Water Engagement Initiative
Main Table Meeting 32.5

Wednesday, December 6, 1pm to 4pm

Webinar Call

Meeting Objectives

To discuss and reach agreement on a Package of Phase 1 Recommendations related to:

1. Data gaps (PMs, baseline ecological studies) to be carried out in Phase 1,
2. Physical works projects to be built in Phase 1, and
3. Other operational considerations for Phase 1.

- To discuss our upcoming workplan and schedule for the remainder of 2023 and the transitioning into Phase 2 in 2024

Alternative Selected

- At the last WEI Main Table meeting on November 8, 2023, the WEI Table reached general agreement on a Phase 1 flow alternative (Alternative 6A)
- There are a number of requirements that WEI participants outlined
- We will discuss those today

Additional Phase 1 components

- Phase 1 Non-Flow Alternatives:
  - Physical works, e.g. ungulate projects, osprey nests
  - Data Gaps
  - Effectiveness monitoring
  - Other implementation recommendations

Phase 1 Non - Flow Alternatives

Building a Package

Refresher (from 2 meetings ago)

Building a Package for Phase 1

- Project Team reviewed a series of potential options and recommendations to be included in Phase 1 (beyond a Flow Altern recommendation)
- Project Team was directed to go away and further work with the TWG to develop a package for the Main Table to review
- TWG has met a number of time to discuss datagaps and priorities related to monitoring research, physical works and other implementation considerations.
- Project Team has suggested a priority list of actions to undertake for each category, as summarized in the pre-reading package

Package of Recommendations for Phase 1

Phase 1 **Flow Alternatives**	Phase 1 **PM Datagaps** (for P2&P3)	Phase 1 **Ecol. Baseline Datagaps**	Phase 1 **Physical Works**	Phase 1 **Effects Monitoring**	Phase 1 **Review Period**	Phase 1 **Triggers**
Alt 1 Status Quo	none	none	none	none	none	none
Alt 4D EWRS_WYF (11/30)		River Reed Canary Grass (#5) - fish stranding assment	Bank Erosion - project(s)	Reservoir Elevation	after 2 yrs	White Sturgeon Recovery
Alt 5D EWRS_WYF (11/30)	River Side Channel PM (#6)	River Fish (#6) - side channel habitat assmnt	Cheslatta Fish - project(s)	River Discharge	after 5 yrs	Unintended Popln Level Effects
***New* Alt 4E** Hybrid 4D (8/30)	River Riparian Habitat PM (#7)	River Productivity (#9) - field surveys	Flooding - project(s)	River Elevation	etc.	etc.
***New* Alt 5E** Hybrid 5D (8/30)		Reservoir Productivity (#12) - Limnology surveys	Osprey & Cormorants - project(s)	River Temperature		
***New* Alt 6A** Hybrid 4E - Wet Yr Freshet Pulse	Reservoir Fish Habitat PM (#14)	Reservoir Fish Habitat (#14) - benthos & popln distri	Reservoir Fish - project(s)	Power Output		
	Cheslatta Fish PM (#17)	Cheslatta Fish Habitat (#17) - Baseline Distr + Abundance	River Fish / Salmon - project(s)			
	Salmon Temp-Migration PM (#18)	River Temp & Migration (#18) - Fish Habitat + Fate Assmnt	Sediment Transport - project(s)			
	Juvenile Survival PM (#19)	River Temp & Juveniles (#19) - Habitat Use + Fate Assmnt	Ungulates - project(s)			
	Chinook Rearing PM (#22)	Chinook Winter Habitat (#23) - Habitat Assmnt	Waterfowl/Shore Nesting Birds - project(s)			
	Resident Fish Rearing PM (same as PM #18)	Resident Fish Temp (#24) - Field & Temp Study	Wildlife Habitat - project(s)			
		Resident Fish Rearing Habitat (#25) - Field & Habitat Study				
		River Mussels (#27) - field assmnt				
	White Sturgeon PMs (#28, 29, 30)	White Sturgeon (#28, 29, 30)				
	Archaelogy Site Erosion PM (#49)	Reservoir Osprey Food Avail (#39) - fish popln distr, abund, hab use				
	River Ice PM (#68)	River Ice Cover (#68) - field survey				

Phase 1 Non - Flow Alternatives

Project Team's Recommended Physical Works

Project Team's Recommended Physical Works

- There are many potential physical works projects that could be undertaken in Phase 1
- TWG reviewed the preliminary list developed by the Project Team, but felt they had insufficient guidance/criteria to prioritize them
  - Relative cost
  - WEI Relevance (river management, broader ecological considerations)
  - Related issues
  - Lifetime
  - Maintenance
  - Benefits
  - Implementation timeline
  - Time to benefit
  - Certainty
  - Climate Change

