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| **To:** | WEI Participants |
| **From:** | Tanya Guenther and Rahul Ray |
| **Date:** | June 16, 2022 |
| **Re:** | Final WEI Table Meeting 27 (Videoconference) Summary, Wednesday, May 25, 2022 |

A videoconference for the Rio Tinto Water Engagement Initiative (WEI) was held on Wednesday, May 25, 2022, from 9:00 a.m. to 3:35 p.m. The videoconference was held instead of an in-person Main Table meeting to promote social distancing in response to COVID-19, while making progress on aspects of the WEI.

This document is a summary of the videoconference and not word-for-word "meeting minutes." The information presented highlights the topics raised, key discussions, and identified action items.

The facilitator was Rahul Ray (RR) from EDI. Zishan Shah, EDI, participated as a member of the facilitation team. Tanya Guenther, from EDI, took notes during the meeting and prepared this summary. Jayson Kurtz (JK) from Ecofish Research participated as the Technical Working Group (TWG) coordinator. Jon Abell, Katie Healey, Adam Lewis, and Kirsten Lyle from Ecofish were present as technical support. Michael Harstone (MH), from Compass Resource Management, participated as a decision analyst. Clayton Schroeder (CS), also from Compass Resource Management, participated as technical support.

Richard Arsenault, Casey Beel, and Adam Lewis were presenters.

Andrew Czornohalan (AC), Operations Director - Power and Services, Kitimat and Kemano participated as a WEI Table member. Andy Lecuyer (AL), Senior Environmental Advisor, Communities & Social Performance Advisor, from Rio Tinto, participated in the videoconference as support.

A draft agenda was included in the invitation, and outlined the anticipated meeting topics:

- Welcome and Introductions
- Agenda, Meeting Summary, Action Item Update
- Rio Tinto Update:
    - Operations
    - Indigenous Community Discussions
- Adaptive Management
    - Overview of Adaptive Management (AM)
    - Past Experience on Other Systems (BC Hydro Water Use Plans [WUPs])
    - Proposed Approach to AM
- AM and White Sturgeon

    - Proposed Approach for Sturgeon (context, key His from other areas and approaches, etc.)
- Climate Change Studies, Key Findings and Implications (modelling , alternatives, triggers)
- Issues Scoping Updates/Technical Memos: Issues Highlights
- Review Proposed Phase 1 Bookend Alternatives
- Next Steps

Table 1 lists the participants that were involved in the videoconference and the organizations they represent.

**Table 1. May 25, 2022—WEI Videoconference Participants**

| Individual | Organization |
|---|---|
| Lyla Brophy | Nechako Valley Regional Cattlemen's Association |
| Stephen Dery | UNBC |
| Curtis Helgesen | Regional District of Bulkley-Nechako |
| Jennifer Howell | District of Fort St. James |
| Donna Klingspohn | Public participant |
| Ray Klingspohn | Public participant |
| Phillip Krauskopf | FLNRORD |
| Clint Lambert | Regional District of Bulkley-Nechako |
| Kevin Moutray | District of Vanderhoof |
| Mark Parker | Regional District of Bulkley-Nechako |
| Jerry Petersen | Regional District of Bulkley-Nechako |
| Ray Pillipow | FLNRORD |
| Tim Plesko | Public participant/Southside representative |
| Raymond Robinson | Northern Health Environmental Health Officer |
| Maria Sotiropoulos | Department of Fisheries and Oceans |
| Dan Sneep | Department of Fisheries and Oceans |
| Denis Wood | Public participant |
| June Wood | Public participant |
| Not Identified | Nechako Watershed Roundtable |
| Henry Klassen | Public Participant |

The following provides a summary of the topics discussed during the videoconference.

## Welcome and Introductions

Attendees were welcomed to the meeting and an opportunity was provided for new participants to introduce themselves.

