COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM
May 14, 2025
Facilitator's Summary
Facilitation Team: Emily Stranz & Nancy Pionk, 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; it is not intended to be the "record" of the meeting. Official minutes can be found on the TMT website: https://public.crohms.org/tmt/agendas/2025/. Suggested edits for the summary are welcome and can be sent to Colby at colby@dsconsult.co.

Review Meeting Summaries & Minutes – TMT Members approved the official meeting minutes from April 30, 2025, and the official meeting minutes and facilitator's summary from May 7, 2025.

Flow Planning Implementation Protocol Technical Team Update – Greg Hoffman, Corps, presented an update from the Flow Planning Implementation Protocol (FPIP) Technical Team (presentation on the TMT website). Greg noted that historically, the FPIP Technical Team (including Action Agencies and State and Tribal fish managers) coordinated on a flow plan for sturgeon, which was then presented as a USFWS SOR to the TMT for consideration. Per the 2020 USFWS BiOP, the FPIP Technical Team will bring forward a consensus recommendation to the Corps and BPA for implementation, instead of a SOR. The FPIP Technical Team will present this summer's operations at the May 28 TMT meeting.

Greg reviewed the history of Kootenai River Ecosystems Function Restoration Flow Planning and its purpose, which is to restore ecosystem function in support of Kootenai River white sturgeon recovery, and specifically, to create attraction flows to move sturgeon upstream, stimulate spawning behavior, and enhance velocity for egg incubation. The FPIP process includes inflow forecasting and scenario modeling to predict Libby Dam (LIB) projected outflow, summertime flows, and end of September elevation.

Lower Monumental Dam (LMN) Operations for Transport Update – Erick Van Dyke, FPAC Chair/ODFW, provided an update on transport operations at LMN following the Corps decision via RIOG. Erick reviewed project graphs (links on the TMT website) and noted a pattern of decreases in spill volume and within-day flow fluctuation during transport operations. Erick expressed FPAC member's concern that within-day flow fluctuations are strongly related to ongoing transport operations, noting that fish managers are interested in reviewing this year's implementation data to compare with FY24 implementation data to document how lessons learned are being implemented. Per request from Jonathan Ebel, IDFG, the Corps will provide 5-minute data for LMN transport operations at the end of the transportation season. The Corps confirmed that May 14 is the last day for every-day barge transport; beginning on May 15 the operation will shift to every-other-day loading and barging.

FPAC Flow Augmentation Recommendation – Erick Van Dyke, FPAC Chair/ODFW, presented the FPAC recommendation regarding flow augmentation. FPAC recommends that BPA request the release of 1 maf of Columbia River Treaty (CRT) storage for flow augmentation begin as soon as possible and no later than May 19. The full volume should be released before August 1. On behalf of FPAC, Erick noted that operational implementation of CRT flow augmentation can limit the realized benefits to anadromous fish under certain circumstances. FPAC is exploring ways to increase the effectiveness of this volume of water in future years.

Tony Norris, BPA, indicated that the Action Agencies (AAs) have a treaty coordination call with Canada on Thursday and will email the decision on the recommendation following that meeting. Tony requested to keep this topic on the TMT agenda so any changes made to the recommendation can be evaluated as needed based on updated streamflow forecasts.

Operations Review

Reservoirs – Chris Runyan, Reclamation, reported on Bureau of Reclamation projects:

- **Hungry Horse (HGH)**: Midnight elevation at the project was 3,534.08 feet (26-feet from full), with inflows of 14.6 kcfs and outflows of 5.5 kcfs. Upcoming operations will continue to meet the Var-Q outflows, however due to drier conditions in May, this may be decreased if there is a residual drop-off. The project is targeted to be 10 feet from full in early June. The basin experienced above-average temperatures last week but those have moderated to near-average temperatures currently. The dam experienced 0.7 inches of precipitation over the last week with 1-2 inches of precipitation in the forecast over the next 10 days.
- **Grand Coulee (GCL)**: Midnight elevation was 1,264.9 feet (25-feet from full), with inflows of 118.4 kcfs and outflows of 102.9 kcfs. Elevation has been pretty flat over the last week. The current operation is to refill in May and June, with close consideration to meeting flood risk objectives. Precipitation has been below average for the basin above GCL.

Aaron Marshall, Corps, reported on Corps of Engineers projects:

- **LIB**: current elevation was 2,421 feet, with inflows of 26 kcfs, and outflows of 7 kcfs.
- **Albeni Falls (ALF)**: current elevation was 2,054.9 feet, with inflows of 44 kcfs, and outflows of 40 kcfs. Refill to normal summer operating range (2,062.0-2,062.5 feet) is expected in June.
- **Dworshak (DWR)**: current elevation was 1,570.65 feet, with inflows of 16 kcfs, and outflows of 1.7 kcfs. DWR is operating to its flood control refill curve.
- **Lower Granite (LWG)**: current elevation was 733.8 feet, with inflows of 115 kcfs, and outflows of 117 kcfs. All Lower Snake projects are operating in their normal MOP range. LMN was returned to its MOP range on May 8.
- **McNary (MCN)**: current elevation was 337.7 feet, with inflows of 245 kcfs, and outflows of 231 kcfs.
- **Bonneville (BON)**: current elevation was 72.9 feet, with inflows of 261 kcfs, and outflows of 242 kcfs.

Water Quality – Dan Turner Corps, reported a tailrace gage failure at LWG; the gage was back online on Monday, with a reading of 127% TDG; the spill cap was then lowered. LMN had TDGs of 126% and 127% at the LMN forebay; however, the spill cap was not lowered as LMN is operating to 125 % in the tailrace, per the state water quality standard. In the lower Columbia River, projects are operating at minimum generation, spill the rest. MCN reached the spill cap for a few hours. The Snake River projects had some spill cap increases at LWG and LMN, with some minimum generation, spill the rest at LMN.

Fish – Kelsey Swieca, NOAA, reported that yearling Chinook passage is generally trending down in the lower Snake River but remains fairly high in the lower Columbia River with the smolt index at BON reaching a maximum of 86,000 over the weekend. Steelhead passage at LWG is also decreasing following a sharp uptick late last month. Snake River sockeye are showing up at LWG and their passage is expected to be fairly punctuated; the fish are expected to pass through the system reasonably quickly over the next week.

Adult spring Chinook passage is likely at its peak at BON; the run is currently 127% of the 10-year average. Adult steelhead counts are relatively low at the lower river projects; the run is at 49% of the 10-year average at BON. At Ice Harbor (IHR), Chinook passage is at 97% and steelhead passage is at 124% of the 10-year average. No adult delays have been observed for this season to date at LMN or LWG (per the FOP definition). Erick noted that the timing for steelhead in the basin is different than salmon timing, he cautioned about reading too much into YTD or metric like 10-year averaging among species.