Project Team's Recommended Physical Works

- The Project Team's prioritization approach was to focus on candidate projects based on their relationship to,
  - MT member conditions of accepting flow alternative 6.
  - Mitigate or offset trade-offs between Alt 6 and Status Quo, and considering Alt 5 (which was conditionally endorsed at meeting 31)
    - i.e., which PMs performed better for SQ or Alt 5 than Alt 6

- All other projects will be identified as important as they provide value and benefits in the watershed (but they may need other partners to take the lead)

Project Team's Recommended Physical Works

Goal	Location	WEI Relevance	Description	MT Trade-off Decision
Improve caribou calving ground access	Reservoir	Flow	Remove LWD on beaches of calving islands (expand SERNbc pilot project)	in lieu of Alt 1 status quo
Improve caribou survival	Reservoir	Flow	Dredge land bridges to decrease wolf predation	in lieu of Alt 1 status quo
Reduce osprey nest flooding	Reservoir	Flow	Relocate flood-prone nests, remove flood-prone nesting sites	in lieu of Alt 5D
Improve mainstem fish habitat	River, Chesatta	Flow	Construct instream fish habitat (LWD structures, Newbury weir/channel restoration structures)	in lieu of Alt 5D
Reduce fish stranding	River, Chesatta	Flow	Re-contour high-risk stranding habitat, salvage and relocate stranded fish	In lieu of Alt 1 and Alt 5D
Improve sidechannel fish habitat	River	Flow	Scarify sidechannels (dig micro-channels), LWD/fish habitat complexing, excavate sidechannel inlets, cattle management	in lieu of Alt 5D***
Reduce flooding	River	Flow	Construct flood berm in Vanderhoof	in lieu of Alt 1 status quo***
Reduce bank erosion/ improve channel stabilization	River, Chesatta	Flow	Bioengineering or hard bank protection, flow deflection structures	
Reduce cattle impacts to fish/wildlife habitat	River	Ecological improvement/WEI parking lot	Fencing, constructed watering sites, Range permit revisions/enforcement	
Improve riparian conditions	River	Flow	Cottonwood planting (expand MoF pilot project), cattle management	
Improve tributary fish habitat	River (tributary)	Ecological improvement/WEI parking lot	Construct instream fish habitat (LWD structures, Newbury wier, riparian planting, beaverdam analogs), cattle management	
Improve tributary habitat/temperature	River (tributary)	Ecological improvement/WEI parking lot	Plant tributary riparian areas	
Reduce tributary sediment input	River (tributary)	Ecological improvement/WEI parking lot	Bioengineering bank protection	
Improve fish access in tributaries	River (tributary)	Ecological improvement/WEI parking lot	Remove obstructions (e.g., culverts)	
Reduce invasive species	River	Ecological improvement/WEI parking lot	Canary reed grass suppression, side-channel scarification	
Reduce reservoir erosion	Reservoir	Footprint	Protect infrastructure adjacent to eroding foreshore	
Stabilize Cheslatta Lake levels	Cheslatta	Ecological improvement/WEI parking lot	Construct outlet weir (KDRF scenario)	
Improve productivity	Reservoir, Cheslatta, River	Ecological improvement/WEI parking lot	Fertilization	

Phase 1 Non - Flow Alternatives

Project Team's Recommended Datagaps

Project Team's Recommended Phase 1 Datagaps

Refer to Table in Pre-reading package

Main Table members were asked to review the recommended list of high priority datagaps and identify whether there are any datagaps missing that they think are important and need to be addressed in Phase 1; and if there are some, please be prepared to describe your reasoning for including them.

Project Team's Recommended Phase 1 Datagaps

- PM data gaps
  - Targeted studies to refine existing PMs and/or develop new PMs
- Ecological baseline
  - Research to address uncertainties regarding the current state of ecological components
- Approach
  - Identify and assess data gaps (review issue/PM list, technical memos, TWG/MT comments, etc.)
  - Scope studies (high-level design/cost)
  - Prioritize

Project Team's Recommended Phase 1 Datagaps

- Prioritization criteria:

