COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 9, 2021
Facilitator's Summary
Facilitator: Doug Baus; Notes: Colby Mills

The following Facilitator's Summary is intended to capture basic discussion, decisions, and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members. Official minutes can be found on the TMT website: http://pweb.crohms.org/tmt/agendas/2021/.

Dworshak Dam Operations

Jon Roberts, Corps, reported on operations at Dworshak Dam. Conditions continue to be monitored and assessed daily. Looking out at the 10-day forecast, a heat wave is expected Saturday through Monday, and will taper off Tuesday through Friday with a slight cool down. More heat could potentially follow the next weekend on Saturday and Sunday. The Corps will continue to monitor and make adjustments as needed.

The Lower Granite tailrace is holding at the criteria of 68 degrees F, and incoming river temperatures from Anatone and Orofino have decreased due to cooler air and nighttime temperatures; these will mix in the pool today to provide a slight buffer heading into the heat wave. Releases picked up last night as the project sends more water into the Clearwater basin to mix with the pool over the hot weekend. The Corps expects the Lower Granite tailrace to be in the 67.5-68-degree F range, and is working to be as efficient as possible with Dworshak water.

Surface temperatures in the Lower Granite pool have risen up to 77.8 degrees, and stratification continues at the 15–20-meter mark. Temperatures are not expected to rise as high at the surface, although this weekend could reach the upper 70–80-degree F range with air temperatures in the 100-degree F range. Stratification continues to look well, and will be monitored throughout the weekend.

Short-term modeling results for the next few days show the project keeping close to the 68 degrees F tailrace criteria. Additional water released from Dworshak yesterday will continue through the weekend heatwave; adjustments could be made to come down potentially Monday through Wednesday to conserve water as soon as possible.

Jon reviewed alternative long-term operations (posted to the TMT website), that have been suggested by and coordinated with TMT or FPAC members. These have been updated since yesterday's FPOM meeting, and include accounting for impacts like the Doble testing outage at Lower Granite. Also included are analysis estimates on how far each alternative extends Dworshak's water into August. This list of alternatives is not exhaustive, and the modeling team will continue running additional models and analyses as needed. As predictions are made closer to August, the estimated range of water will be much more refined, as well as the impacts from operational changes.

In regards to how these operations may affect the probability of refill, based on preliminary high-level analysis, the project looks to be in the 91-92% range for refill (calculated at Dworshak on July 1), not accounting for other risks or impacts. It was noted that the start date for flow does impact refill.

Jon noted that any operational changes resulting in an exceedance of 70 degrees F in the Lower Granite tailwater would use too much of the conserved water in lowering the temperature back down to 68 degrees F by August 7.

Implementation Update for SOR 2021-3

Doug Baus, Corps, reviewed a summary of operations coordinated at the July 2 TMT meeting (posted to the TMT website). These operations included spill adjustments to Lower Granite and Little Goose, and an adjustment to the juvenile transportation operation:

1. At Lower Granite: effective daily from July 3-31, from 0900 hours – 2300 hours, RSW spill only (approximately 7 kcfs); and from 2300 hours – 0900 hours, spill the 18 kcfs identified in the FOP.
2. At Little Goose: effective daily from July 3-31, from 0900 hours – 2300 hours, ASW spill only; and from 2300 hours – 0900 hours, 30% of outflow except during low flows (as described in the 2021 FOP).
3. Juvenile transportation: collection at Lower Granite began at 1100 hours on July 2 with the first truck departing on July 4; collection at Little Goose began at 0700 hours on July 4, with the first truck departing on July 6.

Jay Hesse, voiced concern regarding potential additional shaping of flows into daytime hours, and the need to accurately portray the amount of spill going over the RSW. Noting that minimum generation spill the rest conditions provide potential for different shaping during the day, he requested further analysis into the operation with updates to the TMT. Action Agencies confirmed that the intent of operation is to spill via the weir only, and that as far as spill rates go, they must operate within the project operating range. Scott Bettin, BPA, acknowledged Jay's concern, and noted that flows at Lower Granite are stable and pretty flat.

