COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
July 2, 2025
Facilitator's Summary
Facilitation Team: Emily Stranz & 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; it is not intended to be the "record" of the meeting. Official minutes can be found on the TMT website: https://public.crohms.org/tmt/agendas/2025/. Suggested edits for the summary are welcome and can be sent to Colby at colby@dsconsult.co.

Review Meeting Summaries & Minutes – TMT Members will review the official meeting minutes and facilitator's summary from June 25 at the next TMT meeting. Facilitator, Emily Stranz, DS Consulting, clarified that meeting minutes/summaries only cover what is discussed in their respective meetings, and do not include post-meeting discussion; any edits to previous minutes/summaries should be submitted prior to formal TMT review and approval.

Sockeye Conversion Update – Jonathan Ebel, IDFG, reported 56 tags, expanded (based on tagging rate) to 953 hatchery Snake River sockeye at Bonneville (BON). Current conversion rates observed so far include BON to The Dalles (TDA) at 82%, BON to McNary (MCN) at 46%, MCN to Ice Harbor (IHR) at 73%, and IHR to Lower Granite (LWG) at 47%. The overall conversion to LWG is 0.16 as of today. Tags are crossing BON every day with fish moving relatively quickly through the system; travel times range from average to faster than average for this early part of the run. No tags have been detected yet at Priest Rapids (PRD), indicating that so far, no fish have diverted into the Upper Columbia.

Dworshak Operations – Jon Roberts, Corps, reported on current operations at Dworshak Dam (DWR). The project is currently releasing 10,000 cfs, through full powerhouse generation and 500 cfs of spill, keeping TDG below the 110% gas cap. The reservoir has drafted about 4-feet from full pool since ramping up for the current SOR operation (presented at TMT last week) and is expected to draft 1 foot/day for the duration of the operation.

Water releasing from DWR is currently between 42-43°F, slightly higher than the usual colder 40-41°F, due to early snowmelt and runoff this year (incorporated in modeling). This cooler water from DWR is keeping temperatures downstream lower than usual for this time of year. DWR water has reached Lewiston where it's been about 55°F each day; and is expected to hover there for the next couple weeks. Although not influenced by DWR outflows, yet contributing to temperatures downstream, the Snake River at Anatone is fluctuating around 70-71°F, although it is expected to increase with the heat wave at the end of the 10-day forecast. The Clearwater at Orofino, at a lower flow of around 4 kcfs, is currently 71.5-72°F; flows will typically recede to about 2 kcfs in late August/early September. The LWG tailwater is around 66°F and is expected to stay there through tomorrow as it gradually increases to the 68°F mark. In the LWG forebay, the 15–20-meter mark (deep spill area) is a bit cooler than the usual 68°F, between 65-66°F.

The 10-day forecast for the region shows initial cool weather followed by a heat wave with temperatures expected to exceed 100°F in the lower Snake area between July 10-12; tailwater temperatures are expected to remain below 68°F with the releases from DWR though the river system will continue to warm with the heat. In Lewiston, temperatures are cooling at night, which helps cool off the lake when daytime temperatures reach into the 90s. Jon reminded the group that 10 days of regional heat waves (105°F) and other factors are considered in the operational modeling to manage temperatures and flows. In response to a Fish Manager concern about IHR forebay impacting ladder temperature differentials, Jon reported that the IHR tailwater is currently right under 67.4°F and the Corps continues to monitor forebay

temperatures going downstream. The forebay temperature page will be added as a link for future TMT agendas.

Jon presented modeling results that compare the relative differences in releases from DWR and the related impact on Lower Snake River water temperature between two different scenarios: a "no change" alternative to maintain the LWG tailwater at 68°F, and the current SOR operation (10 kcfs +/- out of DWR through July 23, allowing for 71°F tailwater temperature between July 23 and August 16, then returning to 68°F tailwater).

Finally, Jon noted that the Corps has been working to develop modeling for IHR tailwater temperatures over the last couple of years. He added that water particle travel time and temperature impact depend on several factors, however, with the current conditions, water from DWR augmentation is expected to arrive at LWG within 3 days and to impact the temperature with 4-5 days; it should take another 4-6 days to get to IHR. After 10 +/- days after leaving DWR, water temperature impacts are expected at IHR.

Fish Managers emphasized the efforts put in by the Corps' Walla Walla team, appreciating the real time and best available information provided. IDFG also noted appreciation to the Corps for getting the temperature gauge at White Bird running again.

SOR Implementation and Alternatives Discussion
The Columbia River Regional Implementation Oversight Group (RIOG) met on July 1 and decided to reengage the TMT in discussions on the DWR operation, with NOAA to provide potential alternatives for TMT to discuss. Trevor Conder, NOAA, explained that although NOAA would like to bolster support for sockeye via cooler water temperatures, they heard the concerns from other Fish Managers and are willing to consider concluding the SOR early, as well as other potential ways to conserve water, such as removing the RSW at LWG or curtailing flows from Hells Canyon. NOAA suggested continuing to run the SOR operation into next week and then reassessing conditions and operations. TMT representatives raised the following considerations and concerns during discussion:

- Cold-water resources from DWR are finite; the risk of depleting these sources too early will limit the ability to adaptively manage temperatures later in the season, which many States and Tribes expect will negatively impact other fish species and protective management actions for other listed migratory fish.
- Some noted that they do not support removing the RSW, as it provides passage support for fish.
- The 68°F water temperature target is intended to be an upper end for passage temperature and 71°F is a high-risk temperature range harmful to salmonids and other species.
- Due to the water sources, there was concern that water temperatures may be too high for running the trap regardless of the LWG and IHR tailwater temperatures.
- Due to a forecast heatwave, there will likely need to be 10 kcfs out of DWR early next week, however, there is an opportunity to conserve water until then by reducing DWR releases over the weekend.
- In order to recover the water used so far in the SOR operation and allow for water temperatures to not exceed 69.5°F in late July through mid-August, a total of 8.9 kcfs would need to be conserved. Ramping down to 8 kcfs for two days would recover ~4 kcfs.

ACTION: After further discussion and clarifications, NOAA agreed to an immediate reduction of DWR outflow from 10,000 cfs to 8,000 cfs for two days starting tonight at midnight, then a return on Sunday to 10,000 cfs to prepare for the upcoming heat wave. The reduction would aim to recover water to help maintain temperatures below 69.5°F from July 23 to August 15, maintaining 68°F before that date. Action Agencies noted this was technically feasible, while BPA expressed

some marketing challenges that will need to be coordinated. *[Facilitator's Note: In edits, the Corps clarified that the ramp at DWR starts at midnight, decreasing by approximately 500 cfs every 6 hours until reaching 8 kcfs by midnight on July 3.]*

The Corps Walla Walla District will provide an update for the next TMT meeting.

Questions or Comments from Non-TMT Members – There were no questions or comments from members of the public.

The next scheduled TMT meeting will be on July 9, 2025, at 9:00 AM.

Columbia River Regional Forum
Technical Management Team
OFFICIAL MINUTES
Wednesday, July 2, 2025

Today's TMT meeting was held via Microsoft Teams and conference call, chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. Minutes were collected by Andrea Ausmus, BPA (contractor, CorSource Technology Group). A list of today's attendees is available at the end of these minutes.

1. **Review Summary and Minutes**

   a. June 25 Facilitator Summary and Minutes

   - Still pending
   - Review at next meeting.

   Charles Morrill, WA, said that some of the TMT members had a chance to look at the notes from last week. He said that his question, because TMT was not going to review them today, was how do members provide feedback on the notes pertaining to comments within the document that Washington had technical concerns with. He asked if he should submit the concerns to Stranz or if we should wait until we have that discussion. He said that it centers around the SOR and the timeliness of the response. He said that there was a RIOG meeting and that information had not passed down and the Corps is continuing the operation. He said that it was more a request in the process than procedure. He said that the one comment he did have that he thought should be shared today. He said that he thought it was his understanding that Montana changed their polling, that was not corrected, that was not expressed correctly in the notes. He said with that he would stop, and Stranz could provide whatever guidance was necessary.

   Stranz said as far as providing comment and edits on the meeting summary, TMT would use the same process that they have always used. They can send those comments to Colby Mills, and she will get those incorporated before they are posted to TMT for formal review and approval. She said to please do that. She said as far as a change of polling from Montana, it was news to her. She had not heard that, and she would leave that to Brian Marotz, MT, to send it into DS Consulting as an edit on the summary if that is the case.

   Morrill said that he appreciated that.

   Marotz asked Morrill to repeat what he had said about a change from Montana. He said that he was not aware of that.

   Morrill said that it was his understanding that Montana supported the SOR. He said that he heard via a colleague that Montana was going to change that. He said if that was wrong than _.

   Marotz said that was news to him. He said that he had not been approached about changing that at all.

   Morrill said okay.

Tony Norris, BPA, said that the minutes cover the meeting so if that was going to happen you would want to cover that in this meeting, so that it would be covered in these minute notes. He said that the meeting notes are designed to describe what happened at the meeting. If something happened after the meeting that would not really be appropriate for the minutes, and you would want to document that in a subsequent meeting.

Morrill said that he appreciated that clarification from Norris. He said that he thought that answered his other question of if they have concerns over statements within the meeting those would have to be addressed to continue discussion on elements of concern on the ongoing operation. He said that his question now was how would those be, can those be brought forward in today's TMT meeting and added to the agenda. He said that he was not clear on that process.

Stranz asked if the notetakers captured something wrong or left something out from the June 25 meeting he was more than welcome to provide comments to that meeting summary or the minutes, to correct anything that was wrong or missing.

Morrill said that he did not see anything wrong, he saw things that Washington had concerns with what was communicated at the meeting. Washington sees some of the elements as worthy of asking questions or a few additional clarifications for the ongoing operation.

Stranz said that was today's meeting. She said that he would have chances to ask questions and the notetakers will make sure to do their best to capture today's conversation and the summary for today.

Morrill said okay and thanked Stranz, telling her that it was very helpful. He said that there may be others too, he was not sure.

Stranz asked if there was anything else on the meeting summary/minute review process.

Morrill said no. He said that he thought that Colby did a great job summarizing the meeting and he appreciated that.

2. **Sockeye Conversion Update –** *Jonathan Ebel, ID*

- When early in run like this conversion rates do not tell you much unless there is a blockage somewhere.
- Bonneville Dam (BON):
  - Tag Count: 56 tags
  - Expanded Count: 953
    - Based on tagging rate.
- Conversion Rates:
  - As tags are moving over BON and the fish are moving through the system with a lower number of PIT tags the conversion rates bounce around.
  - BON > TDA: 82%
  - BON > MCN: 46%

- MCN > IHR: 73%
- IHR > LWG: 47%
- Conversion to LWG: 0.16 (as of today)

- Current Fish Behavior and Travel Time:
  - Fish are crossing BON every day.
  - Fish are rapidly moving up the system.
  - For fish that successfully made it from Point A to Point B the travel time was average to a little faster than typical (for the early part of the run).
- Priest Rapids:
  - No tags so far have been detected.

Doug Baus, Corps, thanked Ebel for the update.

3. **Dworshak (DWR) Operations –** *Jon Roberts, Corps-NWW*

Stranz said that she knew that there was a RIOG meeting yesterday but she had not heard a whole lot out of that meeting. She said that she was wondering if it was helpful for TMT members to have a brief process caucus in order to get aligned on what they had all heard coming out of RIOG or if TMT should just move forward with the agenda topics as they are and go from there.

Lorz said that RIOG said to kick it back to TMT.

Stranz said that was the extent of what she had heard.

Lorz said that they said to come back and talk at TMT because we are the most efficient and best group ever to talk about stuff.

Stranz said that was nice. She asked if anybody felt the need to take her up on a process caucus or were TMT members good to go.

Baus said that he supported Lorz' recommendation.

Lorz said that he was Team Band-aid, just rip it off and let's just do it. He said that he prayed that he would get to a vacation sometime this week so lets get it on.

Norris said let's roll.

