COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

July 15, 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.

Dworshak/Lower Granite Water Temperature

Steve Hall, COE-Walla Walla, updated TMT on Dworshak and Lower Granite tailwater temperatures. He noted that current tailwater temperature is 65 degrees Fahrenheit, cooling off from last week's high temperatures which exceeded 68 degrees. Steve directed the group to the agenda links to three water temperature scenarios that his team modeled. The model runs show potential scenarios with outflows of 7.5kcfs, 10kcfs and 13kcfs. Steve also prepared a model run of potential operational scenarios for Dworshak summer augmentation volumes. Based off of the modelling, Steve anticipated that if outflows remain at 7.5kcfs through July, the project will release 7.4kcfs through August in order to hit the August 31st target elevation of 1,535ft. If Dworshak is operated at full powerhouse for the remainder of July, August outflows will likely be 6.3kcfs; and if outflows are at 11.5kcfs in July, August outflows will be around 5.4kcfs; max spill to TDG in July would result in a flat flow of approximately 4.5-4.6kcfs for August. The Salmon Managers expressed appreciation to Steve and his team for their effort on the modeling.

Steve requested that Salmon Managers provide recommendation regarding which operational scenario they would like to see implemented. Steve noted that maximizing releases in the short term at DWR would improve water temperatures at Lower Granite and Little Goose, however, releasing surface water is not ideal, as it is warmer due to solar radiation and warm ambient temperatures Following a brief caucus, the Salmon Managers recommended that DWR operate at full powerhouse for 1 week and then the operation will be revisited at TMT. IF conditions change and allow for the temperature buffer (1.5 degrees F) to be maintained with less discharge, the project should decrease releases from DWR. It was noted that if more than full powerhouse is needed in order to maintain the 1.5 degree buffer, the project should shift and operate to the 68 degree threshold, instead of the buffer. Steve acknowledged the Salmon Managers interest and noted that it is difficult to operate to the 68 degree threshold; however, the project team will do their best.

- **ACTION:** The Action Agencies will operate DWR at full powerhouse from July 15 to July 22nd in order to maintain a 1.5 degree buffer around the 68 degree threshold for the LWG tailwater. If feasible, while still maintain the temperature buffer, the project will decrease discharge. If more than full powerhouse is needed to keep LWG tailwater temperatures within the threshold, the project will shift and operate to 68 degrees instead of the 1.5degree buffer.

Operations Review

Reservoirs

- John Roache, BOR, reported on Reclamation projects: Grand Coulee elevation was 1,289.4ft, the project touched full on 7/13 and will manage with a gradual draft to target 1,277.7ft by August 31st.
- Hungry Horse elevation was 3,548.3ft with 3.1kcfs outflow; Discharge was ramped up for transmission work and will return to 2kcfs by Friday, July 17 in order to meet the September target elevation of 3540ft.

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

- Libby was at elevation 2,443.9ft , with 9.7kcfs inflow and 9kcfs outflow.
- Albeni Falls was at elevation 2,062.3ft, with 9.8kcfs inflow and 12.2kcfs outflow.
- Dworshak was at elevation 1,577.1ft with 0.9kcfs inflow and 7.5kcfs outflow.
- Lower Granite average inflow was 26.9kcfs.

- Bonneville average inflow was 147.4kcfs.
- McNary average inflow was 158.8kcfs.

Additionally, following TMT and FPOM coordination, Lower Granite closed the RSW on July 8 and on July 13 switched to Unit 1 priority.

Fish

Paul Wagner, NOAA, reported on fish. Adult Sockeye mortality is high at Bonneville and The Dalles. This is due to temperatures that are far above average for this time of year. 810 Sockeye have passed Ice Harbor (145% of the 10 year average), however, they are not converting well to upstream projects. For example, 733 Sockeye passed Lower Monumental, 499 at Little Goose and 244 at Lower Granite. As a result of low conversion rates in the Snake River, a trucking program has been initiated to collect fish at Lower Granite and transport adult Sockeye to the Eagle Fish Hatchery in Idaho. Paul noted that fish are experiencing cumulative stress by traversing the LWG reservoir and then passing into warmer temperatures upstream. The trucking program is intended to aid survival rates and ensure that the gene pool is carried over to the next year. Russ Kiefer, ID, noted that Sockeye numbers are in the hundreds when we should be seeing numbers in the thousands. He continued that passage rates at Bonneville are over 200%, but at McNary, passage rates are close to the 10 year average, this suggests a massive conversion problem throughout the system. Russ also noted that the program is viewed as an emergency operation in the BiOp, which allows for the trap to be operated above the standard temperature criteria. As of 7/14, four fish were trucked from Lower Granite.

