

Memorandum

To: Wells, Rocky Reach, and Rock Island HCP Hatchery Committees, and Priest Rapids Coordinating Committee Hatchery Subcommittee Date: November 21, 2022

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

cc: Larissa Rohrbach, Anchor QEA, LLC

Re: Final Minutes of the October 17, 2022, HCP Hatchery Committees and PRCC Hatchery Subcommittee Meetings

A special virtual meeting of the Habitat Conservation Plan Hatchery Committees (HCP-HCs) and Priest Rapids Coordinating Committee's Hatchery Subcommittee (PRCC HSC) was held by WebEx on Monday, October 17, 2022, from 1:00 p.m. to 2:00 p.m. Attendees are listed in Attachment A to these meeting minutes.

I. PRCC HSC

A. Brood Year 2021 Methow Summer Chinook Early Release

Rod O'Connor summarized that issue; the juvenile summer Chinook Salmon being discussed today are currently being reared at Eastbank Hatchery. They need to be transferred off station this week. Typically, they would be transferred to Carlton Acclimation Facility (Carlton AF) to overwinter and would be released as yearlings to the Methow River. On October 11, 2022, Grant PUD informed the Committees by email of a recommendation from fish health professionals to release fish immediately as subyearlings to designated waters because of an increase in mortality due to bacterial kidney disease (BKD) in this group. The email included documents that summarized recommendations from Doctors Betsy Bamberger (Douglas PUD) and Megan Finley, WDFW (WDFW), including Finley's pre-transfer exam report and a request from Douglas PUD to Grant PUD dated April 24, 2019, that they change their water source to alleviate the gill issues observed in the past (Attachment B).

Bamberger said the memorandum (memo) distributed last week summarized Finley's findings as part of her pre-transfer examination. Currently, the daily mortality rate is relatively low; however, the prognosis of BKD (with its history in this region) is poor enough to recommend that the subyearlings not be moved to Carlton AF as planned. The concern is that the move would cause so much stress that mass mortality would occur immediately following the transfer and throughout the winter until release in April. The memo describes why immediate release is preferred; even if released as subyearlings, the Chinook Salmon would likely experience higher survival overall in the wild outside of a hatchery setting. The memo also listed reasons why Carlton AF is a fish health facility of concern. There have been gill issues due to surface water exposure that have somewhat been resolved by

delaying exposure to surface water until February, with weekly increases in surface-water proportion from February until April. Gill issues tend to increase until release in April, and fish tend to be released successfully, but the additional stressor of BKD created a concern that mortality would increase. Bamberger and Finley share the same opinion that for the best welfare of the fish, they should be released now and avoid the transfer to Carlton AF altogether. Fish should be released to appropriate waters, which is a discussion for the HCP-HCs and PRCC HSC.

Keely Murdoch asked for confirmation that there is no option to keep these fish at Eastbank Hatchery longer. Ian Adams (Chelan PUD) said they can hold fish for a couple of weeks longer at most, but then would need that space for other programs.

Murdoch asked what would happen if half of the fish were released, and then the remainder were held and treated to see if they would stabilize after giving them time to respond. Bamberger said a reduction in stocking density is not likely to lead to a change in the clinical manifestation of BKD because it is unlikely to be curative when the bacterial infection has been already initiated. There is no treatment for BKD; there are only treatments for secondary infections or strategies to reduce horizontal transfer to healthy fish in the cohort. Finley said currently the density index is already low at 0.07 (high densities are considered .25 to .3), and she was not sure there would be any benefit from further reduction in densities.

Brandon Kilmer said if they were to hold those fish at low densities until April, there may be low mortality until smoltification, but then there is likely to be a high mortality event that would trigger an early release at that time. Crowding, hauling, and switching to a new water source at Carlton AF will exacerbate that mortality.

Bill Gale asked if the daily mortalities have increased in the past two weeks since Finley's survey, noting there were still fairly low levels two weeks ago. Finley said they are losing about 10 fish a day, and numbers will go up with transfer to Carlton. Although mortality has been low, the longer they are held, the higher the rate of horizontal transfer and mortality is likely to increase. Gale asked if they were moved, would they put other production at risk at Carlton AF? Bamberger said they would be the only fish at Carlton AF, but the staff at Carlton also work part time at Methow Fish Hatchery on spring Chinook Salmon, so there is some risk of transfer between facilities, although biosecurity measures are strong.

