NorthWestern Energy Thompson Falls Hydroelectric Project (No. 1869)
Annual Thompson Falls Technical Advisory Committee Meeting
Missoula, Montana (MFWP Office)
November 29, 2017, 10:00 AM to 3:00 PM

Welcome
The Thompson Falls Technical Advisory Committee (TAC) Meeting was held at the Montana Fish, Wildlife and Parks office in Missoula. Brent Mabbott, NorthWestern Energy (Licensee), facilitated the meeting. List of attendees provided at the end of this meeting summary.

Announcements (NorthWestern)
Jon Jourdonnais retired September 2017; Andy Welch was hired as the new Hydro License Compliance Leader and Jordan Tollefson is the new Hydro Compliance Professional.

- **Relicensing**
  Mary Gail Sullivan – the FERC project license will expire in December 2025. NorthWestern is in the planning process of relicensing and plans on using the Integrated Licensing Process (ILP) versus the Traditional Licensing Process (TLP).

  The first FERC filing isn't due until 2020. Ginger Gillin, GEI Consultants, Inc., will be the lead consultant for NorthWestern during the relicensing process. The ILP has a rigorous and set schedule for consultation with stakeholders which requires a lot of upfront work prior to Licensee submittal of the License Application to FERC. FERC is actively involved in the beginning.

  NorthWestern is planning on setting up a stakeholder meeting end of next year (Nov/Dec 2018). Between then and now, NorthWestern is gathering existing information to identify any data gaps and/or study needs. NorthWestern is voluntarily taking this approach prior to submittal of the Pre-Application Document.

- **New Radial Gate Construction Update (NorthWestern)**
  Construction occurring now and on schedule. Finish by April 2018 (prior to spring runoff)

- **2017 Baseline Fisheries Results**
  Only completed autumn gillnetting (October 11-12, 2017). Caught 188 fish; eight species. Black Bullhead and Northern Pikeminnow were most abundant. Did capture some large NP this year. One salmonid (WCT) was also captured. No previously tagged fish recorded. Of the fish collected in Thompson Falls Reservoir using gill nets, 82 percent have been species that have never been collected in the fish ladder over the period of record.

- **2018 Baseline Fisheries Data Collection**
  Spring Electrofishing – Thompson Reservoir (Upper and Lower)
  Fall Electrofishing – Above Islands and Paradise to Plains
  Fall Gillnetting – Thompson Reservoir (annual activity)
  Baseline electrofishing again in 2020 (alternating years)

NorthWestern Energy Thompson Falls Hydroelectric Project (No. 1869)
Annual Thompson Falls Technical Advisory Committee Meeting
Missoula, Montana (MFWP Office)
November 29, 2017, 10:00 AM to 3:00 PM

- **2017 Total Dissolved Gas (TDG) Monitoring and Results**

TDG monitoring data goes back to 2004. Montana Water Quality Standard for TDG is 110 percent. Literature indicates when TDG is above 120 percent is generally when impacts to fish are seen. If fish stay in deep water, less impact.

TDG monitoring was done at 3 sites: Above Dam, High Bridge, Birdland Bay Bridge. **Above dam** – flows coming into project site (upstream of dam). **High Bridge** – downstream of Main Dam through a natural waterfall. NorthWestern has tried to measure upstream and downstream of falls below Main Dam, but monitors blow out and results were not very satisfactory. Difficult area to drill down to difference between Main Dam spillway to High Bridge. **Birdland Bay Bridge** – downstream entire project (includes water through powerhouse, dry channel, and main dam)

General Data Results: **Above Dam** – always below 110 percent; **High Bridge** – always the highest levels observed; and **Birdland Bay Bridge** – mix of powerhouse flows and main spillway flows, so TDG levels are in between TDG levels Above Dam and TDG levels below the High Bridge site.

2017 Results – 2017 was an average water year, with peak flows exceeding 80,000 in early June. Flows declined rapidly in July. Results from 2017 were similar to previous years (2003-2014) within the various flow ranges. **Above Dam** was again below 110 percent. Increases start with increase flows and then TDG levels level off at about 60,000 cfs and do not appear to continue increasing. Gas bubble trauma (GBT) was very limited GBT in fish during surveys. No GBT surveys were completed in 2017. Previous results in corresponding annual reports.

