COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
June 23, 2021
DRAFT 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. 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://pweb.crohms.org/tmt/agendas/2021/.

Review Meeting Summaries & Minutes
The official minutes and facilitator's summary for June 16 will be reviewed at the next TMT meeting.

Gas Bubble Trauma Monitoring
Lisa Wright, Corps, reported that the Corps has posted the final reports for GBT monitoring data of native non-salmonids (provided by the USGS and the FPC real time GBT reports); these are the final reports of the year as GBT monitoring is over with the start of summer spill.

Dworshak Dam Operations
Jon Roberts, Corps, reported on Dworshak operations, noting an intense heat wave that is expected to hit the region bringing temperatures over 100 through the 10-day forecast; nighttime temperatures are expected to be above 60 degrees. The Corps will work to utilize Dworshak water to keep the Lower Granite tailwater from exceeding the 68 degrees F limit, per the BiOp. Lower Granite's tailwater is currently 65 degrees F and has been steadily rising over the past week. Jon noted that air temperatures above 95 degrees F heats up the river rapidly. The incoming water from the Snake River is not exceeding 68 degrees, however it is expected to rise. The Lewiston gauge is still recording 65-62 degrees, which is influenced now by water from Dworshak. Jon reminded the group that once a change is made at the project, it takes 3-4 days for the water to have an effect in the Lower Granite tailrace, and that various outside factors and weather conditions can change the outlook.

Last year at this time, the Lower Granite pool depths (15-20 meter range) were 58 degrees F. The current average tailwater temperature for Lower Granite is about 7 degrees higher than last year. Additionally, the project is moving water earlier than normal (2 weeks earlier than last year and about 8 days over average). The project started moving water last night (7,500 cfs) and will increase discharge by 2,500 cfs by this afternoon. Dworshak outflow will be pushing close to the 110% TDG limit (will reach by end of today) and Lower Granite tailwater temperatures are expected to reach the 68-degree F mark or slightly over. Jon provided some operational scenarios comparing the effects of staying at minimum outflow, increasing outflow to full powerhouse, and increasing outflow to full powerhouse plus spill, which are available on the TMT website.

Drafting the pool this early in the passage season will impact water available for augmentation later in the summer. The project crossed 1,597 feet yesterday (3-feet from full); the project is required not to dip below 1,535 feet by September 1. There was appreciation for the Corps' obtaining a flood risk management deviation earlier in the year which resulted in the pool being 7 feet fuller than if operated strictly for flood risk; the Corps will continue to reflect on how to maximize efficiency and lessons learned for future dry years. Sheri Sears, Colville, noted that challenges from climate change will continue and increase in severity moving forward, and it would be worthwhile to determine a strategy for how to adapt to these issues in the future.

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

- **Hungry Horse**: forebay elevation was 3,558.1 feet (within 2 feet of full) and is on schedule to reach 3,560 feet. Releases yesterday were 4,500 cfs, with inflows of 7,500 cfs. The project should hold at 4,500 cfs through the weekend, maybe decreasing towards the beginning of next week.
- **Grand Coulee**: forebay elevation was 1,288.6 feet, with inflows of 135,000 cfs, and releases of 115,000 cfs over the past few days; the project should finish refill by the first part of July.

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

- **Libby**: midnight elevation was 2442.4 feet, with average inflows of 27.3 kcfs, and outflows of 9 kcfs;
- **Albeni Falls**: midnight elevation was 2062.2 feet, with average inflows of 34.6 kcfs, and outflows of 38.4 kcfs;
- **Dworshak**: midnight elevation was 1,597.2 feet, with average inflows of 5.5 kcfs, and outflows of 2.4 kcfs;
- **Lower Granite**: average outflows of 35.7 kcfs;
- **McNary**: average outflows of 186.9 kcfs; and,
- **Bonneville**: average outflows of 180.2 kcfs.

David Bogema, Corps, noted that Libby Dam is looking to hold outflow at 9 kcfs over the next few weeks while the Corps continues to evaluate inflows for peak pool elevation in late July. The intention is to reach 2,449 feet in September. Selective withdrawal has been repaired and the project is able to make temperature adjustments from the turbine releases.