Gale said he has two concerns about the early release: 1) the release being considered would not occur in the place the production is planned for and 2) he is not aware of an October release contributing to production in any measurable way in terms of returning adults.

Mike Tonseth said he is also not aware of information that would suggest that a late fall subyearling release would result in any substantial adult returns and has trepidation about releasing them without attempting to do anything else. Based on our permits, there is only one watershed where the

fish are allowed to be released and that is the Methow Subbasin either as a direct release into the Methow River for an early release, or from Carlton AF at a subsequent date. Either way, they will still be exposed to the transport stressor. Our permit conditions prevent us from releasing fish unless disease levels are at an emergency level, which is an "epizootic" level. Finley asked what the permit defines as an epizootic level. Tonseth said he would look at the related biological opinion (BiOp), but it would be a significantly higher level than it is now. Bamberger said the term epizootic is highly subjective; fish health's recommendation is based on the diagnosis of BKD and the upcoming stressors, which include not just the transfer but also the daily feeding, monthly maintenance, tagging, and any other expected actions. Bamberger said that the current recommendation is not solely based on what the daily mortality is now but rather looks toward the future and the challenges these fish will surely endure. To avoid substantial loss, the fish need to be released now. Bamberger said she would hope that fish health's clinical assessment would take precedence over language in a BiOp document. If these fish were forced to limp across the finish line in April, they would be drastically altered, in poor condition, and likely contribute to reduced returns. It's no longer expected that these fish would return at a normal rate. Tonseth said language further down in the permit allows for early release given an expectation of a catastrophic mortality event; and early release should be entertained based on language in the permit.

Farman said he also does not know what the definition of epizootic level is defined as without looking at the BiOp but agrees with Tonseth that it does not appear to have reached that level. Farman said he does not want to get hung up on definitions of epizootic or emergency in permits; the permit has flexibility when these types of problems arise. National Marine Fisheries Service (NMFS) tends to go along with recommendations of fish health professionals as well. Farman said he understands the concern with the transfer but is uncertain what would be gained by releasing fish from a location outside of the Methow Basin.

Tracy Hillman said subyearling releases used to occur from Turtle Rock (near Eastbank Hatchery); the practice was discontinued with BY 2009 due to lower returns compared to yearling releases based on smolt-to-adult return rates. Gale said those releases were not done in October, and migration through the hydro-system may be poor in October and November; Tonseth said they were June releases at 50 fish to the pound. Tonseth said the natural population does this all the time; approximately 70% of the wild fish leave the Twisp River in the fall to find overwinter habitat, and no one knows for sure where they go. Hillman said work from the 1980s showed fish were observed leaving the Wenatchee around 75-80 mm in October and November; however, whether their survival is any better than fish that do move downstream is unknown.

Kilmer said another stressor is that the main channel of the Methow River has moved away from the Carlton AF, so if a larger outbreak were to trigger an early release, it would entail crowding and pumping fish to a truck for transport to an offsite release location because there is no flow adjacent to the acclimation facility until April.

Tonseth said, regarding the option to direct release these summer Chinook Salmon into the Methow River now, Endangered Species Act (ESA)-listed spring Chinook Salmon from the Twisp and Methow rivers would likely be redistributing throughout the system at the same time. The release could create more than one type of negative interaction with ESA-listed fish because, as hatchery subyearlings, they are substantially larger than wild subyearlings, and they are likely to comingle with the ESA-listed species. Tonseth asked Farman what NMFS's position would be on that potential risk. Farman said, regarding the number of interactions at this life stage, he doesn't know if it is a major issue. Hillman said if the behavior in the Methow is anything similar to what is observed in the Wenatchee, the ocean-type Chinook (summer Chinook Salmon) tend to move out of the mainstem into the Columbia River in the fall and vacate habitat that then tends to become occupied by spring Chinook Salmon. So, there could be the potential for interaction between summer and spring Chinook Salmon and steelhead, given that these fish are all seeking concealment cover in the winter. Farman said he would have to think about what the limiting factors for that habitat would be. It is a concern whether these fish could spread out and find an area where they are not in as much competition, but he is not sure what to conclude without knowing the specific area. The BiOp did not really address competition for that area; it may be that biologically, it is not a major concern, and he was unsure about the coverage for that because it was not addressed specifically in the BiOp. Farman said he is not as concerned about the risk of disease transmission in the wild because of spacing across the habitat and cold temperatures.