Summer Chinook are still passing at Bonneville in strong numbers, between 1,000-4,000 per day, with total counts at 134,000 (170% of the 10 year average). Numbers for Jacks are close to 15,000 (85% of the 10 year average) a similar trend was seen with spring Chinook Jacks, where numbers were somewhat below average. For Sockeye, numbers are strong, 486,000 passed Bonneville (210% of 10 year average and 84% of last year average). However, up-river conditions and warm water temperatures are leading to fallback, stalling and increasing mortality rates. Lamprey, however, are experiencing better conversions at John Day and The Dalles (170% of the 10 year average at Bonneville).

Paul also reported on juveniles. He noted that sub-yearling Chinook are still passing, with numbers increasing at Lower Granite. He noted that due to a change in operations with the RSW, fish were no longer passing at the surface route, but were diverted to the juvenile bypass system which increased collection numbers. Russ noted that as weather cooled over the week, reservoir temperatures dropped and flow augmentation increased out of Dworshak, this allowed fish to migrate and increase passage numbers overall. At Lower Monumental, passage rates are low which is typical for this time of year. At McNary, peak passage occurred on July 6 with 314,000 fish passing and numbers dropping off dramatically since. At John Day, mortality rates dropped compared to last week. At Bonneville, passage numbers were up, likely due to a recent hatchery release, however, continue to decrease from day to day.

Water Quality

Laura Hamilton, COE, reported on water quality, noting that all TDG gauges are functioning. She also noted that the Corps is experiencing issues with their server and thus spill data for Ice Harbor, Little Goose, John Day and The Dalles Dams is currently unavailable. They are working to identify and fix the server issues.

Power Systems

Nothing to report.

The next TMT meeting will be a conference call on July 22nd at 9:00AM.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM—OFFICIAL MINUTES

July 15, 2015
Minutes: Pat Vivian

1. Introduction

Representatives of the COE, BOR, BPA, NOAA, Idaho, Nez Perce Tribe, Washington, USFWS, Colville Tribe, CRITFC/Umatilla Tribe, Oregon, Yakama Tribe and others participated in today's TMT meeting. Doug Baus, COE, chaired the discussion, with facilitation by Emily Plummer, DS Consulting. This summary is an official record of the proceedings, not a verbatim transcript.

2. Review Meeting Minutes – July 1 and 8

With the TMT web page out of service, review of minutes and facilitator's summaries was postponed until TMT meets again in person.

3. Dworshak/Lower Granite Water Temperature

Steve Hall, COE Walla Walla, reported. Current tailwater temperatures at Lower Granite Dam are down to 65 degrees F after a week of exceeding the 68 degrees F flow augmentation trigger. Ambient temperatures at the time broke records daily, and a forecast of cooler weather failed to materialize. That meant Dworshak did not release enough water to cool the tailwater, given that it takes three days for water from Dworshak to reach Lower Granite.

Hall showed TMT the latest temperature modeling results (see attachment 3a on today's agenda). Current Dworshak releases are 7.5 kcfs, and modeling indicates that releases should be increased this evening in order to avoid further temperature exceedances at Lower Granite in three days.

The next two graphs compare TMT's options in three scenarios (attachment 3b). The first shows maintaining Dworshak releases at their current rate of 7.5 kcfs; the second shows flows increasing to 10 kcfs tonight; and the third shows flows increasing to 13 kcfs or gas cap spill tonight. The disparity between the 10 kcfs and 13 kcfs scenarios would be apparent around July 19-20, when another temperature peak is forecasted.

