
To: WEI Technical Working Group members

From: Jayson Kurtz, TWG Coordinator, Ecofish

Date: June 9, 2021

Re: Summary of TWG meeting held Wednesday, June 9, 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)
- Wayne Salewski Nechako Environment and Water Stewardship Society

Meeting Objective: brainstorm remaining interests regarding reservoir fish and river fish, and revisit wildlife interests.

Agenda:

- Discuss remaining interests, Objectives and PMs.
 - River fish (remaining interests)
 - Reservoir fish (remaining interests)
 - Wildlife (revisiting beaver and bird issues)

Updates:

Nechako Watershed Roundtable Spring Technical meeting (May 26)

- Connecting water and land use planning
- WSA presentation from BC
 - Water Sustainability Plan – ordered by Gov't unlike WUP which are proponent-led
- Lakes Monitoring program – Wayne
 - Deep water capable water quality equipment
 - WQ assessments

- Monitoring will begin on Takla and Trembleur Lakes looking at WQ and productivity.
- Integrated Watershed Research group – same info Stephan has been providing to us.
- Breakouts:
 - Strategic Goals and Actions (Jayson attended)
 - Stewardship portal partnership
- Discussion on how NWR can support technical and on the ground projects.

Telemetry monitoring

- Province has deployed 30 acoustic receivers in Fraser Lake and will be releasing tagged (with temperature and pressure sensors) sturgeon in the lake and will be able to detect downstream and upstream movement (receivers will be installed in Stellako, Endako, and Nautley). Will also tag burbot and RT and can add other species of interest (i.e., salmon, lake trout). Also, temperature and DO data are being collected.
- Three real-time radio telemetry stations are now set up on Nechako River to track fish movement.
- Freed-up telemetry station that could be applied elsewhere – use someplace upstream of Stuart, potentially Takla.

Bathymetry proposal with NHC

- NHC has put in proposal to do bathymetry work (lidar in Sept, cross sections and velocity for habitat) to develop a DEM and ice model.
- Collecting data 9 km below Burrard Bridge to develop ice and flood model, and data on Nautley River.
 - Nikolaus suggests data collection extend to sturgeon core areas 30 km downstream of the bridge (Huulat rapids).
- Will compare 1990 survey data to inform model.

Wayne re Bathymetry (SAR)

- Conducting bathymetry of sturgeon spawning areas.
- Depth as well as substrate hardness/type



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	<ul style="list-style-type: none"> - MW and RB are good species to start looking at temperature effects on resident fish. - Also consider species that spawn/incubate in mainstem – are there issues related to incubation? - What species incubate during temp – affected periods? <p>Pathway - Should consider in-river spawners (is incubation affected by summer temp) and N pikeminnow as well as they may be benefiting from warmer water. Reach out to NWSRI regarding temperature tolerances for white sturgeon.</p>
fish	winter fish habitat flows	are winter flows sufficient to protect eggs? Salmon overwinter habitat?	<ul style="list-style-type: none"> - NFCP has information on salmon incubation and a good understanding that the current regime is adequate for providing flow. - OW flows for BT information is needed. Recent OW flow was signaled in models for BT – Nikolaus to provide update in the future. - OW flows have not been specifically defined in previous WUPs but are often captured by incubation flows

			<ul style="list-style-type: none"> - Consistency of fall flow through the winter has been used. Also, 20% of MAD has been used but it is context specific; however, could be used as general starting point. - Could look at historic flow of Nechako and understand frequency distribution of OW flows and if that's proficient than we can compare to 20% MAD to see if it's similar or different. - Having specific OW PM might not be necessary if we are trying to minimize difference between spawning and incubation flows (i.e., incubation flow may meet or exceed OW flow necessary). - Hydraulic habitat modeling is typically applied to growing season – no good examples for winter requirements <p>Pathway – look at current and historic discharge and compare to 20% MAD.</p>
Fish	resident fish species (habitat, flows, temperature)	<p>Reservoir operations can affect suitability and availability of fish habitat, which can affect fish survival, growth and population</p> <p>specific issues captured in other issues</p>	<ul style="list-style-type: none"> - Data limitation on resident fish, hard to be specific, hard to understand response to change. - Start monitoring populations of concern that are either depressed or enhanced (e.g., pikeminnow) - May be able to apply known HSI curves to other species depending on similarities (e.g., CH fry and RB parr) or meta-analysis optimum, and look for opportunities for adopting.

