COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 27, 2015

Facilitator's Summary

Facilitator, Emily Plummer; Notes, Tory Hines, DS Consulting

The following Facilitator's Summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Review Meeting Minutes

The Official TMT Minutes and Facilitator's Summary for the June 17, June 24, June 25, July 1 and July 8 meetings were reviewed by TMT members and approved.

Dworshak/Lower Granite Water Temperature

Steve Hall, COE-Walla Walla, updated TMT on Dworshak and Lower Granite water temperatures. He noted that current Dworshak tailwater temperature is 65 degrees Fahrenheit. Surface temperatures at Lower Granite are cooler than prior weeks due to the cooler air and even some precipitation in the region. At Little Goose, temperatures were relatively cool, likely due to the emergency operation passing deeper, cooler water through the turbines and better pool conditions. Temperatures in the Little Goose forebay are at 21 degrees Celsius and surface temperatures at Lower Granite are at 21.5 Celsius. At Lower Monumental, temperature string data shows that temperatures cooled off at 20 meters depth and surface temperatures dropped to 21.5 degrees Celsius, down from 22 degrees. Steve attributed the cooling at depths of 20 meters and deeper to the change in operation at Little Goose. Tom Lorz, Umatilla, noted that on July 22nd temperatures at depth were in the low 20 degree Celsius range and from July 23rd onward temperatures continued to cool which he attributed to releases from Dworshak; he questioned the cooling impact of the Little Goose operation. Steve stated that temperatures cooled down to 20.5 Celsius at a depth of 10 meters on July 24th and 25th, but on July 26th cooler temperatures were only at 20 meters depth and below; from Steve's perspective this is a clear indicator that the cool water from the Little Goose operation maintained cooler temperatures at depth.

Steve continued that on July 24th and July 25th Dworshak discharge was at 7.5kcfs and on Sunday, July 26th the operation returned to full powerhouse at 9.9kcfs. Steve noted that at this point and until further TMT coordination, the project will continue running full powerhouse in order to keep temperatures below 68 degrees Fahrenheit. He also noted that the project servers are down; however, they are hoping to have additional model runs soon. The region is expecting warmer weather towards the end of the week.

Emergency Trapping and Transport of Snake River Sockeye Operations Update

Doug Baus, COE-NWD, provided an update on the emergency trapping and transport of adult Snake River Sockeye operation. He noted that the Corps implemented NOAA's and other regional managers recommended experimental emergency operation at Little Goose, which entailed a two-day period (7/23-25) of no spill during the daylight hours of 4:00AM to 8:00PM and a period of single unit operation at minimum generation while spilling the remainder of outflow during the nighttime hours of 8:00PM to 4:00AM. Following the completion of the emergency operation, LGS operations returned to the previously coordinated TMT operation (targeting spill of 11kcfs, 9kcfs, or 7kcfs dependent on previous day's average outflow). Regarding LWG operations, the Corps is maintaining Unit 1 priority and deep spill with no RSW.

Trevor Condor, NOAA, noted that there was a slight increase in passage during LGS no spill operations and a decline once the operation reverted back; he also noted the increasing passage trend that began prior to implementing the emergency operation. Bill Hevlin, NOAA, provided the following Sockeye counts:
July 20th – 6 fish; July 21st – 7 fish; July 23rd (test day 1) – 10 fish; July 24th (test day 2) – 12 fish; and on July 26th - 8 fish. Bill noted that fish counts increased around July 21st, when the air temperatures cooled, thus making it difficult to say if the increase in Sockeye passage was due to the emergency operation at Little Goose or a

response to temperature. Trevor noted that Steelhead and Chinook passage numbers also responded to the cooler temperatures and/or the operation, with numbers spiking around July 24th. Additionally, Sockeye have been observed in cool water corridors at the Lyons Ferry Fish Hatchery; IDFG and NOAA are exploring options to assist these fish upstream.

