

Memorandum

To: Wells, Rocky Reach, and Rock Island
HCP Hatchery Committees

Date: June 20, 2018

From: Tracy Hillman, HCP Hatchery Committees Chairman

cc: Sarah Montgomery, Anchor QEA, LLC

Re: Final Minutes of the May 16, 2018 HCP Hatchery Committees Meeting

The Wells, Rocky Reach, and Rock Island Hydroelectric Projects Habitat Conservation Plan (HCP) Hatchery Committees meeting was held at the Grant PUD office in Wenatchee, Washington, on Wednesday, May 16, 2018, from 9:00 am to 12:30 p.m. Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

- Mike Tonseth will coordinate with Todd Seamons (Washington Department of Fish and Wildlife [WDFW]) to produce an outline or recommended approach for genetic monitoring (Item I-A). *(Note: this item is ongoing.)*
- Mike Tonseth will coordinate with Todd Seamons regarding reviewing the memorandum, "Alternatives for Methow Basin Conservation Steelhead Programs" (Item I-A). *(Note: this item is ongoing.)*
- Kirk Truscott will work with Casey Baldwin (Colville Confederated Tribes [CCT]) to summarize the CCT's current protocols for genetic sampling (Item I-A). *(Note: this item is ongoing.)*
- Tom Kahler and Greg Mackey will provide historical information to Tracy Hillman for incorporation in the Draft Hatchery Program Timelines (Item I-A). *(Note: this item is ongoing.)*
- Tracy Hillman will review aspects of the Independent Scientific Advisory Board's *Review of Spring Chinook Salmon in the Upper Columbia River* under Hatchery Committees' purview (Item I-A). *(Note: this item is ongoing.)*
- Charlene Hurst will send a Word version of the steelhead Biological Opinion (BiOp) to Greg Mackey and Matt Cooper (Item I-A). *(Note: this item is ongoing.)*
- Greg Mackey will continue researching whether to include age-3 males in broodstock and discuss it with Craig Busack (National Marine Fisheries Service [NMFS]; Item III-B). *(Note: this item is ongoing.)*
- Betsy Bamberger (Douglas PUD) will coordinate with the Washington Animal Disease Diagnostic Lab (WADDL) to obtain optical density values to inform culling for bacterial kidney disease (BKD; Item III-C). *(Note: this item is ongoing.)*

- Keely Murdoch and Mike Tonseth will provide an update on their evaluation of the size of conservation programs in October 2018 (Item I-A). *(Note: this item is ongoing.)*
- Keely Murdoch will provide coho salmon broodstock collection protocols to Mike Tonseth by late February or early March 2019 for inclusion in the 2019 Broodstock Collection Protocols (Item I-A). *(Note: this item is ongoing.)*
- The Hatchery Committees will discuss genetic monitoring in June and July 2018 (Item I-A).
- Sarah Montgomery will schedule a longer meeting on July 18, 2018, with times in the agenda, and coordinate with the Priest Rapids Coordinating Committee Hatchery Sub-Committee (PRCC-HSC) facilitator (Item I-A).
- Betsy Bamberger will research the practicality of assessing BKD by culturing (Item III-C).
- Permit applicants will send public comment distribution lists to Charlene Hurst (Item III-D).

Decision Summary

- There were no decision items approved during today's meeting.

Agreements

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

Review Items

- Sarah Montgomery sent an email to the Rocky Reach and Rock Island Hatchery Committees on June 16, 2018, notifying them that the Draft 2017 Chelan PUD and Grant PUD M&E Annual Report and its appendices are available for a 30-day review, with edits and comments due to Tracy Hillman by July 16, 2018.

Finalized Documents

- No items have been recently finalized.

I. Welcome

A. Review Agenda, Review Last Meeting Action Items, and Approve the April 18, 2018 Meeting Minutes (Tracy Hillman)

Tracy Hillman welcomed the Hatchery Committees and asked for any additions or changes to the agenda. There were no changes.

The Hatchery Committees representatives reviewed the revised draft April 18, 2018 meeting minutes. Sarah Montgomery said there are some outstanding comments, which the Hatchery Committees reviewed and addressed. Hatchery Committees representatives present approved the draft April 18, 2018 meeting minutes as revised.

