

Memorandum

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

Date: May 19, 2017

From: Tracy Hillman, HCP Hatchery Committees Chairman

cc: Sarah Montgomery, Anchor QEA, LLC

Re: Final Minutes of the April 19, 2017, HCP Hatchery Committees Meeting

The Wells, Rocky Reach, and Rock Island Hydroelectric Projects Habitat Conservation Plans (HCPs) Hatchery Committees meeting was held at the Grant PUD office in Wenatchee, Washington, on Wednesday, April 19, 2017, from 9:00 a.m. to 12:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

Action Item Summary

- Andrew Murdoch (Washington Department of Fish and Wildlife [WDFW]) will write an overview of proposed expanded sampling at the off-ladder fish trap (OLAFT) at Priest Rapids Dam (Item I-A). *(Note: this item is ongoing.)*
- Hatchery Committees representatives will review the Hatchery Monitoring and Evaluation (M&E) Plan Objectives before the Hatchery Committees May 17, 2017, meeting (Item I-A). *(Note: this item is ongoing.)*
- Hatchery Committees representatives will review McLain Johnson's (WDFW) Genetic Monitoring Update for discussion at the Hatchery Committees May 17, 2017, meeting (Item I-A). *(Note: Sarah Montgomery distributed the update on April 6, 2017.)*
- Brett Farman and Charlene Hurst will provide an update to the Hatchery Committees on the differences between Endangered Species Act (ESA) Section 7, Section 10, and Section 4(d) coverage in regards to permitting for some HCP programs (Item II-B).
- Mike Tonseth will organize a workgroup to discuss the future of the Twisp Steelhead Program and define its proposed actions for consultation (Item II-D).
- Catherine Willard and Keely Murdoch will provide coho salmon recalculation numbers to the Hatchery Committees for discussion at the Hatchery Committees May 17, 2017, meeting (Item III-A).
- Keely Murdoch will provide the latest Yakama Nation (YN) Coho Salmon Master Plan to Sarah Montgomery for distribution to the Hatchery Committees (Item III-A).
- Hatchery Committees representatives will discuss internally the brood year stray rate target and prepare for further discussion at the Hatchery Committees May 17, 2017, meeting (Item II-E).

- Matt Cooper will invite Penny Swanson (National Oceanic and Atmospheric Administration) to give a presentation about epigenetics at the Hatchery Committees May 17, 2017, meeting (Item IV-B). *(Note: Cooper asked Montgomery to add a talk by Mackenzie Gavery to the May 17, 2017 agenda.)*

Decision Summary

- The Hatchery Committees representatives present approved the Outplanting Adults Plan (for spring Chinook salmon in the Chewuch River) as follows: Chelan PUD, Douglas PUD, U.S. Fish and Wildlife Service (USFWS), WDFW, National Marine Fisheries Service (NMFS), YN, and Colville Confederated Tribes (CCT) approved on April 19, 2017. Grant PUD (Priest Rapids Coordinating Committee Hatchery Sub-Committee [PRCC HSC]) also indicated approval during the joint HCP-HC/PRCC HSC session (Item II-C).

Agreements

- There were no agreements discussed during today's meeting besides the decision listed in the above section.

Review Items

- There are no items currently out for review.

Finalized Documents

- Sarah Montgomery sent an email to the Hatchery Committees on April 20, 2017, notifying them that the Final Outplanting Adults Plan is now available for download from the Hatchery Committees Extranet site.

I. Welcome

A. Review Agenda, Review Last Meeting Action Items, and Approve the March 13, 2017, Meeting Minutes (Tracy Hillman)

Tracy Hillman welcomed the Hatchery Committees and asked for any additions or changes to the agenda. No revisions were requested.

The Hatchery Committees reviewed the revised draft March 13, 2017, meeting minutes.

Sarah Montgomery said there are several outstanding comments to be discussed, which the Hatchery Committees reviewed and addressed. Hatchery Committees representatives present approved the draft March 13, 2017, meeting minutes, as revised.

