COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
November 3, 2021
Facilitator's Summary
Facilitator: Emily Stranz; Notes: Colby Mills

The following Facilitator's Summary is intended to capture basic discussion, decisions, and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings; it is not intended to be the "record" of the meeting. Official minutes can be found on the TMT website: http://pweb.crohms.org/tmt/agendas/2021/. Suggested edits for the summary are welcome and can be sent to Colby at colby@dsconsult.co.

Review Meeting Summaries & Minutes
TMT Members approved official meeting minutes for the August 11, 18 (pending an edit on sockeye tagging efforts from Jonathan Ebel, ID), and 25 meetings; as well as facilitator's summaries from the October 20 and 27 meetings.

Chum Operation
Doug Baus, Corps, reported on the chum operation (as coordinated by the TMT on October 27) to operate Bonneville Dam outflow at all hours to provide a tailwater elevation range between 11.3 – 13 feet; complete operational steps are posted to the TMT website. The chum spawning operation will continue until the transition into the incubation phase (end of December). The Corps will continue to provide updates at TMT meetings in coordination with WA. Doug noted that project tailwater elevation on November 3 was 11.8 feet.

At Bonneville, the RFC inflow forecast for the next 10-days is between 125-140 kcfs, with similar conditions in the tailwater. RFC weather forecasts for the next 10-days show lots of variability: there is a probability of average to above average precipitation in western and northeastern Washington, with average to above average precipitation in Oregon and west of the Cascades. There is some variability in southeastern Washington and eastern Oregon, with below average precipitation. The 5-day QPF shows areas with above average precipitation in Oregon and Washington, but below average precipitation is forecasted in the upper Columbia and into Canada, and eastern Oregon.

Doug noted that above average precipitation has been rare recently, so the percentages for the month of October are significant. The Snake River basin above Ice Harbor Dam observed 163% of normal precipitation; Columbia River above Arrow only 80% of normal; Columbia River above The Dalles was 119% of normal; and the Willamette River basin above Portland was 107% of normal.

Tony Norris, BPA, reported that prior to the start of augmenting for chum, Grand Coulee's peak forebay elevation was 1,286.5 feet, and the project is providing about 0.4 feet per day on average to support chum operations; it could potentially be drafting below 1,283 feet early next week. Hamilton Creek is flowing strong, based on a site visit. Tony noted that after the augmentation draft in July/August for Grand Coulee, which drafted Lake Roosevelt to 1,277 feet, additional augmentation volumes required to support the Bonneville minimum flows beyond the end of August drafted the project to 1,274.7 feet. Overall, the project filled just shy of 12 feet in September/October prior to the chum operation.

Charles Morrill, WA, reported that weather conditions for collecting survey data haven't been great, although the crew visited the Ives/Pierce area on Monday and spotted 2 live chum, which indicate chum are in the area. Charles will provide a summary of chum survey data next week so that TMT members can stay up to date on chum action between sessions.

2021 Preliminary Survival Estimates
Claire McGrath, NOAA, reported on the annual preliminary PIT-tagged juvenile salmonid survival estimates for 2021 spring outmigration in the Snake and Columbia Rivers, provided by the Northwest Fisheries Science

Center (memo posted on the TMT website). Also included in the estimates are the proportion of Snake River smolts collected and transported in 2021. The final report will be released in February or March of 2022. The Covid-19 pandemic caused restrictions to field work, although to a lesser extent than in 2020. Tagging did occur at Lower Granite Dam this year at a reduced capacity, and the Columbia River estuary trawl operated normally.

Preliminary estimates show that uncertainty remains high; especially with survival estimates for wild fish. Detection probabilities were low at projects downstream from Lower Granite, due to high spill rates and low flows. Every dam, except Lower Granite, had detection rates below the average between 2007-2019, which has resulted in high uncertainty around the survival estimates. The Science Center adjusted their analytical method as a result, and they continue to use data sources downstream of Bonneville, such as PIT detections at bird colonies. The RSW PIT detector at Lower Granite significantly increased the sample sizes for survival estimates; without the spillway detections there would be very few survival estimates for wild Chinook or steelhead.

