of resident fish.

Murdoch also congratulated Benson on Okanagan Nation Alliance's achievements. Murdoch asked if the increase in kokanee is a result of residualism of sockeye outplants or habitat improvements. Benson said he thinks its habitat improvements. There are two spawning modes observed in the channel. Benson said some fish are switching life histories, which is complicating analyses. Benson said his perspective is that they are different ecotypes of the same species. Benson said in the traditional ecological knowledge of Okanagan elders there is a term for hybrid in the language. Murdoch said the concept of hybrids is interesting because they are the same species but noted that managers were able to observe kokanee genetics.

Murdoch asked if historically both ecotypes were in the lakes. Benson said yes, historically they were probably both there and that kokanee ecotypes have been deviating farther from the natural anadromous stock. Benson said that hybrids don't do as well, they appear to be an intermediate form. However, if the elders were aware of them, perhaps they had a purpose as a food for other species or overall productivity of the system. Benson said monitoring will show whether the genetics of the ecotypes continue to diverge. Murdoch asked if isolation is the reason for genetic differences. Benson said historically they were probably the same form. Mackey said when kokanee and sockeye are sympatric, kokanee are much more efficient at sequestering carotenoids than sockeye, so there are some physiological and genetic differences.

Pearsons asked Benson what changed with the Provincial perspective in recent years. Benson said this is a change that has occurred across the Province due to the outcomes of a truth and reconciliation commission that was similar to the post-apartheid commission in South Africa. Benson said there was a travelling commission that listened to all parties. The federal government signed on to the commission as well as the Provincial government. Benson said the outcomes have trickled down throughout all areas of social sciences, agriculture, and natural resources like fish and forestry. Benson said the link to UNDRIP forces changes to be implemented now. Benson said existing technical groups including the Canadian Okanagan Basin Technical Working Group have been a successful model for cooperation that has been in place since the 1990s to facilitate change.

Hillman thanked Benson for his presentation.

III. Wells HC

A. Surplus Wells Fish Hatchery Summer Chinook Eggs

Greg Mackey said that there are approximately 120,000 surplus eggs from the Wells Hatchery summer Chinook salmon egg treatment study and likely more than that from the production programs due to high fecundity and survival this year. Eggs will be shocked late this week and mortalities will be picked early next week. There is a need for the eggs to be transferred or sacrificed by December 2, as they will hatch between December 8 and 9, 2019. Mackey also said there are likely to be surplus summer Chinook salmon eggs from the Wells Subyearling Program due to high fecundities in the broodstock. The surplus eggs will be incubated on a program for developing subyearling smolts.

IV. Rock Island/Rocky Reach HC

A. Surplus Chelan Falls Summer Chinook Eggs

Tonseth said WDFW is also expecting a surplus of 400,000 to 600,000 eggs in the Chelan Falls summer Chinook program. Tonseth said he is waiting to hear from Kirk Truscott on CCT's needs and that the Chelan Falls program eggs will be shocked and picked by January. Tonseth has received some requests for small numbers of eggs for salmon in the-classroom projects but no other programs need large numbers of surplus eggs.

Willard asked Tonseth to remind the committees why there was such a large surplus in the Chelan Falls program. Tonseth said for 2019 one collection site that was identified was the Wells trap where 380 adults were collected. Concurrently, Chelan PUD coordinated beach seining with CCT and installation of an instream picket weir to collect broodstock directly from the Chelan River. Tonseth said and Willard confirmed the picket weir was successful after some initial installation challenges. Tonseth said the fish from the Chelan River were collected in warm water (>70°F) so there was uncertainty around egg quality and fecundity. Given those uncertainties, WDFW decided to spawn all fish collected. Tonseth said pre-spawn survival of the river-trapped fish was better than fish trapped at Wells Dam. Tonseth said they have only met program targets in 2 of 5 recent years. Tonseth said they did not predict that the Entiat National Fish Hatchery would have similar success this year and they were able to supply eggs to the YN programs. Tonseth said unless there is a program identified for the surplus eggs, they will be destroyed. Tonseth said it is not expected to have a surplus next year as a number of uncertainties in broodstock collection for the Chelan Falls program have been addressed. Willard said in January she will present a summary of Chelan Falls broodstock collection results.

