

## Memorandum

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

Document Date: November 21, 2022

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

cc: Larissa Rohrbach, Anchor QEA, LLC

**Re: Final Minutes of the October 19, 2022, HCP Hatchery Committees and PRCC Hatchery Subcommittee Meetings**

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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 Douglas PUD Headquarters in East Wenatchee, Washington, on Wednesday, October 19, 2022, from 10:00 a.m. to 1:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

## Action Item Summary

### Long-term

#### Joint HCP-HCs and PRCC HSC

- Kirk Truscott will work with Confederated Tribes of the Colville Reservation (CTCR) staff to develop a model that addresses the probability of encountering natural-origin (NOR) Okanogan River spring Chinook Salmon at Wells Dam (Item I-A). *(Note: This item is ongoing; expected completion date to be determined.)*
- Kirk Truscott will determine the number of scales that should be collected from spring Chinook Salmon at Wells Dam for elemental signature analysis to discern Okanogan River spring Chinook Salmon from Methow River spring Chinook Salmon (Item I-A). *(Note: This item is ongoing; completion depends on the outcome of the previous action item.)*
- Keely Murdoch and Mike Tonseth will obtain estimates of pre-spawn mortality (PSM) from Andrew Murdoch to update the retrospective analysis for Wenatchee spring Chinook Salmon (Item I-A). *(Note: This item is ongoing; expected completion date to be determined.)*
- Members of the HCP-HCs and PRCC HSC will discuss potential hatchery management changes for rearing and release following completion of the 10-year Comprehensive Reports (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 prior to the next meeting (Item I-A). *(Note: This item is ongoing.)*

## Near-term (to be completed by next meeting)

### Joint HCP-HCs and PRCC HSC

- Todd Pearsons and Catherine Willard will revise Grant and Chelan PUD's draft Statements of Agreement (SOAs) on Sockeye Salmon obligations for approval in an upcoming meeting (Item I-A). (*Note: This item is ongoing.*)
- Mike Tonseth will work with Douglas PUD and Grant PUD to prepare a draft comprehensive version of the 2022 Broodstock Collection Protocols for approval by email prior to the next meeting (Item I-A).
- Mike Tonseth will work with Matt Cooper to distribute an analysis showing feasibility of the Methow spring Chinook Salmon Outplanting plan based on historical run size data and proportionate natural influence (PNI) targets (Item II-B).
- Mike Tonseth and Keely Murdoch will reach out to staff for historical information to support a discussion on effects of redd desiccation on Chinook productivity in the Methow River (Item II-B).
- Grant PUD will provide a follow-up on Carlton Acclimation Facility (AF) release approaches (Item IV-B).

### Rock Island/Rocky Reach HCP-HCs

- Catherine Willard and Larissa Rohrbach will convene the Hatchery Evaluations Technical Team (HETT) to discuss comparisons between approaches for estimating Wenatchee steelhead escapement (Item III-A).

## Decision Summary

- None.

## Agreements

- None.

## Review Items

- Douglas PUD's draft *Implementation of Comprehensive Monitoring and Evaluation of Wells Hatchery Complex Programs in 2023* was distributed on Tuesday, October 25, with comments and edits due by Wednesday, November 23, 2022.
- The draft, comprehensive, 2022 Broodstock Collection Protocols was distributed on Wednesday 26, 2023, for review and email approval.

- Grant PUD's draft *Priest Rapids Hatchery Monitoring and Evaluation Annual Report for 2021 – 2022* was distributed on Monday, October 31, with comments and edits due by Wednesday, November 30, 2022.

## Finalized Documents

- None.

## I. Welcome

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

Tracy Hillman welcomed the HCP-HCs and PRCC HSC, reviewed the agenda, and asked for any additions or changes to the agenda. Minor adjustments were made to the agenda. Two items, broodstock collection protocols and HETT coordination for Wenatchee steelhead escapement, were discussed briefly during the review of action items, and so were removed from the agenda.

The HCP-HCs and PRCC HSC reviewed and made minor revisions to the September 19, 2022, meeting minutes.

Action items from the HCP-HCs and PRCC HSC meeting on September 19, 2022, were reviewed. *(Note: Italicized text below corresponds to action items from the previous meeting.)*

### Joint HCP-HCs and PRCC HSC

#### Long-Term

- *Mike Tonseth will distribute an analysis showing feasibility of the Methow spring Chinook Salmon Outplanting plan based on historical run size data (Item I-A). (Note: This item is ongoing; expected completion to be determined.)*
- *Kirk Truscott will work with CTCR staff to develop a model that addresses the probability of encountering NOR Okanogan River spring Chinook Salmon at Wells Dam (Item I-A). (Note: This item is ongoing; expected completion date to be determined.)*
- *Kirk Truscott will determine the number of scales that should be collected from spring Chinook Salmon at Wells Dam for elemental signature analysis to discern Okanogan River spring Chinook Salmon from Methow River spring Chinook Salmon (Item I-A). (Note: This item is ongoing; completion depends on the outcome of the previous action item.)*
- *Keely Murdoch and Mike Tonseth will obtain estimates of PSM from Andrew Murdoch to update the retrospective analysis for Wenatchee spring Chinook Salmon (Item I-A). (Note: This item is ongoing; an update presentation will be scheduled for early 2023).*

Murdoch and Tonseth provided a detailed update to this action item. Murdoch and Tonseth met with Katy Shelby and Mike Hughes who shared data recently made available in analyses of the

Wenatchee Relative Reproductive Success Study (RSS). It will be another 2 to 4 months until all data are available. There is some adult genotyping left to finish the analyses.

PSM was not as high as it was 10 years ago, and it was lower in Nason Creek than in the Chiwawa River. The Nason Creek data are not complete yet. The female data are good quality; male data are lower quality. PSM data used in the Wenatchee spring Chinook Salmon adult management plan was probably representative. Given there were differences between Nason Creek and the Chiwawa River, especially given progress on the Nason Creek conservation plan, there is a need to update that piece and to update the larger spring Chinook Salmon management plan, probably based on females. One path is to update this simple retrospective model for Committee discussion; the other is having a broader discussion of the RSS outcomes. No cross-type effect was observed in spring Chinook Salmon as has been documented for steelhead; that is, there was no difference in productivity from wild by wild (WxW) crosses compared to hatchery by hatchery (HxH) crosses. This leads to the question whether there should continue to be spawning protocols that sustain the separation between HxH and WxW or if a return to crossing all types randomly would be acceptable.

Murdoch said the Wenatchee spring Chinook Salmon permits expire in 2026, and the discussion should be had before then. Tonseth agreed it is timely to look at the results of the 15-year RSS and decide how that should influence hatchery programs and adult management so that outcomes of the RSS can be incorporated into the biological opinion (BiOp) for the new permit. Pearsons said changes to the spawning approach could be made outside of the permit renewal, and BiOp if at the upper Wenatchee scale there is no difference in productivity between HxH, HxW and WxW matings. Tonseth said perhaps the programs could return to a randomized factorial approach to mating, but how many wild fish to incorporate into the program is still a separate question. Pearsons asked, if there is not a detectable domesticating effect, how does that affect PNI management? Murdoch said the safety-net and conservation programs allowed for the ability to adjust PNI; at the time the adult management plan was written, this was based on Hatchery Science Review Group recommendations, and there was no RSS to lean on. Tonseth said for the Wenatchee spring Chinook, the simplified Ford equation is still used to calculate PNI, not the multi-population model. The multi-population PNI will also be calculated for this year's monitoring and evaluation (M&E) report. Tonseth said cross-type matings are weighted differently in the multi-population PNI model.

Pearsons asked if PSM was very different than published in the past, which was about 50%. Murdoch said it was around 30% on average, based on female data. Tonseth said 35% was used in the management plan, which is fairly close to the PSM estimates. The Chiwawa River data set is the strongest and cleaner for females than it is for males, and a consideration in the future may be to use female equivalents as the currency for estimating spawner escapements. It looked like PSM might be lower in Nason Creek than the Chiwawa River, but there is concern that it is related to a lower sample size. There are more robust returns to Nason Creek recently, and that dataset should improve. If there is better pre-spawn survival in Nason Creek, that trend could continue to improve in the future.

