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FINAL MEMORANDUM

To:	Wells, Rocky Reach, and Rock Island HCPs Hatchery Committees	**Date:**	December 17, 2015
From:	Tracy Hillman, HCP Hatchery Committees Chairman		
Cc:	Sarah Montgomery, Anchor QEA, LLC		
Re:	Final Minutes of the November 18, 2015, HCP Hatchery Committees Meeting		

The Wells, Rocky Reach, and Rock Island Hydroelectric Projects Habitat Conservation Plans (HCPs) Hatchery Committees meeting was held at Douglas PUD headquarters in East Wenatchee, Washington, on Wednesday, November 18, 2015, from 9:30 a.m. to 3:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

ACTION ITEM SUMMARY

- Craig Busack will discuss with Keely Murdoch any further documentation needed for NMFS consultation on Goat Wall Acclimated Releases (Item I-A).
- Mike Tonseth will add contingencies for overages to the Broodstock Collection Protocols (Item I-A).
- Tonseth and Andrew Murdoch (WDFW) will develop a timeline for conducting genetic sampling for HCP program species (Item I-A).
- Andrew Murdoch will keep the Hatchery Committees updated on the WDFW moratorium on hexacopter use (Item I-A).
- Washington Department of Fish and Wildlife (WDFW), Chelan PUD, and the National Marine Fisheries Service (NMFS) will provide comments or written feedback regarding the Draft Wenatchee River Basin Biological Opinion (BiOp) to Karl Halupka (U.S. Fish and Wildlife Service) before December 25, 2015 (Item II-A).
- Keely Murdoch will discuss, internally, the potential delay of Goat Wall Acclimated Release activities until 2017 (Item III-A).
- The Hatchery Evaluation Technical Team (HETT) will recalculate hatchery replacement rate (HRR) targets using recent smolt-to-adult return (SAR) data (Item II-B).
- The HETT will calculate the variability in regional program HRRs and evaluate if

standard deviation can be used as a measure of tolerance for identifying low HRRs for spring Chinook salmon programs (Item II-B).

- The HETT will review potential methods for increasing homing fidelity of spring Chinook salmon in the Methow basin (Item II-B).
- Tracy Hillman will ask Kirk Truscott if the Colville Confederated Tribes (CCT) agree to adopt the three-population gene flow model for calculating proportionate natural influence (PNI; Item III-C). *(Note: Hillman followed up with Truscott, who provided CCT agreement on December 10, 2015.)*

DECISION SUMMARY

- The Hatchery Committees representatives present approved the WDFW and University of Idaho study proposal titled, "Supplemental Radio-Tagging of Summer Steelhead" (Item IV-A).

AGREEMENTS

- The Hatchery Committees representatives present agreed to adopt the three-population gene flow model for calculating PNI for the Methow spring Chinook and Summer Steelhead HGMPs consultations. CCT agreed to adopt the model via email on December 10, 2015 (Item III-C).

REVIEW ITEMS

- There are no items that are currently out for review.

FINALIZED DOCUMENTS

- There are no documents that have been recently finalized.

I. Welcome

A. Review Agenda, Review Last Meeting Action Items, and Approve the October 21, 2015, Meeting Minutes (Tracy Hillman)

Tracy Hillman welcomed the Hatchery Committees and asked for any additions or changes to the agenda. Keely Murdoch added Goat Wall Pond Acclimation as an agenda item.

The Hatchery Committees reviewed the revised draft October 21, 2015, meeting minutes. Sarah Montgomery said there are several outstanding comments to be discussed. The Hatchery Committees discussed the outstanding comments and made revisions.

Hatchery Committees members present approved the draft October 21, 2015, meeting minutes, as revised.

Action items from the Hatchery Committees meeting on October 21, 2015, and follow-up discussions were as follows *(note: italicized text below corresponds to agenda items from the meeting on October 21, 2015)*:

- *The Hatchery Evaluation Technical Team (HETT) will develop a method for calculating hatchery replacement rate (HRR) targets before the next Hatchery Committees meeting on November 18, 2015 (Item III-A).*
  This will be discussed during today's meeting. This item is ongoing.
- *The Hatchery Committees will discuss Objective 4 (HRR) and Objective 5 (stray rates) of the prioritized 5-Year Hatchery Monitoring and Evaluation (M&E) Report objectives flagged for Methow spring Chinook salmon during the next Hatchery Committees meeting on November 18, 2015 (Item III-A).*
  This will be discussed during today's meeting.
- *Keely Murdoch will provide Craig Busack with Goat Wall Acclimated Release documents for review (Item III-B).*
  This item was completed via email on October 22, 2015.
- *Craig Busack will discuss with Keely Murdoch any further documentation needed for National Marine Fisheries Service (NMFS) consultation on Goat Wall Acclimated Releases (Item III-B).*
  Keely Murdoch said this item is ongoing.
- *The Hatchery Committees representatives will discuss internally the Washington Department of Fish and Wildlife (WDFW) proposal that Douglas PUD authorize the Yakama Nation (YN) to perform Goat Wall Acclimated Release activities as an extension under WDFW activities (Item III-B).*

This will be discussed during today's meeting.

