

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 19, 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

TMT members approved minutes and facilitator's summaries for the 12/19 (YER), 5/24, 5/29, and 6/5 meetings, with the following post-meeting addition to the 5/24 minutes and facilitator's summary:

- In the Little Goose operations section, representation of the black dots should have been defined as "when the percent of fish converting in less than three days is below 50%."

Water Supply Forecasts

Joel Fenolio, BOR, reported on the official June Water Supply Forecast for Hungry Horse Dam. The June to July residual volume is 680,000 acre-feet, or 80% of average. The April to August forecast inflow volume is 1,700 kaf or 88% of average, while the May to September forecast is 1,400 kaf. The project is just below average in terms of potential water supply for this year.

Doug Baus, Corps, reported the official June water supply forecast for Corps projects:

- **The Dalles:** NWRFC April to August volume forecast (5 days QPF) is 83 maf, or 94% of average;
- **Lower Granite:** NWRFC April to July volume forecast (5 days QPF) is 24 maf, or 121% of average;
- **Libby:** Corps NWS April to August volume forecast 4,676 kaf, or 79% of average;
- **Dworshak:** Corps NWS April to July volume forecast is 2,425 kaf or 99% of average;
- **Grand Coulee:** NWRFC April to August volume forecast (5 days QPF) is 48 maf, or 85% of average; and,
- **Albeni Falls:** NWRFC April to August volume forecast (5 days QPF) is 12 maf, or 95% of average.

Volumes were well above average in April and May, while volumes for June and July are forecasted to be below the 30-year average. August and September are expected to see volumes ranging back up near average. In terms of flow, for Lower Granite, inflows are forecasted to be below average for June and July, and then mid-July flows should bump up above average. The Corps will look into this discrepancy in data between flow and volume forecasts.

The Dalles had above average volumes in April, near average in May, and are forecasted to be below average in June, July, and August while moving closer to average in September. Inflows are forecasted to be below average for June, July, and August.

The 6-10 day climate forecast shows a probability of below average temperatures with a probability of above average precipitation. The 30-day outlook (as of May 31) shows a probability of above average temperatures, and a combination of an equal chance or below average precipitation west of the Cascades, and an equal chance of precipitation east of Cascades.

Treaty Fishing

Kyle Dittmer, CRITFC, presented SOR 2019-C1 (posted on TMT website) submitted by CRITFC to the Corps and BPA last week. The SOR requests to operate the Lower Columbia pools for the summer 2019 treaty fishery. Specifications include operating Bonneville and the Dalles pools within a 1.5-foot band and John Day within a 2-

foot band during the time periods of June 17 at 0600 hours to June 22 at 1800 hours, and June 24 at 0600 hours to June 26 at 1800 hours. Kyle noted that estimated runs so far at Bonneville Dam are 36,300 adult summer Chinook and 94,000 sockeye, which are both below average. CRITFC will be running a series of net flights each week and will share the survey data with Action Agencies. Kyle also emphasized that June 15-27, will be exclusively for ceremonial and subsistence fishery for the Tribes, followed by the commercial season, which is very short this year. Operations for this SOR are currently being implemented.

Dworshak Operations

Jon Roberts, Corps NWW, reported on current operations at Dworshak Dam. The project is ranging from 6.5-6.6 kcfs in total outflow and is operating in the top .5-foot of the reservoir. Current elevation is 1,599.8 feet. The Northwest River Forecast Center shows inflows continuing to recede over the next 10 days to about 2,500-3,000 cfs.

The 12-hour average in the Lower Granite tailwater is 64.16 kcfs and continues to be monitored. All discharge is running through the powerhouse so TDG levels are at 100% in the tailrace and between 97%-98% at the hatchery. This is expected to continue until potential spill for flow augmentation in July.

The current operational scenario uses analog year 1993, reflecting receding flows, for which the project will continue to operate through the powerhouse to maintain a full pool as long as possible until flow and temperature augmentation is needed. The water temperature comparisons model will continue to run every few days until temperatures at Lower Granite are consistently at 65 degrees F when it will be run daily. Forecasts show a cooling off period with the incoming weather system and will be below 65 degrees F for the next 10 days. Charles Morrill, WA, noted that there is a pattern of Lower Granite forebay temperatures quickly spiking and falling.

Libby Dam Summer Operations

Sonja Michelsen, Corps, presented Libby Dam summer operations, which can be viewed on the TMT website. The April – August inflow forecast from May 1 for Libby Dam was 4.98 maf, or 85% of average, which set the sturgeon volume at 0.8 maf. Bull trout minimum flows after the sturgeon pulse are 7 kcfs through August 31 and the May VarQ release is 18,000 cfs. There was no flow request this year from the Kootneai Tribe as they continue restoration work in the tributaries. Sonja noted that things are very dry which is resulting in not much variation in operations this year and a relatively low but stable pool elevation for the summer.

FOP Spring Spill

Julie Ammann, Corps, reported that the Lower Snake projects are operating to the Flex Spill Agreement, and have been hitting 119-120% TDG, except for Ice Harbor, which has been at minimum generation. Spring spill on the Snake will end at 0001 hours on June 21 and then shift to summer spill operations, which include:

- 18,000 cfs spill at Lower Granite;
- 30% spill at Little Goose 24/7;
- 17,000 cfs spill at Lower Monumental;
- 30% spill at Ice Harbor.

As the Lower Columbia transitioned into summer spill on June 16, daily average spill levels have decreased, resulting in a drop in TDG levels. Julie noted that summer TDG standards for WA goes back to 120% in the tailrace and 115% in the forebay; as the gas moves through the system there have been exceedances in the downstream forebay gauges at John Day and The Dalles. Julie noted that the gas is dissipating naturally, which can take a few days depending on flows. Summer spill levels on the Lower Columbia are:

- 57% spill at McNary 24/7;
- 35% spill at John Day;
- 40% spill at The Dalles;
- 95,000 cfs spill at Bonneville.

Scott Bettin, BPA, reported that flex spill operations on the Lower Columbia ended on Saturday, and projects on the Snake will continue flex spill operations until the 21st. He thanked Tom Lorz, Umatilla/CRITFC, for notifying BPA that it wasn't possible to change the 8hr block from morning to afternoon hours at Little Goose, and all 8 hours were implemented in the morning.

