COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
September 25, 2019
DRAFT Facilitator's Summary
Facilitator: Emily Stranz; Notes: Colby Mills, DS Consulting

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. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members. Official minutes can be found on the TMT website: http://www.nwdwc.usace.army.mil/tmt/agendas/2019/.

Review Meeting Minutes & Summary
TMT members approved the minutes and summary from the August 28 meeting.

Dworshak Operations
Steve Hall, Corps, reported on current operations at Dworshak Dam. The project is implementing the Dworshak Board operation, with a pool elevation of 1,521.3 feet, inflows of 1 kcfs and discharging 2.4 kcfs. TDG levels in the tailwater are sitting around 98-99%, and TDG in the hatchery is sitting just below 98%. Temperatures in the Lower Granite Dam tailwater are under 65 degrees F, so Dworshak Dam reduced outflows down to 2.5 kcfs from 4.5 kcfs on Monday night, and did not exceed the 1-degree change in 24 hours criteria described in the Dworshak Board Operational Plan.

Rain in the forecast will drive inflows up somewhat, and the project will get to 1,520 feet on September 30, as per the Board's plan. Rain is expected in the basin on Thursday with relatively cool temperatures continuing into Friday and Saturday, but it isn't expected to affect the pool elevation reaching 1,520 feet. TMT members appreciated the job well done to implement the Dworshak Board's operation.

Survival Memo
Paul Wagner, NOAA, reviewed highlights of the Northwest Fisheries Science Center's preliminary juvenile survival and passage data. The memo summarizes estimates of juvenile salmonid survival that passed through the individual reaches of the Snake and Columbia Rivers. These are preliminary survival estimates of PIT-tagged juvenile salmon passing in Spring 2019 and percentages of Snake River smolts transported in 2019. A copy of the memo can be found on the TMT website, and the complete analysis will be released in February or March of 2020.

Julie Ammann, Corps, asked if/how this data could be used in real-time decision making to inform and shape future operations. The group needed time to consider this and Claire offered to take a deeper dive and present alongside Steve Smith at the 2019 YER. Additionally, it was noted that the Science Center is revising their method for estimated survival and that more detail will be provided at a later date.

2020 Water Management Plan
Doug Baus, Corps, updated the TMT on the 2020 Water Management Plan review process. The draft plan will be posted by October 1. The first round of comments should be emailed to Action Agencies (Joel Fenolio, Scott Bettin, Tony Norris, Julie Ammann, Doug Baus, and Lisa Wright) by October 31. The second round of edits should be emailed to the Action Agencies by November 25, followed by the final posted on December 31st. Tony Norris, BPA, noted that TMT members might want to review the Emergency Action Plan and suggest any edits.

→ **ACTION:** Edits and comments should be noted in tracked changes and suggest specific changes.

Operations Review
Reservoirs: Joel Fenolio, BOR reported on Bureau of Reclamation projects:

- **Grand Coulee**: the project is trying to refill up to 1,283 feet by the end of September, but due to Bonneville constrains will more likely be 1,282 feet, and reach 1,283 feet by mid October.
- **Hungry Horse**: midnight forebay elevation was 3,550.8 feet, with inflows around 600 cfs and releasing 2,450 cfs. The project is looking to be on track to be 10-feet from full by end of the month, discharging 200 cfs to the Columbia Falls minimum.

Doug Baus, Corps, reported on Corps of Engineers projects:
- **Libby**: midnight elevation was 2,442.1 feet, with average inflows of 6 kcfs and outflows of 6 kcfs;
- **Albeni Falls**: September 24 midnight elevation was 2,061.6 feet, with average inflows of 9.3 kcfs and outflows of 18.3 kcfs;
- **Dworshak**: September 24 midnight elevation was 1,521.3 feet, with average inflows of .8 kcfs and outflows of 2.4 kcfs;
- **Lower Granite**: average outflows were 27.6 kcfs;
- **McNary**: average outflows were 68.3 kcfs; and
- **Bonneville**: average outflows of 74.2 kcfs.

Tony noted that natural flows are up this year, due to the cool and wet conditions in the basin.

Water Quality: Dan Turner, Corps, reported that on September 1, TDG water quality criteria changed to 110% to coincide with the non-fish passage season. The CCIW Bonneville tailwater gauge shows TDG above 110% due to TDG generated by the fish ladder; this is a localized effect, and dissipates soon downstream. Dan also noted a spill operation of 10 kcfs at McNary that is generating just about 110% TDG (107-108), which will be monitored to keep below the criteria.