- *Keely Murdoch will discuss with Tom Scribner the proposal by WDFW to release excess hatchery-by-hatchery origin steelhead into lakes (non-anadromous waters) in the Methow and Okanogan basins (Item III-C).*
  Keely Murdoch provided YN support for the proposal via email on October 22, 2015.
- *Mike Tonseth will add contingencies for overages to the Broodstock Collection Protocols (Item III-C).*
  This action item is ongoing. Tonseth said the changes will be made in February 2016.
- *Sarah Montgomery and Matt Cooper will send a Doodle poll to the Hatchery Committees in order to convene a conference call to discuss gene flow standards for Methow spring Chinook salmon (Item VI-A).*
  This item was added to today's agenda due to scheduling constraints and will be discussed during today's meeting.
- *Sarah Montgomery will put the NMFS consultation update first on the agenda for the Hatchery Committees meeting on November 18, 2015 (Item VII-A).*
  This item was completed, and the consultation update will be discussed during today's meeting.
- *Craig Busack will request that Amilee Wilson (NMFS) and Karl Halupka (U.S. Fish and Wildlife Service [USFWS]) attend the next Hatchery Committees meeting on November 18, 2015 (Item VII-A).*
  This item was completed. Busack said Halupka is in attendance at today's meeting, and Wilson is unable to attend.

II. Joint HCP-HC/PRCC HSC

A. Consultation Coordination (Craig Busack and Karl Halupka)

Craig Busack said Amilee Wilson is working on the comments to the Wenatchee River Steelhead BiOp, and Charlene Hurst (NOAA) is working on the 1347 consultation. Busack said he has been working on the Methow spring Chinook salmon consultation, and there have been many discussions between NMFS and Chelan, Douglas, and Grant PUDs. Alene Underwood said the most recent meeting included a discussion of spring Chinook salmon and steelhead consultations in the Methow basin, and Chelan PUD, Douglas PUD, Grant

PUD, and NMFS agreed on a tentative date of May 2016 for the spring Chinook salmon BiOp. Busack said the most important things for spring Chinook salmon consultation are gene flow standards and bull trout consultation. He said NMFS has previously issued permits to many programs without completed bull trout consultation, but with strong litigation pressure in Puget Sound, NMFS is no longer allowed to issue permits in that manner. He said there is a possibility that the Wenatchee River steelhead permit could be issued without a completed bull trout consultation, but it would likely be the last one.

Karl Halupka said the adult management plan for steelhead in the Methow basin is currently incomplete and consultation is necessary. Mike Tonseth said that the draft steelhead adult management plan is about three-quarters complete. Halupka said reviewing all existing consultation-covering activities and components of the programs (which he called a gap analysis) is the first step in deciding what consultation is needed in the Methow basin. He said the Bull Trout BiOp written for the Federal Energy Regulatory Commission relicensing of Wells Dam is comprehensive but appears to have a gap. Halupka said tangle netting for broodstock in the Chewuch River is the only feature not currently covered under the Wells Bull Trout BiOp that could result in adverse effects. Tonseth said monitoring during tangle netting is well documented, and the encounter rate of bull trout is zero. Halupka said tangle netting may have a "Not Likely to Adversely Affect" determination, but further analysis needs to be completed. He proposed that he could provide a draft gap analysis for the Methow basin before December 25, 2015, in preparation for the coordination group meeting on January 14, 2016. Halupka added that there was debate whether the Methow or Okanogan consultation should be completed next. Mackey stated that tangle netting was a stop gap measure that was employed prior to Chelan PUD reinstating their program at Methow Fish Hatchery. He said the sharing agreement for the Chelan PUD program includes broodstock collection from the Douglas PUD facilities, so tangle netting would no longer be an action required by Chelan PUD, hence this item should not be an issue for bull trout consultation.

Busack said there is no mention of YN remote acclimation sites in the 2013 BiOp. Mackey said the 2010 HGMP says that fish may be acclimated in acclimation sites developed by others but it does not say that they are part of the proposed action. Keely Murdoch said Goat

Wall and Mid-Valley acclimation sites are covered in the coho salmon BiOp, and the impacts to bull trout would be the same if other fish were in the ponds. She said the new pond, Early Winters, is currently under consultation under the expanded acclimation project, which will be an addendum to the BiOp, but has not been completed and is not proposed for use in 2016. Busack said NMFS expects some sites to arise after consultation and permit issuance are completed, so NMFS defers to the Hatchery Committees to ensure affects not analyzed in the BiOp are not greater than those covered in the BiOp. Halupka said he appreciates that NMFS can afford flexibility to the Hatchery Committees, and USFWS would like to follow suit, but it has more constraints and a different style of consultation. He said describing as many potential acclimation sites as possible in the BiOp for use in the 10-year permit period is a priority. Keely Murdoch said YN is in the process of making an addendum to the coho salmon BiOp that includes new sites, some of which are multi-species. She said YN is identifying all acclimation sites it expects to use in the next 10 years, but sometimes sites change due to landowner decisions.

Kirk Truscott said the CCT would not be enamored with prioritization of the Methow basin over the Okanogan basin. He said CCT have an important steelhead program that is trying to shift to a local production component, and without proceeding with the HGMP permitting process, they are unable to make requisite program changes. He said, ideally, the permitting processes for both the Methow and Okanogan basins would proceed concurrently on an expedited timeline. Busack said a coordination meeting is scheduled for January 14, 2016. He said Hurst is a new staff member; she is working on the 1347 consultation because it is relatively straightforward, and this does not signify priority over the Okanogan or other consultations. He said when the 1347 consultation is finished she will work on others such as the Okanogan consultation. Busack said both the Methow and Okanogan basins are expected to be simpler than the Wenatchee basin. Halupka agreed, and said he is not sure if the process will be expedited. Mackey said fishery or adult management plans are actions outside the Douglas PUD HGMP, but the plans would need bull trout consultation because it is part of the BiOp and overall management strategy.