Dave Swank, USFWS, reported that a few lamprey are starting to trickle in at BON. The lamprey passage system (LPS) is operational at BON and counts are now available on the FPC daily adult counts website. Dave noted that the LPS counts are a 16-hour count, so there will be differences between the year-to-date full 24-hour count (also available on the FPC website) and the 16-hour counts.

Power System – Tony Norris, BPA, reported no significant issues or updates regarding the power system; the region is experiencing seasonal spring temperatures.

Questions or Comments from Non-TMT Members – There were no questions or comments from members of the public.

The next scheduled TMT meeting will be on May 21, 2025, at 9:00 AM.
A DS Consulting Process Meeting will follow the TMT Business Meeting.

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Columbia River Regional Forum
Technical Management Team
OFFICIAL MINUTES
Wednesday, May 14, 2025
Minutes: Andrea Ausmus, BPA (contractor, CorSource Technology Group)

Today's TMT meeting was held via Microsoft Teams and conference call, chaired by Doug Baus, Corps, and facilitated by Emily Stranz, DS Consulting. A list of today's attendees is available at the end of these minutes.

1. **Review Summary and Minutes**

   a. April 30 Minutes

      - Approved

   b. May 7 Summary and Minutes

      - Approved

2. **FPIP Technical Team Update** – *Greg Hoffman, Corps-NWS*

   a. FPIP/TMT History

      - FPIP Operations were typically brought to TMT for approval through SOR.
        - System Operation Request (SOR) would come from USFWS as result of BiOps in 2000 and in 2006 (later clarified in 2008)
        - Annual coordination of ecosystem flow management happens through the Flow Plan Implementation Protocol (FPIP) group. Group was established through the BiOp in 2006.
      - The FPIP group consists of the Action Agencies (AA), US Fish and Wildlife Service (USFWS), the States and Tribal representatives.
        - Work to craft a flow plan to execute sturgeon tier volume.
        - AA would prepare the Flow Plan (2005; part of AA Proposed Action) with the Flow Plan Implementation Protocol Technical Team and then share the information with USFWS who would in turn come to TMT with an SOR.
      - Over 20 years TMT has never disagreed with the proposed operation.
        - As a group FPIP rather than developing an SOR the AA would implement FPIP as called for in the 2020 BiOp.
        - Even though it was not required FPIP felt that it would be great to come to TMT and talk about what they do and why they do it.
      - Dave Swank, USFWS, said that this was part of the proposed action in the BiOp and so it is the default action and SORs are usually something that is brought to

TMT to change what the default plan is. Through a lot of discussion within the group last year no one objected to doing away with the SOR.

Jonathan Ebel, ID, said that without a SOR there is no polling. He asked if the decision or the plan that FPIP will implement a consensus. He asked if there is consensus of what Hoffman was going to present amongst the Fish Managers in the Kootenai.

Hoffman said that the consensus comes from the FPIP Team which includes members and representatives from other agencies, including Corps, BPA, Idaho Fish and Game (IDFG), Montana Fish, Wildlife & Parks (MFWP), Kootenai Tribe of Idaho, and US Fish and Wildlife Service.

Ebel said that he was just asking. He said moving into the future what we will see from the Corps for the sturgeon operations will be a plan based on FPIP consensus recommendations.

Hoffman said yes and some of what he will see today is a result of the FPIP consensus and what they have seen with their monitoring and evaluation program, which was primarily IDFG. He said that FPIP was and is an experimental flow plan that the Corps wrote as part of the Proposed Action in the 2004 B.A. in collaboration with the FPIP Technical Team. He said that it was a different kind of BiOp back then where everybody came together and said what can we do with Libby Dam (LIB) in place to get sturgeon to spawn upstream of Bonners Ferry. He said that the earlier BiOp had required some actions at LIB involving the installation of two additional turbines for the express purpose of increasing flow downstream for sturgeon spawning and recruitment in Bonners Ferry. The outcome of that was a settlement agreement in the federal district court in Missoula with a lot of parties involved that everyone agreed to plan flows together. He said that they had tested spill at LIB to emulate the addition of two turbines at LIB. He said that he would talk more about that.

Ebel said that he appreciated that, but the root of his question was that there are multiple layers to that process and in an SOR it provides the State one more ability, in case something is going really against, or the recommendation was not consensus-based. The SOR process allowed for the ability to object if it was not consensus-based. He said that he appreciated that Hoffman was going to share some of what they had learned on this process over time. He said that he had been in contact with Sean.

Hoffman thanked Ebel for that. He said that it is consensus-based, that was the idea of the flow plan formation, that nobody knows what to do when the USFWS BiOp said to install two additional turbines. He said that there was a tremendous amount of upheaval downstream of Bonners Ferry, ID, where that entailed threatening every year, for a long time, the flood stage downstream. He said that the was a lot of angst. He said that the idea way back then was consensus, let's figure this thing out without blowing out the valley. He said that it is the basis for what he was going to talk about today, that is where this whole idea comes from. He said that he was not going to tell TMT exactly what they are going to do this year because it is still in process. He said that he was going to share some scenarios that they have looked at. He said that typically TMT does not see the inner workings of FPIP, the SOR process was good but there was not a lot of background. It would be some of what happened and an explanation of what they wanted to do with water and then TMT would not hear from FPIP for another year. He said that this

opportunity is to explain how and why and what FPIP is contemplating. There are different types of water years, and this one is a particularly dry one and there are things that we have learned with IDFG research and monitoring along with the Kootenai Tribe of Idaho's conservation aquaculture program for sturgeon and habitat restoration work. He said that the flows that FPIP and TMT talk about at this time of year are adaptive in that we have been able to shift objectives, biological and ecological objectives based on what FPIP is seeing in the river. He said that it is a really neat process, and it had been a 20-year process.