Hall presented his analysis, which includes a scenario for 11.5 kcfs out of Dworshak, done without temperature modeling. If Dworshak releases remain at 7.5 kcfs through the end of July, the project would release approximately 7.4 kcfs for the remainder of August in order to attain elevation 1535 ft by August 31. If releases go up to full powerhouse, that would leave approximately 6.3 kcfs releases in August. If July releases go up to 11.5 kcfs, that would leave approximately 5.4 kcfs releases in August. If the project spills to the gas cap of 13 kcfs in July, that would leave approximately 4.5-4.6 kcfs as flat flow releases in August.

Turning on the RSW to move hot water downstream wouldn't help sockeye passage, Hall said. Modeling shows this would provide little to no benefit in terms of forebay temperature control due to the effects of solar radiation, and it would only increase temperatures downstream. By contrast, stratification will provide cool water for fish below a depth of 5-10 meters as long as there's no wind to mix the pool. Operation of unit 1 is pouring cool water into the entrance of the fish ladder, which improves conditions for sockeye passage.

Asked to provide guidance on water management, the Salmon Managers caucused to give a consensus recommendation to the Action Agencies for Dworshak temperature augmentation releases over the next week. At a minimum, Hall said, powerhouse flows are needed to ensure that 68 degrees F is not exceeded at Lower Granite in three days. The options modeled for the Salmon Managers to consider were: (1) Gas cap spill (13 kcfs) at Dworshak through end July; (2) The current operation (7.5 kcfs); (3) Full powerhouse releases (9.4-9.6 kcfs) until elevation 1535 ft is attained; and (4) 50% maximum spill (11.5 kcfs).

After caucusing, the Salmon Managers present (USFWS, Colville, Washington, Oregon, CRITFC/Umatilla and Yakama tribes) recommended that the COE continue operating Dworshak to meet the temperature criteria at Lower Granite with a buffer of 1.5 degrees F. This means running Dworshak at full powerhouse flows (9.4-9.6 kcfs) without spilling for the next week or so, with adjustments if conditions change. Russ Kiefer, Idaho, said FPAC's priority over the next week is to operate Dworshak to meet the Lower Granite temperature criteria, basing the operation on updated modeling.

Dave Statler, Nez Perce Tribe, further clarified that FPAC believes spilling to the gas cap should only be done as a last resort if necessary to keep Granite tailwater temperatures below 68 degrees F. For the sake of water conservation, gas cap spill would not be justified to maintain a buffer, i.e. keep the tailwater at 66.5 degrees F.

Baus said the COE will release full powerhouse flows from Dworshak for the next week, increasing the operation to gas cap flows only if modeling indicates that exceedance of the 68 degrees F criteria at Lower Granite tailwater is imminent without the full 13 kcfs. TMT will revisit this operation at its next meeting July 22.

4. Operations Review

4a. Reservoirs. Hungry Horse is at elevation 3,548.3 ft, with releases of 3.1 kcfs until July 17, when the project will ramp down to 2 kcfs until it meets the end of September target of 3,540 ft. Grand Coulee is at elevation 1,289.4 ft after touching full at 1,289.7 ft, which is 0.3 ft below the BiOp target due to Lake Roosevelt incremental storage releases.

Libby is at elevation 2,443.9 ft with average inflows of 9.7 kcfs and releases of 9 kcfs. Albeni Falls is at elevation 2,062.3 ft with average inflows of 9.8 kcfs and releases of 12.2 kcfs. Dworshak is at elevation 1,577.1 ft with inflows of 0.9 kcfs and releases of 7.5 kcfs. Lower Granite average outflows are 26.9 kcfs, Bonneville average outflows are 147.4 kcfs, and McNary average outflows are 158.8 kcfs.

On July 8 at 1 pm, the COE closed the Lower Granite RSW based on TMT and FPOM coordination, Lisa Wright, COE, reported. The project is now passing spill in a uniform pattern with no RSW. On July 13 at 4 pm, the project switched to unit 1 priority.

4b. Fish. Adults: Paul Wagner, NOAA, reported that fish are stalling and dying throughout the system due to much hotter water temperatures than normal for this time of year. There have been noteworthy sockeye mortalities at Bonneville and below The Dalles. Over the past week, 1,000-4,000 summer Chinook per day (170% of the 10-year average) have passed Bonneville, but conditions upstream for these fish are not good and conversion rates are poor.

