

FINAL MEMORANDUM

To: Wells, Rocky Reach, and Rock Island HCPs Hatchery Committees **Date:** August 31, 2015
From: Tracy Hillman, HCP Hatchery Committees Chairman
Cc: Kristi Geris
Re: Final Minutes of the July 15, 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, July 15, 2015, from 9:30 a.m. to 1:30 p.m. Attendees are listed in Attachment A to these meeting minutes.

ACTION ITEM SUMMARY

- Kristi Geris will follow up with Craig Busack to confirm edits to statements made by Busack, as reflected in the revised draft Hatchery Committees June 17, 2015 meeting minutes (Item I-A). *(Note: Busack confirmed the edits via email on July 16, 2015, which Geris distributed to the Hatchery Committees that same day.)*
 - Mike Tonseth will coordinate with Craig Busack on the Hatchery Committees' decision regarding the fate of excess brood year (BY) 2014 Methow spring Chinook salmon currently being held at Eastbank Fish Hatchery (FH) and Methow FH (Item II-A).
 - Sarah Montgomery will contact Craig Busack and request National Marine Fisheries Service (NMFS) concurrence of the Wells Hatchery Committee agreement regarding Douglas PUD's proposed Hatchery Monitoring and Evaluation (M&E) Annual Report schedule (Item III-B). *(Note: Busack provided NMFS concurrence of the agreement via email on July 20, 2015, which Montgomery distributed to the Hatchery Committees that same day.)*
 - Douglas PUD will provide the draft 2014 Douglas PUD Hatchery M&E Report to Sarah Montgomery by August 1, 2015, which Montgomery will distribute to the Hatchery Committees for review (Item III-B). *(Note: Greg Mackey provided the draft*
-

report to Montgomery on July 31, 2015, and Montgomery distributed the draft report to the Hatchery Committees for review on August 1, 2015.)

- Sarah Montgomery will distribute a Doodle Poll to reconvene the Hatchery Evaluation Technical Team (HETT) in August 2015, as no suitable meeting date was found in July (Item IV-A). *(Note: Montgomery distributed a poll for August 2015 on July 16, 2015, and another for September 2015 on August 20, 2015, as no suitable meeting date was found in August.)*

DECISION SUMMARY

- The Hatchery Committees representatives present approved the following for excess BY 2014 Methow spring Chinook salmon currently being held at Eastbank FH and Methow FH:
 1. Transfer 29,755 fish (hatchery-by-hatchery [HxH] or hatchery-by-wild [HxW]) to Winthrop National Fish Hatchery (NFH) to be incorporated into the Winthrop NFH Safety Net Program.
 2. Transfer remaining excess brood (approximately 26,000 wild-by-wild [WxW]) to Methow FH for release from Methow FH or satellite locations (Item II-A).

AGREEMENTS

- The Wells Hatchery Committee representatives present agreed to Douglas PUD's proposed Hatchery M&E Annual Report schedule to provide the Hatchery Committees with a draft Hatchery M&E Annual Report for a 30-day review by August 1, 2015, with the final report due to NMFS by October 1, 2015 (Item III-B). *(Note: Craig Busack provided NMFS concurrence of this agreement via email on July 20, 2015, which Sarah Montgomery distributed to the Hatchery Committees that same day.)*

REVIEW ITEMS

- Kristi Geris sent an email to the Hatchery Committees on July 1, 2015, notifying them that the draft 2016 Douglas PUD Hatchery M&E Implementation Plan is available for
-

a 60-day review period, with edits and comments due to Greg Mackey by Sunday, August 30, 2015 (Item III-A).

- Sarah Montgomery sent an email to the Hatchery Committees on July 23, 2015, notifying them that the draft 2016 Chelan PUD Hatchery M&E Implementation Plan is available for a 60-day review period, with edits and comments due to Catherine Willard by Monday, September 21, 2015.
- Sarah Montgomery sent an email to the Hatchery Committees on August 1, 2015, notifying them that the draft 2014 Douglas PUD Hatchery M&E Report is available for a 30-day review period, with edits and comments due to Greg Mackey by Monday, August 31, 2015 (Item III-B).

FINALIZED DOCUMENTS

- There are no documents that have been recently finalized.

I. Welcome

A. Review Agenda, Review Last Meeting Action Items, Approve the June 17, 2015, Meeting Minutes (Tracy Hillman)

Tracy Hillman welcomed the Hatchery Committees and asked for any additions or changes to the agenda. Bill Gale removed the U.S. Fish and Wildlife Service (USFWS) bull trout consultation update, and added an update on activities at Leavenworth NFH. The NMFS Hatchery Genetic Management Plan (HGMP) update was also removed, as no NMFS representatives were able to attend today's meeting.

The Hatchery Committees reviewed the revised draft June 17, 2015, meeting minutes. Kristi Geris said there are several outstanding comments to be discussed, as follows (Note: *italicized text* indicates clarifying edits):

- Regarding the Methow spring Chinook salmon adult management update, Gale clarified that it seems incorrect to assign the same proportion of natural-origin fish in hatchery broodstock (pNOB) *level to segregated programs such as Leavenworth and Winthrop.*
 - Regarding the same discussion, Greg Mackey clarified that Craig Busack noted it would be simple to split goals into separate facilities; *with a percent hatchery-origin*
-

spawner (pHOS) of 5% for the segregated Winthrop NFH program. Geris will follow-up with Busack to confirm Mackey's edits. (Note: Busack confirmed Mackey's edits via email on July 16, 2015, which Geris distributed to the Hatchery Committees that same day.)

