

Water Engagement Initiative Main Table Meeting 31

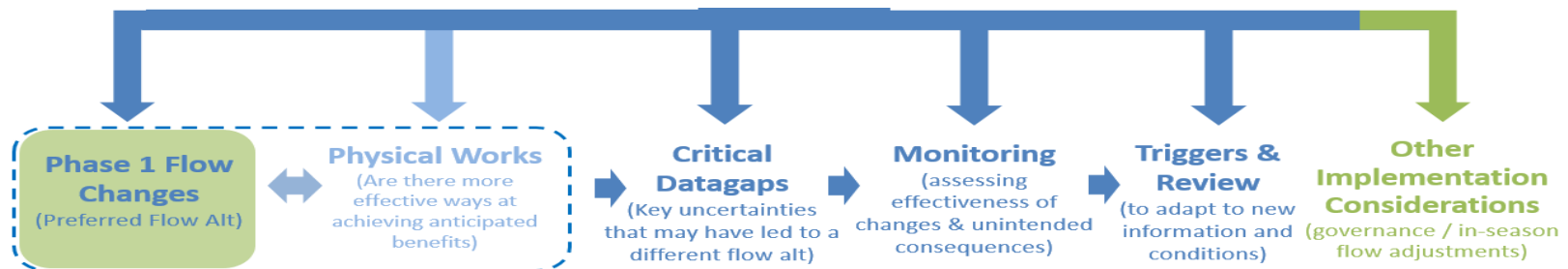
Thursday, June 29, 2023, 9:00 am to 4:00 pm

Vanderhoof Community Event Centre



Meeting Objectives

- To provide an update since our last meeting,
- To review and **assess the performance** of the P1 Round 2 Flow Alternatives
- To discuss and **identify preferred Flow Alternative(s)**; and, whether there are **new and improved flow alternatives** to model and assess at the next meeting?
- To discuss other flow – related recommendations that would make up a **“Package” of Phase 1 Recommendations**



- To discuss our **upcoming workplan** and any next steps

Agenda (Day 2)

Thursday, June 29, 2023

9:00 am: Overview of Day 2

9:30 am: Assessing the Flow Alternatives: Performance Measures

10:45 am: Break

11:00 am: Ranking the Flow Alternatives: Exercises

12:00 pm: Lunch

12:45 pm: Reaching Agreement on P1 Flow Alterns and Next Steps

2:00 pm: Intro “Package” of Phase 1 Flow Related Recdns

2:15 pm: Break

2:30 pm: Package of Phase 1 Flow Related Recommendations

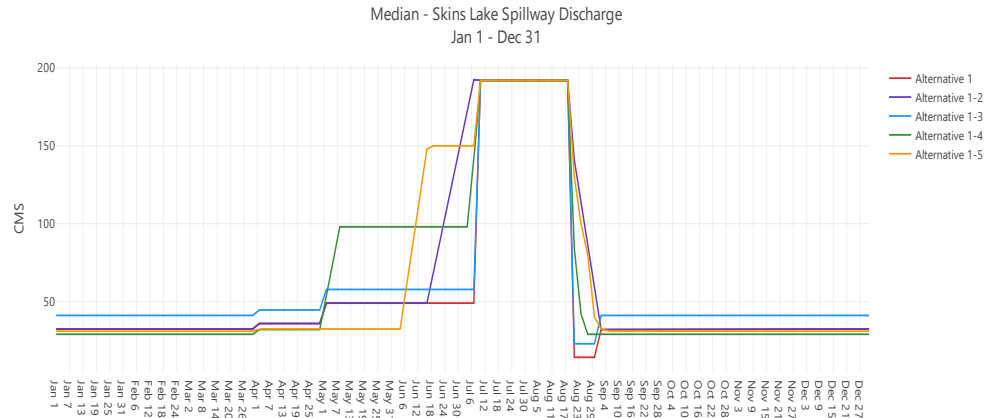
3:45 pm: Next steps

4:00 pm: Adjourn

Working Towards the End of Phase 1

A “Package” of Phase 1 Flow Related Recommendations

Phase 1
(Immediate Term)



Phase 1 Flow
Changes
(Preferred Flow Alt)

Physical Works
(Are there more
effective ways at
achieving anticipated
benefits)

Critical
Datagaps
(Key uncertainties
that may have led to a
different flow alt)

Monitoring
(assessing
effectiveness of
changes & unintended
consequences)

Triggers &
Review
(to adapt to new
information and
conditions)

Other
Implementation
Considerations
(governance / in-season
flow adjustments)

Review & Re-
Assess Flow
Changes

Phase 1

Assessing Round 2 Flow Alternatives

- TWG Shortlisted Performance Measures

Katie Healey

Jayson Kurtz

Cutting to the Chase ...



Criteria	Performance Measures		Unit	Preferred	MSIC	Alt 1	Alt 3D	Alt 4B	Alt 4D	Alt 5B	Alt 5C	Alt 5D
Fish					Direction	Status Quo	EWRS_WYF	SQ_WYF	EWRS_WYF	SQ_WYF	EWRS	EWRS_WYF
* #6 River fish access to side/off channels	Median	Average flow	CMS	Higher	20%	92.6	94	98.8	99.3	97.7	93	98.2
* #12 Reservoir productivity-flushing	Median	Average discharge	CMS	Lower	20%	84.9	86.1	91.5	92.3	89.9	85.7	90.3
* #17 Cheslatta watershed fish habitat	Median	Range of flow	CMS	Lower	20%	191.8	187.9	187.8	187.8	187.8	191.8	187.8
* #18a River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 18C	Days	Lower	20%	30.5	NA	NA	NA	NA	29.5	NA
* #18c River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 20C	Days	Lower	20%	5.5	NA	NA	NA	NA	5	NA
* #21a River Chinook incubation flow	Median	Ratio of min incubation flow to average spawning flow	%	Higher	20%	50.3	53.1	48.4	48.3	49	50.2	48.9
* #22a V2 River CH rearing habitat post-emergent Habitat	Median	Percent of max available post-emergent habitat (modified Envirocon)	%	Higher	20%	100	100	100	100	100	100	100
* #22b V2 River CH rearing habitat pre-migrant habitat	Median	Percent of max available pre-migrant habitat (modified Envirocon)	%	Higher	20%	84.8	80.7	83.9	78.4	83.9	78.7	77.4
* #25a Resident fish rearing habitat	Median	Percent of maximum available juvenile Rainbow Trout habitat	%	Higher	20%	66.2	69.6	66	66.1	66	66.7	66.2
#26 Resident fish overwinter habitat	Median	Percent of max available overwintering habitat (mod. Slaney et al. 1984)	%	Higher	20%	95.6	99	95.6	95.6	96.4	95.6	96.4
Wildlife												
* #32 Reservoir caribou land links	Median	# of days water elevation is > 852 m	Days	Higher	20%	8	11.5	6.5	6	7.5	9.5	7
* #38 Reservoir osprey nesting habitat		Number of years where reservoir elevation exceeds 852.44m	Years	Lower	20%	12	11	10	9	10	12	9
* #41b Reservoir wetland habitat		Number of years where reservoir elevation exceeds 852.94 m	Years	Higher	20%	8	8	8	8	8	8	8
* #45b River bird inundation of nests		Number of years where Cheslatta discharge exceeds 275 cms	Years	Lower	20%	5	5	5	4	4	5	4
Culture & Heritage												
* #49b Cheslatta watershed inundation of arch sites	80th %	# of days > 300 cms	Days	Lower	7	2.2	4	0.2	0.2	0.4	2	0.2
Flooding & Erosion												
* #53 River open-water flooding	Max	# of days flow >550 at Vanderhoof	Days	Lower	7	2	0	2	0	0	6	0
Rio Tinto Operations												
* #65b Smelter Power	Max	# of days smelter load isn't met	Days	Lower	7	0	0	0	0	0	0	0
* #66b Kemano power reliability (Tier 1)		Tier 1 power reliability	%	Higher	5	96.98	96.98	96.98	96.29	96.98	96.98	95.92
* #67 Kemano power exports (Tier 2)	Median	Mean Tier 2 power generation	MW	Higher	20	136.3	102.5	119.7	125.1	114.1	137.7	120.3

Assessing Flow Alternatives – Performance Measures



Round 2 Performance Measures

Pre-Read, Page 9

- TWG reviews shortlist, MSIC each round
- Same 19 shortlisted PMs as last meeting:
 - 6 - River fish access to side/off channels
 - 12 - Reservoir productivity-flushing
 - 17 - Cheslatta watershed fish habitat
 - 18a - River water temperature and migrating salmon (18C)
 - 18c - River water temperature and migrating salmon (20C)
 - 21a - River Chinook incubation flow
 - 22a - River Chinook rearing habitat



Round 2 Performance Measures

Pre-Read, Page 9

- 25a - Resident fish rearing habitat
- 32 - Reservoir caribou land links
- 38 - Reservoir osprey nesting habitat
- 41b - Reservoir wetland habitat
- 45b - River bird inundation of nests
- 49b - Cheslatta watershed inundation of archeological sites
- 53 - River open-water flooding
- 65 - Kemanos power generation (smelter load)
- 66 - Kemanos power exports (Tier 1)
- 67 - Kemanos power exports (Tier 2)



Round 2 Shortlist PMs cont'd

- Recognition that not all PMs are “equal”: data dependent
 - Flow curve
 - Threshold
 - Ratio
 - Range
 - Direction
- PM confidence assessment
- Data gap assessment