Tom Lorz, Umatilla Tribes/CRITFC, added that while Lower Granite is at MOP+3, the reporting data should be more representative of the actual amount of spill going over the RSW. AAs recognized this concern, noting that it is a physical gauge reporting issue, and will investigate this action further and provide an update at future TMT meetings on spill rates associated through surface spill versus conventional spillbays. OR also noted that it is unknown if these actions impact forecasting tools, and any links between the two should be considered and reported back to the TMT.

Adult Sockeye Passage

Claire McGrath, NOAA, reported on adult snake river sockeye. Lower Columbia fish ladders are observing declining counts, as expected to date. Sockeye passage at Bonneville YTD is 130,900, or 47% of the 10-year average; McNary YTD is 93,169, or 53% of the 10-year average; Ice Harbor YTD is 554, or 53% of the 10-year average. Lower Monumental and Little Goose sockeye passage are both above the 10-year average, at 117% and 108% respectively; and Lower Granite YTD is 157, or 85% of the 10-year average.

Fish are moving through the system, although reports from crews at the traps are that many sockeye are dull in color and show a high incidence of lamprey bites (about 50%). There appears to be fewer than average wounds observed from pinnipeds or fishing nets, suggesting that the wounded fish are probably not surviving to Lower Granite. There is strong indication that fish are being stressed by the hot water conditions. Compared to 2015, conversion is better in the lower Columbia to date, and similar to 2015 in the lower Snake (based on ladder counts). Water temperatures in the lower Columbia have approached but not reached 2015 levels, while they have in the lower Snake. Tributaries are hot and remain hot, and the heat wave was exacerbated by low flows. Claire noted that fish exposure time to warm water does matter, as observed in current fish stress.

Jonathan Ebel, ID, reported 43 total PIT-tags from the Snake River across Bonneville, and the total conversion to Lower Granite is 12% of PIT-tags. Window counts at most projects are tracking in the median, except for slower counts in the Little Goose to Lower Granite reach.

Jonathan reported that the trap and haul operation is trapping Monday through Thursday, and hauling Tuesday and Thursday. 38 sockeye have been transported so far, and the window count during that period was 61 fish; this is in the take range as listed in the BiOp. The operation will continue next week Monday through Thursday.

Blane Bellerud, NOAA, added that there is some indication that travel time was picking up as of the first week in July, and there may be some slowing down at Lower Granite. He noted that there are no signs of fish losing their homing ability, as what occurred in 2015.

To address some confusion regarding the observed lamprey bites on both sockeye and Chinook, Claire will collect photos of the physical trauma and further analysis on the causes; she will report her findings back to the

TMT. Overall, the situation is good, although impacts of thermal stress on fish are apparent, so anything that can be done to mitigate this harm is of utmost importance.

Spillway Weir Operations
Lisa Wright, Corps, summarized the current FPP criteria for closing the spillway weirs at the Snake River projects, and their current conditions (posted to the TMT website). The primary reason for these closure criteria is for tailrace hydraulics. Currently, every project has 2 out of the 3 criteria met, so spillway weirs will remain open until all 3 criteria are met, unless otherwise coordinated. From a hydraulics standpoint, the Corps believes it is reasonable to think about closing the spillway weirs very soon.

System Operational Request (SOR) 2021-4
Before the SOR was presented, Doug noted the expectations of the AAs on making implementation decisions. Due to the complexity of the SOR, and the broad suite of actions, the AAs did not plan on making a final implementation decision today. AAs will listen to concerns and feedback from TMT members while reviewing the SOR; after internal coordination, they will report back with their decisions at the next TMT meeting, on July 14. Some actions presented are more consistent with operations that could be taken today for adaptive management. Jon will continue doing additional analysis on the impacts of the SOR actions.