- Regarding the same discussion, the Hatchery Committees suggested adding a note indicating that Busack also mentioned a three-way proportionate natural influence (PNI) model that could be adapted to the situation in the Methow Basin.
- Regarding the HGMP update, Mackey clarified that Busack expects to finish drafting permits for the *Wenatchee* Chinook Hatchery Programs in the next few weeks. Geris will follow-up with Busack to confirm Mackey's edits. *(Note: Busack confirmed Mackey's edit via email on July 16, 2015, which Geris distributed to the Hatchery Committees that same day.)*
- Regarding review of the "Evaluation of Hatchery Programs Funded by Douglas County PUD 5-Year Report 2006-2010," Kirk Truscott clarified that he noted if fish have a high precocity rate, they will not contribute as *anadromous* adults.
- Regarding the same discussion, Hillman clarified that he said hatchery-origin recruits (HORs) were first *measured* in the Methow in 1993 at 2%.

Geris noted that edits and comments have not yet been received from Grant PUD on the draft joint Hatchery Committees/Priest Rapids Coordinating Committee Hatchery Subcommittee (PRCC HSC) section of the draft June 17, 2015, meeting minutes, as both Todd Pearsons (Grant PUD), and Peter Graf (Grant PUD) had been on vacation until yesterday, July 14, 2015. Pearsons said Grant PUD reviewed the joint section and has no edits or comments to submit. Hatchery Committees members present approved the draft June 17, 2015, meeting minutes, as revised.

Action items from the Hatchery Committees meeting on June 17, 2015, and follow-up discussions, were as follows (*italicized* item numbers below correspond to agenda items from the meeting on June 17, 2015):

- *Tracy Hillman will provide the paper titled, "Anadromy and residency in steelhead and rainbow trout (Oncorhynchus mykiss): a review of the processes and patterns,"*
-

(Kendall et al. 2014) to Kristi Geris for distribution to the Hatchery Committees (Item II-A).

Hillman provided this paper, as well as a paper titled “Analyzing large-scale conservation interventions with Bayesian hierarchical models: a case study of supplementing threatened Pacific salmon” (Scheuerell et al. 2015) to Geris on June 18, 2015, which Geris distributed to the Hatchery Committees that same day.

- *Anchor QEA will set up a WebEx (screen share) for all future Hatchery Committees meetings to more effectively share information with those attending the meeting via conference call (Item II-A).*

Sarah Montgomery set up a WebEx, as discussed, and will include the screen share access link on all future meeting agendas.

- *Greg Mackey and Mike Tonseth will provide a revised Methow Basin Spring Chinook Adult Management Worksheet and the revised 2015 Methow Basin Spring Chinook Adult Management Plan to Kristi Geris for distribution to the Hatchery Committees (Item III-A).*

Mackey provided these revised documents to Geris on June 18, 2015, which Geris distributed to the Hatchery Committees that same day.

- *Craig Busack will resend the Doodle Poll to schedule the next joint NMFS/USFWS Biological Opinion (BiOp) Coordination Meeting (Item VI-A).*
- Busack resent the poll on June 18, 2015.

- *Greg Mackey will provide his presentation titled, “Carrying Capacity of Spring Chinook and Summer Steelhead in the Methow River Basin, Washington,” that he presented at a past American Fisheries Society (AFS) Conference to Kristi Geris for distribution to the Hatchery Committees (Item VIII-A).*

Mackey provided this presentation to Geris on June 18, 2015, which Geris distributed to the Hatchery Committees that same day.

- *Tracy Hillman and Kristi Geris will incorporate edits discussed into the draft Hatchery Committees Meeting Protocols, and will distribute the updated draft to the Hatchery Committees (Item IX-A).*

Hillman and Geris updated the draft, as discussed, which Geris distributed to the Hatchery Committees on June 18, 2015.

- *Tracy Hillman and Anchor QEA will coordinate future joint Hatchery Committees/ PRCC HSC sessions with the PRCC HSC Facilitator, as needed (Item IX-B).*

Hillman said he, Anchor QEA, and the PRCC HSC facilitator team are coordinating as discussed.

- *Kristi Geris will distribute a Doodle Poll to reschedule the Hatchery Committees meeting in August 2015 (Item IX-C).*

Geris distributed a poll on June 18, 2015.

II. WDFW

A. Chelan PUD Spring Chinook Program at Methow FH (Greg Mackey and Mike Tonseth)

Greg Mackey recalled that as of the last Hatchery Committees meeting on June 17, 2015, Chelan PUD had provided Douglas PUD with a signed Interlocal Agreement (ILA), which Douglas PUD planned to present to its Board for final approval. Mackey said the ILA has been approved and Chelan PUD is back at Methow FH, which means the Methow FH M&E program now includes all three PUDs (i.e., Douglas, Chelan, and Grant).

