



Priest Rapids Coordinating Committee Meeting

In person at Wanapum Dam, HOB Room 107 and Webex
Tuesday, September 26, 2023
2:00 p.m. to 3:45 p.m.

Meeting Minutes

PRCC Representatives and Alternatives

Curt Dotson, Tom Dresser (Alt), GPUD
Kirk Truscott, Casey Baldwin (Alt), CTCR
Tom Lorz, CTUIR
Scott Carlon, Justin Yeager (Alt), NMFS

Bill Gale, USFWS
Chad Jackson, Andrew Murdoch (Alt) WDFW
Keely Murdoch, Brandon Rogers (Alt), YN

Meeting Attendees

Larissa Rohrbach, Anchor QEA
Bryan Nordlund, Facilitator (Online)
Tom Lorz, CRITFC (Online)
Kirk Truscott, CTCR (Online)
Curt Dotson, GPUD
Tom Dresser, GPUD
Rod O'Connor GPUD
Scott Carlon, NMFS (Online)

Tim Taylor, GPUD
Nathan Buck, Wanapum (Online)
Chad Jackson, WDFW
Andrew Murdoch, WDFW
Keely Murdoch, YN
(Online)

Action Items

- C. Dotson will issue the handling and holding protocols to Grant PUD's Draft 2025-2027 Smolt Survival Study Plan (Appendix C of the plan) for review by the PRCC.
- T. Lorz will compile and provide feedback from CRITFC on Grant PUD's Draft 2025-2027 Smolt Survival Study Plan, focused on lessons learned from the Snake River and Lower Columbia River studies.
- L. Rohrbach will distribute materials from past workshops to the PRCC.

Review Items

- Grant PUD's Draft 2025-2027 Smolt Survival Study Plan (V7) was distributed on September 25, 2023.

Decisions and Approvals

- None.

I. Welcome, Announcements and Agenda Review

- No changes to the agenda were requested, and the PRCC approved the agenda.

II. Meeting Minutes Status

- The August 22 PRCC meeting minutes were distributed by email on September 12, with revisions due by September 22. They were approved in the meeting by Representatives in attendance, and by USFWS by email following the meeting.

III. Action Items Review

- *B. Nordlund will determine whether WDFW's presentation of a memorandum on wild smolt survival should be presented as a joint topic for the next HCP-CC and PRCC meetings.*

Grant PUD staff joined today's HCP-CC meeting for a joint presentation of the concepts in WDFW's wild smolt survival memorandum.

- *Grant PUD will report the number of fish mode starts and stops prior to December 31, as required by PRCC SOA 2022-03.*

C. Dotson said he would complete this before the end of the year.

IV. Wild Smolt Survival

A memorandum authored by A. Murdoch on "*Wild Spring Chinook Smolt Survival*" (wild Chinook survival memo) was distributed to the PRCC on August 11, 2023. The concepts and key points were presented by A. Murdoch earlier in the day jointly with the HCP-Coordinating Committee, Grant PUD's PRCC representatives, and PRCC facilitators. The purpose of the memo was to suggest approaches for using of PIT tag detection data from fish tagged in tributaries and PIT or acoustic-tag detection data from mainstem survival studies to evaluate differences between survival of hatchery-origin and wild Chinook salmon. The discussion below follows from that presentation of the memo.

C. Dotson shared questions and comments regarding the suggested analytical approach.

C. Dotson asked how long PIT tagged hatchery-origin fish are typically held after tagging and whether they are released at much later date, which would mean that tag loss and tagging-related mortality would take place in the hatchery ponds and not "observed" as smolt mortality in comparison to a scenario where the same incident

takes place in the river? A. Murdoch said juveniles are held from weeks to months after tagging in hatcheries. C. Dotson said, for Grant PUD's 2003 to 2005 survival study, fish were PIT tagged and held in large ponds for weeks to observe tag loss, but PIT tag expulsion can also happen later. He said that losses due to tag expulsion or damage (counted as "mortality"), or handling mortalities would be observed for wild fish tagged and released back to the river within hours or a day, whereas "mortality" associated with the tagging would be "filtered" out of the hatchery-reared population. C. Dotson said wild fish would be tagged then released into a more dangerous environment, stay in the tributary for a longer duration of time until they start their mainstem out-migration, and experience high mortality from predators compared to tagged fish held in a hatchery where they are mostly protected from predation until they are ready to be released at peak time for out-migration – thus the hatchery fish are in a more "dangerous environment" for a much shorter duration compared to the a tagged wild smolt in the river system. A. Murdoch said that wild fish tagged in tributaries are typically held for approximately 24 hours after tagging and released at dusk in protected areas near the shoreline to reduce predation risk. He agreed that numbers of subsequent detections could be biased low for wild fish because of tag loss. He said there could be many biases observed when comparing survival of hatchery-origin versus wild juveniles in the first reach (in tributaries, before encountering downstream or mainstem Columbia River detection points). When analyzing data for the memo, hatchery releases were paired with wild fish samples from the same tributaries to account somewhat for these differences.