Water Quality: Dan Turner, Corps, reported on the transition to summer spill. TDG in the tailraces are coming down; summer forebay criteria for TDG is 115%. Some forebay sites in the Columbia exceeded this criterion as well as in the Lower Snake due to the transition to summer spill. Higher TDG from spring spill is working through the system, and Dan noted that the incoming heat wave could bring TDG up.

Fish: Claire McGrath, NOAA, reported that juvenile spring migrating stocks are at very low numbers throughout the system and passage is nearly done for yearling Chinook, steelhead, sockeye and coho. Sub-yearling Chinook are dominating the sampling, with prime passage generally around July 1; they will continue to pass over the next couple months.

Adult Chinook continue to move through the system; steelhead numbers are low, as expected in June. At Bonneville Dam summer Chinook YTD passage is 60% of the 10-year average; Chinook jacks at 68% of the 10-year average; and low numbers of steelhead as expected (19-78 total, 9-51 wild) in the past week. Sockeye have been late to arrive this year, although have increased this week with YTD passage at 30,446, and lamprey at 2,511. Dave Swank, USFWS, noted that the adult lamprey run started in low numbers compared to 10-year average; they are on a trajectory for a below average year. Shad are at 3.3 million YTD.

Adult sockeye passage is picking up and we should see the sockeye counted at Bonneville move upstream towards McNary within the next week. Claire noted that this year's sockeye run is late but has ramped up in past few days (7% of average total); with a condensed total run time. The last decade generally saw lower returns in odd number years, which could correlate to a competition with pink salmon. With sockeye arriving late to Bonneville, total returns are unclear but will be concentrated in the next couple of weeks, unfortunately to coincide with the upcoming heat wave. Claire suggested that Salmon Managers may want to talk more about management options as they continue to closely monitor the situation. Jonathan Ebel, ID, noted that 3 PIT-tagged Snake River sockeye have been detected at Bonneville.

In the Snake River, Chinook and steelhead are passing at lower numbers, and shad are beginning to arrive at Lower Granite.

Power System: Tony reported on the upcoming heatwave, noting that BPA is expecting to meet the needs of the region and there is nothing to flag for concern.

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 June 30, 2021 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
DRAFT OFFICIAL MINUTES
Wednesday, June 23, 2021
Minutes: Melissa Haskin, BPA (contractor, FLUX Resources)

Today's TMT meeting was held via conference call and webinar, chaired by Lisa Wright, Corps, and facilitated by Emily Stranz, DS Consulting. See the end of these minutes for a list of attendees.

1. Weekly Native Non-Salmonids GBT Report

Lisa Wright, Corps, directed the TMT to the final GBT monitoring reports of the season, which are available on the TMT website under today's agenda. The four reports provided today include:

1. USGS - Native, nonsalmonid GBT report (June 14-17)
2. USGS - Data (June 14-17)
3. FPC - Real-Time GBT Reports, June 17
4. FPC - Real-Time GBT Reports, June 21

2. Dworshak Dam Update

Jon Roberts, Corps, reported on operations at Dworshak Dam. The region has been experiencing a heat wave, which is expected to intensify over the next few days and continue into next week. The 10-day forecast calls for highs in the triple digits and lows in the 60s – meaning there will be little nighttime relief, compared to what is normally seen in the region. The Lewiston forecast is showing two days – Sunday and Tuesday – at 117°F. According to Charles Morrill, WA, 117°F would be a record at Lewiston, which last hit a high of 115°F in 1961.

Dworshak Dam water is used to help keep the lower Snake River cool. The Corps targets 68°F in the Lower Granite tailwater, per the BiOp. When air temperatures are over 95°F, the river water tends to heat rapidly, said Roberts. Currently, inflow to the Snake River is not exceeding 68°F. The gauge at Orofino went down yesterday evening. The Lewiston gauge on the Clearwater is recording temperatures in the ~62-65°F range. Lower Granite's tailwater is currently 65°F but expected to rise. Cool water from Dworshak Dam should hit Lewiston by tonight.

Compared to last year, temperatures in the region are much warmer. For example, on June 23 (today), at the 15 to 20-meter range in Lower Granite's forebay, the temperature is ~64-65°F. Last year on this day, the temperature, at the same depth, was 58°F. Looking across the season, the average temperature in the Lower Granite tailwater is currently 65°F. Last year, it was 59°F, meaning that there is already a 6 to 7-degree difference, Roberts said.