- Richard Arsenault is a professor at École de Technologie Supérieure in Montreal. He works with climate change researchers on the Nechako project. He provided a presentation about the climate change research project.
- Jon Abell is an environmental scientist with Ecofish. He is working with the technical team providing technical support to the group.

## Agenda, Meeting Summary, and Action Items Update

The agenda was reviewed and the following adjustments were proposed:

- Move the Rio Tinto Update to after lunch
- Move the climate change and adaptative management presentations to the start of the meeting.

There were no objections to the proposed revisions to the agenda.

The action item from meeting 26 was reviewed.

**ACTION ITEM**: RR will share the links of the legal opinions for members to review, if they wish.
**Update**: Links were forwarded to Main Table members on Tuesday, April 12, 2022.

## Climate Change Studies, Key Findings and Implications (modelling, alternatives, triggers)

**Dr. Stephen Dery (SD) provided an update on climate change research in the Nechako.**

Key highlights included:

- The Industrial Research Chair (IRC) has several projects focused on climate change and water security in the Nechako Basin.
- Two projects involve using the fifth generation of the Variable Infiltration Capacity (VIC) hydrological model to simulate the naturalized hydrology of the Nechako and its tributaries for 1) historical conditions (1950–2019) led by Dr. Rajtantra Lilhare and 2) the potential future conditions (up to 2100) led by Dr. Jingwen Wu. An additional project focuses on water temperatures across the Nechako.

- Ongoing and future tasks include:
    - Landcover sensitivity (disturbances) runs using substitution of all forested areas with grasslands in VIC simulations.
    - Analysis and results (baseline and sensitivity):
        - Analyses: Quantification of flow regulation versus climate change impacts on the overall hydrology of the Nechako Watershed.
        - Results: Reconstruction of daily flows and hydrographs for the Nechako River (main stem at Big Bend Cree, Vanderhoof, Prince George) and major tributaries/systems (Chilako, Eutsuk, Nadina-Stellako-Nautley, Stuart.
- Relative to historical conditions (1950–2019), the upper Nechako watershed may experience heavy precipitation events over a longer period of the year (mostly September through to February) with rain in autumn and rain/snow in winter.
- Preliminary results from 2021 early summer heat dome.
    - Used hourly water temperature data for 35 sites

  - Computed average water temperature for one week prior to the 2021 heat dome and one week during the heat dome.
  - Calculated the difference in water temperature for week 2 to week 1.
  - Tracked overall maximum water temperature during week 2.
- Detailed information can be found on the presentation slides or by visiting https://www.zenodo.org/record/6426024#.Yllss89jM12w.
- Summer 2022 field season plans:
  - Two undergraduate students (Jade Reynolds and Meghan Hunter-Gauthier) have been hired as field technicians to lead data collection efforts across the Nechako watershed.
  - Gracie Wilson is joining the IRC next week to undertake water temperature data analyses and quality control.
  - Plans to visit all 25 currently active NHG sites for data downloads.
  - Possible additional of other water temperature loggers (e.g., Cheslatta River, Sather Creek) and a weather station at Cheslatta Lake.
- The IRC works in partnership with industry, government, academic institutions, stakeholder groups, communities and funding agencies.
- The IRC can be reached via email at irc.unbc.ca.

**Dr. Richard Arsenault (RA) gave a presentation entitled, "Water temperature of the Nechako River under a changing climate."** https://www.getinvolvednechako.ca/wp-content/uploads/2022/05/Climate-change-impacts-Nechako-Richard-Arsenault-May-25-2022.pdf

Key highlights included:

- Research project goal: Evaluate as best as possible the impacts of climate change on water temperatures in the Nechako River along with the associated uncertainty.
- Project objectives:
  - Water temperature modelling of the Nechako River is necessary to simulate water temperature variations due to climate change.
  - Evaluating the impacts of climate change requires understanding the intricacies of climate modelling in order to ensure robust results.
  - Simulation of the impact of climate change is rife with uncertainties (What will the future look like? How will mankind's greenhouse gas emissions evolve?).
- Key findings:
  - Water temperatures will likely increase in the future due to climate change.
  - Increases will depend on the actual climate change, but we can already estimate them to be in the order of 2 to 3° compared to current temperatures if managed inefficiently (constant releases)
  - Some high-flow releases have no impact on temperature, or actually increase average daily temperatures.