			<p>- Need to consider invasive species, and CC – we should also consider what species do we NOT want to promote?</p> <p>Pathway – propose instream flow criteria. Also, generate matrix table for species (or species group of concern), life history, habitat needs, and identify data availability, watershed specific data or general.</p>
Reservoir			
Fish	fish access into tributaries	Need to determine if low reservoir levels are impeding fish access into tributaries	<p>- Need to follow up with Gary Blackwell regarding specific areas of concern. He was also concerned about log jams preventing access, but previous studies suggest this was not a concern.</p> <p>- Redd inundation and tributaries – when reservoir is low fish spawn in gravel and then reservoir levels rise and potentially could affect eggs (less O2).</p> <p>- Very limited information on spawning in the reservoir. Cheslatta Nation completing study on pygmy whitefish. Jayson to follow up with Mike.</p> <p>Pathway – map trib locations and extent of drawdown (access and inundation of redds). Summarize info from Gary and collect information during upcoming field trip.</p>
Fish	resident fish habitat	reservoir operation can alter suitability and availability of habitat (spawning, rearing).	<p>- Chris Perrin is looking at how operations may be affecting productivity in the reservoir. He’s looking at change in habitat from drawdown (considering change in habitat type and species use of habitat).</p>

			<ul style="list-style-type: none"> - Littoral vs pelagic model looks at productivity and available habitat (area) for different species. - Potential spawning habitat affects on burbot. <p>Pathway – use littoral DEM model to estimate habitat availability as well as productivity. Consider lake spawning species (burbot) to see if operations depth can affect timing.</p>
Fish	resident fish habitat	Do reservoir operations affect spawning habitat in Tahtsa narrows?	<ul style="list-style-type: none"> - If dredging, does additional drawdown affect stream continuity? - Wayne: has not observed any stream continuity concerns <p>Pathway – we need to look at background information (reports forthcoming) to determine if data exist around spawning habitat in Tahtsa Narrows.</p>
River			
wildlife	birds	water fluctuation impacts exposure to predation	<ul style="list-style-type: none"> - Beyond aquatic-semi-aquatic species, it is difficult to tie wildlife to flow regime beyond riparian function - Maintaining natural process: cutbank etc. for nesting birds - Predatory birds such as eagles and osprey should be considered as strongly correspond to fish but caution given recovery from species decline in 60s, 70's - No heron rookeries (occasional nests only). - shorebirds, and bank nesting birds.

			<p>Pathway – Summarize potential wildlife interactions similar to reservoir summary.</p>
Wildlife	beaver lodges	water fluctuation impacts exposure to predation	<ul style="list-style-type: none"> - Important to understand effect on beavers and historical reasoning (Fort Fraser hunting and trapping) for current flow requirement. - Anecdotal evidence that beavers are very populous, and they need to be better managed. No more beaver trapping and killing of predators could cause an increase in beaver populations. - BC manages beavers only when impacting infrastructure – managed through trapping regulations. <p>Pathway – Summarize potential wildlife interactions similar to reservoir summary. Need to discuss with Province to determine what information is there for species of concerns (beavers, otters, muskrat, beavers), and compare trapping effort over time. Andy to provide any information on beavers.</p>
Wildlife	Spring and fall nesting; potential interaction with flushing flows; water fluctuation impacts on floodplain nesting	potential issue is for large fluctuations in river level to either a) wash away beaver lodges or b) dewater or excessively flood entrances rendering lodges unusable	<ul style="list-style-type: none"> - Otters, beavers, muskrat could be affected by changes in flows. - Otters are being studied currently because of sturgeon predation through University and NEEF funding. Studies are shifting to evaluate timing of latrine site usage using trail cameras, genetics, feeding habits, and abundance. Proposal to tag otters. - Anecdotal evidence that High flows in Vanderhoof in 2007 and 2012 caused decline in muskrat population. Bank