Halupka said the NMFS and USFWS draft BiOps contain differences in measures aimed at reducing residualization. He said, if the NMFS' Wenatchee River steelhead BiOp needs

bull trout consultation before it is issued, it might take a while because WDFW, NMFS, and Chelan PUD have not provided comments on the draft. Halupka suggested that WDFW, NMFS, and Chelan PUD provide comments or written feedback before December 25, 2015, so the January 14, 2016, meeting can focus on the response to comments, with a target BiOp finalization date at the end of January or in February. WDFW, Chelan PUD, and NMFS will provide comments or written feedback regarding the Draft Wenatchee River Steelhead BiOp to Halupka before December 25, 2015.

B. 5-Year Hatchery M&E Review Planning- Objectives 4 and 5

Objective 4

Catherine Willard said the HETT met on October 29, 2015, and came up with different approaches to calculating an HRR target. Tracy Hillman summarized the approaches as follows:

> The HETT considered several methods for estimating HRR targets for each hatchery program. The HETT proposes the following approach for setting HRR targets:
>
> $$HRR_T = \begin{cases} >1.0 & \text{if } NRR<1.0 \\ NRR\times(\Theta) & \text{if } NRR\geq 1.0 \end{cases}$$
>
> where:
>
> HRR_T = a program-specific HRR target
>
> NRR = natural replacement rate
>
> Θ = a program-specific multiplier
>
> The HETT identified several methods for identifying a program-specific multiplier:

- Calculate the average HRR/NRR ratio during the historic time series for each program. Use the highest average ratio and apply it to all programs of the same species. For example, if the Chiwawa spring Chinook salmon program has the highest average ratio, that ratio is then used as the multiplier for all spring Chinook salmon programs.
- Calculate the average HRR/NRR ratio during the historic time series for each program. Use that average as the multiplier for the specific hatchery program. That is, the average ratio for Chiwawa spring Chinook salmon would be used as the

multiplier for the Chiwawa spring Chinook salmon program, and the average ratio for Twisp spring Chinook salmon would be used as the multiplier for the Twisp spring Chinook salmon program.

- Calculate the average HRR/NRR ratio during the historic time series for each program. Calculate the mean (or weighted) mean of the average ratios for each species. This mean average ratio is used as the multiplier for all programs of the same species. For example, all spring Chinook salmon programs would use the same multiplier.
- Calculate the ratio of the hatchery egg-smolt survival rate to wild egg-smolt survival rate for each program. Multiply this ratio by an estimated correction factor for hatchery fish SARs for each program. These estimates are then used as the multiplier for each specific program.
- Select program-specific multipliers based on management interests.

Questions and comments were discussed as follows:
Hillman said the HETT recommends using a fixed multiplier instead of a fixed target. As such, the target changes yearly. He said if the adaptive management implications of not meeting a target are limited, another option would be to set a simpler target, such as HRR greater than 1.

Andrew Murdoch said the objective in the original M&E program was targeted at post-release performance, and the HRR target was calculated based on broodstock and SAR rates. He said, because the broodstock part of the program is captured in hatchery survival rates, the equation is much improved. He said the HETT should try to anchor the natural variation in hatchery SARs by comparing it to wild SARs in order to understand how HRRs change over time. He said he has assessed SARs for wild Chiwawa spring Chinook salmon after adjusting differential in-basin survival, and he found that hatchery fish have approximately 70% of the SAR of wild fish. He said this has changed and increased over time, partly due to noise in estimation of adult returns. He said data collection for adult returns of spring Chinook salmon are focused on the spawning grounds, so it is important to understand how the data have been collected over time given that sampling effort has varied widely across the years. Craig Busack asked if hatchery SAR rates were much lower than

wild SAR rates, and if a pattern holds true across other basins. Andrew Murdoch said that earlier on in the time series, hatchery SAR rates were approximately half of wild SAR rates.

Kirk Truscott asked how to assess comparison of natural and hatchery SARs in the Chiwawa River when a known number of hatchery fish are released and only an estimate of smolt production that has some degree of error. Andrew Murdoch replied there is a survival model that takes into account the size and abundance of emigrants, and wild Chiwawa River smolt survival can be estimated to the mouth of the Wenatchee River. Truscott said there is an error in the natural-origin smolt estimate. Andrew Murdoch replied he has not figured out how to capture that uncertainty, but the method for calculating emigrant estimates is relatively precise. He said in-hatchery survival is not an objective of the M&E Plan; it just supports other objectives. He said there are enough data to look at SAR rates for wild and hatchery fish over time to see how they compare.