  - Temperature of water released at Skins Lake has little to no bearing on temperatures at Vanderhoof or Finmore (thermal equilibrium is reached in Cheslatta-Murray lakes).
- Next steps:
  - Evaluating the impacts of changes in water releases on water temperatures.
  - Including flows from the Stuart River to assess how temperatures will change beyond Finmore in the Nechako River.
  - Working—and comparing results—with other groups (Stephen Dery).

**Discussion/questions following the presentations included:**

- Clint Lambert (CL) asked SD about the heat dome. Did that affect the temperature of the reservoir?
  - SD shared that there is no water temperature data for the reservoir. Downstream at Cheslatta Lake there was an increase of 3 degrees. There was a response in the reservoir and downstream, but not to the extent of Cheslatta Falls to Prince George. We also have data from Ootsa which was an increase. Some responses in the creeks of the Nechako mainstems.
- CL asked with STMP, did they have to release more water than on average to get the temperature down to the level needed or was it the same as previous years?
  - AL: There was quite a lot of water released last year. There were a few exceedances with STMP releases. The releases are good in the early stages, but it gets to a point where it can't keep up.
  - SD said the overall average went up 3 degrees. Curious, if there are creeks and rivers that are warmer, how is that affecting the reservoir in total.
  - SD: One plot that showed the increase, one that showed the maximum water temperatures. Small creeks saw an increase of only 1 degree in the heat dome.
- Donna Klingspohn (DK): Looking at estimates of between 2 and 3 degree increase in temperature with climate change, what kind of environmental impacts would this have?
  - RA: The 2 to 3 degree increase is what can be expected if we do not change the management or actively time releases and pulses. Don't expect it to be measured as 3 degrees warmer in 30 years, but if we do nothing there will be an increase. If there were to be a 2 to 3 degree increase, there are some biologists we work with who stress the health for salmon and white sturgeon might be sensitive to water temperature. I would expect increases would be negative for the fish species, but this is outside my scope.
  - Jason (JL): Temperature changes like that can be important to fish. Fish have a general fairly wide temperature tolerance. Most of the species we are interested in are getting near to up to their tolerance. It can affect behaviour, reproduction, feeding, and potentially more acutely with fish dying. Some papers are predicting the demise of some species due to temperature changes.

- RA: This is why we want to evaluate the impacts, including impacts in the Stuart River. It is not a managed system and there is no way to time pulses. If the temperature does increase in the Stuart, and then joins the Nechako, it could be problematic for fish down the reach to the Fraser.
- JK: Two issues the TWG are working on include resident sockeye and salmon. Drafting technical memos in terms of flow alternatives and performance measures and how we look at flow changes.

