
To: WEI Technical Working Group members

From: Jayson Kurtz, TWG Coordinator, Ecofish

Date: October 29, 2020

Re: WEI Technical Working Group meeting: Wednesday, October 21, 2020, 9:00 am to 11:00 am

Objective: to brainstorm river fisheries interests:

List of potential issues:

Interest	Potential Issue/pathway of effect
Off-channel	need to refine
ramping	Fluctuating water levels in the river can strand fish in shallow water
River temperatures for fish (chinook salmon)	Warm summer water temperatures can affect adult chinook migration and pre-spawn survival.
River temperatures for fish (Sockeye)	Warm summer water temperatures can affect sockeye migration/survival. Need to consider existing STMP, and whether a different temperature target and/or timing is more appropriate. Also need to consider a dynamic flow schedule that accounts for in-season conditions (temp, precipitation, reservoir elevation).
River temperatures for fish (resident trout)	River temperatures can affect growth and survival
winter fish habitat flows	are winter flows sufficient to protect eggs? Salmon overwinter habitat?
resident fish species	issue needs to be refined, could include habitat, flows, temperature
Riparian restoration or enhancement	need to refine
Chinook salmon	issue needs to be refined, could include habitat, flow/flow timing, temperature

Interest	Potential Issue/pathway of effect
Side-channels	need to refine
Sturgeon	Spawning timing corresponds with declining hydrograph, natural hydrograph should be returned
Sturgeon recruitment	Defer to NRWSRI
Sturgeon - providing clean spawning gravel	Defer to NRWSRI
Sturgeon – establish naturally self-sustaining population	What criteria is success? Defer to NRWSRI?
Sturgeon – interaction with Upper Fraser populations	Is there any interaction with upper Fraser sturgeon? Opportunities to enhance/mitigate migration. Defer to NRWSRI
Tributaries	need to refine

Attendees:

- Rahul Ray (EDI)
- Jayson Kurtz (Ecofish Research Ltd.)
- Stephen Dery (UNBC)
- Mike Robertson (Cheslatta, until 9:30am)
- James Jacklin (MFLNRORD)
- Alec Mercier (Water Resource Engineer Rio Tinto)
- Nikolaus Gantner (Sr. Fisheries Biologist, FNRORD) – guest attendee
- Dan Sneep (DFO)
- Justice Benckhuysen (RT)
- Ray Pillipow (Fish and Wildlife Manager, MFLNRORD) – guest attendee
- Wayne Salewski.

Brief introductions so guests and TWG members are aware of today’s expertise.

Water release facility update (Mike)

- Ongoing environmental inventory. For example, drilled 9 core holes for geotechnical analysis
- Wayne asked if the project will go through an environmental review. Mike responded there are 2 design options (spillway only, and spillway with 35MW generation). Generation is below threshold for BCEAA, but unclear if spillway will trigger formal assessment.

Action items from last meeting

- Jayson – Attended City of PG flooding seminar (including ice-jam flooding). Will get summary
- Caribou – James and Jayson have reached out, awaiting information regarding migration impacts
- Ramping rates – Ecofish working on ramping assessment to determine if further investigation is needed
- Temperature – Jennifer (Ecofish) doing a literature summary
- Climate research – Justice reached out, no response yet
- Fish access – Jayson will follow up with Gary and Mike after this meeting
- Jayson reached out to Chris Perrin to talk about reservoir productivity
- Justus – no data on float plane yet, but in progress
- Entrainment risk assessment – ongoing with Ecofish
- Fish in the river – James providing support in this meeting

Reminder that focus of TWG is on technical issues related to flows and RT operations. What issues have merit that we can have influence over? Can we dismiss any issues that don't have technical merit? Do we need experts to do some work to support?

Nechako River Fish Issues

Resident Fish (Nikolas and Ray, input by others)

- Priority species is white sturgeon, then BT, RB, MW, BB, LT, also SU, RSC, important for ecosystem (all potentially affected by temp and/or flow).
- Other than work by Slaney during early cold-water release studies and Abelson (1985) Fisheries Management Plan there has not been much research, so we do not have a good understanding of sportfish in the watershed.

Action item: Jayson to review and summarize 1985 management plan

- Some habitat priorities identified during WRP studies.
- Habitat understanding is at gross scale; little info on Nechako-specific habitat.
- Little info on population status'.
- General understanding of effects of river impoundment.
 - RB fishery heavily depressed in upper Nechako during 80's
 - Understanding at the time was the release facility would produce a "blue ribbon" fishery.
- Overview assessment of tributaries would be beneficial.
- Province has a Salmon Restoration Specialist (Erica Jenkins) that could be resourced if needed.
- Limited info on MW life history and habitat use; known broadcast late fall spawner could be affected by flow changes.