B. DECISION: Excess BY 2014 Methow Spring Chinook (Mike Tonseth)

Mike Tonseth recalled discussing during the Hatchery Committees meeting on January 21, 2015, a potential overage originating out of Eastbank FH for BY 2014 Methow spring Chinook salmon. He said at that time, there were excess WxW fish at Methow FH, and excess HxW and WxW fish at Eastbank FH (where the hatchery component was the secondary component). He recalled contemplating a number of options for the excess fish, but ultimately deciding to wait until fish were tagged to determine populations.

Tonseth said, unfortunately, inventories were more robust than previously thought, which resulted in more fish on station than originally projected. He said high survival from green egg to ponding at both Eastbank and Methow FHs (upper-80% to 90%) has resulted in roughly 302,000 Methow spring Chinook juveniles on hand, which is about 135% of the aggregate production obligation of approximately 224,000 fish; however, it is only 55% of the release level allowed by extended Permit 1196. Tonseth said he is still awaiting feedback from Craig Busack regarding NMFS' opinion on exceeding the current program release goals. Mackey said he is not sure if the Permit 1196 extension letter discusses fish numbers.

Tonseth clarified that it does not; however, it alludes to a program implementation element of the new HGMP that could still be covered by the existing permit with the caveat of added ability to perform adult management. He said this is the gray area, and questioned whether the current numbers are grossly over the allowable release target, or well within. He said there are roughly 47,000 WxW fish at Eastbank FH, roughly 30,000 HxH also at Eastbank FH, and roughly 225,000 at Methow FH. He said from a technical perspective, there are about 37,000 excess fish, and he added that it would be preferable to keep all of the WxW fish.

Tonseth said WDFW asked the Colville Confederated Tribes (CCT) if they could take some of the excess fish. The CCT indicated they are already at capacity. He said USFWS indicated they have capacity to incorporate 30,000 fish into their Winthrop Safety Net Program. He added that those plans, including viral sampling, are underway. Bill Gale clarified that USFWS thinks they have space, and a final inventory should be ready by the end of this week. He asked if the 30,000 fish slated for Winthrop NFH are marked, and Tonseth said they are snout-wired and adipose (ad)-clipped.

Tonseth said if USFWS can take 30,000 fish from Eastbank FH, this leaves about 270,000 WxW progeny for the combined conservation program, including about 47,000 fish at Eastbank FH (with transfer of those fish pending Hatchery Committees decision). He said WDFW believes this is within the existing permit, even though numbers are considerably above the recalculated mitigation level. He said the excess fish cannot be culled. He said WDFW's preference is to send the fish to the Methow Basin. He added that because the 47,000 fish at Eastbank FH are predominantly from the Chewuch River, WDFW wants those fish returning to the Chewuch River. He recalled the email outlining options for the excess BY 2014 Methow spring Chinook that was distributed to the Hatchery Committees by Kristi Geris on July 9, 2015. The four options were as follows:

1. Retain excess fish at Methow FH and release from facility or satellite locations
 2. Release excess fish as sub-yearlings as soon as possible or as reasonable
 3. Overwinter acclimate excess fish at Carlton Pond, then transfer to Chewuch Pond in the spring
 4. Other?
-

Tonseth said WDFW does not support Options 2 or 3, but wanted to include them for consideration. He said he spoke with Douglas PUD, who agreed the best approach is to release the fish at Methow FH and perform adult management, as needed (Option 1). Kirk Truscott asked if Option 1 poses any regulatory issues. Tonseth said he does not believe so; however, he plans to confirm this with Busack. Mackey said he spoke with the Wells Hatchery Complex Manager and confirmed there is space for the excess fish. He also suggested allowing the Hatchery Operators to decide when to transfer the fish, likely in early fall 2015. Todd Pearsons asked if the fish will be of similar size so they can be pooled together, and Mackey said he would have to check. Tonseth said coordination will be through Brian Lyon (WDFW), the new Eastbank FH Complex Manager (formerly Similkameen Hatchery staff). Gale asked who will coordinate with Chris Pasley (USFWS, Winthrop NFH Complex Manager) on the 30,000 fish being transferred to Winthrop NFH. Tonseth said he or Lyon will coordinate with Pasley on the Winthrop NFH transfer. Tonseth added that once the time comes to transfer fish, he recommended direct communication between Lyon and Pasley for the Winthrop NFH transfer, and Lyon and Brandon Kilmer (WDFW) for the Methow FH transfer.

Keely Murdoch said the Yakama Nation's (YN's) preferred option is to overwinter at Carlton Pond and transfer to Chewuch Pond in the spring (Option 3). She said this option provides a second data point on how this rearing scheme affects homing rates to the Chewuch River. She said, however, she understands Option 3 is not the preferred option for others, so the YN is supportive of Option 1 in the interest of reaching agreement. Tracy Hillman asked if NMFS has provided a vote. Tonseth said he has not yet received a vote from NMFS, and that he will coordinate with Busack on the Hatchery Committees' decision regarding the fate of excess BY 2014 Methow spring Chinook salmon currently being held at Eastbank FH and Methow FH.