The Corps shared 3 operational scenarios with TMT:

Scenario 1. Remain on minimum releases through the heatwave.
Scenario 2. Conservatively increase releases to maximum powerhouse capacity.
Scenario 3. Spill maximum allowable while remaining below 110% TDG limit.

Roberts reminded the TMT that a change in Dworshak outflow takes 3-4 days to arrive in the Lower Granite tailwater. The forecast considers variables such as mixing, air temperature, and solar radiation. It also includes forecasts for what ID Power might do at Hell's Canyon, which tends to affect the Lower Granite tailwater a day sooner than water out of Dworshak Dam would. The forecast goes 10 days out but is most used in the 5-7 day range. The current models are set to an analog year of 2016. According to modeling, the results for scenario 1 would be that temperatures will likely rise to somewhere close to 73-degrees over the next 10 days. It would be difficult to recover temperatures back to 68°F, which is what the BiOp requires, noted Roberts.

Based on the model results, the Corps increased Dworshak outflow on Monday, which is about 2 weeks earlier than last year and 8 days earlier than an average year. Last night, the Corps increased flows to 7,500 cfs and at 1000 this morning, it will add an additional 2,500 cfs for a total discharge of 9,000 cfs. This will put conditions close to the 110 TDG limit by mid-afternoon but keep the tailwater close to 68°F (it may go slightly over 68°F, noted Roberts). Roberts added that when ambient air temperatures go over 100°F, the Corps must spill close to the TDG limit to keep tailwater conditions favorable. When those ambient temperatures rise over 105°F, it becomes a struggle to maintain the BiOp temperature since the Corps is limited to a maximum TDG of 110%.

In sum, the Corps is moving water to maintain the tailwater at Lower Granite below 68°F, while also meeting state water quality standards for TDG in the Dworshak tailrace. Drafting drastically this early will affect available water later in the season. Dworshak Dam was forecasted to hit full on July 1 and was 3-feet from full when it began to draft yesterday. The pool must not be below 1,535 ft. on September 1. Looking long-term, during summer the project tends to run near powerhouse capacity at ~9,400 cfs. Based on the current 10-day forecast, Roberts expects the project will need to run 12,500 cfs until July 2, at the earliest. If it were to drop to the average of ~10 kcfs after July 2, the project would need to return to minimum discharge on or about August 19-20. This assumes there are no additional heat waves.

Tom Lorz, Umatilla Tribe/CRITFC, commended the Corps on its early action but noted the extra 3-feet of water that did not make it into the reservoir would have been desirable. Perhaps it could have been filled earlier, he mentioned, asking if the Corps plans to do a retrospective analysis. Roberts said there will be a retrospective and additional analysis but added that there has already been some analysis completed this year. That analysis resulted in a deviation request to fill 7-feet above what is required for flood control. After that, both April and May were dry months.

Sheri Sears, Colville, remarked that with climate change, these types of scenarios may occur more often moving forward. In the past, there has been talk about developing a strategy for high temperature years. She believes a strategy will be important going forward. Emily Stranz, DS Consulting, will add this topic to a future process meeting agenda.

3. Operations Review

3a. Reservoirs – Joel Fenolio, Reclamation; Lisa Wright, Corps

Reclamation projects:

Hungry Horse – Midnight elevation 3,558.1 ft., which is within 2-feet from full and on schedule to hit 3,550 ft. Releases are 4,500 cfs and inflows are 7,500 cfs. The project will continue to release ~4,500 cfs through the weekend and may decrease early next week.

Grand Coulee – Midnight elevation 1,288.6 ft., inflows have been steady at 135,000 cfs. Over the past four days, releases have been near 115,000 cfs. Heading into the 4th of July weekend, the project will hit 1,286 ft. and finish refill by the first part of July.

Corps Projects:

Libby – Midnight elevation 2,442.4 ft., yesterday's average inflows 27.3 and outflows 9 kcfs. Lorz asked about maintenance issues at Libby Dam. David Bogema, Corps, noted that the project will likely hold 9,000 cfs and reach 2,449 ft. in September. The Corps will evaluate flows to hit a peak pool elevation in late July. At this time, the selective withdrawal structure has been repaired and the project is making temperature adjustments. The project can adjust temperature from turbine releases, said Bogema.