A. Murdoch agreed there are large differences between hatchery-origin and wild fish in outmigration timing, duration, and behavior which influences their experience in the tributary environment. However, the survival differences persist for the reach between Rocky Reach Dam (RRD) to McNary Dam (MCN). C. Dotson noted that wild fish could have traveled at different times and for different durations compared to hatchery-origin fish in this mainstem reach as well, affecting their survival differently. A. Murdoch said differences in survival are likely related to behavior, which is driven by size, arrival time to the mainstem Columbia River, and passage rates, resulting in different behavior at each project. He said there may be opportunities to learn something from existing data, and his purpose is to propose a data mining exercise to look for a signal. There is a wealth of information across the PUD and Federal survival studies to leverage.

A. Murdoch said regarding sample size of PIT tagged wild fish, over 1,000 wild fish may be tagged in tributaries in a given year. When analyzing wild fish, an increase in sample size increases precision which is reduces uncertainty associated with survival estimate, but does not necessarily change the survival estimate itself.

C. Dotson asked if A. Murdoch is suggesting that PIT tag detections be used to look at passage selection. A. Murdoch said he is proposing to leverage acoustic tag study data from individual fish, and potentially pool data across studies and dams, to look for patterns within the existing data without having to tag a lot of wild fish. As additional data from studies and hatchery releases is incorporated, we can look for relationships with certain variables such as fish length and condition factor, given a certain amount of variability in these factors. A. Murdoch said he is unaware of anyone who has done this type of evaluation; perhaps there are no relationships that emerge, but perhaps there are some variables that help explain those relationships.

C. Dotson asked, regarding marine survival measured as smolt-to-adult return back to Bonneville Dam, whether there are fishing regulations that bias results due to retention of hatchery adults and release of wild fish. A. Murdoch said the only place Upper Columbia River Chinook salmon could be caught in terminal fisheries would be in the Buoy 10 fishery (in the lower Columbia River) which is very tightly controlled; it occurs early to target early-returning lower Columbia River Chinook salmon then shuts down, and catch and release mortality is factored in to the take for that fishery. Marine sport or commercial fisheries do not tend to capture upper Columbia spring Chinook salmon. C. Jackson said spring Chinook salmon fisheries have been mark-selective for years, and he would have to double-check blackmouth (spring Chinook salmon) fisheries off the coast of Canada and Alaska to confirm whether Columbia River spring Chinook are captured. B. Nordlund noted that some may be captured at sea at younger ages prior to their year of return to the Columbia River or nearby coast.

B. Nordlund shared that in past work as an engineer for NMFS he observed that when screw trap screens were replaced with those that met NMFS criteria, catch increased 10-fold, and the designers of those screens demonstrated low mortality, and typically any mortality was among the fry-sized fish. If screw traps are emptied daily, mortality is of low concern, however, if fish are held in screw trap for 2 to 3 days after PIT tagging they are using up a lot of energy. B. Nordlund it's important to note that not all screw traps or operations are the same. A. Murdoch said WDFW's traps are custom-made, and by permit they are checked daily, sometimes as frequently as hourly or continuously on the larger rivers. A. Murdoch and K. Murdoch agreed that screw traps in the upper Columbia River are operated with a high level of consistency.

K. Murdoch said because there are complicating factors in the data, it is important to look closer at the data to understand what wild fish survival is, and whether these mainstem survival studies that have been implemented using mainly hatchery-origin fish do adequately represent wild fish survival. K. Truscott agreed this could be good utilization of data for answering whether there may be differences in survival between hatchery-origin and wild fish, and whether additional data sets can be evaluated to identify patterns in those differences.

K. Truscott asked if enough spring Chinook salmon are PIT tagged as parr in tributaries and subsequently encountered at RR to estimate RR to MCN survival, and whether the handling effect on wild fish tagged in tributaries could be avoided by PIT tagging at RR. A. Murdoch said, for the Entiat population the answer is "no"; they experience very high mortality when they reach the RR pool and survival to RR is around 12%. For the Methow population, productivity is so low that the screw traps do not capture enough for tagging, and fish tagged as fry suffer a high level of overwinter mortality. They do not capture 10,000 fry like they do in the Chiwawa River. K. Truscott asked if Wenatchee River PIT tag barge detections could be used as a point of entry into the project area. A. Murdoch said it is possible, and WDFW will know more next spring. A. Murdoch referenced Mark Sorel's (UW and WDFW) research that determined a derived estimate for mainstem survival.