Tom Kahler projected the official NMFS Permit 1196 Extension Letter (2013), and Mackey read the following:

“NMFS has taken into account new information submitted by the applicants that describe reductions in hatchery production as a result of 2012 recalculations of PUD obligations. Also, we do not anticipate that the number of broodstock collected for these programs will be higher than the current hatchery propagation programs described in the 2013 Upper Columbia River Salmon and Steelhead Broodstock Objectives and Site Based Broodstock Collection Protocols (WDFW 2013). Finally, we note that the proposed direct-take programs all include measures to reduce risk from large proportions of hatchery fish spawning in the wild. Provided that the planned program reductions and feasible risk reduction measures that are described in the application documents and draft permits are implemented, the existing permits, including all Terms and Conditions will remain in force until new permits are issued.”

Gale noted that he would also like Hatchery Committees approval of the proposed Winthrop NFH transfer. Hillman asked if there is a backup plan. Tonseth said a backup plan will be drafted if the scenario arises and added that if something needs to be discussed with the Hatchery Committees before the next meeting, he will contact the Committees via email. He also noted the upside of this situation that for BY 2014 at Methow FH, the pNOB will be 1.0 for the first time ever.

The Hatchery Committees representatives present approved the following for excess BY 2014 Methow spring Chinook salmon currently being held at Eastbank FH and Methow FH:

1. Transfer 29,755 fish (HxH or HxW) to Winthrop NFH to be incorporated into the Winthrop NFH Safety Net Program; and
2. Transfer remaining excess brood (approximately 26,000 WxW) to Methow FH for release from Methow FH or satellite locations.

C. Methow Spring Chinook Adult Management (Mike Tonseth and Greg Mackey)

Mike Tonseth said, as discussed last month, about 98% of hatchery fish need to be removed to hit the projected PNI target of 0.59 based on a spring Chinook salmon run estimate above Wells Dam of 8,123 hatchery-origin adults and 818 natural-origin adults. He said factoring in assumptions about pre-spawn mortality on fish from Wells Dam to hatchery outfalls, and

then from outfall locations to the spawning grounds, the estimated number of hatchery-origin adults to remove is about 6,592 fish. He said currently the number of hatchery-origin adults removed is 5,518 fish. He added that among those removed, 1,888 fish were removed from Methow FH, 3,498 fish from Winthrop NFH, and 132 jacks were removed at Wells Dam during broodstock collection. He said the plan is to operate as long as possible, maximizing the operation window. He applauded the effort to date, noting that crews have already removed approximately 84% of the target removal number. He said that Michael Humling (USFWS) snorkeled the lower regions and found hundreds of fish still holding. Bill Gale noted that Kristi Geris just forwarded an email from Humling to the Hatchery Committees today before the meeting summarizing Humling's findings. Tonseth also noted that for the Methow River, there is generally another surge of fish once spawning starts.

Gale said one problem USFWS is now encountering is running out of outlets. He added that no one wants these fish for consumption. He said Chris Pasley is coordinating with a maggot farmer; however, that option involves storing frozen carcasses. He said Northwest Harvest may also be an option. Tonseth said he is also coordinating with a Nutrient Enhancement Program, which is about ready to accept carcasses to produce analogs. He said he plans to contact Mike Lewis (WDFW) at Priest Rapids Dam to coordinate a transfer.

Tracy Hillman asked about the estimated number of fish in-basin that have escaped to spawn (have not been surplus). Tonseth said there are about 3,000 hatchery-origin adults unaccounted for, which may include a certain number of pre-spawn mortalities; and about 818 natural-origin adults, which may be about 318 accounting for pre-spawn mortalities.

Kirk Truscott asked if the Twisp Weir was operated this year. Tonseth said it was operated for only a short period of time because Douglas PUD was able to collect their full HCP spring Chinook salmon broodstock obligation at Wells Dam. He said no adult management was conducted at the weir, and added that WDFW anticipates that, in general, any adult management at the Twisp Weir will be limited.

III. Douglas PUD

A. Draft 2016 Douglas PUD Hatchery M&E Implementation Plan (Greg Mackey)

Greg Mackey said Kristi Geris sent an email to the Hatchery Committees on July 1, 2015, notifying them that the draft 2016 Douglas PUD Hatchery M&E Implementation Plan is available for a 60-day review period, with edits and comments due to Mackey by Sunday, August 30, 2015. Mackey said the plan is almost identical to last year. He also noted plans to repeat the Twisp Weir juvenile steelhead sampling effort.

B. Draft 2014 Douglas PUD Hatchery M&E Report (Greg Mackey)

Greg Mackey said Douglas PUD received the draft 2014 Douglas PUD Hatchery M&E Report from Charlie Snow (WDFW), and the draft report is now with Grant PUD and Chelan PUD for review before being distributed to the Hatchery Committees for review. Mackey said he discussed with Todd Pearsons review timelines for the Priest Rapids (Grant PUD), Wenatchee (Chelan PUD), and Methow (Douglas PUD) Hatchery M&E Reports, and Pearsons suggested staggering the review periods. Mackey said this could be helpful to both the writers and reviewers of the individual reports. He recalled in the past, review timelines used to be based on NMFS permitting; however, he noted that permits are not necessarily the driving force behind these deadlines. Pearsons said Grant PUD's new permit stipulates a September 1, 2015 deadline for the Wenatchee Hatchery M&E Report, and an August 2015 deadline for the Priest Rapids Hatchery M&E Report. He asked if the Hatchery Committees prefer that the review timelines are in sync or staggered. Keely Murdoch said it seems logical to stagger the timelines; however, it may also be difficult to keep track of the different deadlines. Bill Gale suggested that drafting the reports may be the driver and asked if the same writers author all three reports. Pearsons said the Wenatchee and Priest Rapids Hatchery M&E Reports have different authors, but the Methow Hatchery M&E Report involves all three PUDs.