Murdoch said lower PSM could be related to more holding habitat or just better spawner escapement. There were some really bad years about 10 years ago where there were density-dependent effects; but the recent data are not appearing that way. Tonseth said early data from the RSS used for the adult management plan showed higher PSM, but also large returns were associated with apparent density-dependent effects.

Kahler said these results of the RSS are really encouraging. One concern with genetic analysis is it has mostly been based on neutral markers; recently, much has been learned, and new analyses have been done using selective markers that could be applied to the old data. Perhaps reproductive success isn't the only thing we should be looking at. The Chiwawa River has been supplemented since 1989 and the Methow River since 1974, so there has been introgression at a grand scale. It would be great to achieve recovery, but how will they respond with climate change? What is the population phase, and do they have the population diversity to survive that? It would be great to hear from Mike Ford (National Marine Fisheries Service [NMFS]) and other geneticists studying this (Garrett McKinney, WDFW).

Tonseth said there is a difference between hatchery and wild fish in site selection, and results were controlled for spawning sites. Hatchery returns tend to select least-optimal habitat sites, and second-generation fish select better habitats. Pearsons said, in some ways, that finding is similar to the original Williamson et al. paper<sup>1</sup>. There are not big differences between hatchery and wild fish when you account for where they spawned. Murdoch said the hatchery fish may home back to the lower Chiwawa River and upper Wenatchee River, but when their progeny come back, they don't go back to those areas. Hatchery fish that spawned higher in the system had higher reproductive success; hatchery fish that strayed into places like the White River and spawned adjacent to wild fish had similar reproductive success to the wild fish. Any reduced reproductive success in hatchery fish was attributable to where those fish were spawning.

Hillman said millions of dollars have gone into Nason Creek restoration, including the creation of large holding pools for adults. This is good news for habitat restoration staff. Murdoch said in lower Nason Creek, there are a lot of easy-to-access lower gradient, large pools and large wood habitat; fish need to go much farther up the Chiwawa River to find that, and that could cause a big difference in PSM. The Chiwawa PSM has improved compared to what it was 10 years ago too. Tonseth said adult management has only been implemented in the past 10 years, so there are multiple treatment effects confounding the conclusions, but there appears to be a wealth of information from the RSS.

Murdoch said, as this relates to reducing conservation program size, then more wild fish could be allowed to escape, and more hatchery fish could be allowed to escape to balance PNI. In low-run years, perhaps more safety-net fish would need to be allowed to escape. The Committees can go

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<sup>1</sup> Williamson, K. S., A. R. Murdoch, T. N. Pearsons, E. J. Ward, and M. J. Ford, 2010. Factors influencing the relative fitness of hatchery and wild spring Chinook salmon (*Oncorhynchus tshawytscha*) in the Wenatchee River, Washington, USA. *CJFAS* 67:1840-1851.

down this path but would also want to look at the big picture and at potentially go back to randomized mating, which would simplify broodstock collection, marking, etc.

Tonseth said these data are leading to a need to review multiple elements of the program. The data will not be complete to revise the broodstock collection protocols (BCPs) this fall; however, the BCPs may be revised next year as the data become available. Shelby and Hughes should be invited to give a presentation in early 2023 when the data analyses are complete.

- *Members of the HCP-HCs and PRCC HSC will discuss potential hatchery management changes for rearing and release following completion of the 10-Year Comprehensive Reports (Item I-A). (Note: 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 prior to the next meeting (Item I-A). (Note: This item is ongoing.)*

### **Near-term (to be completed by next meeting)**

#### **Joint HCP-HCs and PRCC HSC**

- *Todd Pearsons and Catherine Willard will revise Grant and Chelan PUD's draft SOAs on Sockeye Salmon obligations for approval in an upcoming meeting (Item I-A). (Note: This item is ongoing.)*
- *Members of the HCP-HCs and PRCC HSC will send additional questions about the Yakama Nation's (YN's) proposal to continue acclimating spring Chinook Salmon at the Goat Wall site to Keely Murdoch no later than September 30, 2022 (Item II-A).*

This item is complete. An update to the hydrograph chart near Goat Wall in response to requests for additional historic hydrographic information was sent via email by the YN on September 26, and a response was sent by Grant PUD on October 7, 2022.

- *Mike Tonseth will work with Douglas PUD and Grant PUD to prepare a draft comprehensive version of the 2022 Broodstock Collection Protocols for approval in the October 19, 2022, meeting (Item II-C).*

Tonseth said the final components needed were received and will be sent for distribution tomorrow for an email vote. Spring Chinook Salmon protocols were approved this spring; the spring Chinook production numbers and broodstock numbers have been updated to reflect the changes with recalculation.

#### **Rock Island/Rocky Reach HCP-HCs**

- *Catherine Willard will convene the HETT to discuss comparisons between approaches for estimating Wenatchee steelhead escapement (Item III-A).*

This item is ongoing. Larissa will poll potential participants following today's meeting.

## Wells HCP-HC

- *Mike Tonseth will research the source of rearing density and flow index targets for HCP plan species (Item V-A).*

This item is complete. Tonseth found documentation of density index targets for each species but not for flow indices. Flow indices were referenced in design specs for hatchery facilities, but they were not program specific and probably for good reason. Flow indices are often changed to address program needs; flow criteria will change depending on vessel type. The density indices that are in place are tied to the permits, such as 0.06 for offspring of fish with moderate bacterial kidney disease enzyme-linked immunosorbent assay results, or 0.12 otherwise.

- *Kirk Truscott will revise the CTCR evaluation of summer Chinook Salmon rearing space at Wells Fish Hatchery to reflect the change in the source of eyed eggs (Item V-A).*

This item is complete. A revised memorandum was distributed via email on October 3 and will be attached to the final September 21, 2022, meeting minutes.

## II. Joint HCP-HC and PRCC HSC

### A. DECISION: Goat Wall Acclimation SOA

On October 7, 2022, Grant PUD distributed written responses to Danielle Grundy's (YN) summarization of the hydrologic conditions near the Goat Wall acclimation site (Attachment B). Keely Murdoch thanked Todd Pearsons and Rod O'Connor for sending additional questions in advance of today's meeting because it gave the opportunity for the YN staff to discuss them internally. Murdoch summarized that there seem to be two issues of concern: redd desiccation in the upper Methow River and juvenile survival to Rocky Reach Dam.

Murdoch asked Grant PUD to clarify their position on whether the flow data between 2019 and 2021 are representative of typical conditions. She asked if they believe those years are not typical and have concluded that redd desiccation might be a greater concern than previously realized. Pearsons said the risk might be higher or lower in the future; if the 2019 to 2021 years were distributed more evenly among the variation observed in past years, we might conclude they are more representative. The flows in 2019 to 2021 go lower earlier in the year, go lower later in the summer, and look fairly different than the other years. Murdoch said it would be expected for 50% of the lines to be above and 50% to be below the median, and the YN staff felt the 2019 to 2021 flows were a lot closer to the median value than the rest of the years. The YN also considered that the past 3 years could be more typical of the future patterns than the past 10 years, although this spring will look very different. Murdoch said secondly, the YN staff want to better understand why this issue is important to the Committees; the YN staff understand that redds going dry is not a good thing, but they do see NOR redds go dry every year that they consider a natural effect. The YN doesn't see that adding Goat Wall fish actually increases prevalence of redd desiccation, and because of observations from the Wenatchee RSS for example, they feel that getting fish to spawn in the habitats they were

intended to spawn in is really important. Fish acclimated at Goat Wall are mitigation for NOR fish as well, and the YN would like to see them come back to similar areas as NOR fish. Fish at the hatchery are in many cases subject to redd superimposition.

