COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
March 20, 2019
DRAFT Facilitator's Summary
Facilitator: Emily Stranz; Notes: 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.nwdwc.usace.army.mil/tmt/agendas/2019/.

Chum Operation
Doug Baus, Corps, began by providing the TMT with an update on the current water supply forecasts for Corps projects.

- The Dalles: NWRFC April to August volume forecast (5 days QPF) is 73 maf, or 83% of average; and,
- Lower Granite: NWRFC April to July volume forecast (5 days QPF) is 17 maf, or 88% of average.

Peter Cooper, BOR, reported on Grand Coulee operations. The project is currently operating to meet Vernita Bar, with a midnight elevation of 1258.7 feet, inflows of 52,000 cfs and outflows of 75,000 cfs. Doug continued with an update on Bonneville Dam operations. On March 20, at 0600 hours, the current project tailwater elevation was 11.4 feet. Doug noted that the forecasted increase in Snake River inflows will help provide the chum tailwater, and thus Grand Coulee operating for Vernita Bar is sufficient to maintain the chum tailwater below Bonneville Dam.

Over the next 10-day period, inflows at Lower Granite are expected to increase up to about 56 kcfs, and inflows at Bonneville are forecast to hover between 133-145 kcfs. With the Snake River coming up, as well as incrementals, Bonneville inflows will be more than enough to meet the 11.3 feet chum tailwater minimum.

The 10-day precipitation forecast shows rain coming into next Monday, Tuesday and Wednesday in the Columbia River Basin, although the impact of that precipitation varies throughout the basin. The Upper Columbia remains at 50% of average precipitation; whereas, the central and eastern portions, as well as the Snake River, are expected to see higher than average precipitation (110-125%). Rain is on the way; however, the water year is tracking to be below average.

Chum Cumulative Day Average Degree Days - March 15
Paul Wagner, NOAA, provided a report on chum emergence and temperature units (TUs), noting that emergence for both chum and Chinook is expected at around 1,000 TUs. According to the information available, the earliest spawning chum within the area monitored for temperature, is approaching up to 1,300-1,400 TUs, and the later spawners are up to around 1,000 TUs. Paul concluded that the magic numbers have been hit, if indeed the numbers accurately reflect where the chum spawned – which is not the case for all of the chum that spawned downstream of Bonneville Dam. Charles Morrill, WDFW, noted that site visits to Hamilton Creek suggest that emergence will be later in the Hamilton area, as the emergence has not peaked yet. Additionally, Chinook are further behind in regard to emergence and TUs, as they tend to spawn in locations without hyporheic flow.

It was noted that TUs are also tracked for the Hanford Reach fish below Priest Rapids, and they're estimated for a later emergence, estimated to be around May 11th. This is likely the timeframe that fall Chinook and chum from later spawners below Bonneville will be emerging.

Charlie offered that the region is in a better position to protect the chum and Chinook redds below Bonneville due to increased stream flows, however, recognized that Grand Coulee is not likely to hit the 85% probability of reaching the April 10 elevation.

To conclude, Doug reported that, due to the forecasted low flows, the Corps anticipates Bonneville will be operating at minimum generation and spilling the rest at the start of spill season on April 10, and encouraged Salmon Managers to track total dissolved gas (TDG) at Ives/Pierce via the Warrendale gauge. Dan Turner, Corps, noted that TDG production at Bonneville Dam has bumped up to 107-108% due to minor amounts of spill, water temperatures, and use of fish ladders and corner collector.

The group agreed to cancel the March 27th TMT meeting. The next TMT meeting is a face-to-face meeting on April 3, 2019 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.