PM Confidence

PM Number	PM Status	Consolidated Issue Name	Performance Measure	Overall Confidence (in PM)
6	shortlist	River fish access to side/off channels	average flow (more is better)	Low
12	shortlist	Reservoir productivity-flushing	Average discharge (less is better)	High
17	shortlist	Cheslatta watershed fish habitat	range of flow (less is better)	Low
18	shortlist	River water temperature and migrating salmon	PM1: # of days average daily temp exceeds 18C (fewer is better)	High
18	shortlist	River water temperature and migrating salmon	PM3: # of days average daily temp exceeds 20C (fewer is better)	High
21	shortlist	River CH incubation flow	Ratio of min incubation flow to average spawning flow (higher is better)	Moderate
22	shortlist	River CH rearing habitat	Percent of maximum available pre-migrant habitat (modified Envirocon)	Moderate
22	shortlist	River CH rearing habitat	Percent of maximum available post-emergent habitat (modified Envirocon)	Moderate
25	shortlist	Resident fish rearing habitat	Percent of maximum available juvenile habitat (Modified Slaney et al. 1984) (more is better)	Moderate
26	shortlist	Resident fish overwinter habitat	Percent of maximum available overwintering habitat (modified Slaney et al. 1984)	Moderate
32	shortlist	Reservoir caribou land links	# of days water elevation is > 852 m (more is better)	Moderate
38	shortlist	Reservoir osprey nesting habitat	Number of years where reservoir elevation exceeds 852.44m (fewer is better)	Moderate
41	shortlist	Reservoir wetland habitat	Number of years where reservoir elevation exceeds 852.94 m (more is better)	Moderate
45	shortlist	River bird inundation of nests	Number of years where Cheslatta discharge exceeds 275 cms (fewer is better)	Low
49	shortlist	Cheslatta watershed inundation of archeological sites	PM2: # of days > 300 cms (fewer is better)	Low
53	shortlist	River open-water flooding	# of days flow >550 m ³ /s (fewer is better)	High
65	shortlist	Kemano power generation	# of days smelter load isn't met (fewer is better)	High
66	shortlist	Kemano power reliability	Tier 1 reliability (more is better)	High
67	shortlist	Kemano power exports	Mean Tier 2 power generation (more is better)	High



General Results

Pre-Read, Page 48

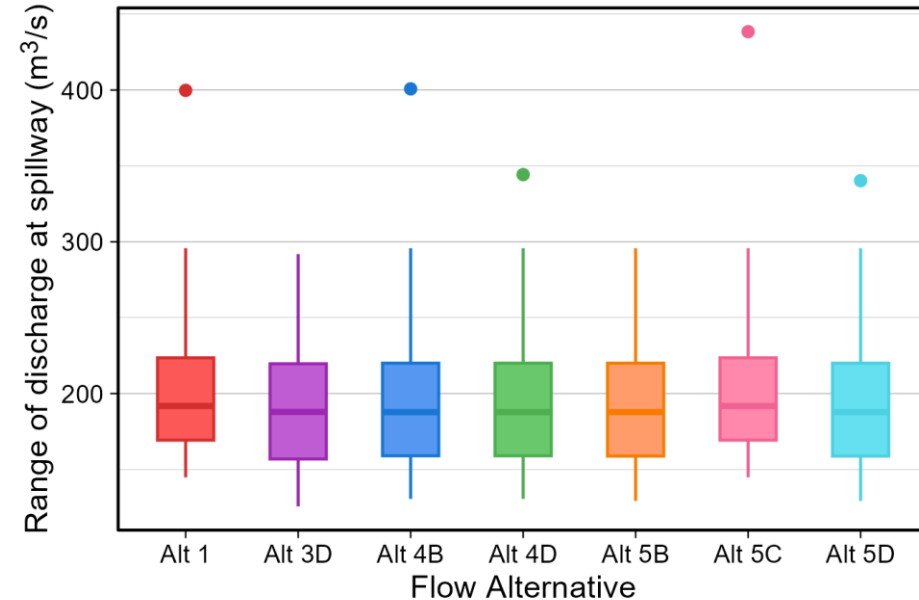
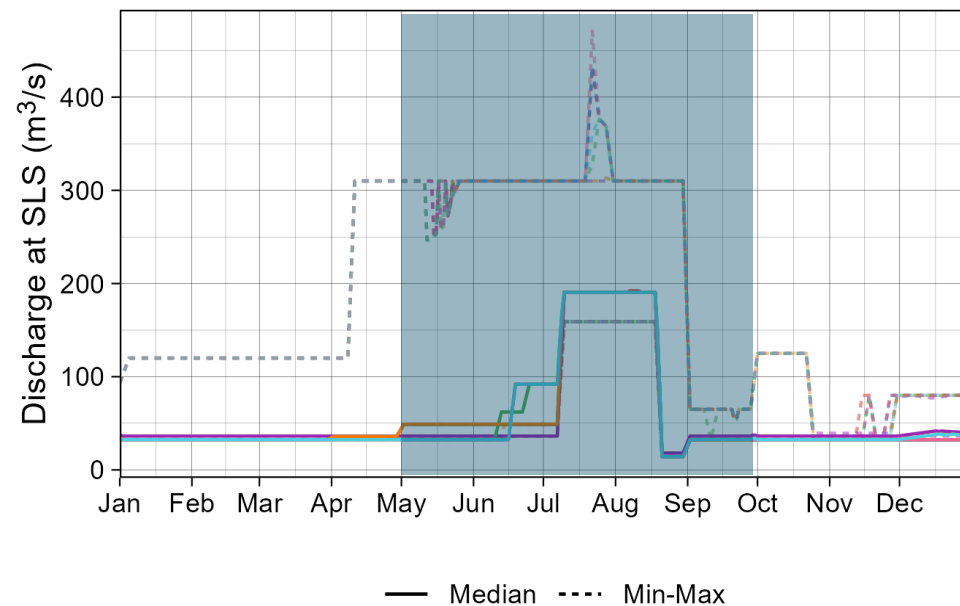
Alternative	Performs Well For
Alt 1 (Status Quo)	
Alternative 3D	Caribou land links
Alternative 4B	Cheslatta fish habitat
Alternative 4D	Cheslatta fish habitat, reservoir osprey nests, Tier 2
Alternative 5B	Cheslatta fish habitat
Alternative 5C	Caribou land links, Tier 2
Alternative 5D	Cheslatta fish habitat, reservoir osprey nests



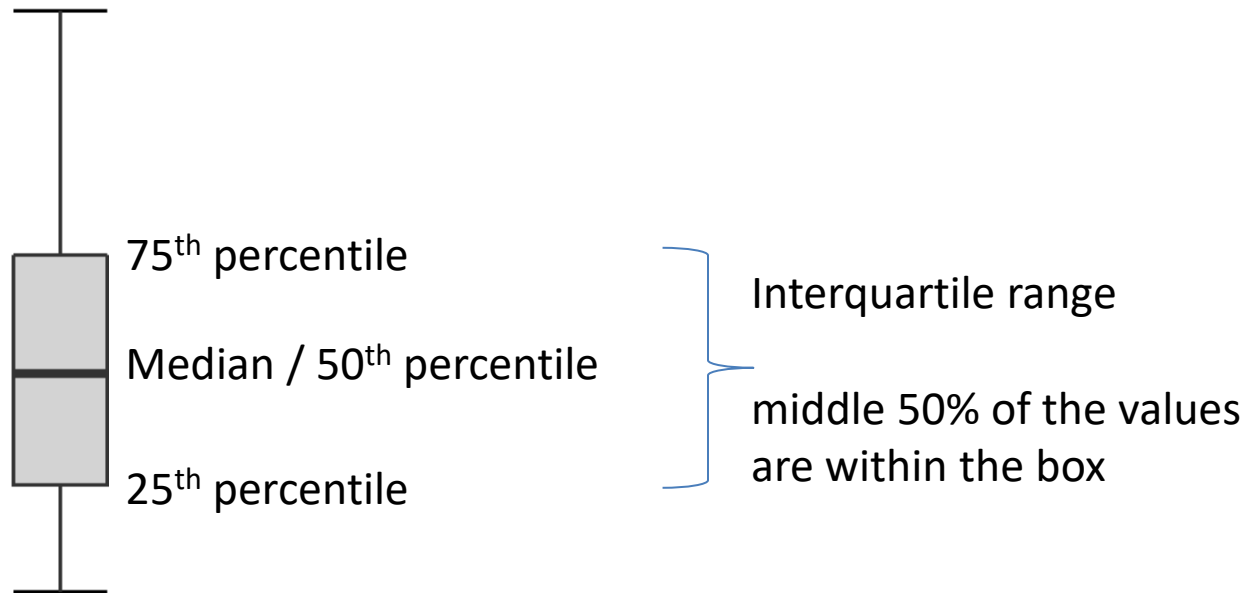
Example - Issue #17: Cheslatta watershed fish habitat

Pre-Read, Page 39

PM17: Range of flow	Location:	Cheslatta Watershed (primarily river)
	Timing:	May 1 - Sept 30
	Unit:	CMS
	Direction:	Less is better
	MSIC:	20%