Mackey said the CCT's Chief Joseph Hatchery may be the only outlet for surplus fish at this time. Tonseth agreed and said he is waiting to hear back from Truscott. Truscott suggested that in the interim, Mackey reach out to Matt McDaniel, the manager at Chief Joseph Hatchery, to determine if there is capacity at Chief Joseph Hatchery for the surplus eggs.

Keely Murdoch said she will ask Melinda Goudy (YN) if there is capacity in the Yakima Basin programs for more eggs.

V. PRCC HSC

A. Approve the October 16, 2019 Meeting Minutes, Committee Updates, and Meeting Summary Review (Todd Pearsons)

The PRCC HSC representatives approved the October 16, 2019 meeting minutes as revised.

Hillman reviewed the agenda. He explained that the intent of the agenda item on White River spring Chinook salmon recovery was to identify questions for Craig Busack (NMFS). His responses to the questions will support decision-making on a White River spring Chinook salmon hatchery program.

B. Priest Rapids Fall Chinook Salmon Broodstock Collection

Todd Pearsons gave a briefing on the Angler Broodstock Collection (ABC) Fishery that occurred in the Hanford Reach for the collection of fall Chinook salmon broodstock. The Coastal Conservation Association (an angling advocacy group; CCA) is the group that coordinates the anglers. The derby was capped at 100 boats for logistical reasons. Slots were filled in the first week of registration.

Pearsons said this year there were three fishing sites instead of two (Vernita Bar, White Bluffs, mid-reach). In total, 1,572 fish were collected over 3 days, which was the highest number ever collected. Last year 1,342 fish were collected. In the first year, 2012, 69 fish were collected.

Pearsons said there was good survival because all transfer boats were equipped with oxygen. Pearsons said there were enough natural-origin males to allow the Priest Rapids Hatchery (PRH) to make 1:2 crosses (M:F) instead of 1:4 crosses. In the past, 1:4 crosses were done to maximize use of natural-origin males; however, 1:2 is the typical protocol.

Murdoch asked whether the timing of the Columbia River recreational fishery closures this year occurred just before the ABC fishery as it did last year. Pearsons said yes. Murdoch asked if that was part of the angling success. Pearsons said yes, that was likely part of it, but also the publicity and participation increased this year. The CCA portrayed it as the largest fishing derby of its type in the world. Murdoch asked if the fishery will be closed at the same time in the future. Tonseth said they looked through the fishery regulations and the answer is yes, the current regulatory structure in place over the past 2 years will continue to be in place over the next 2 years, creating the lag time

between closure of the recreational fishery and implementation of the ABC fishery. Pearsons said the fishery remains closed in the area of the derby.

Murdoch asked if there was an entrance fee. Pearsons said yes. He said there is a benefit to the CCA in that they acquire a lot of new members through this event. Pearsons said Grant PUD provides funding for prizes. Pearsons said one thing that has changed is that there are a number of fishing guides participating. Pearsons said CCA likes it because it increases their membership, anglers like it because they can fish waters that are typically closed to them and they are contributing to the hatchery program, and guides like it because they can book trips for the derby. Experienced anglers have been instrumental in the popularity of the program and in increasing numbers of fish captured.

Pearsons said in the 2019 BCP it was agreed to collect fewer fish at the Priest Rapids Off Ladder Adult Fish Trap (OLAFT). The target number to be trapped at the OLAFT was brought down to 650 fish, which was not achieved this year, but numbers captured in the ABC fishery greatly exceeded the target of 600 fish.