Hillman asked Kirk Truscott if he has any thoughts. Truscott said an emergency release of summer Chinook from Similkameen Pond in the Okanogan Subbasin was necessary at the end of last December, and they did not see many passive integrative transponder (PIT) tags leaving the river the following spring, but the fish were severely compromised prior to release, so that is not an apples-to-apples comparison. There may be less predation on the summer Chinook Salmon if they are released early into the Methow River compared to if they were released into the Columbia. To release fish from Eastbank Hatchery into the Columbia River, there would need to be some level of concurrence from NMFS that is inconsistent with permit conditions.

Tonseth said regardless of the action taken, there will be no positive outcome for these fish. Gale agreed that this population is going to have a big loss regardless of which of the distasteful options are taken.

Tonseth said these fish are not PIT tagged (PIT tagging was scheduled for the spring), so there will be no PIT tag records to make some juvenile-based outmigration assessment, and he would not be inclined to support the additional stressor of PIT tagging if they were held until spring.

Murdoch said her concerns have been adequately addressed by Bamberger and Finley.

Farman said NMFS's concern would be around where these fish would return, depending on what their survival would be. Farman asked if fish need to be transported to be released from

Eastbank Hatchery anyway. Adams confirmed they do not have the ability to direct stream plant fish into the Columbia River from Eastbank Hatchery. Farman asked if these fish would have to be crowded and trucked anyway, why couldn't they be released into their intended destination? Kilmer said a direct transfer from Eastbank Hatchery into the Methow River would be his recommendation. Hillman asked Finley if her recommendation was to transfer fish by truck and release them into the Columbia River, or if she was leaving it to the Committee to determine the release location. Finley said she is understanding that the only option could be in the Methow River; her recommendation is that they need to be released now.

Tonseth said he is not sure WDFW could support releasing the fish into the Columbia River but would probably support release into the Methow River because even though they are not listed, they are the progeny of natural-origin parents. Tonseth said he would advocate for the release site to be at the town of Carlton because there is a boat ramp to facilitate access to the river. Farman said he is in agreement that his preference would be to release them into the Methow River, at the location where they are intended to be, and he did not anticipate that they would be released elsewhere.

Gale asked if the entire lot is currently in a single pond and if all of the raceways are displaying the same levels of mortalities. Finley said all 200,000 are in the same super raceway. Gale said he likes the idea of hedging bets by releasing half and holding half through the winter, based on real doubts that releasing fish now will contribute anything to adult returns, but said he hasn't made a final decision.

Rod O'Connor thanked everyone for the discussion, thanked Bamberger and Megan for sharing their positions, and noted that Grant PUD's position has been to follow the fish health recommendations.

Tom Kahler said the fish are not Douglas PUD's program, but it is Douglas PUD's staff operating the Carlton AF, so it puts Douglas PUD in a difficult position if they were to be transferred to Carlton AF and then require an emergency release later in the season. If the fish are transferred to Carlton AF, Douglas PUD would want the Committees to consider what would trigger an emergency release from the facility ahead of time to allow Douglas PUD to plan for it and some predetermined strategy describing what would be done as a contingency if catastrophic losses were to occur. They cannot be kept on groundwater for the full extent of the rearing. Kahler said otherwise, his position would be to follow the fish health recommendations.

Truscott asked if representatives are leaning toward crowding the fish up, loading them into trucks, then releasing them into the Methow River.

Hillman summarized the following two options based on today's discussion:

1. Release all fish into the Methow River now at the town of Carlton.
2. Release half of the fish into the Methow River now and hold half at Carlton AF through the winter.

Truscott asked what the rearing density would be for the full 200,000 fish at Carlton AF if reduced by half or one-third of the loading density. Kilmer said at 15 fish to the pound and approximately 215,000 fish, rearing density would be 0.08 for full population, so 0.04 for half the population, but the BKD stressor would still occur; those low densities work when BKD hasn't broken out. Once BKD has broken out, adjusting densities won't stop the disease.