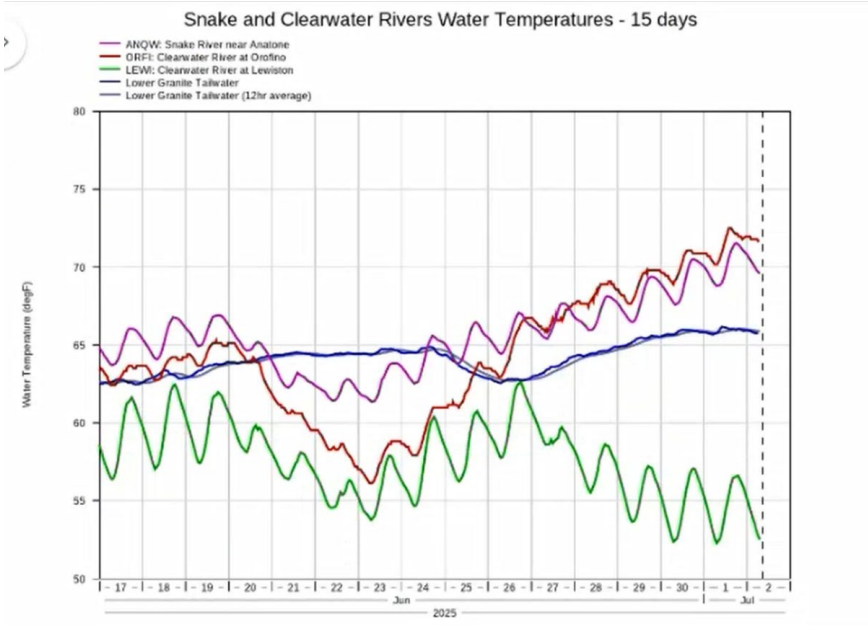
a. Current Hourly Data

- Releasing: 10 kcfs
  - 500 kcfs spill and the rest is on full generation.
  - Below the 110% of the gas cap
- Drafting: 1 foot/day
  - Drafted: 4 foot from full
  - DWR was full at the start of ramping up for the SOR operation.

b. Snake and Clearwater Rivers Temperature Data

- Anatone (Snake River):
  - Temperature: 70 – 71°F
  - Expect the temperature to hover around in that location and then increase with the heat wave that will be at the end of the 10-day.
- Orofino (Clearwater Mainstem):
  - Natural flow at the confluence of where the North Fork comes in. That is the remaining ~8000 square miles of the natural flow in the Clearwater and it can be more reactive to temperature so you will see it fluctuate with a higher band throughout the year.
  - Temperature: 71.5 – 72°F
  - Flow: 4 kcfs
    - We will see this recede ~2 kcfs by the time we get into late-August, early-September.
- DWR
  - Temperature: 42 – 43°F
    - Unlike in the past we will not see colder water (40 – 41°F) because we had an early runoff. This is modeled in Walla Walla's analysis.
  - Flow: 10 kcfs
- Lewiston
  - Water has made it Lewiston, the last temperature gauge that is on the Clearwater before it runs in the Main Stem of the Snake.
  - Temperature: >55°F
    - Water temperature will cycle with the day and night.
- Lower Granite
  - Tailwater Temperature: ~66°F
    - Running below 68°F

- Snake and Clearwater River Water Temperature Graph



- The green line is a good indicator of what the temperature at Lewiston is doing. Can see the impact of the DWR water getting to Lewiston as soon as DWR started ramping up. With DWR at the highest flow anticipated for the next couple of weeks the Corps anticipates that hovering around the 55°F mark for what they anticipate coming down the Clearwater. The cooler water is delaying the tailwater temperature at LWG from increasing to 68°F. This is why we are down further than typical in this discussion.

c. Lower Granite Forebay Temperature String

Date	Time	Pool (m)	0.5m	1.5m	3m	5m	10m	15m	20m	25m	30m	35m	Battery
07/01/2025	00:00	223.62	72.2	70.0	69.1	68.3	66.2	65.6	65.0	64.8	64.5	63.2	13.60
	01:00	223.62	71.7	69.8	68.6	67.5	66.2	65.5	64.9	64.8	64.6	63.2	13.57
	02:00	223.64	71.2	69.9	68.8	67.2	66.5	65.4	65.1	64.8	64.6	63.4	13.57
	03:00	223.66	71.2	70.3	68.2	67.4	66.3	65.6	64.9	64.7	64.5	62.9	13.57
	04:00	223.67	71.0	69.8	67.9	67.3	66.1	65.7	65.2	64.8	64.1	63.1	13.57
	05:00	223.68	70.7	69.6	67.9	67.2	66.1	65.8	65.2	64.8	64.4	63.4	13.57
	06:00	223.70	70.4	70.2	68.9	67.4	66.2	65.6	64.9	64.7	64.5	63.4	13.62
	07:00	223.72	70.7	70.7	70.3	67.0	66.2	65.4	64.9	64.6	64.4	63.1	13.69
	08:00	223.74	70.9	70.9	70.6	67.8	66.1	65.6	65.0	64.6	64.5	63.9	13.74
	09:00	223.77	71.2	71.2	70.6	67.9	66.2	65.5	65.0	64.7	64.6	64.0	13.85
	10:00	223.79	-	-	-	-	-	-	-	-	-	-	-
	11:00	223.81	71.9	71.4	69.8	68.1	66.8	65.8	65.4	64.9	64.7	63.1	13.76
	12:00	223.81	73.3	71.6	69.9	68.8	67.2	65.8	65.1	64.7	64.5	63.1	13.74
	13:00	223.81	73.3	71.7	70.5	69.9	67.4	65.9	64.9	64.6	64.3	62.9	13.71
	14:00	223.81	73.8	71.9	70.9	68.8	67.4	65.8	64.8	64.3	64.0	62.8	13.71
	15:00	223.78	75.2	72.8	71.0	69.4	66.7	65.6	65.1	64.7	64.1	62.7	13.69
	16:00	223.78	74.0	72.4	70.8	70.0	66.1	65.5	65.0	64.7	64.1	62.7	13.67
	17:00	223.75	76.1	72.9	71.1	70.1	66.6	65.3	65.0	64.7	64.4	62.8	13.67
	18:00	223.74	74.0	72.4	71.4	70.1	66.7	65.4	65.1	64.8	64.4	62.9	13.69
	19:00	223.71	79.8	73.5	71.3	69.6	66.6	65.5	65.0	64.7	64.5	63.0	13.69
	20:00	223.71	76.7	74.2	71.3	69.0	67.2	65.4	65.0	64.8	64.5	63.1	13.62
	21:00	223.67	74.1	72.2	71.4	69.3	66.9	65.5	65.0	64.7	64.4	63.2	13.60
	22:00	223.69	75.0	73.0	71.5	69.9	66.9	65.6	65.0	64.7	64.5	63.2	13.60
	23:00	223.69	76.6	72.4	71.4	69.7	66.6	65.7	65.0	64.5	64.0	63.2	13.60
Date	Time	Pool (m)	0.5m	1.5m	3m	5m	10m	15m	20m	25m	30m	35m	Battery
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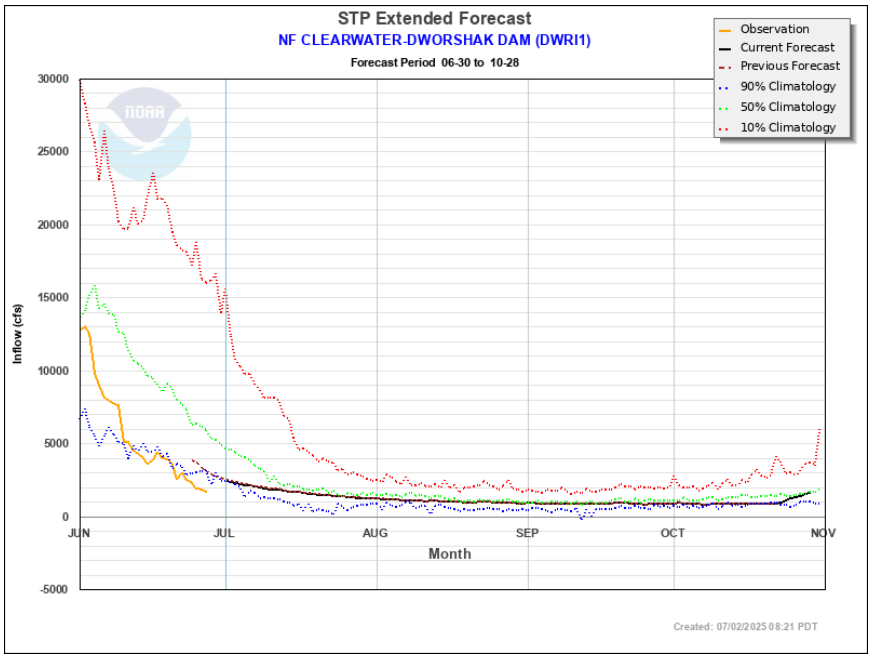
	01:00	223.70	75.5	73.3	71.4	69.3	66.4	65.7	65.0	64.6	64.1	63.0	13.57
	02:00	223.70	75.3	73.8	71.2	68.3	66.4	65.5	65.1	64.7	64.4	63.0	13.57
	03:00	223.70	74.1	73.8	70.9	68.2	66.5	65.7	65.0	64.7	64.3	63.0	13.57
	04:00	223.71	73.6	73.6	71.0	67.9	66.7	65.7	65.0	64.4	64.0	63.0	13.57
	05:00	223.72	73.5	72.7	70.8	68.1	66.7	65.7	65.0	64.4	63.8	63.0	13.57
	06:00	223.71	73.2	72.0	70.6	67.7	66.4	65.6	64.9	64.6	64.0	62.9	13.62
	07:00	223.72	73.5	71.0	70.7	68.2	66.2	65.5	65.0	64.7	64.2	62.9	13.71
	08:00	223.76	-	-	-	-	-	-	-	-	-	-	-

- Typically looking at where the RSW is taking water from, which is in the upper portion of the reservoir (1.5 – 3-meter mark) and then looking at the other spillbay tainter gates (15 – 20-meter mark).
  - 15 – 20-meter mark is where they like to keep the thermocline at 68°F.
- 15/20m line: 65 – 66°F
  - Cooler, and will continue as we continue to send cool water.
  - It would take longer for the thermocline to push down with just the natural flow from both the Snake River and the Clearwater being warmer and then eventually with just the heat through the canyon.

d. Dworshak STP Extended Inflow Forecast



- Trending below what the STP current forecast had shown, which is not unusual and does not play into how much water we have but it can be an indicator of if DWR is tight on water later on, or if it is running very close to the edge.
- Adjusted down for the Corps analysis that is run in real-time. Take it as a starting point for how much water is left in DWR.
- Analysis considers the black line being offset or shifted down to meet where the yellow-orange line (observed) is at.

e. 10-Day Regional Forecast (July 3 – July 12)

- Cooler weather from July 3 into July 4 weekend even with some potential precipitation touching the Salmon and Clearwater Systems which will help ensure some of the natural water stays a little cooler as it makes its way down to the Snake.
- Second week of July and into the end of the 10-day.
  - Heatwave
  - First 100°F temperatures will make it into the Lower Snake area (July 10 – 12).
  - With the water that has already been sent under the 10 kcfs operation there is no anticipation of being above 68°F.
- Last day of the 10-day appears to show it cooling off. This is a bit far out on the 10-day for real-time, but they will continue to track that and see how it would play out to see if it would recede or impact.
    - No impact of going above 68°F

f. Weather Forecast for Lewiston, ID

- Below 68°F at night, which is significant because the cooler temperatures at night allow for the top of the reservoir to cool off.
- After the heatwave the long term shows Lewiston getting back to the 90s with the temperature at night dropping back below 68°F.

g. Current Operation

- Plan is to continuing running 10 kcfs as directed under the SOR that was provide last week and continue the operation at least through next week unless there is a change before then.
- There is no need to go any higher for minimizing temperatures at this point.

Morrill said that he had an opportunity to have a long talk with Roberts and Willow Walker and between yesterday's conversation and today, and the amount of work they put in, they have updated a lot of the information that they discussion yester. He said that he wanted to acknowledge the effort put in by Roberts, Walker and his team. Morrill said that they are working hard to give us the best information they can. He said that was the first and most important thing that he wanted to share. He said that the other question he had was part of the TMT meeting today. He said that the SOR was designed to try to keep water temperatures cool. He said that he was looking at and wondered if TMT wanted to take the time to look at what we are seeing in the way of surface temperatures at Ice Harbor (IHR), just to keep people informed. He said that it was the intent of the SOR to try to provide cooler water at IHR. He said that his other question he had for Roberts and crew was if they were paying any attention to, and he presumed they were, looking at the depth of where we are seeing temperatures in the excess of 68°F as we move downstream at Little Goose (LGS), Lower Monumental (LMN) and IHR.

Roberts said to answer Morrill's question about temperature as they move down. He said currently **IHR tailwater right now is right under 67.4°F** as of this morning, that is the current IHR tailwater it is about 67.4°F as of this morning and then they continue to track temperatures going downstream. He said that there is an option on the TMT website where we can pull up the basin temperatures from the TMT website. He asked if whomever was controlling the screen would do that.

Morrill said that was what he was looking at now, so yes please.