To improve the certainty of survival estimates, improved monitoring and the increased capability of detection is needed. This is an ongoing regional conversation, and although the need is clear, there are no firm plans. Claire noted that RSW detectors at other key projects has been proposed but is no small task. Jonathan added that for ID, tagging efforts are limited by the number of fish available to tag, and that PIT-tag costs go up while funding stays flat, limiting the ability to increase tagging in hatchery stocks. There was concern that the limited precision of estimates makes it difficult to determine patterns emerging under the current spill regime.

Operations Review

Reservoirs: Joel Fenolio, Reclamation, reported on Bureau of Reclamation projects:

- **Grand Coulee**: midnight elevation was 1,285.2 feet, with inflows of 76,000 cfs and releases of 93,000 cfs; the project is operating for chum flows.
- **Hungry Horse**: midnight elevation was 3,544.5 feet. Project outflow is currently down to about 1,000 cfs to target the South Fork minimum. Precipitation at the end of October increased flows at Columbia Falls to a peak of about 11.5 kcfs with high flows out of the North and Middle Fork. Project outflow will stay down at about 1,000 cfs in the meantime until they start operating back to Columbia Falls minimum.

Lisa Wright, Corps, reported on Corps of Engineers projects:

- **Libby**: midnight elevation was 2,450.3 feet, with average inflows of 4.5 kcfs, and outflows of 4 kcfs;
- **Albeni Falls**: midnight elevation was 2,052.6 feet, with average inflows of 14.7 kcfs, and outflows of 20 kcfs;
- **Dworshak**: midnight elevation was 1,517.6 feet, passing inflows of 1.6 kcfs;
- **Lower Granite**: average outflows of 19.2 kcfs;
- **McNary**: average outflows of 114.8 kcfs; and,
- **Bonneville**: average outflows of 129.1 kcfs.

Water Quality: Dan Turner, Corps, reported that steelhead spill continues. TDGs are generally below 110% at Lower Granite and Little Goose, and forced spill is occurring at John Day (not part of the spill program and due to units being out of service), which is creating higher TDG above 110%. The units should be back online at the end of this week and TDG levels should decrease.

Within the last week of October, TDG levels were remaining at or below 110%. It has been a challenge with this operation to stay at or below 110%; currently at Lower Granite, there are 2 2-hour blocks per spill day to keep TDG levels within criteria. At Lower Monumental the soft constraint in the forebay elevation is keeping spill through the spillway weir at 8 kcfs or lower.

At a previous TMT meeting, a request was made for the Corps to check in with the Washington Department of Ecology regarding the interpretation of the TDG criteria. After consulting internally, the Corps reported back to

TMT that they believe the standard is clear at 110% TDG measured as a 1-hour maximum, and is implementing the operation to comply with such. The Corps does not have questions on the standard and does not plan to seek further clarification with Ecology.

Fish: Claire reported that the last sampling site for juveniles ended on November 1, and as expected was passing low numbers of sub-yearling Chinook; the highest counts were at Lower Granite.

For adults at Bonneville, low numbers of fall Chinook and steelhead are passing, with declining Coho and a couple of chum. Fall Chinook YTD passage is 67% of the 10-year average and jacks YTD is 72%. Steelhead passage remains historically low, with a total YTD passage of 34% of the 10-year average, with wilds at 33%. Coho YTD is 254% of the 10-year average, and jacks are at 220% of the 10-year average; pink salmon YTD passage is 317 fish past Bonneville.

At Lower Granite, fall Chinook, Coho and steelhead continue to pass; fall Chinook YTD passage is 89% of the 10-year average, with jacks at 77%. Total steelhead YTD is 40% of the 10-year average, with wilds at 39%. Coho YTD passage is 365% of the 10-year average, with jacks at 175%.

Power System: Tony reported morning peak energy conditions from the colder fall temperatures. The last several days of high pressure and dry weather has resulted in less wind on system.

Questions or comments from members of the public: there were no questions or comments from members of the public

The next scheduled TMT meeting is a conference call on November 17, 2021, at 9:00 AM.

Columbia River Regional Forum

Technical Management Team
OFFICIAL MINUTES
November 3, 2021
Minutes: Melissa Haskin, BPA (contractor, FLUX Resources)

Today's TMT web meeting was chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. See the end of these minutes for a list of attendees.