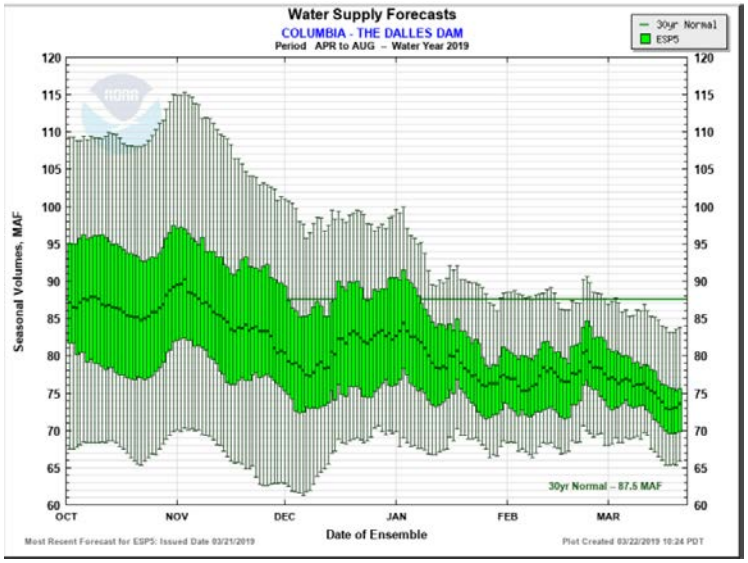
Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES
March 20, 2019
Minutes: Melissa Haskin, FLUX Resources

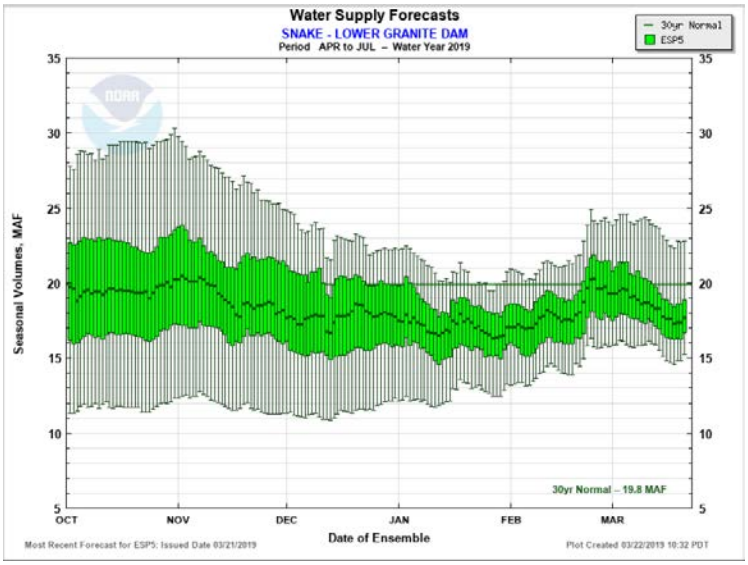
Today's TMT meeting was chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. See the end of these minutes for a list of attendees.

1. Chum Operation - Doug Baus, Corps NWD; Paul Wagner, NOAA Fisheries, Peter Cooper, BOR, and; Tony Norris, BPA

1a-b. The Dalles and Lower Granite Water Supply Forecast

The Dalles water supply forecast for April-August with 5-day QPF is 73 maf (83% of average). The Lower Granite 5-day QPF for April-July is 17 maf (89%).





1c. Grand Coulee Operations Data

Peter Cooper, Reclamation, reported on operations at Grand Coulee Dam. Midnight elevation was 1,258.7 ft with inflows of 52 kcfs and outflows of 75 kcfs. Reclamation is operating Grand Coulee to meet the Vernita Bar minimum.

1d. Bonneville Dam Hourly Data

At 0600 this morning, the Bonneville Dam tailwater elevation was 11.4 ft.

1e. Lower Granite Inflow Forecast

The Snake River is forecasted to increase and inflows should help maintain the chum tailwater elevation below Bonneville, which will allow for lower flows out of Grand Coulee.

Tony Norris, BPA, noted that the amount of water necessary to maintain the chum tailwater varies on an hourly basis depending on multiple variables. Currently, the east wind is increasing the amount of water required to meet the tailwater minimum. The east wind is expected to drop off soon.