Todd Pearsons said there are not concerns about in-hatchery survival, but adults still return in variable numbers. Pearsons said a lot of data are being collected and asked what objective criteria SARs should be measured against. He asked what the purpose of an HRR target is, and said HRRs should exceed NRRs and should also exceed 1. Andrew Murdoch said the original intent of the M&E Plan was to use HRRs in order to signal that something is wrong in the hatchery, outside environment, release strategy, or other area. He said a better way of determining an HRR target is needed in order to identify a problem. Pearsons said it would help to identify if post-release survival is a significant problem. He asked why a manufactured HRR target is needed when these comparisons can already be made with the data that are being collected for SAR. He said the key pieces are whether or not a program is mining the wild population, and if the program is sustainable. Hillman said there is a specific performance objective for HRR (unlike SARs and in-hatchery survival metrics), which drives the assessment of hatchery performance and SARs. He asked if it would be better to identify specific objectives for within-hatchery performance, and perhaps SARs, rather than identifying HRR targets. Andrew Murdoch said, after looking at the data and the wild SAR rates, he thinks a simple expansion is not relevant because there is a lot of variability. Greg Mackey said SAR data for hatcheries is more reliable than for wild populations because there are more measurement error factors in wild SARs. He said the point of having an HRR target

is to assess the program and determine whether a minimum standard is being met. Hillman said there were a few years when HRRs were less than NRRs. When this happened, the monitoring team examined within-hatchery performance and SARs to see if the problem could be identified. Because this happened rarely and did not occur over several consecutive years, the source of the problem was not identified. He said it was likely related to carcass sampling.

Mackey said, referring to adult management practices, setting an HRR or SAR target would be nonsensical when 80% of the hatchery fish are removed. He said setting an HRR target makes sense if it is above the minimum level and is set in the context of how fish are managed. Hillman said comparing NRRs to HRRs is confusing because NRRs are based only on spawning escapement, and HRRs would be based on both spawning escapement and hatchery fish surplused. Mackey said a regional comparison in the M&E Report would be useful so that SAR and NRR can be seen for each program.

Truscott said comparing SAR rates between programs is a reasonable process to assess efficacy of individual programs and is a good idea. He said CCT wants to ensure that just meeting the minimum HRR does not preclude harvest opportunities. Hillman asked if data are available to calculate natural-origin SAR rates for every program and said SAR rates are often estimated for natural fish based on tagged hatchery fish. Andrew Murdoch said reliable natural-origin SAR is only available for Chiwawa spring Chinook salmon.

Mike Tonseth said Chelan, Douglas, and Grant PUDs have an obligation to meet mitigation responsibilities, and Joint Fisheries Program management objectives and expectations are above that. Tonseth said the settlement agreement and HCPs outline that the main objectives are that the Program contributes to recovery, augments natural populations, and contributes to harvest, with priority given to recovery, and excess fish going to harvest. He said part of the scope of the Hatchery Committees is to maximize the efficiency of the program so that if adults are taken in, products from those adults are optimized. Pearsons asked what the escapement objectives should be for different basins. Tonseth replied that has only been done for Wenatchee River spring Chinook salmon. Truscott said the total spring Chinook salmon escapement to the Wenatchee basin should account for target plus

harvest. Pearsons said targeting a harvest on a listed population, other than a conservation fishery, is a troublesome concept. Andrew Murdoch said there is always surplus for every hatchery program because mitigation is not spread across the landscape, and the safety-net programs can be used for harvest. He said all fish produced by appropriately sized conservation programs ideally would be needed and allowed to spawn naturally on spawning grounds.

Hillman asked if everyone agrees that the HRR target should at least be greater than 1. Keely Murdoch asked how often HRR has been less than 1. Andrew Murdoch replied that HRR has been less than 1 only a few times as a result of major disease issues or weird outliers in the data. Busack said HRR could be below 1 for non-hatchery reasons. Hillman agreed, and said not meeting the HRR target is a trigger to look at each of the metrics making up HRRs. Tonseth asked if comparing HRRs to NRRs should be an objective rather than a standard. He said real-time adaptive management tools are not readily available because at least 2 years go by before information becomes available to make a change. He said the ratio between HRR and NRR might be more important than absolute values, especially considering the potential period of poor ocean conditions likely ahead. He said, in order to compare the values, a complete brood year is needed, and by the time change can be affected in the causal factor, several generations would have passed.

Hillman said the HETT proposed that the 5-year geometric mean of HRRs should be greater than or equal to 1 in order to ensure reaction to a single year does not occur. This provides the lower target. The higher target would be based on a multiplier applied to the NRRs. If HRRs fall below the lower target, the program is in need of change. If the HRRs fall between the upper and lower targets, the program is doing well. Andrew Murdoch said tying HRR targets to NRRs is a good idea, and if there is introgression, it may be simple to come up with more realistic SAR rates for these programs. Hillman said other options for identifying HRR targets include using the old approach with more up-to-date SAR estimates or using the approach that Mackey presented during the November 18, 2015, meeting. Mackey said a deviation metric could also be used to flag HRR values that are out of the ordinary. Pearsons agreed and said HRR can be compared across programs and against earlier time periods. He said HRRs outside of one standard deviation from the norm should

be flagged for assessing causation. Hillman said the HETT could provide those results using spring Chinook salmon as an example. Truscott added that the minimum HRR value should not be identified as the target. The HETT will recalculate HRR targets using revised SAR calculations. The variability in HRRs will also be calculated and evaluated if one standard deviation can be used as a measure of tolerance for identifying low HRRs for spring Chinook salmon programs.

Willard said the HETT is setting up a conference call for December to discuss these items, and setting up a monthly recurring meeting time to discuss Appendices 1 through 6 starting in January 2016.