1. Review of Official Minutes and Summaries

The official meeting minutes for the 8/11, 8/18, 8/25 were approved with one edit from Jonathan Ebel, ID, to correct the sockeye numbers in the 8/18 minutes. The facilitator summaries for the 10/20 and 10/27 meetings were approved with no additional edits.

2. Chum Operation – Doug Baus, Corps; Joel Fenolio, Reclamation; Claire McGrath, NOAA; Tony Norris, BPA; and Charles Morrill, WA

Doug Baus, Corps updated the TMT on chum operations, which were coordinated at the October 27 TMT meeting. The operation began Monday, November 1 at 0600. The coordinated operation is available on the TMT website and the Bonneville Dam tailwater is currently being operated in step #2, which states:

> "During all hours, operate project outflow to provide a tailwater elevation in the range of 11.5-13.0 feet."

The Corps will update the TMT on the chum operation through November and December, then coordinate to transition to the incubation phase of the operation.

Baus reminded TMT that the tailwater elevation used for the chum operation is reported in the hourly data as "Project Tailwater Elevation" in the column on the right. There are two tailwater elevations reported for different locations and the chum operation manages to the Tanner Creek gauge data in that column.

At 0500 this morning, the Bonneville Dam tailwater elevation was 11.8 ft. Yesterday, the average tailwater elevation was 11.6 ft. On November 1, when the operation started at 0600, the tailwater was at 11.7 ft.

The RFC inflow forecast for Bonneville Dam is 125-135 kcfs over the next 10 days.

The 10-day weather forecast calls for average to above average precipitation in Oregon, west of the Cascades, and in western and northeastern Washington. Southeastern Washington and eastern Oregon will likely see below average precipitation. The 5-day forecast shows areas with above average precipitation in Oregon and Washington, but below average precipitation in the Upper Columbia and into Canada and eastern Oregon.

Baus highlighted some monthly precipitation totals. October precipitation in the Snake River Basin above Ice Harbor Dam was 2.6 inches, which is 163% of average. In the Upper Columbia

Basin above Arrow Dam, precipitation was 80% of normal. In the Mid-Columbia Basin mainstem above The Dalles Dam, precipitation was 2.6 inches (119% of normal). In the Willamette Basin above Portland, observed precipitation was 5.4 inches (107% of average).

Tony Norris, BPA, reported that prior to flow augmentation for the chum operation, Grand Coulee's peak elevation was 1,286.5 ft. at Lake Roosevelt. The project is providing about 4-tenths of a foot daily to support the chum operation thus far. If this level of augmentation were to continue, the project would likely drop below 1,283 ft. by early next week. Norris visited Hamilton Creek last week and observed that the springs are running strong. He did not observe any fish but noted the fish survey team covers more area.

Norris added that augmentation in July and August dropped Grand Coulee to 1,277 ft. Additional augmentation was required into September to support the minimum flow at Bonneville dam that further drafted the pool to 1,274.7 ft. The Action Agencies have since filled the pool almost 12 feet in September and October to prepare for the start of the chum operation.

Charles Morrill, WA, noted that weather conditions have been unfavorable for survey data collection. On Monday, two live chum were reported in the Ives/Pierce Island complex, indicating that chum have begun to arrive. Morrill will report on chum again next week to TMT members and agencies.

3. Preliminary Survival Estimates – Claire McGrath, NOAA

NOAA's Northwest Fisheries Science Center released its preliminary survival estimates for the passage of spring-migrating juvenile salmonids through Snake and Columbia River dams and reservoirs for spring outmigration in 2021. McGrath shared a few highlights from the report. Below are several passages that McGrath highlighted. McGrath reminded the TMT that these are preliminary data, which may be updated and corrected as more data become available and analyzed. The final report will be available in February or March. McGrath also noted that like last year, COVID resulted in some restrictions to data collection and sampling. Last year, in 2020, no PIT-tag data were collected at Lower Granite and the estuary trawl was not operated. This year, PIT-tag data were collected at a reduced rate and the estuary trawl was operated normally. The reduced sampling at Lower Granite means there is a high level of uncertainty in the data. The current report is available in full on the TMT website.