Even when Grand Coulee is just running to Vernita Bar, there is uncertainty as to how much incremental flows between Grand Coulee and Priest Rapids will contribute. This makes it difficult to determine how much to release from Grand Coulee on a daily basis.

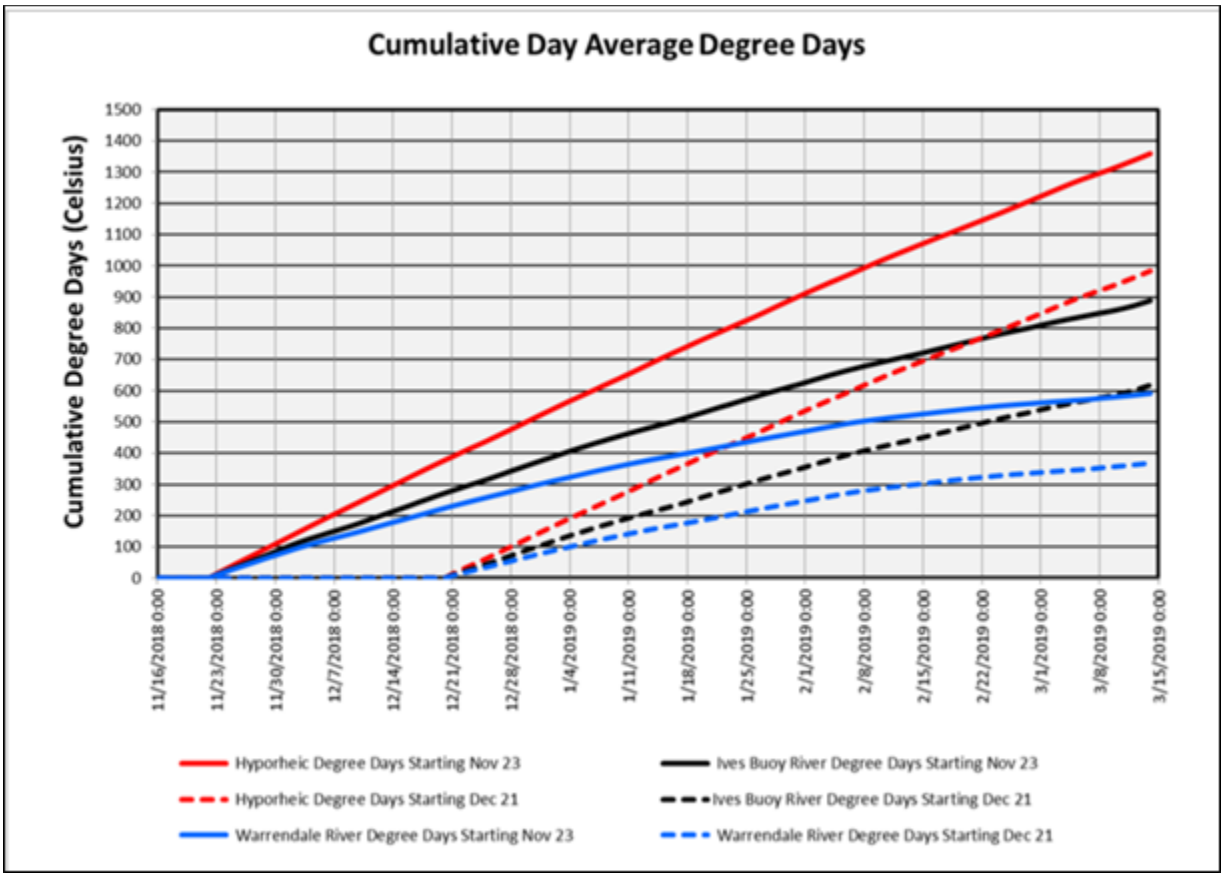
The NWRFC inflow forecast for Lower Granite increases to 56 kcfs by the end of the 10-day period.