	Anatone - Snake River Near Anatone (ANQW)				Lower Granite Dam forebay (LWG)				Lower Granite tailwater - Snake R. below dam (LGNW)				Little Goose Dam forebay (LGSA)				Little Goose Dam tailwater (Snake R. below Little Goose) (LGSW)				Lower Monumental Dam forebay on Snake River (LMNA)				Lower Monumental tailwater below the dam on Snake River (LMNW)				Ice Harbor Dam forebay (IHRA)				Ice Harbor tailwater- Snake R. below Goose Is. (IDSW)			
Date	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05	Min	Avg	Max	>68.05
07 01	68.8	70.1	71.5	24/24	65.3	65.5	65.7	0/24	65.7	65.9	66.2	0/24	65.7	66.2	66.5	0/24	65.0	65.5	66.1	0/24	66.0	66.5	66.7	0/24	66.4	66.8	67.1	0/24	66.8	67.0	67.4	0/24	66.9	67.4	68.1	2/24
07 02	69.6	70.1	70.8	9/9	65.2	65.3	65.5	0/9	65.8	65.8	65.9	0/9	65.7	65.8	66.0	0/9	65.3	65.3	65.4	0/9	66.5	66.6	66.7	0/9	66.7	66.8	66.8	0/9	67.0	67.1	67.3	0/9	67.3	67.3	67.4	0/9

Lower Snake River Temperature Report for July 2025

Roberts said that this is what they are tracking against as well. He said that there was the **67.3°F at IHR**, and you can see as the cooler water is going down. He said that they also track the forebay temperatures in each one of them. He said that they would ensure that this would be added as a link for future TMT meetings so that they do bring it up and take a look and review it at TMT each week. He said that it is important.

Morrill said that he appreciated that very much. He said that the forebay temperatures that he was looking at for July for IHR were up to a high of 75°F or better late in the day. He said that it does set up a condition for potential ladder temperatures differentials of concern. He said that it was another little element TMT needs to pay attention to as we move forward implementing the SOR. He said thank you so much and that it is very much appreciated. He said that he knew that they put in a lot of hours at this time of year and he was sure that he spoke for all of his colleagues when he said that we really appreciate what they are doing and thank you.

Erick Van Dyke, OR, said that he echoed Morrill's appreciation of effort with Roberts and his staff to provide the information. He said that we really appreciate it. He said often when we talk about this topic we look at Anatone gauge. He said that he just wanted to make sure that we were centered on realities of what we might expect this operation to do to that relationship at Anatone. He asked Roberts if there was an expectation that anything that we are doing now with flow augmentation would influence the temperature at Anatone.

Roberts said to answer Van Dyke's question, any they are doing with a release out of DWR will not influence the water temperature and the flow that is passing the Anatone gauge, that is a little bit upstream of the confluence. He said that the Anatone gauge does take into consideration water from Hell's Canyon, as well as, the Salmon, Grand Ronde, and the Imnaha River which are major runoff areas of major rivers from between there and Anatone. He said that what were are doing at DWR would not have any effect for what is occurring actually at Anatone.

Van Dyke thanked Roberts. He said he wanted to make sure that TMT was centered around the realities that Anatone provides an influence for increases in temperature most of the time when we talk about it and that there is no expectation that we could change that with this operation.

Roberts said yes, that is correct. He said, for TMT's awareness, that the Corps also tracks the Salmon River temperature, they have the **temperature there at the White Bird Gauge. He said that it is currently running at ~68.5°F** right now. He said that water still heats up as it moves down the canyon and reflective walls inside of the Hells Canyon. He said that the Corps does track that water there and that is why some of that potential rain, while it would not fall directly on the Lower Snake, even if it falls in the Salmon Basin or the Clearwater. It can help a little there. He said for other's awareness, that it is a *small* positive note from the weather for us in the next 10 days.

Morrill asked Roberts about the chart on the screen. He said that the "*Lower Snake River Temperature Report for July 2025*" displayed was a 24-hour average.

Roberts said yes, that was the average for the day. He said that we can look at other specific basins or gauges on a different screen but that was the average for the day.

Morrill said that the hourly data that he had mentioned did show temperatures yesterday, getting up to ~75°F by the end of the day. He said that he wanted to double check.

Roberts said in the forebay that was correct, not in the tailwater. He said that there is a little bit of difference on the fish ladders because of what LWG and LGS can do with some pumping of cold water up where LMN and IHR do not have that ability. So while they do have cold water still at this point at the bottom of their lakes that is passing through the turbines right now there is not a way to necessarily bring that up to help facilitate the temperature at the ladder. He said as was brought up that is the IHR forebay. He said that we do have cold water at the bottom and that is what they are continuing to try to influence, similar to what we do at LWG, trying to keep the thermocline, or trying to delay the thermocline. If you look at a previous year that will mix pretty quickly. He said that we are working with the 10 kcfs in that SOR, for everyone's awareness, the additional 10 kcfs is essentially delaying that full mixing with a little bit lower temperature coming from each project upstream.

Ice Harbor Temperature String

(located in the project forebay)

Spillway Crest: 119.2 m

July 2025

Day: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Temperature in Degrees Fahrenheit

<32	32	34	36	37	39	41	43	45	46	48	50	52	54	55	57	59	61	63	64	66	68	70	72	73	75	77	79	81	82	84	>86
neg	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	>30

Equivalent Degrees Celsius

Date	Time	Pool (m)	0.5m	1.5m	3m	5m	10m	15m	20m	25m	30m	35m	Battery
07/01/2025	00:00	133.49	74.2	71.9	70.3	68.1	66.9	66.7	66.3	66.3	66.3	65.9	12.24
	01:00	133.43	72.8	71.1	70.2	67.8	67.2	66.6	66.4	66.3	66.3	65.9	12.24
	02:00	133.48	73.0	73.0	69.8	67.9	66.9	66.7	66.5	66.4	66.3	65.9	12.24
	03:00	133.48	72.6	72.6	70.2	67.8	67.1	66.7	66.4	66.3	66.3	65.9	12.24
	04:00	133.47	72.0	72.0	69.4	68.1	67.0	66.6	66.5	66.4	66.4	65.9	12.24
	05:00	133.47	71.4	71.4	71.3	68.7	67.1	66.7	66.4	66.4	66.3	65.9	12.24
	06:00	133.47	71.9	71.6	71.2	68.6	67.0	66.8	66.5	66.5	66.4	66.0	12.24
	07:00	133.47	71.1	71.0	70.7	70.1	67.4	66.8	66.5	66.4	66.4	66.0	12.47
	08:00	133.44	71.3	71.2	70.0	69.4	67.4	66.9	66.6	66.5	66.5	66.0	12.71
	09:00	133.41	71.2	70.8	70.6	69.7	67.5	67.0	66.6	66.6	66.4	66.0	13.17
	10:00	133.44	71.7	71.2	70.5	70.1	67.5	67.0	66.6	66.5	66.4	66.1	-
	11:00	133.44	72.1	71.2	70.5	70.1	67.7	67.1	66.8	66.6	66.4	66.1	13.41
	12:00	133.42	73.2	71.5	71.0	70.1	67.7	67.1	66.7	66.5	66.4	66.0	13.41
	13:00	133.41	74.0	71.4	71.1	70.8	67.5	66.9	66.6	66.4	66.4	66.0	13.41
	14:00	133.42	72.7	71.7	71.2	69.4	67.6	67.0	66.6	66.6	66.5	66.0	13.17
	15:00	133.40	73.1	72.0	71.0	69.5	67.6	67.0	66.6	66.5	66.5	66.1	12.94
	16:00	133.40	73.7	72.2	71.2	68.9	67.5	66.9	66.6	66.6	66.5	66.1	12.94
	17:00	133.47	73.6	73.2	71.1	69.0	67.3	67.2	66.6	66.5	66.5	66.1	12.71
	18:00	133.47	74.7	73.3	71.1	68.5	67.5	66.9	66.6	66.5	66.5	66.1	12.47
	19:00	133.51	73.5	72.7	70.3	68.9	67.6	66.9	66.6	66.5	66.5	66.1	12.47
	20:00	133.53	73.6	73.0	70.4	68.5	67.4	67.1	66.6	66.6	66.5	66.1	12.47
	21:00	133.55	73.6	73.5	70.7	68.4	67.5	66.9	66.6	66.5	66.5	66.1	12.24
	22:00	133.59	74.2	73.5	70.5	68.2	67.5	66.9	66.6	66.5	66.5	66.1	12.24
	23:00	133.51	73.8	73.4	70.5	68.9	67.4	66.9	66.7	66.6	66.5	66.3	12.24
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	02:00	133.48	73.3	71.8	70.4	68.8	67.4	67.0	66.8	66.6	66.5	66.3	12.24
	03:00	133.51	72.7	71.6	69.6	68.9	67.3	67.0	66.7	66.6	66.6	66.2	12.24
	04:00	133.54	72.5	72.3	69.4	68.5	67.8	67.2	66.7	66.7	66.6	66.3	12.24
	05:00	133.47	72.3	71.7	68.9	68.3	67.2	67.0	66.8	66.7	66.5	66.4	12.24
	06:00	133.48	72.2	71.1	69.3	69.1	67.4	67.0	66.9	66.8	66.6	66.4	12.24
	07:00	133.44	71.2	71.1	69.8	68.3	67.7	67.0	66.9	66.8	66.6	66.3	12.24

Morrill said thank you. He said that was the key part of that and he would suggest that we keep these links for the future TMT meetings as we watch the sockeye migration continue onward.

Ebel said to Van Dyke's comment on Anatone and Robert's response, just so folks know. He said right now the Salmon River is contributing about 1/3 of the flow to the Anatone gauge as seen at the White Bird gauge. He gave a shoutout to Roberts and the Corps for getting the temperature gauge back at White Bird. He said that they really appreciate that at IDFG. He said that the Salmon River is contributing about 9 cfs at the moment and Hells Canyon Complex is contributing 15 kcfs and the Grand Ronde and Imnaha are dribbling in some water. That is kind of the source of the temperatures that you are seeing right now, along with just the warming in that canyon that will increase fairly quickly. He asked Roberts how the Corps planned on evaluating or identifying whether this flat 10 kcfs from LWG is actually contributing to maintenance of the cool water at the bottom of IHR right now. He said that he asked that because on this date in 2023_ He said that he had not looked at any other years, but in 2023, which was kind of a hot,

it was a slow burner, the 15-meter mark at IHR was the same temperature as it is at present. He asked how the Corps would know that it was having an effect.

Roberts told Ebel that they have a set of models and analysis that the Corps runs here that they have been working on over the last couple of years , then continue to work on for this year, to get a least relative temperature range based on different impacts of where or what the tailwater temperatures would be based on how well water is mixing or not mixing, as well as, what level the cold water is at in each of the forebays, and then similar to what we do at DWR, they run a travel time as well as a mixing based on spill generation and the RSW or ASW that is at each Project to project what the mixed temperature would be about a mile downstream at their tailwaters. And then the Corps moves that volume of water down to the next reservoir. He said that it is very similar to what they do at LWG. They have been working on it as it has been an area of interest and point. He said to note in comparison to a previous year he would say that depending on which year, and which basin conditions you have, the operation of moving 10 kcfs of water down the river at maybe an earlier time, such as now, will have different effects for different years because the basin conditions are just that they are different. The setup of each basin is a little different each year and so understanding what would have occurred in 2023 and how that would have impacted the forebays is not an answer that he had for Ebel right now. He said that it was something that they are going to look at in the Fall, how this operation of 10 kcfs would have affected the river based on a basin-by-basin specific condition. They are going to look at potentially 2010 up through about 2023 or 2024. He said that we would have a better understanding of that after this year. What they are analyzing and modeling for this year is based on the current conditions and that is what the alternatives will begin to show, probably next week. He said that the 10 kcfs of water had not reached IHR yet, it was still on its way essentially, any impact or influence it would be having. It was still making its way down the system and any intention that we would see over the next several days or the next week we would start seeing a delay in temperatures. He said that you could start seeing a little bit of the delay in the temperatures at LGS right now potentially. He said that we would begin to see that trickle down effect at IHR over the weekend and that would give us a better way to evaluate the effectiveness of the operation.

Ebel said it was a good reminder of how they do the modeling and how they have attempted to extend the model downstream to IHR. He said that he was trying to wrap his head around how do we actually evaluate.

Roberts said that there is definitely a range and so with all of the nuances, and that was all that we would have on the base condition, a range. He said that there would be a potential relative difference that could be looked at as a starting point for a discussion but knowing and reviewing and considering all the other kind of nuances at each Project as we move in real-time, whatever might be occurring, is important to document and note for the Corps so that we can make the analysis as accurate as possible for the current conditions that we have without looking at it from too long of a planning. He said it is simply just why it is not as accurate as what they can analyze at LWG directly for operations. He said that he thought Ebel would see that also, and everyone else will, on the slides for the modeling analysis. He said that we would talk about that too and he would point it out.