- Denis Wood (DW): the map shows temperature measuring of the tributaries to the mainstem of Nechako and reservoir. Is there a relationship between the creeks that showed the greatest amount of change during the heat dome to the amount of logging occurring in the watersheds that feed those creeks?
    - SD: That has not been looked at. The Chilako is one that has seen a lot of deforestation and experienced an increase over the heat dome. The lower elevation systems saw the most increase, but we want to look at how deforestation impacts water temperatures.
- Ray Pillipow (RP): Could the model introduce theoretical inputs downstream versus Kenney and Skins options? For example, if there were pipeline type inputs from hypolimnetic draws along the system it would be interesting to understand attenuation.
    - RA: It is possible to adjust model to add lateral inflows from any point. We've been looking at the one at Skins Lake or Kenney dam.
- Mark Parker (MP): There is forecasting for more extreme rain events. What effects do they have on the water temperature?
    - SD: Good question. It will depend on the type of storm system. The atmospheric rivers in the fall tend to be warm systems and the water temperature bumps up during these precipitation events. With climate change, air temperature will increase and that will dominate the water temperature response.
- Henry Klassen (HK): Does the modelling indicate then that there would be a significant improvement in the overall temperatures if the release was at Kenney dam?
    - RA: Yes – the water temps does decrease significantly, a few degrees cooler throughout the river. There is a definite gain in terms of water quality for having the spillway at Cheslatta Falls. Something to consider if that option is on the table or not, if theoretically we were to release water there it would be positive in terms of quality. In terms of releases, you would cut out a few days of water transit time and it would be more efficient.
    - HK: Dr. Dery, has any work been done in the temperature studies and flows on the Chilako River? There are very extensive logging effects on that watershed, with large blocks of

clearcuts along the river. That would have an impact too on the temperature of the lower reaches of the Nechako?

- SD: There are three water temperature sensors in the Chilako system. All of them were reporting very high water temperatures during the heat dome. It has seen a lot of disturbance, and there is a lot of sediment in the water. A good question would be to ask how turbidity is affecting water temperature.

- Michael Harstone (MH): Last week, an article in New York Times pointed to a heat dome over the Pacific Northwest. They were saying with climate change, it will not be a 1 in 1000 year event, it is likely to happen once every 10 years. A question: When you step back from research, we are looking at flow regimes, largely driven by environmental interests and how do we protect and mitigate effects? I would be curious to know your opinion, what are the implications?

  - RA: It is an interesting problem. Faced with climate change affecting everyone, and extreme events are going to be more frequent and more extreme. A warmer atmosphere has more energy and will produce more rainfall. It will be more reactive. These events are being more frequent and coming up to a level where we are starting to hit the celling of what the environment can take. If water is released, it does not matter the temperature it is released, by the time it gets to Vanderhoof and Finmore it will be very warm. The lakes are potent heating devices. To try to prolong and make the impacts as less as possible, considering a water release facility at Kenney Dam would be sufficient to manage the temperatures for a longer time. It will not protect against all events though, nature at some point will win. Second point is that considering the fish (salmon) that migrate through the Fraser, even if we can maintain water temps in a cool range and maintain temperatures, once that connects to the Stuart River, salmon will die and there is nothing we can do. We are hitting close to the limits of what the environments can tolerate and will fish evolve fast enough to respond to this? We see observable changes, the environment is sending a message and we can do lots to push it back, but what can we do in the long term?
  - SD: In terms of long-term projects, the Nechako will still be a water rich system and a have a lot of precipitation. We will see greater fluctuations from year to year. We may have summers with extreme droughts and then floods. Need to continue getting data as well. We need more data to understand what is happening. We will continue doing that as well.

- Dan Sneep (DS): Hearing some comments that are alarming and appreciate the impassioned perspectives that people have. Should we shift focus to getting a water release facility in place as soon as possible? If that is what it will take to save salmon, are we wasting time by not making that the priority?
  - HK: We could build a spillway at Kenney Dam to shorten the distance between PG and Kenney Dam. I think we need to get started on that and a schedule of how it can be done and paid for. As long as we avoid these things, we will pay for it double, triple or quadruple down the road. HK also said that we should start the process to move public infrastructure to higher ground, particularly in the Vanderhoof area.

- MH: When we start looking at options we talked about phases, immediate term, next 6 to 24 months, then longer term that would require 1 to 3 years, and then what should we look at for longer term that would require infrastructure changes. Not sure it changes anything as to how we approach different flow options to look at.
- DS: There is great value in looking at flow options. There are lots of options we can address through this process. I like the idea of phases, but do not want to lose sight of the reality. There are steps that need to be made sooner rather than later. We 've been talking about a water release facility for decades, and it puts stress that we should not dawdle on this.
- MH: Water temperatures are not 2 to 3 degrees higher right now. In the interim, there are still some flow manipulations that would provide value. We will talk more about other alternatives later today.