b. Presentation – Kootenai River Ecosystem Function Restoration Flow Planning

- Slide 1
  - This FPIP thing is all about sturgeon. It is a neat species.
    - Center photo was taken in Kootenai Lake, downstream of Bonners Ferry, up north.
  - There has been a lot going on for a long time for this species. The Corps has been working operationally for a long time to try to recover the species.
  - Hoffman has been working in the Kootenai since 1996 with a lot of good people. Brian Marotz, MT, has been working there longer.
  - Hoffman said that it has been a pleasure to work for the species in the Kootenai territory with the Kootenai people.
    - This is where it comes from, it is a collaborative effort starting with the people and the fish.
- Slide 2
  - Photos of Kootenai.
    - Photo 1 (Upper Left): The Kootenay River in British Columbia coming into Koocanusa Reservoir. Free flowing river with a lot of wood moving through, a lot of ecological function.
    - Photo 2 (Lower Left): Kootenai River in Idaho upstream of Bonners Ferry, looking downstream at sturgeon habitat from the mouth of the canyon section near the confluence with the Moyie River. This is sturgeon spawning water, and this is where we want them to spawn, upstream into Montana.
    - Photo 3 (Upper Right): Kootenai Falls downstream of LIB
    - Photo 4 (Lower Left): The Kootenai Valley downstream of Bonners Ferry. The river is confined by levees and the emphasis of flow management in this section is to connect the river with accessible floodplain habitats seasonally,
    - Libby Dam and Corra Linn levy actions, or the valley, used to be a flood plain. It is a glacial Kootenay Lake. Sturgeon move up through the lake to Bonners Ferry, through Bonners Ferry and into the spawning habitat upstream of there. Running LIB to affect habitat that far downstream and it is a challenge.

- Slide 3: Kootenai River Temperature and Flow Pre-Libby Dam versus Post-Libby Dam
  - When you put a dam in you alter the hydrograph and the thermograph. They are two things that can be influenced by at hydropower facilities.
    - Green circle represents the time of the year that is being talked about with sturgeon.
    - Teal lines show pre and post Libby dam for flow.
    - Blue lines represent temperature.
  - Where the two lines cross that is when sturgeon spawn. There is a cue when the hydrograph's receding limb starts to come down and when the temperatures get to be ~10° – 12°C.
- Slide 4: Snapshot of what the hydrograph looked like before Libby and after Libby.
  - The water that dams were built to move and suppress happened.
  - January, February, March is when it makes power.
  - April – August the dam is used to reduce the risk of floods.
  - Moving back into Winter the dam starts making more power.
- Slide 5: Sturgeon spawning flows – flow increase to increase depth
  - Biological opinions and the listing of species period.
  - BiOp era: post listing, sturgeon were listed in 1994
  - The BiOp shows a pulse, that is the sturgeon pulse, and this has changed over time.
    - The service and others were experimenting with flows specifically for sturgeon spawning.
  - The flows would come back down after the pulses and then come back up in the late summer/early fall in order to draft Koocanusa reservoir down to a set elevation for salmon downstream.
    - There was double peak situation that was not good ecologically for the resident species.
- Slide 5: Flow normalization – Aquatic & Riparian objectives
  - Next era came from a tremendous effort from Montana through the Power Planning Council's mainstem amendment process to eliminate the double peak.
    - The peak was deleterious to the ecosystem functionality down through the summer months.
  - This was done through FPIP and the mainstem amendments happening at the same time there was the ecological flows where they had a more normative shape to the hydrograph.
    - The delta there was around the 2006 BiOp, things changed with FPIP.
- Slide 6: 2005 Kootenai River Ecosystem Function Restoration Flow Plan

  - Originating document was prepared for the proposed action in 2004 and then clarified for the 2006 BiOp with a renewed updated proposed action.
  - They wanted to create attraction flows to get the fish upstream into that part of the valley in order to stimulate spawning behavior. Number 3 refers to the habitat, they wanted fish to spawn upstream where the velocity is higher, where there is gravel for the eggs to attach to.
    - The 35kcfs, the flow plan was written to do a spill test three out of the ensuing ten years after the BiOp was approved. They ended up doing it in 2010, 2011, and 2012.
- Slide 7: 2006 BiOp
  - Scott Bettin was the co-chair for FPIP from the beginning.
    - He retired last year after 42 years of working with BPA.
  - Bob Halleck was the original USFWS Kootenai River White Sturgeon Recovery Team Lead back in the 1990s.
  - There was some spill that happened in 2006 that was controversial, it caused some damage, TDG and was the impetus for going back and doing the 2008 upgrade.
- Slide 8: FPIP Flow Plan for 2024 Sturgeon Operations at Libby Dam
  - Spill testing occurred and it was FPIP Team that planned it.
  - FPIP puts out a plan every year, the one shown was last years and shows a list of membership on who the consensus members are.
    - The group has not always been like it is currently. It did not always include the Lower Kootenai Band and the Ktunaxa Nation Council.
    - When talking about habitat on both sides of the border FPIP brought those folks into to collaborate on ecosystem function as well.
- Slide 9: Libby Dam Typical Water Year
  - Shows a graph of Libby's typical water year, specifically the period that the volume is something that FPIP looks at and manage the water for species at LIB. These are dedicated volumes of water.
  - There is nothing typical of a LIB operation. There are VarQ operations preceding the refill period, the sturgeon volume executions, and the end of September target elevations.
- Slide 10: Libby Water Year 2025
  - FPIP begins with inflow forecasting.
  - WY25 1991 – 2020 average: 81%
  - FPIP uses the final May Forecast – April through August forecast.
    - WY25 April – August: 4.9 maf
    - Average is just over 6.
- Slide 11: Sideboards of Sturgeon Operations
  - The WY25 April through August sets into motion the tiered approach.

        - WY25 Sturgeon Volume: 0.8 maf to shape
    - It also sets the Minimum Volume for the Kootenai River after the sturgeon pulse.
        - WY25 Minimum Volume: 7 kcfs
        - From May 15 until the sturgeon pulse this is the minimum discharge as well.
    - End of September for Koocanusa Reservoir elevation is determined by the May forecast.
        - Pool Target: 2446.7
        - It is interpolated in a range of the percentiles.
        - Conservative.
- Slide 12: FPIP Spring
    - Scenario modeling is used to look at the projected shaping of LIB outflow. Look at what it is projected. Look at what summertime flows would look like and after that down to the end of September elevation.
        - For sturgeon specifically look at what the flow shapes look like in terms of flow at Bonners Ferry, which includes flow from tributaries downstream of LIB.
        - FPIP looks at the shape of the flow and the receiving limit of the hydrograph and look at the flood stage, it has been a long time since the 1764' flood stage at Bonners Ferry.
        - Initially FPIP in their direction, based on what they knew about the species targeted 1764' and that was what was required for sturgeon. Things have changed since that time, FPIP have different targets.
        - FPIP gets an updated Water Supply Flow Forecast and then they go back and look at how much water there is and what can be done with the water.
- Slide 13: Selective Withdrawal System
    - The selective withdrawal system can influence the discharge temperatures.
        - There are times that the thermal mass of water develops isothermy where the entire reservoir becomes one temperature. This occurs every year. Depending on the volume of, what is coming in and what is going out, and what the temperature of the air is the re-stratification of the reservoir can vary.
    - Initial modeling (2020) shows water temperatures at elevation on the foreface of the dam. As inflow increases into the reservoir the water that comes in is a little warmer than the thermal mass, so it skids across the top of the reservoir and show up in the forebay as warming water on top of the cold water.
    - LIB can take advantage of the temperature differences between the levels by using the crane (updated in 2006). This is a critical component of what FPIP does for sturgeon as well as other ecosystems function thermally.
        - The selective withdrawal system is slated for additional upgrades and modifications to make it more fully functional.