Jay Hesse, Nez Perce, said that he thought the water particle travel time from DWR to LWG is typically like three days. He said that he thought that was what Roberts had in his models. He asked if Roberts could refine his memory on that and asked what the travel time was from DWR to IHR.

Roberts said that speaking for today's conditions, which is important because we are looking at a lower flow condition right now, this would be different if it was higher flow and we were moving a lot more water volume in the system. But in today's world, which is lower flows, it takes about three days to get water to start kind of mixing and influencing. He said that water gets there a little faster, but it does not quite mix until about the fourth day. Between day 4 and 5 we actually will see an impact of an effect of water at the LWG tailwater gauge. He said that the water would arrive a little bit sooner but for it to get mixed and register on the temperature gauge and get a consistent reading it takes about 4 to 5 days, depending on a few things. How much Hells Canyon is running as well as wind conditions can affect the mixing data from LWG on down to IHR. Typically, we are looking at right now about another four to six days from LWG. All total coming out of DWR we are looking at ten days on average on a range plus or minus a day and a half depending on conditions, about ten days to get all the way to IHR. With us looking at the 10-day forecast and that being as accurate as it sometimes is, that is why we will see much more of a range at IHR versus where we can be quite a bit more precise at LWG tailwater.

Morrill asked Roberts if he thought we had enough wind data to look at the conditions as you move downstream to different pools and at IHR to help us understand the effect of wind on breaking up any stratification that sets up.

Roberts said that we do. He said that we have a weather station at IHR that the Corps operates, they also have a weather station at LWG. He said that they also have a station in the upstream portion of the lake at LWG right before you get to Lewiston, Clarkson. He said that they also have some other ways to correlate through airport data and meteorological radar from their weather service centers to get some low-level air temperatures as well. There are a lot of wind farms out there in the region that they can get wind speed and directions from also. He said that would be a consideration potentially, for probably something the Corps would flag as something that could be more beneficial to have on at LGS and LMN if it was a consideration that the region wanted to have this operation in its toolbox for continuing to do. He said that they could potentially get a little bit better information but that would take them into the Fall before they would be able to actually analyze if that would be beneficial. For this season, we do have one a IHR and they do have one at LWG. And they do have the wind farms directly between or at least in the geographical area that we can track. So fairly good compared to the kind of nothing, especially with being a sparce area.

Morrill said that he appreciated that, and he has the greatest degree of trust and respect for Roberts' crew in looking at what they have to work with. He said that we do know that wind can vary from LWG down to IHR and that could be an element that, as we look at the information that is available that they may find some interesting cluse and guidance that could help us understand why we do not have a consistent response between LWG and the model that we have versus by the time we get down to IHR.

Roberts said absolutely.

h. Model Results – Updated July 2, 2025

- Slide 1: DWR Summer 2025 Operations
  - Analysis
    - This is an analysis that they were able to put together based on the TMT meeting last week and they tried to capture as much of the discussion and information to be helpful for the region to continue their discussion.
    - They updated their analysis again late Monday and then reran it early Tuesday morning. It is based on information of yesterday morning and it is the same information that was provided to FPAC. There is a small editorial change to add some additional information and clarification at the request of some different members.
  - Alternatives
    - The operation that is being run against the SOR from last week is Alternative 1. Alternative 0 is if we were operating with a standard projection of if we were looking at managing for 68°F.
  - Notes
    - They have included two heat waves that typically are above 100°F, as well as the doble testing that would occur or any known outage that occurs at one of the Projects this Summer. It may not be representative of the most accurate timing; they are not 100% sure when the heat waves will occur.
    - They are plotted on one-day averages for both temperatures and flow due to the longer reach. There is a little bit of variation within the day, similar to basin condition reports.
- Slide 2: Alternative 0
  - Alternative 0 includes the current projected heatwave and 2 additional heatwaves.
  - Alternative 0:
    - Looking to maintain LWG tailwater at 68°F.
    - Anticipate that we would start ramping right around July 5 to move in for the heatwave. The ramp would have started 10 days later that what we had already started.
    - Anticipate that there would be a potential that we would end above 1535’ (or at ~1540’).
  - Note:
    - For this alternative we are trying to conserve water for the unknown to minimize any risk further into the season for the entire season to maintain it under 68°F at LWG tailwater.

- Projections:
  - The projection for IHR tailwater of what it would be if we had not run anything or had not expanded any 10-day water shows that based on today moving forward that we would anticipate water if it were not going to reach IHR in the next three to four days the IHR tailwater temperature with the heatwave would heat up because the forebay would heat up water from the rest of the Canyon.
  - Each year, IHR's forebay does completely mix where the temperature differential from the top of the pool to the bottom of the pool is a lot smaller range than it would be at LWG so additional cool water does not really have much benefit until we get a natural cooling in the entire system in the Fall. Those temperatures meter out about the third week of July.
  - IHR water runs closer to 71 – 72°F. There is some variation possible depending with the heatwaves.

- Slide 3: Alternative 1
  - Alternative 1 includes the DWR water already being sent on its way and it is at LWR, and the initial amount of that water is already at LGS.
  - Alternative 1:
    - Expect over the next two to four days that as the water starts to make it down that the water would mix with the forebay at IHR so that it would start delaying the overall mixing of the IHR forebay which by effect would also allow a slightly cooler release at IHR's tailwater.
    - They anticipate, especially with the 100°F heatwave coming through, that the cooler DWR water to IHR forebay will arrive, even with the heat on top of the lake, ultimately, we will see some of the forebay retain some of its stratification which will continue to keep a slightly cooler temperature there at IHR's tailwater.
    - With the operation they anticipate there being essentially a delay in the rise of the IHR tailwater based on there being a delay in the full mixing of its pool because there is slightly cooler ware getting sent. This could vary if there are extremely strong winds or some other reason that the pool would mix faster. The Corps plan to keep an eye on that.
    - Right now, the Corps is seeing a delay of about five days for the conditions that are going on where the IHR tailwater would be a little bit cooler.
  - Note:
    - The Corps put a 71° line as it seemed to be an important kind of threshold.
    - Moving more water earlier in the season and ensuring that we did not go over the TDG requirements at DWR or drafting below 1535' before August did mean that we need to be aware that there is a risk later in

the season where temperatures would rise above 68°F at LWG tailwater.

- Based on the SOR they made that time period between July 3 and August 14, but we really have to start moving water sooner than that on August 7 because the outages there and to move water in a way that could actually cool the entire system back down under 68°F in preparation for Fall Chinook brood stock collection to start August 17.
- All of this could allow temperatures at LWG to rise up to 71°F which in turn would have an effect further down at IHR as we send warmer water down the system, but there is a potential for it to cool back down as we typically see and move into the Fall as return to moving 68°F water from LWG down through the rest of the system.
- The Corps modelled more extreme conditions, at the very edge of two heatwaves plus the doble testing outages, so that they could accurately reflect that they could return the water temperature back to 68°F. If it was slightly cooler, we got cloud cover or a random anomaly of a rain event, those could play to our benefit but were not anticipated.

- Projections:
  - There is a risk of moving into the range of 69 – 71°F, but this may not be the case and it maybe closer to 69 – 69.5°F. This is unknown because it is so far out.
  - After July 23, the SOR had noted running 10 kcfs through July 20, so they would start a ramp down.
  - The temperature relaxation at LWG (written in the SOR be held from July 23 – August 15) from the 68°F criteria would be monitored in real-time.
  - The flat flow that is in the SOR of 8 kcfs is just an average and the 10 kcfs for the remainder of the month is an average and the Corps would conserve water where they could or send the appropriate amount of water not to lose any type of stratification in the river. They would be managed in real time similar to how it is done every year within TMT.

Roberts said that he would pause. He said there are two more slides regarding the Clearwater, or the impacts of the Clearwater temperatures, that we can move on to as needed and desired in a moment. He said that there was a lot of information so he would just stop there and try to answer any questions or provide any clarification. He said that they are taking notes on their side so that if there is something that is a little unclear today, or if something would be more helpful, they could incorporate that into their analysis or notes updated for next week.

Ebel said on the kind of reduction in flow for around July 23, and the SOR said 8 kcfs, and Roberts said that the Corps would manage it to conserve water or run water out. He asked what Roberts was specifically managing to. He asked if Roberts in that scenario was going to manage to a certain temperature in the tailrace or Roberts had mentioned

maintaining a thermocline. He asked if there was a thermocline, where would that be. He asked if Roberts could clarify where he was managing to at that period of time.

Roberts said for this analysis, absent having the meeting at TMT, which we are having here today. He said that they would adjust it based on feedback based on what the region is looking for. He said that for this analysis, what they are managing did not exceed 71F and to ensure that the thermocline did not get to a level in LWG's forebay that would not allow the Corps to return to 68°F essentially around August 15, August 16. Those were the two criteria that they were using. He said that the tailwater temperatures would slowly create up there in this analysis and then peak out, the Corps would send more water and then it would start to come back down. The criteria today was 71°F maximum tailwater out of LWG as well as not losing thermocline where the Corps could not return to 68°F at LWG tailwater starting on August 16. That is what they used for this analysis.

Ebel said it was similar to what the Corps had done in the past when we asked for 69°F to 69.5°F, it is just that they moved it up to 71°F.

Roberts said that they ran it against the 69.5°F but they saw that it did hit 71°F in the five days and there was not a way around that without either losing the thermocline or running out of water before the end of August. He said that they tried to keep it there, but it had to go up to 71°F potentially in some of the scenarios if we caught a heatwave at the same time. It was more of a worst-case scenario or a more extreme scenario, but they wanted to make sure that there was that potential at least at LWG.

Ebel said if they are running _. He said that he hoped that the inflows do not get any lower than they are projected because that is really bad for Upper North Fork Clearwater. He said this might be a worst case scenario but at the same time this seems to be running it pretty tight on the 1535' with respect to like this is what you could do to return_ if we end up in a scenario where the Corps struggles to return_ Roberts said that he said that this was the most that he could do in terms of returning the river to, or returning the tailwater to 68°F during that period. He asked what Robert's comfort level on how tight this is in terms of getting to 1535' relative to where we are at in the season. He said that we have seen this before, Ebel said that he was sure that Roberts was aware, these projections will come out with, on the normal ones, like Roberts showed on the previous slide, the Alternative 0, like a September 1 elevation of 1540' but we always come under that first projection and so what was Robert's comfort level with not needing additional water to achieve his aims.

Roberts said that this comfort level is high. He said that the reason there are some notes there is that they could not keep it at 69.5°F in some of the more extreme scenarios, which is why they were showing it there. He said that is why it bounces up to 71°F, 70°F for a solid 4 – 5 days in there so_ There he did not have the confidence that they could maintain it at 69.5°F in every scenario. He did have confidence that they could keep it under 71°F in any extreme scenario that they had seen so far. He said that there is a way, if the weather cooperates to keep it at 69.5°F but 100% guarantee or a high level of confidence with the water we currently have at our disposal that would be more up to real time conditions at that point because we are running all of the water that we do have right now that we would potentially buffer against has already started moving and the Corps feels very confident that they would be right at 1535'. They are not running a factor of safety in addition to this like we would on some years. He said most years we

have several days to accommodate some room and then if we might run into some concerns in addition to that there might be another SOR to say if there is even a little bit of concern to hold onto that water and then if that does not play out, we wind up having some water left over. This is essentially moving all the water that we would have leftover to earlier in the season to support the sockeye run right now and that is moving the risk around. He asked if that helped a little.

Ebel said yes. He said that folks know his preference, that he prefers to have buffers, but we will go from there.

Hesse said the discussion was helpful in understanding the dynamic-ness of the operations between July 23 and August 7 and that it is not a static 8 kcfs. He asked if there was a dynamic-ness to the dates from today through July 20. He said that he knew that in last week's discussion the notes and the Corps' decision added the ability to go above 10 kcfs if necessary but Hesse was not seeing it in Roberts' modeled line. He asked if that was just because the models that Roberts runs do not require that or like the 8 kcfs is it inherent within the line but not shown because of averages.