Gale asked if at the Carlton AF facility a pump could be run with enough flexible hose to reach from the facility to the Methow River main channel during low flows. Kilmer said no, there is not enough hose to reach the main channel (which is at least 300 yards away), and he has never pumped fish that far and would not advise that crowding and pumping of fish. It would be less stress at that point to short pump them onto the truck and release them at the town of Carlton. Kilmer said the main channel of the Methow has gone to the far bank. There is minimal flow in the side channel, which is currently a dead end, and the fish would have to swim upstream to find the main channel. The pipe would have to go downhill and uphill to reach the main channel, and it is not something he would recommend. Gale said he is pretty certain fish are pumped that far to the Icicle Creek main channel at Leavenworth National Fish Hatchery without issues. Kahler cautioned that an emergency release from the Carlton AF during the winter with snow and a potentially frozen river would not resemble conditions at Leavenworth in April, and he is concerned about the risks to both fish and hatchery personnel.

Hillman asked if members would be ready to make a decision on the proposal to release all 200,000 fish at the town of Carlton this week.

Farman said he would agree with that proposal. Farman said he is not opposed to holding on to some fish, but hearing what Kilmer and Bamberger are saying, not much would be gained with the lower rearing density. If the intent was to hold them to PIT tag them, holding them at low densities may not improve their survival.

Murdoch said about 10 days of rain starting at the end of this week is forecasted. It might be helpful to wait for that rain and for the flows and turbidity to increase to provide cover for the fish.

Murdoch said she would still like to think about the decision. If all fish were trucked, and some were split to Carlton AF and some directly released, it seems that they should all be trucked at the same

time to avoid multiple handling events. Murdoch said she supports waiting until next week for the rain event. Fish tend to move around more when there is a pulse in the flows, and perhaps that could help move fish out of that occupied habitat.

Tonseth said a direct release now is not desirable, but the fish are as healthy as they are going to be; they are not going to get better. Tonseth said he would support the proposal on the table to release all fish now, and his preference would be a direct release in the Methow River, but he supports waiting for a little more water in the river if possible.

Tonseth said accompanying the rain is a fairly strong cold front and asked Findley what type of tempering period would be needed if fish were released next week. Findley said current temperatures at Eastbank Hatchery would be about 56°F and rising. Adams said the increase would be negligible over the next week or two. Kilmer said the Methow River is currently 50.2°F. Tonseth said the temperature in the Methow River would drop more rapidly with a few cold nights and days with rain by about 15°F. Findley said it should be considered whether it's better to release now with a smaller temperature difference. Murdoch said we would not know how quickly flows would increase, but a little bit of turbidity might help.

Farman said, regarding the temperature delta between the locations, to defer to the people who will do the work. Between the options of releasing all fish or holding some, he was leaning toward releasing all.

Truscott said, given the circumstances, he could support release of the whole group at the town of Carlton and would like to see the temperature differential as small as possible and loading the trucks as light as possible. Kilmer said the fish usually would require 8 loads, depending on number of drivers, over 2 to 3 days for about 700 pounds of fish. Adams said the truck have 2,000-to-3,000-gallon tanks.

Gale said he could agree with the proposal but would prefer to wait for some rain early next week. Gale proposed continuing to think about the issue until Wednesday's regular HCP-HC and PRCC HSC meeting.

O'Connor said he could support waiting to make a decision until next week to release fish. O'Connor suggested considering releasing them this week in anticipation of the upcoming weather change to let the temperature change happen for the fish in the natural environment.

Hillman summarized that the decision on the table was to move the fish from Eastbank Hatchery to be released at the town of Carlton with a preference for releasing them closer in time to the rain event but before there is a large differential in temperature, deferring to fish health and culturists on the release logistics and how much tempering would be necessary.

Todd Pearsons said he wants to make sure that Chelan PUD has sufficient direction on this to be able to accommodate what's being discussed. Adams said Chelan PUD can adjust after knowing what day releases should start. Tonseth asked Finley what would be considered a light loading for the trucking. Findley said with staff occupied with spawning adults, it may take Monday through Friday to complete transfer of the fish. Deanne Pavlik-Kunkel noted that the transfer was planned for Wednesday of this week. Murdoch suggested planning on starting the release early next week because of this balance between flows increasing and temperature decreasing. Adams said additional fish do need to be moved off station by the week of October 31; next week would be a good week for Chelan PUD.

Hillman asked all PRCC HSC representatives if they could support release of all of the brood year 2021 Methow summer Chinook Salmon directly into the Methow River at the town of Carlton starting on Monday October 24, 2022, and all representatives agreed.