Action items from the Hatchery Committees meeting on March 13, 2017, and follow-up discussions were addressed (*note: italicized text below corresponds to agenda items from the meeting on March 13, 2017*):

- *McLain Johnson (Washington State Department of Fish and Wildlife [WDFW]) will revise the timeline for conducting genetic analysis for HCP program species incorporating suggestions provided during the Hatchery Committees January 18, 2017, meeting (Item I-A).*
This item is complete. Johnson sent the revised timeline to the Hatchery Committees on April 6, 2017.
- *McLain Johnson and WDFW geneticists will perform a power analysis to inform genetic analysis intervals and intensity for HCP program species (Item I-A).*
This item is complete. Johnson sent a memo regarding genetic analysis intervals to the Hatchery Committees on April 6, 2017, and will be discussed at the May 17, 2017, Hatchery Committees meeting.
- *Andrew Murdoch (WDFW) will write an overview of proposed expanded sampling at the off-ladder fish trap (OLAFT) at Priest Rapids Dam (Item I-A).*
Mike Tonseth said this item is ongoing.
- *Hatchery Committees representatives will review the Hatchery Monitoring and Evaluation (M&E) Plan Objectives before the Hatchery Committees April 19, 2017, meeting (Item IV-A).*
This is ongoing and will be discussed during the Hatchery Committees May 17, 2017, meeting.
- *Casey Baldwin will discuss internally the steelhead marking strategy in the draft 2017 Broodstock Collection Protocols and provide feedback to Mike Tonseth (Item IV-D).*
This item is complete.
- *Keely Murdoch will discuss internally the Yakama Nation (YN)'s egg requests for their summer Chinook salmon program (Item IV-D).*
This item is complete. Murdoch provided input to Mike Tonseth.
- *Hatchery Committees representatives will discuss internally WDFW's proposal for collection and rearing for the Twisp Steelhead program in 2017 and provide a vote by March 30, 2017 (note: this includes adult collection at the Twisp Weir, transfer to Winthrop National Fish Hatchery (NFH), spawning as part of aggregate composite population. and incubation to eyed-egg or fry stage at Winthrop NFH, then transfer to Methow Fish Hatchery [FH]; Item IV-E).*
This item is complete.
- *Catherine Willard will revise the draft study plan, "Outplanting Surplus Methow Composite Spring Chinook Salmon Adults to Increase Natural Production in the Chewuch River," and distribute it to the Hatchery Committees for approval at the April 19, 2017, meeting (Item IV-F).*
This item is complete and will be discussed today.

- *Tracy Hillman will preliminarily revise the brood-year (BY) stray rate target language in the Hatchery M&E Plan for further discussion at the Hatchery Committees April 19, 2017, meeting (Item IV-G).*

Hillman said edits to language in the M&E Plan depend on further discussion of brood year stray rate targets.

- *Tracy Hillman will assess the relationship over the last 10 years between exceeding BY stray rate targets and exceeding recipient stray rate targets (Item IV-G).*

This item is complete and will be discussed today.

II. Joint HCP-HC/PRCC HSC

A. USFWS Bull Trout Consultation Update (Matt Cooper)

Matt Cooper said Karl Halupka (USFWS) sent him an update on USFWS consultations, which he summarized as follows:

- Halupka received comments on the draft biological opinion (BiOp) for the batch of Wenatchee subbasin programs, and USFWS is working on incorporating the comments into the BiOp. Halupka expects the BiOp will be finalized in May 2017.
- The USFWS discussed the consultation process for mainstem programs with NMFS.

Catherine Willard asked if Halupka plans to send the draft BiOp to the applicants for review once more before it is finalized. Cooper said he does not expect so. Mike Tonseth asked if Halupka has an update for the Hatchery Committees on the consultation process for Methow steelhead. Bill Gale said Halupka is generally following the consultation schedule set by NMFS.

B. NMFS Consultation Update (Brett Farman/Charlene Hurst)

Charlene Hurst said NMFS is prioritizing consultations that need to be finished in 2017 per the United States v. Oregon Management Agreement. Hurst said NMFS is currently drafting proposed actions for the consultations and any proposed actions should be sent to herself or Karl Halupka.