        - Unit #6 will come online at LIB in the next two years.
        - It is an operation to move a gate, it takes 25 – 30 minutes to move each gate. The upgrade is going to enable the crane to travel to another part of the dam, which will improve accessibility.
    - Temperature is tracked based on what historically came under the dam and it is a nice tool to have in the summer months to cool off the system for the benefit of resident species.
- Slide 14: Bonners Ferry
    - Downstream of Bonners Ferry there is fine depositional material found in glacial lake bottoms.
        - Most of the spawning prior to FPIP was downstream of Bonners Ferry, fish were not coming upstream of town.
        - When fish spawn over the fine deposition, the eggs are adhesive when fertilized and they hit the substrate and become entombed. Survival is extremely low. Very low recruitment when LIB went in,
    - Upstream of Bonners Ferry, there is coarse deposition that is better suited for sturgeon to leave their eggs.
    - FPIP, after flow planning, the BiOp and habitat construction, had two trains of thought.
        - Bring the fish to the habitat, which is upstream.
        - Bring the habitat to the fish, some projects constructing habitat occurred downstream of Bonners Ferry, near Shorty's Island where fish were spawning.
- Slide 15: Upstream Habitat
    - 2008 BiOp directed with agreement from the AA that the AA would support the Kootenai Tribe's efforts in leading restoration of habitat for sturgeon downstream of the Moyie River.
        - Between the Moyie River and Bonners Ferry (and now downstream of Bonners Ferry)
        - Large Scale efforts began in 2010 and continued through 2019.
        - Habitat to bring fish to.
    - Bob Halleck was pleased with what was done for habitat since his departure.
- Slide 16: Non-Sturgeon uses
    - When FPIP started to do the ecological flows, they started to get a response with the receding limb of the hydrograph. They did not immediately drop flows and then ramped to a double peak in the summer months. When this changed, they started to get some riparian recruitment.
        - This was by intent; they shaped the receding limb and over time it was evident that it was working.
        - Last year, January 2024, they published a paper.
    - Scientists are involved in a lot of what goes on the Kootenai River.

        - Not just fish on Kootenai, there is a lot of mitigation that goes on with the operations.
        - Paul Anders was instrumental in all things Kootenai since the early 1990s.

- Slide 17: Recruitment Box
    - The receding limb of the hydrograph can be favorable to riparian recruitment if it is shaped correctly.
- Slide 18: Recruitment Assessment
    - FPIP was able to assess this over time and generally speaking the greener the boxes (peak, timing, recession, and scour) the better they were.
        - The peak of the flows were assessed for their ecological value through the years. The timing and the recession of the hydrograph were assessed as well.
        - The scour is an indicator of what was after springtime flows in the wintertime on the hydrograph. We still move a lot of water through the areas in the winter and at times that can uproot and wipe out any willow or cottonwood recruitment that may have existed.
    - This graph goes through 2017, but some years Flood Risk Management can take precedence over what FPIP is trying to do.
- Slide 19: Ten/Fifteen Years After Habitat Work
    - Flows adapted over time, they has been riparian recruitment, and they have moved fish into the braided reach.
    - Fish and Games research has indicated that there has been movement over time.
        - The research indicates that what FPIP has been doing has shown documented sturgeon movement and egg deposition with egg maps that Fish and Games and telemetry that show that when we can create conditions that move up into the areas upstream of Bonners Ferry.
        - In 2022, there was likely recruitment of wild spawned sturgeon from upstream of town. This was found using tagging and telemetry and new technologies to apply to the research.
        - Know what the target ecologically with flows.
    - Nims Ranch was purchased, and the Kootenai Tribe has done a lot of habitat upgrades and established connection with the mainstem Kootenai.
        - Using FPIP in 2018 they were able to shape flows to get water out onto the landscape and Kootenai Tribe and their conservation aquaculture program were able to put fish out to document how the fish would grow out on the landscape where the water is warmer, and the productivity has increased in the spring rather than fish being limited to what is going on in the cold water of the mainstem Kootenai.
        - The Tribes focus of the habitat has shifted downstream now that the upstream is largely in place and functioning. They are looking at providing off-channel habitats.

        - The next big one is the Kootenai National Wildlife Refuge. The habitat has been cut off from the river for quite some time and providing some flow onto the landscape for potential sturgeon recruitment will be inundated during the time when there will be larval drifting downstream from those habitat sites.

- Slide 20: 2025 Scenario Development
    - Based on normalized objectives from the last several years.
    - Objectives:
        - Fish flows for moving fish upstream and then getting fish out on the landscape or getting water on the landscape. In bigger water years the river comes up earlier and they are able to use operations to connect habitats. This year is pretty dry and so that possibility was eliminated. There is a target elevation that we cannot reach without a lot of backwater from Kootenai Lake at this time.
        - Timing: 2022 there was sturgeon water and there was potential recruitment in 2022. IDFG was interested in pursuing that line of research and having flows that were peaking around a similar time as in 2022. FPIP is looking at doing this for this year, either 20 kcfs or 25 kcfs for a peak. They are currently considering the different BiOp scenarios involving the different ramping rates up and back down and extending the ramping rates to have a smoother receding hydrograph.
- Slide 21: Probability Charts
    - LIB Inflow showing the projected inflows into the Koocanusa Reservoir looking at the peaks.
        - 30k NP ESP traces
- Slides 22 - 27: Bonners Ferry
    - Using the traces FPIP uses models to start the scenarios.
        - Depicted using a start date of May 27, it could be before that or after. It is what FPIP is looking at for what the habitats at what would be accomplished with the objectives of moving water at this time.
- Slides 28 - 31: Bonners Ferry Stage
    - FPIP would like to get to 1760 to connect habitats but with the water supply that will not happen. This is why they are contemplating different scenarios because that objective will not be met.
        - What is the best use of water if we cannot connect the habitats?
        - Some of that may be the receding limbs of the hydrograph.
- Slide 32: Kootenai River and Kootenay Lake Flow and Elevation
    - A lot of what would affect this is dependent on how Kootenay Lake is operated under the 1938 IGC Curve.
        - Minimum pool is in April and the connectivity and elevations and stages in the river are related to that.