1f. Bonneville Inflow Forecast

The NWRFC inflow forecast for Bonneville Dam is 133 to 145 kcfs over next 10 days. With the Snake River coming up, inflows at Bonneville should be more than enough to meet the 11.3 ft minimum.

1g. Chum Cumulative Day Average Degree Days - March 15

Paul Wagner, NOAA, reported on accumulated temperature units at gauges downstream of Bonneville Dam. He noted that chum from the earliest spawners have likely emerged. The caveat is that we do not have temperature data in every location that chum spawned. Fall Chinook emergence is later than chum.

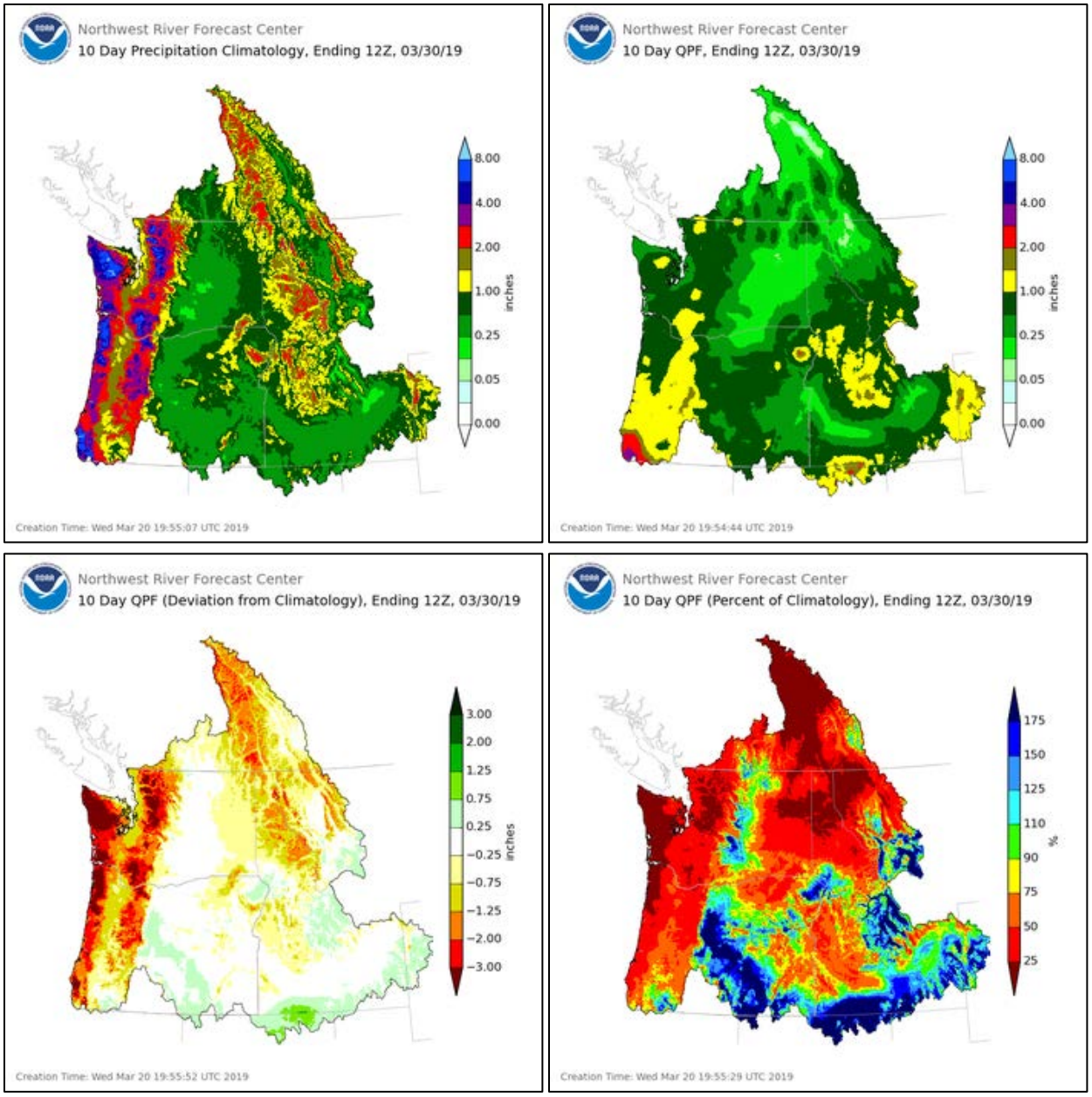


The above chart shows that the earliest spawners (starting November 23), marked by the solid red line, are approaching 1,300-1,400 cumulative degree days. The ones that spawned later (starting December 21) are at about 1,000. Chum usually emerge after about 1,000.

The Hanford Reach fall Chinook below Priest Rapids emerge later. This year, the estimated emergence date is May 11.

Charles Morrill, WA, reported on the chum emergence at Hamilton, saying they seem to be late this year. He added that the outlook for protecting emerging chum and fall Chinook seems positive.

The 10-day meteorological forecast calls for some rain next week but not much in the upper Columbia basin. Forecasted precipitation is well below average (25-50%) for this time of year except in parts of central Oregon and southern Idaho where the forecast is 110-125% of average.



Doug Baus, Corps, reported that due to the forecasted low flows and below average runoff, it is likely Bonneville and other projects will be operating at minimum generation and spilling the rest during some hours at the start of spill season on April 10.

Dan Turner, Corps, reported on TDG production at Bonneville. The Warrendale gauge downstream of Bonneville is reporting 106-107% TDG, likely due to minor amounts of spill and flow through the corner collector and fish ladders. The Dalles is spilling as well due to an outage in the east fish ladder, which explains the higher TDG coming into the Bonneville forebay. The Cascade Island gauge just went in and is reporting 114% due to low flow.