Spill Priority List

Julie updated the TMT on the May 24 coordination to move Little Goose operations to the bottom of the spill priority list during spring spill. With summer spill, the list reverts to the upstream / downstream order. Fish Managers supported this implementation.

Little Goose Dam Operations

Doug Baus, Corps, summarized Little Goose Dam operations to date (summary posted on the TMT website). As coordinated by the TMT on June 12, from June 13 – 20 the project is spilling at 30% for 8 hrs/day (0400-1200) and maintaining the ASW in high crest position during all hours.

The Corps received feedback from NOAA that there was agreement at FPAC to modify unit priority at the project. The Fish Passage Plan states a priority of 1, 6, 2, 3, 4, 5 during spring spill. Units 1 & 6 were forced out of service over the past two days, so units 2, 3, and 4 were utilized. Surprisingly, unit 6 came back on at 5pm yesterday, and the Corps reached out this morning to the project to convey the modified unit priorities of 1, 2, 3, 4, 5, and 6. The project is now operating in accordance with the new unit priority. Unit 1 is estimated to return to service on June 28 or sooner. Unit 5 is also out and expected to return to service in 2021.

At 0800 hours, the project had a total outflow of 65.2 kcfs, On Friday with the start of summer spill, the project will spill at 30% for 24 hrs/day. The current forecast shows inflows dropping to 49 kcfs by the end of the next 10-day period.

Claire McGrath, NOAA, reported variability in fish passage from day-to-day. They are seeing reasonable passage with varying travel times, although NOAA is not yet comfortable moving back to the morning/evening hours operation as about 9% of converted fish had passed with a 10+ day travel time between Lower Monumental and Little Goose. She noted that they are pleased with the past week's passage and appreciate the TMT's cooperation.

YTD (as of June 16) percent conversion between Lower Monumental and Little Goose Dams, is 86.9%, which is slightly below the average of 90-91%. About 9.6% of converted fish had been there for 10 or more days, which is higher than the average 5%; travel times have historically been on average 2 days. NOAA believes the current operation to be successful and wants to keep fish moving as there is still evidence of an issue with fish conversion. Claire did note that PIT-tagged data and ladder counts are telling different stories, and that data are limited.

Dave Swank, USFWS, noted that the conversation around the biological significance of extended travel time is ongoing and vibrant at FPAC. He noted that FWS is not as concerned about the extended travel time because it is common for 98% conversion by the end of June. Charles Morrill, WDFW, pointed to a 2018 FPC memo on impacts of fish delay, noting that impact was not significant until fish were delayed by 20+ days.

Operations Review

Reservoirs: Joel Fenolio, BOR, Reported on Bureau of Reclamation projects:

- **Hungry Horse:** midnight elevation was 3,556 feet, with inflows of 5,600-5,700 cfs. The project is currently releasing 3,000 cfs and will hold and target full pool at 3,550 cfs next week or the first part of July. Current summer flat flows look to be between 2,500-3,500 cfs to be 10-feet from full at the end of September.
- **Grand Coulee:** midnight elevation was 1,286 feet, releasing 1,000 cfs, with inflows of 120,000 cfs. The project will potentially hold at 1,286 feet going into the July 4 holiday.

Joel noted that flow augmentation operations have begun, with a release today of 3,500 cfs from the Upper Snake out of Milner, which will be held through the middle of July. The Boise and Payette are just on the border of flood control operations and refill, and more details will be provided at the next meeting.

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

- **Libby:** midnight elevation was 2,424.0 feet, with average inflows of 21.2 kcfs and outflows of 20 kcfs for the sturgeon pulse;
- **Albeni Falls:** midnight elevation was 2,062.4 feet, with average inflows of 37.7 kcfs and outflows of 41.5 kcfs;
- **Dworshak:** midnight elevation was 1,599.9 feet, with average inflows of 6 kcfs and outflows of 6.6 kcfs;
- **Lower Granite:** average outflows were 76.3 kcfs;
- **McNary:** average outflows were 192.6 kcfs; and,
- **Bonneville:** average outflows were 189.1 kcfs.

Water Quality: Julie had nothing further to add, and reminded the TMT that projects are switching over to summer spill.

Fish: Claire reported that all projects reflect adult salmon below the 10-year average. Bonneville Dam is seeing 1,200-1,800 Chinook and 150-200 jacks daily. YTD numbers are 75,650 adult Chinook (40% of the 10-year average) and 9,600 jacks. Steelhead continue to trickle in at 25-50 per day (2,773 YTD), with 1,969 sockeye (9,400 YTD), and 176-300 lamprey (3,830 YTD) which is 64% of the 10-year average. Shad continue to pass at extreme rates of 200,000 or more daily. Some TMT members wondered if this could impact other fish in the river and their counts. Lower Granite has seen 19,627 Chinook to date, or 30% of the 10-year average, with similar percentages for jacks (4,000 YTD).

The 2-week passage index shows very few yearling Chinook remaining in the system, with 0-300 range at Lower Granite (2.9 million YTD) and 250-1300 range at Bonneville (1.7 million YTD). Sub-yearlings at Lower Granite are in the 2,000-5,000 range daily (.5 million YTD). Bonneville has 20,000 passing daily (3 million YTD) Steelhead, sockeye, and lamprey numbers are winding down although Bonneville saw an uptick of lamprey (100,000 YTD).

Power System: Scott reported that winds are inconsistent, and temperatures are fluctuating.

The next scheduled TMT meeting is a conference call on Wednesday, June 26, 2019, at 9:00 AM.

The group decided to keep the June 26 conference call, and tentatively cancel the in-person meeting on July 3 due to the holiday.

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
June 19, 2019
Minutes: Melissa Haskin, FLUX Resources

1. Welcome and 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 previous documents discussed and final meeting minutes are available on the TMT website.

2. Minutes

Minutes for 12/19 YER, 5/24, 5/29, and 6/5 were approved.