Truscott asked if these fish were progeny of adults with low and below-low BKD levels. Hillman noted this is the first time this has come up with this group and asked if there was anything that could be done in the future to minimize this issue. Tonseth suggested carrying the discussion about emergency release measures to Wednesday's meeting to identify what options are available on an emergency basis in the Methow Basin. Pumping and trucking is never going to be the best option.

II. Administrative Items

A. Next Meetings

The next regular HCP-HCs and PRCC HSC meetings will be held on Wednesday October 19, 2022; Wednesday November 16, 2022; and Wednesday December 22. The October 19 meeting will be held in person at Douglas PUD's auditorium with a WebEx virtual attendance option.

B. List of Attachments

Attachment A List of Attendees

Attachment B Recommendations and Supporting Documents for Early Release of BY 2021 Methow Summer Chinook

**Attachment A
List of Attendees**

Name	Organization
Larissa Rohrbach [°]	Anchor QEA, LLC
Tracy Hillman [°]	BioAnalysts, Inc.
Ian Adams [°]	Chelan PUD
Scott Hopkins ^{*°}	Chelan PUD
Catherine Willard ^{*°}	Chelan PUD
Kirk Truscott ^{*‡°}	Confederated Tribes of the Colville Reservation
Betsy Bamberger [°]	Douglas PUD
Tom Kahler ^{*°}	Douglas PUD
Brandon Kilmer [°]	Douglas PUD
Rod O'Connor ^{*°}	Grant PUD
Todd Pearsons ^{*°}	Grant PUD
Deanne Pavlik-Kunkel [°]	Grant PUD
Tim Taylor [°]	Grant PUD
Brett Farman ^{*‡°}	National Marine Fisheries Service
Megan Finley [°]	Washington Department of Fish and Wildlife
Mike Tonseth ^{*‡°}	Washington Department of Fish and Wildlife
Keely Murdoch ^{*‡°}	Yakama Nation
Bill Gale ^{*‡°}	U.S. Fish and Wildlife Service

Notes:

* Denotes HCP-HCs member or alternate

‡ Denotes PRCC HSC member or alternate

° Joined by Webex

Attachment B

Recommendations and Supporting Documents for Early Release of BY 2021 Methow Summer Chinook



Public Utility District No. 1 of Douglas County

1151 Valley Mall Parkway • East Wenatchee, Washington 98802-4497 • 509/884-7191 • FAX 509/884-0553 • www.douglaspu.org

MEMORANDUM

To: Eric Lauver (Grant PUD)
Todd Pearsons (Grant PUD)
Rod O'Connor (Grant PUD)

From: Dr. Betsy Bamberger (Douglas PUD), Fish Veterinarian
Dr. Megan Finley (WDFW), Senior Aquatic Veterinarian

Date: October 6, 2022

RE: Recommendation for immediate release of Grant PUD's Methow Summer Chinook Program from Eastbank Fish Hatchery to designated waters

Public Utility District No. 2 of Grant County's (Grant PUD) Methow Summer Chinook program consists of approximately 200,000 smolts spawned and reared at Eastbank Fish Hatchery (EFH) until transfer for acclimation and eventual release at the Carlton Acclimation Facility (CAF). Grant PUD has contracted Washington Department of Fish and Wildlife (WDFW) and Public Utility District No. 1 of Douglas County (Douglas PUD) to operate EFH and CAF, respectively, to assist with their fish mitigation obligations. The 2021 Methow Summer Chinook broodstock were spawned in the fall of 2021; their progeny, now juveniles, are scheduled to be transported from EFH to CAF the week of October 17th. These fish are to remain at CAF until their ultimate release into the Methow River in early-to-mid April of 2023.

On September 29, 2022, a fish health report was written by Dr. Finley (WDFW) as part of a routine pre-transfer inspection of the Summer Chinook program at EFH. The disease assessment included a primary diagnosis of bacterial kidney disease (BKD) along with secondary external bacterial coldwater disease (BCWD) (see Attachment 1). It was also observed that recent mortality had been progressively increasing over the last three weeks. These results were relayed to Dr. Bamberger (Douglas PUD) via personal communication later that day.

Endemic to the Columbia Basin, BKD has long been considered one of the most devastating bacterial diseases affecting wild and propagated anadromous salmonid stocks in the Pacific Northwest. BKD can cause both acute and chronic morbidity and mortality, but it typically presents as a persistent disease condition precipitated by stress. Currently there is no effective treatment for BKD, making it a particularly intractable and serious fish health concern that can amount to considerable losses of stock.