New radial gates are being installed to address dam safety issues. The impact of the new radial gates on TDG are unknown, but the bedrock below the new gates may help step down the water and reduce TDG levels. NorthWestern will monitor to evaluate TDG following installation of the new gates. NorthWestern will continue to measure TDG to understand potential impacts and identify optimal operations to minimize TDG and provide attractant flow for fish and upstream fish passage.

- **Ladder History & Goals Overview (Ginger Gillin, GEI)**

Fish passage was a non-issue in early history of dam (1910). Fisheries became a highlighted issue with the listing of Bull Trout as an endangered species in 1998. PPL Montana voluntarily set up the Fisheries TAC in 2001. At the time, U.S. Fish Wildlife Service (FWS) didn't have enough information to write a Biological Opinion (BO). The TAC started with a Study Plan for fish passage. The first question was, "Is fish passage even desirable?", followed by, "Are there disease or genetic concerns to consider?" Radio telemetry studies were implemented for 3 years to answer these questions. The project site is a complex layout with two powerhouses and two spillways. It wasn't known which path fish took to migrate upstream. There was a need to understand where fish went (migratory paths). The results indicated fish primarily end up at the Main Dam.

MFWP Policy

Management emphasis to enhance and maintain all species except walleye and lake trout.

Passage can help achieve management goals by providing increased numbers of sport fish to a depressed population.
MFWP supports passage of all salmonids (except lake trout) and native species.
All species except walleye and lake trout should be passed at Thompson Falls Dam

FWS BO (2008) Required construction of a permanent fishway.
"The primary effect of the…fishway, is a major beneficial effect on habitat access by allowing volitional movement of bull trout (BULL) upstream past the Project."

NorthWestern Energy Fish Ladder Goals

- Comply with all environmental laws and requirements.
- Provide upstream adult BULL passage.
- Operate the ladder as volitional fish passage as soon as possible.

Discussion
Question to the group – Do these management goals still apply in 2017?

Ryan Kreiner (MFWP) – The state does not want to walleye to pass or move upstream. Since walleye have moved upstream in orifice mode, MFWP believes this would rule out volitional passage in orifice mode. Goals listed by NorthWestern do not included "pass as many fish (all species) as possible."

2016 walleye results: Walleye passage at ladder occurred on June 11 and 22, 2015 at 19.9 and 19.1 degrees Celius (°C). Flows were 34,800 cfs and 18,900 cfs (approx.).

Brent (NorthWestern) – Thinks there are times of the year when NorthWestern can run volitionally and other times of the year that may not be able to run volitionally.

Mark Deleray (MFWP) – Known that walleye can go in orifice mode, but unclear that they can go up in notch mode.

Ladd Knotek (MFWP) – It's a difficult dilemma since we know fish are being illegally introduced upstream but not "established" at this point. So MFWP cannot support volitional passage at this point. Maybe someday in the future walleye presence upstream is different and the view may change.

Ginger (GEI) – What data will be necessary for MFWP to be comfortable with volitional passage? With only two walleye out of 30,000 fish and 7 years of data, it will be very difficult to prove that walleye cannot pass the ladder.

Ladd Knotek (MFWP) – Not sure if there is an answer yet for Ginger's question. MFWP doesn't think their Policy has changed. MFWP does not want walleye and does not want pathogens, etc.

Ryan (MFWP) – Pathogens sampling occurs every 5 years above and below Thompson Falls Dam. Also, MFWP notice that walleye are an expanding presence in Noxon in recent past.

Andy (NorthWestern) – What benchmarks can be developed to where NorthWestern can consider volitional passage? Two of 30,000 walleye is low; is one walleye too many? What are the thresholds? Would like to know what mechanisms need to be in place to get to end goals of volitional.

Skaar (MFWP) – Is there an issue to not have volitional passage? Andy (NorthWestern) – No requirement.

Kevin (FWS) – The FWS focuses on "timely and effective" fish passage; doesn't have to be volitional. Not certain what the thoughts were at the time with volitional passage was discussed in the 2008 BO. Volitional passage may end up being updated/revised in the new BO.

Craig (Confederated Salish and Kootenai Tribes (CSKT)) – Remembers that the primary concern for CSKT was walleye passage.