Action items from the Hatchery Committees meeting on April 18, 2018, and follow-up discussions were addressed (*note: italicized text below corresponds to agenda items from the meeting on April 18, 2018*):

- *Andrew Murdoch (Washington Department of Fish and Wildlife [WDFW]) will write an overview of proposed expanded sampling at the off-ladder adult fish trap (OLAFT) at Priest Rapids Dam and present this information at the Hatchery Committees May 16, 2018 meeting (Item I-A).*
This item will be discussed today.
- *Mike Tonseth will coordinate with Todd Seamons (WDFW) to produce an outline or recommended approach for genetic monitoring (Item I-A).*
Tonseth said this item is still ongoing. Todd Pearsons asked when the genetic monitoring approach should be determined in order to incorporate it into the program review. Tonseth said the data needed for genetic analyses are still being collected, but the timelines for processing and analyzing the genetic samples could change. Pearsons asked if the analyses are staged to accommodate lab processing, or if all samples could be processed in the same year. Tonseth said the WDFW lab would not be able to process all the samples in the same year. He said baseline information and analysis methods still need to be discussed. Running baseline data again would be expensive and would take time. Pearsons said it would be helpful to know the budget for genetic monitoring and when funds need to be available. Pearsons suggested resolving anything requiring little input from the geneticists soon, such as during the June Hatchery Committees meeting, in order make progress on some topics.
- *Mike Tonseth will coordinate with Todd Seamons (WDFW) regarding reviewing the memorandum, "Alternatives for Methow Basin conservation steelhead programs" (Item I-A).*
Tonseth said this item is ongoing. He said he received a response from Seamons and will distribute it to the Hatchery Committees. He noted that Seamons did not prefer alternative 3.
- *Sarah Montgomery will reconfigure the Extranet site to sort permits and Biological Opinions (BiOps) by species and date and upload the related documents (Item I-A).*
Montgomery said this item is complete. She said she will work with Julene McGregor to change the view on the site, so it is more user-friendly. Mike Tonseth said he has a permit to add and will send it to Montgomery.
- *Kirk Truscott will work with Casey Baldwin (Colville Confederated Tribes [CCT]) to summarize the CCT's current protocols for genetic sampling (Item I-A).*
This item is ongoing.

- *Tom Kahler and Greg Mackey will provide historical information to Tracy Hillman for incorporation in the Draft Hatchery Program Timelines (Item I-A).*

This item is ongoing.

- *Tracy Hillman will review aspects of the Independent Scientific Advisory Board's (ISAB's) Review of Spring Chinook Salmon in the Upper Columbia River under Hatchery Committees' purview (Item I-A).*

Hillman said this item is ongoing. He said he will contact the statistician who helped with the review regarding suggestions for multivariate Before-After-Control-Impact (BACI) analyses.

- *Tracy Hillman will send Mary Conner et al.'s 2016 paper, "Evaluating impacts using a BACI design, ratios, and a Bayesian approach with a focus on restoration," to the Hatchery Committees (Item I-A).*

This item is complete. Hillman distributed the paper following the meeting on April 18, 2018.

- *Matt Cooper will invite Chris Tatara (National Oceanic and Atmospheric Administration [NOAA]) to the Hatchery Committees May or July 2018 meeting to discuss steelhead residualism (Item II-A).*

Cooper said Tatara plans to attend the July 18, 2018 Hatchery Committees meeting. Due to the many topics already identified for the July Hatchery Committees meeting, representatives present suggested making the meeting longer, delaying the PRCC HSC meeting, and adding times to the agenda. Montgomery said she will work on these items and coordinate with the PRCC HSC facilitator.

- *Matt Cooper will ask Penny Swanson (NOAA) about how feeding patterns during a 2-month holding period might compromise studying early maturation in steelhead (Item II-A).*

Mike Tonseth said he spoke to Don Larsen (NOAA) about feeding patterns. He said Larsen indicated that holding the fish would likely not compromise an early maturation study and suggested putting the fish on a maintenance diet to replicate stream behavior.

- *Charlene Hurst will send a Word version of the final BiOp for the steelhead to Greg Mackey and Matt Cooper (Item III-A).*

Brett Farman said he will check on the status of this item.