3. Water Supply Forecast - *Joel Fenolio, BOR, and Doug Baus, Corps NWD*

Joel Fenolio, Reclamation, provided the following Hungry Horse Dam Official Water Supply Forecasts for the month of June, which was released June 5.

- Jun-Jul: 680 kaf (80% of average)
- Jan-Jul: 1,820 kaf (87% of average)
- Apr-Aug: 1,700 kaf (88% of average)
- May-Sep: 1,420 kaf (84% of average)

The following are the minimum flows downstream of Hungry Horse Dam for the rest of the calendar year.

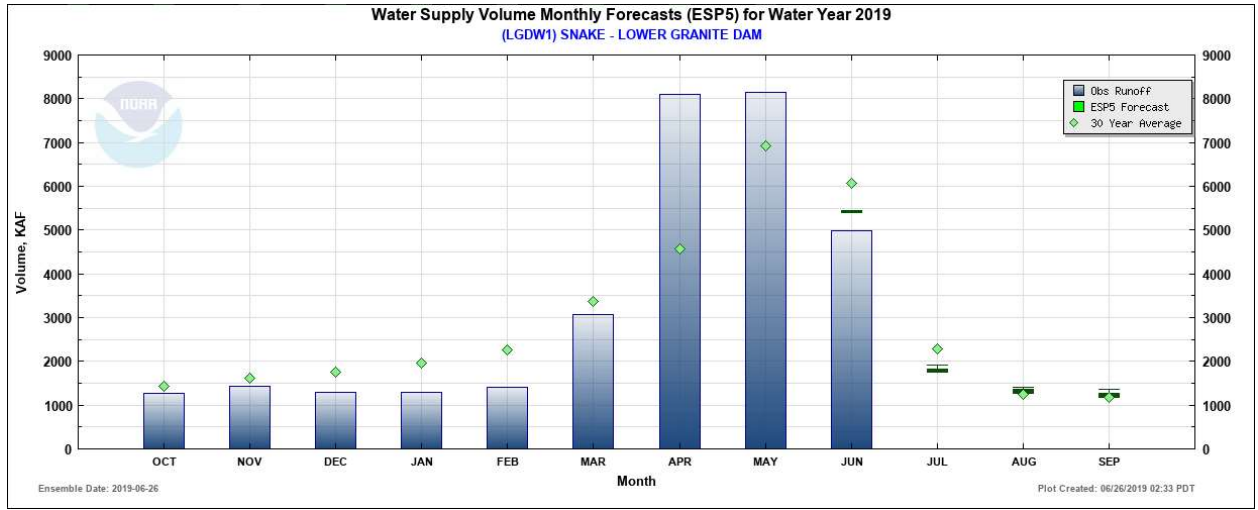
- Columbia Falls: 3,480 cfs
- Hungry Horse: 870 cfs

Doug Baus, Corps, provided the following official Water Supply Forecasts for the month of June.

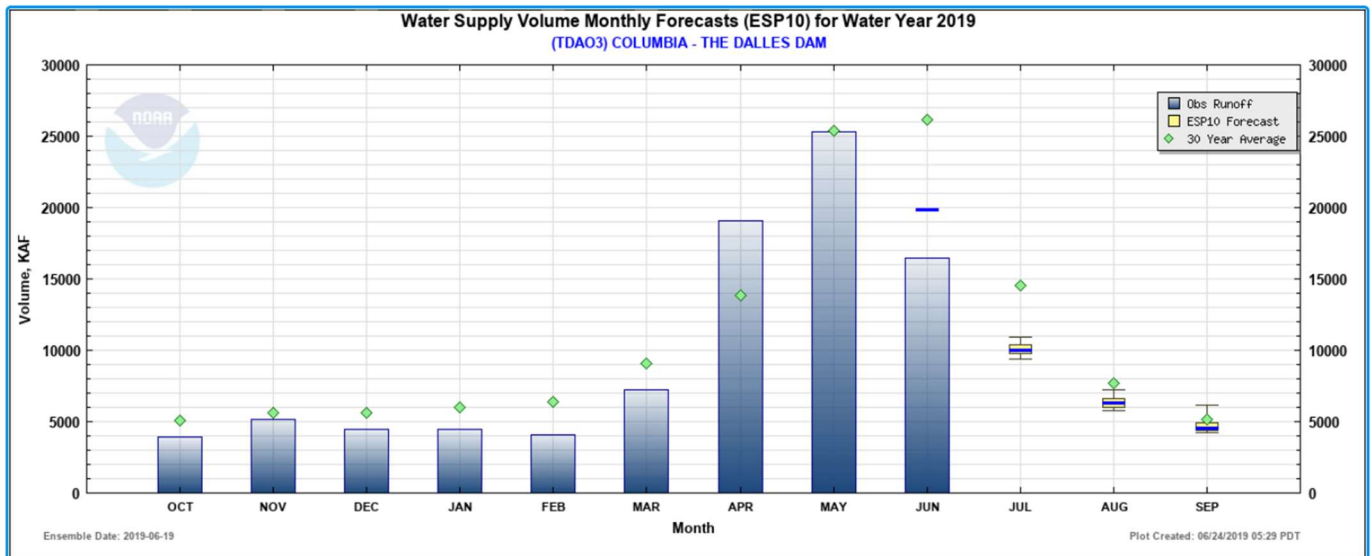
- The Dalles Dam: NWRFC April to August volume forecast (5 days QPF for) is 83 MAF (94% of average).
- Lower Granite Dam: NWRFC April to July volume forecast (5 days QPF) is 24 MAF (121% of average).
- Libby Dam: Corps NWS April to August volume forecast is 4,676 KAF (79% of average).
- Dworshak Dam: Corps NWW April to July volume forecast is 2,425 KAF (99% of average).

- Grand Coulee Dam: NWRFC April to August volume forecast is 48 MAF (85% of average).
- Albeni Falls Dam: NWRFC April to August volume forecast is 12 MAF (95% of average).

At Lower Granite Dam the observed runoff volumes for the months of April and May were above the 30 year average (see below). The water supply volume monthly forecast calls for a below average runoff during the months of June and July and close to average in August and September.



At The Dalles, the month-by-month runoff volumes were above average in April and average in May (see below). In June, July, and August, the forecast is for below average runoff. This will remain the case until September when the forecasted runoff approaches average.