Hurst said Emi Kondo (NMFS) is working on the consultations for unlisted programs. She said the draft BiOp is almost complete, but more programs need to be added. The upper Columbia River unlisted programs will be addressed after the Leavenworth program consultation is finished.

Hurst said she recently requested information regarding consultation for steelhead programs, which she expects to be completed faster than other consultations. She said the proposed action will need to be finished by June 2017 so that the BiOp can be completed by December 2017, and more work is needed on the gene flow model. She said she set up monthly meetings for the steelhead

consultation and asked if any other parties would like to be included in those meetings. Bill Gale asked for Hurst to include himself and Matt Cooper. Keely Murdoch asked to be included and said all Hatchery Committees members should be invited to these coordination meetings and discussions to avoid future slowdown of the consultation process. Kirk Truscott asked that he and Casey Baldwin be included and said steelhead for the Okanogan programs are reared at Wells Fish Hatchery (FH). Todd Pearsons also asked to be included and said if steelhead rearing at Wells FH for the Okanogan programs is not covered under the Tribal Resources Management Plan, then it should be included with this consultation. Greg Mackey said gene flow targets are still undetermined and asked for more information from Hurst on proportionate natural influence (PNI) goals. He said non-governmental organizations have been interested in using proportion of hatchery-origin spawners (pHOS) standards to evaluate hatchery programs. Hurst said the Hatchery and Genetic Management Plans (HGMPs) reference a PNI goal of 0.67, which she said would be a reasonable standard to apply to the programs. She said for the pHOS standard, the Hatchery Scientific Review Group (HSRG) guideline is 30% for integrated programs, so 30% would be a reasonable standard to use for these programs. She said a sliding scale or other technique, and a long-term timeline could help programs attain this goal. Gale asked if Hurst is referencing "effective" pHOS or "straight" pHOS. She said NMFS does not typically use effective pHOS, and Gale said the HSRG largely references effective pHOS. Gale noted that HSRG guidelines for integrated programs mention that the guidelines may not be applicable for depressed or threatened populations; rather, the guidelines are for an ideal hatchery-wild population interaction. He said a depressed population with low abundance may not be able to achieve a pHOS of 30%. Hurst said NMFS will consider the HSRG guidelines when discussing sliding scales and pHOS targets.

Pearsons asked Hurst which programs are bundled for this consultation. Hurst said the steelhead consultation bundle includes the Winthrop program, Wells complex programs (Wells FH, Twisp, and Methow FH), and any releases under the Wells Steelhead HGMP. She said the consultation for unlisted programs will result in one BiOp, which includes Wenatchee summer Chinook salmon, Chelan Falls summer Chinook salmon, Wells summer Chinook salmon, Priest Rapids fall Chinook salmon, Methow summer Chinook salmon, and Ringold upriver bright fall Chinook salmon (which is included with the rest for efficiency). The bundle does not include Similkameen summer Chinook salmon, which is bundled with Chief Joseph programs. Hurst said the type of permit under this BiOp is undecided and could be Section 7 coverage with *United States v. Oregon* as the federal nexus or Section 10 including a National Environmental Policy Act process with permits issued in 2018. Pearsons asked how each permit coverage type would affect the programs. Hurst said she would discuss the program implications of each coverage type with NMFS legal counsel and update the Hatchery Committees.

Gale asked if Entiat summer Chinook salmon are the only unlisted program not included in the bundle besides Okanogan summer Chinook salmon. Hurst confirmed and said the Entiat program already has coverage. Gale said the Entiat summer Chinook salmon program has a BiOp that will expire and he would like to get the expiration modified. Hurst said she would look into this.