**Jason/Casey presentation on climate change and what do we do next? (from the TWG updates slide deck)**

https://www.getinvolvednechako.ca/wp-content/uploads/2022/05/TWG-presentation-climate-change-adapt-mgmt-sturgeon-issue-scoping-PM-bookend-for-MT-meeting-27-May-25-2022.pdf **(multiple presentations)**

**What does climate change mean for WEI?**

- How do we incorporate Climate Change (CC) research results into WEI?
  - Status quo (make our decisions based on the historical hydrological record : 1950s to current).
  - Choose a subset of the historical hydrological record to represent anticipated near-term conditions.
  - Adopt CC research climate projections.
  - Hybrid or alternative approach.
- What data is needed?
- What is the timeframe?

Discussion following the presentation included:

- DS: BC Hydro water use plans were developed 20 years ago and climate change was a buzz word. They relied on the 40, 50, 60-year period of record. In the decade or two since they were implemented, there have been times with inflows higher or lower than the predictive record. There is a need to anticipate changes. Relying on historic data is problematic.
- TWG has discussed using a 30-year time frame instead of the historical data.
  - SD: The intra-annual variability has intensified quite a bit since the 2000s, specifically in terms of amount of precipitation. Over the 30-year period we could look at the 10 warmest years as predictive of what the climate may be in the future.

- RA: We have researched this topic, but applied to hydrological forecasting. Using a 30-year period is better than a shorter period in almost all cases. If using the most recent, there may be things missed that may happen in the next few years. Extending to 40 or 50 years does not make much difference. If using a 30-year window for the baseline that could work. If you want to go further then the trends will out pace the data.
- **There was an agreement to proceed using the 30-year period.**
- June Wood (JW): In the short term, are we looking at mainly a re-distribution of the current flows and in the long term changing agreements we would be looking at a different volume?
- MH: Phase 1 alternatives are using the same water budget and reallocating to different months or weeks (0 to 24 months). The phase 2 alternatives would change the water budget (still short-term 2 to 5 year range) and these would require discussions with the water controller. Phase 3 alternatives are looking at new enhancement projects.

## Adaptive Management

### Overview of Adaptive Management (AM)

Jayson Kurtz and Adam Lewis provided an overview of AM.

- Step 1: Assess problem
- Step 2: Design
- Step 3: Implement
- Step 4: Monitor
- Step 5: Evaluate
- Step 6 Adjust

Passive: Assumes hypothesis is correct and monitors results.
Active: The hypothesis is uncertain, experiments and flow trials.

## AM and White Sturgeon

### Proposed Approach for Sturgeon (context, key His from other areas and approaches, etc.)

Adaptive management options include:

- Implement flow alternatives for other interests and monitor results on sturgeon (passive AM).
- Purposeful flow trials for sturgeon (active AM)
  - Collaboration between WEI and NWSRI to maximize benefits, minimize risk (including interruption to NWSRI research).

Discussions/questions following the presentation included:

- HK: Important to remember the distinct difference between the Nechako and other rivers. We have diverted 70% of the river to another watershed. He gave an example. If you had a creature that needed 1000 calories to stay alive and you provide it with only 300 calories. You could rearrange those calories on a plate in all the different kinds of ways you could imagine and fed them to the creature. You would in the end starve the animal no matter how attractive you made the balance of the 30% of the food requirement. There is a reluctance of the economic model to be applied that we've all grown used to, in terms of the amount of hydro being produced and the benefits for all of us. If we agree that we want to provide the sturgeon with the recovery habitat, then we have to face the fact that we have to go back to somewhere between where we are now and where the sturgeon once upon a time was when it was given exactly what it needed to thrive and flourish. If we can do that over a long period of time and survive the cost of doing it, I think it would be a miracle. We are up against a tremendously difficulty situation. It will require making decisions to approach a reality of the changes we can make and keep them in place long enough for these slow-moving creatures to show us the adaptation to the environment we provide for it. I certainly support the process that we are going through, and we need to take the time to do it. It will require changes of enormous proportions.