Bull Trout (Nikolas and Ray, input by others)

- Blue listed
- Overwinter in Nechako

- Spawn in upper Fraser tribs
- The fish come in in the fall and they overwinter. They are likely following smolts out of the system in the springtime and temperature thresholds are driving them back into the Fraser river and Nechako in the spring.
- BT are cold water (18 degrees threshold preference) so will migrate into upper Fraser River tributaries for warm seasons: any concerns in Nechako will be during winter.
- Potential pathways of effect:
 - Temperature.
 - Prey availability (timing of smolt migration re temperature).
 - Glide and pool habitat.
- Even without dams Nechako might be warmer than other watersheds? Can we model winter flow activity and temperatures? RT answer: yes, at the broad scale we have a flow model, and we have temperature modelling as well.
- What is the performance measure to understand velocity/temperature/depth effect BT overwintering in the Nechako, thresholds?

This led to a discussion around focussing on one species or the broader ecological perspective. Jayson described the approach of looking at each species, understanding whether key habitat or life history is sensitive to operations, describing thresholds/PMs, then identifying overlap between species and then narrowing to most important PMs to describe all aspects of fish concerns.

- There is a lack of information and a limited number of deep pools and the fish are moving out.
- Dan stated temperature would have implications on the BT population
- Jayson asked if there is a large temperature change/water release in the spring that causes the river to warm up is that going to move the BT out of their overwinter habitat earlier than normal? Is there some measure that we want to add for BT in overwinter habitat when evaluating flow alternatives?
- Is there a performance measure for BT in the Nechako River (absolute, threshold, direction...) that the province wants to evaluate to determine if good/better/worse for BT. We need to ask if flow is the biggest limitation or is it something else that is out of our control (not part of WEI process).
- James/Nikolaus/Ray committed to identifying PMs for BT.
 - James was concerned about effort and timing, which led to a discussion on general timeframe for TWG.
 - Target 6 months to have issues, Objectives, PM and flow alternatives to Main Table
 - Therefore, there is some timeline flexibility; Jayson suggested a month or so would be reasonable.

Action item: BC to propose PMs for bull trout.

- We will continue this approach with other species at another meeting.

Other river concerns (group discussion)

- Concerns re potential changes to macrophyte community re channel form or water clarity.

- Focus on how operations change the access to all of the tributaries.
- Province's perspective is chinook are doing well (compared to other upper Fraser populations). Wayne had different opinion.

This prompted discussion on the importance of being objective, science focused in TWG. Its ok to provide opinion but include context/reference.

- DFO interested to focus on operational changes, issues related to Rio Tinto operations. Then the other impacts can be considered.
- Wayne: There are some lamprey, is this a species to consider?
- Wayne: MW was major food fishery for Saik'uz FN relied upon on off-salmon years.
- Wayne: restoration efforts (e.g., Murry Creek) have been successful in rebuilding spawning tributaries and now supports better RB population. He emphasized the importance of tributaries to support Nechako River fish populations.
- Wayne: discussion around tributary access because of sediment accumulation. For example, Targe (Copley) Creek upper Nechako across from Swanson creek is important salmon spawning stream with gravel bar at the mouth limiting access. This applies to other feeder streams around the Nechako.
- Wayne: Broadened discussion to watershed planning and concerns regarding upstream/upland impacts. His group has funding to restore streams, but access and other impacts limit their effectiveness.
 - *This prompted discussion about WEI and TWG objectives and process. The group agreed to focus on what can be affected by operations; we can identify other impacts, and make recommendations, but our process is not designed to address these.*
 - Wayne agreed to work with the TWG to identify tributaries with potential fish access concerns.

Action Item: Wayne and Jayson to identify tributaries with potential fish access concerns and propose next steps to define and resolve issue.

Sturgeon (update from Nikolaus)

- NRWSI regular monitoring programs ongoing.
- Predation is a concern. Otters and eagles are main predators along with some fish predators. River clarity is a factor: clear water benefits visual predators.
- Looking at predation of released fish through studying river otters as main predators, radio tags to monitor movement, alternate fish release locations (Fraser Lake).
- Habitat restoration continues to be a key focus, also hatchery production out of Vanderhoof.
- NWSRI website has recent update; Nikolaus can provide updates in the future.