- **2017 Ladder Results**

2017 Operational Season – Notch Mode Only
March 21 – October 31, 132 ladder checks, 14 days closed (June 2-15)
Max Water Temp 24.3 °C
Peak Flow ~82,100 cfs
Higher than usual early spring flows >30,000 cfs
2017 total fish count at ladder (n=530), 305 Salmonids, 225 Non-Salmonids
One BULL at ladder on September 18 (new fish); water temp 15.1 °C; streamflows 8,270 cfs. Detected again in Thompson River Oct 23, 2017.
No tagged BULL detected in ladder in 2017

- **Discussion and Recommendations for 2018 Ladder Operations (Weir Mode)**

Ryan (MFWP) – We predicted to miss the big pulse of primarily non-salmonids in the summer. We certainly pass more fish in orifice. Did not expect to see a lower percentage of tagged-fish entering the ladder ascending to the top. Looking at NorthWestern goals and running the ladder in orifice mode, we are trading goals for volitional passage to "pass as many fish as possible."

Ladd (MFWP Region 2) – End goal is to see as many recreational fish as possible passed upstream. In the interim further testing to evaluate the notch would be fine.

Craig (CSKT) – Seems like we are missing some type of whole ecosystem benefits when we exclude some of the taxa (in notch mode compared to orifice) but there are some trade-offs too.

Kevin (FWS) – Sample size for Bull Trout are so small… we would like to see notch mode for another year.

Andy (NorthWestern) – What is the goal or advantage to running in notch mode?

Craig (CKST) – If we did run the notch mode again, we can look at variables again with bull trout. It's an opportunity to learn more…then look if not effective across the range or find out something different.

Kevin (FWS) – Let the mode be consistent for multiple years to address changes in flow and temperatures. Either confirm what we think we know or learn more information.

Mark (MFWP) – Likes idea of continuing in notch mode.

Ladd (MFWP) – Next year use notch mode and make improvements to orifice over the next 2 years. Then we will have a good range of options.

Andy (NorthWestern) – Sounds like the group wants to learn the difference of the weir modes and learn what mode works for different species. Maybe we should have a sub-group meeting to further define objectives and goals for operations through 2020. Longer and clear forecast for study and analysis for next 3 years.

- **Thompson River (ladder fish)**

About 32 percent of the tagged fish released upstream in 2017 were detected in Thompson River; 20 fish released upstream 2016 or earlier.

About 33 percent of the tagged fish released upstream in 2016 were detected in the Thompson River in 2016; 27 fish detected were released upstream 2015 or earlier.

About 39 percent of the tagged fish released upstream in 2015 were detected in the Thompson River in 2015; 61 fish detected were released upstream 2014 or earlier.

- **Glaid's (2017) Thesis – Summary of Results (available on Project website)**

2014	53 PIT Tagged WFTR; none detected in Thompson Reservoir; 2 were detected mainstem Thompson River (4%)
2015	701 Tagged in Fishtrap and WFTR; 26 out migrate to Reservoir (3.7%) in 2015; 166 out migrate to mainstem Thompson River (23.7%)
2014-2015	3 percent out migrated to Reservoir; 22 percent out migrated to Thompson River
Overall:	Low out-migration rate in 2015

23.7 percent out-migrate tributaries to mainstem; majority to mainstem in October.
3.7 percent out-migrate to Reservoir; majority to reservoir in December.
Majority of Bull Trout moved at night (2000-0800 hrs).
Out-migration had a weak association with abiotic factors.
Size was not a strong predictor for out-migration from tributaries, residential, and migratory life histories overlap spatially.

- **2017 MFWP Activities**
  - Thompson River tributary remote array updates completed in tributaries (Fishtrap and WF Thompson River).
  - Updates completed and hope for a full year (2018) of data from tributaries.

- **2017 TAC Funded Project Updates**

Cedar Creek Phase 2 Road Relocation and Large Wood Debris Enhancement Project (2016) (Jon Hanson/Trout Unlimited [TU]) ($30,000)

Paul Parson, Project Manager for TU working in middle Clark Fork River. Focused on Cedar Creek near Superior, MT. Road system was an old railroad bed. Road was straight and did not follow the contour of the land. TU moved the road up on the mountain and put in large wood structures in system (cedar and spruce). Just finished up 3 to 4 weeks ago. Worked through fire season. 2017 – one road section and augmented six log structures.