Box Plots



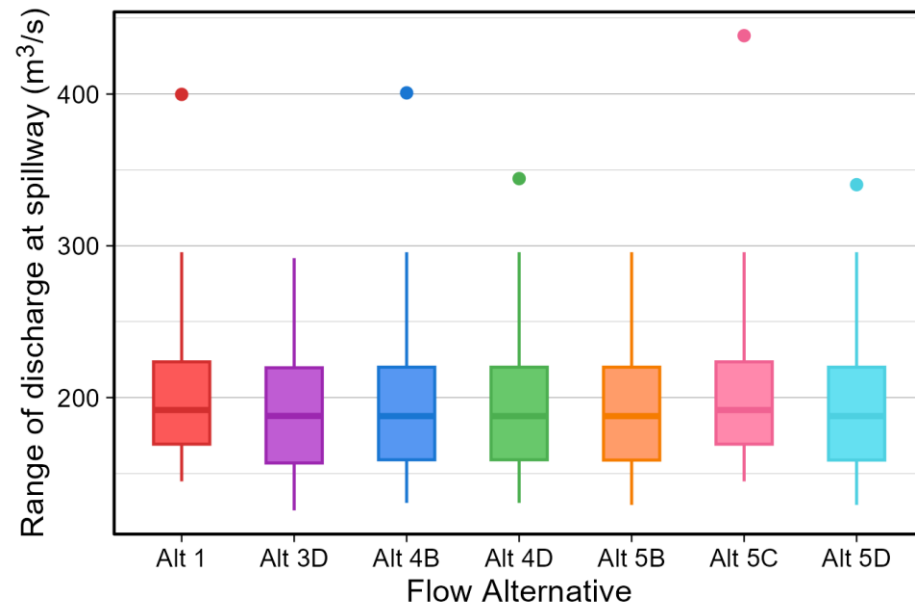
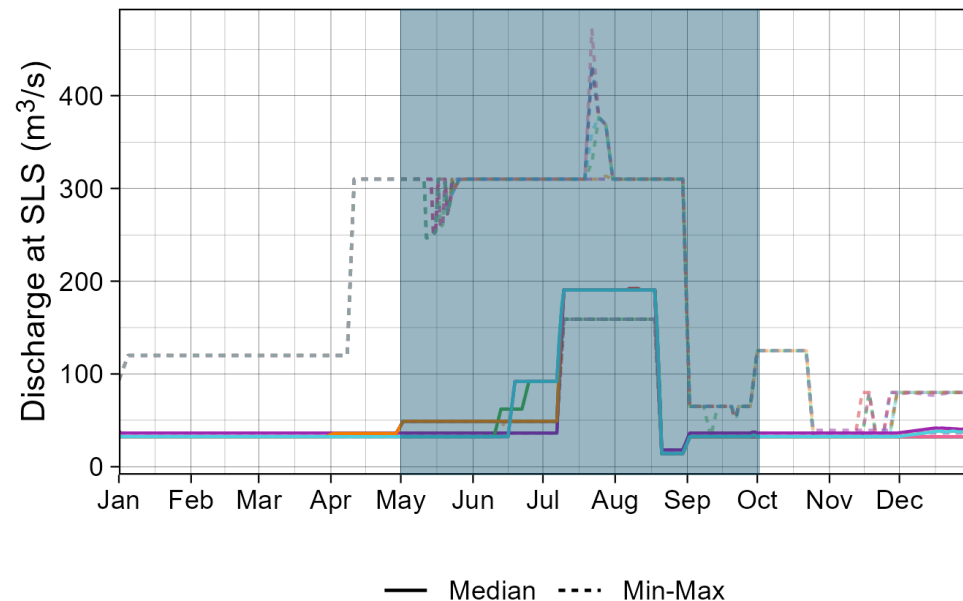
Outlier



Issue #17: Cheslatta watershed fish habitat

Pre-Read, Page 39

PM17: Range of flow	Location:	Cheslatta Watershed (primarily river)
	Timing:	May 1 - Sept 30
	Unit:	CMS
	Direction:	Less is better
	MSIC:	20%



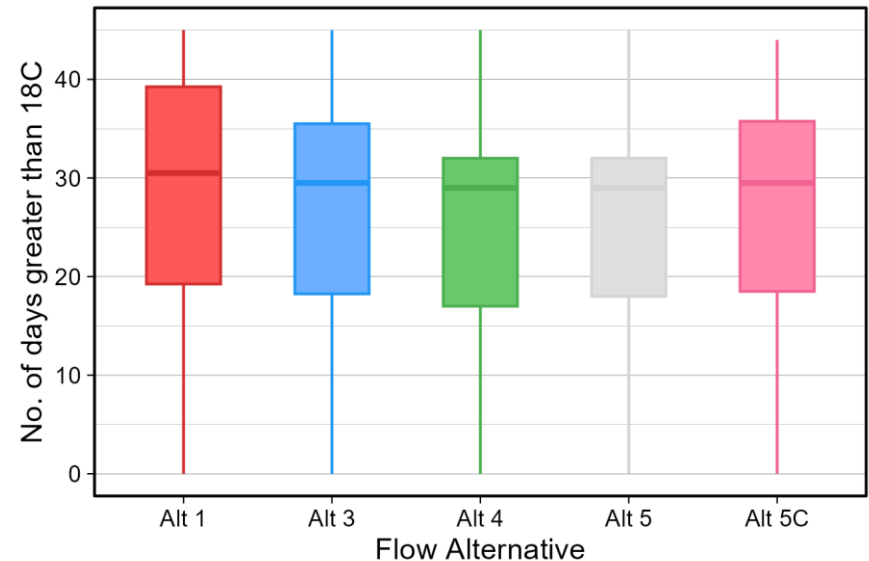
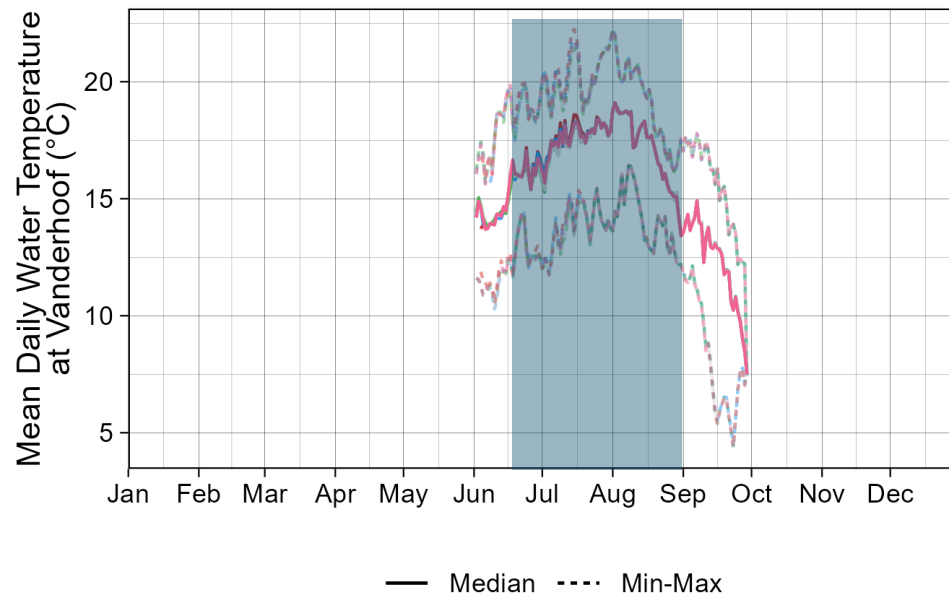
Issue #18a: River water temperature and migrating salmon

Pre-Read, Page 39

PM18: River water temperature and migrating salmon

a) Days > 18C

Location:	Chinook: entire Nechako River Sockeye: Below confluence of Stuart River
Timing:	Salmon migration period: Jun 15 – Aug 29
Unit:	Days
Direction:	Fewer is better
MSIC:	20%



Issue #18c: River water temperature and migrating salmon

Pre-Read, Page 39

PM18: River water temperature and migrating salmon

c) Days > 20C

Location:

Chinook: entire Nechako River

Sockeye: Below confluence of Stuart River

Timing:

Salmon migration period: Jun 15 – Aug 29

Unit:

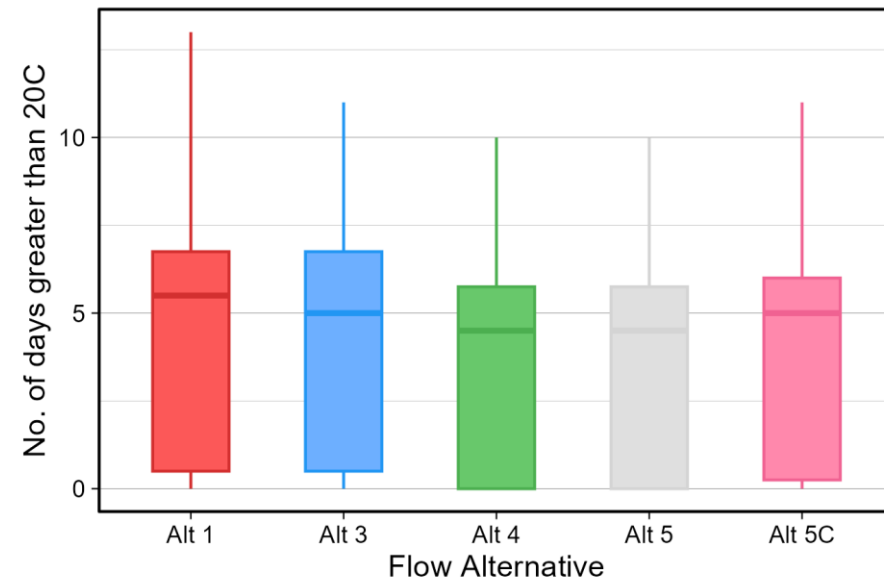
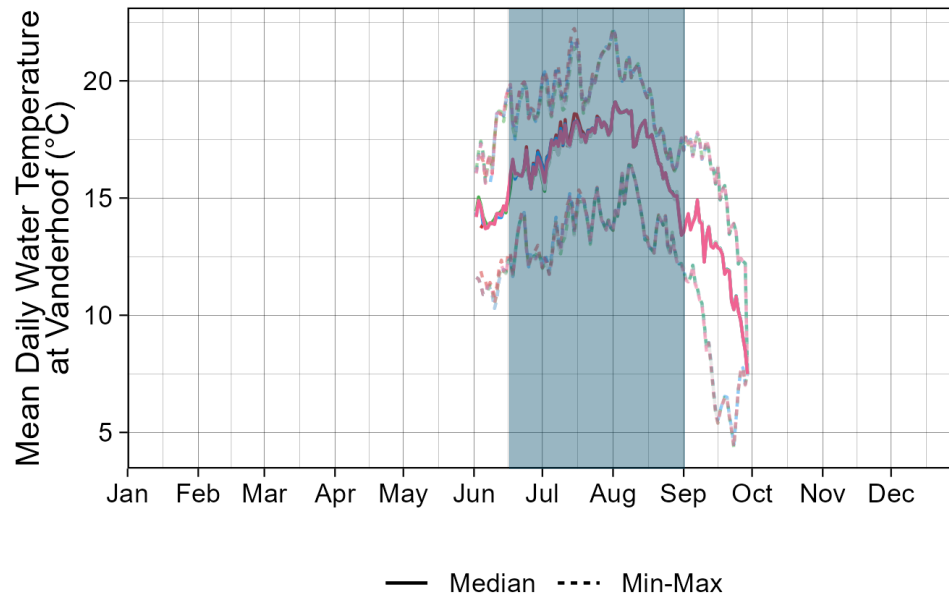
Days