Salmon managers requested the following data from the Action Agencies:

- Oregon requested hourly summary data, similar to that which was provided in 2013, showing fish going up and down the ladder. NOAA will provide this data at the next TMT meeting.
- Oregon requested PIT tag data to see if individual Sockeye are being double counted.
- Oregon requested that NOAA check to see if any of the adult Sockeye have been observed coming over the juvenile ladder separator.
- WDFW requested that air temperature, entrance & exit ladder temperatures and relative run time be included in an updated LGS Hourly Passage Data graph and provided to TMT. Umatilla requested flow data also be included in the LGS graph.
- Additionally, Umatilla requested temperature scroll-case data for Little Goose

There was discussion regarding the goal, objectives, and indicators of 'success' for the emergency operation and operations moving forward. Oregon noted that they do not have a clear understanding of the intention and units of measurement of the emergency operation. NOAA noted that from their perspective, the goal is to get adult Snake River Sockeye to their hatchery destination for spawning. WDFW shared that although the region utilizes the available data in season, often during emergency actions the bulk of the analyses and assessment of 'success' happens following the emergency action. WDFW recapped the LWG and LGS operations thus far during Sockeye passage. It was noted that during emergency situations, all of the 'tools in the toolbox' need to be considered.

- **ACTION:** NOAA and the Corps will work to get TMT members the information requested (listed above).
- **ACTION:** NOAA will review data and following the FPOM meeting today at 1:00PM, NOAA will provide a recommendation for adult Snake River Sockeye operations moving forward.
- **ACTION:** NOAA and IDFG will continue exploring options to trap and haul fish from the Lyons Ferry Hatchery.
- **ACTION:** Until further discussion and recommendation from NOAA, the Corps will continue to operate LGS with the previously coordinated TMT operation (coordinated at the June 25th TMT meeting); the Corps will operate LWG with Unit 1 priority.

Operations Review

Reservoirs

Mary Mellema, BOR, reported on Reclamation projects:

- Grand Coulee elevation was 1,289.1ft.
- Hungry Horse elevation was 3,546.7ft with 2kcfs outflow and .3kcfs inflow.

Lisa Wright, COE-NWD, reported on Corps projects:

- Libby was at elevation 2,443.5ft, with 5.8kcfs inflow and 7.6kcfs outflow.
- Albeni Falls was at elevation 2,062.2ft, with 6kcfs inflow and 6.9kcfs outflow.
- Dworshak was at elevation 1,563.9ft with 0.7kcfs inflow and 10kcfs outflow.
- Lower Granite average inflow was 25.7kcfs.
- Bonneville average inflow was 128.3kcfs.
- McNary average inflow was 145.2kcfs.

Fish
An update will be provided at the next TMT meeting on July 29th.

Water Quality
Laura Hamilton, COE-NWD, reported on water quality, noting that all gauges are functioning and there have been no TDG exceedances.

Power Systems
Nothing to report.

The next TMT meeting will be a face to face meeting on July 29th at 9:00AM.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM—OFFICIAL MINUTES

July 27, 2015
Minutes: Pat Vivian

1, Introduction

Representatives of BPA, COE, Montana, Washington, NOAA, Idaho, Colville Tribe, CRITFC/Umatilla Tribe, USFWS, BOR and others participated in today's TMT meeting. Doug Baus, COE, served as chair and Emily Plummer, DS Consulting, facilitated the meeting. This summary is an official record of the conversation, not a verbatim transcript.

2. Review Meeting Minutes – July 1 and 8

Today the facilitator's summaries and official minutes for June 17, 24, 25, July 1, and July 8 were approved as final.

3. Dworshak/Lower Granite Water Temperature

Steve Hall, COE, reported that Lower Granite tailwater temperatures are down in the 65 degrees F range due to cooler weather and some precipitation in the area over the weekend. The COE reduced Dworshak outflow to 7.5 kcfs on Friday-Saturday, July 24-25, as coordinated at TMT on July 22, returning to full powerhouse of around 9.9 kcfs just after midnight on Sunday, July 26. A lack of updated modeling because the COE servers are down limited TMT's options for review and decision-making today.