Pearsons said part of Grant PUD's concern is there is a lot of uncertainty around redd desiccation, juvenile survival, and also redd superimposition. They are trying to come up with some assessment of risk to decide whether it's better or worse to acclimate fish at the Goat Wall site. When comparing fish from Methow Hatchery to fish acclimated at Goat Wall, there was more redd desiccation for Goat Wall fish, but at the hatchery, there is probably more redd superimposition. There are many risks that are difficult to assess; because of the uncertainty, one conservative approach would be not to expose fish to the Goat Wall risks until there are more data. Grant PUD wants to see the programs they fund succeed. Murdoch said she understands the concerns, and the difference in opinion may be that getting these fish to do the best they can means getting them out into the habitat where they belong. Everyone acknowledges that there are only 3 years of adult-return data from the Goat Wall acclimation study, and the 5-year report will be completed when all the data are collected. Actually, this year's data are likely to look really different with the high spring flows and very low fall flows without a fall freshet. Pearsons said this is similar to a study being done at Priest Rapids Hatchery on fish size, which is at a phase where there is not enough data. Murdoch said the YN would like to be able to continue with the releases and the study while the additional years of data are being collected. Pearsons said it's difficult to come up with a head-to-head comparison of effects of redd desiccation near Goat Wall versus redd superimposition near Methow Hatchery; it would be nice to have a risk assessment that evaluates the plusses and minuses of spawning higher in the system compared to lower in the system based on some assumptions carried over from Wenatchee RSS or other work to reduce the uncertainty associated with the decision. Murdoch said she's uncertain whether those type of detailed data exist; there were some data Grundy mentioned that suggest redd desiccation does not cause 100% percent mortality of eggs in the redd. Tonseth said they have studied the effect with redd capping, and it could be evaluated further. Redd depth and egg survival was studied in the Wenatchee River.

Murdoch moved on to address the questions on survival from passive integrated transponder (PIT) tagging to Rocky Reach Dam. The mean value was not different between Goat Wall fish and Methow Hatchery fish survival. Survival was lower for Goat Wall fish in 2022. Rick Alford (YN) and Grundy believe the post-release survival could be improved with operation of the ponds to release fish when conditions are best, like YN staff do at the Coho Salmon ponds, instead of releasing on a given date. During the study years, Goat Wall fish were released on the same date as Methow Hatchery to control the factors of the study; in some years this means releasing fish before the upper Methow River flows have increased, so the water is low and clear compared to water near the hatchery, which is mixed with water from the Chewuch River, which is more turbid with different geology. The YN staff suggest releasing fish when flows come up to 500 cubic feet per second (cfs).



This factor has not been tested directly; if it's decided to move forward with this acclimation, the YN would recommend including that flexibility in management.

Pearsons asked when these fish are released. Tom Kahler said its usually early in the 3rd week of April. Pearsons said he agrees that timing releases for the best conditions is the best thing to do. A challenge can be that a bump in flow may not occur at the time when fish are ready to go. Tonseth said in the Wenatchee programs, they also try to release when conditions are best with an increase in flows and late-afternoon or night releases.

Kirk Truscott asked if there were enough PIT-tag detections to look at survival from Rocky Reach Dam to McNary Dam for these groups. Murdoch said survival to McNary Dam is becoming increasingly difficult to generate because more fish are taking the spillway and out-migrating undetected. Tonseth suggested the relative difference between the Goat Wall fish and Methow Hatchery fish could be compared.

Tom Kahler shared some survival data he compiled because he said he wanted to be more informed on the issue. Kahler shared preliminary calculations of survival for Goat Wall fish from release to Rocky Reach Dam compared to other programs from the Methow Basin (Methow Hatchery, Chewuch, Twisp, and Winthrop National Fish Hatchery). The survival of Goat Wall fish appears lower than other programs, except in 2019 and 2020 when Twisp releases had lowest survival; however, it's difficult to know if the differences are real because the standard errors are big and overlapping due to low detection rates.

Tom Kahler then showed mean minijack rates, jack rates, smolt-to-adult returns, and survival from release to Rocky Reach Dam for each program. Minijacks are the number of tags detected at adult facilities at same year of release, except for those detected in Rock Island and McNary ladders moving downstream. Goat Wall fish appear to have a lower minijack rate. Many years of data were included except for the Goat Wall group because only years when there were adult returns were included. Bill Gale said it would be interesting to overlay the minijack rates based on gonadosomatic index from prerelease assessment to look whether they correspond. Kahler said there does not appear to be good correspondence.

Murdoch asked, as an aside, why the minijack rate for Methow Hatchery is so high, especially with the knowledge the Goat Wall fish are from the same stock but are just spring acclimated at Goat Wall. And for the Twisp releases, why would there be so many more minijacks than adult returns? Gale referenced publications that found the closer a population is tied to a wild population, the higher the proportion of minijacks<sup>2</sup>. Murdoch said that doesn't explain why the Goat Wall, Chewuch, and Methow Hatchery groups, which all are from the Methow composite source for broodstock, all

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<sup>2</sup> Harstad, D. L., D.A. Larsen, and B.R. Beckman, 2014. Variation in Minijack Rate among Hatchery Populations of Columbia River Basin Chinook Salmon. Transactions of the American Fisheries Society. 143:768-778.

have different minijack rates. Gale asked if mortalities after ponding are excluded. Kahler said he did not know if pond mortalities have been removed from those files, or if they've been corrected for other sources of error like shed tags. For all the Methow programs, the tagging file uploaded to the Columbia Basin PIT Tag Information System (PTAGIS) is supposed to have those pond mortalities removed. Willard and Murdoch thought that pond mortalities were removed from the Chewuch and Goat Wall files as well, so the data should be accounting for fish that are mortalities and therefore are not out-migrating. Gale said perhaps there are mortalities at the acclimation site that are not picked out, so are not removed from the tag files. Murdoch thanked Kahler for putting these data together.

Gale said the discussion around Goat Wall comes from a proposal that U.S. Fish and Wildlife Service (USFWS) has been approving for a number of years based on the premise that it helps distribute adult returns more widely out into the basin. The other strategy to do that is adult outplanting, for which there is a plan that has been in the parking lot for 5 years now. The two proposals are interconnected. The USFWS staff would like to see the Committee deliberately consider adult outplanting as a direct comparison to spring juvenile acclimation. Gale suggested developing the outplanting plan again during this offseason; if adult return numbers are similar to this season, it might mean outplanting Winthrop NFH safety net fish instead of conservation program fish from Methow FH. Tonseth said the plan was approved in 2017; however, the primary challenge to implementing that plan are the proportion of hatchery-origin spawners pHOS and PNI limits in the permits that were just recently renewed. Tonseth said Charlene Hurst (NMFS) was engaged with that plan at the time. Tonseth said the programs would need to reconsult on those permits to consider the effects of adult outplanting on PNI. Murdoch asked if that could be done on an experimental basis; the plan was created but never implemented. Tonseth agreed that it's worth discussing, with Brett Farman's engagement, because one of the dilemmas is wanting to test the efficacy of adult outplanting but being limited by the terms and conditions of the permits. Gale said it's difficult to know in the season whether PNI targets will be exceeded and that he would support outplanting on an experimental basis to answer some basic questions, such as monitoring with PIT arrays to determine whether adults will stay in the release location or whether they would just move back down near the hatchery. Tonseth said he would not advocate for outplanting Winthrop National Fish Hatchery returns, but he would advocate outplanting returns to Methow Hatchery. Farman said NMFS would be willing to discuss outplanting adults as an option, although the implementation would likely still be tied to permit conditions, and it may be difficult to come up with a waiver for a study proposal that would negate what is in the permit. If NMFS were to reopen the permit for review, decisions are not likely to change on the adult management. Farman said he would be initially uncomfortable applying outcomes of the Wenatchee RSS to the Methow Subbasin directly. It's worth exploring, but the idea of going beyond the adult management proposal that is in the permit will be challenging unless there are data to show that an increase in pHOS would not result in more hatchery and wild fish spawning together. Willard said she remembers this discussion about

PNI and that there was a spreadsheet showing what the PNI would have been if outplanting were done. Tonseth said that previous analysis indicated that if the adult outplanting plan had been implemented in the past, the programs would not have been able to meet the terms and conditions of the permit for pHOS and PNI. Gale will ask Matt Cooper to reopen that analysis where Michael Humling (USFWS) had left off. Gale said its time to evaluate this alternative approach for spreading fish throughout the basin; adult outplanting may work better than juvenile acclimation, which relies on finding a site where rearing is possible, which may not be near good spawning habitat. With an adult outplanting strategy, spawners could conceivably be relocated where they are needed. Tonseth said if it's not feasible with spring Chinook Salmon, which is a listed population, perhaps it could be tested with summer Chinook Salmon, an unlisted population.