2015 Cedar Creek project – 3 miles in Cedar Creek. 113 log structures. 2015 areas abut to 2017 section. Fish densities doubled from control to treatment. Positive results (WCT primarily). Successful in reconstruction floodplain. Starting to see beaver recruitment.

Beartrap Fork Culver Removal Project (2016) (Jon Hanson)
Executed contract. No contractors available due to 2017 wildlife season. U.S. Forest Service (USFS) set up to start work and complete project in 2018. Funds allocated: $11,000.

Rattlesnake Creek Fish Screen Project, Phase I (2016) (Rob/Ladd) ($13,125)
Turned into fish passage project. Rob Roberts (TU) works in upper Clark Fork River (upstream of Missoula). Rattlesnake headwaters are in the wilderness area and the last 2 miles of stream flow under several bridges/culverts. Bull trout are present. There are six diversions for agricultural use on the Rattlesnake. TU objective include improving non-functioning structures, eliminating fish barriers. NorthWestern seed money provided the ability to start design of improvement of the old, non-functioning structures.

In 2017, TU completed topographic survey of all irrigation diversion sites and conceptual design. TU has installed new fish screen on 3 of the 6 diversions. Now the dam is the last barrier. In 2017, city of Missoula purchased the Montana Water Company. A MOU with the city of Missoula exists to start work on removal of the dam (proposal for 2018 funding).

2017 Bull Trout Genetics ($10,000)
No Bull Trout genetics in 2017. New assignment model being developed for upper Rock Creek and upper Clark Fork and Blackfoot through UM.

2017 Thompson River Watershed Coordinator ($16,500)
Coordination of various entities (FS, DNRC, Weyerhaeuser, MFWP, FWS) to develop Watershed Restoration Plan. The draft Watershed Restoration Plan will be available for everyone in December 2017 for review and comment. Many drainages heavily impacted that are not bull trout focused but in need of restoration.

2018 Proposals

Agency/Entity	Project Proposal	TAC Funding Requested	Total Project Costs	TAC Vote
MFWP (Ladd Knotek)	Koch In-holding Acquisition Lower Fish Creek	$60,000	$800-900,000	Approved unanimously by TAC via email Aug/Sep 2017 – still waiting for owner to decide if selling property
MFWP (Kreiner)	Crow Creek Stream Reconstruction Design	$30,000	$30,000	Vote Yes (unanimous) **if legal agrees – update 12/18/2017, projects located downstream of Dam are not eligible for TAC funding**
TU/MFWP	Rattlesnake Dam Removal Project, Phase 1	$20,000	$100,000	Vote Yes by MFWP, CSKT, NorthWestern. FWS abstain vote
NorthWestern / Avista	Prospect PIT Tag array	$20,000	$40,000	Vote Yes (unanimous) **if legal agrees - update 12/18/2017, projects located downstream of Dam are not eligible for TAC funding**
LCFWG	3-years for Thompson River Coordinator	~~$49,500~~ **Approved $16,500**	$49,500 (additional match expected)	Vote Yes $16,500 for 2018 Yes - unanimous
NorthWestern	BULL Genetics	$10,000	$10,000	Yes – unanimous
NorthWestern	Emergency Fund	$10,000	$10,000	Yes – unanimous
TOTAL Requests		$214,500		
TOTAL Approved 2018		**$116,500**		Updated Total (excludes two Prospect Proposals not eligible for funding)
2017 work still pending for 2018	**Beartrap Ck Culvert Replacement**	**$11,000**		
2018 Budget		**$127,500**		

Description/Discussion of 2018 Proposals

Brent – We have MOU and add $100,000 per year with cap of $250,000. The current balance is about $120,000. NorthWestern will add $100,000 after first of the year (2018). Balance for 2018 projects is about $220,000.