The 6 to 10-day forecast calls for below average temperatures and above average precipitation. The long-term forecasts had not been updated.

4. Treaty Fishing - *Kyle Dittmer, CRITFC and Doug Baus, Corps NWD*

The Columbia River Inter-Tribal Fish Commission (CRITFC) submitted a SOR for the following conditions:

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles: Operate the pool within a 1.5 foot band during the treaty fishing period.

John Day: Operate the pool within a 2-foot band during the treaty fishing period.

They asked the SOR be implemented Monday, June 17, 2019, 6 am, through Saturday, June 22, 2019, 6 pm and Monday, June 24, 2019, 6 am, through Wednesday, June 26, 2019, 6 pm. The Corps is already implementing the SOR. Dittmer said that while the typical fishing season for tribes can run up to 4 weeks, it seems like it may only be 2 weeks this year. CRITFC will run fish net flights this week and next week.

The forecast is for 36,000 adult Chinook in the Columbia, which is right below average and 94,000 sockeye, also below average.

Dittmer noted that the first week of fishing is for ceremonial/subsistence fishing and the second week is for commercial fishing.

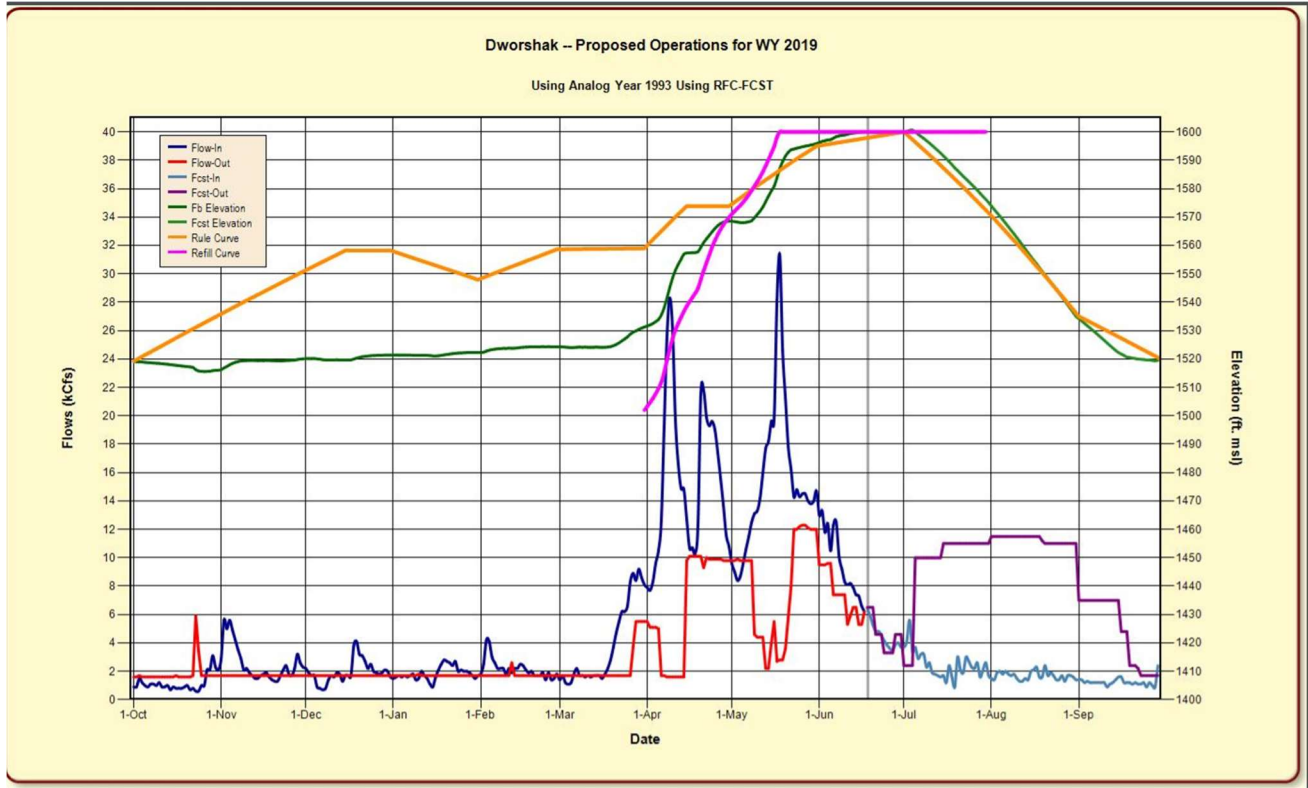
Dave Swank, USFWS, wondered why the days for fishing are mid-week. Dittmer said that the main customer is often restaurants and they typically want the fish for the weekend so the fishing has to happen earlier in the week.