Hillman called for a vote of the Wells HCP-HC and PRCC HSC on the Statement of Agreement entitled "Goat Wall Acclimation Continuation," which would allow for continuing this component of the YN's Upper Columbia Spring Chinook and Steelhead Acclimation Project.

WDFW, Grant PUD, NMFS, USFWS, YN, and Douglas PUD approved the SOA. CTCR did not approve the SOA.

Kirk Truscott said he did not approve the SOA because of concerns regarding fish returning to that reach of the Methow River that dewater, and the risk of redd desiccation, recognizing it's a small number of fish returning from 25,000 juveniles. He questioned what productivity could be compared to spawning lower down in the system; the differences in smolt survival data are stark, although he appreciated Murdoch's explanation for why those differences may occur.

Kahler said that leaves Douglas PUD with the need to decide what to do with those fish. They would be released with the Methow Hatchery population. They have not been PIT tagged. Murdoch said they do have a unique coded wire tag (CWT), but that may not matter. The YN will continue to monitor the population and continue to bring those data back to the HCP-HC for updates, and a 5-year report will be prepared as part of the contract. The sixth year's release data would not be able to be included in a report until early 2026.

Truscott noted, if there is a pause in this program, there will be another year of flow data to estimate desiccation risk. Tonseth suggested having a conversation about what data are needed on effects of dewatering to estimate loss of eggs that are incubating in areas that dewater. Truscott said an evaluation like that will be key for evaluating upper basin acclimation to determine if it's a net positive compared to what is being done. If there is going to be a pause on acclimation at Goat Wall, work could be done to determine what the adult equivalents from the Goat Wall fish would be, assuming they would spawn naturally, and to calculate whether outplanting a comparable number of adults would push the composition of the spawning population toward violation of permit conditions. Gale said USFWS has been working with WDFW on egg survival and redd superimposition in the Entiat River but have not done any work on redd desiccation.

Truscott said from a technical standpoint, he would be concerned about an open-ended agreement to acclimate fish. The YN data show that juvenile survival rates don't necessarily correlate to adult returns, for instance in 2019 there was a lower juvenile survival rate but a higher smolt-to-adult return compared to other years. Truscott said he does agree with the YN staff's suggestion to release fish when conditions are optimal rather than on a set date. Truscott said he proposes that an SOA be developed on an annual basis, but that it's imperative to devise a means for evaluating the tradeoff between desiccation and superimposition, particularly if the problems become more pronounced with climate change. Murdoch said the problem years are when there are high flows over an extended period of time to encourage spawning and then it goes dry; for instance, this year there were really high flows during spring Chinook spawning then low flows. Tonseth said climate change could also affect spawner distribution of summer Chinook Salmon, which could exacerbate redd superimposition.

Truscott said he supports USFWS initiating another discussion about adult translocation to make better use of adults. Tonseth said if there is a pause on juvenile acclimation, it may open up opportunities to translocate adults and still meet the permit terms and conditions for PNI.

The topics of adult translocation compared to juvenile acclimation and redd desiccation in the Methow Basin will be included in next month's agenda.

### III. RI/RR HCP-HC

#### A. Chelan PUD's 2023 M&E Implementation Plan

Catherine Willard said Chelan PUD will work through approaches for estimating Wenatchee steelhead escapement with the HETT and will not ask for approval of the implementation plan at this time.

Willard said during the last meeting, Kirk Truscott asked for a comparison between the current method and the proposed method, which was used in 2020 due to an inability to carry out redd surveys during the COVID-19 pandemic. Willard presented a set of charts comparing the methods (Attachment C). The current method uses spawner surveys to determine the proportion of spawners that are of hatchery origin (HOR) and NOR. Willard showed the first set of charts showing the comparison in the mainstem. The proposed method would estimate mainstem escapement with the Dam Adult Branch Occupancy Model (DABOM), minus overwinter mortalities, harvest, broodstock, and harvest in the recreational fishery. The current model relies on redd surveys. While the proposed method does have more error associated with PIT-tag detection, uncertainty from the current approach comes from observer error, which is expanded in the model, and uncertainty in fish per redd, which is driven by the sample size of PIT-tagged fish. Tonseth asked if Kevin See (WDFW) ran those comparisons using the revised tagging data from fish tagged at Priest Rapids Off-Ladder Adult Fish Trap, and Willard said she would confirm with See. Willard showed the second set of charts

showing spawner escapement in the Wenatchee Subbasin overall. The models use the same DABOM approach for estimating escapement in the tributaries.

Truscott said it's interesting that the trend is flip-flopped between NOR and HOR fish; the proposed method is estimating higher for NOR fish with high confidence intervals in most years. The current method is estimating higher escapements for HOR fish in 2014 and 2015. Depending on whether you look at NOR or HOR, the different methods have different variances.

Mike Tonseth said from 2017 forward, there has been no conservation hatchery in place; there may be some error in estimating harvest because of lack of creel surveys.

Keely Murdoch said this is the reason the HETT should be convened: to dive into the data.

Truscott said data from the current method has tighter confidence intervals. Willard agreed and said that is true for the mainstem, but because the majority of the fish are spawning in the tributaries, the confidence intervals are smaller.

Hillman compiled the following list of people who should be contacted to participate in the HETT:

- CTCR: Casey Baldwin (Truscott to confirm)
- USFWS: Greg Fraser and Charles Frady
- WDFW: Katy Shelby, Kevin See, and Andrew Murdoch
- Chelan PUD: Catherine Willard and Scott Hopkins
- Grant PUD: Todd Pearson and Rod O'Connor should be invited
- Douglas PUD: will participate when able, to stay informed
- YN: Jeff Caisman
- NMFS: Brett Farman

Larissa Rohrbach will prepare a poll for these participants to identify a date to assemble the HETT.

## IV. PRCC HSC

### A. Brood Year 2021 Methow Summer Chinook Release

#### *Early Release of Brood Year 2021 Methow Summer Chinook Salmon*

The PRCC HSC agreed in an extra conference call on Monday, October 17, to release of all of the subyearling brood year (BY) 2021 Methow summer Chinook Salmon directly into the Methow River at the town of Carlton starting on Monday, October 24, 2022. The decision was a result of mortalities observed during rearing at Eastbank Hatchery attributed to bacterial kidney disease (BKD), and recommendations of Douglas PUD and WDFW fish health and fish cultural professionals to release the fish early instead of the typical plan to overwinter fish at Carlton AF for release in April 2023.

Kirk Truscott said there are other fish that Eastbank Hatchery staff need to move next week. Approximately 250,000 summer Chinook Salmon are at Chief Joseph Hatchery to be transported for overwintering at Similkameen Pond, but the Eastbank Hatchery staff typically transport them. Flows are currently low in the Similkameen River, around 250 cfs, and temperatures are dropping approximately 1°F a day; the low temperature today was 49.5°F (Ian Adams noted water at Eastbank Hatchery is 59°F now). If fish are moved for release at the Carlton site all of next week, the water at the Similkameen site is going to be in the low 30s°F by the following week. Truscott said he does not want to compromise the fish being moved to Similkameen by adjusting logistics for the Carlton release. At the Similkameen site, it's a balancing act to move juvenile fish to the site after spawning ends to avoid disease transmission from carcasses; however, several years ago, there was a late transfer into cold water and many fish died. Mike Tonseth agreed that the Similkameen fish would be a priority because they are healthy now; we are combating the same environmental conditions and transfer challenges for both groups, and both are likely to involve a certain amount of tempering for the differences in temperature. Truscott confirmed that no Eastbank Hatchery trucks or staff would be necessary to move fish from Chief Joseph Hatchery to the Similkameen site.

Rod O'Connor said the original schedule was to start the transfer of fish from Eastbank Hatchery to the Carlton site today. Tonseth said from a fish health perspective, they need to be off feed for 24 hours, so then the earliest they could be released would be on Friday but crowding them over the weekend would create additional stress, so the release will start on Monday.

Tonseth suggested adjusting the spawning schedule at Eastbank Hatchery to allow staff to transfer the juvenile Methow summer Chinook Salmon as early as possible next week on subsequent days to limit the amount of time they are crowded. Adams said three trucks are available to use. They potentially can make two trips per day, and the raceway has already been tempered at a lower temperature in anticipation of moving fish on Monday. Catherine Willard confirmed by email following the meeting that Chelan PUD will be able to transport the fish on Monday and Tuesday. Willard also confirmed she will make sure Chelan PUD staff will be ready to perform the prerelease evaluation.