- Estimated survival for hatchery and wild yearling Chinook salmon at Lower Granite (head of reservoir to tailrace) was 85.6%. This estimate marks the fourth year in a row that the estimate for Lower Granite was below the long-term mean of 91.9%.
- Mean estimated survival for yearling Chinook salmon from Lower Granite to McNary in 2021 was 73% (95% CI: 69.1-76.9%). For wild Snake River yearling Chinook, mean estimated survival from Lower Granite tailrace to McNary tailrace was 60.7% (95% CI: 47.8-73.6%).
- Mean estimated survival of yearling Chinook from McNary to Bonneville was 81.9% (58.6-105.2%). For wild fish, survival from McNary tailrace to Bonneville tailrace was 57.2% (25.3-89.1%). This resulted in a survival estimate from Lower Granite tailrace to Bonneville tailrace of 34.7% (14.0-55.4%). This was substantially below the long-term

mean of 47.2%, but not statistically different from it, because the 2021 estimate was very imprecise.

- For Snake River steelhead (hatchery and wild combined), mean estimated survival in 2021 was above average in the Lower Granite to Little Goose and the Little Goose to Lower Monumental reaches, but below average in the Lower Monumental to McNary reach, though all three estimates were very imprecise. Estimated survival was below average in both the McNary to John Day and the John Day to Bonneville reaches, though the estimate from McNary to John Day was also very imprecise.
- Mean estimated survival for steelhead from Lower Granite Dam to McNary Dam in 2021 was 79.8% (95% CI: 65.9-93.7%). Mean estimated survival from McNary Dam to Bonneville Dam was 53.5% (47.8-59.2%). Mean estimated survival for steelhead from Lower Granite Dam to Bonneville Dam was 42.7% (34.0-51.4%). For wild Snake River steelhead, estimated survival from Lower Granite Dam tailrace to Bonneville Dam tailrace was 27.4% (95% CI: 17.5 37.3%).
- Estimated survival in 2021 of Snake River sockeye salmon (hatchery and wild combined) from the tailrace of Lower Granite Dam to the tailrace of Bonneville Dam was 31.7% (95% CI: 25.2- 39.8%; Table 8).
- The run in 2021 was only slightly early for steelhead and neither early nor late for Chinook. We estimate that 44.3% of wild and 11.7% of hatchery Chinook salmon, and 20.9% of wild and 54.1% of hatchery steelhead passed prior to the start of transportation. These numbers are slightly higher than in 2019 and 2020 for steelhead, indicating that run timing did reduce steelhead transportation rates some in 2021.

McGrath noted that all projects had lower detection rates this year than the 2007-2019 average. Some were as low as less than half of the average. On the Snake this year, flows were low, water temperatures were above average, and spill was the highest on record. On the lower Columbia River, flows were also low and spill was high but not the highest on record. TDG was moderate. Overall, it was slightly above the long-term mean (likely due to the fact that spill volumes were low and the projects were operating at minimum generation for much of the spring).

Travel time estimates were similar to other low flow years. Over the past few years, a trend has been observed of shorter smolt travel times relative to flow and spill. This was not seen in 2021.

Transport rates were the lowest on record.

McGrath ended by highlighting that the report notes that if spill remains at the levels it was in 2020 and 2021, then it may be important for the region to find ways to compensate for the loss of PIT-tag detection data from juvenile bypass systems.

This item is on the agenda for the TMT Year-End Review as it has been in the past.

Tom Iverson, Yakama Nation Fisheries, asked if there are plans to improve monitoring for better estimates. Last year, there were additional efforts at the bottom of the system, which did help, noted McGrath. She said there are no firm plans, but the need is there. She added that this is an ongoing regional discussion. Jonathan Ebel, ID, noted that tagging efforts are limited by the number of fish that are available to tag. In the Snake River, fish numbers are down. In the long-term, increasing tag costs may also impact tagging.

4. Operations Review

4a. Reservoirs – Joel Fenolio, Reclamation; Lisa Wright, Corps

Reclamation projects: Grand Coulee – Midnight elevation 1,285.2 ft. Inflows 76 kcfs and outflows 93 kcfs. The project is operating for chum flows. **Hungry Horse** – Midnight elevation 3,544.5 ft. Releases are at 1,000 cfs for the South Fork minimum due to high flows out of the North and Middle Fork. Outflow will be at 1,000 cfs for the meantime before going back to the Columbia Falls minimums.