Erick Van Dyke, OR, presented SOR 2021-4 (posted on the TMT website), that requests short-term operation modifications to address unreasonably high water temperatures in the region, that is resulting in heat stress and lethal river conditions for fish. He noted that the SOR doesn't have a full list of Salmon Managers signed on, due to time constraint challenges in submitting the SOR. The SOR aims to build a list of actions that have the potential to address high river temperatures, and stretch Dworshak flow to meet water needs through August.

Erick presented Actions 1-6, allowing for questions, clarification and feedback from TMT members on each. Actions 1 and 3-6 required more internal assessment on behalf of AAs regarding outcome benefits and risks/impacts (including navigation safety); more overall evaluation and modeling on alternatives is needed to meet objectives of temperature management and stretching water to August. There was general consensus on Action 2 to be implemented today (July 9), with frequent monitoring and analysis, and AAs confirmed that the action could be implemented.

During the discussion, Erick noted that sometimes there are different levels of support among TMT members for different uncertainties. Additionally, Jay noted that there are also impacts to cultural resources, and that all of the actions have impacts to other interests besides fish and that perhaps impacts to the navigation community should have more analysis. A deeper discussion on potential alternatives should happen within the next week.

AAs did not make a final decision today on implementation of the SOR in its entirety due to the complex operations requested. However, there are some actions that fall within the typical routine real-time coordination at TMT and FPOM. Based on the feedback from TMT members, the Corps believed that Action 2 could be implemented.

- → **ACTION**: Effective July 9; Little Goose to close the ASW; from 0900 hours – 2300 hours spill approximately 7 kcfs (ASW-equivalent); from 2300 hours – 0900 hours spill per the FOP.
- → **ACTION**: Effective July 9; at Lower Monumental and Ice Harbor dams, close the RSW and spill per FOP all hours.

The TMT will reconvene at the July 14 meeting with the goal for AAs to have a final decision on the remaining SOR actions and opportunity for TMT polling.

Questions or comments from members of the public: no questions or comments from members of the public.

The next scheduled TMT meeting is a conference call on Wednesday July 14, 2021 at 9:00 AM.
This summary is respectfully submitted by the DS Consulting Facilitation Team. Suggested edits are welcome and can be sent to Colby at colby@dsconsult.co.

Columbia River Regional Forum

Technical Management Team
OFFICIAL MINUTES
FRIDAY, July 9, 2021
Minutes: Melissa Haskin, BPA (contractor, FLUX Resources)

Today's special TMT meeting was convened to discuss Dworshak Dam operations, adult sockeye passage, spillway weir operations, and SOR 2021-4. The web meeting was chaired and facilitated by Doug Baus, Corps. See the end of these minutes for a list of attendees.

1. Dworshak Dam Update – Jon Roberts, Corps NWW

1.a. NWRFC 10-Day Weather Forecast

The 10-day weather forecast shows a heat wave starting this Saturday and extending into Monday. It will cool down Tuesday through Friday. Another heatwave may enter the region again next weekend, but it is hard to tell this early, said Roberts.

1.b. Snake and Clearwater River Temperatures

The tailwater at Lower Granite is near ~67.5-68°F. In the last 48 hours, incoming water from Anatone and Orofino has cooled due to cooler temperatures during nighttime hours. This cooler water will mix today and tomorrow, providing some relief in the Lower Granite tailwater. The Corps started releasing more water from Dworshak Dam last night. To be as efficient as possible with the water out of Dworshak Dam, the tailwater temperature will remain near 68°F over the next few days.

1.c. Lower Granite Forebay Temperature

At the top of the pool, temperatures were about 77.8°F, yesterday. Stratification is being held at the 15 to 20-meter depth. This weekend, surface temperatures could increase into the 80s as ambient air temperatures rise into the triple digits.

1.d. Water Temperature Comparisons

Roberts shared modeling results for the next 3-4 days. Temperatures in the Lower Granite tailwater will be near 68°F. The Corps thinks it may be possible to decrease Dworshak Dam releases as early as Monday and will monitor the situation over the weekend.