Roberts said that based on the time that we started the water this year and sending water from DWR exceeding 10 kcfs before July 20 would jeopardize other criteria such as not having the water available to keep the river below 71°F or being able to return the water or not being able to have enough water where we would not be drafting below 1535'. He said right now they do not see the need for any reason at LWG tailwater to send more than the 10 kcfs that is currently going to maintain it under 68°F for the duration until we get to when it would be potentially relaxed after July 23. He said that there is not any analysis that does show that but if we were for some reason to request higher water to be sent between now and July 23 there would be an additional trade off for greater risk than what we are seeing right now for other operations or benefits in the river later on. He said that there could be an opportunity to lower the water slightly toward the last week too. He did not know but going higher would need another analysis. He said right now we do not even see the need of running higher but depending on what type of benefit it is trying to be gained at_. He said that they do not see the need to go higher, at least for LWG's tailwater. He said that he could imagine there might be an opportunity to delay the rise or mixing in IHR's forebay, but he had not run an analysis on that with he current conditions, that was just kind of a theoretical conjecture. He said that he did know that if we ran any higher than 10 kcfs we would put other things at jeopardy and would want to at least provide an analysis on that.

Dave Swank, USFWS, thanked Roberts for the modeling and the update. He said that it was very helpful as always. He said that he may have missed it when Roberts started talking about the results. He asked if Roberts could go into more detail about the dashed green line showing the IHR temperature range and exactly what those are representing and how they were derived.

Roberts said that on both the graphs the dashed lines are essentially a 90-percentile range that we have for the limits of where the IHR tailwater temperature could potentially go based on the effects of the current conditions that we have for this Summer, whether that is with sending water or not having to send water. He said that they would update that for next week in the legend.

Swank asked if the percentiles were from multiple model runs.

Roberts said that it was the overall percentile from our analysis that we have completed that is done. He said how they get through the analysis, yes, they have a modeling that they are looking at down to LWG and then they move it down with travel time and volume to the next reservoir, so forth and so on. He said that it gets less accurate, so they typically do not show the confidence range at LWG's tailwater which is +/- 1° each year. He said that they do not typically show that all of the time to not busy up the graph, but that range is quite a bit higher by the time we get to IHR based on a lot of other factors and other conditions as well as how far out the travel time is for water and conditions to impact it. He said that it is typically around +/- 3.5 – 5°. He said that it could be a little lower when some things converge a little better in the analysis, for example during July 25 through August 1, IHR's tailwater converged pretty well there because the pool is fairly mixed at that point and Alternative 0 starts to converge towards the end of August the pool was fully mixed and we are starting to see some potential for cooler weather and cloud cover to move into the region that sucks some heat of the entire Lower Snake River. He said that they wanted to provide the range as it is more than what we are used to looking at with LWG so that is why they wanted to put that on there so there was not an expectation of a single line that we just cannot model or analyze it to that level of certainty even in real time. With erasing as many assumptions that they can it still is very difficult right now, they just have not had enough time to bore enough information yet to delve into that. He said that it is kind of a dream of for them next year, they have kind of front loaded this analysis into play, it had been planned to run in a side-by-side comparison this year, they have done that for the last year or so. He said that TMT was just getting it a year earlier. He said that he would update the legend there to make that a little clearer.

Van Dyke said that he knew that they have been putting extra time into making these for the region so they understand the little details on labeling and how difficult that can be. He said that he appreciated the extra information. He said that the question that he was focusing on was the notion of heatwaves because Roberts was using a lot of model averaging, Van Dyke was curious to make sure that we recognize that those two heatwaves are an average of years with low water supply and hot conditions or if that was averaged over a wider grouping of conditions.

Roberts said that he thought the best way_ He said that he would explain it, that at least for them, the way that they piece the analysis together is they take the basin conditions that we have today, so we know that we have early snow runoff, we know there is zero snow anywhere left on the mountain, which can impact a little bit of cold water coming out late. They take the basin conditions of the snowpack, the low flow conditions that are currently already happening, what is already in the river, as well as, for example, where the Hells Canyon Complex is already situated at for this year. Then they will move any type of forecast that might be projected either short term or long term for a flow condition down to where they see there is a potential for it to be. He said that they think that there is a potential for flow to go a little lower than what is projected on the STP. They do not typically raise the STP in the Summer, they may raise it just a little bit, but in regard to that analysis they always hedge a little bit lower on those things. Once they have the flows in place for the different reaches and river systems, they then also look at all the planned operations for each of the Projects, whether that is Summer Spill, when different flow triggers would be hit that might cause an adjustment at the dam or its RSW, or a change in their spill pattern, as well as, when their planned outages are. He

said that once they have that information and the flow in there, they then try to take the biggest variable which is the weather and the temperatures that we might get and then they interplay them in the flows to get different scenarios, whether that might be _ We have this heatwave that we already know about, so they have that one already planned but then based on the Climate Prediction Center and what they have seen in the past for their low flow years or dry conditions. He said that they look at other 105°F heatwaves, in this case, and they overlay them across the flow in late-July, where we cannot really see a 10-day forecast, all the way through the first week of September for us. He said that they move those around in their modeling and their analysis. He said that they would do a run where we might have two heatwaves back-to-back, or an extended heatwave. He said that they are essentially trying to capture the duration of the heat. So sometimes those come back-to-back, sometimes they are in late September, sometimes they might be on top of an outage. So, they move those heatwaves around and that is how they get the different analysis and different runs. So, at LWG they converge fairly well, within +/- 0.5° for what they are showing currently but there was some scenarios where we did get up beyond 69.5°F and so to be comfortable in all the runs that they were looking at, that seems reasonable for this time of year, or potential possibilities. That is why they did want to show up to the 71°F at least at LWG because there is some potential to get up there on about one-third of the different analyses or runs that they did on the IHR tailwater. He said that was how the range essentially got developed there and that is why it is what it is. It does get averaged out on a day average, to show the range. He said that the main overarching point is that they take all of today's conditions that are known about to remove as many assumptions as they can and then they do move around the heatwaves to give them as much variability in the understanding of the impacts so that they can relay them to the region, to TMT, to understand where there is risk and they will continue to update those each week moving through the rest of the Summer as they get better information each seven days.

Van Dyke said that information is really useful. He said that it helped him think about what was going on here. He said that it gets to why he was curious about it in that a heat wave can be the number, but it also can be the duration and when it occurs. All those things are going to be important for us to pay attention to, obviously, and recognizing you are using the tools that are available to help you understand when to expect that might happen, but that does not mean it will happen that way, so we get that too. He said that the question he should have asked may be since Roberts is using two in this model, if there is more than two where the most impact might occur on the timeline, even if it is just on more. He asked if Roberts had a feel for that at this point of if that was something that we could talk about later.

Roberts asked if Van Dyke was referring to adding an additional two heatwaves.

Van Dyke said one, two, however many, he was not sure.

Roberts said to make it more simple than just two heatwaves, they run a total of 10 days at 105°F and higher and then they parse them out into different heatwaves. Typically, we do not ever see one last that long, but he did not want to jinx this and that has happened before by all means. He said that they parse out the heat waves in different durations, whether it is two or three or one to generate about_ In the current run right now, in the current analysis it is ten days at 105°F so that is what we are looking at.

Van Dyke said that was the clarity for the ten day. He said that it is when we get past the ten day where things start to get less certain and that was the part that he has had his brain on. He said that this might get a little complex to talk about now to keep Roberts on track but it is something that is of vital importance here. Van Dyke said that it was specifically because one thing he felt we have to point out here is that this temperature 71°F is a life impacting temperature range for salmonids, including Sockeye, and in the past, we have been targeting ranges that are focused on improving and maintaining passage which are much lower. He said that the 68°F is what many think of as the ceiling for that level of action for fish passage. In reality, 65°F is a more common temperature for changes in how fish are responding to passage impacts. He said to note that we need to recognize that the 71°F is a very high temperature that folks should have full expectation will impact the life conditions of the animals that are experiencing it, it is not a threshold that meaningfully protects fish. He said that was the point and the concern and that he wanted to make sure that was said out loud at this point. He said that he appreciated the detail that Roberts shared with TMT today, it was helping get us to places that he thinks are important moving forward for what we might expect from this action.

Roberts said just in addition, for the reason, they only modeled the SOR, so they did not model any other alternatives such as a change in spill, look at Hells Canyon operations, or any of those things either. So, they are working with one tool in the toolbox right here, which is DWR's water, which we all know is a very finite resource and has its own implications. So if there are other alternatives or other scenarios where they change the mixing or criteria to move the cold water more efficiently through the system at different times of year, they are happy to provide those alternatives too if that is something even different parties or people would be interested in understanding. They can try to get that provided for next week.

Hesse said understanding one of the long-standing objectives is with the temperature management beyond the 68°F tailrace temperature is LWG trap temperature that allows trapping to continue. Typically, there is a threshold of 70°F for that an the trap temperatures are not synonymous with tailrace temperatures given water sources. He asked Roberts if he had run an analysis or could add another line to the graphic that would show anticipated trap temperatures and if he had already done that could he speak to the periods in when that trap would not be operational during the Alternative 1.

Roberts said that they did look at that to some degree. They did not have it on the graph so yes that is a note there. He said that there is more uncertainty around that one than just LWG tailwater temperature, but they did take into consideration the adult fish trap to be below 70°F and ideally below 68°F for essentially starting on August 17 and moving forward. He said with that they did not see any consistent scenarios. He said there was one or two potential runs or analysis where if all the heat came at the end of Summer altogether and we were conserving, maybe running less water than was shown in July, while meeting other objectives. For example, if all the heat came right there at the end of Summer that looked like it could cause a potential problem but that is also something we would have a better idea about in the future. They did not see any consistent scenarios where that would be an issue based on the current water that was being run if we were to focus more on ensuring, for an example, 69.5°F was what we

wanted to achieve in all the scenarios across the summer then moving the water differently at some point in the Summer to allow that to occur could impact the fish trap. He said that it is just depending on where we want to pull the water from eventually. But they did not see anything consistently causing a problem on the fish trap unless it was all the heat at the end of August to answer Hesse' question.

Hesse said in Roberts' graphic shown for Alternative 1 that shows tailrace temperatures exceeding 69°F for roughly 10 days, Roberts believed the trap would maintain operational ability through that period.

Roberts said no, not at all. He said that they were targeting the trap's operational ability after August 17.

Hesse said that he heard that part, but he guessed his question was more specific to periods before then because while not used for Fall Chinook brood stock, it is still used for a number of run reconstruction and fish monitoring aspects.

Roberts said that was not analyzed. He said that was something they could add to the list, but he would not anticipate it being_ He said that he meant that it would be very close to 70°F if not slightly higher. He said that they would have to take a closer look at that. They did not look at it before August 17.

Morrill said that he did not see if Thomas Starkey from Washington Ecology was in the participants list. He asked if he was on the call today because Morrill was curious whether Starkey would have any comments in terms of what Morrill believed the guidelines are for the Water Quality Attainment Plans and that target, he thought was 68°F. He said whether that is a flexibility that is allowable and how that may be considered by Ecology or in the lower river by DEQ is a question he thought we should considering asking either representative, for the Snake River, particularly Starkey.

Starkey said he did have a question, but he would speak to Morrill's comment first. He said that they are in the process of working with the Army Corps on addressing temperature impacts on the Snake and Lower Columbia. He said that they do not allow waivers or any sort of criteria above what has already been described in both the state standards or the new Temperature TMDL, which they are working in Celsius, so sorry for the quick conversion, 20.3°C, which is just over ~68°F which will be their target for their water quality work, so anything above that is an exceedance of the state water quality standard and it would be described as such in Ecology's attainment plans. He said that the other question that he had was about the operation. He said since the last meeting a lot of the fish managers (FM) were discussing some of the tradeoffs and pros and cons of this operation and since then he was trying to keep an eye out for an SOR, some sort of written description, perhaps from NOAA or another fish agency that describes the biological basis for this operation. Specifically, the tradeoffs and benefits for one species versus potential impacts on others, which he had been scouring the website this morning and had not been able to find any sort of written reasoning for the operation. He said that his question was is there somewhere he can find that.

Trevor Conder, NOAA, said that NOAA submitted an SOR with some rationale in it and they have also submitted to Starkey's RIOG rep, a presentation that they gave yesterday describing that rationale further. He said that Starkey should be able to contact Charlene Hurst and get that information.

Starkey said okay, that was alright, he could reach out to Hurst. He asked if it would not be on the list for SORs on the TMT website or if it was pending being added there.

Conder said that the SOR should be on there.

Stranz said that the SOR is on the agenda for last week and then the additional RIOG stuff Starkey would have to reach out to Hurst for.

Morrill asked if NOAA had additional references pertaining to the SOR could they not be shared with TMT.

Conder said that he could check with his Policy representative. He said that it was highly likely. He asked to be able to check first because it was made for RIOG.

