COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
May 10, 2017
DRAFT Facilitator's Summary
Facilitator & Notes: Emily Stranz; Support: Colby Mills, DS Consulting

The following Facilitator's Summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. 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://www.nwd-wc.usace.army.mil/tmt/agendas/2017/

Official Water Supply Forecast
The Corps and Bureau of Reclamation reported on the official April water supply forecasts:
Mary Mellema, BOR, reported:

- Hungry Horse inflow forecast:
  - April-July: 119% of average
  - Jan-July: 129% of average
  - April-Aug: 120% of average
  - May-Sept: 119% of average

Doug Baus, Corps, reported:

- The Dalles: April-Aug: 127% of average
- Lower Granite: April-July: 147% of average
- Libby: April-Aug: 139% of average
- Dworshak: April-July: 121% of average
- Grand Coulee: April-Aug: 120% of average
- Albeni Falls: April-Aug: 130% of average.

Doug directed the group to the Snake River precipitation table (link on the TMT agenda) which highlights the above average precipitation so far for the 2017 Water Year (October 2016 through the present). Precipitation has been well above average throughout the Columbia Basin. In regard to water supply volume, water year 2017 is ranking as the 8th highest April-August since 1960; and 5th highest January-July. He also reported on the Climate Forecasts:

- The 6-10 and 8-14 day temperature outlook is forecasted to be below average, and the precipitation above average.
- The 30-day temperature and precipitation outlook is an equal chance of below, near, or above average.

Charles Morrill, WDFW, suggested that TMT members take a look at the SNOTEL site, and noted that there is still snow accumulation at high elevations, however, depending on weather, the SWE could reach melting point soon.

SOR FWS #1: Libby Dam Releases for Sturgeon and Bull Trout Augmentation
Jason Flory, USFWS, presented on SOR FWS #1 which calls for a double pulse operation at Libby Dam. He explained that is the same operation as was implemented in 2013 and 2014. There will be two pulses of increased outflow from Libby Dam: the first will take place to coincide with the low elevation snow melt and will be close to or at full turbine capacity for 5-7 days. The second will be timed to coincide with the high elevation snow melt, and will last for 7-14 days. The initial pulse is intended to move upstream to spawning areas; the second pulse is intended to encourage them to spawn. After the two pulses, the project will ramp back down to stable summer flows.

The TMT members present were polled on the SOR: BPA, BOR, Corps, Kootenai, MT, NOAA, Nez Perce, Umatilla, USFWS, and WA all supported the SOR; OR did not object.

→ **ACTION:** The Corps will implement SOR FWS #1.

SOR-2017-1: September through first week of November 2017 Libby Dam Outflow for Kootenai River Habitat Restoration Program

Sue Ireland, Kootenai Tribe, presented SOR-2017-1 which calls for 6kcfs or less outflow from Libby from September through the first week of November to allow for in-water habitat work. This is part of an ongoing effort since 2011 aimed at improving habitat for Kootenai River white sturgeon, including building spawning and rearing habitat. The construction this year will be finishing up the "pool-ladder" concept for the reach just upstream of Bonners Ferry. Sue noted that this work is implementing the USFWS BiOp.

The TMT members present were polled on the SOR: BPA, Corps, Kootenai, MT, NOAA, Nez Perce, USFWS, and WA all supported the SOR; OR and Umatilla did not object.

→ **ACTION:** The Corps will implement SOR 2017-1.

Libby Operations

Joel Fenolio, Corps, provided an explanation of what the Libby operations will look like as SOR FWS #1 and SOR 2017-1 are implemented. He started by recapping the winter and spring weather conditions, including precipitation and snowpack, which were above average; as well as temperature, which was below average this year. He noted that the BiOp calls for 1.2MAF of water released for the sturgeon pulse and 9kcfs minimum for Bull Trout though August 31. To create space in the reservoir needed to implement the SORs, Joel plans to target the end of September elevation (2,449ft) at the end of August. The FCRPS BiOp requires Libby Dam to draft to 10 ft from full pool (full pool being 2459 ft) over the summer. He noted that the potential for reaching flood stage at Bonners Ferry feeds into the need to start ramping Libby up to full powerhouse on May 15th, which will mean that they will be done releasing the 1.2MAF by mid-June and start to reduce the releases to the summer flat flow. It was noted that there will likely be two ramp-downs: 25kcfs to summer flat flow at the end of the sturgeon pulse operation and from the summer releases to be at 2449 ft at the end of August to 6kcfs in September to support the Kootenai Tribes flow request for the habitat work. It was suggested that if possible this second ramp-down could be adjusted in real time to be more gradual to mitigate for impacts on the channel's wetted parameter and river productivity. Joel noted that the operation can be adjusted in-season.