- RK: Stumbled across a report from the water quality assessment (Ministry of Environment and Parks) from 1987 about the Nechako. We are monitoring the flows of the river when to increase we are talking about climate change on perceptions, modelling and effects of logging in our watershed, including agricultural. But, I haven't seen any report or any thoughts on the fact that what are we doing to also include in our monitoring process things like the wastewater discharges at the water treatment facilities or lack thereof, and also include those in the effects those are having on our Nechako River. The report refers to the subbasin (Vanderhoof, Fort St. James, etc.).

- JK: There are many influences on the interests that we are looking at, including water quality. Our process around flow alternatives does not consider that. We do have an opportunity to deal with those types of issues. We haven't fully identified it, but have developed some options for fire management, agricultural upland, water management, water treatment, etc. Can we raise these issues with the authority responsible for them? It is a challenging one from a process perspective. We can influence Rio Tinto flow options, but understanding how those effects interact or are superseded or not impacted by other trade off decisions. We could reach out to the province to see what the current water quality is.

- RK: Every contributor or influence we have flowing into the water system needs to be included. We can blame for what certain people should have or should to have done. We need the government agencies to pay attention as well.

- DS: One of the particular challenges with climate change and sturgeon, is that these processes will likely take longer than the career of the average biologist, hydrologist, engineer, etc. It requires a long-term vision and commitment, much longer than election cycles or careers. We need to try to instill

that commitment in our respective organizations. Experience on the recovery teams (over 10 years ago) working to develop flow trials for example. There is a sense that recovery teams may get bogged down. I wonder what is your sense JK? How is this collaboration going work? Will we come up with a flow trial that we think will be good for sturgeon, or are we going to develop that? Will it be efficient and timely?

- JK: We still need to explore how we can come up with flow trials. We will continue the discussion at the TWG. Fish have adapted to the flow of the water they get at the time of year. How do we make things better? Need to understand what sturgeon need and is there a way to provide more water? Can we see what they need when and design? It will be a combination of us providing some ideas and then reviewing and giving some feedback. They were taking what was provided and monitoring it, instead of looking at what a different flow could look like. We do have three people overlapping with that group and the WEI. We have a good start on that and just need to continue to advance it.

- MH: Research has highlighted. For the pallet sturgeon they found when mimicking flows, the reservoirs have taken the sediment out and the larvae get eaten up fast. It is a combination of flow, turbidity and temperature. Those three things need to be better understood. Following up on the collaboration, it is important to have good communication. We may have recommendations for short-term flow changes and the sturgeon recovery team will be asked what they think. There are the short-term questions that we come up with around flow management and we think that it is not going to have an unintended negative impact on sturgeon, but how do we give reassurances to the recovery team? There are also longer-term questions about more substantive changes and flows.

## Rio Tinto Update:

### Operations

Andrew Czornohalan provided an operations update including:

1. Current watershed data: precipitation and elevation
2. Freshet forecast, looking to spring/summer and next steps
3. T2 update

See slide deck for additional details. https://www.getinvolvednechako.ca/wp-content/uploads/2022/05/Community-Presentation-20220525.pdf :

Discussion following the operations update presentation included:

- HK: Is the intent to continue these new releases into the future (5–10 years) to set up a reflection on the group?

  - AC: We are at the stage of planning for monitoring to see what it looks like. We view this as an interim flow that we can monitor and try to replicate before we get to the next phase which would see some infrastructure built and future state in place. Keen to get to STMP process and testing hydrographs against full range of metrics with the HydroViz and STMP tools.