Two proposals submitted for 2018 (Prospect Ck PIT Tag Array, Crow Creek Restoration) with project areas downstream of Thompson Falls Dam. **Brent will organize sub-group (FWS, MFWP, USFS, CSKT, NorthWestern members) to discussion and develop recommendations for defining the boundaries and priorities areas for projects to be eligible for TAC funding.**

Koch In-holding Acquisition Lower Fish Creek - (Ladd Knotek-MFWP)

Last big in-holding in Fish Creek WMA (wildlife management area). Last best bull trout population between Missoula and Thompson River. Trying to get a 320-acre parcel that will cover 1.2 miles of mainstem Fish Creek. Presentation provided last annual TAC meeting in 2016. Parcel appraised at $900,000; decision to sell is in owner's hand. Once/If approved, MFWP can get funding. Ladd (MFWP) will only use TAC funding if owner agrees to sell property.

Crow Creek Stream Reconstruction Design (Ryan-MFWP)

Crow Creek enters Prospect Creek on upper end of drainage, located downstream of Thompson Falls Dam. Upper end is seasonally isolated. Entirely native fish community in creek (WCT, BULL). Two power lines up Prospect (Bonneville Power Administration and NorthWestern). Sections of Crow Creek lack trees due to power line corridor. Following a 2007 restoration project, fisheries surveys indicate WCT biomass and abundance went up after restoration. Jason Blakey is studying WCT in Crow Creek and highest densities were in the 2007 restoration reach. Proposal to get $30,000 for design to mimic 2007 restoration project located upstream of proposed project.

Ladd (MFWP)– is this project in Avista project area? Eric (Avista) – yes, it's in Avista Project area. Because the effect is part of the power line corridor, Avista won't tackle it all, but worthwhile partnering. Jon Hanson(NorthWestern) is coordinating with USFS through a special use permit to remove one or two power poles through the area that would thus allow for some of that restoration in that area. NorthWestern increased project costs by about $250,000 with recommendation from USFS resulting in fewer poles in the floodplain in Prospect drainage. Craig (CSKT) –thought this was a great project.

Brent (NorthWestern) – That project is out of "our" boundary right now; suggested Ryan (MFWP) submit proposal. Andy (NorthWestern) – This funding is operated through the MOU which specifically states upstream projects. MOU is under BO Terms and conditions #4 and then under FERC Order (approved and part of license). It's a license condition and needs support of FWS.

FWS – have relaxed boundaries that in the past have been focused on upstream only. FWS would rather cast a wide net to do good projects as they may be available.

Andy (NorthWestern) – If we want to pursue projects, need legal staff provide input.

TAC Vote on project (design component) – MFWP, CSKT, FWS, and NorthWestern vote: Yes

Group decided to vote in order to ear-mark if smaller group defines boundary and legal approves.

Brent Action Item: Get smaller group to define boundary for TAC Funding and the provide recommendation for Andy to take to legal to review. MFWP recommended the subgroup define prioritization areas and mitigation goals.

Trout Unlimited/MFWP – Rattlesnake Dam Removal Project, Phase 1
TAC Vote: FWS has no doubt there are benefits to bull trout but still has concerns with invasive species (brown trout) moving upstream. FWS abstained. CSKT, MFWP, and NorthWestern vote: YES

Majority: Yes.

NorthWestern/Avista – Prospect Creek Array
A PIT tag antenna proposed for installation near the mouth of Prospect Creek to document movement of PIT tagged fish. Electricity for operation of the antenna will be secured (funded by the Thompson Falls Fisheries TAC) from a local resident and MFWP personnel will monitor the antenna.

$20,000 NorthWestern and $20,000 Avista (to split cost)

TAC – vote (MFWP, FWS, CSKT, NorthWestern): Yes. Funding is contingent on legal review of definition for allocation of TAC funds.

Brent (NorthWestern) – Action Item: Get smaller group to define boundary for TAC funding and the provide recommendation for Andy (NorthWestern) to take to legal to review.

LCFRWG – Thompson River Coordinator (3-years)
Over the next 3 years, the Lower Clark Fork Watershed Group (LCFWG) will take the lead on implementing the Thompson River Watershed Restoration Plan. Continued support from NorthWestern will be instrumental in making this possible. The LCFWG will develop project ideas identified in the plan and move on-the-ground projects forward—completing activities such as connecting key stakeholders, identifying opportunities for collaboration, securing funding, obtaining permits, and hiring contractors. The LCFWG's work will also include key maintenance, monitoring, and follow-through post-implementation that is necessary for a project's success into the future. After the finalization of the Thompson River Watershed Restoration Plan, the LCFWG will focus efforts in 2018 on planning, with the idea of project implementation in 2019 and 2020.