5. Dworshak Operations – *Jon Roberts, Corps NWW*

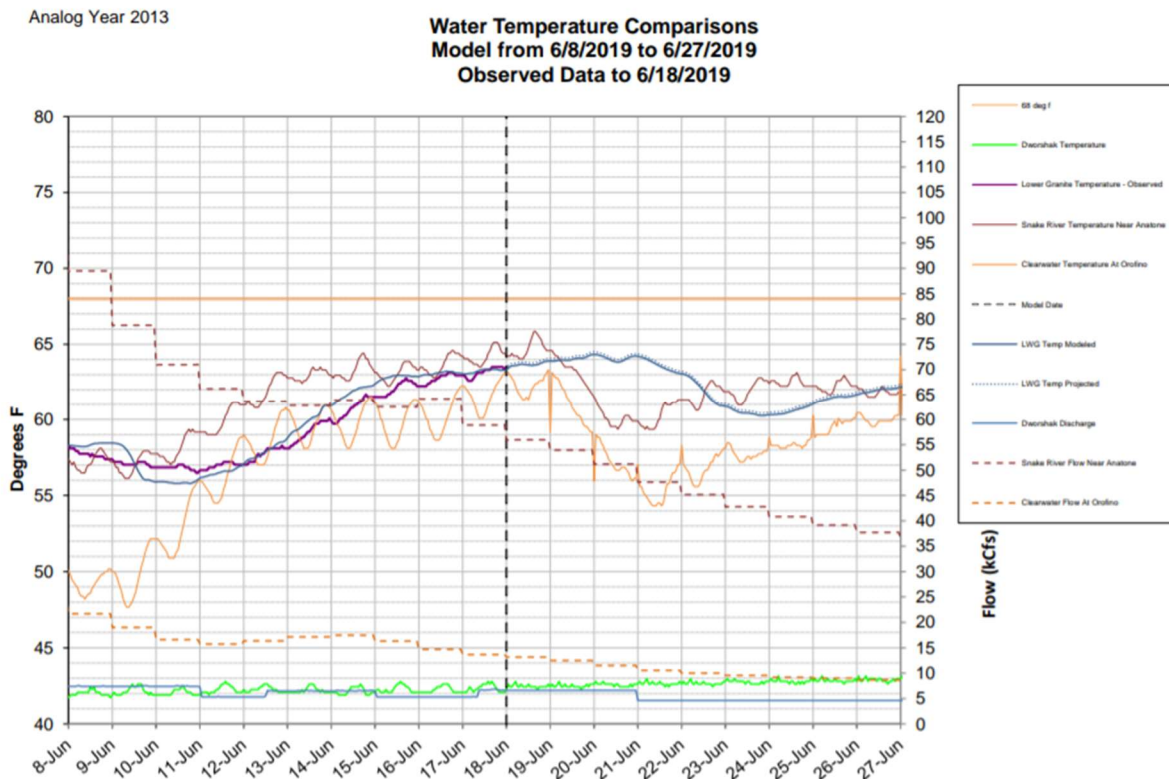
Jon Roberts, Corps, reported on operations at Dworshak Dam. The reservoir's current elevation is 1,599.9 ft. Outflows are 6.5 to 6.6 kcfs and the Corps is operating in the top half foot of the reservoir, while keeping it full. Inflows are falling off and there may be a slight bump in the next few days.

Currently, the 12-hour Lower Granite tailwater average is 64.16 degrees F. All Dworshak discharge is going through the powerhouse so TDG is low at about 100%. It is 98% at the hatchery. This should continue until there is spill for flow augmentation.

Roberts presented the Corps planned operation (see below) for Dworshak Dam based on historical data using 1993 as the analog year.



Roberts showed the following temperature modeling.



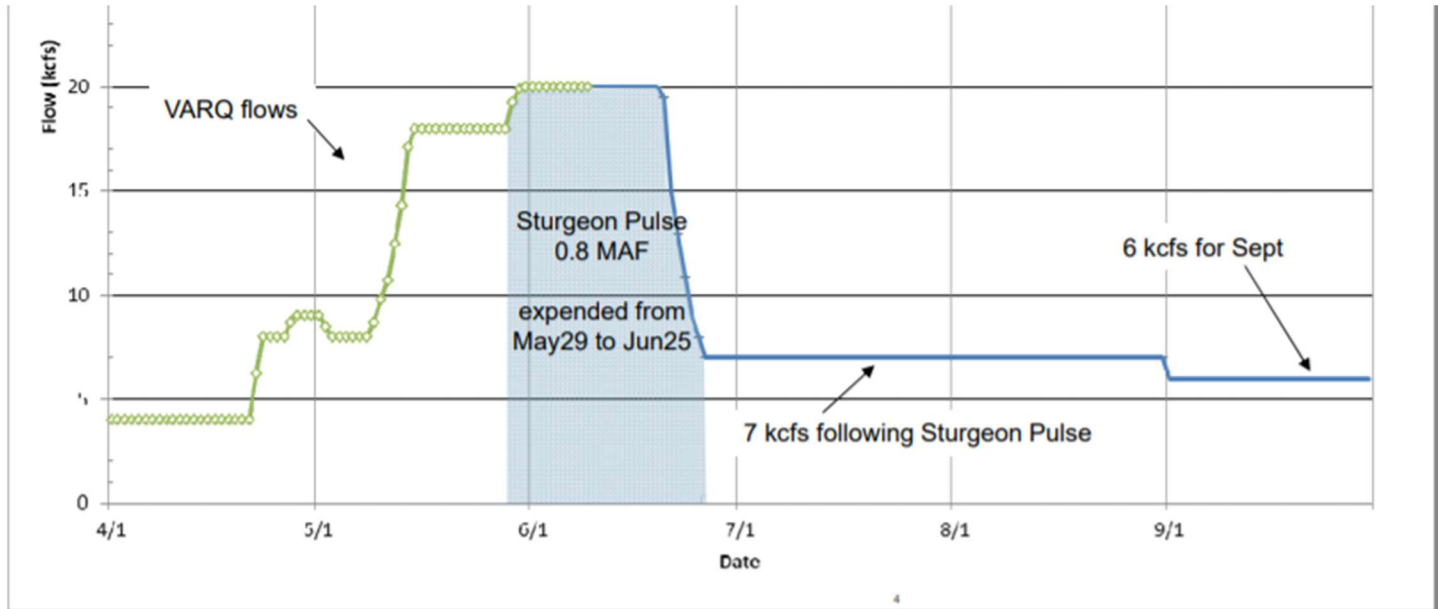
The model shows a slight dip down in water temperatures over the next few days due to an incoming weather system.

Modeling will continue every 2-3 days until the Lower Granite Dam tailwater temperature reaches 65 degree Fahrenheit, when it modeling will be daily.