Ice Harbor Forebay Operation

Doug Baus noted that on May 3rd and 5th the Corps emailed TMT regarding expanding the Ice Harbor Dam forebay operating range from the 1-foot MOP range (437-438 ft) up to a 2-foot range (437-439 ft). This expanded IHR forebay range will be used when needed to avoid dropping below the minimum IHR pool elevation of 437 feet when inflows drop during daily spill reductions at Lower Monumental Dam for the fish transport barge transit across the tailrace. The daily LMN spill reduction coupled with limited LMN turbine capacity results in greater outflow than inflow at IHR. The expanded IHR forebay range is required to maintain the minimum pool of 437 feet required for adequate depth at the IHR navigation lock sill. The Corps expects this operation to continue through June 20th, when current forecasts indicate flows will drop below 100 kcfs; however, the date is subject to change depending on actual flows.

TDG and Contingency Reserves

Tony Norris, BPA, suggested that the region revisit the option of shifting the contingency reserves to above the 1% range at The Dalles and McNary to reduce TDG. TDG levels exceed state standards throughout the system. There were questions regarding how this operation would impact prioritization of wind energy on the grid, impacts of current TDG levels on both adults and juvenile fish, and whether the impact to TDG would be significant. The group decided to continue the discussion at the FPOM meeting on 5/11/17. It

was suggested that the group consider the GBT biological criteria and most recent GBT sampling from Bonneville which should be out later today.

The next TMT meeting will be a face to face on May 17th.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM MEETING

May 10, 2017
Minutes: Pat Vivian

1. Introduction

Representatives of Montana, Washington, Kootenai Tribe, USFWS, Nez Perce Tribe, COE, NOAA, BPA, BOR, Oregon, NPCC, Umatilla Tribe and others participated in today's TMT conference call. Doug Baus, COE, served as chair and Emily Stranz, DS Consulting, facilitated the conversation.

Today's agenda included review of two System Operational Requests (SOR FWS#1 for Libby sturgeon bull trout augmentation flows, and SOR #2017-1 to accommodate Kootenai River white sturgeon habitat restoration).

2. Official Water Supply Forecast

2a. May Forecasts. Baus and Mary Mellema, BOR, reported the official water supply forecasts for May in individual basins.

- Hungry Horse (April-July) – 1,878 kaf, 119% of average
  (January-July) – 2,698 kaf, 129% of average
  (April-August) – 2,325 kaf, 120% of average
  (May-September) – 2,015 kaf, 119% of average
- The Dalles (April-August) – 111 maf, 127% of average
- Lower Granite (April-July) – 29 maf, 147% of average
- Libby (April-August) – 8,190 kaf, 139% of average
- Dworshak (April-July) – 2941 kaf, 121% of average
- Grand Coulee (April-August) – 68 maf, 120% of average
- Albeni Falls (April-August) – 16 maf, 130% of average

2b. Water Year Precipitation Table. Observed precipitation on the Snake River above Ice Harbor Dam was 241% of average in October 2016, followed by 126% of average in November and December and 215% of average in February. Observed precipitation above The Dalles was 246% of average in October and 195% of average in February.

As noted in the NWRFC precipitation tables, observed precipitation values for this water year (October 1, 2016 though today) have been significantly above normal throughout the Columbia River Basin. The above normal precipitation values have resulted in a high water supply ranking as measured at The Dalles Dam. Out of 57 water years the current 2017 water year (April – August) is the 9th highest in water supply volume.

2c. Climate Forecast. The RFC climate forecast indicates that temperatures will be below average and precipitation will be above average over the next 6-10 days in the Pacific Northwest. The 30 day outlook shows an equal probability of above and below average temperatures and precipitation.

Charles Morrill, Washington, observed that, according to Snotel site data, snow water equivalents (SWEs) are starting to break at a number of key sites although snow is still accumulating at higher elevations. How the snowmelt runs off will depend heavily on weather.

3. Libby Dam Releases for Sturgeon and Bull Trout Augmentation – SOR FWS#1

Jason Flory, USFWS, introduced this SOR for the annual summer operation to mitigate the effects of Libby Dam on sturgeon and bull trout. The goal is to reestablish sturgeon spawning in the narrow reach upstream of Bonners Ferry.

The May final runoff volume forecast for April-August at Libby establishes the sturgeon volume. This year it's 8.2 maf, which makes it a tier 5 year with a 1.2 maf sturgeon volume. The abundant water supply allows for a double pulse operation, which will attempt to mimic early peaks resulting from the runoff of low elevation snowmelt.

The first sturgeon pulse will be 20 kcfs releases for 5-7 days, timed to coincide with peak runoff. After a natural pause, the higher elevation snowmelt comes downstream. So Libby outflows will ramp down for a few days to powerhouse capacity, then the second pulse of 18-20 kcfs releases will continue for 14 days.