1.e. LWG Temperature Alternatives

Roberts took TMT through 6 operational scenarios that were updated yesterday and include adjustments for the Lower Granite outage for Doble testing that begins August 9:

Scenario 1. Follow standard summer operations per the FPP.
Scenario 2. Reduce daytime spill.
Scenario 3. Operate per summer spill without the RSW.
Scenario 4. Maintain the tailwater temperature at 70°F
Scenario 5. Maintain the tailwater temperature at 69°F, with limited RSW.
Scenario 6. Draft Dworshak up to 10 feet deeper than the normal 1,535 ft. by Sep 1st.

These models showed cooling water from Dworshak running out between August 20 and 24, depending on the scenario. He also showed TMT combinations of the scenarios listed above.

Jay Hesse, Nez Perce, asked what the elevation would be if 8 days of water were used (a combination of alternatives 2 and 3). Jon said August 31 would likely be 1,524 ft and September 30 would be 1,509 ft. He noted that the normal end of August target is 1,535 ft and end of September is 1,520 ft to ensure a 95% chance of refill at Dworshak the following year. As the elevation drops, so does the chance of refill. Thus, an end of September elevation of 1,509-1,510 ft, would reduce the probability of refill to ~90-92%, roughly. Refill is calculated July 1 and drafting can start before then like it did this year.

The scenarios Roberts presented have a margin of error of 1-2 days. Closer to August 31, that margin reduces. By August 1, the margin should be less than a day.

Roberts added the model was run with the temperature in the adult ladder/trap in mind as well as in the tailwater. The model assumes a constraint of 70°F at the ladder entrance. He noted that allowing the ladder to go above that only provides 0.5 to 1 day of additional Dworshak water use for later in the season. That said, when the temperature rises above 70°F, any water saved is usually required to drop the temperature in the ladder back down. Once the water is above 70°F, a lot of water is needed to get the temperature back down to 68°F, he noted.

2. SOR 2021-3 – Doug Baus, Corps

Baus directed the TMT to a summary of TMT-coordinated SOR 2021-3 operations, available on the TMT agenda website. The SOR included 3 actions:

1. Change to spill at Lower Granite
2. Change to spill at Little Goose
3. Change for juvenile passage

Following a description of operations, Jay Hesse, Nez Perce, shared his concern about spill at Lower Granite. Specifically, with the raised MOP operation from 0900 to 2300, he is concerned that actual spill over the RSW was higher than 7 kcfs. The intention of the SOR is to shift the time of spill and is not meant to create an opening for load-shaping, he said. He expressed a desire for spill to not decrease because of load-shaping from 2300 to 0900 during the operation.

The Corps explained that at Lower Granite there can be slight changes in the forebay due to the variable MOP operation. Right now, Lower Granite is operating at MOP+3. The intent is to spill through the weir only, which is what the Corps is doing. Data show the Action Agencies working within the operating range with fairly constant spill. BPA has the ability to shape some of the water, said Scott Bettin, BPA. Normally, water is stored at night and shaped during the day. Currently, this is happening on a much less significant level than normal, shared Bettin, adding that his agency hears Hesse's concern and will take it into consideration moving forward.

Since the Action Agencies are operating in MOP+3, the flow going over the RSW is higher than what is being reported on the website (which is a calculation assuming the pool is in MOP). There is some concern about the spill requirements in the FOP and if actual operations are meeting the intent. The Corps will investigate the issue and report back at the next TMT meeting.

3. Adult Sockeye Passage - Claire McGrath, NOAA

Sockeye counts are on the decline at Lower Columbia projects, as is expected at this time of the passage season. At Bonneville, YTD sockeye passage is 130,900, or 47% of the 10-year average. About 2,000-4,000 fish are passing the project daily. At McNary, counts are ~3,000-7,000 per day, with a YTD of 93,169, or 53% of the 10-year average. In the Snake River, Ice Harbor daily counts range from 35-68 fish and the YTD total is 554, or 53% of the 10-year average. At Lower Monumental and Little Goose, sockeye passage is above the 10-year average (117% at Lower Monumental and 108% at Little Goose). At Lower Granite, 19-34 sockeye are passing per day and the YTD passage count is at 157, or 85% of the 10-year average.

