

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

February 21, 2018

Facilitator's Summary

Facilitator & Notes: Emily Stranz; Support: Donna Silverberg, 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/>

Dworshak Operations

Steve Hall, Corps, reported on current and proposed operations at Dworshak. Current elevation is 1,526ft, with 4kcfs inflow and 20 kcfs outflow. TDG levels in river are between 121-122% and 106% in the hatchery. The inflow forecast is expected to drop to around 2.6kcfs due to the cold temperatures and snowpack in the region is well above normal. There are more storms expected to add to the snowpack in the near future. So far, 2018 is tracking very well with the 2011 season.

Steve noted that the Corps ran an early bird water supply forecast based off of the conditions in the basin and is anticipating a 3.1maf April-July water supply. This is up from the current official water supply forecast of 2.8maf. The 3.1maf water supply equates to an end of March flood control elevation target of 1,459.4ft, and an April 15th target of 1,445ft. This forecast is tracking well with the NW RFC forecast which is anticipating an April –July supply of 3.05maf.

Given these conditions and the end of March and April 15th flood control elevation targets, the Corps suggested an operation to hold 20kcfs through the end of the February and into March, then dropping down to 12kcfs around March 18th if possible and coming back up to around 20kcfs to meet the April 15th elevation. This operation is expected to put the reservoir below the end of February target; however, to allow the Corps to meet the end of March and April 15th targets, while moving water sooner than later to hopefully avoid having to increase higher than 20kcfs later in the season when it is less desirable from a fish perspective. Another option would be to go up to 20kcfs and then down to 16kcfs for a longer duration before bumping back up to 20kcfs. The Corps provided both of these modelled scenarios, which are available on the TMT web site.

The group discussed the impact of the current and suggested operations on fish, both in hatchery and in river. Dave Swank, USFWS, noted that TDG is currently 106% in the collection channel and degassers are not working as well as expected due to cold ambient temperatures. There may be potential to warm the degassers to improve function. Dave noted that if these heightened levels of gas are going to persist, they will need to consider an early release. Jay Hesse, Nez Perce, agreed, noting that they will conduct a fish health sample tomorrow and will know whether or not the current levels of TDG are affecting feeding. Jay also suggested that they check the temperature unit accumulation in-river to get a better idea of when fall Chinook are expected to hatch. Once the eggs hatch, they are more susceptible to the gas and a significant amount of fish will be impacted. He said ideally, they can move the water before these fish hatch. Dave questioned whether dropping to 18kcfs in the near future could provide some relief to the hatchery fish.

The TMT agreed to gather more information and reconvene to continue this discussion the afternoon of Thursday, February 23rd. To inform that conversation Jay and Dave will provide an update on the fish health sampling, in-river temperature units, early release options, and options to warm up the degassers. Steve will provide a model run of 18kcfs.

- **Action:** USFWS, Nez Perce, and the Corps will gather more information and provide it back to TMT in preparation for the TMT check in call at 4:00pm on February 23rd.
- **Action:** the TMT will revisit DWR operations once they have reviewed the additional information.

Methodologies to Monitor Adult Passage in the Snake River

Russ Kiefer, Idaho, provided an update on the process to determine a regional method to monitor adult passage during the upcoming spill season. Currently, the Fish Passage Center, DART, and NOAA Hydro are developing models to monitor adult passage. Russ noted that there was a meeting last week with DART regarding the TMT's information needs and that draft guidance for the groups is in the works. He expected to have a first draft of the guidance to share with TMT by the end of the day and asked that if people would like to be involved in the editing, please contact him ASAP. Tom Lorz, Umatilla, suggested that part of the guidance be that the modelers first assess passage in the Snake River, and then move on to the Lower Columbia if the models work. Russ agreed to add this guidance and asked that those more familiar with data from the Lower Columbia provide input on what datasets would be useful for such an exercise should it be determined to be of use.

- **Action:** Russ will provide draft guidelines for TMT member review. TMT will discuss the guidelines at their 2/28 meeting.

The next TMT meeting will be a check in call on Dworshak operations from 4:00-5:00 on Thursday, February 22nd.