Releases for the first pulse will probably start May 15. The first pulse is intended to encourage sturgeon to migrate farther upstream to the designated spawning area, not to induce spawning. The selective withdrawal gates will not be installed until the second pulse because the goal of the second pulse is to trigger spawning with releases of warmer water. After the second pulse ends, Libby will ramp down to stable summer flows until the sturgeon volume of 1.2 maf is exhausted.

The double-pulse operation will help clarify whether mimicking natural pulses influences sturgeon spawning behavior. Similar operations with double pulses in 2013 and 2014 led to a small increase in the number of sturgeon migrating upstream of Bonners Ferry to spawn.

Erick Van Dyke, Oregon, asked about temperatures in the pool, and Flory said water at the spawning temperature of 8-10 degrees C will be released using the selective withdrawal gates. It is hoped that sturgeon will spawn not at the beginning but the end of the second pulse, using the first pulse as an opportunity to migrate rather than to spawn. To this end, warmer water will not be released from the reservoir until the end of the sturgeon operation. A decline in flows also tends to trigger sturgeon spawning.

The TMT members present were polled on the SOR: BPA, BOR, Corps, Kootenai, MT, NOAA, Nez Perce, Umatilla, USFWS, and WA all supported the SOR; OR did not object.

→ **ACTION:** The Corps will implement SOR FWS #1.

At the request of **Montana**, the operation is characterized as a double pulse, not a double peak, to distinguish it from the double peaks of summer that cause ecological harm to the wetted perimeter of upstream channels and reservoirs.

4. Libby Dam Outflow for Kootenai River Habitat Restoration – SOR 2017-1

Sue Ireland, Kootenai Tribe, presented the second SOR on TMT's agenda today to accommodate white sturgeon habitat restoration. The project is part of a multi-year effort that began in 2011 to improve spawning habitat and increase juvenile rearing habitat for Kootenai white sturgeon by constructing a sequence of pools for migration and spawning upstream of Bonners Ferry.

The SOR calls for limiting outflows to 6 kcfs at Libby from September through the first week of November 2017. Once the contractor begins work, flows cannot exceed 6 kcfs although they can be less. Accommodating this work ensures Action Agency compliance with the USFWS BiOp to mitigate the effects of Libby Dam on sturgeon and bull trout.

The TMT members present were polled on the SOR: BPA, Corps, Kootenai, MT, NOAA, Nez Perce, USFWS, and WA all supported the SOR; OR and Umatilla did not object.

→ **ACTION:** The Corps will implement SOR 2017-1.

5. Libby Operations

With strong support for both SOR FWS #1 and SOR 2017-#1 regarding Libby Dam, Joel Fenolio gave a PowerPoint presentation on the COE's proposed plan for implementing both operations.

Precipitation in the Kootenai basin has been well above normal – 500-600% of average in October 2016, followed by another period of record rainfall in February, then continued above average in March and April. This winter was one of the coldest in the past 20-30 years. The combination of prolonged rain and cold saturated the ground, creating record soil moisture levels throughout the inland Northwest. As of May 1, snowpack across the Kootenai basin is still 110%-150% of average and soil moisture levels are 95-99% which indicates runoff is more likely than usual to create system flooding.

The Libby inflow volume forecast of 8.2 maf this year for April-August is 140% of average. That sets the sturgeon volume at 1.2 maf, to be followed by bull trout minimum flows of 9 kcfs. The current VARQ flood level is 16.9 kcfs. A forecast of 120 maf inflows at The Dalles sets the end of September draft target for Libby at 10 ft from full.

Therefore, in order to implement the two SORs, Fenolio proposed that the 2449 ft end of September elevation target at Libby be moved to the end of August. He noted that B.C. Hydro has requested that Libby not pass full powerhouse flows through the end of the sturgeon pulse due to backwater effects at Kootenai Lake.

The current plan has Libby going to full powerhouse on May 15, then ramping down to 18 kcfs and finally to flat flows in mid to late June, when the 1.2 maf sturgeon pulse has been exhausted. How this plays out will depend on actual inflows, but the plan is to refill Libby in early August with the reservoir attaining 2449 ft by end August then ramping down to the requested minimum flows of 6 kcfs for habitat restoration.

Fenolio asked for TMT concurrence on the plan to switch the 2449 ft elevation target to the end of August instead of September. Wagner wondered how the potential for flood risk at Kootenai Lake will be managed. Fenolio said the declaration of spring has already occurred, which means the project is required to operate to channel capacity.

Brian Marotz, Montana, said a rapid drop off from summer flows is not optimal for fisheries for this season. While a drop from 25 to 15 kcfs would not affect channel morphology upstream, a drop from 15 to 6 kcfs would probably affect the wetted perimeter, the part of the river channel that's biologically productive. Fenolio replied that the drop at the end of August is a modeling construct that will be revisited in real time in response to actual conditions.