In view of this recent diagnosis, WDFW and Douglas PUD fish health recommends that the Methow Summer Chinook juveniles be immediately released as sub-yearlings to avoid significant loss and degradation of the program at CAF. Although it is difficult to isolate, quantify, or otherwise predict the effects of any single factor, such as infectious disease, on fish

populations in the wild, it is generally believed that immunosuppressed and/or moribund fish have a higher likelihood of survival outside the confines of an artificial setting. Additionally, the risk of horizontal transmission is theoretically lowered if healthy fish are not forced to cohabitate with others already infected in conditions where densities are maximized. Conversely, the underlying stress associated with standard hatchery conditions that fail to properly replicate life in natural waters could, in itself, be enough to continually provoke a BKD infection already established.

If these fish were to be moved as planned, any existing clinical or subclinical BKD in the population will be exasperated by the handling, crowding, and hauling associated with transfer to CAF and the subsequent adjustment to new water chemistry, rearing vessels (which include overhead walkways), and fluorescent lighting. Routine management procedures (such as tagging and monthly inventories) would have to be strategically rescheduled or possibly avoided altogether.

The disease state of these fish could be additionally antagonized by the water source issues known to occur at CAF. Recurrent atypical gill disease, associated with exposure to CAF's surface water, has plagued previous Summer Chinook cohorts in the past, prompting Douglas PUD to propose and successfully negotiate an adjustment to water source allocation in 2019 (see Attachment 2). While these changes to rearing conditions have proven effective in mitigating loss associated with gill disease, each year from February to April the gill fitness of the population gradually worsens as surface water is incrementally incorporated into the system. Fish infected with BKD would likely find this period of water source transition insufferable. Fish in poor condition but able to survive to release could find it difficult to navigate the obstacles associated with successful outmigration, including but not limited to predation, conspecific competition, changes in barometric pressure, shifts in salinity, and other secondary pathogens.

Lastly, it would be logistically challenging to formulate an emergency release plan for the Methow Summer Chinook program out of CAF assuming the mortality rate of the fish proved intolerable or catastrophic. The Methow River sustains low flows and conditions unsuitable for fish release through the fall and winter months. The fish would have to be transported to another site off-station to achieve release into the wild or remain at CAF until spring when flows returned to acceptable levels.

It is understandable to consider the current low-level mortality in this population at EFH today as relatively benign. However, the prognosis associated with BKD is poor, even in the best circumstances. The two fish veterinarians involved in the assessment of this fish program believe the risk for potential harm is unacceptably high if these fish are transferred to CAF from EFH as planned.



Washington Dept of Fish and Wildlife

2220 N Ashland Avenue

East Wenatchee WA 98802

(509) 607-6243

megan.finley@dfw.wa.gov

Fish Health Report

Case No: 858 Exam ID: 1130 Exam Date: 9/29/2022 Hatchery: Eastbank
 Season: Summer Species: Chinook Stock: MeOk/Wenat BY: 2021
 Exam Type: Transfer Mortality: Increased No. Healthy Examined 3 No. Morb Exam 3
 Life Stage: Juvenile Ave Body Condition Score : 5 Water Temp F: 53
 Score: 1-9 1=thin, 9= obese

Body Systems with problems are checked.

Gills Coelom Gastrointestinal Neuro Sensory Reproductive
 Skin Fins Hepatic Kidney / Spleen Cardiac Hematology

Stressors checked that apply

Handling/Husbandry Marking/Tagging Water Velocity Smolting Feeding stressors
 Transfer/Hauling Predation Loading/Density Parr Reversion Environmental stress

Ponds Form

Ponds Report

Pond Number	Number Fish	Daily Loss	Percent mortality	Size FFP	Flow Index	Density Index	Treated
11	212,264	23	0.011	43.00			<input type="checkbox"/>

HX/Subjective
Necropsy:

Mortality has been increasing over 3 weeks from 1-2/day to 25 today. No abnormal behavior was observed. Feed has been decreased weekly from 1.2% to 0.9% over 4 weeks. Water temperature is starting to increase.

Objective:

2 mortalities, 1 moribund (MB), 1 poor performer (PP) and 3 healthy fish were examined.