Corps Projects: Libby Dam – Midnight elevation 2,450.3 ft., yesterday's average inflows 4.5 and outflows 4 kcfs. **Albeni Falls** – Midnight elevation 2,052.6 ft., inflows 14.7 kcfs and outflows 20 kcfs. **Dworshak Dam** – Midnight elevation 1,517.6 ft., passing inflows 1.6 kcfs. **Lower Granite** – Yesterday's average outflows 19.2 kcfs. **McNary Dam** – Yesterday's average outflows 114.8 kcfs. **Bonneville Dam** – Yesterday's average outflows 129.1 kcfs.

4b. Water Quality – Dan Turner, Corps

Spill for adult steelhead continues at McNary and the four Lower Snake River projects. TDG has been below 110%. Downstream of John Day, forced spill has increased TDG above water quality standards. There are units out of service, which has resulted in forced spill and that spill is managed differently than planned spill. Dave Swank, USFWS, wondered if this is a long-term or short-term issue. Scott Bettin, BPA, said the units should be online around the end of this week.

In the last week of October, TDG was at or below 110% at fish passage projects. There have been issues maintaining the spill operation while staying at or below 110% TDG. Currently, Lower Granite is operating in two 2- hour blocks per spill day. These blocks seem like a successful way to keep TDG below water quality standards. At Lower Monumental, keeping the forebay low with the soft constraint of 537-538.5 ft. is keeping spill through the spillway weir at 8 kcfs or lower, resulting in TDG at 110% or lower.

Previously, there was a request for the Corps to coordinate with WA Dept of Ecology to determine how to interpret the criteria. The Corps believes that the standard is clear at 110% TDG measured as the maximum and is operating to that standard. The Corps does not have questions and will not reach out to Ecology.

4c. Fish – McGrath

Juveniles: The last sampling ended November 1 and is done for the year. The highest counts were at Lower Granite. Overall, numbers for sub-yearling Chinook were low.

Adults: At Bonneville, fall Chinook, coho, and chum are passing. Fall Chinook have been passing at 45-141 per day, with YTD totals of ~345,000 at the project, which is 88% of last year's count at this time and 67% of the 10-year average. About 55,268 jacks have passed the project, which is 94% of what was seen last year at this time and 72% of the 10-year average. Steelhead arrived late but passage is ending around when it does historically. YTD numbers coming in at 62% of last year and 34% of the 10-year average. Unclipped are 54% of last year and 33% of the 10-year average. Coho are passing at 198-701 per day. YTD totals are at 230,000 adults, which is 254% of the 10-year average. Jack coho are strong as well. Pink salmon are still trickling with a YTD at Bonneville of 317.

At Lower Granite, fall Chinook passage has dropped to a range of 26-55 per day. YTD passage is 89% of the 10-year average and 128% of last year. Jacks are at ~10,000 YTD, which is about 77% of the 10-year average. Total steelhead are 70% of last year and 40% of the 10-year average. Wild steelhead at 39% of the 10-year average. Coho are still going strong, with YTD counts 365% of the 10-year average. Jack coho are currently 175% of the 10-year average.

4d. Power – Norris

In fall and winter, colder temperatures lead to power peaks in the morning. Over the last few days, dry weather and high pressure has meant less wind.

Today's Attendees:

Agency	TMT Representative
Army Corps of Engineers	Doug Baus (Chair), Lisa Wright, Julie Ammann
Bonneville Power Administration	Tony Norris, Scott Bettin
Bureau of Reclamation	Joel Fenolio
NOAA Fisheries	Claire McGrath
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	Jonathan Ebel
Montana	Brian Marotz
Nez Perce Tribe	Jay Hesse
Umatilla Tribe/CRITFC	Absent
Colville Tribe	Kirk Truscott
Warm Springs Tribe	Jen Graham
Kootenai Tribe	Absent
Spokane Tribe	Absent

Other Attendees (non-TMT members):

Corps – Alexis Mills, Aaron Marshall, Dan Turner, Chris Peery, Willow Walker, Jon Roberts, Catherine Dudgeon, Scott St. John

BPA – Melissa Haskin (CONTR, FLUX Resources, Notetaker)

DS Consulting – Emily Stranz (Facilitator), Colby Mills

Chelan PUD – Jay Finch

Yakama Nation Fisheries – Tom Iverson

Columbia Basin Bulletin – Mike O'Bryant