COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

August 5, 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 of Meeting Minutes

The July 15th, 22nd 27th, 29th and 30th Official Minutes and Facilitator's Summary will be reviewed at the next TMT face to face meeting on August 19th.

Libby Operations Update

Joel Fenolio, COE-Seattle, provided an update on Libby Operations. He noted that inflows are dropping off quickly this summer, with inflows at 6 kcfs and outflows at 7 kcfs. He continued that the operation will hold at minimum outflows of 7kcfs, then ramp down to the bull trout minimum in September. Joel noted that in May TMT coordinated to target an elevation of 2,439 ft by the end of August, with flexibility to come in higher and in-season review/adjustment of the operation if needed. The current elevation is 2,443 ft with end of August elevations projected to be near 2,440 ft with releases staying at 7 kcfs. The actual end of August and September elevation will depend on the actual inflows through the end of September. According to last week's modeling, there is a 75% chance of ending the month of September at 2439 ft if the Libby Dam elevation was 2441.5 ft at the end of August. The modeling shows that the median trace had an elevation of 2,436 ft, 3 ft below the 2439 ft target, at the end of September if Libby Dam continues to release minimum flows through September. Jim Litchfield, MT, extended appreciation to the Corps for implementing an operation that stabilized outflows.

Albeni Falls Update

Joel Fenolio, COE-Seattle, provided an update on the Albeni Falls operation (PowerPoint on TMT agenda). Joel noted that efforts to provide benefits for kokanee spawning at 2051-2055ft showed no benefits. He noted that the USACE, BPA, IDFG, Pend Oreille Basin Commission, and the Idaho Governor's Office coordinated target elevations that will allow for additional certainty of the Albeni Falls drawdown. He noted that there may be fluctuations in the elevations, however, the operation will aim hold the summer pool between 2,062 ft to 2,062.5 ft, through the third Sunday of September or through September 18th, whichever is later. Additionally, an effort will be made to stay above 2,061 ft through the fourth weekend of September or September 25th, whichever is later. By September 30th, the pool will be no lower than 2,060 ft.

Dworshak / Lower Granite Water Temperature

Steve Hall, COE-Walla Walla, updated TMT on Dworshak and Lower Granite water temperatures. He noted that current Lower Granite tailwater temperature is 65.4 degrees Fahrenheit. Steve noted the updated model results include water temperatures for the Snake River at Anatone and for Clearwater at Orofino as requested by TMT members last week. He continued that if the operation holds outflows to 7.5kcfs out of Dworshak, temperatures should stay two degrees below the 68 degree Fahrenheit threshold. If the operation were to ramp down to 5.4kcfs water temperatures slowly climb but do not approach the 68 Fahrenheit mark until the end of the 10 day period. The Corps noted that dropping to 5.4kcfs is a viable option at this time.

Steve clarified that the model shows an operation holding at 7.5kcfs through August 11th and then shifting to a flat flow of 5.4kcfs mid-August. If the operation immediately reduces to 5.4kcfs, the effect would be an average discharge of 6kcfs for the remainder of the month. Steve noted that ramping down to 5.4kcfs would retain more water that may be needed to counteract warmer temperatures later on in the month. The Salmon Managers present noted that they had discussed dropping down to 5.4 at FPAC and would like to suggest that the Corps implement that operation as soon as possible.

- **ACTION**: The Corps will implement the operation as follows: decrease discharge to 5.4kcfs on Thursday, August 6, at midnight. They will notify TMT when the model results indicate the operation is 3 days away from exceeding the 68 degree Fahrenheit buffer.

Little Goose Update on Regional Requests

Doug Baus, COE-NWD, provided an update on the regional requests regarding the cycling of navigation locks and the auxiliary pump installation at the Little Goose fish ladder. It was noted that due to a valve issue and structural issues at a downstream gate, it is not feasible for the Corps to operate the navigation locks at a higher frequency at this time. Steve Hall stated that the valve is scheduled for repair this fall and the downstream gate is scheduled for repair in 2017; it is important that the navigation locks remain functional until the repairs are completed. Steve also noted that water temperature modeling indicated that navigation lock cycling results in 1.3kcfs which provides no temperature benefit downstream. Tom Lorz, Umatilla, noted that the request for cycling the locks was to increase fish passage not to improve water temperatures. Trevor Condor, NOAA, stated that 1-11% of Sockeye use navigation locks, thus it is beneficial to continue this conversation at FFDRWG and FPOM.