R. O'Connor offered editorial and methodological suggestions. He suggested consolidating tables 1 and 2 to show survival estimates, CVs, and sample sizes all in one table, and more clearly differentiating summer and spring Chinook salmon datasets

in the tables. He suggested some of the differences from tributary hatcheries or screw traps to RR, could be addressed with a small amount of additional analysis. Showing differences in time between tagging and first detection, or quantifying other similar factors would set up a better discussion. Breaking up the reported results into two groups for analysis, survival from tributary to RR, then survival from RR to MCN, could reveal where the greatest differences occur. There is a need to account for differences in migration distance; showing loss per kilometer would provide more context for discussion. A. Murdoch agreed with those recommendations.

A. Murdoch said the intent of the memo was to start a conversation. There are still questions about whether differences are all attributable to behavior, or if there are differences happening at the dams. This type of analysis hasn't been done, but perhaps could be done now using accumulated data from all the existing studies, acknowledging there are different objectives for each survival study. A study to better compare the survival between hatchery-origin and wild fish would be a phenomenal step forward.

V. Survival Study Plan

C. Dotson said the latest draft of Grant PUD's Draft 2025-2027 Smolt Survival Study Plan (V7) was distributed by L. Rohrbach late yesterday. Two appendices were added. Appendix A includes the statistical methods. Appendix B captures comments and responses made in versions shared over email or from comments captured in meeting minutes.

A. Murdoch asked if Grant PUD has reviewed the (Virtual Release with Dead Fish Correction (ViRDCt) model designed by Ryan Harnish (PNNL) that is being used to estimate survival in the Snake and Lower Columbia River, because it is based on a single release instead of paired releases, which would significantly reduce workload and cost (less labor associated with tagging, and fewer tags to analyze in the dataset). C. Dotson said he had lightly reviewed the ViRDCt model and noted some differences in approach. He said that Grant PUD was still in the process of having internal discussions about the R. Harnish paper and ViRDCt model. A. Murdoch said one paper evaluated the statistical efficiencies of eliminating the paired release.

A. Murdoch said that he didn't see anything in the study plan to address the issue of dead-fish drift. C. Dotson asked if he was making reference to the paper by Rebecca Buchanan about modeling the probability of detecting false-positives from dead-fish drifting? A. Murdoch answered "yes". C. Dotson said that this survival study plan does not have a component for evaluating tag drift in dead fish, which may create false-positive detections, however the problem of dead fish and false-positive detections has been evaluated in past Grant PUD survival studies and Grant PUD is comfortable with what we have learned from those studies. The analysis authored by R. Buchannan on tag drift (i.e. dead fish detections) at Snake and Lower Columbia River Dams determined that at Bonneville Dam, there was a 10% probability of false-positives at a detection point 5.3 km downstream of the dam.. On the Snake River projects this stretched from 15 km to 40 km downstream of the dams. C. Dotson noted that the R. Buchannan paper reported on a lot of studies that had low sample sizes (<1,000 fish) and low detection efficiencies at their detection arrays. . For Grant PUD's studies, all

their study sample sizes have been close to 2,000 fish and detection efficiencies at their arrays have been mostly above 98% detection. C. Dotson also noted that graphs in the R. Buchanan paper show estimated probability of a false-positive from a dead fish with the probability going to nearly 0% when the distance of the detection array is 50 km downstream of the dam. In Grant's 2025-27 survival study plan, the closest detection array downstream of PRD will be 74 km. In 2016, Grant PUD used a closer detection point downstream of Priest Rapids Dam (PRD) at Vernita Bridge to study handling effects, however fish were moving through so fast they were not detected, so that detections closer to the Tri-Cities were substituted in the study with PRCC approval.

T. Lorz said he was surprised that Grant PUD hasn't considered the ViRDCT approach. He suggested comparing between methods using the R1 releases from a previous survival study to determine if there is any difference, given the ViRDCT approach does provide considerable cost savings.

C. Dotson said that given that it is a license obligation, and a check-in on Project performance, Grant PUD was concerned about changing to a method that is relatively newly developed by PNNL, understanding there could be cost savings and fewer impacts on the resource by tagging fewer fish. Release by helicopter is a cost that adds to this cost. C. Dotson said Grant PUD's preference may be to go forward with the planned approach to make direct comparisons to past study results.