Pearsons suggested adopting the same review period duration for the Methow Hatchery M&E Report as for the Wenatchee Hatchery M&E Report, but staggering the due date for the Methow Hatchery M&E Report by one month (i.e., October 1, 2015 deadline). He added that this timeline is similar to the existing schedule. Tracy Hillman asked if there is any information contained within the Methow Hatchery M&E Report that is needed by the Hatchery Committees before October 1, 2015 to make future management decisions (e.g., Broodstock Collection Protocols). Mike Tonseth said he does not believe so. Mackey said

the Methow Hatchery M&E Report can be used to inform the upcoming Methow Hatchery M&E Plan for the next year; however, if a change is needed to the plan, this is typically understood before the final annual report is complete (i.e., the Committees do not need to wait for the report to be complete). He asked Snow if this timeline works for him, and Snow indicated that it does.

The Wells Hatchery Committee representatives present agreed to Douglas PUD's proposed Hatchery M&E Annual Report schedule to provide the Hatchery Committees with a draft Hatchery M&E Annual Report for a 30-day review by August 1, 2015, with the final report due to NMFS by October 1, 2015. Sarah Montgomery said she will contact Craig Busack and request NMFS concurrence of this agreement. *(Note: Busack provided NMFS concurrence of the agreement via email on July 20, 2015, which Montgomery distributed to the Hatchery Committees that same day.)*

Douglas PUD will provide the draft 2014 Douglas PUD Hatchery M&E Report to Montgomery by August 1, 2015, which Montgomery will distribute to the Hatchery Committees for review. *(Note: Mackey provided the draft report to Montgomery on July 31, 2015, and Montgomery distributed the draft report to the Hatchery Committees for review on August 1, 2015.)*

C. Methow Basin – Possible Water Right Restrictions (Tom Kahler)

Tom Kahler said earlier in the year, Douglas PUD received a letter from the Washington State Department of Ecology (Ecology) regarding the 2015 water forecast for the Methow Basin, which indicated that this year may be a dry year, and if so, Ecology will contact Douglas PUD again regarding water usage at Methow FH and associated facilities. Kahler said in June 2015, Ecology sent another letter to Douglas PUD containing an Order stipulating that beginning June 29, 2015, Douglas PUD must notify Ecology of plans to divert water. He said this affects the following three things:

- Surface water for Foghorn Ditch from December to May
 - Surface water for the Twisp Pond for spring use
 - Douglas PUD's groundwater right
-

Kahler said Douglas PUD contacted Ecology, and Ecology clarified that no action is required if Douglas PUD discharges groundwater to the river above or at the point where water would return to the river, which they do. He said the surface water right may become a problem later in the year; however, this depends on the climate between now and then. He added that Douglas PUD plans to coordinate and communicate actions, as needed. Mike Tonseth asked if the Order applies to consumptive use only (rather than non-consumptive use). Kahler said that is correct, and clarified that the potential issue is the withdrawal at Foghorn Dam and the discharge, less than 1 mile downstream, which can potentially result in a dewatered reach.

Kahler said historically this has never been an issue. He recalled receiving a similar letter from Ecology in 2001; however, no actions were ever required because of when the water was used. He said Douglas PUD needs to develop a contingency plan in case there is still a low-water situation. Tonseth said the forecast does not look good, noting below normal precipitation until January 2016.

D. PRESENTATION: Carrying Capacity (Greg Mackey)

Greg Mackey shared a presentation titled “Carrying Capacity of Spring Chinook and Summer Steelhead in the Methow River Basin, Washington” (Attachment B), which Kristi Geris distributed to the Hatchery Committees on June 18, 2015. This presentation included a review of methods for estimating carrying capacity, including estimates based on habitat capacity, smolt estimates, and stock-recruit relationships. Stock-recruit models and quantile regression were discussed using hypothetical and real data to demonstrate different types of carrying capacity estimates for Methow spring Chinook salmon and summer steelhead (i.e., stock-recruit models provided a model of the average stock-recruit response, while quantile regression fit through the 95th quantile provided an estimate of the maximum stock-recruit response that is likely given the data). An overview of estimates was also reviewed, which included additional methods for estimating carrying capacity cited from existing literature. Similarities among estimates can provide a level of confidence, while contradicting data may prove difficult in identifying the “correct” estimate. Questions and comments were discussed as follows:

Ksp and Kr (Slide 22 of Attachment B)

Mackey noted that between the Ricker and 95th Quantile models, the number of estimated spawners needed to produce the maximum number of recruits (Ksp) is very similar, while the estimated number of maximum recruits (Kr) is radically different (almost double). Kirk Truscott asked with regard to the vastly different Kr values which of the two curves (i.e., Ricker or 95th Quantile) resulted in the greatest confidence. Tracy Hillman said it seems the 95th Quantile would have the smaller confidence interval; the statistical analysis should provide confidence intervals. Hillman asked if one is interested in estimating the carrying capacity, why not just use the highest data point (instead of modeling)? Mackey said this can be done; however, modeling the data allows one to evaluate the stock recruit relationship across any number of spawners. Todd Pearsons added that from a management perspective, Ksp cannot be determined based only on one point; the curve is needed. Mackey said this is also a useful tool for ecological purposes.