Erick Van Dyke asked for more information as to why the Corps is anticipating Bonneville will be operating at minimum generation during spill season. Doug clarified that the minimum generation requirement at Bonneville is about 35 kcfs (a range of 30-40 kcfs). Assuming the spill cap is 120 kcfs, it would require a total flow of about 155 kcfs to maintain minimum generation and achieve the spill cap. The current flow forecast for April 10 is 137.2 kcfs – subtract the minimum generation requirement of 35 kcfs and that leaves approximately 102 kcfs remaining for spill.

Julie Ammann, Corps, clarified that it does not look like there will be higher flows and that minimum generation for part or all of the day is very likely for Bonneville and other projects. It will not be clear how much of the day until April 10 gets closer.

4. Next TMT. The next TMT meeting on March 27 has been cancelled. The next meeting will be face-to-face on April 3 at 9 a.m.

Today's Attendees:

TMT Members:

Agency	TMT Representative
Army Corps of Engineers	Doug Baus (Chair), Lisa Wright, Julie Ammann
Bonneville Power Administration	Tony Norris, Scott Bettin
Bureau of Reclamation	Peter Cooper
NOAA Fisheries	Paul Wagner, Claire McGrath
US Fish & Wildlife Service	Dave Swank
Washington	Charles Morrill
Oregon	Erick Van Dyke
Idaho	Russ Kiefer
Montana	Jim Litchfield
Nez Perce Tribe	N/A
Umatilla Tribe	Tom Lorz
Colville Tribe	Sheri Sears
Warm Springs Tribe	N/A
Kootenai Tribe	N/A
Spokane Tribe	N/A

Other Attendees (non-TMT members):

Corps – Dan Turner, Steve Hall, Aaron Marshall, Alexis Mills, Michelle Yuen
DS Consulting – Emily Stranz (Facilitator), Colby Mills
FLUX Resources – Melissa Haskin (Note taker)
Columbia Basin Bulletin – Mike O'Bryant
Clearing Up – K.C. Mehaffey
PPC – Shane Scott