- Slides 33 - 36: Libby Dam Outflow – Probability Chart
  - Looking at LIB there is the same types of scenarios. The important piece is the flow after the pulse.
    - This is a burial zone in the Kootenai downstream of LIB that can be optimized with a slightly higher flow in the summer. This can make a big difference ecologically.
    - FPIP is considering this as well. All four scenarios are a little different.
- Slides 37 – 40: Lake Koocanusa Elevation – Probability Chart
  - Shows Koocanusa refill and how it looks with the end of year target elevation.
  - FPIP will eventually arrive at one scenario and they will probably come back to TMT and let TMT know what FPIP will do.
- Slide 41: Recognition of those that have collaborated with FPIP.

Brian Marotz, MT, thanked Hoffman and said that it was a great walk down memory lane. He said that it has been a great group of people collaborating over time. Marotz said that FPIP has made a lot of headway. He said that it is a good thing that sturgeon are a long-lived species because it takes that long to mobilize that much momentum, to overcome the momentum that we had on Kootenai River before this point. He said that he thinks back Paul Andrews, who was such a shock when he passed and Sue Ireland was engaged for a long time and then retired (fortunately she is still doing great, Marotz said that he had talked to her not long ago). He said that he maintains that when these fish come back in earnest, he wants all of us on the shoreline cheering them on. He said that he had a question, at one point we were talking in earnest about a non-essential population moved upstream, move females upstream above LIB so that we had a genetic resource up there in case things went bully downstream. He asked if there was any more discussion on that idea.

Hoffman said that there had not been any discussion in the recovery team-type of forums that we still have in, the CMART. It is kind of off the radar, they have talked about it. He said that the USFWS Recovery Team Lead had changed a few times over the past couple of years and the last he had heard from the Service is that a ten-day population establishment is probably not likely at this time. It is not a dead idea, but it is not being talked about frequently right now.

Swank said that he had not heard anything about it recently, but Aaron Ramirez might know more about than he does because he is not really dialed into everything that goes on with Kootenai River white sturgeon. Swank asked if Ramirez was on.

Hoffman said that he had not seen Ramirez log on earlier, but he is the one that has spoken to the non-likelihood of that occurring at this point. He said that it had been a discussion topic for a long time.

Swank can ask if Ramirez knew anything about it, but Swank had not heard anything about that proposal for a while.

Ebel said that the presentation was great, and he appreciated all of the stuff that had gone on by all of the people, Hoffman included, for Kootenai sturgeon. He said that he wanted

to point out that the lessons that have been learned and the observations that have been made on the response of these fish on dam operations are really helpful as we tackle the expansion of this problem across space. He said that it is helpful as we try to figure out what the do with other populations. He said that he really appreciated all the work that Hoffman has done.

Hoffman thanked Ebel in turn, he said that he appreciated it. He said that IDFG have had a great staff over time and there is a lot of neat research that is going on right now so that it is exciting.

Ebel said that the Corps has been working hard to implement some of these things so that we can learn, that is an important part as well.

| *Brian Marotz (Unverified)10:07 AM*

| *I'd like an update on the latest monitoring results for Kootenai White Sturgeon (spawning migrations, location of documented spawning events, and trends in free embryos)*

| *Jonathan Ebel (Unverified)10:13 AM*

| *Brian, I can pass that on to Sean Wilson. He gave a talk at Idaho Chapter AFS meeting based on an in press manuscript. I can send the slides or check if Sean is willing to present in some venue you can attend. It's interesting stuff.*

3. **LMN Operations for Transport Update –** *Erick Van Dyke, OR/FPAC Chair*

Over the last couple of weeks TMT has been revisiting the operations that are occurring at LMN for transport actions to continue following the Corps' RIOG decision.

a. FPC Spill to FOP Graphs

- LMN
  - On the graphs the parts to focus on are the black line that represents outflow and the patterns of within day flow fluctuations. Shown as how the blue dots are associated with the red lines.

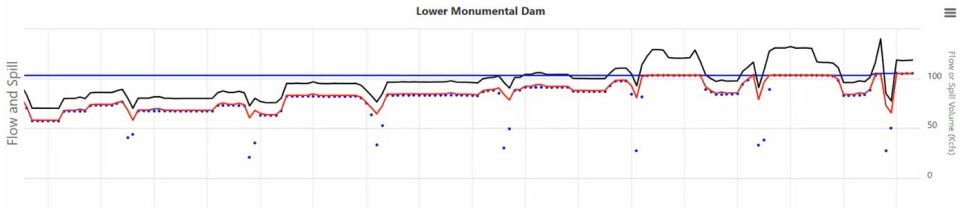


Figure 1: FPC LMN Flow and Spill

  - The decreases in spill (blue dots) are still demonstrating what the FM see as a within day flow fluctuation at LMN in order to accommodate barge loading, docking and departing from the location where fish are loaded at LMN.

- IHR
  - Something described earlier and has been described as a concern for the within day flow fluctuations at LMN is that it reaches downstream and has a wider impact that just at LMN.

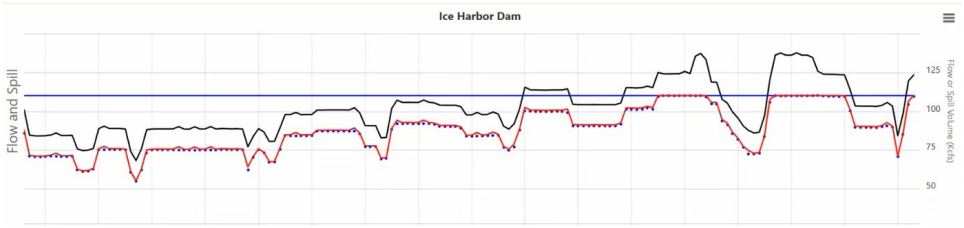
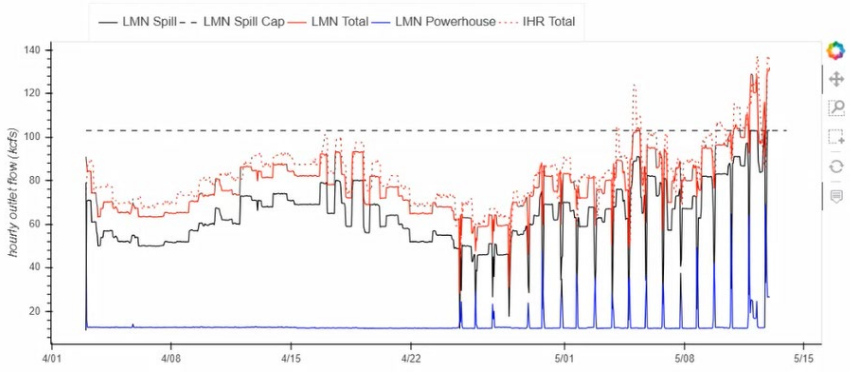