External: MB: bilateral exophthalmia, distended abdomen
 Gill: MB: anemic, heavy bacterial loads (BKD). Healthy, PP: NSF
 Skin: MB, healthy: NSF. PP: eroded tail, filamentous bacteria (BCWD)
 Internal: MB: fluid-filled stomach, gray swollen kidney

Assessment
Diagnosis:

BKD (Renibacterium salmoninarum) was found in the kidneys of 2 mortalities and 1 moribund fish, and the gills of the moribund. Healthy fish were free of significant bacteria. The poor performer had external BCWD.

BKD in this population is currently at a low level. However the numbers of mortalities has been elevating over a period of 3 weeks. The warmer water temperatures will increase the possibility for horizontal transmission of the bacteria. Ideal growing temperatures for BKD is 59-69F. As well, decreasing feed when temperatures are increasing can be an additional stressor that can increase BKD transmission.



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Fish Health Report

Treatment
Directions:

No treatment recommended at this time. Available antibiotic treatments may not be effective. High dose terramycin can reduce bacterial shedding and secondary infections but it cannot reach intracellular bacteria. Erythromycin treatment requires 28 days of medicated feed and is less palatable at lower feeding rates.

Addendum:



DEPARTMENT OF NATURAL RESOURCES

1151 VALLEY MALL PARKWAY • EAST WENATCHEE, WASHINGTON • 98802-4497 • 509.884.7191

Proposal for Water Source Adjustment During Rearing Months at Carlton Acclimation Facility

April 24, 2019

Chronic morbidity and mortality events, primarily caused by atypical bacterial gill disease and protozoan infestations, have affected overall juvenile survival at Carlton Acclimation Facility (CAF) over the last few years. Disease outbreaks (loosely defined as an occurrence of infection that results in 0.05% daily loss) have happened consistently each year, often requiring therapeutic intervention. Efforts by staff to mitigate mortality have resulted in relatively low impact on the program, with total on-site fish loss ranging from 2.0% to 11.9% annually between 2015 and 2019. The general reduction of fitness and condition in the remaining population, however, is more difficult to quantify.

Retrospective analysis of fish loss over the course of several rearing cycles does not definitively identify a predisposing event or set of conditions that contribute to elevated losses, but it does show that outbreaks occur when fish are exposed to some amount of surface water, independent of duration or seasonality. It is theorized that subtle yet meaningful factors relating to water quality parameters, high pathogen loads, and/or variable influxes of particulate matter may account for the Methow River's effect on the summer Chinook stock reared at CAF. It should be noted that spring Chinook at Methow Fish Hatchery, upriver, do not experience the same type and severity of mortality as that observed at CAF, despite both fish stocks sharing a water source (except the Twisp and Chewuch rivers enter the Methow downstream of Methow Hatchery but upstream of CAF). Differences between facilities, rearing practices (including egg incubation and incidence of juvenile transfer), and environmental conditions may explain this disparity. Brood year 2013 spring Chinook reared at CAF maintained good health with only 0.4% total mortality while summer chinook held simultaneously displayed poor health and high mortality (sustaining approximately 5.7% total loss). These two pieces of information suggest that spring Chinook are not particularly susceptible to the health issues that summer Chinook regularly endure at CAF.

Over the past few years, the use of surface or ground water has varied depending on river conditions and access to the on-site well. Generally, fish are first introduced to well water upon arrival at CAF in mid- to late-October. River water is then scheduled to be gradually introduced into the system beginning December 1st until release in mid-April.

Douglas County PUD would like to propose the following change to the water use schedule:

October 15th – February 1st: 100% well water

February 1st – March 1st: Transition from well water to surface water (25% shift per week)

March 1st – Mid-April (Release): 100% surface water

It is felt this strategy will minimize the risk of elevated mortality associated with use of river water while still allowing a reasonable opportunity for spring imprinting. Well water, at approximately 52 °F, is on average warmer than surface water during the winter, requiring a greater amount of feed to be given to accommodate the fishes' increased metabolic rates over the winter. Thus, a larger fish is anticipated at

release (14 fish per pound or bigger is projected) if the size on arrival from Eastbank Fish Hatchery remains 35 fish per pound.

Douglas County PUD strives to produce the healthiest fish possible at CAF without sacrificing program goals. We appreciate Grant County PUD's consideration of this proposal.