T. Lorz said the ViRDCT model is being used quite a bit in the field now, also on lamprey. In the future, there may be major efficiencies gained with fewer release groups. T. Lorz suggested testing the newer approach against the R1 groups from previous studies to compare approaches by re-analysis of previous work. C. Dotson agreed that is a good suggestion. K. Murdoch agreed those are good ideas given this study plan will be implemented over two, and maybe three years.

K. Truscott asked if there will be a per-project or per-development survival estimate. C. Dotson said there will only be 2 releases, however virtual detections and releases can be created using arrays at locations within the two project areas (Wanapum and Priest Rapids). It will not be as precise as when 3 releases were implemented. The study area will be similar to the study implemented in 2017, from the top of the Wanapum (WAN) project to bottom of the PRD project. K. Truscott noted the Beverly Bridge detection site is very close to WAN; although we could not be confident that all fish detected there are alive. He continued that the PRCC agreed to different operating ranges for fish mode at WAN; and if for some reason the PR project component of survival does not meet targets, we would not know where to look. C. Dotson acknowledged there could be false positives from dead fish drifting downstream of WAN that will create negative bias to PRD survival because those fish will not make it to PRD.

K. Truscott asked if Grant PUD will append a document on fish handling procedures and C. Dotson agreed they would. C. Dotson said they will use a standard approach following Marty Liedke's (USGS) protocol using the same taggers that have been used for many years.

K. Truscott asked about fish collection points, and C. Dotson said the Rock Island Dam (RID) fish collection facility is identified in 4.1 of the draft study plan. Grant PUD has been consulting with Chelan PUD to move forward with that. K. Truscott asked if there

could be an option for tagging, holding and release at RID to avoid transporting fish to Wanapum Fishtown for tagging and transporting back upstream for release by helicopter. C. Dotson said using the Wanapum Fishtown facility allows for holding at a site that is the midway point between and the two release points.

C. Dotson also shared a hardcopy of criteria from the 2017 study showing reasons for excluding fish from the study that were collected for tagging, to follow up on last month's discussion on the number of fish that could potentially be excluded due to size limitations (Attachment A).

C. Dotson said he will issue the handling and holding appendix soon so it can be reviewed as a complete package by the PRCC by end of October.

T. Lorz said he is awaiting feedback from other CRITFC staff to support Grant PUD with lessons learned from Lower Columbia River and Snake River survival studies.

N. Buck and S. Carlon had no questions at this time.

C. Dotson said approval of the plan is needed by December at the latest for placing equipment orders.

VI. Sub-yearling Chinook Salmon Workshop Planning

Joint HCP-CC and PRCC workshops have been held in the past to review the latest technology and information on sub-yearling outmigration, and the HCP-CC are engaged in planning the next workshop for 2024. Chelan PUD is currently analyzing sub-yearling behavior data, there is updated technology, and there is interest in reviewing what others in the Federal hydropower system are monitoring. The intent is to determine whether a sub-yearling survival study can be done.

The next sub-yearling workshop is tentatively planned for June 11, 2024, location to be determined. This timing allows sufficient time for Chelan PUD to analyze their third year of behavioral data. All 3 PUDs will participate, as in the previous workshops. Planning for this workshop will be included as a standing agenda item for the coming months.

C. Jackson asked that PRCC members share ideas with B. Nordlund and J. Ferguson (HCP-Coordinating Committee Chair) for inviting subject matter experts.

L. Rohrbach will distribute materials from past workshops to the PRCC.

VII. 2023 Fish Passage Operations Report

Fish passage operations are occurring for the 2023 season, summarized in the following subsections.

Fish Ladder Inspections

K. Murdoch said she is carrying out combinations of in-person and electronic inspections. This month she will perform the inspection by electronic monitoring, next month in-person.

Fish Spill Updates

Adult fish spill occurs from mid-August (the end of juvenile fish-spill) until November 15.

Fish Counts for 2023

The following are fish counts as of September 29, 2023:

I. Project	Spring Chinook Salmon (Adult + Jack)	Summer Chinook Salmon (Adult + Jack)	Fall Chinook Salmon	Sockeye Salmon	Coho Salmon	Steelhead
Priest Rapids	18,696	49,547	32,241	231,341	10,375	6,982
Wanapum	18,792	57,251	18,115	228,148	6,575	6,837
Rock Island	17,619	51,574	9,034	247,751	8,419	7,280

C. Dotson said coho salmon are just starting to come in. Spring and summer Chinook salmon counts aligning between projects. Some Chinook salmon move into Crab Creek, Sand Hollow and also the tailrace of Wanapum Dam for spawning. Thus, fish that spawn in the Wanapum tailrace are not detected at the Wanapum Dam detection point for ladder counts. Some of the differences in numbers between projects may be due to some fall-back and re-ascension (e.g., sockeye at RID). Grant PUD is much more confident in this year's numbers than last year.