Figure 2: FPC IHR Flow and Spill

  - The same changes are occurring at IHR in outflow (black line) even though there is no change in operation in the blue dot departure from the red line.

b. LMN, IHR Flow & Elevation Timeseries

- Van Dyke asked if the Corps would like to represent the data provided by the Corps. Baus responded that the Corps was asked to put the hyperlink for that information on the agenda. He said that they did not have any talking points prepared but if there were questions the Corps could answer those. Van Dyke said that he would say a few things.



- The departures from all of these lines and how they are bouncing around demonstrates where the within day flow fluctuation is occurring at LMN.

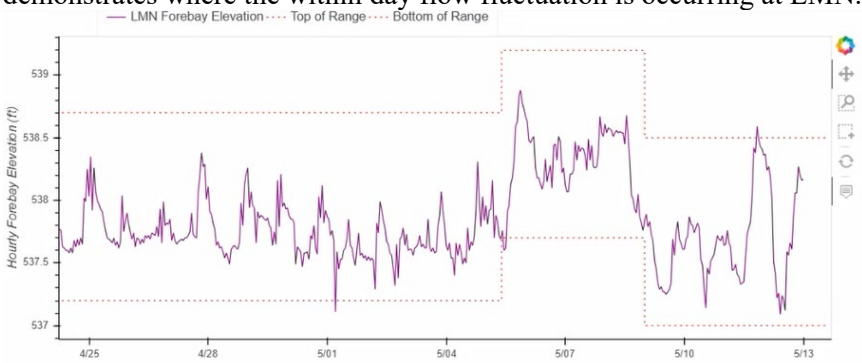


Figure 3: LMN Forebay Elevation

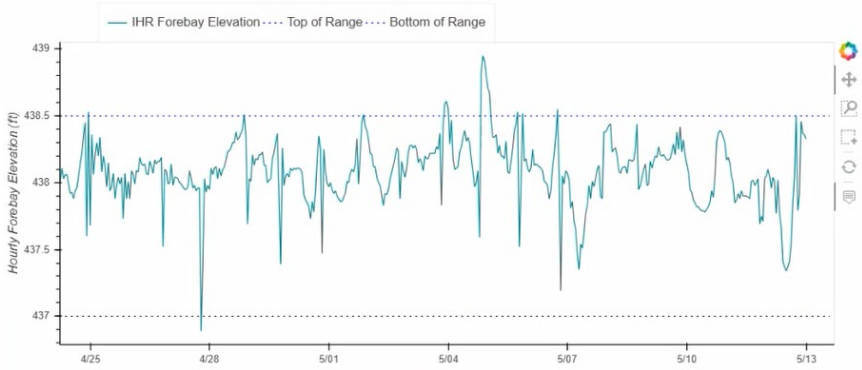


Figure 4: IHR Forebay Elevation

- These two graphs show how forebay elevation has been responding. For IHR there was a point that the forebay fell below 437 feet on April 27, and then there was an operational change and more emphasis by operators on some of the challenges that they are facing.

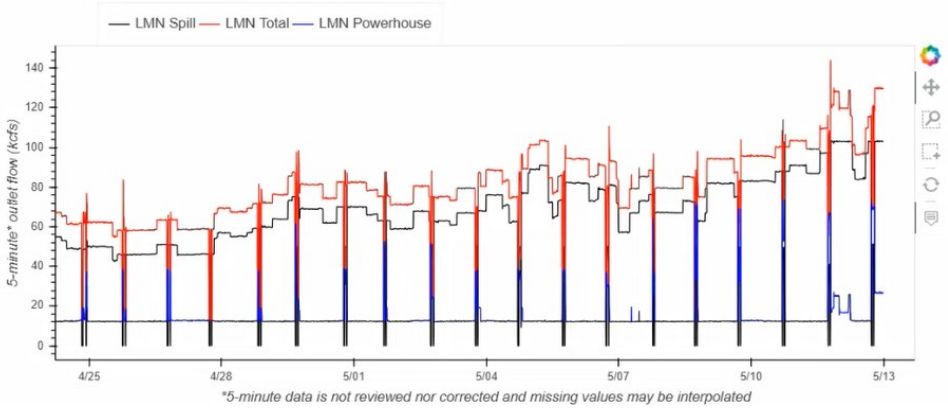


Figure 5: LMN

- Van Dyke said that there was a point that powerhouse (PH) flow was being represented, on April 27 there was not an increase of PH flow as described and that was associated with this decrease.
- Norris responded, saying that there were some issues with real-time coordination between duty schedulers and PH operators that delayed the pickup of generation.
- Van Dyke said that was around the time that we having issues with forebay and it appeared that changes were made.
- He said that what the graphs show is that, even though that one event happened that way, there are still departures that have the elevation flows swinging in around the elevations presented, it is a jagged line, not a straight one.
- The FM believe that it is their observation still that the within-day fluctuations are strongly linked to the transport operations that are ongoing.

Ebel said that he was still asking for, also in writing, that it would be helpful, and maybe it would have to be at the end of the year, in a zip file transfer, of the five-minute data. He said that this would also be interesting to take a look at with the five-minute data if there were any differences between implementation of this operation this year and the implementation last year. In the interest of documenting how lessons learned have been implemented. He asked again for the data, as in the numbers that are underneath the graphs. He said that it would be helpful.

Baus said that they would get him the data at the end of the transport season if that worked for him.

Ebel said that would be great, and that they would figure out how to deal with the file size when they get there.

Van Dyke said that it was expected that transport at LMN would be shifted to every other day operation. He said that he was not sure if it was going to be covered later, or if this moment was the right time to do it. He said that he wanted to reach out and ask if that change is expected to occur as planned or if there was any differences. He asked if there was anyone that could give TMT and update on that.

Baus said that the update provided at the last meeting was that they would go to transportation every other day at LMN today, May 14. He asked that if that had changed would anyone else from the Cops have any different information from last week.