The Corps also investigated the feasibility of the adult ladder at Little Goose Dam. A formal memo was distributed to FPOM yesterday that indicated that a pump could reduce peak days above 72 degrees Fahrenheit if installed. Steve noted that the pump would pull water from 20 meter depth and provide 25cfs of water into the forebay at the ladder exist. He continued that there could be a benefit during a low water year, however, the Corps will need to conduct a cost-benefit analysis to determine if an auxiliary pump is feasible in the long run, as this tool would only be needed in the lowest water years. Further investigation of feasibility and cost for implementation of rental pump operation at LGS for September 2015 could be investigated pending availability of funding.

- **ACTION**: Members of FFDRWG and FPOM will continue the navigation lock discussion and look at available data to determine strategies at various projects and the benefits of cycling locks more often.
- **ACTION**: TMT members will provide comments to the auxiliary pump memo and continue the discussion at FPOM.

Operations Review

Reservoirs

Mary Mellema, BOR, reported on changes at the Reclamation projects:

- Hungry Horse midnight elevation was at 3,545.8ft with 1.8kcfs outflows and continuing to draft, decreasing by 20ft from full by the end of September as part of the BiOp's dry year strategy. Discharge will be increased as needed to maintain the Columbia Falls minimum of 3.5 kcfs which could draft the project below 3540 feet.
- Grand Coulee midnight elevation was at 1,285.8ft, with the end of August target of 1,277.7 feet to meet the BiOp's dry year strategy required drawdown to 1278 feet plus the 0.3 feet for the Lake Roosevelt Incremental Storage Release Program.

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

- Libby was at elevation 2,443ft, with 6kcfs inflow and 7.1kcfs outflow.
- Albeni Falls was at elevation 2,062.3ft, with 6.4kcfs inflow and 6.9kcfs outflow.
- Dworshak was at elevation 1,554.1ft with 1.1kcfs inflow and 7.6kcfs outflow.
- Lower Granite average inflow was 25.7kcfs.
- Bonneville average inflow was 128.7kcfs.
- McNary average inflow was 139.8kcfs.

Fish

Trevor Condor, NOAA, provided an update on fish. For juveniles, he noted that 2013 sub-yearling numbers at

Lower Granite Dam are similar to 2015, with numbers dropping below 1,000 at the end of July and picking back up to 9,000 toward the end of August. At Little Goose, numbers remain low, under 1,000, with bypass rates around 25%. He noted a large portion of fish are passing Granite and holding above Little Goose, indexes are also low at McNary and Bonneville. For adults, summer Chinook are tailing off as we transition to fall. For the year, a record, 161,000 summer Chinook passed Bonneville, the last highest count was 132,000 in 1957. A total of 179,000 summer Chinook, including Jacks, were counted overall. However, the conversion rate at McNary for the summer was extremely low, resulting in the same number of summer Chinook passing McNary this year as last year, even though counts were at a record high for Bonneville.

Russ Kiefer, ID, provided an update on the Snake River Sockeye, noting that trapping efforts over the last two days resulted in 0 fish being caught and no movement occurring over Lower Granite for the last four days. After the mid-morning operation today, the trap and haul effort will be concluded with a total of 47 fish trapped, all of which are still alive. A total of two adult sockeye have been captured at weirs in the Stanley Basin. Lisa Wright, COE-NWD, noted that, as coordinated at TMT, Lower Granite resumed unit priority identified in the Fish Passage Priority (Unit 2 as the priority unit) at 0500 hours on Monday, August 3, and it will continue to operate as planned until further recommendation.

Water Quality
Laura Hamilton, COE, noted that all TDG gauges are working well and no TDG exceedances have occurred. Doug Baus, COE-NWD, noted that at the next TMT meeting, the Spill Priority List will be discussed.

Power Systems
Nothing to report.