Steelhead – 95th Quantile (Slide 31 of Attachment B)

Mackey said the 95th Quantile fit suggests the population could replace itself at about 1,000 spawners. Hillman asked whether this is for the entire Methow Basin or one tributary. Mackey said it is for the entire basin and is based on the Quantitative Analysis Report steelhead run reconstruction work by Cooney et al. (2002), as referenced on Slide 2 of Attachment B.

General Comments

Keely Murdoch noted that when considering carrying capacity and the upper limit for a basin, often it gets overlooked that the model assumes spawners are using habitat appropriately. She said, for example, in the Chiwawa River or Upper Methow Basin, the bulk of the fish populating the dataset are HORs spawning in high densities, which are strongly influenced by factors that are not the same for natural-origin recruits (NORs). She said, therefore, the numbers tend to be highly influenced by where HORs tend to spawn. She said this can result in underestimating carrying capacity for a basin. Hillman said this may have a greater influence on productivity than on carrying capacity. That is, density-dependent factors should operate in such a way that areas within the river or watershed with high densities will have lower survival and growth, while areas within the same river or watershed with lower densities should have high survival and growth. He said, for example,

in the Chiwawa River, high densities of fish (mostly HORs) spawn in the lower Chiwawa River where the habitat is of lower quality, while lower densities of fish (mostly NORs) spawn in the upper river where there is higher quality habitat. He said if density-dependent factors are regulating the population, the carrying capacity should not change as a result of different densities within different areas. He added, on the other hand, the intrinsic productivity of the stock (slope of the stock-recruitment curves at the origin) could change under the scenario described by Murdoch. Hillman said this is because large numbers of fish are spawning in low-quality habitat, which reduces egg-to-fry or egg-to-parr survival, and therefore productivity. With regard to Slide 19 of Attachment B, Hillman said the steeper the slope at the origin, the higher the productivity. He said during modeling of supplemented and reference populations during the 5-year analysis, he found that populations with low carrying capacities tended to have higher intrinsic productivities, while populations with higher capacities tended to have lower intrinsic productivities. He said the reason for this is unknown.

Bill Gale questioned, regarding steelhead, how to contemplate the idea that both anadromous and resident fish contribute to recruits. He asked if any hypothetical modeling has been conducted to determine how the data are affected. Andrew Murdoch (WDFW) said efforts are underway for exploring how resident populations affect overall data. He suggested it will not be a big factor. He said studies are ongoing in the Yakima Basin, which should be extremely informative. He added that the efforts will include a pedigree analysis.

IV. HETT

A. HETT Update (Catherine Willard)

Catherine Willard said draft Appendices 2 through 6 were due May 29, 2015, and all have been received. She said draft Appendix 1 was due June 30, 2015, and has not been received. She said Tracy Hillman and Andrew Murdoch are still working to complete draft Appendix 1, and planning is underway to schedule the next HETT meeting. Hillman said Appendix 1 addresses estimation of carrying capacity for all stocks and populations. He said all data are compiled, but as Greg Mackey noted in his presentation, there are many ways to calculate carrying capacity, and the HETT first needs to discuss which method is preferred. Hillman said as a side note, he is working with Tim Beechie (NMFS Northwest Fisheries

Science Center) on using geomorphic and stream habitat variables to estimate carrying capacity for juvenile spring Chinook salmon. Hillman said this approach assumes a given class of habitat will produce so many juvenile Chinook salmon. He said if one knows the total amount of each class of habitat within the basin, one can then calculate the total number of fish that could be produced within the basin. He said this is similar to an approach used by the HETT in the past; however, the HETT used Intrinsic Potential rather than geomorphic classification to extrapolate abundance. He further explained that most of the data for the geomorphic exercise comes from the summer Chiwawa surveys and noted that in addition to snorkeling randomly selected sites from the pool of habitat types within each geomorphic reach, they also measure the physical dimensions (width, depth, and length) of every habitat unit within the sampling frame (complete census). He said the work with Beechie provides a “bottom-up approach” to estimating carrying capacity, while the modeling work conducted by Mackey offers a “top-down approach.”

Willard said Kristi Geris distributed a Doodle Poll on July 2, 2015, to reconvene the HETT in July 2015; however, there is not a date that works for everyone’s schedules. Willard suggested reconvening in August 2015, and Sarah Montgomery said she will distribute a Doodle Poll to reconvene the HETT in August 2015. (*Note: Montgomery distributed a poll on July 16, 2015.*)

Hillman asked how quickly the Hatchery Committees need the appendices finalized. Mackey said they did not need to be finalized right away, and added that Appendix 1 was mainly intended as background information for report writing.