### *Carlton Pond Intake and Release Issues*

Tonseth proposed a discussion for the coming months to address the problems with the intake and release strategies caused by channel migration at Carlton AF. There is now a plan for the 2021 brood; however, unless there's some resolution of the problems caused for the release point from that facility, a potential future emergency release from that facility might not be feasible. Clearly, crowding and trucking fish is not the best option in an emergency situation.

Keely Murdoch said it would be interesting to see some current aerials or Light Detection and Ranging of the channel and also to understand under what flows the channel is watered sufficiently for releases directly to the river.

Bill Gale said at Leavenworth National Fish Hatchery, juvenile fish are regularly pumped 300 feet or more from the raceways to the thalweg of Icicle Creek avoiding direct release into the spillway pool; pumping them out into the thalweg seems to result in less predation and gets them into an area where they out-migrate more quickly. Gale said he would like to discuss whether pumping fish from the Carlton AF to the main channel of the Methow River is still a realistic option. Adams said the pump manufacturers have specifics on the maximum distance its recommended to pump water.

Tom Kahler said there should be considerations about the ability to carry out emergency releases at any time of year, including in the winter, to ensure it's feasible and safe.

### *Fish Health Summary at Eastbank Hatchery*

Megan Finley (WDFW Fish Health) had prepared a draft summary of BKD prevalence across recent years, distributed on October 11, 2022 (and attached to the October 17 meeting minutes), with her preliminary thoughts and recommendations that should be discussed further by the Committees. Finley suggested a potential re-evaluation of the prophylactic approaches to BKD management. Tonseth suggested inviting Finley to present her summary in a Committee meeting, in preparation for drafting the 2023 BCPs. There would be no options for the 2023 brood adults because they have mostly already been spawned, but perhaps there are some options for treating juveniles. Tonseth confirmed following the meeting that Finley could be available to present future disease management approaches for the Eastbank programs in the December 2022 meeting.

## V. Administrative Items

### A. Wells HCP-HC Representation

Douglas PUD informed the Wells HCP-HC in a memorandum dated October 13, 2022, that Tom Kahler will be their HCP-HC representative going forward.

Bill Gale noted that Charles Frady has recently been hired by USFWS to fill the position vacated by Michael Humling as their Hatchery Evaluation Biologist.

### B. Next Meetings

The next regular HCP-HCs and PRCC HSC meetings will be held on Wednesday, November 16; Wednesday, December 22; and Wednesday, January 18, 2022. The November meeting will be held at 10 a.m., in person, at Douglas PUD's auditorium with a WebEx virtual attendance option. The HCP-HC and PRCC HSC agreed they would consider meeting virtually from December through February because of travel challenges.

## VI. List of Attachments

Attachment A List of Attendees

Attachment B Grant PUD's Responses to Additional Data Provided by the Yakama Nation on Spring Chinook Salmon Acclimation at Goat Wall

Attachment C Wenatchee Steelhead Escapement Model Outcome Comparisons



**Attachment A  
List of Attendees**

Name	Organization
Larissa Rohrbach	Anchor QEA, LLC
Tracy Hillman	BioAnalysts, Inc.
Scott Hopkins* <sup>o</sup>	Chelan PUD
Catherine Willard*	Chelan PUD
Kirk Truscott* <sup>‡</sup> <sup>o</sup>	Confederated Tribes of the Colville Reservation
Betsy Bamberger <sup>o</sup>	Douglas PUD
Tom Kahler*	Douglas PUD
Andrew Gingerich	Douglas PUD
Rod O'Connor <sup>‡</sup>	Grant PUD
Todd Pearsons <sup>‡</sup>	Grant PUD
Tim Taylor	Grant PUD
Brett Farman* <sup>‡</sup> <sup>o</sup>	National Marine Fisheries Service
Mike Tonseth* <sup>‡</sup>	Washington Department of Fish and Wildlife
Megan Finley	Washington Department of Fish and Wildlife
Keely Murdoch* <sup>‡</sup>	Yakama Nation
Bill Gale* <sup>‡</sup> <sup>o</sup>	U.S. Fish and Wildlife Service

Notes:

\* Denotes HCP-HCs member or alternate

‡ Denotes PRCC HSC member or alternate

<sup>o</sup> Joined by Webex

**Attachment B**  
**Grant PUD's Responses to Additional Data Provided by the Yakama Nation on Spring Chinook Salmon  
Acclimation at Goat Wall**

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## Graph of Upper Methow Gauge

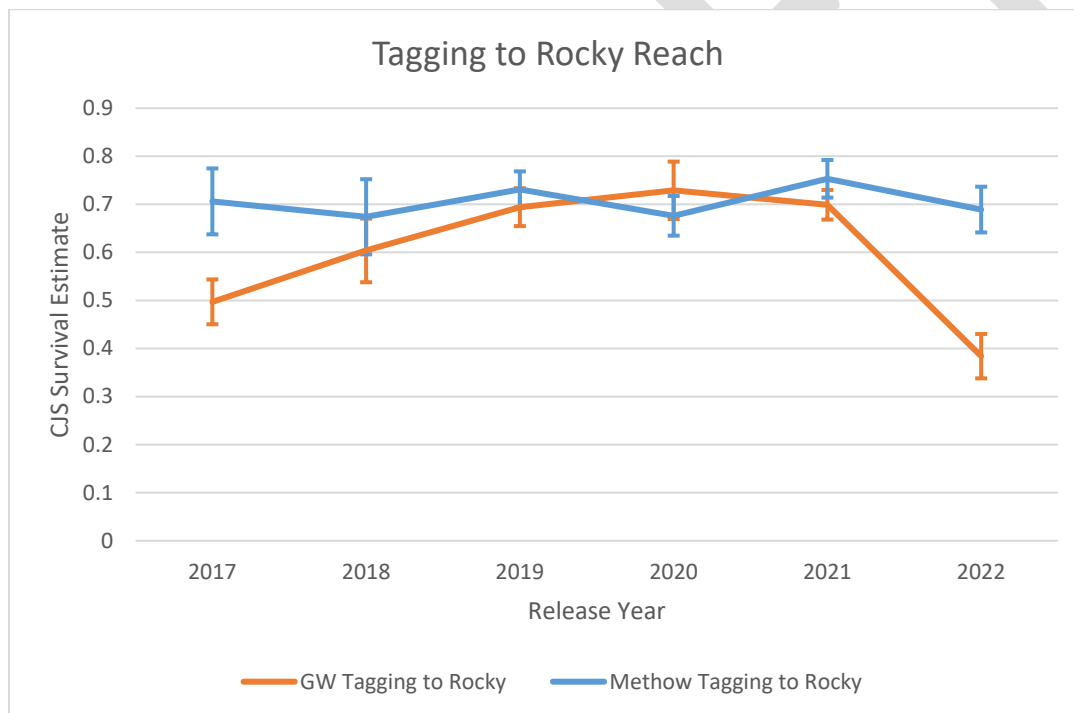
GPUD 10/5/2022 Response:

Thank you for the additional discharge lines on the flow graph. It was very helpful for putting the 2019-2021 data into a broader time span.

Based on a visual look at the graphs, it looks like the reach went dry in 12 out of the past 15 (80%) years in the upper Methow site. This suggests that reach dessication will likely be a regularly occurring phenomenon in the future and that the risk of redd dessication could be significant.

The years 2019-2021 look fairly unusual because dessication in the reach occurred earlier than what occurred in most of the other years. As such, it may not be reasonable to assume that what occurred during 2019-2021 will be a good predictor of what may be seen in the future.

In addition, the juvenile survival data from Goat Wall indicates that 2 of 6 (33%) of years were significantly lower (e.g., 20-30%) than survival from the Methow Hatchery.



In short, given the information that has been provided, it appears that the risk of lowered juvenile survival and increased redd dessication from fish acclimated at Goat Wall Acclimation Pond is not negligible and is higher than the risk of fish acclimated at Methow Hatchery. The question remains whether the costs of remote acclimation at Goat Wall (e.g., increased redd dessication, lowered juvenile survival) is lower than the benefits (e.g., expanded spawner distribution, reduced redd superimposition) when compared to fish acclimated at Methow Hatchery.