			<p>denning, entrance below water level but den above. High water floods entire den, drowns kits unable to swim.</p> <ul style="list-style-type: none">- Muskrats also may predate of mussels so linked to fish populations. <p>Pathway – Summarize potential wildlife interactions similar to reservoir summary. Assess water level and muskrat den elevation.</p>
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Mussel discussion

- Anecdotal decline, can we confirm? What causes decline?
 - o Saikuz chief and council comment that mussels were so heavy they could walk across.
 - o Wayne has casual maps of mussel beds.
 - o Wayne is aware of tributary presence as well.
- Are they food sources for sturgeon?
- Mussel specialist expert to connect with Wayne to discuss potential studies.
- Nikolaus to forward MOE and UNBC invert specialist contact for information.
- Data limited – need to complete general background information. What is species, host species, WQ, temperature, evaluate threats/recovery.
- Fort Fraser through Diamond Island muskrat latrine sites contain mussel shells.
- **Pathway** – backgrounder on mussels

River productivity/food web etc. discussion

- Typically discussed in WUPs, but not a driving factor for PMs/flow alternatives (i.e., typically not sensitive)
- We should understand bottom-up food web, what constrains fish?
 - o Temp, nutrients to facilitate invertebrate community.
 - o Need to consider species: which benefit which are limited? Are we driving a community that isn't natural?
- Is there evidence of fish size reduction that might be related to food? Would that help us confirm if this is an issue?
 - o Could look at information on fish index data (i.e., Stellako)
 - Maybe look at size distribution of time as an indicator
- Anecdotal comments that insect hatches not as predictable, large
- Wide net: insectivorous birds, floodplain function
- **Pathway** – discuss with Chris Perrin to determine if we want to have a study looking into food availability.

Riparian/Cottonwood discussion

Could look at cottonwood recruitment as other WUPs have. Cottonwoods are throughout Nechako River and tributaries and are important habitat for birds.

- Project on Stoney Creek looking at cottonwood pruning to reduce branch fall and erosion.
- Planting of cottonwoods has occurred.
- Cattle could be preventing recruitment by eating saplings.
- Wayne will be evaluating state of cottonwood community and take photos over next few days.

Action Item – backgrounder on in-river spawners (is incubation affected by summer temp) and N pikeminnow as well as they may be benefiting from warmer water.

Action Item – Jayson to reach out to NWSRI regarding temperature tolerances for white sturgeon.

Action Item – Look at current and historic discharge and compare to 20% MAD.

Action Item – evaluate how we can use known habitat suitability to propose instream flow criteria.

Action Item – generate matrix table for species (or species group of concern), life history, habitat needs, and identify data availability, watershed specific data or general

Action Item – backgrounder on mussels

Action Item – Need to discuss with Province to determine what information is there for species of concerns (beavers, otters, muskrat, beavers), and compare trapping effort over time.

Action Item – Andy to provide any information on beaver regulation, was it related to Fort-Fraser hunting and trapping association or FN concerns?

Action Item –Chris Perrin to use littoral DEM model to estimate habitat availability as well as productivity

Action Item – Wayne to document cottonwood recruitment during upcoming trip on river

Action Item – Summarize potential wildlife interactions similar to reservoir summary.

Action Item – Assess water level and muskrat den elevation.

Action Item – look at background information (reports forthcoming) to determine if data exist around spawning habitat in Tahtsa Narrows.

Action Item – map trib locations and extent of drawdown (access and inundation of redds).

Action Item – Summarize info from Gary and collect information during upcoming field trip.

Action Item – Jayson to follow up with Mike regarding pygmy whitefish study.

Action Item – follow-up with Gerd about his beaver understanding.

Action Item – Consider lake spawning species (burbot) – can operations depth and timing affect?