Direction:

Fewer is better

MSIC:

20%

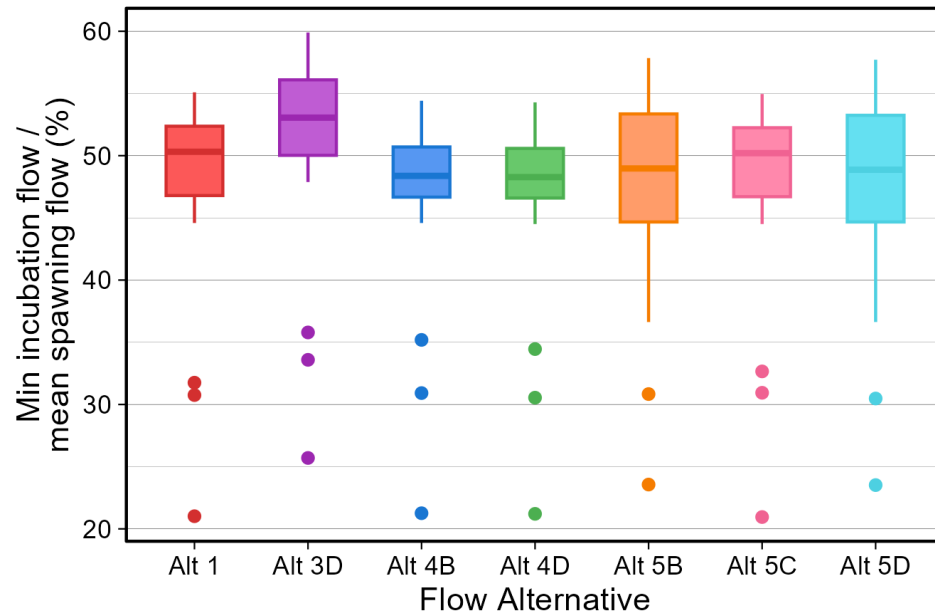
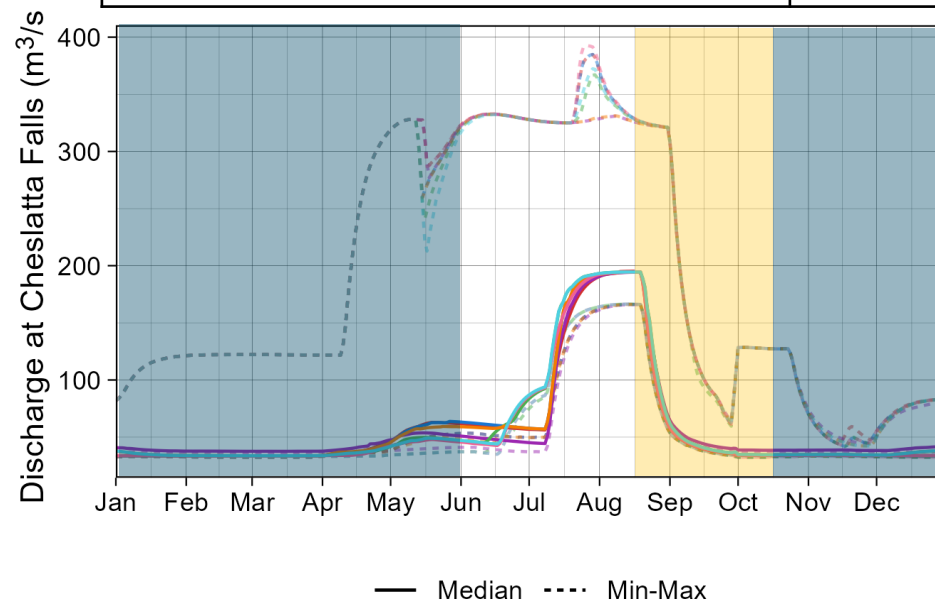


Issue #21a:River Chinook incubation flow

Pre-Read, Page 40

PM21a: Ratio of min incubation flow to average spawning flow

Location:	Nechako River below Cheslatta Falls
Timing:	Aug 15 – May 31
Unit:	%
Direction:	Higher
MSIC:	20%

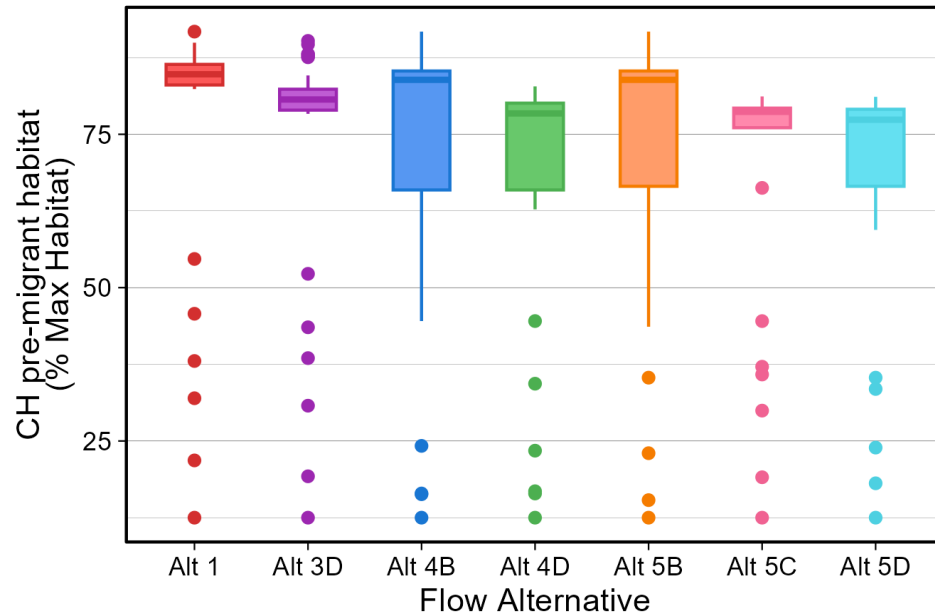
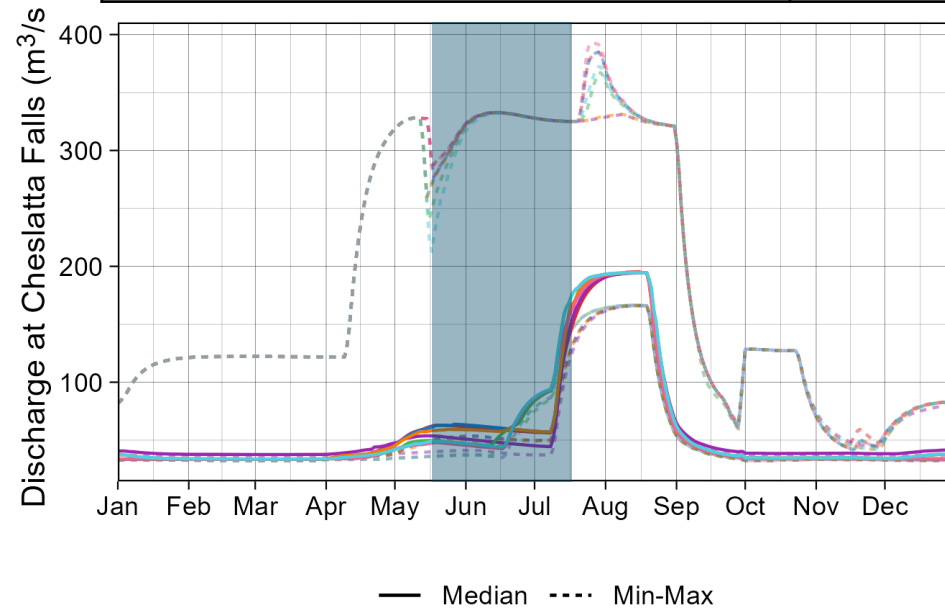


Issue #22b: River Chinook rearing habitat

Pre-Read, Page 40

PM22b: Percent of maximum available pre-migrant habitat (modified Envirocon curve)

Location:	Nechako River below Cheslatta Falls
Timing:	May 15 – July 15
Unit:	% of max available habitat
Direction:	More is better
MSIC:	20%