Fish: Paul reported on adult fish passage. At Bonneville Dam fall Chinook passage to date has been 228,000 fish, or 50% of the 10-year average, and is the most successful run this year so far. Fall Chinook jacks are at 53% of the 10-year average, steelhead are at 26% of the 10-year average, and wild steelhead are at 37% of the 10-year average. Paul noted significant amounts of juvenile shad are currently passing downstream at Bonneville.

At Lower Granite Dam, fall Chinook passage is at 40% of the 10-year average, fall Chinook jacks 32%, steelhead 15%, and wild steelhead is 22% of the 10-year average. Only 17 sockeye were caught at the Sawtooth Hatchery trap this year.

Fall Chinook juveniles are nearing the end of substantial passage at all sites, and at Bonneville Dam especially, collection has been overrun by juvenile shad coming down the river. Snake River projects all show signs of increasingly lower passing numbers.

Power System: Tony Norris, BPA, reported recent high winds in the system, although it's quieted down now. He noted the need to implement reserve deployments to balance the system during periods of high winds.

The next scheduled TMT meeting is a conference call on October 9, 2019, at 9:00 AM.

This summary is respectfully submitted by the DS Consulting Facilitation Team. Suggested edits are welcome and can be sent to Colby at colby@dsconsult.co.

Columbia River Regional Forum
Technical Management Team OFFICIAL MINUTES
Wednesday, September 25, 2019
Minutes: Melissa Haskin, FLUX Resources

1. Introductions

Today's TMT meeting was chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. See the end of these minutes for a list of today's attendees. Copies of documents discussed and meeting minutes are available on the TMT website.

2. Review Meeting Summaries and Minutes

Minutes and summaries from the 8/28 TMT meeting were approved with no additional edits.

3. Dworshak Operations – Jon Roberts, Corps NWW

Jon Roberts, Corps NWW, reported on operations at Dworshak Dam, which is operating per the Dworshak Dam Board operation discussed at the last TMT. The project is discharging 2.4 kcfs (down from 4.5 kcfs the previous day) and inflows are 1 kcfs. The forebay elevation is 1,521.3 ft.

TDG is ~98-99% currently in the Dworshak tailrace and in the range of ~98% at the hatchery (Figure 1).

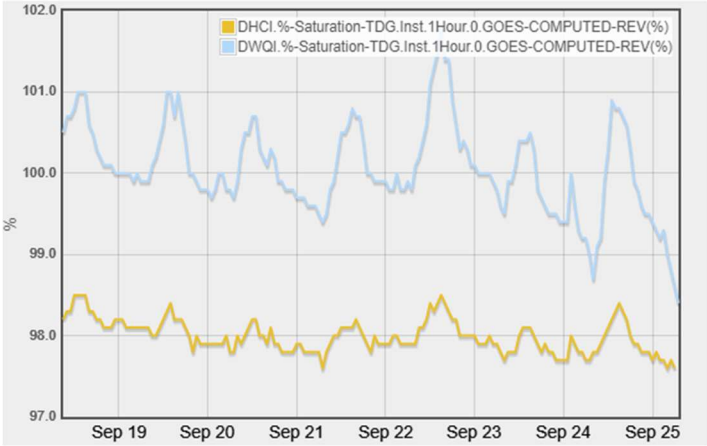


Figure 1. Total Dissolved Gas (TDG) at the Dworshak Dam tailrace (DWQI) and Dworshak Hatchery Collection (DHCI) over the last 6 days, September 19-25.

Temperatures in the Lower Granite tailwater are cool, currently > 65°F. Yesterday, temperatures were slightly above 65°F. The Corps met the Dworshak Dam Board request of not exceeding more than 1-degree change in a 24-hour period.

The NWRFC 10-day inflow forecast for Dworshak shows some precipitation in the forecast, which should drive flows up slightly (Figure 2). The dam's forebay is on schedule to draft to 1520 ft. on September 30, per the Board's plan.