Temperature string data linked to the TMT website indicate that the reduction in Dworshak outflow resulted in warmer temperatures in the Lower Granite forebay at depth due to the smaller volume of cold water in the system. However, the Lower Granite forebay surface temperatures cooled slightly due to the weather.Before the reduction in Dworshak outflow last weekend, Lower Granite forebay surface temperatures peaked at 22 degrees C. The high for Sunday, July 26, was down to 21.5 degrees C.

In relation to an experimental operation recommended by NOAA in an effort to save adult sockeye (see item 4 below), Hall reported that the surface temperature in Little Goose forebay is down to just under 21 degrees C due to the cooler weather. Temperatures were also reduced in the Lower Monumental forebay at depths of 20 meters and greater, as a result of the experimental emergency operation at Little Goose that passed all flow through the turbines during the day for two days.

Tom Lorz, CRITFC/Umatilla, wondered whether it's possible to distinguish between the effects of Dworshak flow augmentation, the Little Goose experimental operation, and cooler weather. He credited the temperature improvements at Lower Granite to Dworshak releases, not cessation of daytime spill at Little Goose (see item 4 below). Hall said the dramatic change

in the deep water temperatures from July 22-24 can only be explained by the special operation at Goose.

Steve Haeseker, USFWS, also questioned the connection between cessation of spill at Goose and cooler water temperatures, given the increase of 1.4 degrees C in Little Goose tailwater on July 24 over the previous day. At Little Goose, the tailwater gauge is on the north side of the river, Hall explained; cool flows from Dworshak pass through units 1 and 2 on the opposite side. Temperature mixing is unlikely as the water moves downstream. This is why the tailwater station in this situation is not considered representative of conditions across the river.

At this time, Hall said, the COE plans to continue full powerhouse discharges from Dworshak. TMT will revisit the flow augmentation operation at its next meeting on July 29. Because the forecast shows warmer conditions toward the end of this week, full powerhouse flows will probably be needed to keep Lower Granite tailwater temperatures just under 68 degrees F through the heat wave.

4. Update on Emergency Trapping and Transport of Snake River Sockeye

Baus recapped the emergency steps recommended by NOAA and other regional salmon managers that the COE has taken to help adult sockeye pass Little Goose and Lower Granite Dams. The COE implemented a 2-day experimental operation at Little Goose Dam from July 23 at 4 am through July 25 at 4 am, consisting of no spill during the daytime (4 am-8 pm) and nighttime (8 pm-4 am) operation of a single unit at minimum generation and spilling the remainder of outflow. Since then, Little Goose has resumed the FOP spill operation as coordinated with TMT of 7, 9, or 11 kcfs fixed spill dependant on the previous day's average outflow. At Lower Granite, the Corps is continuing to operate with Unit 1 priority and deep spill with no RSW.

There was a slight increase in sockeye passage at Goose during the 2-day experimental operation of no daytime spill, and a decline to zero sockeye when the project reverted back to constant spill, Trevor Conder, NOAA, reported. NOAA believes the overall response to the experiment was slightly positive, though it was noted that there was an increasing trend in passage in the days preceding the experimental operation. Bill Hevlin provided sockeye passage counts at Little Goose: July 21 = 5; July 22 = 7; July 23 (test day 1) = 10; July 24 (test day 2) = 12; July 25 = 0; July 26 = 8. However, Conder noted, when numbers are this low, it's a judgment call whether the increase was due to the Goose operation or to the cooler weather.

Hevlin asked how far downstream the Lyons Ferry hatchery is releasing cool water and where the water is entering Little Goose pool. Charles Morrill, Washington, added that a well has been supplying water on the Snake River. Adult sockeye have been observed near the hatchery, but lately conditions have been too windy and muddy for continued observation. Morrill didn't know how much more cool water might be available from the well.

Lyons Ferry has a weir, an adult ladder and traps, but staff haven't yet seen any adult sockeye there, Morrill said. Kiefer said the adult trap will soon be opened, and there is hope of finding adult sockeye in the trap.