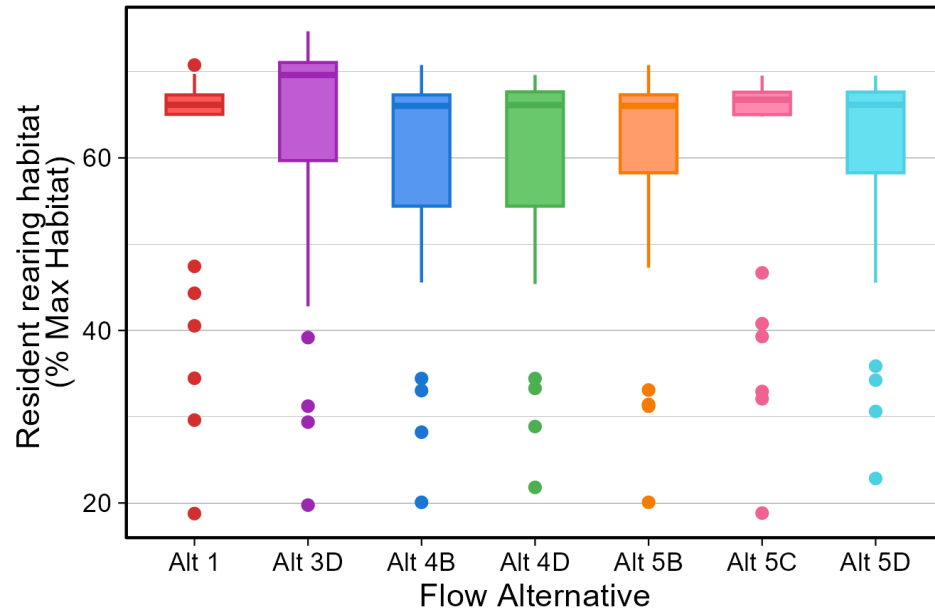
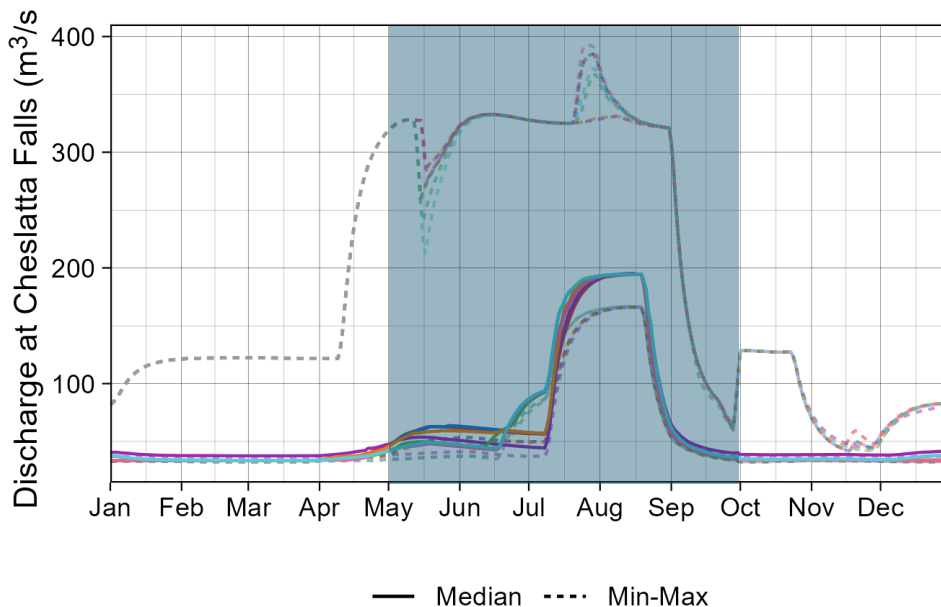


Issue #25a: Resident fish rearing habitat

Pre-Read, Page 41

PM25a: Percent of maximum available juvenile Rainbow Trout habitat (modified Slaney et al.1984 curve).

Location:	Nechako River below Cheslatta Falls
Timing:	May 1 – Sept 31
Unit:	% of max available habitat
Direction:	More is better
MSIC:	20%

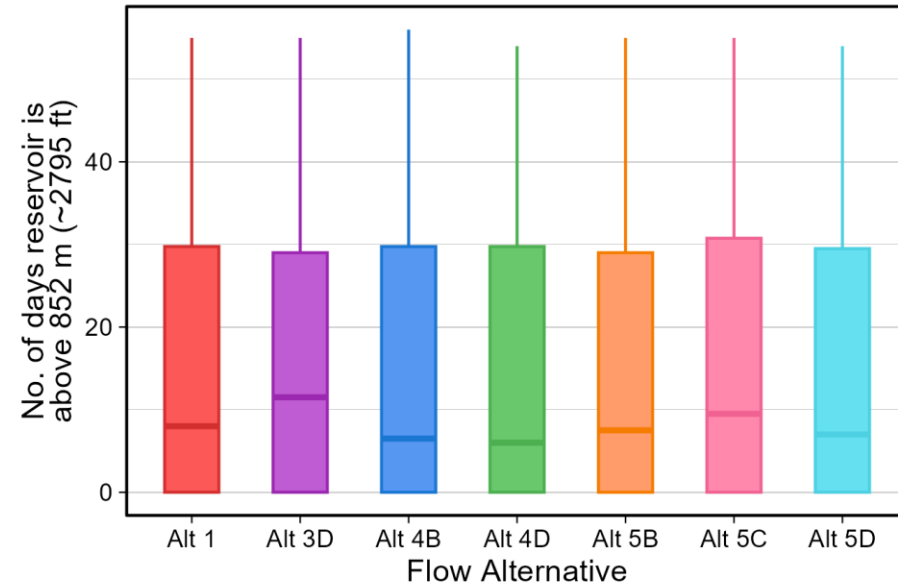
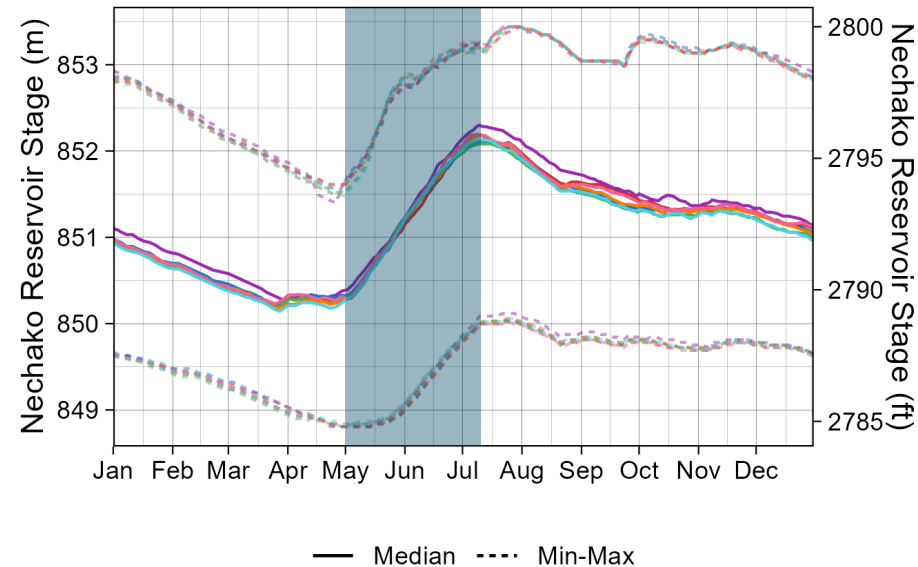


Issue #32: Reservoir caribou land links

Pre-Read, Page 41

PM32: # Of days water elevation
is > 852 m

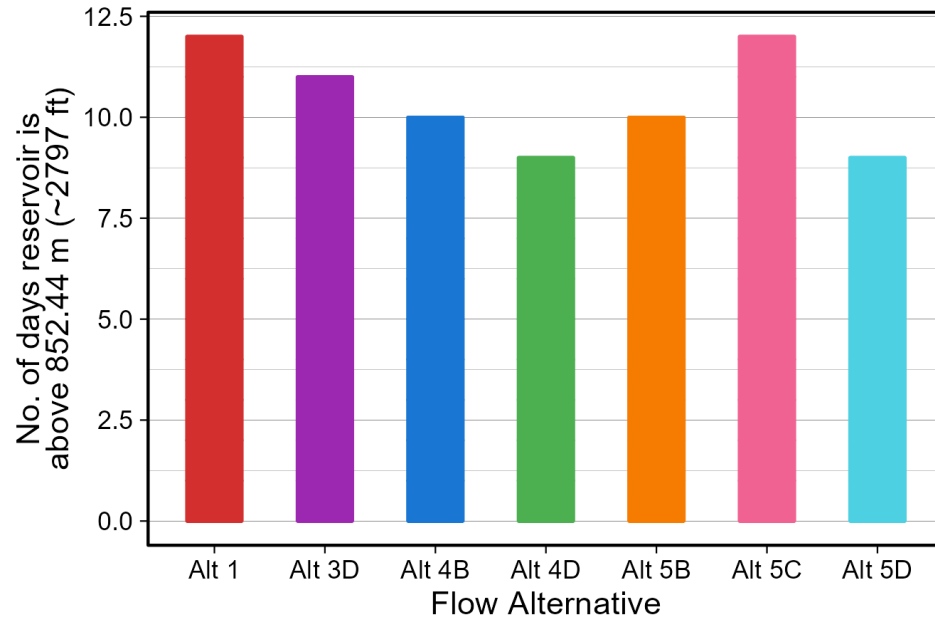
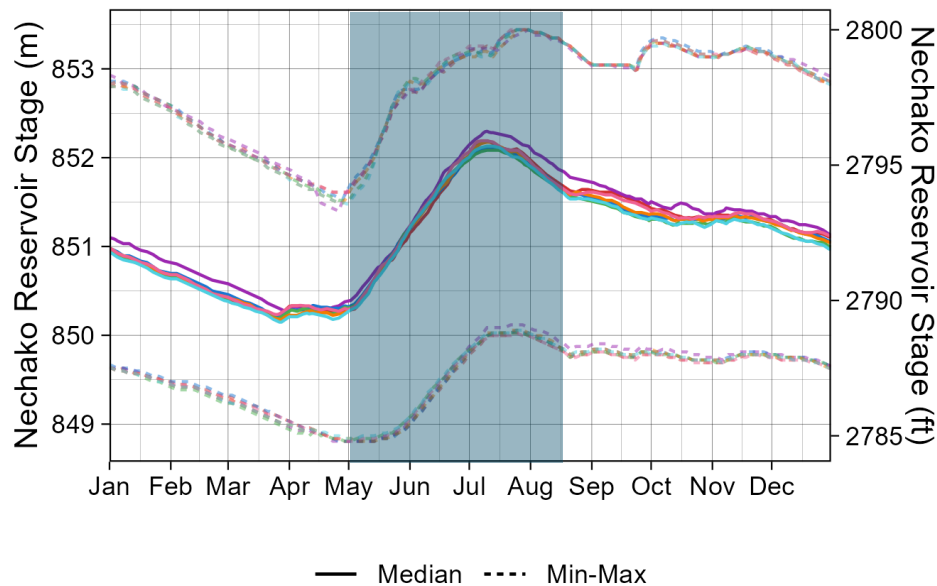
Location:	Nechako Reservoir
Timing:	May 1 – July 7
Unit:	Days
Direction:	More is better
MSIC:	20%