V. USFWS

A. Leavenworth NFH Update (Bill Gale)

Bill Gale said there have already been several days of high-water temperatures (70 degrees Fahrenheit) at Leavenworth NFH. He noted that this high-water temperature condition has occurred in the past, but this year the high temperatures have occurred earlier in the year. He said there is concern regarding juveniles on station, and as flows reduce from Icicle Creek, the hatchery may lose its groundwater source. He said USFWS is closely tracking the situation. He said the hatchery is drawing water from Snow and Nada lakes 1 month early to

help increase flow and decrease temperature in Icicle Creek. He said use of reservoir water has already decreased water temperature at the hatchery; however, those reservoirs may not refill depending on precipitation. He said USFWS also received authorization from Ecology and the Environmental Protection Agency to discharge a portion of, or all, effluent to the hatchery channel (opposed to the normal point of discharge) to recharge the aquifer. He said he believes the adult brood on station can be carried to spawning; he just hopes there are no issues with *columnaris*. He said USFWS opted not to perform an emergency fish release.

VI. Joint HCP Hatchery Committees/PRCC HSC

A. Review of the “Evaluation of Hatchery Programs Funded by Douglas County PUD 5-Year Report 2006-2010” – Methow Spring Chinook Objectives 2, 5 (Catherine Willard)

Catherine Willard shared a presentation titled “Review of 5-Year Hatchery M&E Report – Methow Spring Chinook Salmon” (Attachment C), which Sarah Montgomery distributed to the Hatchery Committees following the meeting on July 15, 2015. The presentation was organized by Hatchery M&E Objective and by stock. Hatchery M&E Objectives addressed Objective 2 (migration timing, spawn timing and redd distribution), and Objective 5 (stray rates). These objectives were reviewed for each Methow spring Chinook salmon program (i.e., Twisp, Chewuch, and Methow). Questions and comments were discussed as follows:

Objective 2: Twisp Migration Timing (Slide 4 of Attachment C)

Mike Tonseth asked if migration timing is still an issue, and Andrew Murdoch said it is not. Tonseth asked if the next 5-year report will have some values where data were not yet available in the previous report, and Murdoch said he believes so. Murdoch added that he does not believe there has been a big difference in migration timing.

Objective 2: Twisp Redd Distribution (Slide 6 of Attachment C)

Tracy Hillman asked if low run size was the reason why there appeared to be a relatively large difference in NOR and HOR redd distribution in 2006. Murdoch said he is not sure, but noted that during that time, sample size in the spawner surveys was a problem.

Objective 2 (General Comments)

Hillman asked if there are any concerns or items that should be flagged for future discussion under Objective 2. The following were discussed:

Keely Murdoch said spawner distribution in the Methow Basin is a problem that needs to be addressed. She noted that last year, the Hatchery Committees approved the Goat Wall Evaluation Study, which is addressing this; at this time, no action is needed until that study is underway. She said she does not believe additional studies are needed unless the Hatchery Committees want to discuss adult management plans.

Bill Gale noted that the years reviewed in this presentation were years when there was no adult management. He said now, with HORs being removed, the numbers should be better. He added he believes there should be a significant net improvement in productivity in the basin.

Tonseth noted the downstream shift in mean spawning location for NORs, as depicted in Figure 49 on Slide 14 of Attachment C. Gale asked if there might be some other explanation why in later years NORs were further downstream. Tom Kahler suggested tracking this. Kirk Truscott questioned whether the evaluation of spawning location is proportional. He suggested this may not be an environmental issue; rather, it may be the product of NORs spawning lower in the basin. He asked if there are corresponding data for NORs in the upper basin. Hillman noted that the y-axis only shows river kilometers (rkm) ranging from 80 to 120 rkm. He said if the axis showed rkm ranging from 0 to 120 rkm, these data points would look like a horizontal line suggesting little trend in spawning distribution. He said it seems significant because of the way the figure was developed.

Andrew Murdoch said regarding the Wenatchee Basin, and the Relative Reproductive Success (RRS) Study, at the tributary level, there are different patterns between HORs and NORs. He said in areas of similar spawning distribution of HORs and NORs, there is no difference in RRS; however, overall reproductive success of hatchery fish is lower. Keely Murdoch said the report speculated that the similar RRS could be the result of lower overall densities in the White and Little Wenatchee rivers. She added that the overall reduced survival was the result of known low survival rates through Lake Wenatchee, rather than similar spawning distribution. Andrew Murdoch said everything is measured at the Lower Wenatchee River, so there is a lake effect. He added that in the Upper Wenatchee River

there is a habitat issue, and in the White River there is a lake issue. He said habitat and genetic effects need to be separated. He said in the Chiwawa Basin, HORs are spawning in suboptimal habitat in the lower river, but their adult progeny move upstream to spawn, resulting in a different distribution than their parents, which is slowly biasing productivity estimates. He questioned whether this is happening in other locations.

Objective 5: Twisp Summary (Slide 21 of Attachment C)

Gale asked about the stray rate target of 5%. Hillman explained that the current criteria were established by the Interior Columbia Basin Technical Recovery Team and included in the Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan. These criteria indicate that fish that do stray to non-target independent populations should not comprise greater than 5% of the non-target spawning population, and fish that stray into non-target spawning areas within a population should not comprise greater than 10% of the non-target spawning aggregate.