McGrath commented that the crew at the Lower Granite trap have reported unhealthy looking sockeye. There seems to be a high incidence of injury (up to 50% of those that arrive at the traps), likely from lamprey bites. However, there do seem to be less wounds on those fish caught in nets, which would suggest that those that become wounded perish before making it to Lower Granite. Fish may be stressed by the warmer-than-normal water temperatures. Compared to 2015, to-date conversion is better in the Lower Columbia and on par with 2015 in the Lower Snake River. In 2015, water temperatures rose much earlier than they did this year. McGrath shared that tributaries have been hot – as high as 80°F in some places during the last heat wave. Exposure to these elevated temperatures affects fish and there has been evidence of thermal stress in both sockeye and Chinook, she said.

There were additional questions from fish managers regarding the lamprey bites. McGrath said staff at the trap think the bites are from lampreys and that 72% of fish are showing bites. There is a lower incidence in transported fish, she noted. Dave Swank, USFWS, expressed confusion as to how higher temperatures would lead to higher rates of lamprey bites. Lamprey attacks in fresh water are rare, he said, wondering if the bites had maybe happened in the ocean. He added that lamprey counts are below the 10-year average and lower than last year. Charles Morrill, WA, asked if the bites are from adults, juveniles, or both. McGrath said it appears to be both. It is unclear if the bites are fresh. Jonathan Ebel, ID, reported that ID is seeing similar injuries on Chinook, but that steelhead are looking healthy. Lorz noted that many things can look like lamprey bites and asked for photos. McGrath will reach out to the crew to get photos and additional information. Blane Bellerud, NOAA, will also provide an end-of-season update at the TMT year-end review, currently scheduled for December 15.

Ebel reported on PIT-tag data, noting that 43 unique Snake River PIT-tags have been detected at Bonneville. Of those, 67% converted to The Dalles, 72% converted from The Dalles to McNary; 81% converted from McNary to Ice Harbor; and 29% converted from Ice Harbor to Lower Granite. Total conversion to Lower Granite is 12%. Additionally, window counts are coming in around the median for this time of year, except at Little Goose and Lower Granite where they are somewhat lagging behind normal.

Ebel also reported on the trap-and-haul operation, noting that as discussed at TMT, trapping is occurring Monday through Thursday and hauling is occurring on Tuesdays and Thursdays. Thus far, 38 sockeye have been transported. For the period of Monday through Thursday this week, 61 fish had been counted. That means about 50% of sockeye are being transported, which is in line with what is required in the BiOp. The operation continues next week.

Bellerud, NOAA, noted that travel time between projects decreased during the first week of July. As Ebel noted, fish seem to slow at Lower Granite. Right now, fish are taking about 2-3 days between projects. Thus far, there are no signs of "crazy fish", which is the term for fish that lose their homing ability and fall back.

McGrath wrapped up the conversation by saying that it is of upmost importance to keep fish moving and the river cool to support this movement, right now.

4. Spillway Weir Operations - Lisa Wright, Corps

Wright shared a document with TMT that explains the 2021 FPP criteria to close the spillway weir at lower Snake River projects. Until criteria met, the weirs will stay open unless otherwise coordinated. The criteria may be met in the next few days, she commented.

5. SOR 2021-4 - Erick Van Dyke, OR; Scott Bettin, BPA; and Doug Baus, Corps

Baus noted that the Action Agencies likely won't make a decision regarding SOR 2021-4 in its entirety at today's meeting. The SOR is complicated and includes 6 actions. His intent is to better understand the views of TMT members and gather information regarding the requests. He would like to use this meeting as an opportunity to listen. There will likely be no official TMT poll today, instead, that will be deferred until the July 14 TMT meeting. That said, some of the actions in the SOR are consistent with previous in-season management and it is possible to take some action today, depending on today's discussion. Erick Van Dyke, OR, expressed dissatisfaction with the Corps plan to not take action today and instead take additional time for analysis and information gathering. He does not want it to become a regular occurrence to make decision outside of the TMT meeting itself. Baus responded that some TMT actions can be made during meetings, particularly if other similar actions have been made in the past with proven results, but these more complicated SORs take more time to analyze and coordinate. Roberts added that additional analyses regarding the impacts of the SOR are underway and will be available at the next TMT meeting.