Tonseth said WDFW supports moving away from collecting natural-origin fall Chinook salmon at the OLAFT. Tonseth said Paul Hoffarth (WDFW) was initially concerned that the number collected in the ABC fishery would not be adequate, but this number has been large in the past 2 years. Tonseth proposed collecting broodstock only via the ABC fishery in 2020. Hillman asked Tonseth to remind the Subcommittee why WDFW prefers to not use the OLAFT for broodstock collection. Tonseth said there is uncertainty about the origin of the fish that ascend Priest Rapids Dam (PRD), whether they are returning to the Priest Rapids pool or are part of the aggregate that spawns in the Upper Columbia Basin, and it's unknown what contribution the adults ascending PRD are making to upstream populations.

Pearsons said he was initially apprehensive of relying solely on the ABC fishery because the reason for use of the OLAFT and fishery is to select the type of fish to meet a PNI target of 0.67. Pearsons said he has become more comfortable with the idea of not using the OLAFT because PNI has been high the last few years. Pearsons suggested using the OLAFT as a back-up option for collecting fish without having to develop a new proposal if there is a decline in PNI in future years below the target of 0.67. Pearsons suggested not collecting at the OLAFT in 2020 but treating the approach as a pilot method for the next few years in case an adequate number of fish are not captured in the ABC fishery. Tonseth said that would be a reasonable approach but would require CCT approval. Tonseth said the success of the ABC fishery depends on consistency in return timing, fishery timing and run size, and at this time there is no reason to expect these factors to change.

Murdoch said she would want to verify during the pilot years that the PRH program would backfill with hatchery-origin fish if the program runs short. Pearsons said they try to collect fish at the OLAFT

that are not known to be hatchery fish, but they do spawn hatchery fish as needed. Murdoch said if PRH doesn't meet production it would likely be due to a low run size, not because of failure of the ABC fishery.

Tonseth said the PNI target is compared to a 5-year mean, so one year of PNI below the target of 0.67 would be acceptable. Pearsons said yes, but if PNI is very low in one year, for instance as low as 0.2, it may not be possible to elevate the 5-year mean PNI in subsequent years.

Pearsons asked if this proposed change to broodstock collection should be written into the BCPs now or wait until Truscott is available to approve this pilot plan. Hillman and Tonseth advised Pearsons to go forward with edits to the BCP.

C. White River Spring Chinook Salmon: Recovery Questions

Hillman said the intent of the discussion on White River spring Chinook salmon recovery is to identify questions for Craig Busack (NMFS) before he retires. His responses will support decision-making on a White River spring Chinook salmon hatchery program. Spawning aggregates of the Wenatchee spring Chinook salmon population were discussed. Major spawning areas (MSAs) include the Chiwawa River, White River, Nason Creek, Little Wenatchee River, and upper Wenatchee River; minor spawning areas (mSAs) include Chumstick Creek, Peshastin Creek, Icicle Creek, and Mission Creek.

Tracy Hillman recorded questions for Craig Busack as they were posed in the meeting. Hillman presented the initial question about the necessity of the White River spawning aggregate for recovery of the Wenatchee River spring Chinook salmon population.

Murdoch asked if Busack is working closely with Northwest Fisheries Science Center (NWFSC) because at yesterday's PRCC meeting, Scott Carlon (NMFS) suggested that scientists at the NWFSC may be changing their thoughts on the importance of the White River spawning aggregate to the recovery of the Wenatchee River spring Chinook salmon population. Murdoch noted that the importance of the spawning aggregates are written into the recovery plan so that would represent a change to the recovery plan. Murdoch said in her view this would represent a major change to the recovery plan. The implication is that there is no concrete decision at this time but the topic may be under discussion. Graf agreed that the view was not specific, so a general question to be ask is what is the NWFSC's recent view on the White River spawning aggregate.

Murdoch posed questions from Tom Scribner (YN). Scribner asked if the White and Little Wenatchee spawning aggregates are limited by predation in the Lake Wenatchee, how do the federal regulatory agencies interact to resolve this issue? Is there a willingness by NMFS to rewrite the recovery plan? Tonseth agrees this is difficult because the programs are bound by the direction in the recovery plan. Tonseth asked, given the uniqueness of Lake Wenatchee and the White River and Little Wenatchee

spawning aggregates, should they be considered one aggregate? Matt Cooper asked how often the recovery plan undergoes review. Murdoch said it doesn't. Tonseth said the plan was written in 2007.