Objective 5

Willard summarized flagged topics from previous discussions about Objective 5.
Keely Murdoch said there are high stray rates for Chewuch Acclimation Facility spring Chinook releases, which are intended to supplement Chewuch River populations. She said the YN hoped that their proposed plan to overwinter spring Chinook salmon in acclimation ponds at Carlton Ponds, with short-term acclimation at Chewuch Acclimation Facility, would provide information on homing back to the Chewuch River. She said, in the current arrangement, with fish overwintering at Methow Fish Hatchery (FH), the homing sequence is not linear; fish are getting familiar inputs from multiple directions (Methow FH and Chewuch River), and some of the fish choose the wrong input to follow. She said the numbers of stray rates in the annual and 5-year report do not match, but both are too high. She said her understanding is that in the new annual reports, Chewuch-acclimated fish that return to Methow FH are not counted as strays, but they should be counted as strays because they are not returning to their release site. Busack asked if the conversation is about fish not returning to the tributary in which they were acclimated. Keely Murdoch replied yes, and that stray rates are not meeting the standards. She said the YN thought there would be benefit to the alternative arrangement that was conceived for overwintering fish in circular ponds at Carlton Acclimation Facility in order to improve stray rates. She said the YN has previously brought this up as a concern, because rearing at Methow FH and acclimating at Chewuch Acclimation Facility is not linear, and the fish do not spend much time in the Chewuch River. She said she would like the Hatchery Committees to come up with a study

plan to address these issues. She said some study plan ideas could be a 5-year study where two groups of fish are acclimated at Chewuch Acclimation Facility, or a side-by-side study with Methow-FH-reared and Wells-FH-reared fish using short term acclimation. She said the homing failure of 80% of fish is not achieving the objectives of supplementation.

Pearsons asked if the report indicates that fish returning to the Chewuch River increase the number of natural-origin fish. Keely Murdoch replied the 5-year report states that the number of natural-origin fish has not increased. Pearsons asked if an increase in natural-origin fish is apparent in the Methow and Chewuch rivers. He suggested an alternative of not supplementing the Chewuch River. Keely Murdoch said the YN would not agree to not supplementing the Chewuch River. Pearsons asked if it makes sense to spread the risk and not supplement all different populations in the Methow basin. Keely Murdoch said if fish are acclimated in the Chewuch River, and return to the Methow River, they do not have the option of contributing to natural-origin recruits (NORs). Pearsons asked how many hatchery-origin recruits are in the Chewuch River. Andrew Murdoch said there is a fundamental issue in spawner density over available habitat. He asked if the objective of the Goat Wall proposal, for example, is to redistribute some adults that currently spawn in the Methow River up into higher quality spawner habitat. Keely Murdoch said the fish released in the Chewuch River are similar but in a different tributary, and the difference is that fish released in the Chewuch River are not supplementing the Chewuch River population. Andrew Murdoch said the Twisp program brood year stray rate also exceeds the target. Tonseth said one issue is that the hatchery program may or may not increase natural productivity. He said another issue is, despite the intent for adults to return to the intended tributary, there is an issue with site fidelity.

Pearsons said focusing on each M&E objective individually is a problem because multiple objectives can be achieved with a single solution such as not supplementing the Chewuch, and that a solution to one objective (e.g., lack of homing in the Chewuch River) might be undone with a solution for another (e.g., not supplementing the Chewuch River). He asked how or when the concept of not supplementing the Chewuch River would be addressed. Tonseth asked how to improve site fidelity regardless of location. Hillman said there are three different stray-rate calculations. In one case, strays from fish short term acclimated in

the Chewuch Pond cannot make up more than 10% of the spawning escapement within other major spawning areas of the Methow basin. He said, additionally, brood year stray rates identified in the M&E plan cannot be greater than 5%. In this case, the brood year stray rates are much greater than 10%. Keely Murdoch said the Chewuch River is the most extreme example of stray rates, and therefore a study design should be conceived to address site fidelity issues. Busack said this issue appears like an imprinting and acclimation issue rather than just a general stray-rate issue. Keely Murdoch said that the issue is the location of Methow FH compared to the acclimation sites; it is not linearly arranged. She said the Twisp River is a separate gene flow issue, but the issue for Chewuch River is homing.

Truscott said this has importance for the way Methow programs are stocked (predominantly NOR-based). He said a fraction of NORs are being removed for broodstock and if the adult returns from this production return to the Methow FH rather than contribute to the natural spawning population to support attainment of the escapement target and natural production, this could have a mining effect and adversely affect future natural production. Busack said the implicit assumption is that Chewuch, Methow, and Twisp rivers have three different gene pools, but are all considered the same population from a population genetic standpoint. He said the treatment of the three rivers as separate may be inappropriate given what is known about natural gene flow rates between the areas. Tonseth said the Methow and Chewuch rivers are managed similarly, and the Twisp River is managed as a separate component. Hillman said, when the Upper Columbia Recovery Plan was written, the authors followed the Interior Columbia Basin Technical Recovery Team recommendations, which identified major and minor spawning areas and stray rate targets. These recommendations were carried over into the Hatchery M&E Plan. He said, according to the Recovery Plan and the Hatchery M&E Plan, the upper Methow River, Chewuch River, and Twisp River are considered separate spawning aggregates (major spawning areas). As such, the recommendations within the Recovery Plan call for allowing local adaptation of the spawning aggregates. Keely Murdoch said broodstock for the Methow and Chewuch is composite, so local adaptation is not occurring. She said when the YN agreed to supplement the Chewuch River, the intent was for supplemented fish to spawn there.