C. Spring Chinook Salmon Out-planting in the Chewuch River (Catherine Willard)

Catherine Willard shared a document titled, "Draft Outplanting Adults Plan," which Sarah Montgomery distributed to the Hatchery Committees on March 24, 2017. Willard said she updated the draft based on discussions during the March 13, 2017, Hatchery Committees meeting and summarized the changes as follows:

- Fish will not be outplanted if they have a disease outbreak
- Further clarification of release sites is included
- Results will be summarized in a report and presented to the Hatchery Committees

Mike Tonseth asked why the results will be presented in February 2018 and said it would be helpful to present them before February so the first draft of the 2018 Broodstock Collection Protocols can incorporate any study elements. Willard said the results can be presented in January or sooner and made that revision in the document.

Bill Gale suggested further clarifying language regarding disease outbreaks to "exhibit disease concerns as identified by fish health personnel" and this edit was made. Tonseth mentioned that internal WDFW meetings indicate that the standard practice of inoculating hatchery fish is currently being phased out, while current practices and rates of culling will likely remain. He said this is being studied further.

The Hatchery Committees representatives present approved the Outplanting Adults Plan (for spring Chinook salmon in the Chewuch River) as follows: Chelan PUD, Douglas PUD, USFWS, WDFW, NMFS, YN, and CCT approved on April 19, 2017. Grant PUD (PRCC HSC) also indicated approval. (Montgomery distributed the Final Outplanting Plan on April 20, 2017 [Attachment B].)

Tonseth brought up a related conversation—the Final 2017 Broodstock Collection Protocols, which were recently discussed and approved by the Hatchery Committees. Tonseth said during the second round of revisions to the protocols, the HCP Hatchery Committees approved the protocols, and then the protocols were sent on to the Wells HCP Coordinating Committee for review; however, this occurred before the PRCC HSC had approved the protocols. Grant PUD made a comment in Appendix C in response to edits by Kirk Truscott and Keely Murdoch regarding prioritization of fish in the Methow program that was not addressed and discussed before the protocols were approved. Todd Pearsons added that it is important for parties who are on the HCP Hatchery Committees and

the PRCC HSC (i.e., YN, CCT, NMFS, USFWS, WDFW) to designate to all committees when they are voting on an item that pertains to all committees and to include the PRCC HSC facilitators in any email responses to a vote request. Montgomery added that she only tracks approval for HCP Hatchery Committees items, but will make sure to include the PRCC HSC facilitators and Grant PUD in those email discussions.

The unaddressed comment in Appendix C (Adult Management) was about how fish would be used in years of low abundance for meeting the safety net component at Winthrop NFH or a production shortfall at Methow FH, versus being used to meet escapement objectives in tributaries. Pearsons said if escapement objectives are met, the fish should be outplanted for experimental reasons; however, if there is a shortage of fish spawning in the natural environment, outplanting could be prioritized over populating the safety-net program. Gale asked how managers would know if enough fish are present on spawning grounds. Tonseth said WDFW is looking into using passive integrated transponder (PIT)-tag detection data to estimate how many fish will be present on spawning grounds in various locations. Gale said the outplanting experiment may or may not work, so the prioritization discussion should occur after the utility of translocating adults is demonstrated. Pearsons said outplanting adults poses few risks to natural spawners and asked again in the case of few fish on spawning grounds whether managers should outplant adults or populate the safety-net program. Murdoch said Appendix C includes the language, "as long as both programs [Methow conservation and Winthrop safety-net] meet full production," meaning that program targets should be met and then any extra conservation program fish could be outplanted instead of put into the safety-net program.

Tonseth reminded everyone that Appendix C is about adult management and fish discussed in this section are surplus to broodstock needs (i.e., escapement objectives are already met). Tonseth said he agrees that there should be a higher priority for putting conservation fish on spawning grounds if needed to meet escapement objectives. Gale said the outplanting study has not been tested yet, so while these are interesting discussions and concepts, it might make the most sense to perform the study before discussing this in too much detail. He added that the discussion pertains more to the Joint Fisheries Parties (JFP) than the HCP Hatchery Committees. Truscott agreed and said hatchery production should not be shorted until outplanting is tested. Pearsons clarified that the question is about whether conservation fish would be put on spawning grounds instead of used in the safety-net program. Gale added that any escapement numbers should be evaluated using the 3-population PNI model. Truscott said he would not want to reduce broodstock numbers for the Winthrop program to test adult translocation, because the Winthrop program is important for long-term management and gene flow in the basin. He said if the translocation study works, though, a loss to production might be defensible in order to increase natural productivity. Greg Mackey summarized that there are tradeoffs at stake: fish spawning in the wild could contribute directly to conservation,