BC Hydro Evaluation Criteria Questions	WEI sub questions
1. WEI Status	1.1 What is the PM status (dropped, short-list, proxy, deferred until technical info available, adaptive management/monitoring)? 1.2 What is the issue status (adaptive management/monitoring, physical works in lieu)? 1.3 Is this a parking lot/watershed issue (not directly related to flow regulation)?
2. Will filling the data gap provide information related to the calculation of a PM?	2.1 How does filling the data gap help improve the PM?
3. Is the data gap significant enough to affect the ranking alternative related to a PM *or* to impact future phases or operations?	3.1 Would the MT make a different decision if we had this information? 3.2 Does filling the data gap update scoping for a full range of potential operations (i.e., Phase 2 or 3)?
4. Can the study provide meaningful, reliable data within the timeframe available?	4.1 How long would the study take (one month, one season, multiple seasons, multiple years)? 4.2 Can we complete this work under the current WEI schedule?
5. Do the benefits outweigh the costs?	5.1. What is the relative expense of the study (low $0-$50,000, moderate $50,000-$250,000, high > $250,000)? 5.2 Can the low/moderate data gap be addressed concurrently w/ high priority data gaps?

- 35 high priority studies

Project Team's Recommended Phase 1 Datagaps

Issue information			Study description(s)	Relative Cost $ < $50k $$ = $50k-$250k $$$ > $250k	Priority Level (Low, Moderate, High)	
#	Name	Basin			Ecological Baseline	PM
5	River Reed Canary Grass - Fish stranding	Nechako River	Field assessment to determine Reed Canary Grass distribution during growing season.	$	High	
			Fish stranding assessment / experiment.	$$	High	
6	River fish side channel habitat	Nechako River	HEC-RAS DEM to determine side channel depth over range of Nechako River flows.	$		High
			Field assessment of wetted area.	$	High	High
			Habitat function flow relationship for side channels.	$$ - $$$	High	High
7	River functional riparian habitat	Nechako River	HEC-RAS DEM to determine timing and duration of riparian habitat inundation over range of Nechako River flows.	$		High
8	River Reed Canary Grass - Invasive species/habitat impacts	Nechako River	Field assessment to determine Reed Canary Grass distribution during the growing season.	$ - $$	High	
			Field assessment of Reed Canary Grass impacts on native habitats/species.	$$$	High	
9	River productivity	Nechako River	Field surveys to further characterize existing conditions.	$$	High	
11	Reservoir productivity-growth	Nechako Reservoir	Limnology surveys (secchi, nutrients, chlorophyl A, alkalinity, TDS) macrophyte, periphyton observations, substrate type.	$$	High	
			Data to update bathymetry model.	$$ - $$$		High
13	Reservoir fish habitat	Nechako Reservoir	Data to update bathymetry model.	$$ - $$$		High
			Contemporary benthos and zooplankton density data during entire growing season including biomass from length mass regressions.	$$	High	
			Fish population distribution and habitat/use assessment.	$$$	High	
15	Cheslatta productivity-growth	Cheslatta watershed	Lake limnological data (e.g., water chemistry, algal productivity, bathymetry and littoral habitats).	$$	High	
17	Cheslatta fish habitat	Cheslatta watershed	Hydrological data collection (in -river hydrometric gauges, lake level monitoring).	$$		High
			Fish distribution and abundance data across all habitat types (e.g., spawning and rearing habitat; FHAP).	$$	High	High

Project Team's Recommended Phase 1 Datagaps

18	River water temperature & migrating salmon	Nechako River	Field assessment to determine fish habitat use / behaviour across a range of river temperatures (includes water temperature monitoring and fish surveys).	$ - $$$	High	High
			Migrating salmon fate assessment (aerobic scope need, lethal/sublethal effects).	$$ - $$$	High	High
19	River water temperature & juvenile salmon	Nechako River	Field assessment to determine fish habitat use / behaviour across a range of river temperatures (includes water temperature monitoring and fish surveys). Includes timing of migration.	$$ - $$$	High	High
			Juvenile salmon fate assessment (aerobic scope need, lethal/sublethal effects).	$$ - $$$	High	High
22	River CH rearing habitat	Nechako River	Habitat quality and quantity assessment.	$$		High
			Instream flow study to update habitat flow relationship.	$$ - $$$		High
23	River CH winter habitat	Nechako River	Habitat quality and quantity assessment (ice effects captured separately in Issue #68: river ice cover).	$$	High	
24	Resident fish river water temperature	Nechako River	Field assessment to determine fish habitat use / behaviour across a range of river temperatures (includes water temperature monitoring and fish surveys).	$$ - $$$	High	
			Salmon temperature studies (Field assessment to determine salmon habitat use / behaviour across a range of river temperatures (includes water temperature monitoring and fish surveys) and fate assessment (aerobic scope need, lethal/sublethal effects).	$$ - $$$	High	High
25	Resident fish rearing habitat	Nechako River	Field assessment to determine resident species abundances, habitat use, and distribution across all life stages.	$$ - $$$	High	
			Habitat quality and quantity assessment.	$$	High	
27	River mussels	Nechako River	Field assessment to determine mussel distribution, abundance, and host species.	$$ - $$$	High	
28	River WS spawning habitat	Nechako River	To be discussed with NWSRI.	Unknown	High	High
29	River WS rearing habitat	Nechako River	To be discussed with NWSRI.	Unknown	High	High
30	River WS productivity	Nechako River	To be discussed with NWSRI.	Unknown	High	High
39	Reservoir osprey food availability	Nechako Reservoir	Fish population distribution, abundance, and habitat/use assessment.	$$$	High	
49	Archeological sites inundation	Cheslatta watershed	Arch. site erosion assessment at different ramping rates.	$$		High
68	River ice cover	Nechako River	Field survey of ice thickness and water depth to confirm if an issue.	$	High	High