Pearsons asked why more hatchery fish are needed in the Chewuch River. Keely Murdoch replied, in many years, 80 to 90% of the supplemental fish do not return to the Chewuch River. She said a standard was agreed to, and is not being met. She said using 10 years of historic SAR rates and assuming 100% of fish from a 60,000-fish release would return to the Chewuch River, PNI would not be affected. Mackey said, regardless of stray rate, more than half of the spawners in the Chewuch River have been hatchery fish, so supplementation targets are being met. Keely Murdoch disagreed that the historic spawning composition was an appropriate argument in that the current release number has been reduced to about 60,000 so the numbers of hatchery fish returning to the Chewuch to begin with will be significantly reduced. Mackey asked if the final destination of the of fish matters, as long as the Chewuch River is supplemented. He said the question is if the number of fish returning to the Chewuch River is within the bounds of a prudent management number. Hillman said the way broodstock are collected for these programs may preclude local adaptation, unless the Hatchery Committees have redefined subpopulation structure, which would change this discussion from a straying issue to a spawning distribution issue. Keely Murdoch said the genetic composite issue means these fish are not strays, but the point is that more fish should be returning to habitat in the Chewuch River. Pearsons said, from 2004 to 2013, the proportion of hatchery origin spawners (pHOS) in the Chewuch River was high. Tonseth said, in the context of programs, there have been sufficient hatchery fish in the Chewuch River to meet escapement objectives, but those are based on larger smolt releases.

Keely Murdoch said pHOS is 0.25 when calculated using historic hatchery SARs, a release size of 60,000, and historic natural-origin run sizes. She said if 80% of those fish go back to the hatchery, then pHOS would be much less. Keely Murdoch said that it would not be unreasonable for the Hatchery Committees to come up with a study plan. Andrew Murdoch suggested focusing on improving imprinting and homing in the Twisp River, because that is a site everyone can agree on. Keely Murdoch said the YN may agree to that arrangement. Andrew Murdoch also suggested an option could be building long-term acclimation sites in the Twisp River where homing fidelity is a problem. Mackey said the number of strays from a brood year is actually quite low, even if it exceeds 5 to 10%, and it may not make much of a population-level difference for the level of effort that may be needed to investigate and

attempt to address the issue. Andrew Murdoch said if survival was better in the Chiwawa River, there would be more fish for investigating this issue. Keely Murdoch said one benefit the YN thought would come from using circular tanks at Carlton is higher SAR rates. Willard asked if more than 60,000 fish could be acclimated at the Chewuch Acclimation Facility. Keely Murdoch said yes, and that the capacity of the pond is the only constraint. Truscott said CCT would be okay with a larger program at Chewuch Acclimation Facility. Andrew Murdoch asked if the Methow FH has a hatchery-by-hatchery program. Tonseth said no, but the program could have a safety-net component designed to prevent mining if the conservation program is deemed too large. He said pulling out large numbers of wild fish and not meeting related goals would not be acceptable. Truscott said a few things have been identified, which help prevent straying: incubation on natal water source and acclimation in the tributary to which homing is desired.

Pearsons said a larger-scale discussion about adaptive management of supplementation across the basin is needed. He said risk management and decreasing the amount of supplementation should be considered if strong evidence is not presented to support it. Pearsons said, if the monitoring plans are designed to help the Chewuch River, but the better thing would be to not supplement in the first place, then ending supplementation there should be considered. Pearsons asked if no increase, or a decrease in NOR fish would change Keely Murdoch's mind about supplementation in the Chewuch River. Keely Murdoch replied that no data have been presented yet that would change her mind. She said the program has not been operated in a manner that gives supplementation a chance to work as designed. She said adaptive management should figure out a way to fix the homing fidelity problem. Tom Kahler said increasing homing could decrease the proportion of natural origin spawners to hatchery origin spawners. Keely Murdoch replied that the input of fish could be adjusted. Kahler suggested that supplementing the Methow basin with fewer hatchery fish, or supplementing less often, might increase the productivity of natural populations. He said the PUD Hatchery Programs are supposed to contribute to recovery. Keely Murdoch suggested adjusting the release numbers instead of ending the program. Busack said he does not see a way to solve the homing problem except to incubate fish elsewhere in the basin. He said if the Methow tributaries were the focus, Chewuch River could be a control, which may result in allowing diversity to development and lead to greater success. Keely Murdoch

said fish should not be reared at Methow FH, or an incubator should be set up at Chewuch Acclimation Facility, and the program changes could be tested on a small scale.

The HETT will discuss potential methods for increasing homing fidelity of spring Chinook salmon in the Methow basin.