The next TMT meeting will be a conference call on August 12th at 9:00AM.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM—OFFICIAL MINUTES

August 5, 2015
Minutes: Pat Vivian

1. Introduction

Representatives of the COE, BPA, Montana, NOAA, Washington, Oregon, CRITFC/Umatilla, Idaho, USFWS, BOR, Colville, Yakama Nation and others participated in today's TMT meeting. Doug Baus, COE, chaired the meeting, 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 15, 22, 27, 29 and 30

Review of minutes and facilitator's summaries for these meetings was deferred until TMT meets in person again.

3. Libby Operations Update

Inflows at Libby have dropped to 6 kcfs, with releases of 7 kcfs through August, since ramping down from 9 kcfs over the past few weeks, Joel Fenolio, COE, reported. In September, Libby will ramp down to bull trout minimums, as requested by the Kootenai Tribe in May and supported by TMT consensus.

The modeling (based on median ESP values) shown in attachment 3a indicates this operation will result in a reservoir elevation of 2436.3 ft by end September, which is almost 3 ft lower than the reservoir would have been this year at the end of September (2439 ft) without implementation of the SOR. Joel noted that in May TMT coordinated to target an elevation of 2,439 ft by the end of August, with flexibility to come in higher and in-season review/adjustment of the operation if needed. This option was favored by fishermen and downstream interests because it would allow Libby releases to be ramped down gradually in September.

According to last week's modeling, there is a 75% chance of ending the month of September at 2439 ft if the Libby Dam elevation was 2441.5 ft at the end of August. The modeling shows that the median trace had an elevation of 2,436 ft, 3 ft below the 2439 ft target, at the end of September if Libby Dam continues to release minimum flows through September.

Jim Litchfield and Brian Marotz, **Montana**, thanked the COE for coming up with a reasonable operation despite low inflows and acknowledged there isn't much operational flexibility under these circumstances.

4. Albeni Falls Update

Because Idaho Department of Fish and Game indicated last year the experiment of toggling between 2051-2055 ft at Lake Pend Oreille does not enhance kokanee spawning, recreational interests are concerned about lake operations in September. Until now, Fenolio said, ALF operation has been driven by the need to attain 2051 ft elevation by November 10. This has meant operating the lake to reach 2060 ft by end September, which has recreational impacts.

Since the study findings were released, the COE has been working closely with IDFG and the Idaho governor's office to clarify the ALF operation. As a result of the collaboration, Idaho extended the 2051 ft elevation target from November 10 to the end of November to allow more operational flexibility.

One of Idaho's requests was more clarity regarding Lake Pend Oreille operations at the end of September for the annual regatta. In 2014, the lake was kept at elevations ranging from 2062-2062.5 ft through mid-September, then drafted toward 2060 ft by the end of September. To accommodate the regatta this year, the COE is working with BPA to hold the lake above elevation 2061 ft through the fourth weekend of September or September 25 (whichever is later). The minimum elevation is 2060 ft by the end of September. However, the lake might hit lower elevations during September in response to power or flood control operations.

This year, Fenolio said, the project will be managed to its summer operating range through September 20. After that, the goal will be to maintain a lake elevation of 2061 ft or higher though September 27, then target 2060.5-2061 ft elevation on September 30. The default plan for the winter operation is to target a lake elevation of 2051 ft by mid-November, which supports both power operations in winter and flood control operations in early spring.

5. Dworshak/Lower Granite Water Temperature

The temperature at Lower Granite tailwater is currently 65.4 degrees F, Steve Hall, COE, reported. Water quality readings from gages on the Snake River at Anatone and the Clearwater River at Orofino are included in attachment 5b, with temperatures shown as a daily average, not an instantaneous reading. These two gages measure the impact of hot water coming into the system.

Attachment 5b compares the likely temperature effects of 7.5 kcfs continued releases from Dworshak vs. 5.4 kcfs releases as requested by Tom Lorz, CRITFC/Umatilla. The current operation of 7.5 kcfs discharges should keep temperatures at Lower Granite approximately 2 degrees F below the 68 degree standard, Hall said. Ramping down to 5.4 kcfs using only the big unit would cause temperatures to rise slowly, but without exceeding the 68 degrees F standard for the next 10 days.

Based on these modeling results, releasing 5.4 kcfs from Dworshak appears to be a viable option that takes advantage of recent cooling. Hall asked the Salmon Managers for feedback on this proposal. Lorz clarified the request to model 5.4 kcfs out was a suggestion from FPAC.