- HK: What is the agenda generally like for the community leaders forum (CLF)? How does it tie into decision making or protecting decisions on what we do at the local level?
  - AC: CLF started from feedback of the regional district, City of PG and Cheslatta around having a regular forum to look at the inflows, freshet forecasts volumes, etc. This was for information and to develop an understanding of what has happened. The aim is provide an understanding of day-to-day operations. It is not tied to outcomes of WEI, but is tied to real-time impacts to river, flood preparedness for downstream communities, etc.
- DS: Thanks to Andrew for the great presentation. It is great to acknowledge the challenges that Rio Tinto is giving themselves to think outside of the box for operations. Proponents are often being challenged to think differently about how they are operating and looking to benefit multiple interests.
  - AC: This work does not in any way diminish or change the work that WEI is doing. The work needs to be more structured, more deliberate and comprehensive of all interests moving forward. This will only serve to inform the WEI and give us another good year of data.
  - AC: Cheslatta are now operating the spillway and setting up for a whole lot of projects on the reservoir this year. The ROV will be undertaken with Cheslatta support. The annual maintenance riprap repairs will also be done by Cheslatta.
- HK: What is the date of the return to full production at Kitimat?
  - AC: Forecast between end of November and January 1. Looking for smelter at full operating capacity for Christmas.

- DW: Are the meetings with Nechako First Nation ongoing? Has there been any further discussion with those groups about proceeding with the proposed released facility at Kenney Dam?

  - AC: We meet with Nechako First Nations very regularly on a technical front, multiple times a week. Looking to old studies and work that has been done regarding the water release facility. An order of magnitude study has been initiated. The leader of the study has met with Cheslatta representatives and will be meeting with Nechako First Nation representatives in the next few weeks. Looking to complete magnitude report by mid-fall. It will inform the next stage and will look to a pre-feasibility study. Also working with Nechako First Nations and Cheslatta representatives, along with the First Nation Major Projects Collation for the need to study the powerhouse at Kenney Dam. It has been an interesting learning for a project that has been studied a lot. Most of the data and information we are lacking is around costing and baseline environmental monitoring, and rehabilitation of the Nechako canyon, Cheslatta fan and the rehabilitation of the Murray Cheslatta system.

## Issues Scoping Updates/Technical Memos: Issues Highlights

JK provided a presentation on issues scoping and technical memos.

Key highlights included:

- TWG tasked with social, economic, and environmental receptors.
- Related to RT flow operations
- 69 issues to date
    - 63 issues being scoped by TWG
    - 6 issues being addressed by the Southside Working Group
- TWG issues scoping can include:
    - Information reviews
    - Data analysis
    - Field surveys
    - Professional opinions
- Scoping results: technical memos, scoping document
- Most of the 63 issues are sensitive to RT operations
    - Suitable for flow alternatives and SDM
    - TWG has developed draft performance measures.
- Some issues with uncertainty
    - Technical work is ongoing.
- Some issues insensitive to RT operations.
    - Not suitable for SDM
- Insensitive issues reviewed:
    - Methylmercury (#49): No further action suggested.
    - Osprey nesting (#38): No further action suggested.
    - Reservoir woody debris interfering with ungulate migration (#31, 35): Good candidate for physical works (i.e., debris removal) at priority sites.
- Data gaps:
    - Total gas pressure (TGP) (#1)
    - Reed canary grass (#5, 8)
    - Freshwater mussels (#27)
    - White sturgeon (#28, 29)
    - Groundwater flooding (#54)
    - Sediment transport (#57)
    - Fraser Lake backwatering (#58)
- Issues sensitive to RT operations reviewed (to be included in SDM process):

- Salmon migration temperature (#18)
- Caribou land links (#32)
- River erosion (#52, 56)
- Chinook early salmon rearing habitat (#22)
- Reservoir productivity—habitat (#13)
- Vanderhoof flooding (#53)
- Fish access to tributaries (#2, 3)
- River side channel (#6, 7) PM

Discussion and comments following this presentation included:

- DK: The TWG has done solid reflection on why things would not fit. Really appreciate the amount of work that has been done.
- HK: Recommend we leave as much information in to show where the conversations came from and to trigger other comments or thoughts. We can look at all of the other interests that have been brought to the table and consider them individually, so when we get to the point of giving the best on each interest, that comparative analysis against the layout of all of them is critical. It would be useful to use this as a base to create a larger table with more information.