Objective 5: Chewuch Summary (Slide 26 of Attachment C)

Gale said with regard to Andrew Murdoch's question about whether what is happening in the Wenatchee Basin is happening elsewhere, this does not seem to be the case in the Methow River. Keely Murdoch noted that there is a strong attraction back to the Methow River. She added that the Wenatchee River is different because fish are not reared in the Wenatchee River; rather, they are reared at Eastbank FH and overwintered at the Chiwawa Facility. Tonseth said early rearing at Eastbank FH may be the reason for high stray rates into the Entiat River. Gale questioned whether progeny of HORs will return to the Chewuch River. Andrew Murdoch said this has not been observed in the Wenatchee pedigree data. He said progeny of HORs in the Chiwawa River may stray from their natal locations due to parents spawning in suboptimal habitat. He hopes adult progeny of fish spawning in the lower Chewuch River will spawn in the upper Chewuch River. He said the Upper Wenatchee River is a similar example, where the habitat is so poor, the few surviving adult progeny go elsewhere to spawn.

Objective 5 (General Comments)

Willard asked if there are any concerns to flag regarding Objective 5. The following were discussed:

Tonseth said the opportunity exists to test alternative techniques to evaluate site fidelity, such as eyed-egg-imprinting and side-by-side evaluations.

Truscott said it is a problem if NORs are removed for programs and they are not returning to the tributaries of origin. Keely Murdoch agreed and suggested flagging this objective for further discussion. Truscott added that he is also concerned with the return rates to Methow FH, notably juveniles of NOR parents.

Gale said Methow spring Chinook salmon are different than Wenatchee spring Chinook salmon in that the hatchery population is not tributary-specific; rather, they are Methow composites (MetComp). He said he is not sure whether there are two populations at this point. He said it would be optimal to get more fish in the Chewuch River and better quality habitat, but it seems this is being viewed as if fish are being removed. He added that fish are not being removed from the Chewuch River; rather, they are not going into the Chewuch River. Keely Murdoch disagreed with Gale, noting that although MetComp is one population. She said the purpose of Chewuch River releases is to supplement the Chewuch River. Gale said he largely agrees; however, the discussions for Objective 5 imply that fish are straying when they are really returning. He clarified that the Hatchery Committees want more fish in certain locations. Tonseth noted that if the goal is to supplement the Chewuch River, there is no benefit if all the fish go to the Methow River. Tom Kahler said the Hatchery Committees also need to determine how many fish should be returning to the Chewuch River; and Gale added also what is feasible. Mackey said that number needs to be within the management goals (e.g., pHOS and spatial distribution). Gale suggested adult outplanting, where HOR adults are outplanted in the Chewuch River at an acceptable pHOS level, and hoping their progeny return to the Chewuch River; Tonseth said this can be tested. Hillman noted the importance of obtaining input from Craig Busack to align with other regulatory functions. Hillman also suggested the importance of sequential imprinting on where fish tend to home.

How Spawner Distribution Affects Productivity and Reproductive Success (Slide 42 of Attachment C)

Keely Murdoch reviewed quotes from the Chiwawa RRS Study. She said the study includes empirical data explaining why spawning distribution is so important to productivity and RRS. She said the study showed that spawning location for females accounted for a fair amount of difference in RRS when using spawning habitat as a covariate.

Ford et al. 2013 (Slides 43 to 44 of Attachment C)

Keely Murdoch said Andrew Murdoch was referring to this study while discussing RRS in the Wenatchee Basin.

Ford et al. 2009 (Slide 45 of Attachment C)

Keely Murdoch said the far right column of Table 9 represents RRS, which she believes illustrates the importance of having equal spawning distributions. She said she believes low RSSs in the Wenatchee system are due to predation on fish moving through Lake Wenatchee, which is consistent with other studies.

Hillman said next month, the Hatchery Committees will review Hatchery M&E Objectives 3, 6, and 8.

VII. HCP Administration

A. Next Meetings

Tracy Hillman asked if anyone anticipated additional joint HCP Hatchery Committees/PRCC HSC items to discuss at next month's meeting. None were identified.

The next scheduled Hatchery Committees meetings are on August 28, 2015 (Chelan PUD), September 16, 2015 (Douglas PUD), and October 21, 2015 (Chelan PUD).

List of Attachments

Attachment A	List of Attendees
Attachment B	Carrying Capacity of Spring Chinook and Summer Steelhead in the Methow River Basin, Washington

Attachment C Review of 5-Year Hatchery M&E Report – Methow Spring Chinook
Salmon

Attachment A
List of Attendees

Name	Organization
Tracy Hillman	BioAnalysts, Inc.
Kristi Geris	Anchor QEA, LLC
Sarah Montgomery	Anchor QEA, LLC
Catherine Willard*	Chelan PUD
Greg Mackey*	Douglas PUD
Tom Kahler*	Douglas PUD
Todd Pearsons	Grant PUD
Bill Gale*	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

†† Joined for joint HCP Hatchery Committees/PRCC HSC item