- Slide 4: Alternative 0 – Spaulding Stream Temperatures
  - Roberts took a more granular look to outline the impact on the Clearwater. When we move water around differently, there are second or third order effects. One noted that they look for is when there is a transmission line outage or the powerhouse goes down, and we are limited on generation or capability to move water. This can impact the water temperature quickly on the Clearwater. It is also a criteria within the DWR Board for the Corps in their ramping.
    - Temperatures from the baseline condition starting in 2024 adjusted based on what had actually occurred or what we think has occurred.
    - Investigate what threshold is for water rising above 68°F. This is highly influenced from DWR releases and changes in DWR releases throughout the year has a potential to change that especially in the middle of Summer.
  - If we are trying to conserve water in late-July and early August, as well as having a heatwave rolling through, what would the potential impact based on current temperatures out of DWR and potential flows?
    - Running a similar operation as in the past, it stays fairly low averaging 50° – 55°F. It comes up with a heatwave but will moderate throughout the Summer.
    - These are day averages
    - Do not see anything going up in the 60°F range.
- Slide 5: Alternative 1 – Spaulding Stream Temperatures
  - Alternative 1 has the potential of dipping down water. They wanted to look at whether we could conserve water through that time period and still meet the 71°F (or 69.5°F). How much water could we actually conserve if we were not going to lose the thermocline and if we were not going to exceed any other thresholds.
    - There is an understanding that if we drop releases out of DWR to under 5 kcfs before the natural cooling occurs (later in September) there is a potential of increased risk, shown by the exponential curve, of getting above 61°F in the Clearwater system. This could have other impacts

including Cherrylane Hatchery which is directly pulling water off the Clearwater.

- Ultimately there was nothing that flagged a red flag problem in the Alternatives that they were running. They did make a note (the only change from what was provided yesterday).
  - "Spalding temperatures may have an increased risk of surpassing 61°F which Dworshak outflows are 5kcfs or less for the time period of July 1 and August 31."

Stranz asked if TMT members had anything they would like to discuss beyond what was already discussed.

Conder asked if TMT was going to talk about the operation post-RIOG now, if that was what Stranz was thinking.

Stranz said that was what she was thinking.

Van Dyke said that he had one question that maybe should occur before that. He said Roberts said earlier that he was going to do some remodeling, that he was going to probably use years 2010 – 2024 to expand. He said that his question was, because TMT is often looking to try to figure out what we might expect from a situation where we actually provide an operation versus when we do not is whether it is possible for you to look back into the 1990s prior to this augmentation to give us a feel for what modeling might provide us. He asked if the data was available for that kind of thing or if it was a possibility.

Roberts said that he would say that is a possibility in just that he was not sure what type of, just right now off the top of his head, how much data is available. He said that he did know that would be more effort. He said that the reason that he would kind of pick 2010 moving forward is that he knows that he has good data there for his river temperatures that are all consistent. He said that he also has a fairly well documented understanding of the basin conditions so he can go back and benchmark the starting analysis as well as some good weather information records. He said that he was not sure prior to that and even running from 2010 to 2024 that is going to be a thing that they would look at in September and October. It will take them quite a bit of time to do that, to get all those right and to get the context and the graphs put together correctly. He said that it could be something that they could look to provide at maybe an End of Year TMT or a Process Meeting, or whenever the region felt it was warranted, they could tackle that. But prior to 2010 he did not know off the top of his head, that might be something that could be done, he just could not speak to it very well right now. He said that he could take a better look at it though.

Van Dyke said that they could maybe take that offline and try to figure out if it is possible or not and what stands in the way of it actually occurring so that we have an understanding of that.

Roberts said that it is definitely an interesting question, and they will make a note of it.

4. **RIOG Update/Discussion –** *Conder, NOAA*

- Conder said that they had a RIOG meeting yesterday and they had a pretty lengthy discussion on the SOR operation.
- NOAA's Perspective:
  - He said that NOAA was considering the operations initially as improving conditions for Snake River Sockeye and that is a primary concern for NOAA right now.
  - They also feel that it is providing benefits to Spring/Summer Chinook that happen to be in the system.
  - New information shown today is that this is reducing the flip over at IHR and increasing the amount time that we have stratification occurring there providing benefits over what would have occurred had we not done the operation.
  - Cooler water to fish that are migrating right now is a benefit from NOAA's perspective.
- NOAA's RIOG Reaction:
  - There were a lot of concerns, and the regional co-members have a lot of sensitivities with this. A lot of those concerns are valid concerns that NOAA considers important.
  - NOAA wants to be responsive to the concerns that came up in RIOG and is willing to look at options to reduce the temperature spike that we see in the modeling that is occurring in the early-August period and limit that.
  - NOAA wants to look at all available options and they think that we need to continue the operation into next week when we can have a review of the newest model runs and the temperature information at that time but they would consider an appropriate time to cease the operation.
  - NOAA would also consider other thoughts, as Ebel mentioned, and as were discussed at RIOG on how we can reduce the spike that we see in early-August and limit that to below 69.5°F to eliminate some of the more extreme effects and make it more consistent with past operations.

Morrill said thanked Conder for providing the additional clarity and we would go from there.

Ebel told Conder that he thought Roberts was pretty clear that keeping or trying to keep that temperature below 69.5°F is not an option with the volume of water unless something changes that has not been modeled. He asked if NOAA had discussed with the Corps whether ceasing the operation early is going to keep the temperature below 69.5°F.

Conder said that they had discussed it and that is where it was mentioned that there are a few alternatives in addition to ending the operation earlier. He said that it was a matter of how effective the other operations are, whether you are able to do them or not, and that determines how much earlier you could end this operation for that. He said that it is all tied in, things like removing the RSW August 1 has an effect on LWG tailwater (probably a pretty substantial one at that time), Idaho Power, that kind of

stuff. He said that there are other things as well that would affect how early you would have to end this operation to maintain 69.5°F.

Roberts said that he would like to ask the question and clarify what additional alternatives would TMT like them to consider and the parameters. He said that he heard 69.5°F being a threshold. He asked what other changes should he make to analyze that. He asked if it was just to terminate the operation sooner and the second portion of the question is 69.5°F only allowed after July 23 to August 15. He asked what the date range that 69.5°F was being looked at versus just 68°F.

Ebel said that in some ways was what he was asking NOAA Fisheries, for some specifics and how mechanistically this would work. He said there are a lot of small tools that you could start to move around. He said he was not sure when NOAA Fisheries says there is bringing Idaho Power into it what that would look like. He said to him it is what would be difference _ something that is important to the FM is knowing we started moving a lot of water early or ramped it up prior to when we would have anyway, so a lot of water is gone. It is hard to move water back upstream and put it back in the reservoir. He said if we went back to just a 68°F, managing the 68°F at LWG tomorrow, we have got this heat wave and then it is going to cool off. He asked how far in the hole are we in terms of like does that shorten the amount of period, does that allow the Corps to maintain below 69.5°F for *X* many days versus if the 10 kcfs continues on until sometime late next week what does that look like. He said that he guessed there needed to be some clarity because clearly NOAA Fisheries is driving the bus on this one at the moment and committed to bringing those alternatives to the table today.

Conder said that NOAA Fisheries was not interested in ending it tomorrow because of the benefits that they think this is providing for a very at-risk species. He said that they want to have the modeling discussion next week. He said that we have typically had some excess water in the tank at the end of the season, so we have probably used some of that initially. He said but what other tools are out there that are at our disposal to manage this risk and one of those would be ending the operation sooner and they are willing to do that. Sooner than what is currently coordinated, which is on the 20th. He said how much sooner really involves what the criteria is, so maintaining 69.5°F from the 23rd to that period that, August 15 or so, whatever we need to ramp that up down to 68°F again. He said that with that would be the threshold we would want to stay under from the time that we ended the operation until that starts, we would want to maintain a 68°F tailwater at LWG. Those are the loose parameters, he said that TMT could talk about specifics on how to model that. We do not need to bring Idaho Power in here, Ebel had brought it up in the past as a potential effect to this. Conder said that Roberts had brought it up here. They have modeled that it is influential. We have Summer flow augmentation at times that is occurring from that Project that can be modified and address this issue a little bit that we can control. And there are other sources of water that he was not going to specifically call out here today but there are other options on the table. But he thought overall NOAA Fisheries would like to run this operation as long as we can but they also know that we do not want to exceed 69.5°F during that August period, we do not want to get up to 71°F and so they are interested in having that conversation next week based on the most recent modeling and weather forecasts and what people are willing to discuss to come up with that operation.

| *Charles Morrill (Unverified)10:49 AM*

- *Thank you Trevor ! Appreciate the desire to keep temp below 69.5 F at lgr tailrace*
- *Charles Morrill (Unverified)10:56 AM*
- *Where is this discussion to curtail / modify the current SOR going to occur ?*

Stranz asked Roberts if that added conversation give him enough detail to run some model results for next Wednesday's TMT or run the model with some different results.

Roberts said that what he had captured was:

- Running 69.5°F as the upper threshold
- Do not go above 68°F before July 23
- Do not change the RSWs or ASWs
- Do not change the spill criteria so that he is not mixing water differently
- Do not look at Idaho Powers water

Roberts asked if he was correct there, he only looks at what he was doing at DWR for his alternative, do not look at RSWs, spill or Idaho Power as an alternative additionally.

Stranz said that she was seeing two thumbs up from Morrill. She asked what other TMT folks thought.

Conder said from NOAA's perspective, they would want to see the effect that the RSW has on that as needed to further [audio cut out] this cooling operation.

Roberts said that Conder had cut out. He asked what Conder had said after RSW or if it was just trying to in real-time_

Conder said that NOAA would be interested in understanding the effect that removing the RSW would have in August to help with this, to further extend the Sockeye operation. He said what Roberts had described he could model that and that is kind of the baseline, but then we could extend that by *X* amount if we were able to close the RSW to meeting the 69.5°F during August to see how much further that might extend the Sockeye 10 kcfs operation. Conder said that if folks had any other ideas he was interested in hearing them.

Van Dyke said it is this kind of snowball hitting us that drives the kind of consternation we have at this meeting, and we can make statements about what we think that have brought us to this point, but our system management actions that we have promoted to support lifecycle-level actions in the hydro system are what have been put at risk here for adult Sockeye passage. NOAA's recommendations for looking at alternatives, all of them in the past have dug into our actions taken for migratory fish that are listed in the Snake. This is another one that has that pattern coming together in a conversation like this one. He said that he recognized that NOAA's interest is to see if we take away more and more of the fish passage operations what we might get out of it. That is not a balancing act in Oregon's opinion, that is triage, which is really how we got to the other changes that have come to us for these kind of operations. He said that Oregon would be sensitive to that.

Stranz asked for Van Dyke to clarify that he was talking the last piece on what it would look like to remove the RSW in August.

Van Dyke said right, that was one of the many passage actions that has been emphasized for system management. It is first on the list again to be chopped in this conversation and that might be a strong way to put it, but it is clear that the interests are where we are going to start to cascade a bit. Knowing what that means, knowing how someone might anticipate staying away from a criteria that is already likely to impact these animals, that is not an easy place to be. But the reality is this, we should be operating the system for lifecycle management actions and in cases like this, we just degrade it right back down to the kind of things that have put us in the place we are at, in his opinion. So, he felt that it was important to say that right now. He said that he knew that folks were scouring for places were they can take something out to hopefully change where these lines appear. Currently what we should anticipate is that the 10-day will tell us some specifics and anything outside of that will be up in the air. That is just the normal routine at this point. He said that we anticipate that it is likely to occur in this conversation too, so he has said what he felt like was important at this point.

Stranz said she wanted to make sure that by the end of the meeting that Roberts has the information that he needs from TMT to present some ideas next time we meet in case there are changes that need to be made.

Hesse said that he thought this was covered in the previous discussion but as Roberts was making his checklists Hesse would like the LWG trap temperatures to be part of this modeling and flagging when that would not be operational in any of the models going forward. He added a process comment. He said that it sounded like the SOR was submitted last week and being implemented is not going to be revised in writing. He said that what he hear Conder say was that NOAA is committed to exploring adaptive operations to reduce the unintended consequences from the SOR. He said that his suggestion then, or assumption, would be that any additional operations would also be in the form of a new SOR. For example, if NOAA or others wanted to recommend suspension of RSW operations that would by itself be an SOR. He said that it seemed to him that he was assuming that what he heard was the modeling would be run next week. The SOR that is in place now, under objection and elevation, will remain in place and there is the potential for additional SORs in the future to adjust other operations. He asked if folks shared that process check or not.

Conder said he shared it if there are modifications such as removing an RSW. He said if it is such that the only [audio cut out] remove the Sockeye operation on such and such date and revert back to LWG 68°F tailwater criteria. He asked if Hesse felt that it was necessary to write a new SOR in that case.