## Review Proposed Phase 1 Bookend Alternatives

Michael Harstone provided a presentation on Bookend Alternatives. https://www.getinvolvednechako.ca/wp-content/uploads/2022/05/WEI_Table_Meeting_27_presentation_May25_2022_BookendAlts.pdf

Key highlights included:

- Review of the SDM process
- Purpose of bookend alternatives
- Characteristics of developing bookend alternatives
  - Not designed to be acceptable, they are designed to be learned from.
- Proposed Bookend Flow alternatives:
  - Alternative 1: Status Quo
  - Alternative 2: Nechako River Aquatic Species and Ecosystems
  - Alternative 3: Nechako River Sockeye Salmon
  - Alternative 4: Murray/Cheslatta Aquatic Species and Ecosystems
  - Alternative 5: Reservoir Wildlife (Birds)
  - Alternative 6: Reservoir Aquatic Species and Ecosystems
  - Alternative 7: Flood Mitigation
  - Alternative 8: Unregulated Flows

Discussion and comments during and following the presentation included:

- HK: The Nechako Watershed Council had a large number of concerns (27 flow related). At an early stage, the most attractive option was that if we provided the flows (habitat and conditions in which the largest of the creatures in the river would survive and flourish) it was likely the lesser creatures would also flourish. I recommend cutting to the chase and determining what is the best flow to restore habitat for the surgeon. We would find that all of the creatures we are concerned about would survive. I see this as extremely difficult and complex, but could be simplified and more effective in the long run.
- MH: Part of the exercise for bookends is that it may reveal pretty early on if there is an option that seems to be a winner. It will become apparent pretty quick if there is an alterative that does the best for most of the interests, or it might not. Some lesser interests may be a deciding factors to move toward a different alternative. We ask your permission to trust the process.
- DS: Common to see these concerns expressed at the stage of a process. Quickly it will distill itself down to what is really important and what will affect the decision. We do not want to dismiss something at the outset and then consider it later. Need to work systematically to be sure all interests are considered. These processes take time, but it is worth it.
- There was discussion about the process and the benefits of meeting in person versus online.
    - MH: To develop the bookend alternatives we do not need to meet in person; however, when we are talking about peoples values, it would be better if we can be together in person. Jayson provided an overview of the phase 1 bookend alternatives:

Following a review of the proposed bookend alternatives, the question was asked:

> ***Does the TWG have the mandate from this group to run the analyses on the 8 alternatives presented?***

**No objections were brought forward by the table to moving forward with the alternatives presented.**

## Southside Working Group Update

The SWG has been meeting and one of the interests they've been working on is navigation in the reservoir. Buoys have been ordered and will be arriving in the next few weeks. They will be installed by the Cheslatta marine services group. Performance will be monitored

## Next Steps

There was discussion about the amount of work to be accomplished and the challenges of getting together over the summer months. The earlier proposed July 13 meeting day will be cancelled, and our next meeting will be September 21. A poll will be sent out mid-August to determine if the meeting will be held in-person or via videoconference.

Next meeting dates:

- Wednesday, September 21 (possible in-person)

- Wednesday, October 26 (in-person meeting)

## Meeting adjourned

The meeting was adjourned at 3:35 p.m.

## ACTION ITEMS

- **RR will send a poll in mid-August asking participants if they want to meet in person in September or via videoconference.**