Issue #38: Reservoir osprey nesting habitat

Pre-Read, Page 42

PM38: Number of years where reservoir elevation exceeds 852.44m	Location:	Nechako Reservoir
	Timing:	Spring nesting period May 1 – Aug 15
	Unit:	Years
	Direction:	Fewer is better
	MSIC:	20%

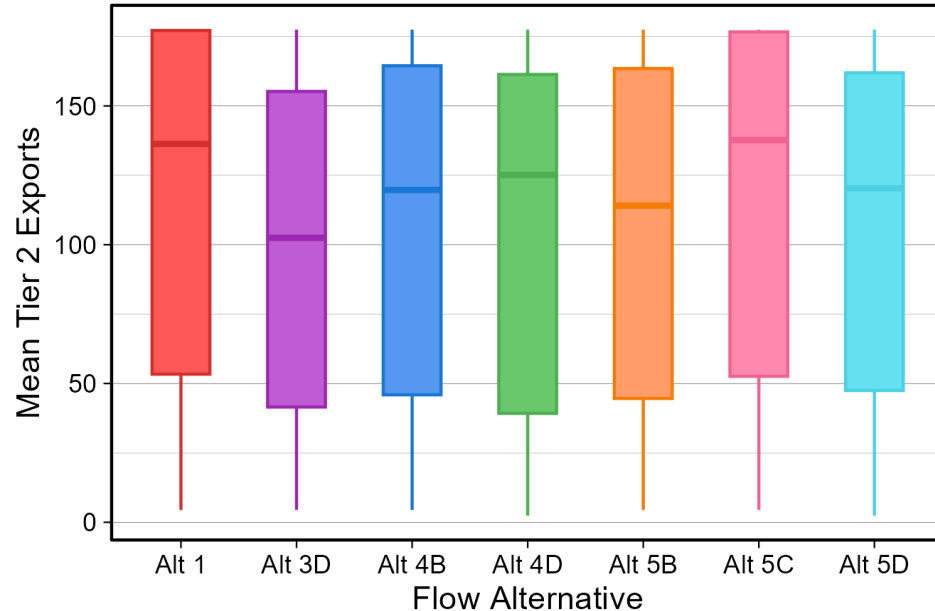
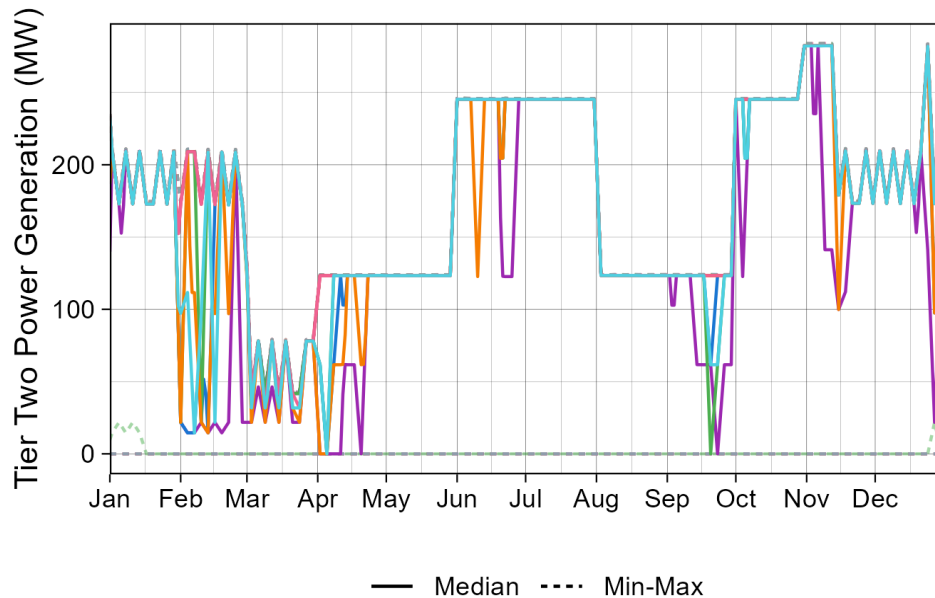


Issue #67: Kemano power exports Tier 2

Pre-Read, Page 44

PM67: Mean Tier 2 power generation

Location:	Kemano / Kitimat
Timing:	Jan 1 – Dec 31
Unit:	%
Direction:	More is better
MSIC:	20



Phase 1

Assessing Round 2 Flow Alternatives

- Commentary

Katie Healey

Jayson Kurtz

Commentary: Round 1 Flow Alternatives

Alt 1 Status Quo	The Status Quo performs well for Tier 2 power generation, but does not perform well for reservoir osprey nesting habitat. <u>While temperature modelling was not completed for the hybrid alternatives, based on what we've learned about flow and temperature, it is likely that this alternative does not perform as well as hybrid alternatives for water temperature.</u>
Alt 3D	Alt 3D (higher flows during both wet and dry years) performs best for caribou land links, and does not perform well for Tier 2 power generation. Other PMs showed no difference from status quo or other alternatives.
Alt 4B	Alt 4B (multi-step flow increase leading to STMP, status quo in dry years) does not perform well for caribou land links. Water temperature modelling was not completed for the hybrid flow alternatives, however the temperature modelling results for Alt 4A suggest potential improvements to water temperature during the years where additional flow is available (compared to the status quo). Other PMs showed no difference from status quo or other alternatives
Alt 4D	Alt 4D (multi-step flow increase leading to STMP during wet years, smaller magnitude stepped increase during dry/typical years) does not perform well for caribou land links, similar to Alt 4B . However, Alt 4D performs well for reservoir osprey nesting habitat, river bird nests, and Tier 2 power. Additionally, the temperature modelling results for Alt 4A suggest potential improvements to water temperature during the years where additional flow is available (compared to the status quo). Other PMs showed no difference from status quo or other alternatives.

Commentary: Round 1 Flow Alternatives

Alt 5B	Alt 5B (high reservoir elevation in wet years, status quo during dry to typical years) does not perform well for reservoir caribou land links or Tier 2 power generation, and performs well for river bird nests. Water temperature modelling was not completed for the hybrid flow alternatives, however the temperature modelling results for Alt 5A suggest potential improvements to water temperature during the years where additional flow is available (compared to the status quo). Other PMs showed no difference from status quo or other alternatives.
Alt 5C	Alt 5C (current water budget reshaped during all years) performs well for reservoir caribou land links, and performs best for Tier 2 power generation. Alt 5C does not perform well for reservoir osprey nesting, and while it does not result in additional years where Vanderhoof flood flows would be exceeded, the duration of flooding during the most extreme year is predicted to be the greatest at 6 days (compared to 0 to 2 days in other alternatives). Other PMs showed no difference from status quo or other alternatives
Alt 5D	Similar to Alt 5B , Alt 5D does not perform well for reservoir caribou land links, but performs well for reservoir osprey nesting. Additionally, Alt 5D performs well for river bird nest inundation, and performs better than Alt 5B for Tier 2 power. The temperature modelling results for Alt 5A suggest potential improvements to water temperature during the years where additional flow is available (compared to the status quo). Other PMs showed no difference from status quo or other alternatives.
General	In general, the hybrid alternatives (Round 2 " B " & " D ") provide improvements over the stand-alone Round 1 alternatives. The hybrid alts with the reshaped flows during dry to typical years (Round 2 " D ") perform better than those that have the status quo during dry to typical years (Round 2 " B "). However, the overall, the improvements over status quo are subtle.