Please let us know if we have misinterpreted your information or if you have any questions about our interpretation.

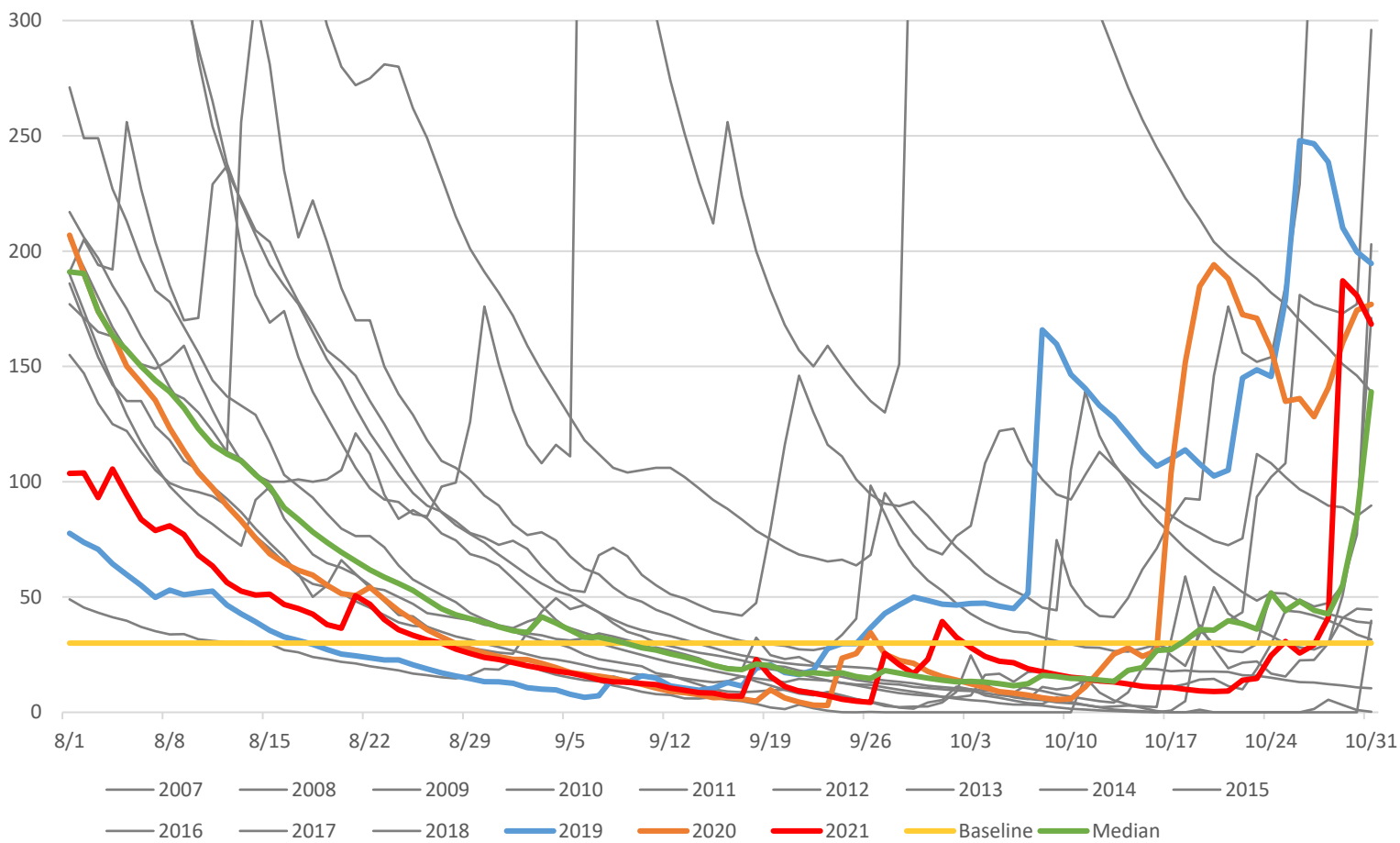
Thanks,

GPUD

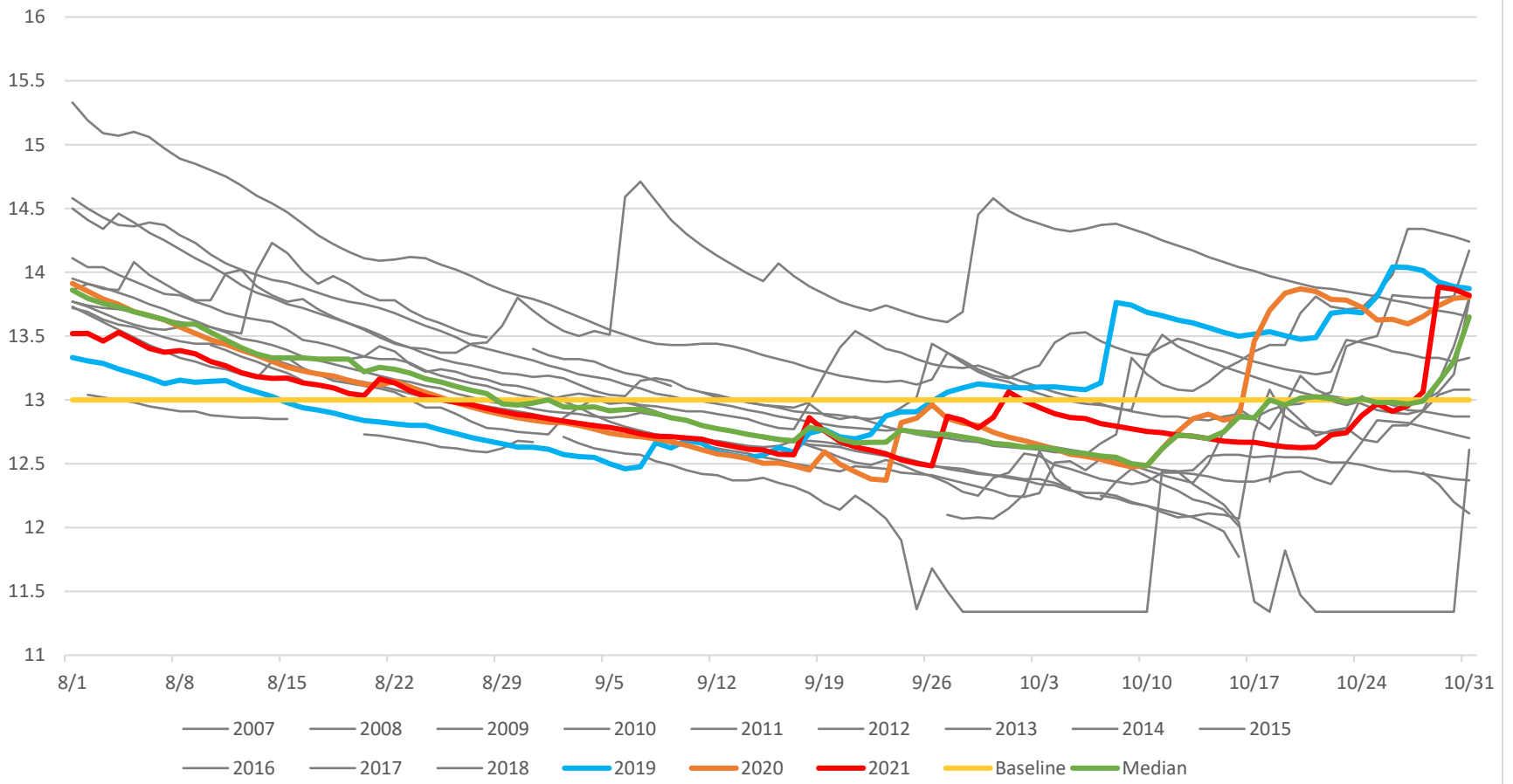
I graphed out both the flow and gauge height of the Upper Methow gauge from 2007 thru 2021. I added the gauge height since that is likely more appropriate with longer data sets. The gauge value is about 13 when disconnection begins in the upper Methow.

