To:	**WEI Technical Working Group members**
From:	Jayson Kurtz, TWG Coordinator, Ecofish
Date:	May 12, 2021
Re:	**Summary of TWG meeting held Wednesday, May 12, 2021, 9:00 am to 12:00 am**

Attendees:

- Dan Sneep (DFO)
- Andy Lecuyer (RT)
- Duncan McColl (FLNRORD)
- Rahul Ray (EDI)
- Jayson Kurtz (Ecofish Research Ltd.)
- Jennifer Carter (Ecofish Research Ltd.)
- Katie Healey (Ecofish Research Ltd.)
- Nikolaus Gantner (FLNRORD)

Meeting Objective: discuss PMs for the next MT meeting and brainstorm remaining interests regarding reservoir fish and river fish, and revisit wildlife interests.

Agenda:

- Discussion on PMs for the next MT meeting.
- Discuss remaining interests, Objectives and PMs.
    - River fish (remaining interests)
    - Reservoir fish (remaining interests)
    - Wildlife (revisiting beaver and bird issues)

Updates

- We have been working with Stephen to collaborate on Nechako water temperature research.
- Jayson met with Gary Blackwell and will summarize information for TWG. He provided context that dates back to 70's and 80's. He mentioned fishing is reasonable but is concerned about Kokanee.

Interests, Objectives, and PMs:

Category	Interest	Potential Issue/pathway of effect	Pathway forward
		River	
Fish	River temperatures for fish (resident trout and char)	River temperatures can affect growth and survival	• No data for resident fish, rearing (non-sturgeon, non-salmon) • Based on BT tagging studies (170 fish), Fraser River fish use the Nechako in the winter for feeding (Oct - May), but not during temperature concern periods (paper pending – PhD thesis chapter plus manuscript) • BT studies on upper Fraser spawning suggest that Nechako discharge may be important – paper pending), and there are potential flow concerns for upper Fraser BT overwinter in the lower Nechako. • RB is probably less temperature sensitive than salmon. • Rearing temperature (or migrating temperature) is typically not an important PM for other WUPs **Pathway:** Province will consider priorities for resident fish temperature interests. Need to research temperature sensitivity for Whitefish and RT for life history in timeframe of concern. BT research can be shared once studies are complete.
Fish	Chinook salmon (habitat flow timing, temperature)	issue needs to be refined	• PM for salmon proposed to be 20°C or 19-23°C (50-80% aerobic scope range) with a function that decreases performance over time. Values are based on general understanding of science, most of which is laboratory-based swimming performance; however, there are gaps in the science that we need to address to adapt PM. • Fish can be monitored to determine how well this threshold is performing.

			• Note, 20°C is associated with acute exposure to constant temperature and corresponds to middle of the range of aerobic scope suggested (50-80%) for CH and SK migration. We can evaluate how other interests compare to this value (i.e., how does temperature change with other interests) and how sensitive the PM is. **Pathway:** There is agreement that we need to understand the context of what the 20°C in the Nechako River at a given point relative to the temperature salmon experience before (Fraser River) and after (Stuart River for ES), elsewhere in the watershed, and understand how climate change and how actual project effects have changed water temperatures in the Nechako and watershed. Also, need to understand driving forces behind salmon decline (i.e., ocean conditions, river conditions?).
fish	Riparian restoration or enhancement	need to refine	Loss of riparian habitat is likely outside the scope of operations (land use, bank armoring, agriculture). Within the scope of operations is associated with side channel wetting, functional channels, flow (i.e., for cotton wood). Vast portions of river have high banks and do not have riparian connection. However, where there is connection, it is often associated with side channels – some of these channels are overgrowing with vegetation. Therefore, providing flow to side channels will also support riparian habitat (see side channels section below). **Pathway:** General agreement that function of riparian habitat is associated with side channels and could be encompassed under side channel PM. Need to determine how we can facilitate natural ecological processes.
fish	Side-channels	need to refine	Need to ensure side channel functionality because they are dynamic features with various types of habitat. Side channels have different function: • Flowing, connected fish habitat

			• Partially/seasonally connected fish habitat - backwatered • Riparian/wildlife **Pathway:** General agreement that we should complete a desktop exercise to map side channels, determine inlet ad outlet elevations. Follow-up with DEM/bathymetry work in fall.
fish	Tributaries	need to refine	• Several tributaries have been identified for fish access concerns (RB spawning and CH rearing). • There is no information on CH fry migration timing. • Tributaries are typically blocked by sandbars in July and Aug. • Need to narrow down when Nechako River water would affect access for tributaries. • Can map tributaries to identify log jams and bars, then use DEM to evaluate when these areas are wetted. • Alexandre Bevington (FMNRORD) is doing Landsat satellite imagery research **Pathway:** General agreement that we should map tributaries using aerial photos or satellite imagery and corresponding flows, DEM and HEC-RAS model, and collect field data for verification. RT HEC-RAS model is +/- 1 m, but need field data (gauges, camera, photos) to help allow more fine scale hydraulic modelling for connectivity.

Discussion on Mussels

- Some folks have expressed concern that mussels have disappeared and that this could be a food source for sturgeon. Before studying, we need to state objective, and over time we can assess and fill data gaps.
    - Nikolaus has a research contact and can provide more information and Wayne has mapped individual mussel beds that remain.
    - Kevin Moutrie has sidescan technology – maps bathymetry and substrate hardness. We need to determine if we can identify mussels or mussel habitat using this technology.
    - Kevin M. has mapped sturgeon spawning habitat from Stoney to Vanderhoof.

Rahul's Presentation

Presented approach to walk through decision making process using a non-related topic (buying a house). Need to make sure we clearly explain the intent of the example and to caution against directly relating to the example to this project.

Action Item – Dan to talk to DFO to provide information on salmon decline and driving forces

Action Item – Jayson to follow up with Dan regarding carcass recovery program

Action Item – Nikolaus to bring forward BT research papers once complete.

Action Item – Jenn to review whitefish and RT temperature tolerances (warm temperature)

Action Item – Jayson to follow up with Nikolaus regarding Alexandre Bevington work

Action Item – Nikolaus to inform PM for overwintering BT in next month

Action Item – Ecofish to create preliminary map of side channels and wetlands, and bin side channels by functionality

Action Item – Jenn to follow up with Wayne to determine mussel distribution

Action Item – Jayson to follow up with Nikolaus regarding mussel distribution and concerns