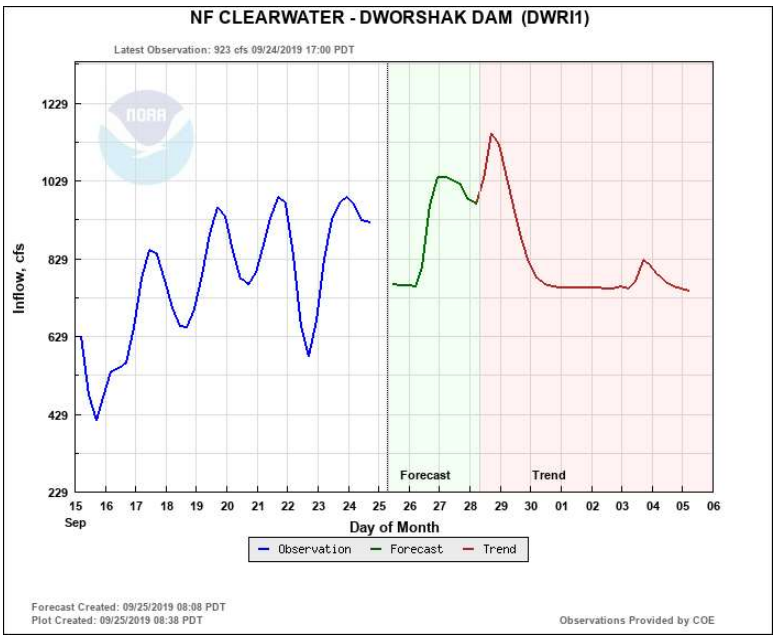


Figure 2. NWRFC observed and forecasted inflow for Dworshak Dam as of September 25.

Today's temperature model results show rain in the Basin and cool temperatures, which should continue through Saturday. The precipitation should not interfere with the 1,520 ft. pool elevation anticipated for September 30.

4. Survival Memo - Paul Wagner, NOAA Fisheries

Paul Wagner, NOAA, presented findings from a Northwest Fisheries Science Center memo that summarizes preliminary survival estimates for spring migrants in the Columbia River hydro system in 2019 as compared with survival estimates from the past 20 years (1999 to 2019). Numbers discussed below can be located in the full report, available on the TMT website.

The final report will be available in February or March 2020. When the report is finalized (post year-end review), NOAA may share a pre-season update with the findings of the report to inform spring 2020 operations.

As a reminder, this season spill was above average and a new spill plan was implemented. TDG was closer to 120% than it has been in the past and passage saw an early bump, which dwindled latter in the season.

A few highlights of the report include:

- Mean estimated survival for yearling Chinook salmon from Lower Granite Dam tailrace to Bonneville Dam tailrace was 52.6%. Estimated survival for the Lower Granite project (head of reservoir to tailrace) was 78.5%, based on fish PIT tagged at and released from the Snake River trap. This is well below average. The combined yearling Chinook salmon survival estimate from the Snake River trap to Bonneville Dam tailrace was 41.3%, also below average.

- The combined Snake River steelhead survival estimate from the Snake River trap to Bonneville Dam tailrace was below average at 41.2%.
- Estimated survival in 2019 of Snake River sockeye salmon (hatchery and wild combined) from the tailrace of Lower Granite Dam to the tailrace of Bonneville Dam was 43.4%. This indicates that prior year hatchery issues have been resolved.

Looking at specific projects,

- Table 2 shows survival probability estimates for yearling Chinook salmon Trap–Lower Granite at 78.5% compared to the mean of 92.4%.
- Table 4 shows survival probability estimates for steelhead as above average at all projects until JDA to BON, where survival drops below average to 73.4%.
- Table 7 shows Upper Columbia River Sockeye survival estimates from RIS-BON at 73.7%, which is well above the 50.6% historical average.
- Preliminary estimates of the percentage transported of nontagged wild and hatchery spring-summer Chinook salmon smolts in 2019 are 41.6% and 33.6%, respectively. For steelhead, the estimates are 36.7% and 36.4% for wild and hatchery smolts, respectively. These numbers are within the range of what was observed last year and are better than what was observed in 2015.

The following figure shows estimated survival from Lower Granite to the Snake River for Chinook salmon over the past 26 years:

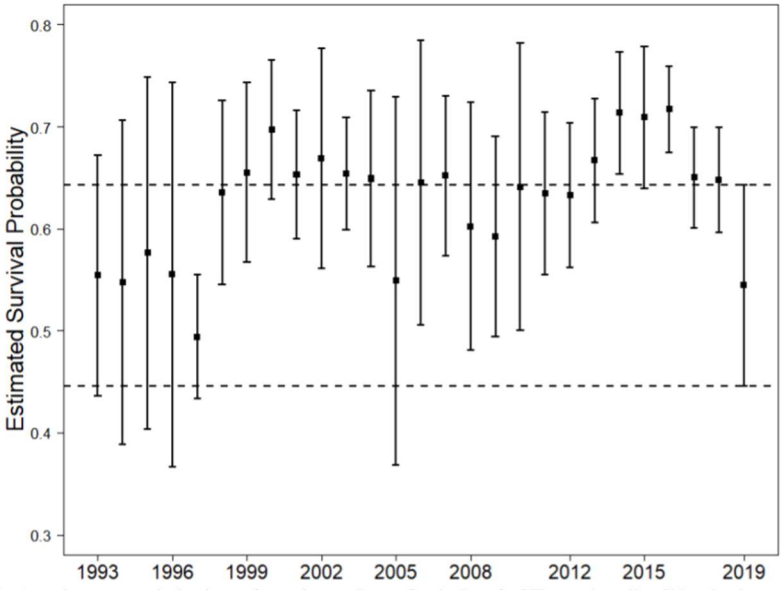


Figure 1. Annual average survival estimates from release to Lower Granite Dam for PIT-tagged yearling **Chinook** salmon released from Snake River Basin hatcheries, 1993-2019. Hatcheries used for average (index groups) are those with consistent PIT-tag releases through the series of years shown. Vertical bars represent 95% confidence intervals. Horizontal dashed lines are the 2019 confidence interval endpoints and are shown for comparison to other years.

Dave Swank, USFWS, wondered if BKD issues could be the root of hatchery arrival issues at Lower Granite. Paul said it could be. Dave would like to investigate this further on his own. Likewise, the numbers at Pahsimeroi may be affected by an early release of hatchery fish due to BKD issues.

Julie Ammann, Corps, wondered if the data discussed could be used as a real-time tool for operational decisions. Paul said the opportunity for that could be limited since the data is always calculated post-season. Claire McGrath said she was hopeful that it could be used as a management tool moving forward. She will work with Steve Smith and create a presentation for 2019 YER. The presentation will specifically cover if the survival in the various reaches tell a story. She will look at if they specifically tell a story in relation to operational changes and environmental conditions.

One of the issues the data shows this year, which has been a point of discussion over the past few years, is that the data from McNary to Bonneville does not "look right." This has caused NOAA to consider if the counting method at that section of the river is accurate and best. The Science Center is investigating this and may have a revised method for estimating survival between those two projects.

5. 2020 Water Management Plan - Doug Baus, Corps-NWD

Doug Baus, Corps, reported on the schedule for 2020 Water Management Plan. The first draft will be posted on October 1, 2019. Comments are due on draft 1 by October 31. Those wishing to submit edits should use the Track Changes option in Word and email the document to Joel Fenolio, Reclamation, Scott Bettin, BPA, Tony Norris, BPA, Lisa Wright, Corps, Julie Ammann, Corps, and Doug. The Corps will compile these comments and release a second draft of the plan on November 18. The final documents will be posted December 31, 2019.

The schedule is front-loaded in anticipation of the holidays and annual leave, which often occurs during those dates.

Tony Norris, BPA, brought up that now is the time to review the Emergency Action Plan as well, should any changes be necessary. For instance, if the order of the list needs to be changed, now would be a good time to discuss that. The plan will remain the way it is unless there is a change.

6. Operations Review

6a. Reservoirs – Joel Fenolio, Reclamation and Lisa Wright, Corps

Grand Coulee – Reclamation is aiming to hit 1,283 ft. by the end of September, however it is more likely that the reservoir will hit 1,282 ft. and then refill to 1,283 by the middle of October. Flows in the Columbia are low so it is hard to refill.

Hungry Horse – Inflows have been ~600 cfs. The project's midnight elevation was 3,550.8 feet. The project is discharging at Columbia Falls minimums of 200 cfs and should be 10 feet from full by the end of the month.

Libby Dam – Midnight elevation 2,442.1 feet. Yesterday's average inflows were 6 kcfs and outflows were 6 kcfs (bull trout minimum).

Albeni Falls – Midnight elevation 2,061.6 feet. Yesterday's average inflows were 9.3 kcfs and outflows were 18.3 kcfs.

Dworshak Dam – Midnight elevation 1,521.3 feet. Yesterday's average inflows were 0.8 kcfs and outflows were 2.4 kcfs.

Lower Granite – Yesterday's average outflows were 27.6 kcfs.

McNary Dam – Yesterday's average outflows were 68.3 kcfs.

Bonneville – Yesterday's average outflows were 74.2 kcfs.

Snake River flows are higher than normal for this time of year. Natural flows are increased due to above average precipitation.