I left 2007 thru 2018 as gray lines while defining 2019-2021 with different colors. The yellow line depicts about when the river begins to disconnect and travels underground. I also added the median values as a green line. The medians were generated from all the years that are graphed (2007-2021). The median suggests that the timing of drying is generally the end of August/early September and fall freshets are generally occurring by the end of October. Year 2020 and 2021 seem to track fairly well with the median.

### Flow at Upper Methow Site 2007 - 2021



### Gauge Height at Upper Methow Site 2007 - 2021



**Attachment C**  
**Wenatchee Steelhead Escapement Model Outcome Comparisons**

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**From:** [Catherine Willard](#)  
**To:** [Larissa Rohrbach](#)  
**Subject:** Wenatchee spawner escapement data set for current and proposed methods  
**Date:** Wednesday, October 26, 2022 9:55:42 AM  
**Attachments:** [Data\\_MethodsComparison\\_October\\_HC.xlsx](#)  
[HC Meeting 10.19.2022\\_Updated.pdf](#)

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**CAUTION:** This email originated from outside of Anchor QEA. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi Larissa,

Can you please distribute the attached data set used to generate spawner escapement estimates utilizing the current method and the proposed method (referred to as the Covid method) and the updated figures comparing the estimates using both methods to the HC?

Thanks!

Catherine

Description of column headings and descriptions of the formulas for the two methods in the Excel file.

Sure thing. The attached figures show estimates of spawners using each method, by origin. Note that redd-based doesn't have an estimate in 2020, because redds surveys weren't conducted that year due to COVID.

In the MethodsComparison.xlsx file:

- Wenatchee Total Escp: Escapement (not spawners) to the Wenatchee
  - Lwe\_fish: number of fish estimated to have moved past LWE detection site
  - Lwe\_se: std err. of above
  - Rem: how many fish were removed in total (Dryden, Tumwater and fishing mortality)
- Tributary Total Escp: Estimates of escapement to all the tributaries in the Wenatchee. We assume this is also the number of spawners in the tributaries
- Mainstem Redds: data on redds in the mainstem Wenatchee
  - Obs\_redds: number of observed (counted) redds
  - Redd\_est: estimated number of redds after applying observer error model and Gaussian area-under-the-curve method outlined in Murdoch et al. (2018)
  - Redd\_se: std err of above
- Mainstem Spawners – Redds: Estimates of spawners in the mainstem, based on redd surveys and pHOS estimates from PIT tags
  - Includes estimates, standard errors, lower 95% CI and upper 95% CI
- Mainstem Spawners – COVID: Estimates of spawners in the mainstem, based on estimates of escapement past LWE, minus removals, multiplied by overwinter survival and then subtracting tributary spawners
- Wenatchee Total Spawners-Redds: Mainstem Spawners-Redds + Tributary Total Escp.
- Wenatchee Total Spawners-COVID: Mainstem Spawners-COVID + Tributary Total Escp.

The "COVID" method involves starting with estimates of escapement from DABOM for steelhead past LWE (into the Wenatchee), by origin. Then we subtract known removals (at Dryden, Tumwater,



and estimated fishing mortality, if any), also by origin. This total is then multiplied by the overwinter survival estimated by Fuchs et al. (2021), again by origin. That is the estimate of total spawners in the Wenatchee. To break it down further, we can subtract the total number of spawners estimated in all the tributaries (based on DABOM), and that leaves us with presumably the number of spawners, by origin, in the mainstem.

Hope that helps,  
Kevin

**Wenatchee Total Escapement**

<b>year</b>	<b>origin</b>	<b>lwe_fish</b>	<b>lwe_se</b>	<b>rem</b>	<b>lwe_escp</b>
2014	nor	1053	78.29	79	974
2014	hor	873.2	70.36	407	466.2
2015	nor	1068.2	70.36	85	983.2
2015	hor	1316.7	80.06	804	512.7
2016	nor	1131.2	87.94	80	1051.2
2016	hor	986.6	77.11	415	571.6
2017	nor	372.7	50.95	58	314.7
2017	hor	392.4	51.14	87	305.4
2018	nor	456	42.66	73	383
2018	hor	339.8	37.18	86	253.8
2019	nor	253.3	41.25	57	196.3
2019	hor	271.7	42.26	67	204.7
2020	nor	635	64.41	66	569
2020	hor	219.7	38.81	63	156.7
2021	nor	867.8	90.61	119	748.8
2021	hor	569.7	71.1	299	270.7

**Tributary Total Escapement**

<b>year</b>	<b>origin</b>	<b>trib_spwn</b>	<b>trib_se</b>
2014	nor	746.7	68.54
2014	hor	366.7	47.56
2015	nor	694.8	60.39
2015	hor	285.4	40.64
2016	nor	632.5	74.66
2016	hor	285.8	52.13
2017	nor	187.3	34.91
2017	hor	131.3	31.78
2018	nor	284.4	35.42
2018	hor	123.9	23.91
2019	nor	162.7	32.25
2019	hor	152.2	31.31
2020	nor	407.9	52.72
2020	hor	135.3	29.01
2021	nor	651.6	78.16
2021	hor	240.8	48.75

**Mainstem Redds**

<b>year</b>	<b>obs_redds</b>	<b>redd_est</b>	<b>redd_se</b>
2014	97	111	23.8
2015	258	309	54.41
2016	112	127	35.94
2017	90	153	40.9
2018	27	34	5.74
2019	52	63	15.56
2020			
2021	100	123	24.38

**Mainstem Spawners - Redds**

year	origin	main_redd_spwn	main_redd_se	lci	uci
2014	nor	89.8	18.81	52.91	126.66
2014	hor	111.3	28.23	55.93	166.57
2015	nor	176.2	29.68	118.05	234.39
2015	hor	374.2	75.78	225.71	522.76
2016	nor	85.7	24.67	37.3	134.02
2016	hor	110.2	33.22	45.06	175.28
2017	nor	85.3	26.17	33.97	136.55
2017	hor	127.5	38.23	52.61	202.46
2018	nor	30	6.31	17.59	42.34
2018	hor	24.1	5.6	13.09	35.04
2019	nor	61.8	19.93	22.74	100.86
2019	hor	33.2	13.38	6.97	59.43
2020	nor				
2020	hor				
2021	nor	76.7	19.85	37.77	115.58
2021	hor	71.9	19.15	34.32	109.39

**Mainstem Spawners - COVID**

year	origin	phi	phi_se	main_rt_spwn	main_rt_se	lci	uci
2014	nor	0.891892	0.04	122	103.97	-81.82	325.73
2014	hor	0.791667	0.06	2.4	78.18	-150.86	155.58
2015	nor	0.891892	0.04	182.1	94.04	-2.2	366.45
2015	hor	0.791667	0.06	120.5	81.07	-38.4	279.37
2016	nor	0.891892	0.04	305.1	114.74	80.18	529.97
2016	hor	0.791667	0.06	166.8	86.99	-3.71	337.27
2017	nor	0.891892	0.04	93.3	58.42	-21.16	207.82
2017	hor	0.791667	0.06	110.5	54.49	3.66	217.26
2018	nor	0.891892	0.04	57.2	53.79	-48.23	162.62
2018	hor	0.791667	0.06	77	40.73	-2.87	156.81
2019	nor	0.891892	0.04	12.4	49.43	-84.5	109.28
2019	hor	0.791667	0.06	9.9	47.37	-82.99	102.69
2020	nor	0.891892	0.04	99.6	80.63	-58.43	257.64
2020	hor	0.791667	0.06	-11.2	43.24	-95.98	73.54
2021	nor	0.891892	0.04	16.2	115.63	-210.4	242.88
2021	hor	0.791667	0.06	-26.5	76.14	-175.72	122.73