- *Keely Murdoch will invite Melinda Davis and Mark Johnston (Yakama Nation [YN]) to the Hatchery Committees July meeting to discuss the YN summer Chinook salmon program (Item III-B).*

This item is complete. Keely Murdoch said Davis plans to attend the July 18, 2018 Hatchery Committees meeting.

- *Sarah Montgomery will distribute the document, "Emerging Discussions from draft 2018 Broodstock Collection Protocols," to the Hatchery Committees (Item III-B).*

Montgomery distributed this document on April 19, 2018.

- *Greg Mackey will research the second item in the Emerging Discussions document, whether to include age-3 males in broodstock, prior to the Hatchery Committees May 16, 2018 meeting for further discussion (Item III-B).*

This item will be discussed today.

- *Betsy Bamberger (Douglas PUD) will coordinate with the Washington Animal Disease Diagnostic Lab (WADDL) to obtain optical density values to inform culling for bacterial kidney disease (BKD) (Item III-B).*

Bamberger said the WADDL is still working internally to decide how to report optical density values. Due to recent contracts with U.S. Fish and Wildlife Service (USFWS), WADDL expects to develop a fit-for-purpose test, and Bamberger said she will update the Hatchery Committees when she has more information.

- *Betsy Bamberger will present information on optical density values and BKD to the Hatchery Committees during their May 2018 meeting (Item III-B).*

This item will be discussed today.

- *Keely Murdoch and Mike Tonseth will provide an update on their evaluation of the size of conservation programs in October 2018 (Item III-B).*

This item is ongoing.

- *Keely Murdoch will provide coho salmon broodstock collection protocols to Mike Tonseth by late February or early March 2019 for inclusion in the 2019 Broodstock Collection Protocols (Item III-B).*

This item is ongoing.

II. Douglas PUD

A. Wells Hatchery Steelhead Production in the Dirt Ponds During Winter 2017-2018 (Greg Mackey)

Greg Mackey said there was loss of some Wells (Columbia River Safety Net) steelhead held in Pond 3 at Wells FH over the winter. He stated that a hydrogeologist conducted surveys in the dirt ponds and found that the issue was not a true sink hole but rather erosion. Nevertheless, Pond 3 did leak and the PUD plans to reline the pond in 2019. They cannot reline in 2018 because of the length of time it takes to conduct design, bidding and contracting.. Therefore, they will not be able to use Pond 3 next year to rear Wells steelhead. He indicated that Pond 4 holds Methow Safety Net steelhead and Pond 1 holds Summer Chinook salmon. They propose to rear Wells steelhead in Pond 2 this winter. A transmission tower in Pond #2 means they cannot place bird netting over the pond. Therefore, the PUD proposes to overstock the pond by 40,000 steelhead, assuming birds will harvest about 20% of the fish in the pond. Thus, the pond will be stocked with 200,000 juvenile steelhead with a release goal of 160,000 steelhead. He said at the time of release, feed conversion will be used to estimate the number in the pond.

Mike Tonseth suggested netting the pond. Mackey said that is not an option because of the location of the transmission tower within the pond. Hillman asked if cover could be placed in the pond to reduce predation. Mackey said he will look into that. Tonseth said he expects Douglas PUD to perform sufficient monitoring such that the Columbia release is no more than 10% of the program goal. He said as the fish are being released, the gate should be closed once the production target number have exited the pond.

III. Joint HCP-HC/PRCC HSC

A. Proposed Expanded Sampling at the Off-Ladder Adult Fish Trap (Andrew Murdoch)

Andrew Murdoch shared the presentation *Estimating Escapement at Various Spatial Scales Using PIT* (passive integrated transponder) *Tags* (Attachment B), which Sarah Montgomery distributed to the Hatchery Committees following the meeting. Andrew Murdoch summarized that expanded sampling at the OLAFT at Priest Rapids Dam could benefit other HCP Plan species (except sockeye), would provide real-time escapement monitoring for broodstocking and adult management purposes, and would provide estimates of run escapement by population and origin at various spatial scales for monitoring and management purposes. The majority of the information Andrew Murdoch presented is included in the presentation slides. Questions and comments are included below.