It was clarified that moving the 2449 ft elevation target to the end of August is required for implementation of both SORs. There were no objections to this change so the COE will proceed accordingly.

6. Ice Harbor Forebay Operation

On May 3, the Corps notified TMT via email that effective May 3, through approximately June 20, the Corps expanded the Ice Harbor Dam (IHR) forebay operating range from the 1.0-foot Minimum Operating Pool (MOP) range of 437.0 to 438.0 feet to a 1.5-foot range of 437.0 to 438.5 feet. This expanded IHR forebay operating range is necessary due to high flows and current outflow limitations upstream at Lower Monumental Dam (LMN) from limited turbine capacity and daily spill reductions for the fish transport barge transit of the tailrace at LMN. Providing IHR with a 1.5-foot operating range effective May 3 will ensure IHR does not drop below the minimum pool elevation of 437.0 feet that is required to maintain a depth of 15 feet at the IHR navigation lock sill.

On May 5, the Corps notified TMT via email that the previously coordinated IHR operating range of 1.5 feet was not sufficient based on real time conditions and increasing river flow, so the Corps increased the forebay operating range to 2 feet (437.0 – 439.0 feet). This operation will continue until Ice Harbor inflows drop to approximately100 kcfs or less. That is currently forecasted to occur on June 20.

Tom Lorz, CRITFC/Umatilla, asked why project staff were not directed to operate in half-foot increments. Baus said, the COE and BPA recognize the preference to operate the IHR forebay in the 1-foot MOP range and will only use the expanded 2-foot range when necessary to ensure the IHR forebay maintains adequate depth over the navigation lock sill during periods of reduced outflow from LMN. IHR will not operate in the expanded operating range of 2 feet on all hours. Whenever possible, the Corps and BPA will operate IHR within the 1-foot MOP range.

Erick Van Dyke, Oregon, asked why the TMT call of May 3 was canceled due to a lack of agenda items if this issue was pending. Baus and Scott Bettin, BPA, explained that no information was available prior to May 2, when the Action Agencies first attempted to operate Ice Harbor within 1 ft and found it impossible to do so while accommodating the fish barge. Baus himself did not receive notification of this until after the TMT call was already canceled. Van Dyke asked who decides when it is and isn't appropriate to be at MOP. Baus said when the COE is not able to operate in accordance with a navigation safety requirement based on real time conditions the COE will adjust forebay operating ranges to ensure navigation safety as described in the BiOp and then coordinate with the TMT.

7. Contingency Reserves Proposal

On April 5 and 12, TMT considered a proposal by BPA to shift contingency reserves to above the 1% range at The Dalles and McNary as a tool for reducing TDG in the river during record high flows and TDG saturation levels. Increasing contingency reserves – which are used only 2-4% of the time if necessary to offset lost generation – would allow the units at TDA and MCN to operate within their full 1% range, thereby reducing spill and TDG levels downstream. (For example, TDG levels at The Dalles were 125% yesterday and would have been 122-123% if the proposal were implemented.)

However, on April 12, the Salmon Managers decided against the recommendation because flows were declining and fish were not showing signs of serious TDG impacts. With flows on the rise again, Tony Norris asked the Salmon Managers whether they wanted to reconsider use of this tool.

Van Dyke said Oregon would need to know more about how it would impact alternative energy sources like wind. Norris said separate reserves are maintained for wind; contingency reserves are only deployed in the case of a large generator outage.

Further discussion led to a decision to refer this issue to FPOM which meets tomorrow.

Margaret Filardo, FPC, reported daily fish sampling is in progress at BON now that the Spring Creek release has occurred, so biological data on GBT symptoms will soon be available to aid in decision making. At these high flows, fish are moving so quickly through the system that signs of GBT might not be as severe as expected. Wagner pointed out that only juveniles are moving quickly, not adults. TMT will revisit this issue at its next meeting after FPOM has had a chance to discuss it.

8. Next Meeting

TMT will meet next in person on May 17.

Name	***Affiliation***
Brian Marotz	Montana
Charles Morrill	Washington
Sue Ireland	Kootenai Tribe
Dave Swank	USFWS
Jay Hesse	Nez Perce
Doug Baus	COE
Paul Wagner	NOAA
Tony Norris	BPA
Julie Ammann	COE
Laura Hamilton	COE
Wayne Jousma	COE
Margaret Filardo	FPC
Mary Mellema	BOR
Paula Calvert	ODEQ
Steve Lyman	PGE
Jason Flory	USFWS
Joel Fenolio	COE Seattle
Michael Bryant	CBB
Leslie Bach	NPCC
Colby Mills	DSC
Ann Setter	COE
Erick Van Dyke	Oregon
Tom Lorz	Umatilla