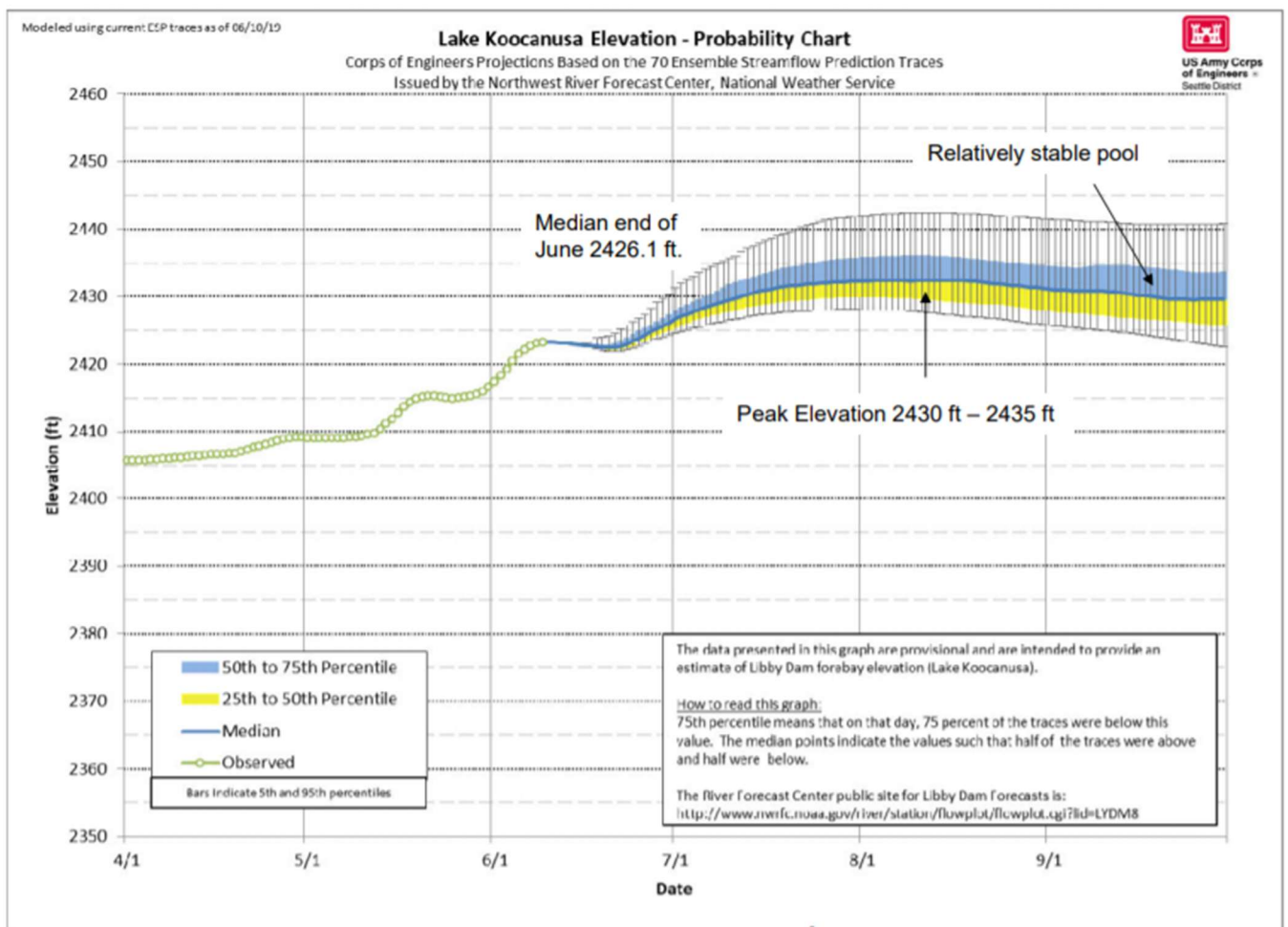
6. Libby Operations - *Sonja Michelsen, Corps NWS*

Sonja Michelsen, Corps NWS, shared an update on Libby. She shared that the May April-August inflow forecast for Libby Dam was 4.98 million acre-feet (MAF). The Sturgeon Volume is 0.8 MAF and the bull trout minimum is 7 kcfs (based on the May Water Supply Forecast). There will be no change in Libby Dam operations for the Kootenai Tribe of Idaho this year, like there have been in years past. She said that due to low refill draft requirements will not be applicable so the pool is expected to remain stable through August and September.

The following slides from Sonja’s presentation summarize Libby Dam spring operations and planned summer operations. During the spring the sturgeon pulse occurred from May 29 to June 25. Planned Libby outflows following the sturgeon pulse are 7 kcfs through August. Planned Libby outflows during September are 6 kcfs.



The following slide shows the Lake Koocanusa median end of June elevation of 2426.1 feet and the anticipated peak elevation of 2430 to 2435 feet.



7. FOP Spring Spill – Julie Ammann, Corps, and Scott Bettin, BPA

The Corps continues to implement the Flex Spill Agreement. On the Snake River, TDG has been mostly in the 119-120% range, except Ice Harbor, which has been hitting minimum generation level therefore there is not sufficient outflow to spill to 120% TDG in the project tailwater. There are a few more days of spring spill. At 0001 hours on June 21, the Corps will switch to the summer operation, which is 18 kcfs spill (24 hrs. per day / 7 days per week) at Lower Granite and 30% spill (24 hrs. per day / 7 days per week) at Little Goose (24 hrs. per day / 7 days per week) and 17 kcfs (24 hrs. per day / 7 days per week) at Lower Monumental and 30% spill (24 hrs. per day / 7 days per week) at Ice Harbor.

On the Lower Columbia, the daily average summer spill levels are generally lower than the spring spill levels. During summer spill (June 21 – August 31, for lower Snake River dams, and; June 16 – August 31 for lower Columbia River dams) TDG must not exceed an average of

115% as measured in the forebays of the next downstream dams and must not exceed an average of 120% as measured in the tailraces of each dam per the WA TDG criteria adjustment.

As a reminder, the summer spill levels on the Columbia are as follows:

- 57% spill at McNary 24/7
- 35% spill at John Day
- 40% at The Dalles
- 95,000 cfs at Bonneville

Moving in to summer, the Corps will let high TDG levels from the spring spill operation dissipate which will take a few days. They are planning to let it degas naturally. It would be really challenging to come up with a spill operation to offset the change in WQ standards for summer spill, particularly with the several day travel time between projects. This is a new situation as this is the first year of the WA short-term modification of the TDG criteria adjustment.

Scott Bettin, BPA, reported that BPA flexed until flex spill ended in the Lower River on Saturday. It will continue to flex until flex spill ends on the Snake.

At Little Goose, operations remained the same with all 8 hours in the morning. Scott Bettin appreciated Tom and salmon managers looking into if a change was possible.