Slide 1: Regarding similar work in other basins, Todd Pearsons asked what types of models are used in the Snake, Willamette, or Deschutes rivers for studying steelhead. Andrew Murdoch said in the Snake River, three models are used to estimate steelhead escapement because there is less information available compared to the upper Columbia River. For example, there are not spawning ground surveys in the Grande Ronde River, and in the Snake River, hatchery fish are not PIT-tagged and wild fish are. In other places, it is difficult to make the analysis more consistent due to run timing. Some locations also have issues with maintaining PIT tag infrastructure in the water, or with vandalism.

Slide 6: Catherine Willard asked what sampling is currently being performed at the OLAFT. Andrew Murdoch said captured fish are scanned with ultrasound, scanned for coded wire tags, scale samples are taken, and some caudal fins are clipped for genetic sampling. Origin, sex, and age are also recorded for each fish that is PIT tagged. Mike Tonseth said this sampling is consistent with what is performed at Dryden Dam and Wells Dam. Keely Murdoch asked if all species of fish are scanned with ultrasound, particularly coho salmon. Andrew Murdoch replied that coho salmon are not examined with ultrasound, but other species are. He said ultrasound is sometimes used to determine the difference between spring- and summer-run Chinook salmon, and also used to determine gender for fish used for broodstock.

Slide 14: Regarding the escapement model, Pearsons asked what the funding source was. Andrew Murdoch said the Bonneville Power Administration (BPA) funded the PIT-tag array and model development and WDFW continues to work on the model using other funds. Andrew Murdoch said the website is useful for tracking how many fish have escaped to each basin.

Slide 23: Regarding carcass recovery bias and female overrepresentation, Greg Mackey asked if females are overrepresented in absolute terms. Andrew Murdoch said females are overrepresented relative to males. Females are more likely to be captured after spawning due to post-spawning behavior. He said larger males are also more likely to be captured than smaller males, but this can be predicted and incorporated into the model.

Slide 26: Hillman asked if Andrew Murdoch has considered using unadjusted fish-per-redd counts to estimate spawning escapement, then compare those to the modeled results. Andrew Murdoch said the run escapement is always much higher than the spawning escapement. Hillman suggested using adjusted and unadjusted fish-per-redd counts to estimate spawning escapements, and then calculate the size of the bias of the unadjusted estimate to the adjusted estimate. Andrew Murdoch said this is a similar method to the one used in the model. He said they corrected the carcass data for bias and estimated the number of fish per redd based on the number of spawners. Pearsons asked why the model does not focus solely on female counts, which drives production. Andrew Murdoch said males need to be included for reporting purposes and for calculating the percent natural influence (PNI). Pearsons said it would be helpful to move away from using data with a high carcass recovery bias, because it adds so much error. Pearsons suggested that a tighter estimate could be determined using just females.

Andrew Murdoch noted that a major benefit of using the OLAFT for this work would be to look at the entire spring-run Chinook salmon evolutionarily significant unit (ESU) in the upper Columbia River. Sampling at Tumwater Dam, for example, does not account for the entire Wenatchee Basin population. He said a sampling scheme farther downstream helps to estimate population size and structure at the level needed for making adaptive management decisions. Tonseth noted this method would help with hatchery effectiveness monitoring. It can provide a better estimate of PNI, which is a permit condition, and provide a better estimate of adult returns so hatchery fish excesses can be managed.

Slide 27: Keely Murdoch suggested that coho salmon also be added to the cost estimate for plan species.

Peter Graf asked what the costs presented represent. Andrew Murdoch said the costs cover operation of the OLAFT and analysis. This includes data management and reporting as well.

Graf asked why spring-run Chinook salmon in particular should be added to the OLAFT sampling. He said work is already funded at Tumwater Dam for spring-run Chinook salmon. Andrew Murdoch said sampling and analyzing the entire upper Columbia River ESU of spring-run Chinook salmon would be efficient and help gain a larger perspective on the population. He asked if there is a potential negative impact to the population from increased sampling and handling at the OLAFT. Pearsons asked how this method addresses a monitoring and evaluation (M&E) need that is not currently addressed. Andrew Murdoch said the alternative would be increasing effort at existing facilities, such as running both ladder traps at Wells Dam. He said handling the fish lower in the river at Priest Rapids Dam would be less impactful than at Tumwater Dam, for example, because Tumwater Dam is closer to spawning grounds and therefore more disruptive.