while approximately 90% of the Winthrop program will be taken out when they return to Winthrop NFH, which would be directing conservation fish to adult management. Mackey said by the time the outplanting will occur, managers will understand the general shape and size of the run from counts at Wells Dam. Tonseth said as the JFP develops the Methow spring Chinook salmon management plan, more guidance will be available for prioritizing fish and programs.

D. Twisp Steelhead Program (Mike Tonseth/Todd Seamons)

Mike Tonseth said Todd Seamons wrote a memo "Re: discovery of potential Ryman-Laikre issues in the Twisp River steelhead using Twisp origin broodstock," which Sarah Montgomery distributed to the Hatchery Committees on March 30, 2017 (Attachment C). Tonseth asked Seamons to discuss his memo and the Twisp steelhead program with the Hatchery Committees.

Seamons provided background for the memo and summarized that the relative reproductive success study in the Twisp River included adult to adult-offspring genetic parentage assignments, which provided the data for these analyses. Seamons said the Twisp steelhead program is seeing amplification of a small portion of the steelhead population by the hatchery (see Attachment C for detailed results). Craig Busack (NMFS) said inbreeding depression is occurring in the Twisp steelhead population. He said a Ryman-Laikre effect is to be expected in this situation, because you can expect hatchery fish to be more productive than wild fish. He said a small number of parents depresses the effective population size of the next generation. Busack said to understand how concerning these effects are, one must understand the extent to which the program is closed. Seamons agreed and clarified that his memo is just an explanation of his analysis and another piece to consider is that life history diversity also reduces the genetic diversity of the population. He said the rate of reduction of diversity increases under a Ryman-Laikre effect.

Busack said from the NMFS perspective, the main issue is the effective size of the Methow steelhead population and although the Twisp is an independent subpopulation, the implications for gene flow with the Methow population need to be considered. Seamons agreed and said for recovery purposes, the Methow population is an important unit. He said WDFW proposes purposefully mixing Twisp hatchery fish with Winthrop NFH steelhead to reduce the rate of diversity reduction. Seamons said there is a tradeoff with allowing local adaptation to occur or not and purposefully mixing fish reduces local adaptation (which may not matter for recovery purposes). Seamons said the Yakima River has population structure within small creeks with genetic distinction. He said it is plausible that more genetic structure has previously existed in the Methow basin and could exist again if hatchery populations were intermixed. Busack agreed and said the population itself has to prosper, but genetic diversity within the population should also be considered. Busack suggested increasing the size of the Twisp program as a way to foster diversity in the Twisp River and also guard against Ryman-Laikre effects. Seamons responded that there is risk to mining the wild population if the

program is expanded and said WDFW's preferred alternative is mixing the hatchery programs (with the tradeoff being the Twisp subpopulation has less of a chance to locally adapt).

Seamons said another consideration is that hatcheries tend to reduce life-history diversity, so incorporating other age classes and life histories in hatchery production could also be considered. For example, rainbow trout, mixed cohorts, coastal parr, or other ideas could be considered. Greg Mackey said there are a lot of rainbow trout in the Twisp River in upstream reaches and in the headwaters. He said he assumes resident and anadromous fish mix to some degree in the Twisp River and bringing resident fish into the hatchery could influence the life histories of hatchery fish. Gale said a USFWS experimental steelhead program at Abernathy Fish Technology Center was sourced from steelhead and resident juveniles that were forced to mature in freshwater. Busack said it would be interesting to examine the genetic profile of rainbow trout in the Twisp River in comparison to steelhead. Todd Seamons said for comparison, there is a lot of genetic diversity between resident and anadromous steelhead.