The following TMT meeting will be a conference call on Wednesday, February 28, at 9:00am.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

February 21, 2018

Minutes: Pat Vivian

1. Introduction

Representatives of Washington, the Nez Perce Tribe, CRITFC/Umatilla Tribe, USFWS, Montana, Oregon, BOR, COE, BPA, Idaho, NOAA, NPCC and others participated in today's TMT call chaired by Doug Baus, COE, and facilitated by Emily Stranz, DS Consulting.

2. Dworshak Operations

Steve Hall, COE Walla Walla, gave an update on Dworshak operations and led a discussion supported by several graphics linked to today's agenda. The discussion did not follow the same order in which the graphics are listed on the agenda.

2d. Hourly Data. Dworshak Dam forebay elevation is currently just over 1526 ft with inflows of about 4 kcfs. Discharges are currently 20 kcfs.

2e. Total Dissolved Gas Report for Dworshak. Current saturation levels are 121-122% in the river below the dam.

2f. Dworshak National Fish Hatchery Collection Channel (DHCI) Total Dissolved Gas. Levels in the hatchery are around 106% saturation with small fluctuations.

2g. NWRFC Dworshak Dam Inflow Forecast. In the short term, inflows are expected to drop to about 2600 cfs due to very cold temperatures. The reservoir will continue drafting based on that assumption.

2a. Snow Analysis. This graphic shows a composite of SNOTEL data in the basin, as compared to normal accumulation at SNOTEL sites. The basin currently has 120% of normal snowpack now, and the weather forecast is calling for continued storms which will add more snowpack. Another factor of note is that it's only February 21 and Dworshak basin has almost received the average amount of snow it normally receives. 2018 could be a big water year.

Hall showed TMT a series of graphics depicting SWEs at individual snow stations and comparing this year to 2011, the closest analog year. Dworshak reservoir is drafting close to 2011 levels now. In some cases, SNOTEL sites this year are providing SWE data that indicate snowpack is greater now than in 2011.

- Crater Meadows is tracking 2011 closely as far as snow water accumulation.
- Hemlock Butte on the southern side of the basin has slightly greater snow accumulation than 2011, but is tracking very closely.
- Hoodoo Basin is actually in Montana just outside Dworshak basin, but it's a good indicator of what's going on in the northeast side of the basin. SWEs in Hoodoo are slightly above 2011 levels.
- Lolo Pass on the southeastern edge of the basin also has SWEs above 2011 levels.
- Lost Lake on the northwestern corner of the basin has SWEs significantly above 2011 levels.

The snow analysis concludes with a graphic of mean daily inflows at Dworshak as of February 20. The purpose of this graphic is to compare 2018 inflows with those of 2011. This year, an inflow event at the beginning of February resembled the inflow event of mid-January 2011. It's likely that Dworshak reservoir could see another inflow event this year before runoff season begins. In 2011, there was significant runoff at the end of March. With the amount of snow that accumulated in 2011, Dworshak inflows peaked at about 32-33 kcfs.

Hall mentioned that two SNOTEL sites in the basin, Elk Butte and Cool Creek, are not reporting although they are collecting data. Elk Butte is in the middle of the West side of the basin and Cool Creek is near the center of the basin. The COE will attempt a snow flight to repair these stations as soon as weather conditions permit.

2b. Dworshak March Runoff Early Bird Forecast. The early bird forecast, based on conditions as of February 20, predicts the March official forecast will be 3.1 maf April-July runoff. Any inflow volume forecast greater than 3.0 maf requires an April 15 flood control elevation of 1445 ft, which is the lowest Dworshak reservoir can possibly go. A 3.1 maf forecast would also mean having to draft Dworshak reservoir to 1459.4 ft by the end of March for flood control. Hall emphasized that if the April 15 flood control elevation is 1445 ft, it will involve significant draft. The COE is confident the April-July runoff forecast will remain close to 3.1 maf because today is within 10 days of the end of February.

Tom Lorz, CRITFC, asked about local flood control. Hall said it would be less of a draft and will get back to TMT on this.

2h. NWRFC Water Supply Forecast – North Fork Clearwater. The RFC’s April-July runoff volume forecast is 3.035 maf, which is only slightly lower than the COE runoff volume forecast for April 1. The RFC forecast has been as high as 3.1 maf and came down recently. The two forecasts are now in alignment.