Catherine Willard said, from the Chelan PUD perspective, it would be helpful to discuss a concurrent plan for how M&E activities at Tumwater Dam, Dryden Dam, and Wells Dam would change with implementation of the OLAFT activities. Keely Murdoch agreed and said the discussion influences management of hatchery programs across the upper Columbia River.

Mackey asked if this model will be presented in a journal or white paper. He noted the the Hatchery Committee should review a technical document on the model. Andrew Murdoch said yes, he is working on writing a paper about the model and the original developers are also working on a manuscript.

Tonseth said the overall goal of this proposal is to increase the quality of data sources from sampling and analysis procedures and reduce potential effects from activities on listed fish species.

Pearsons asked if the costs presented in Slide 27 are in addition to the funding provided by BPA. Andrew Murdoch said yes, the funding from BPA is used to maintain infrastructure (arrays).

Hillman asked what the next steps for the Hatchery Committees are regarding this topic. Andrew Murdoch said there is uncertainty as to how the recreational fisheries and M&E at Tumwater Dam would be worked out, so that should be discussed. He also suggested increasing knowledge about life stage survival and understanding capacity limitations, especially density-dependence.

Pearsons asked if the model can be back-casted to estimate pre-spawn mortality. Andrew Murdoch said yes, to 2008. Pearsons asked if those data can be made available, particularly for Keely Murdoch and Mike Tonseth so they can work on the program size for spring Chinook conservation programs. Andrew Murdoch said yes, and while there is no explicit funding for this work, he will continue working on prespawn mortality data. This will include working with Jeff Jorgensen (NOAA) to predict pre-spawn mortality and its factors within the life-cycle modeling construct. He will also work to incorporate data from the relative reproductive success study into the model, to help determine

escapement goals for each major spawning area and predict gaps that need to be filled with hatchery fish. He said working together to develop the upper Columbia River model will help gain more funding. He said the funding coming from BPA to WDFW is currently under one umbrella. Being able to use the upper Columbia Basin as a model for other basins would put the basin in a good negotiating place for gaining funding. He said there is a lot of potential for this method because it is realistic and the managers agree on using fisheries to manage returning adults. He said there is still much left to determine such as changes to activities at Tumwater and Wells dams, but this method has a lot of potential and even cost-savings. The Hatchery Committees representatives present thanked Andrew Murdoch for the presentation and said this should be discussed again at an upcoming meeting.

B. Age-3 Males in Broodstock (Greg Mackey)

Greg Mackey said he performed a literature search on the use of age-3 males in broodstock and contacted staff at NOAA for additional information. He said he plans to discuss M&E data with Charlie Snow (WDFW) to assess how many age-3 males have been included in broodstock in recent years, then present the information to the Hatchery Committees. Todd Pearsons asked if it would be helpful to invite Craig Busack (NOAA) to participate in this discussion. He said Busack has previously worked on this topic with stakeholders helping with the Cle Elum Supplementation Research of spring Chinook in the Yakima Basin, and he may have a helpful perspective. Andrew Murdoch recalled there was also a hatchery workgroup that gathered in Portland to discuss this topic. Mackey said he will continue gathering information for a more detailed discussion.

C. Optical Density Values and Bacterial Kidney Disease (Betsy Bamberger)

Betsy Bamberger shared a presentation titled *The Challenges of Renibacterium salmoninarum Detection and BKD Management* (Attachment C), which Sarah Montgomery distributed to the Hatchery Committees following the meeting. The majority of the information Bamberger presented is included in the presentation slides. Questions and comments are included below.

Regarding culling of fish with the bacteria, Todd Pearsons asked whether fish can recover and become healthy if successfully treated. Bamberger said yes; however, in some cases there is permanent loss of tissue functionality. In those cases, the fish is no longer diseased, but is maimed.

Regarding the Elliott et al. paper published in *Journal of Fish Diseases* in 2013, Pearsons asked which detection strategy performed better. Bamberger said the enzyme-linked immunosorbent assay (ELISA) test detected more diseased fish; however, in an ideal scenario, the various methods would detect the same percentage of diseased fish. Bamberger said the two polymerase chain reaction (PCR) methods had the highest concordance with percent diseased fish. Bamberger emphasized that detecting the bacteria does not mean a fish is diseased.