Phase 1

Assessing Round 2 Flow Alternatives

- Consequence Table

Consequence Table: Round 2 Flow Alternative

Consequence Table 1

Selected

Better than Selected

Worse than Selected

Same as Selected

Criteria	Performance Measures					Unit	Preferred	MSIC Direction	Alt 1 Status Quo	Alt 3D EWRS_WYF	Alt 4B SQ_WYF	Alt 4D EWRS_WYF	Alt 5B SQ_WYF	Alt 5C EWRS	Alt 5D EWRS_WYF
Fish															
* #6 River fish access to side/off channels	Median	Average flow	CMS	Higher	20%	92.6	94	98.8	99.3	97.7	93	98.2			
* #12 Reservoir productivity-flushing	Median	Average discharge	CMS	Lower	20%	84.9	86.1	91.5	92.3	89.9	85.7	90.3			
* #17 Cheslatta watershed fish habitat	Median	Range of flow	CMS	Lower	20%	191.8	187.9	187.8	187.8	187.8	191.8	187.8			
* #18a River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 18C	Days	Lower	20%	30.5	NA	NA	NA	NA	29.5	NA			
* #18c River water temperature and migrating salmon	Median	Number of days average daily temp exceeds 20C	Days	Lower	20%	5.5	NA	NA	NA	NA	5	NA			
* #21a River Chinook incubation flow	Median	Ratio of min incubation flow to average spawning flow	%	Higher	20%	50.3	53.1	48.4	48.3	49	50.2	48.9			
* #22a V2 River CH rearing habitat post-emergent Habitat	Median	Percent of max available post-emergent habitat (modified Envirocon)	%	Higher	20%	100	100	100	100	100	100	100			
* #22b V2 River CH rearing habitat pre-migrant habitat	Median	Percent of max available pre-migrant habitat (modified Envirocon)	%	Higher	20%	84.8	80.7	83.9	78.4	83.9	78.7	77.4			
* #25a Resident fish rearing habitat	Median	Percent of maximum available juvenile Rainbow Trout habitat	%	Higher	20%	66.2	69.6	66	66.1	66	66.7	66.2			
#26 Resident fish overwinter habitat	Median	Percent of max available overwintering habitat (mod. Slaney et al. 1984)	%	Higher	20%	95.6	99	95.6	95.6	96.4	95.6	96.4			
Wildlife															
* #32 Reservoir caribou land links	Median	# of days water elevation is > 852 m	Days	Higher	20%	8	11.5	6.5	6	7.5	9.5	7			
* #38 Reservoir osprey nesting habitat		Number of years where reservoir elevation exceeds 852.44m	Years	Lower	20%	12	11	10	9	10	12	9			
* #41b Reservoir wetland habitat		Number of years where reservoir elevation exceeds 852.94 m	Years	Higher	20%	8	8	8	8	8	8	8			
* #45b River bird inundation of nests		Number of years where Cheslatta discharge exceeds 275 cms	Years	Lower	20%	5	5	5	4	4	5	4			
Culture & Heritage															
* #49b Cheslatta watershed inundation of arch sites	80th %	# of days > 300 cms	Days	Lower	7	2.2	4	0.2	0.2	0.4	2	0.2			
Flooding & Erosion															
* #53 River open-water flooding	Max	# of days flow >550 at Vanderhoof	Days	Lower	7	2	0	2	0	0	6	0			
Rio Tinto Operations															
* #65b Smelter Power	Max	# of days smelter load isn't met	Days	Lower	7	0	0	0	0	0	0	0			
* #66b Kemano power reliability (Tier 1)		Tier 1 power reliability	%	Higher	5	96.98	96.98	96.98	96.29	96.98	96.98	95.92			
* #67 Kemano power exports (Tier 2)	Median	Mean Tier 2 power generation	MW	Higher	20	136.3	102.5	119.7	125.1	114.1	137.7	120.3			

Consequence Table: Round 2 Flow Alternative

“Condensed”

(Only PMs with Differences > MSIC)

Selected
Better than Selected
Worse than Selected
Same as Selected

Criteria		Performance Measures	Unit	Preferred Direction	MSIC	Alt 1 Status Quo	Alt 3D EWR5_WYF	Alt 4B SQ_WYF	Alt 4D EWR5_WYF	Alt 5B SQ_WYF	Alt 5C EWR5	Alt 5D EWR5_WYF
Fish												
* #17 Cheslatta watershed fish habitat	80th %	Range of flow	CMS	Lower	20%	295.8	270.6	234.6	234.6	233.8	295.8	233.8
* #21a River Chinook incubation flow	Min	Ratio of min incubation flow to average spawning flow	%	Higher	20%	21	25.7	21.3	21.2	23.6	21	23.5
* #22b V2 River CH rearing habitat pre-migrant habitat	20th %	Percent of max available pre-migrant habitat (modified Envirocon)	%	Higher	20%	76.8	73.1	59.6	59.1	64.5	61.9	65.1
* #25a Resident fish rearing habitat	Min	Percent of maximum available juvenile Rainbow Trout habitat	%	Higher	20%	18.8	19.8	20.1	21.8	20.1	18.8	22.8
Wildlife												
* #32 Reservoir caribou land links	Median	# of days water elevation is > 852 m	Days	Higher	20%	8	11.5	6.5	6	7.5	9.5	7
* #38 Reservoir osprey nesting habitat		Number of years where reservoir elevation exceeds 852.44m	Years	Lower	20%	12	11	10	9	10	12	9
Rio Tinto Operations												
* #67 Kemano power exports (Tier 2)	Median	Mean Tier 2 power generation	MW	Higher	20	136.3	102.5	119.7	125.1	114.1	137.7	120.3

AltaViz – Online Tool

<https://www.altaviz.ca/public/220db3fc-2aa8-4eea-9dd1-e3a26c4bb97a>

Access Code: NECHAKOWEI

Phase 1

Assessing Round 2 Flow Alternatives

- Exercises

Phase 1 Round 1 Flow Alternatives

Ranking Exercise

Purpose:

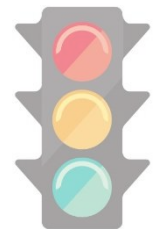
- To get a better sense of people's **priorities & preferences**
- To identify which Round 2 Flow Alternative are **“Preferred”**
- To also identify which flow alternatives would be **“Endorsed”** or **“Accepted”** by Main Table members
- To explore ***whether there are new and improved flow alternatives*** (Round 3) that make sense to model and assess at the next meeting (e.g., Fall 2023)?

Round 2 Flow Alternatives

Ranking Exercises

2 exercises will be undertaken today,

1. **“Direct Ranking”** – is an intuitive technique where you will be asked directly which alternative(s) you prefer most
2. **“Straw Poll on Level of Support”** – is a way to characterize the level of acceptance as a group and gauge the importance and “significance” of making any Phase 1 flow changes.



The goal is to get a sense of our preferences as a group in order to build an understanding of where consensus may lie?

Exercise 1

Direct Ranking

You will be asked to indicate which alternatives are your 'most preferred' and 'least preferred', the steps are:

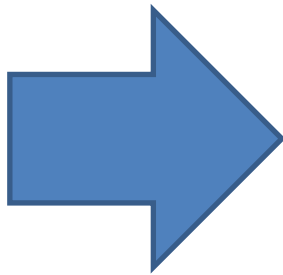
- STEP 1: Rank each alternative from best to worst according to how well the alternatives are meeting your interests
- STEP 2: Distribute 100 points to your most preferred alternative
- STEP 3: Distribute a lesser amount of points to your next 'most preferred' alternative according to how well it meets your needs

Your Name: _____

Direct Rating – Give your most preferred alternative a rating of 100. Rate each remaining alternative relative to your most preferred.

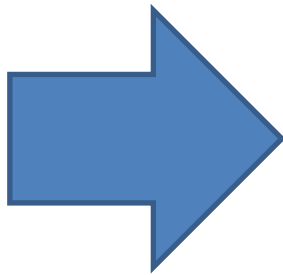
Alternative	Rating (0-100)	Comment
Alt 1 – Status Quo	75	
Alt 3D	95	
Alt 4B	45	
Alt 4D	45	
Alt 5B	25	
Alt 5C	100	
Alt 5D	15	

On-Line Direct Ranking Form 1 - AltaViz



Alternative 1 Status Quo	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred<div></div>Most Preferred</div> <div>Add Comment</div>			
Alternative 2 Naturalized Hydrograph	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred<div></div>Most Preferred</div> <div>Add Comment</div>			
Alternative 3 Sockeye Migration (Temp)	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred<div></div>Most Preferred</div> <div>Add Comment</div>			
Alternative 4 Cheslatta Aquatic Ecosystems	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred<div></div>Most Preferred</div> <div>Add Comment</div>			
Alternative 5 Wildlife (Reservoir)	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred<div></div>Most Preferred</div> <div>Add Comment</div>			

On-Line Direct Ranking Form 1 - AltaViz



Alternative 1 Status Quo	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred Most Preferred</div> <div>Add Comment</div>			
Alternative 2 Naturalized Hydrograph	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred Most Preferred</div> <div>Add Comment</div>			
Alternative 3 Sockeye Migration (Temp)	Rating: 100	Rank: 1	Weighted Percent: 28%
<div>Least Preferred Most Preferred</div> <div>Add Comment</div>			
Alternative 4 Cheslatta Aquatic Ecosystems	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred Most Preferred</div> <div>Add Comment</div>			
Alternative 5 Wildlife (Reservoir)	Rating: 50	Rank: T-1	Weighted Percent: 16%
<div>Least Preferred Most Preferred</div> <div>Add Comment</div>			



On-Line Direct Ranking Form 1 - AltaViz



Round 2 Flow Alternatives

Ranking Exercises

Please
fill out
Ranking
Form



Exercise 2

“Straw Poll on Level of Support”

Main Table members are asked to indicate their level of support and **importance** for each of the Round 2 Flow Alternatives, according to:

Endorse	I fully endorse this alternative; it meets my expectations and interests over the short term (i.e., as a Phase 1 Flow Altern)
Accept	I accept this alternative; there may be some minor aspects that I am not happy about or maybe even some reservations (which my support may be contingent on]; but I generally I could live with it and be willing to support it over the short term (i.e., as a Phase 1 Flow Alternative)
Oppose	I do not support this alternative; because... <i>(please specify)</i> <i>Also, if applicable, indicate what changes would need to occur in order to support an alternative like this?</i>

Exercise 2

“Straw Poll on Level of Support”

Alternative	Level of Support	Conditions / Comments
ALT 1 – Status Quo		
ALT 3D		
ALT 4B		
ALT 4D		
ALT 5B		
ALT 5C		
ALT 5D		

Choose either:

Endorse

Accept

Oppose


Describe any conditions

If you oppose an alternative, indicate what changes would need to occur, if any, in order to support an alternative like this?