**Wenatche Total Spawners - Redds**

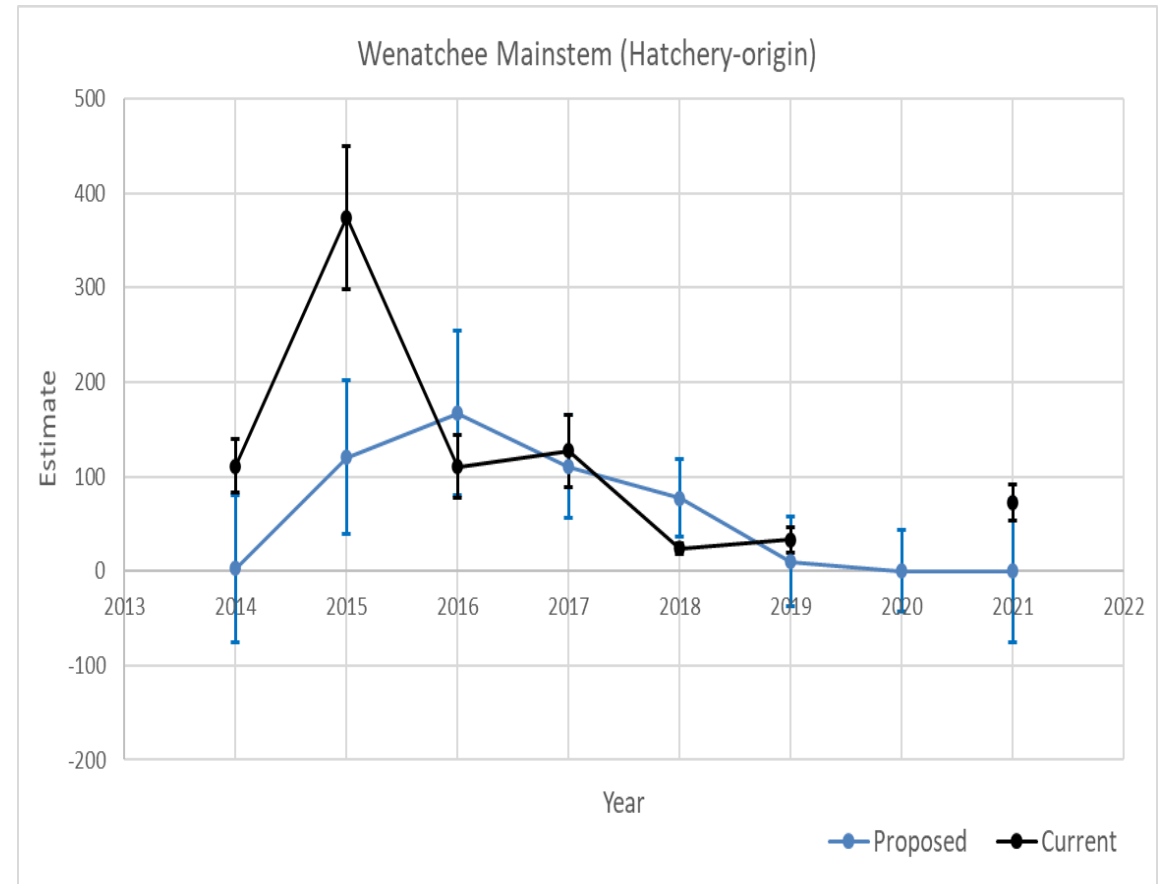
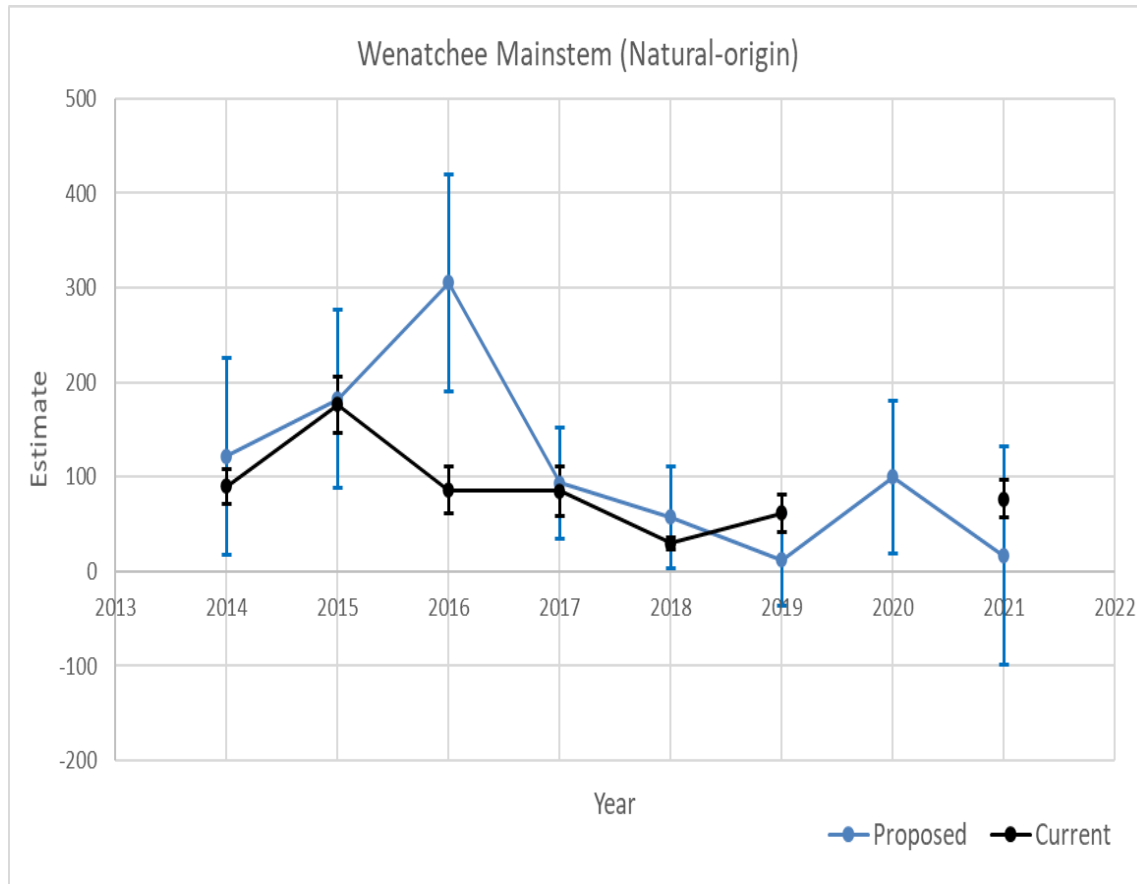
year	origin	all_spwn_redd	all_spwn_redd_se	all_spwn_redd_cv	lci	uci
2014	nor	836.5	71.07	0.08	697.19	975.79
2014	hor	478	55.31	0.12	369.58	586.38
2015	nor	871	67.29	0.08	739.15	1002.91
2015	hor	659.6	85.99	0.13	491.1	828.17
2016	nor	718.2	78.63	0.11	564.05	872.29
2016	hor	395.9	61.81	0.16	274.78	517.08
2017	nor	272.6	43.63	0.16	187.09	358.11
2017	hor	258.8	49.71	0.19	161.38	356.25
2018	nor	314.4	35.98	0.11	243.86	384.89
2018	hor	148	24.55	0.17	99.88	196.13
2019	nor	224.5	37.91	0.17	150.21	298.83
2019	hor	185.4	34.05	0.18	118.67	252.15
2020	nor					
2020	hor					
2021	nor	728.3	80.64	0.11	570.22	886.33
2021	hor	312.6	52.38	0.17	209.97	415.29

**Wenatchee Total Total Spawners - COVID**

year	origin	all_spwn_rt	all_spwn_rt_se	all_spwn_rt_cv	lci	uci
2014	nor	868.7	124.53	0.14	624.6	1112.74
2014	hor	369.1	91.51	0.25	189.74	548.44
2015	nor	876.9	111.76	0.13	657.89	1095.98
2015	hor	405.9	90.68	0.22	228.16	583.62
2016	nor	937.6	136.89	0.15	669.27	1205.89
2016	hor	452.5	101.41	0.22	253.78	651.3
2017	nor	280.7	68.05	0.24	147.29	414.05
2017	hor	241.7	63.08	0.26	118.11	365.38
2018	nor	341.6	64.4	0.19	215.37	467.83
2018	hor	200.9	47.23	0.24	108.34	293.48
2019	nor	175.1	59.02	0.34	59.43	290.8
2019	hor	162.1	56.78	0.35	50.77	273.36
2020	nor	507.5	96.34	0.19	318.68	696.33
2020	hor	124.1	52.08	0.42	22.01	226.14
2021	nor	667.8	139.57	0.21	394.28	941.39
2021	hor	214.3	90.41	0.42	37.07	391.47



# Wenatchee Mainstem



# Wenatchee Sub-Basin