Trevor Conder, NOAA, asked why there's been a bigger disparity recently between predicted and model runs than in the past. Hall said a number of factors, including how water passes through the dam and the percent of river spilled, influence modeling accuracy. Accuracy is calibrated to +/- 1 degree C and the model is currently operating at its outside limits. Modeling takes into account the COE's best estimate of Idaho Power operations, based on RFC data. This uncertainty accounts for part of the differential between modeled and observed conditions. Hall noted that Idaho Power has been communicating closely with the COE regarding significant operational changes.

Attachment 5c focuses on water management, comparing DWR augmentation volumes of 7.5 kcfs with 5.4 kcfs flat flows through August 11. The graph indicates that reducing Dworshak flows to 5.4 kcfs now would allow an average discharge of 6 kcfs for the remainder of August, so reducing flows now would provide a significant benefit. The longer 5.4 kcfs can be held without exceedances at LWG tailwater, the more water will be available later to counteract high temperatures. The COE is running the model on a daily basis to monitor conditions on the lower Snake River.

While there was no formal poll today, **Washington, Umatilla, NOAA, Oregon, USFWS, Idaho,** and the **Colville Tribe** all supported a DWR rampdown to 5.4 kcfs, assuming the COE will keep a close eye on temperatures with daily modeling. **Montana** had no objection to reducing augmentation to 5.4 kcfs.

With this consensus on conserving water, the COE will decrease Dworshak releases to 5.4 kcfs and notify TMT as soon as modeling indicates that Lower Granite tailwater will exceed the 68 degrees F trigger within three days.

BPA requested the switch to 5.4 kcfs be made at midnight tomorrow, August 6, instead of tonight as initially proposed. The Salmon Managers present when BPA made the request (**Umatilla, NOAA, USFWS, Idaho** and **Oregon)** did not object to the delay.

6. Little Goose Update on Regional Requests

At the July 29 TMT meeting, the COE was asked to investigate two proposals for aiding adult sockeye passage: (1) Cycle the Little Goose navigation lock, encouraging sockeye to use it; and (2) Rent pumps to provide additional cool water to the Little Goose ladder. Baus told TMT that yesterday the Corps emailed FPOM members the COE's response to the two proposals. He summarized the COE response as follows:

(1) Cycle the Little Goose navigation lock. The COE concluded that cycling the lock to encourage sockeye passage involves the risk of catastrophic lock failure. There are two factors putting the lock at risk. It has only one functioning sill valve, but the bigger issue is structural weakness of the downstream gate. The valve will most likely be repaired this fall, but the gate repair isn't scheduled until 2017. Until then, lock cycling is not a viable option.

Steve Hall, COE, also said CEQUAL-2 modeling indicates that cycling the lock provides no downstream temperature benefits. A comprehensive review of literature on sockeye passage found their use of locks is incidental at best. Lorz said there's evidence at McNary and Ice Harbor that sockeye do use locks. Trevor Conder, NOAA, said radio-tagging data indicate approximately 1-11% of sockeye use one of the locks in the FCRPS, but only 1% pass via the lock at Goose. Nevertheless, FFDRWG should investigate the potential of using locks for future adult passage benefits. Joe Skalicky, USFWS, pointed out the low rates of lock use by adult sockeye don't factor in the potential benefit of lock cycling. This is worthy of further investigation. Lock-cycling will be further explored at FPOM and FFDRWG, with a possibility of bringing the results back to TMT.

(2) Pump additional cool water into the Little Goose adult ladder. The COE investigated the feasibility and cost of providing rental pumps at the LGS, but a lack of funding at present blocks this option.. Conder said recent biological analysis found that using pumps to cool the ladder could significantly reduce the number of days when ladder temperatures exceed 72 degrees F. This information is included in the memo the Corps sent to FPOM; TMT members were invited to comment in writing to the FPOM memo.

Hall said the diesel pumps would introduce about 25 cfs of cool water from 20 meters depth into the ladder exit. A cost/benefit analysis is needed, but this alternative might be feasible. In a normal year, extra cooling in September isn't needed, but in the worst years it could be a valuable option. Conder asked whether the pumps would also provide cool water to the diffuser. Hall replied that at Goose, unlike Granite, the diffuser intake is adjacent to the ladder exit. Charles Morrill, Washington, asked what volume of water passes through the ladder; Hall said about 75 cfs. Auxiliary pumps would potentially add 25 cfs to the fish ladder from deep in the forebay.