Signatories of the SOR include OR, WA, and the Nez Perce Tribe. Van Dyke shared that he believes other fish managers did not sign on because of the time-constraints of the adaptive process and the level of commitment necessary to sign on.

The six actions outlined in the SOR are:

1) Restoring minimum operation pool elevations (inclusive of a 1-ft operation range) at Lower Granite (MOP range 733–734), Little Goose (MOP 633–634), Lower Monumental (MOP 557–558) and Ice Harbor (MOP 437–438) through August 31, 2021.
2) Short-term prioritization of traditional spillway that return to 2021 FOP summer spill and close spillway weirs at Little Goose, Lower Monumental, and Ice Harbor dams.
3) Short-term emergency transport can continue during lethal heat stressed conditions but should return to 2021 FOP summer reduced powerhouse flow while continuing truck transport if Lower Granite tailwater conditions are maintaining the 68°F criteria.
4) Temporarily change to Dworshak summer flow augmentation:
    a. Modify the end of August draft limit at Dworshak from 1535 to 1525, and
    b. Start 200 kaf Settlement releases September 1—operating to ~1510 rather than 1520 by end of September.

5) Coordinate potential alternative to stretch-out cool water augmentation measures that do not require modifications to federal or state water quality standards.
6) Seek efficiencies for Lower Granite Doble test scheduling where practicable to minimize risk of unintentional loss of Dworshak water conserved by actions taken in SOR 2021-3 and those proposed above.

The TMT went through the SOR item-by-item, collecting additional information, including clarification of each request as well as comments and thoughts from TMT members and agencies.

Action #1 (restore a 1-ft MOP range at lower Snake projects):

Van Dyke noted that this item is meant to stretch flow augmentation through August. It is just one of many items on the list of ideas to reduce strain on the system while trying to meet the objectives currently set (like maintaining the tailwater at Lower Granite at 68°F).

McGrath asked Roberts and Walker if they would be able to estimate the expected temperature benefit in each forebay by operating in MOP. If not, would they be able to provide information on how the surface area of the reservoirs would change. Lastly, she voiced concern for how this action would impact the depth at the fish ladder intake pumps and if that would lead to any unanticipated increases in ladder or trap temperatures. Roberts replied that the modeling is dialed in for real-time well but that when MOP is adjusted, the models do not have the same accuracy. It is hard to quantify the temperature change. As for surface area, lowering the pool will reduce the surface area, but the Corps does not have a way to measure that. Potentially, lowering the pool could raise temperatures in the fish pump, but it would be hard to put a specific measurement on that.

The current variable and raised MOP operations are expected to continue through August 14, per the FOP. Reducing MOP is likely not possible as it would adversely impact navigation safety, which the Corps must maintain.

From BPA's perspective, the agency would need more time to investigate this request.

ID expressed concern for navigation as well but also acknowledged there needs to be some flexibility and asked what the actual impact of reducing MOP would be on navigation and if there are any adaptations that could be made.

NOAA noted that this is a tough spot to be in given that it is hard to estimate the temperature effects. There is no general range of magnitude available to salmon managers to help them make their decision.

The Nez Perce noted that they consider this part of a full suite of actions in the SOR that need to be taken to mitigate water temperature issues through the end of August, when the SRBA water becomes available. They would like to have a plan in place to make sure there is water available until that time. That said, he thinks that additional work needs to be done to determine if, because the reservoirs will be lower, the later-season water will be warmer water from the top of the pool or cooler water from the bottom. This will impact the action's effectiveness, he said. He knows this action will impact navigation and would like additional information on what that means and

what alternatives are available that would maintain navigation while also supporting fish. He believes there are accommodations that can be made that are not being transparently discussed in this forum.