Albeni Falls – Midnight elevation 2,062.2 ft., inflows 34.6 kcfs and outflows 38.4 kcfs.

Dworshak – Midnight elevation 1,597.2 ft., inflows 5.5 kcfs and outflows 2.4 kcfs.

Lower Granite – Yesterday's average outflows were 35.7 kcfs.

McNary – Yesterday's average outflows were 186.9 kcfs.

Bonneville – Yesterday's average outflows were 180.2 kcfs.

3b. Water Quality – Dan Turner, Corps

FOP summer spill has begun so TDG has decreased across the system. The summer TDG state standard is 115% in the downstream forebay and some of the forebays in the Columbia exceeded the 115% criteria. This week, the Snake projects have transitioned to summer spill and there have been a few exceedances there as well, as higher TDG from spring spill works its way through the system. Unfortunately, the incoming heat wave may increase TDG in the forebays.

3c. Fish – Claire McGrath, NOAA

Juveniles: Spring migrating stocks are showing in low numbers, since passage is mostly complete. Historically, subyearlings tend to wrap up the majority of their passage by July 1 and then pass in slow numbers over the summer months.

Adults: Summer Chinook are moving through the system, as are low numbers of steelhead. Sockeye counts at Bonneville have increased over the past few days.

At Bonneville, summer Chinook (counted from June 1) have been passing at 1,748 to 2,723 per day, with YTD totals of ~37,000 at the project, which is ~60% of the 10-year average. About 241-404 jacks have been passing per day over the last week at the project. YTD jack counts are 17,970, which is 68% of the 10-year average. Steelhead have been passing in the 19-78 per week range over the last week. For wild steelhead, it has been 9-51 over the past week. Shad are

passing in substantial numbers with ~178,000-360,000 per day with YTD of 3.3 million. Sockeye have been late to arrive this year. The YTD is 30,000. Lamprey are passing at ~100 per day, with a YTD total of 25,011. Dave Swank, USFWS, noted that lamprey have had a similar run timing as sockeye and are relatively low compared to the 10-year average. Numbers are improved over last year on this date, but the year is on a trajectory to be below average overall, said Swank.

Steelhead and shad are beginning to arrive at Lower Granite.

Sockeye have been picked up as far upstream as McNary, but there is a several-day lag in reporting on the mid-Columbia projects. They should move upstream over the next week, said McGrath. McGrath showed TMT several graphs from the Fish Passage Center and DART. The figures show that this year's run is late compared to past years. It has been ramping up over the past few days. Historically, the fish pass Bonneville from mid-June to mid-July with little variability. As of yesterday, about 7% of the average yearly total have passed Bonneville this year. Usually 25% have passed by this date, remarked McGrath. Over the last decade, returns were lower in odd numbered years, except 2015. This may be due to competition for food in the North Pacific Ocean. It could be a low return year, since it is an odd year. Arrival will likely be concentrated in the next 2-3 weeks, which will coincide with the heat wave. The 2020 BiOp authorizes the transport of sockeye from the Lower Granite trap. If ID were to request this, NFMS would support ID's request.

Jonathan Ebel, ID, shared that 3 PIT-tagged Snake River sockeye have been detected at Bonneville in the last week.

3d. Power – Tony Norris, BPA

With the incoming heat, BPA plans to meet the energy needs of the region.

Today's Attendees:

Agency	TMT Representative
Army Corps of Engineers	Lisa Wright (Chair)
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	Absent
Idaho	Jonathan Ebel
Montana	Brian Marotz
Nez Perce Tribe	Absent
Umatilla Tribe/CRITFC	Tom Lorz
Colville Tribe	Absent
Warm Springs Tribe	Absent
Kootenai Tribe	Absent
Spokane Tribe	Absent

Other Attendees (non-TMT members):
Corps – Alexis Mills, Dan Turner, Aaron Marshall, Jon Roberts

DS Consulting – Emily Stranz (Facilitator), Colby Mills
BPA – Melissa Haskin (CONTR, FLUX Resources, Notetaker)
Columbia Basin Bulletin – Mike O'Bryant
Public Power Council – Shane Scott