Tonseth said the current problems with the Twisp steelhead program are low overall abundance and also single age classes, which is why WDFW proposes compositing programs, and incorporating S2s in the release plan in the Twisp River. Mackey said even though the Winthrop contribution in the Twisp River is low (there are few PIT-tag detections), if Winthrop fish return to the Twisp Weir, they should be allowed upstream of the weir to increase gene flow. Regarding gene flow management, Mackey suggested using a smaller brood and removing fewer fish to decrease the representation of hatchery fish in the run at large and also decreasing sampling removal effects.

Busack emphasized that the Twisp steelhead are a subpopulation of the Methow population and there really is not distinction for any tributaries in the upper Columbia River for steelhead. Gale said the genetic focus should be on creating diversity between Methow and Okanogan steelhead first and within the Methow or Okanogan second. Truscott agreed and said fostering local adaptation within the populations will allow them to slowly diverge.

Tonseth said the JFP will be drafting a Methow basin steelhead management plan and Douglas PUD also needs to define the direction of their Twisp hatchery program as part of the consultation process. He said he will organize a workgroup to better define Douglas PUD's program and the role of the USFWS program to give Hurst a more defined action for consultation. Hurst asked for a defined action by the end of June 2017. Murdoch said when the JFP created the Wenatchee spring Chinook salmon management plan, the comanagers initially drafted it, then brought in CCT, NMFS, and the USFWS. She said she envisions the Methow plan also being the purview of the JFP and not necessarily the PUDs. Tonseth said he agrees with Murdoch, but for defining the Twisp program, Douglas PUD needs to be involved, then the JFP can write the plan. Mackey said he would like for

Busack and Seamons to help define the genetic aspects of the Twisp program and added Douglas PUD does have a stake in the management of Methow spring Chinook salmon and will have to agree to the JFP's plan through the HCP processes.

E. Brood Year Stray Rate Targets (Tracy Hillman)

Tracy Hillman said he was asked to analyze brood year stray rates for Chiwawa spring Chinook salmon. He said the Hatchery Committees expected that recipient populations would have high stray rates in years for which brood year stray rates are high and his analysis showed this to be true for Chiwawa spring Chinook salmon. Hillman asked Charlie Snow (WDFW) to perform the same analysis for Twisp spring Chinook salmon and Snow found a different pattern—when the 5% brood year stray rate target was exceeded, the 10% recipient population target was not exceeded. Hillman summarized the patterns in Table 1.

Table 1. Brood Year Stray Rates

Donor Population Size	Brood Year Stray Rate	Small Recipient Population Stray Rate	Large Recipient Population Stray Rate
Large	High	High	?
Small	High	?	Low

Hillman said when the donor population size is large, the recipient population stray rate is more likely to be high if the recipient population is small. In contrast, strays from a small donor population are unlikely to affect large recipient population stray rates. Thus, high brood year stray rates do not necessarily result in high recipient population stray rates. He suggested the Hatchery Committees consider these patterns and discuss brood year stray rates further while discussing M&E objectives during the May 17, 2017, meeting.

Kirk Truscott said the discussion about brood year stray rates also should consider the purpose of the program. If a large portion of the program is straying, the management target is not being met. Mike Tonseth said some straying has management implications, while other straying can have genetic implications. Truscott asked if there is any information on naturalized populations in the

Wenatchee basin that should be considered in these discussions about appropriate brood year stray rates. Todd Pearsons said no other hatchery programs in the Columbia River basin have a brood year stray rate target that he is aware of and there is no obvious justification for a 5% brood year stray rate target. Hillman summarized that the Hatchery Committees also considered using stray rates from Ford et al.¹ as targets and are currently discussing whether the brood year stray rate target should be eliminated entirely, or if not, what the target should be. Hillman said representatives might consider reading a recent paper by Bett et al.² that focuses on recipient population strays in small populations of Pacific salmon.