Lamprey adult trap and transport has been implemented per agreement developed by the Priest Rapids Fish Forum. B. Nordlund asked how lamprey are counted, and C. Dotson confirmed they are counted in the same video counts as salmonids. C. Dotson said it has been a very successful year for lamprey, with over 12,000 lamprey counted at PRD.

II. PRCC Facilitator Position

B. Nordlund will retire at the end of his contract, in June 2024. T. Dresser intends to create a process that improves upon the previous facilitator selection process.

Updates

III. Review of Outstanding No Net Impact-Funded Projects

- **Lower Wenatchee Instream Flow Enhancement Project Phase II**
No update.
- **Northern Pike Removal (2022 to 2024).**
No update.
- **Washington State Department of Fish and Wildlife PIT-Tag Detection Barge.**
No update.
- **Quincy Northern Pikeminnow Derby (planned for May 12 to 14).**
No update.
- **2023 Real Time Research, Inc., Avian Predation Study.**

C. Dotson said data are being processed by RTR. Preliminary data were shared for Goose Island in the Potholes Lakes: 127 tags have been recovered this year,

compared to 48 last year and greater than 1,000 in earlier years. Grant PUD is holding monthly meetings with Bureau of Reclamation (BOR) staff who are responsible for tern management under their Biological Opinion. On September 23, BOR had an onsite meeting at Goose Island to look for ideas for dissuading and managing that Goose Island colony. The BOR staff appear to have much more focus, energetic and willingness to meet their obligations for Goose Island. The BOR will hopefully have a management plan in place to modify the habitat at Goose Island and to respond if the colony moves from that location.

IV. Subcommittee Updates

Subcommittees that report up to the PRCC are the hatchery and habitat subcommittees convened under the Priest Rapids Salmon and Steelhead Settlement Agreement. The Fall Chinook Work Group and Priest Rapids Fish Forum have policy representatives convened under the Clean Water Act Section 401 Certification. All are signatories to the Fall Chinook Protection Act.

B. Nordlund has forwarded the subcommittee distributions received to date via email to PRCC members and alternates.

- Priest Rapids Fish Forum—met October 4, next meeting November 1.
- Habitat Subcommittee— met September 14, no meeting in October.
- Fall Chinook Work Group— met October 3, next meeting May 7.
- Hatchery Subcommittee— met September 20, next meeting October 18.

V. SOAs Discussed in 2023

SOA number	Key Words	Last Discussed	Status
2022-03	Fish Mode revision	January 24, 2023	Approved
2023-01	Sockeye Salmon Program	January 24, 2023	Approved
2022-02	Hatchery Production Objectives, 2024–2033	February 28, 2023	Approved

VI. Next Meetings

The next PRCC meeting is scheduled for October 24 at 2:00 p.m. at the Wanapum HOB-107 Executive Conference Room. Virtual attendance will be provided.

The PRCC agreed to move the last PRCC meeting of the year to December 19. It will be a virtual meeting.

Table B.1. Total number of steelhead (n=6,087) handled by LGL Limited during the 2016 spring season, and counts of fish by handling category. Fish that were not used for tagging were released alive into the tailrace of Wanapum Dam through the sorting facility's outfall pipe each day.

Handling Category	
<i>Total Handled at Sorting Facility</i>	6,087
Previously acoustic + PIT tagged	41
Previously PIT tagged	758
Did not meet size criteria	3
<i>Not available for tagging</i>	802
% Not available for tagging	13.2%
<i>Met all acceptance criteria</i>	5,285
<i>Excluded for condition</i>	105
% Excluded	2.0%
<i>Number tagged for live release</i>	1,837
<i>Post-tagging mortality</i>	2
% Mortality	0.1%
<i>Pre-release tag failure</i>	63
% Tag failure	3.4%

Table B.2. Total number of excluded steelhead (n=105) by reason for exclusion from tagging by LGL Limited during the spring of 2016. Percentages are based on the total number of fish that met all acceptance criteria (see Table B.1).

Reasons for Exclusion	n	%
Moribund/Emaciated	0	0.0%
Skeletal Deformities	2	0.0%
≥20% Descaling	14	0.3%
Physical Injuries	56	1.1%
Disease and Infection	33	0.6%
Total	105	2.0%