Phase 1 Non - Flow Alternatives

Recommended Effectiveness Monitoring

Recommended Effectiveness Monitoring

- The Project Team has discussed various monitoring options with the TWG as to whether the effectiveness and benefits of a new Flow Alternative could be measured within the timeframe and duration of a flow change implemented in Phase 1. A number of factors weighed into these discussions, including:
  - Expected change/effect under flow alternative (i.e., Consequence table suggests most PMs will not be affected, and where effects anticipated magnitude is small).
  - Lessons learned (WUP process, U.S. Missouri River Pallid Sturgeon, BC Hydro IPP process, other projects)
  - Standard monitoring protocols
  - Monitoring timeframes (including baseline)
  - WEI timeframes (Phase 2/3)
  - PM certainty

Recommended Effectiveness Monitoring

- The recommended effectiveness monitoring consists of,
  - reservoir elevation,
  - river discharge,
  - river elevation,
  - river temperature,
  - power output

Note: These things to be monitored relate to the PMs, which are currently already being calculated and all of these are already being monitored (i.e., no new infrastructure or instrumentation needed to monitor these things).

Phase 1 Non - Flow Alternatives

Other Implementation Recommendations

Other Implementation Recommendations

Area	Description and Recommendation
Formal Review	It is fairly common for a new flow regime (alternative) to have a set and formal review built into its operational plan. There are many reasons for this, but the most common is to review and revisit whether the flow alternative is meeting the expected benefits and/or not having any unacceptable unintended consequences. A key factor in when to stage a formal review is when there will be better information and monitoring in order to carry out a comprehensive review. It is a bit complicated to set the appropriate timing of a formal review on a Phase 1 Flow Alternative that is only meant to be interim until there is a new Phase 2 or Phase 3 flow alternative. However, we do not know the exact timing for when a Phase 2/3 flow change could occur, as there will be uncertainty with it as a result of regulatory approvals and possible environmental assessments that may be required. So for insurance, the **Project Team is recommending that a formal review of the Phase 1 Flow Atlernative be carried out after five years** from when it gets implemented. This assumes that the recommended Phase 1 datagaps will have been completed to better ensure better information is available to carry out the review.

Other Implementation Recommendations

Area	Description and Recommendation
Triggers	A recommendation to proceed with a new Phase 1 Flow Alternative is associated with uncertainty, as our current understanding is imperfect. And we know that there are some primary concerns that if we had a better information base and understanding, we may have led to a different Phase 1 Flow Alternative outcome, but we used the best information we had at hand. One obvious trigger that has been discussed and agreed to earlier (NWEI Sturgeon Strategy) is that if the White Sturgeon Recovery Team recommends flow changes to better recover sturgeon that this would automatically trigger a re-opening and review of the Phase 1 Flow Alternative (assuming that it was still operating). **The Project Team recommends two specific triggers that would led to a review and revisiting of the Phase 1 Flow Alternative, as follows:** • **If the White Sturgeon Recovery Team recommends a new base flow regime.** • **If it is determined that the Phase 1 Flow Alternative is having an adverse population-level affect on priority fish species.**

Other Implementation Recommendations

Area	Description and Recommendation
Operational Updates and Engagement	Rio Tinto implemented a new approach to engage external parties and communities, provide operational updates and seek structured feedback into their operations through the NWEI process and Main Table. **The Project Team wanted to check whether there was a recommendation from the Main Table on this approach and whether it should continue after the planning phases and into the implementation of a recommended Flow Alternative**. The current approach includes regular meetings through the NWEI Main Table, Southside Working Group, Technical Working Group, website and communications materials to the broader public along with the regular updates to the Community Leaders Forum. These updates and briefings provide a window to keep interested parties updates on annual and in-season operational planning as well as providing an opportunity to seek input and direction.