6b. Water Quality – Dan Turner, Corps

As of September 1, water quality state standards for TDG changed 110% at all projects for non-fish passage season. At CCIW, TDG is above 110% due to a localized annual effect. This is due to TDG generated by the fish ladder. It is not reflected downstream of Warrendale. At McNary there is a spill operation of about 10 kcfs, which is generating 107-108% TDG.

6c. Fish – Paul Wagner, NOAA

Adults: At Bonneville, fall Chinook adults counts are about 10,000 per day with a total YTD of 227,000 (50% of the 10-year average) and jacks are 36,000 (53% of average). This is an improvement from earlier this year. Steelhead YTD are 68,348 (26% of average), of which 34,317 were unclipped (37% of average).

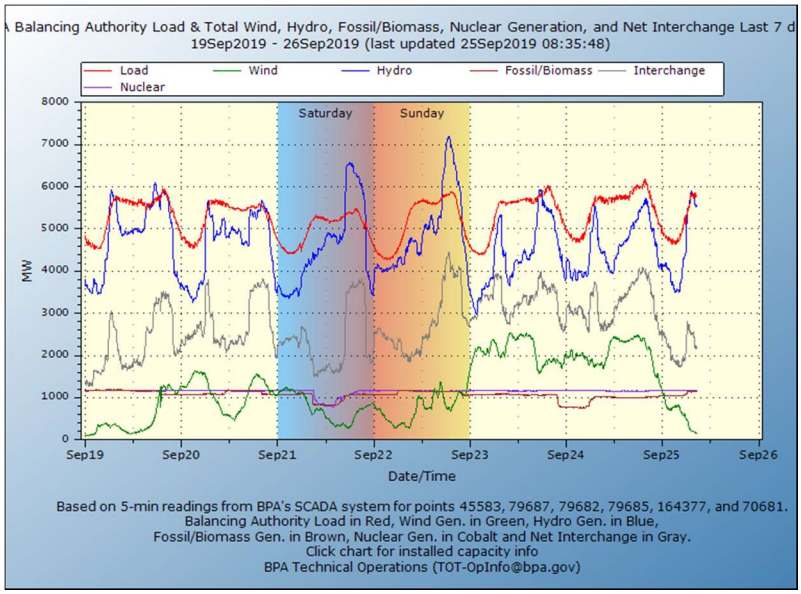
Shad counts are 7,459,145.

At Lower Granite, fall Chinook adults are at 9,938 thus far (40% of average) and jacks are 3,124 (32% of average). Steelhead counts include fish that didn't pass last year, overwintered in the reservoir, and then passed in the spring – total YTD is 9,251 (15% of the 10-year average) of which 4,208 were unclipped (22% of average). 17 Sockeye were counted in the trap. Columbia River sockeye numbers were disappointing this season.

Juveniles: Bonneville counts are 0 because juvenile shad coming through are overwhelming. The season is winding down at all sites.

6d. Power – Tony Norris, BPA

There has been quite a bit of wind on the system. From September 22-24, there were big swings in generation due to a block of wind with associated reserve deployments at -600 to 500 mw. From a laypersons perspective the wind forecasts generators use are very accurate however if the forecast is off by an hour during a steep wind ramp the forecasted generation can be off by over a thousand MW. This causes BPA to deploy reserves to keep the system in balance.



7. Next TMT

The next meeting is a conference call on October 9, 2019.

Today's Attendees:

Agency	TMT Representative
Army Corps of Engineers	Doug Baus (Chair), Julie Ammann
Bonneville Power Administration	Tony Norris
Bureau of Reclamation	Joel Fenolio
NOAA Fisheries	Paul Wagner, Claire McGrath
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	N/A
Montana	Jim Litchfield
Nez Perce Tribe	Jay Hesse
Umatilla Tribe/CRITFC	Tom Lorz
Colville Tribe	Sheri Sears
Warm Springs Tribe	N/A
Kootenai Tribe	N/A
Spokane Tribe	N/A

Other Attendees (non-TMT members):

Army Corps of Engineers – Jon Roberts, Steve Hall, Dan Turner, Alexis Mills, Aaron Marshall, Ann Setter
BPA – Kim Johnson
DS Consulting – Emily Stranz (Facilitator), Colby Mills
FLUX Resources – Melissa Haskin (Note taker)
Columbia Basin Bulletin – Mike O'Bryant
Reclamation – Pete Cooper
Clearing Up – K.C. Mehaffey

Portland General Electric – Ruth Burris