Group discussed if able to pay for multiple years and group concurred this may not be feasible.

TAC agreed to the $16,500 for 2018 effort. Funding will need to be requested annually. TAC approved $16,500 by MFWP, FWS, CSKT, NorthWestern.

NorthWestern – Bull Trout Genetics Analysis
TAC (FWS, NorthWestern, MFWP, CSKT) approved $10,000.

NorthWestern – Emergency Contingency Fund
During ongoing operations and proposal work there are times when this approved proposal would allow for immediate funding of equipment, stream restoration assessments, or other conditions that may require immediate attention. This proposal will eliminate (within the $10,000 limit) the need for TAC approval of a new proposal for spending of TAC funds.

Report at end of the year if any money spent.

TAC (FWS, NorthWestern, MFWP, CSKT) approved $10,000.

Any additional proposals during the year, submit to Brent (NorthWestern) and he will coordinate with TAC via email for review and vote.

Annual Report
Draft will be available for the TAC for review between February 9 and March 9.

Next Meeting
2nd or 3rd week of December for sub group to discuss TAC funding boundaries, priority areas, and ladder operations for next 3 years.

2018 – TAC will meet at the end of November.

Relicensing meeting likely in December (middle December discuss potential proposals for work to do related to relicensing).

Adjourn

Action Items:

1. **Brent (NorthWestern) set up a sub-group meeting (Kevin [FWS], Ryan [MFWP], and Marc [MFWP], Ladd/Pat Saffel, Jon H. [USFS], Brent [NorthWestern]):**
   - **Discuss and develop a recommendation for ladder operations for the next 3 years (2018-2020). Include Andy (NorthWestern) and Craig (CSKT) in emails. TAC will vote on recommendations provided by sub-group via email. Goal will be to have meeting in December 2017.**
   - **Define boundary for TAC funding and the provide recommendation for Andy (NorthWestern) to take to legal for review. Definitions will need to be voted and approved by TAC members.**
2. **TAC to review draft 2017 Annual Report (February 9 – March 9)**

NorthWestern Energy Thompson Falls Hydroelectric Project (No. 1869)
Annual Thompson Falls Technical Advisory Committee Meeting
Missoula, Montana (MFWP Office)
November 29, 2017, 10:00 AM to 3:00 PM

November 29, 2017 Meeting Attendees:

Name	Affiliation	Email	Phone
Andy Welch	NWE	andrew.welch@northwestern.com	406-444-8115
Brent Mabbott	NWE	brent.mabbott@northwestern.com	406-490-1801
Jordan Tollefson	NWE	jordan.tollefson@northwestern.com	406-565-3879
Mary Gail Sullivan	NWE	marygail.sullivan@northwestern.com	406-497-3382
Don Skaar	MFWP	dskaar@mt.gov	406-444-7409
Shana Bernall	Avista	shana.bernall@avistacorp.com	406-847-1293
Eric Oldenburg	Avista	Eric.oldenburg@avistacorp.com	406-847-1290
Craig Barfoot	CSKT	craigb@cskt.org	406-675-2700 ext 7295
Brita Olson	LCFWG	brita@lowerclarkforkwatershedgroup.org	208-304-3852
Harvey Carlsmith	MFWP	hcarlsmith@gmail.com	406-529-0348
Ladd Knotek	MFWP	lknotek@mt.gov	406-542-5506
Mark Deleray	MFWP	mdeleray@mt.gov	406-751-4550
Ryan Kreiner	MFWP	rkreiner@mt.gov	406-827-9320
Marc Terrazas	MFWP	Mterrazas@mt.gov	406-827-9205
Rob Roberts	TU	rroberts@tu.org	406-540-2944
Paul Parson	TU	pparson@tu.org	406-543-1192
Jon Hanson	USFS - Lolo	jrhanson@fs.fed.us	406-822-3919
Kevin Aceituno	USFWS	Kevin_aceituno@fws.gov	406-758-6871
Ginger Gillin	GEI	ggillin@geiconsultants.com	503-342-3777
Kristi Webb	New Wave	kwebb@nw-enviro.com	406-239-4884