Hesse said that he did not know. He said that was not ending the SOR, the SOR would continue because there are consequences and operations, so it is just a modification. He said that one does not seem to _. He said that he was not sure about that one.

Conder said that both options were viable in his opinion.

Ebel said that he did not know why_ He said essentially, he would be writing an SOR to rescind an SOR. He said that you could just rescind your SOR.

Conder said that what he thought Hesse was referring to is we would still have to deal with the issue of exceeding 68°F LWG in August and so how you redefine that operation might be an SOR.

Ebel said yeah, okay. He said that he was trying to navigate this. He said that it was said that there would be an alternative on the table to the SOR and instead there is a bunch of stuff to think about, but he has to going back to Van Dyke's_ What has been suggested and what Roberts rightfully brought up, because we have done these things in the past and discussed them in the past, essentially, we are creating triage. We are being asked to suggest triage operations such as changing spill operations and as Trevor alluded to, talking about the Nez Perce Tribes' 200 kaf. And also Conder brought up federal flow augmentation out of Brownlee and changing _ These are all triage operations that we have discussed in the past to deal with environmental conditions that were forced on us by Mother Nature but now we are talking about doing them, or them being on the table to be modeled, because there was a bunch of water released that_ We deviated from past practice and a bunch of water was released when it was fully necessary to release to maintain 68°F at LWG.

[Conder said that it was necessary because of Mother Nature]

Ebel said that is why it is difficult to think about these because in the past, in 2021, you can look at the discussions that were had especially in 2021 about changing how spill is managed and the effects of that on temperature at LWG. He said that he thought being with somebody who suggested changing this spill regime also at LGS in 2021 to try to conserve water and cool the river and that did not seem to work. He said that he was more along the lines of exactly what Idaho suggested in RIOG, which is back off the SOR go back to what it would look like if tomorrow we went back to maintaining 68°F, which would probably go back to drawing DWR back to 8 kcfs as we water navigate this heatwave and then go backwards. He said that we go back to what makes more sense where we are not actually talking about triage operations that are to address a situation that is entirely contrived. Ebel said that it did not answer Roberts question of what can be modeled for next week because he was hoping that TMT would not have to do these triage operations and change how we are doing things across the Snake because an entity feels like it is a good idea.

Conder told Ebel that the part that he had in his head, that he continually heard Ebel not understand or have the same opinion of is that the current 68°F operations is not providing effective passage conditions for Snake River Sockeye through the Lower Snake in several of the most recent years and we have to do something in addition. He said that was the part that we are trying to address here. Ebel was acting as if the 68°F criteria works just fine. Conder said that we have a lot of evidence that shows that it does not work for Sockeye.

Ebel said that he showed those numbers to RIOG. He said that he did not know if we need to rehash this.

Stranz said that she wanted to acknowledge where we are right now and what needs to happen in order to get somewhere else for next week. She said what she was hearing from NOAA was that they are committed to maintaining this operation into next week and then they are open to a change. She said that she recognized that it feels like triaging to folks but it is where we are right now and so she wanted all of TMT to focus

on what asks they have for Roberts and his team so that we can have a productive conversation for next week. She asked Roberts if he could ground us again in what he had heard his team should model for next week and we will see if there is anything else that people want to make sure is on his list.

- *Jonathan Ebel (Unverified)11:16 AM*
- *In 2024 and 2022, conversion from IHR-GRA was 0.92 and 0.97 and BON-MCN was 0.77 and 0.85. In 2021 and 2023 IHR-GRA was 0.6 and 0.65 while BON-MCN was 0.55 and 0.53*

Roberts said right now what they had noted is:

- Updated information for Alternative 0 and Alternative 1, basically redoing the analysis of Alternative 0 and Alternative 1. They would plan to do that on Monday with some final adjustments Tuesday Morning so it would be available for FPAC and pre-TMT discussions on Tuesday.
- At this point, based on what had been heard they would add a third graph based on what the LWG tailwater temperature of the current operation and its potential impacts, as well as, the trap temperature at LWG in relation to that. Roberts said that he thought putting it all in the same graph might get busy. There is a little bit of confidence interval around it that is a little greater/wider than the LWG tailwater temperature to be able to accurately reflect that.
- He would leave off the last two graphs, as he had not heard any further discussion on the Clearwater temperatures at this point.

For the criteria of the current operation:

- Alternative 0 would be as if we had run 68°F, what the impacts may have been. They will model the potential impacts or increase in temperature down to IHR by next week.
- We would also already start seeing some of the cold water in reality actually getting to IHR so that would be reflective in Alternative 1 with the addition of continuing the operation as it currently states in the SOR just so that there is a continual baseline on that understanding.
- Adding Alternative 2 where we would maintain the maximum temperature at 69.5°F between the dates of July 23 and August 15. And then we would adjust operations before July 23, that would allow for us to have enough water to do the 69.5°F, which would show some type of reduction sooner that July 20, which is what the current SOR shows the 10 kcfs running through.
- As well as not going below 1535’ on any of those scenarios.

Roberts said that he would make a note that next week will be July 9 so that it would be about halfway through the operation. He said that he was not sure what the analysis would show. He said that he was sorry, that he does not have the answer for 69.5°F. He said that he would take a look at it and they could run a preliminary run on that Alternative here, with the July 4 holiday on Friday, he did not know if they could run anything sooner and have any information that would be helpful to anyone prior to next

week. Looking at the calendar they would anticipate running the analysis on Monday with the best conditions that we have. So he had:

- Alternative 0: 68°F
- Alternative 1: Continuing 10 kcfs all the way through July 20, but with updated conditions
- Alternative 2: Capping the LWG tailwater at 69.5°F from July 23 to August 15, anything prior to that would have to be 68°F at LWG tailwater.

Roberts asked if that captured the three alternatives that people were looking for.

Morrill said that he thought so.

Van Dyke said that he was not going to talk to the three alternatives that were captured for Oregon's position. He said that he wanted to ask an important question. He told Roberts what usually happen is as we move through time the lines revert to actuals instead of predicted. He asked if we should anticipate that happening with the next few graph model runs that we see.

Roberts asked what was most helpful for TMT. He said that he could leave the modeled ones on there and then add what actually had occurred or he could put what actually had occurred on there and then just show the most current model runs moving forward with those same conditions. He asked what would be most helpful. He said that he actually might be more confused now that he had said that in his head and apologized to Van Dyke.

Van Dyke said that was fair. He said that he thought that was the reality of how the models work typically and the pictures we get, they change every time we look at them. He said that is because we are responding to what we know and that makes sense to him. He said somehow, we need to figure out how we are going to keep it straight in our heads_

Roberts asked what was best for TMT to be able to compare against.

Van Dyke said that he did not want more lines is what he though most would say. But somehow, we need to get there.

Roberts said that they could run the model up to current data and then they could put for Alternative 0, which is the only one that would be different in the past, they could put the projected temperature absent the 10 kcfs.

Van Dyke said that sounded like a reasonable solution.

Roberts said that they would definitely graph it up and take a look at it here today and tomorrow and play with it just on a communication side to see what works best so they can have it ready for Monday so that they can dive into it.

Van Dyke said that he trusted Roberts' decision making on that.

Ebel what day again was NOAA Fisheries suggesting as an alternative that this operation stop.

Conder said that they were hoping to look at the modeling next week and see what that is, but they are interested in potentially ending it one to two weeks sooner than it is currently listed.

Ebel said one to two weeks, so the 23rd.

Stranz asked if it made sense to have a model run that shows the operation reverted back to normal operations on the 9th.

Ebel said that it doesn't matter, no, because there is a huge heatwave at the end of the forecast right during that day, so it basically you could claim that the you have ended the SOR, but you are not doing that anymore, but you are going to still be pushing the water because of the heatwave.

Conder said yeah, but you would not save any water to not hit 71°F so in order to get back down to 69.5°F_

Ebel said that was what he meant_

[Conder] _to save water

Ebel said that the only way to save water was to save it now.

Conder said that there are other alternatives. That he did not know we would look at the modeling.

Ebel said that was his point. He said that he guessed that he suggested back the water off tomorrow to take advantage of the fact that it is going to be 80°F with nights in the 50s and low 60s in Hells Canyon over the weekend.

Conder said not for sockeye obviously.

Ebel said that he could keep putting the numbers up.

[Stranz tried to break in]

Van Dyke asked Stranz to please stop that because frankly if they wanted to help Sockeye we could come up with a lot of rationale that would have been helpful for Sockeye earlier in the season as well. This is the kind of detail that gets us in a bad space.

[Stranz tried to break in]

Ebel said he guessed he just wanted to say stick with my_

Stranz asked if she could jump in real quick. She said that she understood that there are different perspectives on how to help Sockeye right now and in the past. She said that what she wanted to do is focus on how we were going to move forward. She said that she was wondering if it would be helpful to take a break and _ She said that we have one alternative, or we have a couple alternatives that Roberts and his team were going to model. She said that she was wondering if there were other things that TMT folks want to think about and put on the table. She said that it seemed like having the open discussion right now is not_ is just getting people frustrated. She asked if it would be helpful for FM to put their heads together for a few minutes.

Ebel asked for Roberts' professional option on this. Like on if there was the ability to, off the top of his head, given the forecast for over the weekend would there be any water

conservation benefit without major temperature spikes anywhere backing off of DWR give the forecast.

Roberts said that he would say that if someone wanted to give him 30 minutes, he could come up with at least some preliminary information, but to get a more scientific answer than just_ He said that there might be, is his only help he could provide right now at the top of his head, where we could save, even if we were at 1 kcfs reduction if we were just running like 9 kcfs, or something. He said that he would have to take a little bit of a closer look at it. He could do that if TMT wanted to focus very specifically on a very specific time frame within the next 10 days. If we wanted to look at something he could take a look at it fairly quickly, but it would still be preliminary. He said that he was sorry he was just trying to think through it while talking.

Ebel said that he knew that he put Roberts on the spot. He said that he guessed he did not see_

Roberts said that we have already run water for seven days_

Ebel said that he did not see that NOAA was going to punch but he just wanted to_ We just got this forecast in front of us where it is going to be cool over the weekend, which is always a thank goodness and before it heats up_ It is just in the past we would take advantage of these, and we are not taking advantage of it this time. And we are not taking advantage of an opportunity to save some water and yet we are taking_ We are talking about triage activities at the end of, in the middle of August and so that is_ He said that he wanted to really underscore that.

Roberts said that if TMT wanted to or wanted to_ He said that he was not sure that the approach here would be. But yeah, if TMT, if he had 30 minutes to run through something he could probably get a better answer on if it was worth it or not effectiveness-wise, like what we could save or what_

Stranz said that she was going to turn to Conder. She asked if that was something that NOAA was open to considering today, depending on what Roberts, what his quick and dirty could provide.

Conder said that they would look at the information that he provides and get an evaluation of that and an understanding of the trade-offs. A lot of this, there is a lot of uncertainty around it. He said that he did, even if there is a cooldown, this is still going to provide more cool water than we had provided for Sockeye that are passing right now. So yes, it might help mitigate the triage as Ebel had said but it is not going to provide as much benefit for Sockeye, which we are trying to do. He said that it still comes down to a trade off no matter what it shows, NOAA are still going to want to provide a benefit for these Sockeye, others are still going to be concerned about the triage later in the season. He said that there are other things that can be done to help mitigate the for that nobody wants to talk about. So, what do we do. He said that NOAA would look at it.

Ebel said put it on the table.

Conder said that people do not want to.

Ebel asked Conder to do what.

Conder asked if Ebel wanted to put it on the table.

Ebel said that if NOAA Fisheries has the SOR on the _.

Stranz said that she thought right now that she wanted to make sure that the conversation that we are having is productive and she thought that a break would be helpful in order to ensure that. She asked if TMT folks had beyond, can we continue our TMT meeting beyond noon today.

Hesse said that he had a hard stop around now and he could reengage after about one.

Ebel said that he did not know what we were going to get out of it. He said that RIOG instructed NOAA Fisheries so that they would have an alternative to put on the table. He said that it was assuming that it would be something a little more concrete. Instead, we are getting asked how to correct or how to adjust this SOR using tool that FM do not like to use. He said that he did not know where we go from here so_

Stranz said that she thought if we close today's session where we are going from here is Roberts is going to model the three scenarios that he laid out and we will revisit those next week at TMT. That is one option and the alternative in that case, that NOAA put on the table, is considering concluding the SOR earlier than July 23 and shifting to a 69.5°F max for that period of time where you are exceeding 68°F. She said that was the alternative that she heard. She said that she felt that if we do not_

Van Dyke told Stranz that what we heard was that they were willing to look at it. He said that Stranz had maybe taken it just a step to far from what he heard from Conder.