8. Spill priority list - *Julie Ammann, Corps NWD*

On May 24, TMT coordinated to move Little Goose lower on the spill priority list. It will plan to go back to the default order when the summer spill priority list is implemented. Fish managers support that decision.

9. Little Goose Dam Operations - *Doug Baus, Corps-NWD; Paul Wagner, NOAA Fisheries, and; Tony Norris, BPA*

9a. Summary Document – Corps

Doug provided an update on Little Goose operations, starting with the summary document of operational changes. Since the last TMT, the following operation has been implemented and the document updated:

Thursday, June 13 – Thursday, June 20: Continued 30% spill for 8 hours (0400-1200) and maintained ASW in high crest during all hours. Consensus (no objections) from TMT on Wednesday, June 12.

Baus did note that there was an agreement on modifying unit priority at Little Goose. According to the FPP, the Little Goose unit priority is 1, 6, 2, 3, 4, 5. Unit 1 went out of service on Monday. Then Unit 6 was forced out of service yesterday. The Corps was not expecting it to be back online for a while. This left the project with units 2, 3 and 4 available (unit 5 is out until 2021). Salmon managers recommended that the priority be changed to 1, 2, 3, 4, 5, 6. However, unit 6 returned to service unexpectedly and was put back online. Looking at the hourly data, unit 6 came on at 1700 yesterday. Once the Corps was aware of this, it conveyed the modified unit priority to the project (which it had not done prior) via teletype. There is a modified unit priority in place now for 1, 2, 3, 4, 5, 6. This will dovetail into the summer operation, which starts on June 21.

Unit 1 is estimated to return, June 28 but it may be sooner.

Project data shows that at 0800 total outflow was 65.2 kcfs. Percent spill is 30% right now and the maximum yesterday during flex spill was 77.9%. Friday is the start of summer spill operations (30% for 24 hours a day).

The 10-day inflow forecast drops down to 49 kcfs by the end of the 10 day period.

9b. FOP Fish – Claire McGrath, NOAA

There is some variability day to day in the fish counts but overall passage is “reasonable.” There is a longer travel time than usual. Some travel times are as high as 10 to 18-days.

Overall about 9% of fish are lagging (10+ days of travel time), which is the rationale for continuing the 30% spill operation for 8 consecutive hours.

The ladder counts and PIT-tag data are telling very different stories. McGrath pulled up the PIT tag data, which shows that the travel time between Lower Monumental and Little Goose is much longer than normal. Historically, about 50% of fish pass in 2 days. That is not the case this year.

The YTD conversion this year for Lower Monumental to Little Goose is 86.9%. This does not alarm some salmon managers since the average is 90-91% this time of year. Typically, these numbers catch up by the end of the year. Some of the discussion between salmon managers at FPAC is “can you have that lag? Does it hurt fish?”

Historically about 5% of fish take 10 or more days. This year that is 9.6%. NOAA believes this is significant. This is why NOAA supports the current operation. NOAA believes the operation is working but does still see evidence of a delay issue.

Charles Morrill, WA said that PIT Tag data does not always tell the full story. He finds it surprising that the passage from Ice Harbor to Little Goose is a little below average while from Little Goose to Lower Granite is well below average.

Dave Swank, USFWS, commented that we are clearly seeing a slight increase in the number of fish that are taking 10 days or more to travel. He added that in last 3 years the sample size of pit tag fish has dropped pretty significantly, which could be influencing the data. He said

that by the end of the season, the fish all seem to catch up. He wonders if additional days of travel have any biological effects.

FPC did look into what data they had last year. Erin from FPC reported that they find only an impact for wild Chinook and not other groups but that the data set was small.

10. Operations Update

10a. Reservoirs – Joel Fenolio, Reclamation, and Lisa Wright, Corps

Hungry Horse – Hungry Horse is releasing 3,000 cfs. The forebay's midnight elevation was 3,556 ft. (4 feet from full). Inflows are about 56-57 cfs. It looks like they are dropping but there is the potential of an emerging storm coming from the East. Reclamation will hold releases at 3,000 cfs for now. The pool will likely be full by next week or the first part of July. Flat flows should be 2,500 to 3,500 cfs to reach 10-feet from full by the end of September.

Grand Coulee – Released 100 kcfs yesterday. Inflows have been around 120 kcfs; midnight elevation 1,286 ft. The elevation should be 1,286 ft. or so going into July 3.

Upper Snake Flow Augmentation: Reclamation started releasing from the Upper Snake at Milner today and plans to hold that release through mid-July. The Boise and Payette are still on the border flood control operations and providing augmentation. There should be more details next week.

Libby – Midnight elevation 2,424.0 ft., yesterday's average inflows were 21.2 kcfs and outflows were 20 kcfs.

Albeni Falls – Midnight elevation 2,062.4 ft., yesterday's average inflows were 37.7 kcfs and outflows were 41.5 kcfs.

Dworshak Dam – Midnight elevation 1,599.9 ft., yesterday's average inflows were 6 kcfs and outflows were 6.6 kcfs.

Lower Granite – Yesterday's average outflows were 76.3 kcfs.

McNary Dam – Yesterday's average outflows were 192.6 kcfs.

Bonneville – Yesterday's average outflows were 189.1 kcfs.

10b. Water Quality

No additional update.

10c. Fish – Paul Wagner, NOAA

Adults: At Bonneville, Chinook adults are still passing at about 1,200 to 1,800 per day. The YTD for Chinook is 75,650, of that number, 20,000 were summer fish. There have been about 150 to 200 jacks per day and an YTD of 9,600 jacks (66% of last year and 40% of the 10-year average).

Also at Bonneville, steelhead are trickling in at 25-50 per day. The YTD is 2,773. Sockeye is steadily increasing with yesterday's numbers at 1,969. The YTD is 9,400.

As we have seen all year adult salmon are well below 10-year average.

Lamprey are about 176-300 daily with a YTD of 3,830 (64% of the 10-year average).