Charles Morrill, Washington, asked whether these forecasts take into account low elevation snow. Typically low elevation snow comes and goes, Hall replied. Even the lowest elevation SNOTEL stations are showing above normal accumulation and are tracking well with 2011 SWE values. Low elevation snowpack has caught up to the rest of the snowpack, which is not uncommon. More will be known once a snow flight into the basin is possible.

2c. Operations. This graphic depicts an operation through the rest of 2018, meeting the March 31 and April 15 flood control elevations. It includes two potential scenarios:

1. The COE’s recommended scenario is to continue 20 kcfs discharges out of Dworshak through end February, operating to the March 31 and April 15 flood control targets. This scenario indicates that 20 kcfs out now means Dworshak discharges could be reduced to 12 kcfs around March 18 but would need to return to 20 kcfs to meet the April 15 flood control elevation. This is a conservative operation, with a goal of releasing as much water as possible in the near term to provide TDG relief when fish would normally be released into the river.
2. The second scenario is to continue 20 kcfs for the rest of February, dropping to 16 kcfs in March. It would require going back up to 20 kcfs in the week before April 15 in order to draft down to the 1445 ft flood control elevation.

Of course, this all depends on the shape of the hydrograph, Hall said. Dworshak inflows peaked in early April 2011, which is a distinct possibility again in 2018. The COE recommends holding the course on 20 kcfs out through the end of February and possibly backing off discharges then. The more flows are held back now, the higher they might have to go later, depending on the shape of the hydrograph.

Paul Wagner, NOAA, asked whether keeping Dworshak discharges at 20 kcfs through the end of February is where regional consensus lies. Is more hatchery and forecast information needed?

Dave Swank, USFWS, advocated taking a close look at dropping to 18 kcfs discharges now to get hatchery TDG levels down below 106% saturation. Hatchery staff recognize a threshold of 105% TDG in the collection channel as far as adverse impacts on fish. Icing in the hatchery, as well as cold air and

water temperatures, has been making the degassers slightly less effective than normal. Hatchery staff have considered the possibility of installing heater coils in the degassers, but no funding was available.

The hatchery will probably consider an early release this year. Swank will touch base with hatchery staff and get back to TMT on this.

Jay Hesse said the Nez Perce Tribe hatchery staff will do their next sampling tomorrow, and it will indicate whether fish are feeding or not. He predicted they would stop feeding at current TDG levels, which could mean an early release this year.

Hesse will ask hatchery staff to provide temperature accumulation units and projected hatchery release dates for spring Chinook. Once fall Chinook hatch out of the gravel, they are more susceptible to elevated TDG exposure. Currently the Peck gage is reading 114% TDG, which could impact a significant amount of fall Chinook production, especially in the tribal hatchery at Cherry Lane.

Furthermore, dilutions from the mainstem Clearwater are not available at this time of year to help moderate TDG saturation levels. In-river fish are at risk. While the vacuum degassers at the Nez Perce hatchery are keeping gas levels down to 102% saturation levels, the kelt reconditioning tanks are at 103-104% saturation. The tribe is looking for ways to minimize that level of exposure.

Hesse supported Swank's suggestion of a slight reduction in TDG levels now in order to avoid a lethal threshold for some of these fish.

Swank asked the COE to model 20 kcfs out through February and 18 kcfs out in March as compared to 18 kcfs out now. He wondered whether there is a way to manage this inflow forecast while keeping hatchery collection channel TDG saturation levels at 105% or lower. USFWS would like to see more options to consider at the next TMT meeting.

Wagner wondered whether fish are less susceptible to GBT effects at colder temperatures. Sampling tomorrow will provide an evaluation of stomach contents, which will help clarify the effects of 106% TDG, Scott Bettin added.

Hall said there are two concerns with dropping Dworshak outflows to 18 kcfs now:

1. Inflows could rise in March like they did last year. Getting ahead of the curve now would help avoid the possibility of higher discharges in March and April, when fish are more vulnerable to high TDG levels. The goal of

the 20 kcfs discharge operation is to move water sooner rather than later, before fish are released into the river.