WA shared that any small decreases in temperatures now could make a significant difference in the long-term for both juveniles and adults in the system.

OR was frustrated with an inconsistency in how agencies are using uncertainty in their decision-making processes. He noted that with last week's SOR, many agencies were able to come to a vote and decide, even with uncertainty. However, the same folks are now unable to make decisions in the face of uncertainty this week.

After much discussion, no action was made today regarding action item #1 on SOR 2021-4.

Action #2 (close spillway weirs at Little Goose, Lower Monumental, and Ice Harbor and spill at the FOP level via deep spillbays):

Hesse commented that this action would be beneficial to water temperatures downstream and should be considered for earlier action. He does not see a reason this action should be delayed past today.

Ebel noted that as far as fish passage, sockeye are on the tail end of passage. He wonders what the temperatures below Little Goose would be if this action was implemented immediately. His agency's current priority is sockeye in the river. The daytime tailrace temperature at Little Goose is currently ~68.5°F. At night, it is ~69.5°F. There is weak daytime stratification. The proposed action is expected to increase temperatures below Little Goose. ID's concerns will alleviate once sockeye have finished passing through the system.

Hesse pointed out that action #2 has several pieces and not all need to be implemented. He noted that one part of this action is closing the surface weirs and the other part is shifting spill volume.

With Roberts and Walker gone, additional modeling and information was not immediately available, but Swank noted that he had asked Roberts about the Little Goose surface weir recently and forwarded Roberts' response to FPAC. The conclusion, said Swank, was that compared to last week's SOR (SOR 2021-3), closing the ASW at Little Goose would result in a reduction in water temperature in the tailrace of up to half a degree F on days when the air temperature is 100+°F. In the long-term, that temperature benefit is closer to ¼ of a degree.

NOAA shared that it intends to support the spill operations that fit the region's objectives best. Those objectives being conservation of Dworshak water and keeping the Lower Granite tailwater below 68°F. NOAA concurs with ID and the Nez Perce Tribe that additional analysis is needed, especially with regards to forebay stratification. NOAA would like to see an expected benefit beyond that of the SOR that is currently being implemented.

Overall, there was some initial hesitation among TMT members about closing the surface weirs and returning to 2021 FOP summer spill volumes through the traditional spillbays. However, Bettin stressed the important of discussing this topic further today since the weirs may be closed by Monday based on the FPP flow criteria.

Ebel noted that he would be comfortable closing the weirs at Lower Monumental and Ice Harbor and returning to conventional (deep) spillbays since it may benefit temperatures. He was unsure about Little Goose (which has a date criterion in the FPP of no earlier than August 1), noting that the group could choose to close the weir over the weekend and then confer Monday to see if it should be opened again following the heat wave. His final suggestion was to continue the current operation at Little Goose but to close the weirs at Lower Monumental and Ice Harbor. He would want to continue SOR 2021-3.

Hesse also supported closing the weirs at Ice Harbor and Lower Monumental, adding he would be comfortable closing the ASW at Little Goose and maintaining the day/night spill operation in SOR 2021-3 until further analysis is available.

Baus reminded TMT that the Little Goose FOP spill operation is 30% when flows are above 32 kcfs, then transitions during low flows (< 32 kcfs) to a constant spill rate of 7, 9, or 11 kcfs depending on the previous day's outflow. Julie Ammann, Corps, asked if flow is in the range of ~28-32 kcfs at night with 11 kcfs spill per the FOP, then what should the daytime spill rate be? Van Dyke responded that ID and Nez Perce would prefer for the Corps to spill 7 kcfs.

NOAA supports this plan but wants additional analysis and discussion at the next TMT, especially since closing the weirs is dependent on the inflow forecast. USFWS noted that the benefits will likely be small due to stratification but that they will not object.