C. Gene Flow Standards for Methow Spring Chinook Salmon (Matt Cooper)

Matt Cooper said he worked with WDFW to gather preliminary estimates regarding the effectiveness of collaborative spring Chinook salmon pHOS management in the Methow basin in 2015, presented in a document titled "Methow SCS Adult Management Summary," which Sarah Montgomery sent to the Hatchery Committees on November 17, 2015. He said 2015 is the first year that both federal and local operators worked together in an effort to aggressively manage pHOS. He said the data shared today are provisional data that should only be used for establishing gene flow standards to parameterize the three-population PNI model. Mike Tonseth verbally corrected one item in the document—PNI for total estimated spawners in the Methow basin should be 0.386 using the conventional method, not 0.518 as reported. Tonseth reviewed the basic assumptions of the provisional estimates:

- Winthrop National Fish Hatchery (NFH) production assumed adipose fin-clipped (regardless of coded wire tag[CWT])
- Methow FH production assumed adipose fin present plus CWT
- Wild production assumed adipose fin present only

Tonseth said data auditing for the total run escapement over Wells Dam is not yet completed. He said there was overlap between the summer and spring runs, so for the purposes of this discussion he identified a natural break in the runs on June 10, 2015, resulting in a provisional estimate of 9,500 spring Chinook salmon.

Tonseth said many hatchery fish were removed at both the Methow FH and Winthrop NFH. He said Winthrop NFH pulled in many fish from both programs, and Methow FH primarily collected fish from its own program releases. He said facilities operated an average of 6 days per week, but a provisional extraction rate of 77% is good. Tonseth said the Methow River had the highest pHOS, the Chewuch River had the second highest pHOS, and the

Twisp River had the lowest pHOS. Tonseth said many hatchery fish were spread out from M6 to M8 around Methow FH. He said using Craig Busack's three-population gene flow model results in a PNI of 0.499 using the provisional data. He said the PNI is higher when adult management is implemented, and this will become more distinct in 2016 and 2017, as releases were reduced for those years.

Tom Kahler said future results may be confounded by poor ocean conditions. Tonseth said once the CWT and scale data are available, WDFW can calculate pHOS at the reach level. He said, even with improvements to trap operation, he does not think that management goals are entirely achievable by trap operations alone. He suggested selective fisheries could remove additional fish, particularly in hatchery stretches, by extending the fishery boundary to include those reaches. He said the first step is to finish the Adult Management Plan and get it written into the permit. He said the spawning distribution this year could have been influenced by drought conditions, and fish may have sought cold-water refugia in the hatchery outfalls. Todd Pearsons asked if the risks of impacts to NOR and the potential benefit of reducing hatchery-origin fish on the spawning grounds are compared when deciding whether to have a fishery. Tonseth replied yes, and the effects analysis by the National Oceanic and Atmospheric Administration would also account for that. He said the spring Chinook salmon management plan is approximately halfway complete, and he anticipates that it will be ready for review by December 4, 2015. Pearsons asked if it would be viable to consider having a fishery just in reaches with high-proportion hatchery-origin fish. Tonseth replied yes, but it would be different than the Wenatchee River, for example, because the first year would probably be a trial year to study species encounters and effectiveness and PIT-tag data and instream arrays. Tonseth said that Winthrop NFH fish are being targeted because they are part of the safety-net component and are the only hatchery fish ad-clipped in the Methow basin. He said a fishery would have no direct benefit to the conservation program at Methow FH, but it could help pull out more hatchery fish overall.

Tonseth said one way to potentially improve the programs in a way that affects proportion of natural origin broodstock, and therefore PNI, would be to live-spawn wild males at Methow FH and ship excess natural origin milt to Winthrop NFH, so that part of the Winthrop NFH program could be hatchery-by-wild. Andrew Murdoch asked how PNI

changes if Winthrop NFH is eliminated. Busack said the PNI would rise from 0.499 to 0.56. Andrew Murdoch said that extraction of adults would change, but the Winthrop NFH fish are already mostly being taken out of the system, so PNI would not be greatly affected.

Tonseth said a major uncertainty in this discussion is whether adult management could be used to effectively manage pHOS in the Methow basin. Busack said the Hatchery Committees should consider ideas conceived last year when discussing the minimum number of spawners, and the program should be modeled similarly to the Wenatchee program. Tonseth said the Hatchery Committees need to formalize adopting the three-population model approach to calculating PNI before moving forward with consultation. The Hatchery Committees representatives present agreed to adopt the three-population gene flow model for calculating PNI. Tracy Hillman will ask Kirk Truscott if the CCT agree to adopt the three-population gene flow model for calculating PNI.

III. YN

A. Goat Wall Pond Acclimation

Keely Murdoch said Tonseth had proposed a solution to Goat Wall Acclimated Release permitting similar to one used earlier for Okanogan steelhead. Tonseth said because WDFW is a co-permittee on 1196, it could issue a letter to NMFS that authorizes YN as an agent to operate the Goat Wall acclimation site. Tom Kahler said Goat Wall is not a Douglas PUD facility and therefore is not covered under 1196. He said Douglas PUD's approach has been to relinquish Endangered Species Act (ESA) responsibility for the fish when they leave the facility, and the way this proposal works would not relinquish responsibility because the fish are still under Douglas PUD's permit. Mackey said internal discussions resulted in Douglas PUD being uncomfortable with YN serving as an agent on the permit Douglas PUD holds, and the original agreement to operate Goat Wall was under the proviso that YN would obtain permits. He said Douglas PUD supports delaying release at Goat Wall by 1 year, but keeping the full 5 years of releases. Truscott asked if spring Chinook salmon are the only fish in the acclimation ponds. Keely Murdoch said yes, and the site is covered under the coho salmon consultation, but that does not allow YN to acclimate spring Chinook salmon in the ponds. Truscott suggested that WDFW could be the operator of the pond as a co-permittee under the existing permit, which would serve the purpose of getting fish

acclimated farther upstream in the basin. Mackey said Douglas PUD does not have funding set up for that arrangement. Tracy Hillman asked if the Hatchery Committees could relinquish Douglas PUD of ESA responsibility upon fish transfer. Mackey said the Hatchery Committees could not, and that NMFS and USFWS would have to do that. He said without a solution, Goat Wall activities for 2016 cannot move forward.