Adult sockeye counts at McNary are in the hundreds when they should be in the thousands, Russ Kiefer, Idaho, added. This is symptomatic of serious conversion difficulties. While sockeye counts are over 200% of the 10-year average at Bonneville, they are barely meeting the 10-year average at McNary. Fish are dying throughout the basin, not just in the Snake River.

Following the trend for spring Chinook jacks, summer Chinook jack counts at Bonneville are lower than normal (15,000 to date, or 85% of the 10-year average), Wagner reported. Fish are congregating at Wells Dam, a place they don't normally stop, but it's the coolest location in the river, being close to Grand Coulee. Water temperatures are progressively hotter at locations downstream.

Lamprey adults have been doing well, with Bonneville returns at 170% of the 10 year average and better than usual conversion rates at The Dalles and John Day dams, Wagner noted.

At Ice Harbor, 810 adult sockeye have passed so far this season, which is 145% of the 10-year average but less than last year's count. However, the healthy sockeye return is diminished by poor conversion at upstream projects. For example, Lower Monumental has passed 733 adult sockeye to date, but the adult count drops to 499 at Little Goose and 234 at Lower Granite. In response to these losses, on July 13 Idaho began trapping and transporting adult sockeye from Lower Granite Dam to the Eagle Fish Hatchery in Idaho for broodstock collection. Based on genetic analysis, fish are selected for the broodstock program or for natural reproduction. Wagner noted that broodstock collection is considered an emergency action under the BiOp to protect the gene pool, given that river temperatures are in the high 70s.

Dave Statler, Nez Perce Tribe, asked whether adult sockeye fallback appears to have worsened this year. Kiefer said yes, low upstream passage numbers are indicative of high fallback rates. Another factor that undermines survival is adult passage through the juvenile bypass system. Although transportation has been associated with higher rates of mortality, river conditions are so poor that NOAA and IDFG believe survival odds will be enhanced with transport. Only PIT tag analysis after summer ends will reveal how Snake River fish fared this year in relation to mid-Columbia fish, Kiefer said.

Juveniles: Subyearling Chinook are still migrating, with increased passage at Lower Granite due largely to recent changes in dam operations. When the RSW was closed, an

efficient surface passage route was lost, and more fish are collected in the juvenile bypass system. Passage counts are also up at Little Goose, for reasons that are unclear. Passage at Lower Monumental has declined, which is typical for this time of year. The peak index count at McNary was 314,000 on July 6.

Juvenile sampling has been reduced at all lower Columbia River projects to minimize stress on fish in high temperature conditions, Wagner said. Staff at John Day have reduced sampling to twice a week, and staff at Bonneville have reduced to every other day sampling. While mortality rates at the projects seem to have decreased, the numbers of fish passing have also declined.

4c. Water Quality. Laura Hamilton reported. All TDG gauges are working well, but reporting of spill and total flow data for Ice Harbor, Little Goose, The Dalles and John Day dams stopped at 10 am yesterday with no clear explanation why. Data reporting simultaneously stopped at Grand Coulee and started up again 4 hours later. COE staff are working intensively to solve the problem.

4d. Power. There was nothing to report.

5. Next TMT Meeting

TMT will meet next in a July 22 conference call. Dworshak/Lower Granite temperature management will be discussed.

Name	***Affiliation***
Russ Kiefer	Idaho
Karl Kanbergs	COE
John Roache	BOR
Tony Norris	BPA
Paul Wagner	NOAA
Lisa Wright	COE
Doug Baus	COE
Tory Hines	DSC
Dave Statler	Nez Perce Tribe
Laura Hamilton	COE
Phone:	
Charles Morrill	Washington
Joe Skalicky	USFWS
Don Tinker	SCL
Sheri Sears	Colville Tribe
Steve Hall	COE Walla Walla
John Heitstuman	COE Walla Walla
Ryan Laughery	COE Walla Walla
Michael Bryant	CBB
Greg Lawson	Thompson Reutters

Tom Lorz	CRITFC/Umatilla
Kathryn Kostow	ODFW
Tom Iverson	Yakama Tribe