Bamberger said Douglas PUD intends to perform ELISA and qPCR (quantitative polymerase chain reaction) testing, combined with gross examinations, on spring Chinook this fall. Greg Mackey said females will be examined during spawning, and lesions will be recorded, plus the females will be tested for the bacteria using ELISA and qPCR. Mackey said the eggs need to be culled in late August before they mature and suggested culture as a potential way to test for BKD. Bamberger said she will check on the potential for using culture to test for BKD, but she thinks it would take too long to grow the culture. Bamberger emphasized that there are many options to explore for managing BKD, and as programs change, it is important to be flexible with disease management strategies. She said using multiple strategies to detect BKD and make culling decisions will help manage against acting on false positives or false negatives.

Hatchery Committees representatives present thanked Bamberger for her presentation and summarized that the next steps for this discussion depend on further input from WADDL.

D. NMFS Consultation Update (Brett Farman)

Brett Farman said Charlene Hurst sent the steelhead permits for the Wells program and Winthrop National Fish Hatchery program to applicants and received comments. Farman said Hurst will revise the permits and coordinate with USFWS on implementation terms, then the permits will be provided for review again.

Emi Kondo (NOAA) provided an update on the National Environmental Policy Act (NEPA) process for the Columbia River unlisted programs. She said the Environmental Assessment is being reviewed internally, and she expects it to be provided to General Counsel in June and then to the applicants in July. After the applicants' review, the document will be available for public comment. She said if anyone has email distribution lists to use for the public comment notification, please send the lists to Hurst.

E. 2019 Hatchery M&E Implementation Plan (Todd Pearsons/Catherine Willard)

Todd Pearsons shared Grant PUD's draft 2019 Hatchery M&E Implementation Plan (made available to PRCC HSC representatives). Pearsons said it will be distributed for a 30-day review and discussed the revisions pertaining to the HCP Hatchery Committees.

Regarding Wenatchee summer-run Chinook salmon, there was a change to the field work outlined in the Implementation Plan to eliminate the data collected to inform the observer efficiency model. The data collection will still be consistent with what is already being collected in the Okanogan, Methow, and Chelan rivers. He said in 2014 to 2018, field data was collected to inform and develop an observer efficiency model and 2018 is the last scheduled year of data collection to inform the model.

He said data collection will continue to be consistent with other basins where summer-run Chinook salmon surveys are conducted and there will be no interruption to the data time series.

Catherine Willard said Chelan PUD's draft 2019 Hatchery M&E Implementation Plan is similar and will contain the same change for Wenatchee summer-run Chinook salmon data collection. She said the Chelan PUD plan will also be provided for a 30-day review. Willard said the observer efficiency model has not been run yet, but there are enough data to inform the model then review the results.

IV. HCP Administration

A. Next Meetings

The next Hatchery Committees meetings are June 20, 2018 (conference call), July 18, 2018 (Grant PUD), and August 15, 2018 (Grant PUD).

V. List of Attachments

Attachment A List of Attendees

Attachment B Estimating Escapement at Various Spatial Scales Using PIT Tags

Attachment C The Challenges of *Renibacterium salmoninarum* Detection and BKD Management

Attachment A
List of Attendees

Name	Organization
Tracy Hillman	BioAnalysts, Inc.
Sarah Montgomery	Anchor QEA, LLC
Catherine Willard*	Chelan PUD
Tom Kahler*	Douglas PUD
Greg Mackey*	Douglas PUD
Betsy Bamberger	Douglas PUD
Todd Pearsons‡	Grant PUD
Peter Graf‡	Grant PUD
Deanne Pavlik-Kunkel‡	Grant PUD
Rod O'Conner‡	Grant PUD
Mike Tonseth*	Washington Department of Fish and Wildlife
Andrew Murdoch	Washington Department of Fish and Wildlife
Alf Haukenes†	Washington Department of Fish and Wildlife
Charlie Snow†	Washington Department of Fish and Wildlife
Chris Moran†	Washington Department of Fish and Wildlife
Matt Cooper*	U.S. Fish and Wildlife Service
Michael Humling†	U.S. Fish and Wildlife Service
Brett Farman*†	National Marine Fisheries Service
Emi Kondo‡	National Marine Fisheries Service
Keely Murdoch*	Yakama Nation

Notes:

* Denotes Hatchery Committees member or alternate

† Joined by phone

‡ Joined for the joint HCP-HC/PRCC HSC discussion