III. Chelan PUD

A. Coho Salmon Master Plan and Recalculation Agreements (Keely Murdoch, Cory Kamphaus, Catherine Willard)

Catherine Willard said the Rocky Reach and Rock Island HCP Coordinating Committees approved the Designation of Juvenile Coho Salmon in Phase III (Standard Achieved) at the Rock Island and Rocky Reach Projects Statement of Agreement (SOA) on March 28, 2017, which is an agreement to move juvenile coho salmon at both Projects from Phase III Standard Achieved Interim-Value to designation of Phase III Standard Achieved, with 93% survival at both Projects. She said this agreement is based on a study that adjusted acoustic survival data to PIT-tag data for coho and spring Chinook salmon, and next, survival numbers will inform coho salmon mitigation calculations for agreements. Keely Murdoch said she, Cory Kamphaus (YN), Willard, and Alene Underwood (Chelan PUD) have discussed the next steps for coho salmon mitigation and agree to use the same methods for calculating mitigation numbers as previously used for other species. She said she and Willard will provide the mitigation calculation numbers for review at the May 17, 2017, Hatchery Committees meeting, then Chelan PUD and YN will discuss how Chelan PUD will meet the mitigation requirements.

Murdoch said she is presenting an update on YN's Coho Salmon Master Plan and Kamphaus will discuss the natural production phases and site development parts of the Master Plan. Murdoch shared a presentation titled, "Upper Columbia Coho Restoration Master Plan – 2017 Update"

¹ Ford, M.J., A. Murdoch, and M. Hughes, 2015. Using parentage analysis to estimate rates of straying and homing in Chinook salmon (*Oncorhynchus tshawytscha*). *Molecular Ecology* 24, 1109-1121. Doi: 10.1111/mec.13091

² Bett N.N., S.G. Hinch, N.J. Burnett, M.R. Donaldson, and S.M. Naman, 2017. Causes and Consequences of Straying into Small Populations of Pacific Salmon. *Fisheries* 42 (4), 220-230. Doi: 10.1080/03632415.2017.1276356

(Attachment D), which Sarah Montgomery distributed to the Hatchery Committees following the meeting on April 19, 2017. A summary of the presentation and questions and comments are included in the following sections.

Background (Slides 1-3)

The goal of the Coho Master Plan is to re-establish naturally spawning coho salmon populations in upper-Columbia tributaries (Methow and Wenatchee basins) to biologically sustainable levels, which provide significant harvest in most years. Metrics include escapement and harvest rates.

Phased Approaches: Broodstock Development and Natural Production (Slides 4-11)

Broodstock Development Phase I (BDPI) is complete in both the Wenatchee and Methow basins. Phase II is complete in the Methow basin. In the Wenatchee basin, YN found that there were very few coho redds in Nason Creek, and many more males than females were found at Tumwater Dam. BDP II is ongoing in the Wenatchee basin, and the emphasis is on getting more coho salmon to upstream sites. Murdoch said YN is attempting to trap 50% of the female broodstock at Tumwater Dam for three generations and if reintroduced stock do not sufficiently reach upstream habitat areas, the contingency plan will be implemented. Murdoch said so far, studies indicate coho salmon that come into the system early and green are more likely to ascend Tumwater Dam; however, patterns are not consistent between years, especially drought years.

The Natural Production Phases include decreasing domestication and increasing fitness in the natural environment. YN used EDT and AHA models, to reduce domestication, and phased PNI targets.

In the Methow River, Murdoch said YN may default some of the release numbers to adult outplants instead of juvenile releases due to acclimation space. Murdoch said they have outplanted adults in Nason Creek and subsequently sampled juveniles throughout Nason Creek. Kamphaus said 30% of the juveniles found were related to outplanted adults and in the year YN outplanted adults, there were 95 redds in Nason Creek, which is exceptionally high for that system. Kamphaus said the adults were PIT-tagged and outplanted at a 1:1 ratio; some males moved out of the system and all but one female stayed in the system, likely contributing to the high number of redds for that year.