Based on today's discussion, the Corps will implement Action #2:

1. Close the Little Goose ASW as soon as possible and spill via the deep spillbays at ~7 kcfs from 0900 to 2300 daily and at the FOP level from 2300 to 0900.
2. Close the RSWs at Lower Monumental and Ice Harbor as soon as possible and spill per the rates in the FOP via the deep spillbays all hours.

Action #3 (continue emergency transport during lethal heat stress conditions but return to 2021 FOP summer reduced powerhouse flow while continuing truck transport if Lower Granite tailwater is maintaining the 68°F criteria.)

Van Dyke noted that Actions #3-6 may not need to be implemented immediately but are part of the larger suite of actions that should be considered. He clarified that Action #3 would mean that if for some reason the region was able to achieve proper water savings, that spill would revert back to 2021 FOP summer reduced powerhouse flow volumes. There was considerable confusion over this item. For this item to make sense there would have to be a major shift in weather.

Lorz noted that his agency has no objections but wished there was more time so that a more specific SOR with more details could have been submitted.

Action #4 (allow Dworshak to draft up to 10' deeper to 1,525' Aug 31 and 1,510' Sep 30).

Hesse commented that this action is to retain flow augmentation water identified in the SRBA settlement for September. Cooling effects of that water have biological merit with or without increased temperatures, he said. This action opens the door to get to end of August with flow augmentation by completing a more aggressive drawdown of Dworshak Dam reservoir below 1,535 feet. Hesse noted that his folks are still investigating if this is an option and if so what

entities, if any, would need to be involved in the decision. Additional legal vetting is necessary for this action. However, this item is necessary to pursue because if any of the assumptions are off in the models, there could be a gap in available water. He thinks this should be considered a viable option until proven otherwise. Baus noted that this would need to be negotiated between the US and Nez Perce and will need to be taken offline.

Additionally, McGrath noted that analysis would be needed to estimate the probability of refill, should the reservoir be at a lower elevation as well as risks to other objectives. Loosing cool water in the pool can take time to get back, she noted.

Swank noted that making more water available is not saving water.

Action #5 (coordinate potential alternatives to stretch out cool water augmentation that don't require modifications to water quality standards).

Van Dyke noted that going beyond known temperature thresholds might be ok but might also not be ok. Past thresholds have been determined by work that looks at steelhead migration behavior, among other things. It is important moving forward that the changes made to this year's operations, specifically changes to water temperature criteria, should not be precedent setting or considered acceptable as long-term changes.

McGrath added that she would like to continue the discussion on potential alternatives in tailrace temperatures. She reminded the group that some modeling has shown at Lower Granite that targeting 70°F instead of 69°F results in only a half day water benefit. Water temperatures rise through the lower Snake as the water travels downstream by about 1.5°F in each reach. Water that is 68°F at Lower Granite is currently increasing to about 72°F by the time it hits Ice Harbor, so adding a 1.5°F increase is worrisome, she said. Further investigation on how this will impact all species is important. That said, NOAA prioritizes early migrating fall Chinook and steelhead over late migrating sockeye and summer Chinook, currently.

Hesse is ok with changing tailrace temperature criteria after Snake River sockeye have passed Lower Granite Dam.

Ebel noted that the current SOR Action is not clearly written and needs to be discussed further at next week's TMT. He added that a 1-2°F change in temperature can affect species.

Action #6 (investigate alternatives to minimize impacts of Lower Granite Doble testing).

This action is to seek as much efficiency as possible to stretch Dworshak water based on expected effects from Lower Granite Doble testing. This would add some buffer, he said. He does not want to operate on the edge of what is safe for fish in case there is error in that. Models are not always correct, he said.

Summary and Next Steps

Regarding the SOR in its entirety, the Action Agencies will immediately implement Action #2 and provide responses to Actions 1 and 3-6 then poll at the next TMT meeting.

Today's Attendees:

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

Other Attendees (non-TMT members):

Corps –Jon Roberts, Willow Walker, Alexis Mills, Scott St. John, Eric Chow, Michelle Yuen
NOAA – Blane Bellerud
DS Consulting – Colby Mills, Donna Silverberg