2. There could be an early spike in runoff, or a change in the weather that is not forecasted over the next 10 days. Climate Prediction Center forecasts have been continuously saying conditions will be warmer and drier than normal, which could cause a spike in early runoff. That would necessitate discharges of 25 kcfs, producing even higher TDG levels. Furthermore, it's not definite that dropping discharges to 18 kcfs would bring hatchery TDG levels down below 105%.

Swank requested a TMT conference call tomorrow afternoon, February 22, at 4 pm when monitoring data would be available. At that time, TMT will revisit whether Dworshak outflows should be reduced to 18 kcfs. Swank said we are in uncharted territory because fish last spring were only exposed to 105% TDG for a few days before they were released prematurely.

Charles Morrill, Washington, asked, given the current condition of fish in the hatchery, how early would hatchery staff consider releasing them? The possibility of early release from Dworshak Hatchery has been discussed, but Swank didn't have any prospective dates. Hesse said the Nez Perce hatchery is trying to hold fish long enough to time their arrival at Lower Granite when spring spill starts on April 3. Chinook are typically released at the end of March and steelhead in early to mid-April.

Swank said Chinook are doing better this year because they are benefiting from the oxygenation system. Spring Chinook in system 1 have been exposed to TDG levels of 101-101.5%, while steelhead in systems 2 and 3 have been exposed to 106% TDG. The hatchery would prefer to hold steelhead until April 1, but if they stop feeding, the hatchery will consider an early release.

Morrill requested an update on steelhead condition during tomorrow's TMT call, which will cover the following:

1. Coordination with hatcheries on early release dates.
2. Data from February 22 fish health sampling.
3. Temperature unit accumulations in the river, and anticipated Nez Perce hatchery release dates for in-river fish.
4. A model run of 18 kcfs discharges from Dworshak under current conditions.

Russ Kiefer, Idaho, requested an estimate of how different discharges from Dworshak would affect TDG levels below the project. This might provide some options for TDG management. Hall said the COE has limited data for this kind of comparison but will prepare a scenario based on analytical data. Models to date have not accurately predicted TDG levels in the hatchery.

TMT will revisit Dworshak operations in a call tomorrow, February 22, at 4 pm.

3. Methodologies to Monitor Adult Passage in the Snake River

Last week, NOAA and Dart hosted a conference call in which Oregon and Idaho representatives gave guidance on how to monitor adult passage on the Snake River this year, Russ Kiefer reported. Paul Wagner prepared a document giving general guidance, which Kiefer is editing and will send out to TMT members later today.

Kiefer invited the COE to participate in creating guidelines for developing a methodology that accurately tracks adult passage. While efforts to date have been focused on the Snake River, it seems logical to extend the methodology to lower Columbia stocks as well. Kiefer asked for help on recommending data sets for use in developing the methodology. He wants recommendations of what PIT tag groups to include in the analysis if it extends to the lower Columbia. One example of the questions that arise is, should Snake River spring and summer stream-type Chinook be combined into one data set, given their life history similarities?

Tom Lorz, CRITFC, suggested trying the methodology on a few projects in the Snake first before extending to the lower Columbia; Kiefer agreed. Paul Wagner said he will work with Kiefer on input from the ISAB on this.

Next TMT Meeting

There was agreement that weekly meetings make sense this February, given how inflows at Dworshak are shaping up.

TMT will meet next in a conference call tomorrow, February 22, to check on the results of fish sampling in the hatchery. Then TMT will revisit Dworshak operations on February 28 and meet in person on March 3.

Name	Affiliation
Charles Morrill	Washington
Jay Hesse	Nez Perce
Tom Lorz	CRITFC
Dave Swank	USFWS
Jim Litchfield	Montana
Erick Van Dyke	Oregon
John Roache	BOR
Julie Ammann	COE
Doug Baus	COE
Scott Bettin	BPA

Steve Hall	COE
Aaron Marshall	COE
Leslie Bach	NPCC
Michael Bryant	CBB
Brian Zigler	Snohomish PUD
Russ Kiefer	Idaho
Paul Wagner	NOAA
Eric Chow	COE