Pearsons asked how different the White River spring Chinook salmon spawning aggregate needs to be from other spawning aggregates to be considered independent in terms of Viable Salmonid Population (VSP) parameters such as diversity. Pearsons asked, if that genetic diversity is lost and the aggregates are no longer different, how is diversity recovered? Tonseth suggested reframing the question to ask as how different all the spawning aggregates need to be to achieve the diversity component of recovery? Tonseth asked whether the plan should identify genetic characteristics that need to be met to identify a group as a spawning aggregate. Murdoch said there are specific goals for the abundance metric of VSP but there are not goals for the diversity metric. Murdoch said diversity at this time represents post-1940s divergence within the Wenatchee River spring Chinook salmon population and the goal would be to maintain the divergence that has occurred. Hillman said metrics for spatial structure and diversity are combined into a matrix and the results are used to determine if the population is at very low, low, moderate, or high risk of extinction. There are targets for spatial structure and diversity. For example, the recovery plan identifies how many spawning aggregates need to be populated with natural-origin fish. Hillman said the goal is to maintain natural spawners in 4 of 5 MSAs and in one mSA downstream from Tumwater Canyon. Thus, one or both of the MSAs upstream of Lake Wenatchee are needed for recovery.

Tonseth said there are surplus fish from Endangered Species Act-listed hatchery programs returning upstream of the Icicle Creek that currently cannot be used at LNFH because of NMFS' definition of what constitutes an Endangered Species Act-listed fish; that is, hatchery-reared fish included as part of the listing status. Kahler said in the Methow River, Methow Hatchery-origin fish are declared surplus to the recovery of the population, so that they can be surplussed for adult management or utilized as broodstock in other hatcheries. Tonseth said if listed hatchery fish could be delisted, they could be used at LNFH. Cooper said, hypothetically, a proposal would be for LNFH to be set up as a safety net program, similar to WNFH to maintain mitigation obligations using the Carson stock. Tonseth said possibly, but not at the expense of allowing natural-origin fish to spawn in the Icicle Creek, reclaiming the Icicle Creek spawning aggregate. Cooper said hypothetically, how would recovery of the Icicle Creek aggregate affect the White and Little Wenatchee aggregate. Tonseth said if the Icicle Creek aggregate were recovered to a level of a major spawning area, the White River and Little Wenatchee River could be considered minor aggregates. Murdoch said that scenario is highly speculative.

Pearsons asked, if money were put toward recovery of an aggregate, would the choice be to invest in the White and Little Wenatchee rivers, or in Icicle Creek. Tonseth and Pearsons agreed it would be Icicle Creek due to the quality and quantity of habitat in Icicle Creek.

Murdoch said all of the ideas discussed would require redrafting the recovery plan and asked who the authors of the recovery plan are. Hillman said it is NMFS's plan. NMFS and the State of Washington provided the Upper Columbia Salmon Recovery Board (UCSRB) with funds to help NMFS write the plan. Involving the UCSRB led to a grass-roots effort. Murdoch said reopening the plan would require reinitiating that effort.

Murdoch said if there is an opening to reconsider aggregate status in the recovery plan, the Upper Wenatchee River major spawning area should be discussed. Murdoch said the upper Wenatchee River MSA has very low productivity and the few natural-origin fish that return to the Wenatchee River do not typically spawn in the upper Wenatchee MSA. Spawners in the upper Wenatchee River MSA tend to be hatchery-origin strays. Murdoch suggested that perhaps the Upper Wenatchee MSA should not be considered a MSA. Pearsons agreed and remarked the data show that is not a self-sustaining spawning location and serves more as a sink. Tonseth agreed and commented that the data on spawning success and survival were not available when the plan was written. The plan was written based on where fish were observed spawning.