Further investigation of these two proposals will continue at FPOM and FFDRWG. TMT members were invited to comment in writing on the recent COE memo to FPOM.

7. Operations Review

7a. Reservoirs. Hungry Horse is at elevation 3545.8 ft with 1.8 kcfs discharges, continuing to draft down 20 ft below full by end September for the dry year strategy, Mary Mellema, BOR, reported. However, discharges will probably need to be increased to maintain 3.5 kcfs minimum flows at Columbia Falls downstream. Grand Coulee is at elevation 1285.8 ft, continuing to draft to its end of August target for the dry year strategy of 12 ft below full. Due to incremental storage releases, the end of August target for GCL this year is 1277.7 ft instead of 1278 ft.

Libby is at elevation 2443 ft with inflows of 6 kcfs and releases of 7.1 kcfs, Lisa Wright, COE, reported. Albeni Falls is at elevation 2062.3 ft with inflows of 6.4 kcfs and releases of 6.9 kcfs. Dworshak is at elevation 1554.1 ft with inflows of 1.1 kcfs and releases of 7.6 kcfs. Lower Granite average outflows are 25.7 kcfs, McNary average outflows are 139.8 kcfs, and Bonneville average outflows are 128.7 kcfs.

7b. Fish. Juveniles: Trevor Conder, NOAA, reported. At the beginning of August 2013, which was also a low flow year, there were dips and spikes in subyearling passage at Lower Granite. This trend persists even in years of abundant water but is more pronounced in low flow years. Subyearling passage is following a similar pattern, with low index counts at end July of less than a few thousand fish per day at Granite, then picking up to as high as 9,000 per day recently. However, index counts are less than 1,000 per day at Goose. These fish are not being transported, but they are probably holding above Goose, as suggested by the 25% of subyearlings that typically bypass Granite during times of low spill. Probably they will migrate out later. Index counts are substantially lower at McNary and Bonneville than at Lower Granite.

Adults: Summer chinook adult passage is trailing off, with the transition to fall chinook coming. The good news is this year brought a record high return of 161,000 adult summer chinook to Bonneville (179,000 including jack returns) which breaks the 1957 record of 132,000 adult summer chinook. However, conversion to McNary has been so poor that the count at MCN was the same as last year. Unless there are stragglers who move upstream later, low flows and high temperatures have claimed as many summer chinook as sockeye in the reaches between BON and MCN. Steelhead passage at Bonneville has picked up from its two-week delay with a recent spike of 7,000. The cumulative adult steelhead return at Bonneville is about 90,000 fish to date.

Russ Kiefer, Idaho, gave an update on the Snake River sockeye. No new PIT tagged fish have been detected at Bonneville, but there have been recent detections at The Dalles, McNary and Ice Harbor. IDFG will end the trap and haul effort at Lower Granite today because no fish have moved in the past 4 days. The effort saved 47 fish for broodstock at the Eagle Hatchery, about a third of which were naturally produced. The ratio of males to females was normal early in the trap and haul effort. Kiefer thanked the region for its assistance in this dismal year for Snake River sockeye.

Per coordination at TMT, Lower Granite recently reverted to FPP priority (unit 2 as the priority unit), with the RSW turned off, Wright reported. This operation will continue until TMT recommends otherwise.

7c. Water Quality. All TDG gages are functioning well, and there have been no recent TDG exceedances, Laura Hamilton, COE, reported. TMT will be asked to review the fall spill priority list at its next meeting.

7d. Power System. There was nothing to report today.

8. Next TMT Meeting

The next TMT meeting will be a conference call on August 12.

Name	***Affiliation***
Lisa Wright	COE
Doug Baus	COE

Tony Norris	BPA
Julie Ammann	COE
Jim Litchfield	Montana
Tory Hines	DSC
Laura Hamilton	COE
Trevor Conder	NOAA
Charles Morrill	Washington
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Jim Mann	CBB
Bill Hevlin	NOAA
Tom Iverson	Yakama Nation
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