TMT members had several questions and comments on a graph showing hourly passage data at Little Goose:

- **Oregon** requested that 2015 passage information be summarized as it was in 2013, when sockeye were counted going up and down the ladder. NOAA will provide further information in response to this request.

- **Washington**, suggested correlating run timing with ambient air and water temperatures at both the exit and entrance to the adult ladder. NOAA confirmed that run timing is an important factor because sockeye go up the ladder past the counter when the whole ladder cools.

- **Oregon,** asked whether multiple counts of the same individual are being avoided. NOAA will check the counts of July 21-24 for distortions.

- **Oregon** asked whether sockeye have been observed passing over the juvenile separator at Little Goose. NOAA will follow up on separator counts. PIT tag results indicate that sockeye fallback rates are low this year—31 fish for the entire run.

- **CRITFC/Umatilla** requested that planned changes in flows this weekend be included on the graph.

- **Oregon** wondered whether conversion at Lower Granite is an indication of successful passage at Little Goose, and if not, what the desired outcome would be. NOAA's primary goal is maximizing the number of sockeye that make it to Redfish Lake. Oregon commented that's a worthy goal, but this operation does not fit Oregon's definition of an emergency experiment.

Moving forward, Baus asked TMT members to identify any additional data that should be evaluated relative to the Little Goose experiment. NOAA will perform further data review before making subsequent recommendations on Little Goose operation. The COE will collaborate on temperature data collection when the servers are up and running again and report back to TMT.

Charles Morrill, Washington, recapped the multiple efforts that have been made to support adult passage to date—the Lower Granite trap cooling operation, Dworshak flow augmentation increases, emergency collection of sockeye at Lower Granite for broodstock, and improvement of flow dynamics and hydraulics. The challenge is to identify whether any of the interventions made a difference. Identifying a specific goal is difficult, given that one tool might not be enough in the current situation. Today's discussion added to that list the possibility of collecting adult sockeye at the Lyons Ferry ladder entrance and transporting them upstream.

When sockeye are trapped at Lower Granite, they go directly to the Eagle Fish Hatchery, not Redfish Lake, Russ Kiefer clarified. All 34 fish that Idaho trapped at Lower Granite and transported to the hatchery are still alive. He attended today's meeting by phone with wet suit handy, ready to make a firsthand observation of sockeye presence in the Lyon's Ferry trap.

Currently, the COE will continue to operate Lower Granite and Little Goose dams as previously coordinated at TMT, Baus said, with Lower Granite operating with Unit 1 priority and deep spill with no RSW and Little Goose operating to a fixed spill of 7, 9 or 11 kcfs dependant on the previous day's average outflow. These plans will continue until TMT makes a specific recommendation for a new operation.

5. Operations Review

5a. Reservoirs. Grand Coulee elevation is 1289.1 ft. Hungry Horse elevation is 3546.7 ft with inflows of 0.3 kcfs and releases of 2 kcfs. Dworshak elevation is 1563.9 ft with inflows of 0.7 kcfs and releases of 10 kcfs. Libby is at elevation 2443.5 ft with inflows of 5.8 kcfs and releases of 7.6 kcfs. Albeni Falls is at elevation 2062.2 ft with inflows of 6 kcfs and releases of 6.9 kcfs.

Lower Granite average outflows are 25.7 kcfs, McNary average outflows are 145.2 kcfs, and Bonneville average outflows are 125.3 kcfs.

5b. Fish. Adult passage was already covered. NOAA had no news regarding juvenile passage.

5c. Water Quality. All gauges are working well, and there have been no TDG exceedances since the last meeting, Laura Hamilton, COE, reported.

5d. Power System. There was nothing to report today.

6, Next TMT Meeting

The next TMT meeting will be in person on July 29. Dworshak, Lower Granite and Little Goose operations will be on the agenda.

Name	***Affiliation***
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Laura Hamilton	COE
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