Hillman projected the recovery plan for reference. Hillman showed the recovery criteria for abundance, productivity, diversity, and spatial structure. Pearsons said he is interested in one of the criteria on genetic variation; how different do the stocks have to be (number 1c)? Hillman said the assumption was made that there was some differentiation between spawning aggregates. Specifically, the focus on the White and Little Wenatchee was because it was thought those aggregates were substantially different from others. Pearsons said this was written before more recent information was provided by geneticists (e.g., provided by the panel of genetic experts consulted in late 2018). Pearsons noted that differentiation of the White River fish was determined to have occurred over just two generations, which may not necessarily be adaptive variation, but rather the result of a founder effect. Murdoch said she was also surprised by how little genetic difference there was between populations. Graf said genetic reports have shown that diversity within the Chiwawa aggregate is greater than between aggregates.

Hillman showed the risk analysis scores for the individual spawning aggregates and the criteria for scoring abundance/productivity risk factors (Appendix B to the recovery plan). Hillman said NMFS reevaluates the status of the populations every 5 years to determine if the viable population parameters (abundance, productivity, spatial structure, and diversity) have improved.

Matt Cooper asked what the end goal is for the PRCC HSC. Is the Subcommittee's task to evaluate hatchery actions to move the needle toward recovery? How should the Subcommittee evaluate other actions that contribute to recovery? Murdoch said many of these questions came up when tasked with the question of whether to reinitiate a White River hatchery plan. Pearsons said gathering all the information possible will help the committee determine what program should occur in the White

River. Hillman said one reason to get this information from Busack is to help inform the subcommittee as to the need for a White River Hatchery program. If a program is deemed necessary, feedback from Busack will further inform what fish would be collected for broodstock, how many broodstock would need to be collected, and how many juveniles would need to be produced in the program. Pearsons said using brood from other sources counteracts the goal of recovery to protect or increase the diversity of the White River aggregate.

Murdoch said a lot of research has been done over the past 10 years and a key question is if there are criteria identified that are no longer relevant based on recent results and whether there is an opportunity to revise the criteria. Murdoch asked Hillman if a question like that would carry more weight coming from the HSC or from the UCSRB, and whether the UCSRB would engage on the issue. Hillman said it may get more traction if it is supported by the UCSRB. Hillman said bringing all parties along to create the recovery plan was very challenging; the UCSRB may not be interested in reopening the plan. Murdoch suggested finalizing some additional research such as the reproductive success study. If the science suggests some of the goals are no longer supported, the UCSRB may support reopening the recovery plan. Hillman suggested waiting for the results of the next status review (to be completed in 2020) to see if the populations have moved toward recovery. Hillman noted that in the last status review, NMFS determined that populations in the Upper Columbia were holding steady.

Pearsons suggested asking Busack these questions and the PRCC HSC can take a particular course of action depending on his responses.

Pearsons added a few more questions. Pearsons asked, if the White River genetic signature is lost (has been lost already or is lost due to hatchery actions), what is the path to recovery? Murdoch said Scribner had a similar question. Murdoch said the Relative Reproductive Success Study is showing that the hatchery fish (Chiwawa River strays) spawning in the White are equally as productive as the natural-origin fish spawning in the White River. So why is there still a distinct signature for the White River aggregate? Pearsons said the White River genetics may be diluted and whether the uniqueness of the aggregate has been maintained may come to light in the 10-year Comprehensive Report (to be completed in 2020).

Pearsons asked whether NMFS would support a composite broodstock. Murdoch added if the spawning aggregates are not genetically distinct, how would it change NMFS view on supplementation? Murdoch said the current interpretation is to wait and see if the aggregates are genetically distinct.

Pearsons asked how hatchery-origin spawners contribute to recovery if they don't contribute appreciably to increasing the production of natural-origin offspring. Pearsons said the interpretation

of VSP criteria is that hatchery fish don't count toward recovery, and in fact they can count against the status of the aggregate. Pearsons asked whether starting a hatchery program would contribute to recovery in terms of the VSP criteria or count against it? Cooper said hatchery fish may count towards diversity or other metrics. Murdoch said a hatchery could contribute by maintaining natural-origin productivity. Murdoch said hatcheries won't bring an aggregate to recovery if the limiting factors are not addressed. Hatcheries can buy time and offer an extinction risk buffer.