Other Implementation Recommendations

Area	Description and Recommendation
Phase 1 Studies & Physical Works Project Manager / Coordinator	The further refinement and scoping of the recommended datagap studies and physical works with the TWG along with the project management and coordination to get the studies / projects funded and built will require effort and a high degree of coordination and fundraising across all the agencies and partners in the watershed. **The Project Team is therefore recommending dedicated support to coordinate and manage this work (e.g., Phase 1 Coordinator/Project Manager)**.
Other	**Are there other recommendations that the Main Table would like to discuss and possibly include within the package of Phase 1 Recommendations? If so, please come to the meeting with your ideas.**

Transitioning Phase 1 to Phase 2

What are the next steps?

Transitioning to Phase 2 – Next Steps

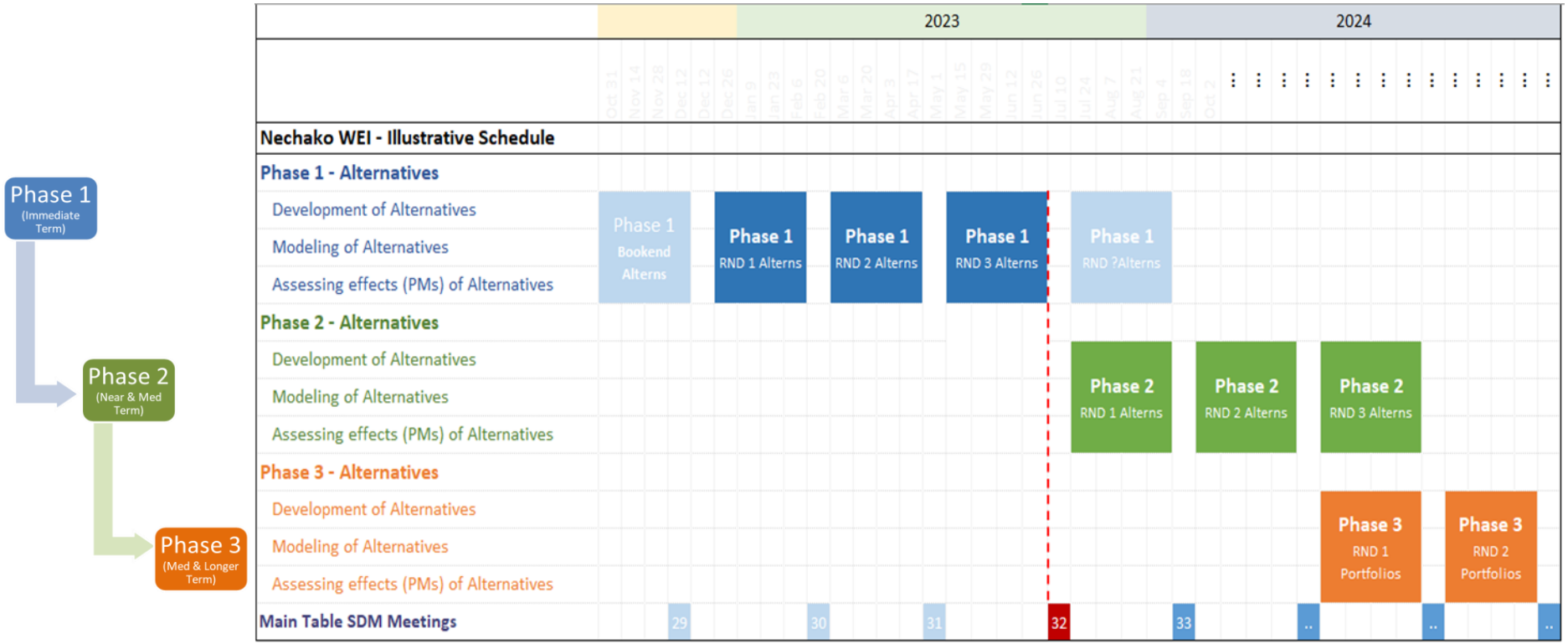
Some questions to consider:

- Do we wait to start Phase 2 until data collection for PM updates has been advanced significantly?
- Are there any scope issues which need to be better defined in relation to Phase 2
  - E.g., with DFO in relation to re-shaping STMP water budget and shape?
  - E.g., with others on other agreements (e.g., Province or BCH w/ power generation)?
- What is the status of the infrastructure investigations e.g. Kenney Dam spillway?
- What is the status of discussions with the Nechako First Nations?

Next Steps

Next Steps

Draft Workplan:



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Adjourn