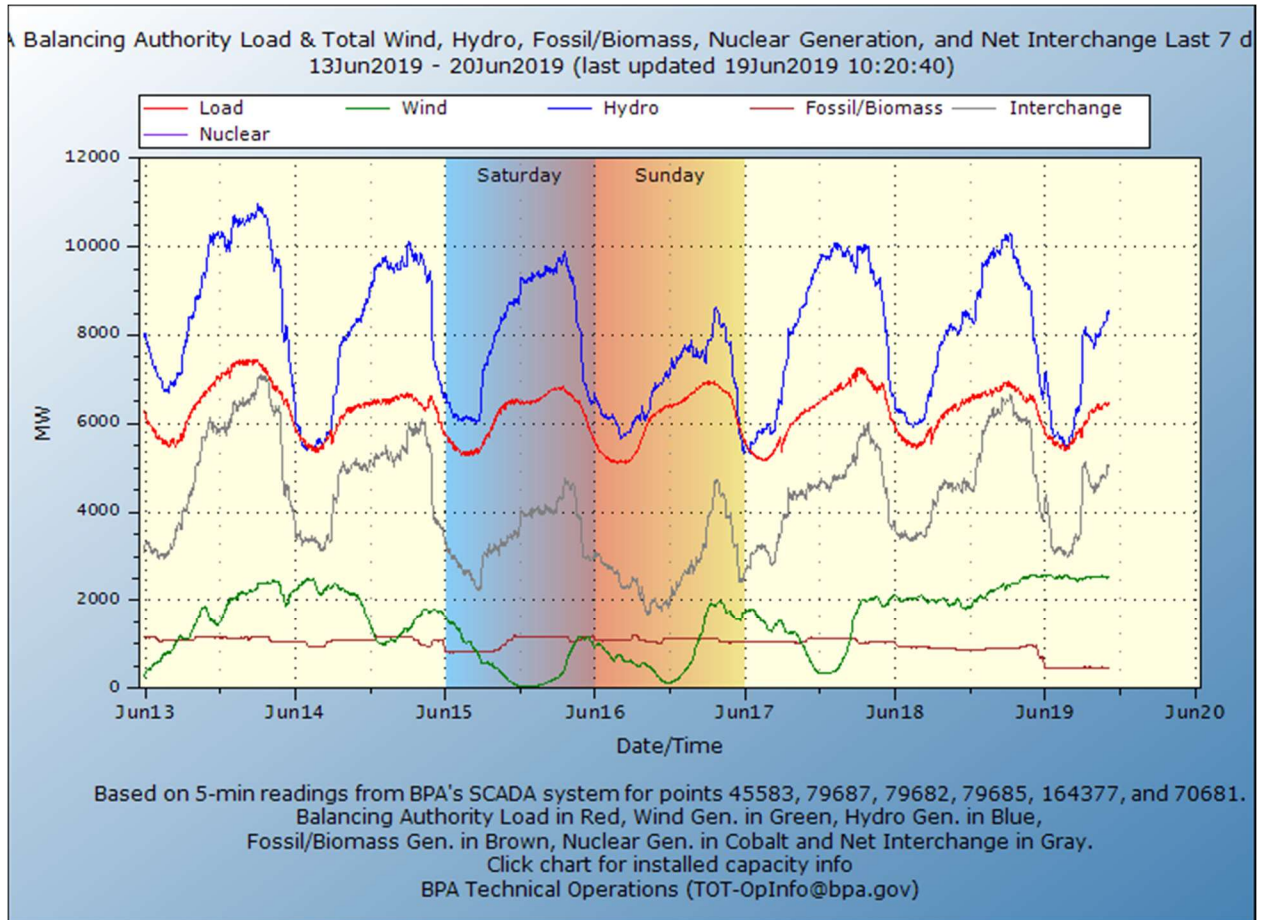
When it comes to shad, they are passing at a rate of 200,000 daily. The YTD is 5.7 million (almost breaking last year's record-breaking number). There is a growing concern about ladders becoming congested.

Looking at Lower Granite spring Chinook the YTD is 30% of average at 19,627.

Juveniles: There are very few yearling Chinook left in the system. The passage index has been 0-300 at Lower Granite. YTD yearling Chinook at 2.9 million at Lower Granite. At Bonneville, passage of yearling Chinook is 250-1,300 daily with a YTD total of 1.7 million. Subyearlings at Lower Granite are about 2,000-5,000 daily and 500,000 YTD. Subyearlings at Bonneville are about 20,000 per day. Steelhead have been winding down from 1,000 daily last week to 125 yesterday at Lower Granite. YTD is 4.4 million to date. Sockeye are passing at about 660 per day at Bonneville. There have been a few individual lamprey at Lower Granite and there has been an uptick of 100-300 per day at Bonneville over the past 5 days. YTD at Bonneville is 100,000 (the index not the nighttime passage).

10d. Power – Scott Bettin, BPA

BPA is expecting wind on the system. The following 7 day load and generation chart shows that it has been windy over the past few days.



11. Next TMT

The next meeting will be a conference call on June 26 at 9 a.m.

12. Today's Attendees

| Agency | TMT Representative |
|---------------------------------|--|
| Army Corps of Engineers | Doug Baus (Chair), Julie Ammann, Lisa Wright |
| Bonneville Power Administration | 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 | Russ Kiefer |
| Montana | N/A |
| Nez Perce Tribe | Jay Hesse |
| Umatilla Tribe/CRITFC | Tom Lorz |
| Colville Tribe | Sheri Sears |

| Agency | TMT Representative |
|--------------------|--------------------|
| Warm Springs Tribe | Jen Graham |
| Kootenai Tribe | N/A |
| Spokane Tribe | N/A |

Other Attendees (non-TMT members):

Army Corps of Engineers – Dan Turner, Steve Hall, Jon Roberts, Alfredo Rodriguez, Michelle Yuen, Chris Peery, Logan Osgood-Zimmerman, Laura Hamilton, Eric Chow, Sonja Michelsen
DS Consulting – Emily Stranz (Facilitator), Colby Mills
FLUX Resources – Melissa Haskin (Note taker)
Clearing Up – K.C. Mehaffey
Columbia Basin Bulletin – Mike O’Bryant
Portland General Electric – Ruth Burris
Umatilla Tribe/CRITFC – Kyle Dittmer