Mike Tonseth asked when the outplanted adults were collected in relation to peak spawning in Nason Creek. Kamphaus said the adults were collected as natural fish were being detected at the Nason Creek PIT-tag array.

Willard asked how the hatchery release numbers were calculated. Murdoch said models were used to determine capacity estimates, then release numbers were calculated for achieving that capacity estimate. The goal is to create a spawning aggregate based on the capacity estimate.

Monitoring and Evaluation (Slides 12-16)

Monitoring and evaluation for the Coho Master Plan includes Project Performance Indicators, Species Interactions, and Genetic Adaptability.

Regarding Project Performance Indicators, Murdoch noted that the volitional release and tributary residence timing Project Performance Indicators overlap with the species interactions sections that YN reports to NMFS, so these indicators inform more than project performance.

Regarding Species Interactions, Murdoch said YN checks for the status of Non-Target Taxa Of Concern species in response to reintroduction of coho salmon.

Regarding Genetic Adaptability, Murdoch said there are phenotypic differences between Tumwater Dam and Dryden coho salmon. She said YN is bringing up a side-by-side release of coho salmon from Leavenworth NFH to study survival rate advantages that could be repeated in future years. Kamphaus said YN is also doing genetic monitoring and looking for genetic and phenotypic changes. He said the Columbia River Inter-Tribal Fish Commission is working on a manuscript on assigning coho salmon genetic divergence to adaptive or neutral markers.

Site Development (Slides 17-20)

Kamphaus said the Coho Salmon Master Plan includes some existing sites (e.g., natural earthen ponds, constructed ponds, tanks), some proposed sites, plus Natapoc FH, which is being designed to provide adult holding, early incubation, and full-term rearing for juveniles. Kamphaus reviewed the status of sites in both the Methow and Wenatchee basins and the implementation timelines for both basins. He summarized that all sites are expected to be complete and operational by September 2019. There were no further questions or comments.

IV. HCP Administration

A. HCP Representative Changes

Tracy Hillman said Chelan PUD designated Catherine Willard as the Hatchery Committees representative and the alternate position is currently unfilled, effective April 12, 2017.

Mike Tonseth mentioned that he asked the Coordinating Committees to approve email distribution access for Alf Haukenes, who is the hatchery/wild interactions unit lead for WDFW.

B. Next Meetings

Matt Cooper asked the Hatchery Committees if they would be interested in a presentation about epigenetics by Penny Swanson. Representatives present said they would be and Cooper said he would invite Swanson to present at the May 17, 2017, Hatchery Committees meeting.

The next Hatchery Committees meetings are on May 17, 2017 (Grant PUD), June 21, 2017 (Grant PUD), and July 19, 2017 (Grant PUD).

V. List of Attachments

Attachment A List of Attendees

Attachment B Outplanting Adults Plan

Attachment C Ryman-Laikre Issues in the Twisp River Steelhead Program Memo

Attachment D Upper Columbia Coho Salmon Restoration Master Plan – 2017 Update

Attachment A
List of Attendees

Name	Organization
Tracy Hillman	BioAnalysts, Inc.
Sarah Montgomery	Anchor QEA, LLC
Catherine Willard*	Chelan PUD
Greg Mackey*	Douglas PUD
Tom Kahler*	Douglas PUD
Todd Pearsons‡	Grant PUD
Peter Graf‡	Grant PUD
Deanne Pavlik-Kunkel†‡	Grant PUD
Bill Gale*	U.S. Fish and Wildlife Service
Matt Cooper*	U.S. Fish and Wildlife Service
Brett Farman*†	National Marine Fisheries Service
Charlene Hurst*†	National Marine Fisheries Service
Craig Busack	National Marine Fisheries Service
Mike Tonseth*	Washington Department of Fish and Wildlife
Todd Seamonst	Washington Department of Fish and Wildlife
Keely Murdoch*	Yakama Nation
Cory Kamphaus	Yakama Nation
Kirk Truscott*	Colville Confederated Tribes

Notes:

* Denotes Hatchery Committees member or alternate

† Joined by phone

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