Hillman said responses from Busack should provide members with some of the information they need to support or reject a White River hatchery program. Answers to these questions provide Subcommittee members justification for making recommendations.

Hillman suggested if Busack cannot represent NMFS' position on these questions, the questions should be provided to someone else at NMFS. Hillman suggested allowing the PRCC HSC members an opportunity to review the list and provide edits/comments by December 5. The list can then be sent to Busack.

The draft list of questions for Busack, recorded by Hillman during the preceding discussion is as follows:

1. Is the White River spawning aggregate necessary to the Wenatchee spring Chinook salmon population in regards to meeting Viable Salmonid Population criteria?
2. What is the NOAA Science Center's most recent view on the importance of the White River spawning aggregate?
3. If survival data indicate the bottleneck for White River spring Chinook salmon is predation (e.g., bull trout) within Lake Wenatchee, how do the federal regulatory agencies interact to resolve the issue?
4. If the White River and Little Wenatchee spawning aggregates are important to recovery and both suffer from similar agents of mortality within Lake Wenatchee, how will NOAA address recovery without one or both aggregates?
 - a. Can both aggregates be considered one aggregate?
 - b. Is there a need to revise the existing recovery plan?
5. How important is the White River aggregate to the overall genetic diversity of Wenatchee spring Chinook salmon?
 - a. How much within-population genetic variation is needed for recovery?
6. If the White River genetic signature is lost, can recovery still be achieved?
 - a. If so, how do we achieve recovery without the White River genetic signature?
7. Would NOAA support a composite broodstock hatchery program for the White River?
8. If White River spring Chinook salmon are not genetically distinct from other Wenatchee spring Chinook salmon aggregates, what would be NOAA's view on White River supplementation?

9. If hatchery-origin fish do not contribute to natural-origin fish, would adding another supplementation program in the Wenatchee contribute to recovery?

D. Chinook Salmon Transfers from Eastbank Hatchery

Todd Pearsons updated the Subcommittee on transfers of spring Chinook salmon from Eastbank Hatchery to acclimation facilities.

Nason Creek spring Chinook salmon were transferred to the Nason Creek acclimation facility in the third week of October. Survival was good.

Carlton summer Chinook salmon were transferred during the second week of October. They are currently being held on groundwater because of past health concerns, and mortality rates have been very low. Pearsons said the use of groundwater seems to be helping with fish health.

VI. Administration

A. Next Meetings

The next HCP-HCs and PRCC HSC meetings are December 18, 2019, January 15, 2020, and February 19, 2020, at Grant PUD in Wenatchee, Washington.

A determination will be made in early December whether the HCP-HCs and PRCC HSC will convene in person or via conference call.

VII. List of Attachments

Attachment A List of Attendees

Attachment B Skaha Lake Sockeye Re-introduction Update

**Attachment A
List of Attendees**

| Name | Organization |
|--------------------------|--|
| Tracy Hillman | BioAnalysts, Inc. |
| Larissa Rohrbach | Anchor QEA, LLC |
| Ian Adams | Chelan PUD |
| Scott Hopkins | Chelan PUD |
| Catherine Willard* | Chelan PUD |
| Greg Mackey* | Douglas PUD |
| Tom Kahler* | Douglas PUD |
| Peter Graf‡ | Grant PUD |
| Todd Pearsons‡ | Grant PUD |
| David Duvall | Grant PUD |
| Ryan Benson | Okanagan Nation Alliance |
| Matt Cooper*‡ | U.S. Fish and Wildlife Service |
| Mike Tonseth*‡ | Washington Department of Fish and Wildlife |
| David Clark ^o | Washington Department of Fish and Wildlife |
| Keely Murdoch*‡ | Yakama Nation |

Notes:

* Denotes HCP-HC member or alternate

‡ Denotes PRCC HSC member or alternate

^o Joined by phone