Tiffany Dixon, Corps, said that it was still the plan. Today is the last everyday barge. Then on May 15 there would have no barge go out, and on May 16 the barge would go out and then that would continue every other day from there.

Van Dyke said that was helpful and he appreciated the update.

4. **Flow Augmentation –** *Erick Van Dyke, OR/FPAC Chair, and Tony Norris, BPA*

   a. FPAC Request – *Van Dyke*

   - It is FPAC's understanding that there have been some changes in how they provide recommendations for Columbia River Treaty Flow Augmentation this year.
     - This is their attempt to try to offer recommendations from FPAC.
     - There was a lot of effort to make sure that the language fit all of FPAC's desires and ability to recommend this is something that FPAC worked through.
   - Request:
     - FPAC recommends that BPA release the 1 maf of Columbia River Treaty Storage for flow augmentation, beginning as soon as possible and no later than May 19. The flow volume should be released before August 1.
   - FPAC Perspective:
     - Operational implementation of the Columbia Treaty flow augmentation can limit the realized benefit for anadromous fish under certain circumstances.
     - FPAC is exploring ways to increase the effectiveness of the volume of water in future years.

   b. BPA Response – *Norris*

   - BPA has treaty coordination calls on Thursday and so BPA will email out a decision on how the recommendation will be implemented after BPA coordinates with Canada.
   - BPA will get an email notification out at least by Thursday afternoon.
   - Norris requested that TMT keep this on the agenda so that TMT can reevaluate that as needed.

5. **Operations Review**

   a. Reservoirs

   Reclamation – Chris Runyan

   - Hungry Horse Dam

- Last Week's Conditions:
  - There were above average temperatures, but they have moderated to near average.
- Current Conditions:
  - Precipitation on Monday: 0.7 inches
- Future Conditions:
  - 10-day Precipitation: ~1 – 2 inches
  - Average temperatures.
  - Unsettled weather conditions and cloudy.
  - No major storm events expected.
- May Precipitation in the Flathead Basin has been below average.
  - Precipitation: 68% of median
- Inflows (5/13): 14.6 kcfs
- Outflows (averaged): 5.5 kcfs
- Midnight elevation: 3534.0 feet
  - From Full: 26.0 feet
  - Filled: 5.5 feet last week.
- Upcoming Operation: Meet VarQ outflows.
  - Because May has been drier than normal Runyan will look at decreasing this because if HGH is seeing their residual drop off. This would be coordinated with the Corps.
- Early June Elevation Expectation: 10 feet from full

- Grand Coulee Dam
  - Conditions:
    - Precipitation (like HGH) has been below average for basins above GCL.
    - This will be taken into consideration for operations.
  - Inflows (5/13): 118.4 kcfs
  - Outflows: 102.9 kcfs
  - Midnight elevation: 1264.9 feet
    - Feet from Full: ~25 feet
    - Flat elevation-wise over the last week.
  - Operations: Refill in May and June with close consideration of meeting flow objectives at MCN.

Corps – Aaron Marshall, Corps

- Libby Dam (Lake Koocanusa)
  - Inflows: 26 kcfs
  - Outflows: 7 kcfs
  - Elevation: 2421.0 feet
  - Operations: As heard from Hoffman more to come on the sturgeon pulse operation.
- Albeni Falls (Lake Pend Oreille)
  - Inflows: 44 kcfs
  - Outflows: 40 kcfs
  - Elevation: 2054.9 feet
  - Operations: ALF will operate to refill Lake Pend Oreille to the normal summer operating range sometime in June, depending on the shape of the runoff and flood risk management needs.
- Dworshak Dam
  - Inflows: 16 kcfs
  - Outflows: ~1.7 kcfs (DWR minimum)
  - Elevation: 1570.65 feet
  - Operations: DWR is operating to its Flood Control Refill Curve and expects minimum outflows in the near term.
- Lower Granite Dam
  - Inflows: 115 kcfs
  - Outflows: 117 kcfs
  - Elevation: 733.8 feet
- Lower Snake River Projects
  - Operations: All Lower Snake River projects are operating in normal operating pool range.
  - LMN was returned to its MOP range on May 9, 2025.
- McNary Dam
  - Inflows: 245 kcfs
  - Outflows: 231 kcfs
  - Elevation: 337.7 feet
- Bonneville Dam
  - Inflows: 261 kcfs
  - Outflows: 242 kcfs

- Elevation: 72.9 feet

b. Water Quality – *Dan Turner, Corps*

- Missing Data
  - Missing data at LGNW, Lower Granite tailwater gauge.
    - Blown membrane happened later on Thursday, and they were not able to get out there until Monday to repair the gauge.
  - After the repair the gauge was reading ~127% TDG with spill, right at the spill cap so the spill cap was lowered there.
  - TDG this morning is looking good at 125% TDG.
- TDG exceedances
  - LMN Forebay (LMNA)
    - Exceedances of 126% TDG
    - The Corps does not lower spill in this case, they are only operating to the 125% TDG of the tailwaters.
- General Information

	MCNARY				JOHN DAY				THE DALLES				BONNEVILLE			
DATE	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS PILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG
	KCFS	KCFS	HOURS	%	KCFS	KCFS	HOURS	%	KCFS %	KCFS	HOURS	%	KCFS	KCFS	HOURS	%
2025-05-13	220	• 185		123	233	• 133	16	118	40	99		119	150	150		122
2025-05-12	220	• 206		124	233	• 139	16	119	40	102		121	150	151		122
2025-05-11	220	• 176		124	233	• 127	16	119	40	94		121	150	150		121
2025-05-10	220	• 169		124	233	• 127	16	119	40	91		122	150	150		121
2025-05-09	220	• 177		123	233	• 128	16	119	40	91		122	150	149		122
2025-05-08	220	• 156		122	233	• 115	16	117	40	85		119	150	149		121
2025-05-07	220	• 148		121	233	• 117	16	118	40	84		121	150	149		121
2025-05-06	220	• 167		123	233	• 122	16	118	40	89		122	150	149		122
2025-05-05	220	• 156		122	233	• 117	16	117	40	89		120	150	149		122
2025-05-04	220	• 135		120	233	• 108	16	117	40	79		118	150	149		122
DATE	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG

Figure 6: Water Quality Lower Columbia River

  - Still minimum generation in the Lower Columbia
    - Still a lot of min-gen spill the rest
    - Green dots are an indicator of likely min-gen spill the rest
  - Reached spill cap at MCN for a few hours
    - This was a first in the new MCN spill pattern operation.
    - Only for a couple of hours, so not a good idea of what TDG would be if we spilled there for a 24-hour period.