Busack said activities could be permitted before the 2016 release, but NMFS does not know when the consultation would be completed. Tonseth said it would probably be unrealistic for the consultation to be completed before March 2016, when the fish need to be transferred. Busack said he thinks he could have it complete by then, but NMFS cannot complete the permit without bull trout consultation, which could be a limitation. Halupka said it would be unlikely for bull trout consultation to be complete by March 2016. Keely Murdoch said YN would not acclimate any other fish in the ponds because the coho salmon expansion in the Methow basin is delayed. She said there is flexibility that can be worked out with the hatchery in moving the fish, and frozen ponds would be a delay, but fish need to be tagged with Passive Integrated Transponders (PIT) in January or early February. Keely Murdoch will discuss internally the potential delay of Goat Wall Acclimated Release activities until 2017.

IV. WDFW

A. DECISION: Supplemental Radio-Tagging of Summer Steelhead (Mike Tonseth)

Mike Tonseth shared a document titled, "Supplemental Radio-Tagging of Summer Steelhead at Tumwater Dam and Twisp weir in 2016 and 2017" (Attachment B), which Sarah Montgomery distributed to the Hatchery Committees on November 4, 2015. Tonseth said WDFW radio tags a percentage of steelhead at Priest Rapids Dam, but this year, fish did not return in the expected number or at the expected time. He said the target number of radio-tagged steelhead was not met, therefore, WDFW and the University of Idaho propose to radio tag steelhead in tributaries (at Twisp Weir and Tumwater Dam) in order to answer more specific questions and increase the number of tags in the system.

Catherine Willard said Tumwater Dam is already shut down for the season. Tonseth said that would move the radio-tagging activities to springtime in 2016 and 2017 for both sites,

which is advantageous because fish would already be on hand and other activities also need to be performed. Andrew Murdoch said 500 radio tags have been budgeted for this project. He said there are three frequencies for the tags used this year (which will turn off in June, 2016), and 100 are currently ready to be used. He said the study will provide information on the number of redds constructed by females, spawning behavior, and location effects, which will add data to the ongoing study in the Twisp River. He said radio-tagging fish in spring would provide more information than tagging in the fall, because groups of hatchery, wild, male, and female fish could be tagged. He said nine reconditioned kelts have already been radio-tagged.

Andrew Murdoch said this research would be part of Nate Fuch's (University of Idaho) graduate thesis, and the information obtained would be just as important as the primary objective. Andrew Murdoch said Lotek Wireless will provide a new tag for evaluation during this study. Todd Pearsons asked how this would affect the reproductive success study in the Twisp and asked if radio tags affect spawning success. Andrew Murdoch said differences in spawning success by default could be evaluated, because at least half of the population will not be radio-tagged. Mackey said tagging a balance of male, female, hatchery, and wild fish would help the reproductive success study. Andrew Murdoch said the return rates of radio-tagged steelhead versus non-radio-tagged steelhead could inform long-term fitness.

Willard said the timeframe for tagging fish at Tumwater Dam is incorrect. Andrew Murdoch agreed, and said the Tumwater Dam tagging could be augmented to look at the number of redds per female and redds per male. He said the data would provide information on spawning densities in different habitat types. Kirk Truscott asked how the study would be different if the tags were used at Wells Dam, providing information on the Okanogan and Twisp rivers. Andrew Murdoch said it is important to concentrate the tags in locations where they can be tracked, and this study is in addition to those already occurring in the upper basin.

The Hatchery Committees representatives present approved the WDFW and University of Idaho study proposal titled, "Supplemental Radio-Tagging of Summer Steelhead at Tumwater Dam and Twisp weir in 2016 and 2017."

V. HCP Administration

A. Next Meetings

The next scheduled Hatchery Committees meetings are on December 16, 2015 (Douglas PUD), January 20, 2016 (Douglas PUD), and February 17, 2016 (Chelan PUD).

VI. List of Attachments

Attachment A	List of Attendees
Attachment B	Supplemental Radio-Tagging of Summer Steelhead at Tumwater Dam and Twisp Weir in 2016 and 2017

Attachment A
List of Attendees

Name	Organization
Tracy Hillman	BioAnalysts, Inc.
Sarah Montgomery	Anchor QEA, LLC
Alene Underwood*	Chelan PUD
Catherine Willard*	Chelan PUD
Greg Mackey*	Douglas PUD
Tom Kahler*	Douglas PUD
Todd Pearsons	Grant PUD
Peter Graf†	Grant PUD
Craig Busack*†	National Marine Fisheries Service
Matt Cooper*	U.S. Fish and Wildlife Service
Karl Halupka	U.S. Fish and Wildlife Service
Mike Tonseth*	Washington Department of Fish and Wildlife
Andrew Murdoch	Washington Department of Fish and Wildlife
Charlie Snow†	Washington Department of Fish and Wildlife
Kirk Truscott*	Colville Confederated Tribes
Keely Murdoch*	Yakama Nation

Notes:
* Denotes Hatchery Committees member or alternate
† Joined by phone