Conder said that they were committed to ending the operation sooner than currently coordinated. He said that they were going to use the modeling results to do that.

Van Dyke said if Conder got more results would he be able to instantaneously or immediately make a decision to change the operation.

Conder said yes.

Stranz said that was consistent with what she was hearing.

Ebel said that he just had to look at the forecast though and it is not_ He said that Conder could end this early, but it is right when there are heatwaves, when you are not actually going to save any water by ending it. So Conder was essentially taking the SOR off the table at a time when it is no longer like it is irrelevant.

Stranz said that was one option, the other option is continuing today's TMT meeting and asking Roberts to do his half an hour analysis and giving us more information on what it would look like if there was a decrease in output out of DWR today.

Ebel said that he requested that analysis.

Stranz said that she heard Ebel requesting the analysis and she was trying to help us move forward so if everybody could just help her with the process piece for a minute that would be great. She said that she heard Hesse said that he can come back at one, she had not heard from anybody else when she asked the question.

Van Dyke said that he could fit within that timeline.

Tom Lorz, Umatilla, said that was why we have TMT; these things are supposed to go to 3:00. He said that Stranz had him until 3:00.

Roberts said that TMT did not have Jon Roberts until 3:00. He said that he was only available until 1:00. He said that he did not want to throw a monkey wrench, but if TMT wanted to stall for like 5 – 10 minutes he would have it. He said that he would just not have graphs, he would just have verbal information.

Lorz said that TMT can stall like no man's business.

Stranz said TMT is going to give Roberts a few minutes to take care of what he needs to take care of to provide TMT with a little more information. Everybody else is taking a break and TMT will reconvene at 11:45. She asked if Hesse would be able to be here at 11:45.

Hesse said that it was not likely. He said that he would rejoin as soon as he could but_

Stranz said that TMT would do their best without him. She thanked Roberts for trying to pull it together for us.

- *Brian Marotz - Montana (Unverified)11:32 AM*
- *I cannot attend the breakout session. I have experience with managing water temperatures, so will help where I can at a later date*

[Break]

5. Additional Preliminary Model Run

Stranz checked attendance again. Tom Lorz (Umatilla), Baus with the Corps Division Office, Van Dyke (Oregon), Ebel (Idaho), Swank (USFWS), Morrill (Washington), Norris (BPA), Roberts (Corps – Walla Walla), Dennis Moore (Colville), Hesse (Nez Perce) and Conder (NOAA) were all present.

Roberts said that there were two quick scenarios that he was able to run with his team.

Step 1: Get us back under 69.5°F across the entire duration of the Summer somewhere, approximately right now, Roberts needs to recover about 8.5 kcfs to do that. That can be spread out in different ways whether that is a 1 kcfs reduction at some point or whatever… The two discussion points that he came up with were:

- Option 1: We could ramp down tomorrow, or immediately, across 2 kcfs, being down at 8 kcfs for 2 days and then come back up to 10 kcfs. As Ebel had indicated we would need to come back up there was already a heatwave coming. We could get 2 days of that, or about 4 kcfs or the 8.5 kcfs back.
- Option 2: In looking forward to next week and this is what we would have available, more in line with the request of when we might need to terminate the operation. If we started ramping down on July 16 instead of July 20 *and* instead of having the temperature relaxation from July 23 to August 15, it was from July 19 to August 15 but not to exceed 69.5°F, then that also takes car of the 69.5°F issue.

The July 23 to August 15 analysis showed that we would go up to 71°F. He said that the quick analysis shows that if we had a little bit longer window in there at 69.5°F, so essentially starting that one four days earlier we can recover the water that way also to not exceed 69.5°F.

He said that no plots were available to share, it was on his whiteboard with his team and computers.

Conder said that they are talking about extending the August period that they had described as earlier further_

Roberts said that he had only hear to earlier.

Stranz said that it was extending the days, but lowering the target, the temperature.

Conder said yeah, the days of 69.5°F. He asked if that was what Roberts had said. He said that NOAA was not interested in that. He said that they are okay with ramping this down and taking advantage of this cooling period and ending the operation sooner and just reverting back to 68°F at LWG. He said that NOAA was going to go ahead and back off this.

Roberts asked if that was immediate. He asked if that was for today, now. He asked for clarification.

Conder said that Roberts had said to ramp down to 8 kcfs.

Roberts said that was what we need to maintain temperature at LWG right now, yes. He said that they would be ramping back up on Sunday to 10 kcfs to prepare for the heatwave. That was still needed for the heatwave.

Conder said let us go ahead and do that, we are going to back off this.

Roberts said to clarify that we would still be above 68°F between July 23 and August 15 and then there is still some time that based on water that has already been moved that we will be under the current water availability. There is still a potential risk to be at 71°F on a couple of days in that time period.

Conder asked if TMT could work next week figuring out how to mitigate_ [audio cut out]

Stranz said that we had lost Conder and Roberts said that he was sorry that he did not hear anything.

Conder apologized he did not know why his computer_

Stranz said to work next week.

Conder said so yeah, lets drop down to the 8 kcfs to meet LWG tailwater now. He said to run that and then we would talk next week about how to best mitigate this. He asked if that sounded okay to everybody so we could move on.

Stranz said to clarify; the operation would be to drop down immediately to 8 kcfs for the next two days, increase again to 10 kcfs on Sunday to manage for the heatwave that is coming, and then next week talk about how to best mitigate those days, that July 23 to August 15 period, where the expectation that temperatures would be above 69.5°F.

Conder said yeah, so essentially return to 68°F LWG tailwater criteria immediately_

Stranz said unfortunately we can hear Conder start to talk and then it goes off. She said that she thought if he was on a headset maybe it is not picking him up.

Conder said he had his face right in his computer. Glitch. He said essentially based on the feedback and being responsive to comanagers, NOAA suggests that we return to

68°F tailwater at LWG until that period that is specified to go to 69.5°F. He said that TMT will work next week on finding ways to not exceed 69.5°F.

Stranz thanked Conder for the clarification. She asked Roberts if there was anything else that his team needed.

Roberts said that he does not need anything from his perspective from the District. He said that he would let Baus or Aaron Marshall chime in from the Division Office as the TMT representatives.

Stranz said okay and asked the same of the Action Agencies.

Baus said that he would want to hear from Bonneville Power Administration. He said the Corps did hear and thank you for the update. He said that he would like to hear an update from BPA on the time series of the request. He said that he was not quite certain. He said that we need to hear BPA speak to that. So he would like to turn it over to BPA.

Norris said that this is a bit of an issue for BPA because they have_ It is a holiday weekend, and they have already marketed through the weekend, and they have Grand Coulee (GCL) on a very tight operation for the holiday weekend. He said that this is a significant imposition. He said that it is going to take a real-time marketing hit for BPA during a period where energy is tight. He said that he thought they could do it but it is not great.

Stranz said okay and thanked Norris for that perspective. She asked if Baus had anything else that he wanted to add.

Baus said that it sounded like Walla Walla was comfortable taking it down to 8 kcfs. He asked Norris to clarify the time series because this is a time sensitive conversation and if folks are expecting a quicker change in DWR operations when might we expect to see that. He asked if there was any clarified time series to how they would describe this change in operation when we would see the reduction to 8 kcfs.

Stranz asked if that was to Roberts.

Baus said that it was to both. To Roberts regarding how we are going to communicate that to the Project and then also to BPA as it relates to what we should expect to see from the real-time implementation of that.

Norris said yeah, when is it, are we ramping down tonight, at midnight, or, and then when are we coming back up specifically.

Roberts said to answer that, he would first start a 24-hour ramp down that is in the Water Management Plan (WMP) by 500 cfs every 6 hours to get down to 8 kcfs outflow. He said that he could start that sometime in the next 24 hours and then as long as he started a ramp up, starting on Sunday, across 2 kcfs ramp up over 20.

Norris asked if that was starting 0000 hours or…

Roberts said no, that would be in the ramping window that is 7:00 – 12:00 at night. So they would ramp back up. Either they could ramp Sunday Night, if we delay for a day or if we go ahead and start ramping down, we can conserve water, and we could ramp back up on Saturday night. It depends on if the Division Office wanted him to start the

ramp in the next six hours or if they want to wait until tomorrow morning. He said that was other people's discretion and to let him know which one.

Norris said tomorrow is better for marketing purposes because BPA has you know that water has already been spoken for so it seems like the Corps should stick to their normal ramping schedules.

Conder said to be clear this is just NOAA's recommendation moving forward here after considering this with their Policy folks. He said that they are trying to be responsive to the RIOG concerns. He said that if the AA need to discuss further, that was fine. He said that it was just where they have landed on this, so he apologized for the back and forth. It was very difficult to try to manage the Sockeye and all the concerns from the region with Fall Chinook and everything else. He said that he apologized that it is putting Norris in a tough place with Marketing. He said that NOAA was willing to work with what the AA want to do, and if that is tomorrow that is fine too.

Stranz said that this had been a tough one for everyone, she wanted to acknowledge that. She asked if folks were comfortable enough with where we are recognizing that there is still some internal coordination that needs to happen at the AA.

Ebel said that given that the goal is to try to recover as much of the deficit as we can, he would encourage the AA to take_ When dealing with water and conservation, the best time to have done something is yesterday. So, to expedite this as best the AA possibly can. Thank you.

Morrill said that he concurred with what Ebel said. Thank you.

Stranz said for BPA and NOAA folks, she assumed that they could coordinate the rest offline. She asked if they needed any more coordination here today at TMT.

Baus said that he wanted to clarify that:

- The AA would coordinate the ramp down at DWR and that it would occur tomorrow as discussed and they would provided an update at the next TMT meeting scheduled for July 9.

Roberts asked what time should he start his ramp down.

Baus said again, as Norris said, as far as whatever our normal procedures are for making these.

Roberts said that it is over a 24-hour period he could start at 1 o'clock this afternoon in 24 hours be down or he could start at midnight and start at 6.

Norris said that midnight was preferable, which is similar to normal practice.

Stranz asked if Roberts needed anything else from TMT now.

Roberts said if that was what he was hearing he would start the ramp down tonight at midnight, and that would work through this day tomorrow and be at 8 kcfs for Friday, Saturday and start a ramp back up on Sunday evening.

Stranz and Baus thanked Roberts.

Ebel said that he appreciated the discussion, but he needed to hop off the call. He said that he appreciated the flexibility and taking into account our concerns. He said that he

would keep working towards getting through this and making it better for all the fish in the river as we keep trying to learn how to adapt to a changing Snake Basin.

6. **Set agenda for next meeting – June 25, 2025**

   Meeting Location: Microsoft Teams

   a. DWR Update

   b. Sockeye Conversion

Today's Attendees:

Agency	TMT Representative(s)
NOAA Fisheries	Trevor Conder
Oregon	Erick Van Dyke
Washington	Charles Morrill
Kootenai Tribe	
Confederated Tribes of Colville Reservation	Dennis Moore
Umatilla Tribe (CRITFC)	Tom Lorz, Pete McHugh
Yakama Nation	Keely Murdoch
Bureau of Reclamation	Chris Runyan
Army Corps of Engineers	Doug Baus (Chair), Aaron Marshall, Lisa Wright
US Fish & Wildlife Service	Dave Swank
Idaho	Jonathan Ebel
Montana	Brian Marotz
Spokane Tribe	
Nez Perce Tribe	Jay Hesse
Warm Springs Tribe	
Confederated Salish and Kootenai Tribes	Tom McDonald
Bonneville Power Administration	Tony Norris, Ben Hausmann

Other Attendees (non-TMT members):

COE – Tiffany Stoeckig-Dixon, Tom Conning, Jessika Solleder, Michelle Yuen, Leah Hamilton, Catherine Dudgeon, Alexis Mills, Jonathan Roberts

BPA – Leah Sullivan, Tammy Mackey

NOAA – Emi Melton

Washington Ecology – Thomas Starkey

Flathead County Commissioner – Randy Brodehl

DS Consulting – Emily Stranz (Facilitator), Colby Mills

CorSource – Andrea Ausmus (BPA note taker, Contractor)

Clearing Up – K.C. Mehaffey

Columbia Basin Bulletin – Mike O'Bryant

NPCC – Kate Self, Rudy Salakory

Energy EPS – Joshua Rasmussen

Grant PUD – Shaun Harrington, Eva Stites

Snohomish PUD – Scott Richards

EKI – Travis Togo

FPC – Erin Cooper, Noah Campbell

PGE – Phil DeVol

AVA – Steve Lentini

PSE – John Chandler

Unaffiliated – Dane Dough, Mike Buchko