DATE	LOWER GRANITE				LITTLE GOOSE				LOWER MONUMENTAL				ICE HARBOR			
	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG
	KCFS	KCFS	COUNT	%	KCFS	KCFS	COUNT	%	KCFS	KCFS	COUNT	%	KCFS	KCFS	COUNT	%
2025-05-13	78 ↓	80	0	• 127	88	68	8	125	105 ↑	• 93	0	124	110	• 100		125
2025-05-12	82 ↓	83	0		88	68	8	125	103	91	0	124	110	• 98		125
2025-05-11	84	84	0		88	69	8	125	103	• 89	0	123	110	• 97		123
2025-05-10	84	84	0		88	68	8	124	103	• 81	0	122	110	• 88		120
2025-05-09	84	• 82	0		88	64	8	124	103	• 77	0	122	110	• 84		119
2025-05-08	84	• 74	0		88	52	8	122	103	• 65	0	121	110	• 74		117
2025-05-07	84	• 74	0	124	88	54	8	124	103	• 65	0	120	110	• 70		117
2025-05-06	84	• 79	0	125	88	60	8	125	103	• 75	0	122	110	• 81		118
2025-05-05	84	• 84	0	125	88	65	8	125	103	• 78	0	122	110	• 87		122
2025-05-04	84	• 79	0	124	88	57	8	123	103	• 68	0	121	110	• 73		117
DATE	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG	SPILL CAP	DAILY AVG. SPILL	PS SPILL	TW TDG

Figure 7: Water Quality Snake River

- Still spilling near spill caps on the Snake River.
- Spill cap changes at LWG and LMN
  - Increase from 103 kcfs to 105 kcfs.
- LWG and IHR still have some min-gen spill the rest even though we are right around spill caps occasionally during the day at those projects.

c. Fish

**TMT would like to caveat that the 10-year averages are NOT their management goal, and the 10-year averages are well below the goals that TMT has for total returns/abundance coming back.*

Salmon – Kelsey Swieca, NOAA

- Juveniles
  - Yearling Chinook
    - Generally trending down in the Lower Snake River but remains high in the Lower Columbia River.
    - Smolt Passage Index (two-week average)
      - Bonneville: 86k per day over the weekend.
  - Steelhead
    - LWG passage is also decreasing following a sharp uptick late last month.
  - Sockeye
    - Snake River Sockeye are showing up at LWG and as usual expect their passage to be fairly punctuated and to see them pass through LWG and then through the system fairly quickly over the next week or so.
- Adult Salmon Counts
  - Spring Chinook
    - Reaching the peak of passage at Bonneville Dam

        - Ten-year YTD Average:
            - Bonneville: 127%
            - Ice Harbor: 97%
    - Steelhead
        - Counts are still low in the lower river at Bonneville and the other lower river projects.
        - Ten-year YTD Average:
            - Bonneville: 49%
            - Ice Harbor: 124%
- FOP
    - Per the FOP definition of adult delay, the criteria have not been met at the projects to initiate a change of operation at LMN or LWG.

Van Dyke said that the detail about the Steelhead. He said that he thought the total was the sum of the year. Steelhead tend to be summer steelhead. Timing is later in the year. Tally may not apply as the salmon counts.

Lamprey – Dave Swank, USFWS

- Lamprey Counts
    - There are a few lamprey starting to trickle at BON.
- LPS – Lamprey Passage System
    - Now have counts for the "LPS Lamprey 3)", it is now hooked up and available on the FPC website.
    - Footnote 3 provides clarification on what exactly these counts represent.
        - Explains what an LPS is.
        - Makes clear that they are separate counts and are not a subset of the previous lamprey column – it is a separate passage system.
        - Quirk that they may still want to refine is that in order to make the LPS consistent with all of the data on the page the LPS counts are currently the 16-hour counts.
        - The 24-hour report for the Lamprey Day and Night report, for BON gives a complete lamprey passage counts. Includes the window counts, the night counts using video (starts May 15), and the LPS 24-hour counts. The YTD count is different than the LPS 16-hour count.
    - Lamprey are more challenging to count than salmon and steelhead. This is brand new, and Swank wanted to make sure that TMT was aware that the LPS counts are now available, but it is a little more complicated than typical fish counts.

d. Power System – *Tony Norris, BPA*

- Generally seasonal temperatures for Spring and no issues to report.

6. **Set agenda for next meeting – May 21, 2025 & *Process Meeting***

   Meeting Location: Microsoft Teams

   a. Flow Augmentation
   b. LMN Transport Update
   c. Sturgeon Update (*set tentatively for May 28, 2025*)

Today's Attendees:

Agency	TMT Representative(s)
NOAA Fisheries	Kelsey Swieca, Emi Melton
Oregon	Erick Van Dyke
Washington	Charles Morrill
Kootenai Tribe	
Confederated Tribes of Colville Reservation	Dennis Moore
Umatilla Tribe (CRITFC)	Pete McHugh, Tom Lorz
Yakama Nation	Keely Murdoch, Tom Iverson
Bureau of Reclamation	Chris Runyan
Army Corps of Engineers	Doug Baus (Chair), Aaron Marshall, Lisa Wright
US Fish & Wildlife Service	Dave Swank
Idaho	Jonathan Ebel
Montana	Brian Marotz
Spokane Tribe	Brent Nichols
Nez Perce Tribe	Jay Hesse
Warm Springs Tribe	
Confederated Salish and Kootenai Tribes	
Bonneville Power Administration	Tony Norris, Ben Hausmann

Other Attendees (non-TMT members):

COE – Dan Turner, Alexis Mills, Tiffany Stoeckig-Dixon, Leon Basdekas, Chris Peery, Nick Bertrand, Leah Hamilton, Michelle Yuen, Oscar Espinoza, Eric Chow, Gregory Hoffman, Tom Conning, Willow Walker, Patricia Madson, Kasi Underhill

BPA – John Bannon, Tammy Mackey

Washington Ecology – Thomas Starkey

Flathead County Commissioner – Randy Brodehl

DS Consulting – Emily Stranz (Facilitator), Nancy Pionk

CorSource – Andrea Ausmus (BPA note taker, Contractor)

EKI – Eve James

Chelan PUD – Carl Bertilson, Kate Von Reis Baron, Jay Fintz, Lance Beyer

Avista – Steve Lentini, Mike Dillon, Ryan Ericksen

Snohomish PUD – Mike Shapely

Portland General Electric – Phil DeVol

Energy EPS – Joshua Rasmussen

FPC – Erin Cooper

Mike Buchko

Ryan Mihuc

Shea Frantz