Exercise 2

“Straw Poll on Level of Support”

Alt 1 Status Quo Endorse Accept Oppose	Add Comment <input type="text"/>
Alt 3D EWRs_WYF Endorse Accept Oppose	Add Comment <input type="text"/>
Alt 4B SQ_WYF Endorse Accept Oppose	Add Comment <input type="text"/>
Alt 4D EWRs_WYF Endorse Accept Oppose	Add Comment <input type="text"/>
Alt 5B SQ_WYF Endorse Accept Oppose	Add Comment <input type="text"/>



Exercise 2

Straw Poll “Level of Support”

Please
fill out
Ranking
Form



Round 2 Flow Alternatives

Results from Ranking Exercises

- *Clayton...*

Round 2 Flow Alternatives

Improving

- *Given the results from the exercises, are there additional revisions and alterations to develop and improve the Flow Options (i.e., Round 3)?*

Phase 1

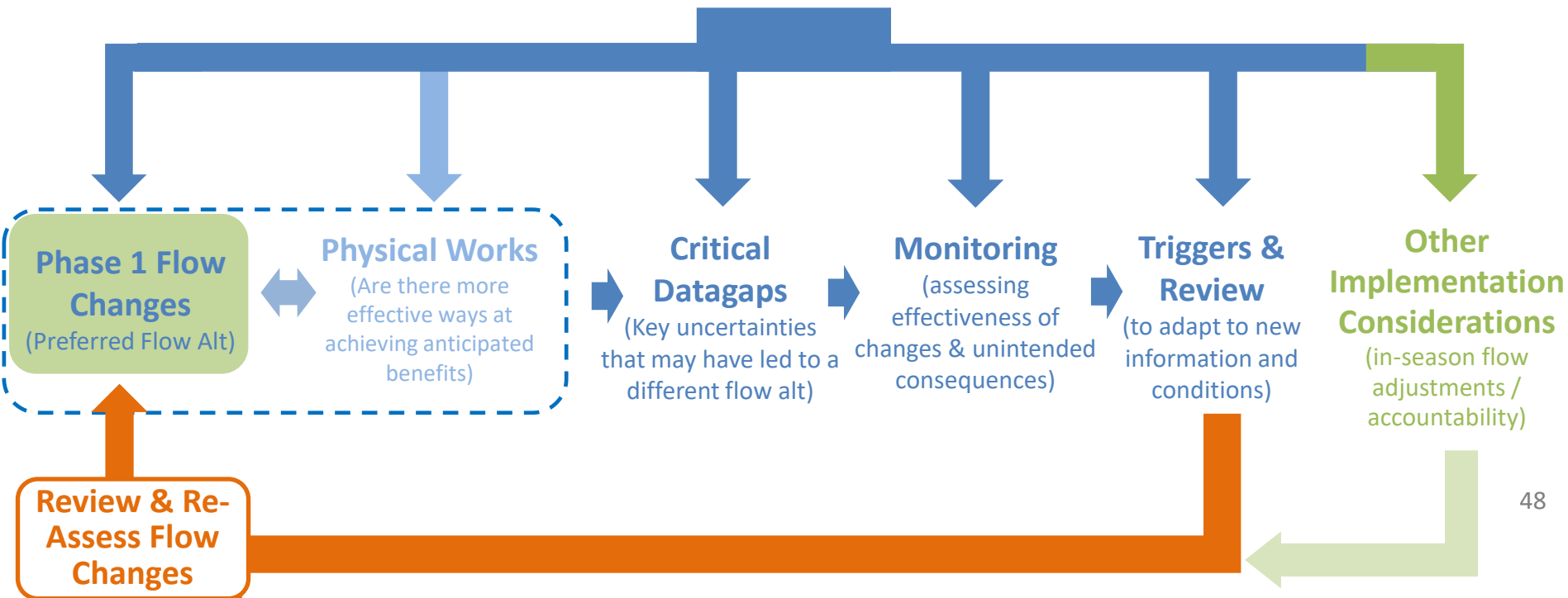
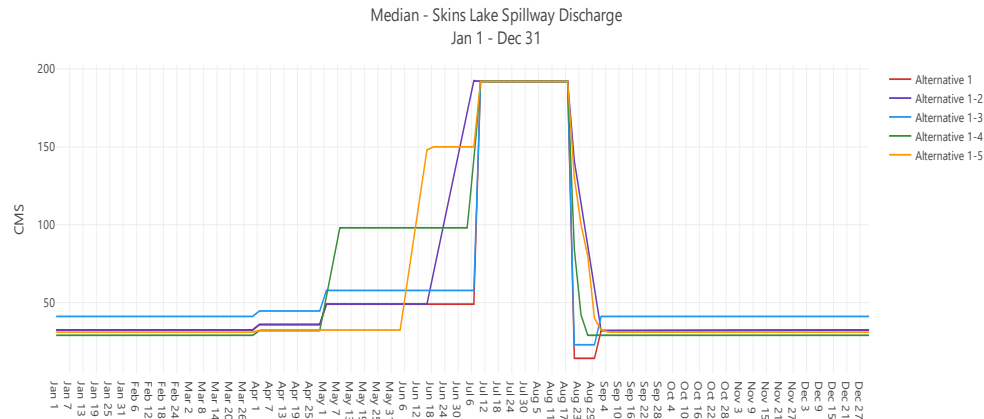
“Package” of Flow Related Recommendations

- Introduction

Working Towards the End of Phase 1

A “Package” of Phase 1 Flow Related Recommendations

Phase 1
(Immediate Term)



“Package” of Phase 1 Flow Related Recommendations

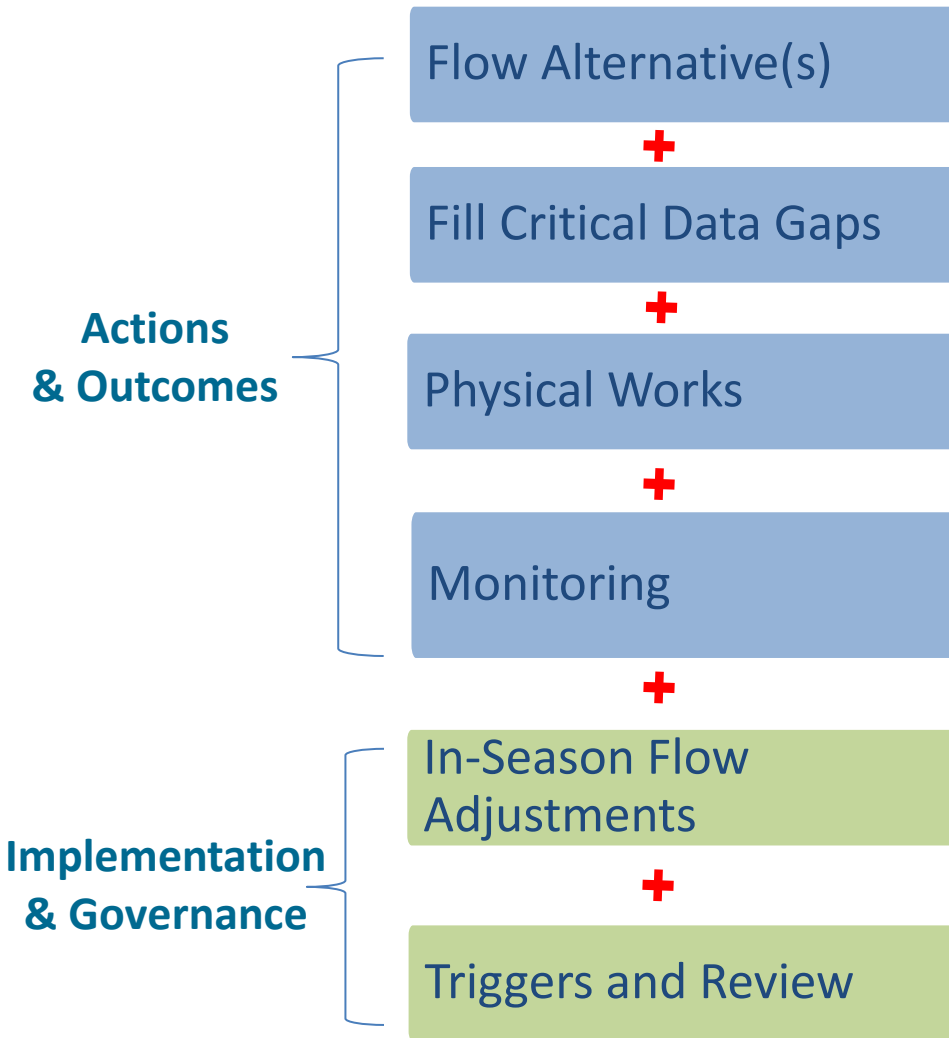


Phase 1 outcome *recommendation*: a “flow alternative package”

- “Improved” Round 1 Alternatives
- Hybrid alternatives – targets and minimums
- New alternatives using current water budget
- Additional hybrid alternatives



example Phase 1 “flow alternative package”



example Phase 1 “flow alternative package”

Actions & Outcomes

Flow Alternative(s)

- Flow Alternative selected by the Main Table

+

Fill Critical Data Gaps

- Develop missing/improve existing PMs to facilitate better decision-making in Phase 2.

+

Physical Works

- Addressing issues via means other than flow changes
- Issues related to flow, footprint, or broader watershed causes

+

Monitoring

- Confirmation of predicted results following implementation of flow changes or physical works.
- Confirmation there are no unintended consequences

+

In-Season Flow Adjustments

- What happens we the preferred flow alternative cannot be implemented?

+

Triggers and Review

- Define criteria for adapting to new information or conditions.

Implementation & Governance



example Phase 1 “package” – actions & outcomes

Flow Alternative(s)

- To be determined by MT
- E.g., hybrid with base (minimum) flow alt for “normal” years, second alternative (target) for “wet” years



Fill Critical Data Gaps

- Side channels - improve PM
- Cheslatta turbidity - new PM
- Winter flow/ice (habitat/fish/aesthetics) – new PM
- Sturgeon flow trials – new PM



Physical Works

- Improved caribou calving ground access (LWD removal)
- Osprey nest relocation
- Side channel excavation



Monitoring

- Direct PM monitoring (e.g., # of days river temp >20C)
- Issue-receptor monitoring (e.g., survival of migrating adult salmon)
- Ecological result monitoring (e.g., number of out-migrating juvenile salmon)



example Phase 1 “package” – implementation & governance

In-Season Flow
Adjustments



Triggers and Review

- In-season weather/hydrologic monitoring/modeling
- Communications with community leaders?
- WEI governance team?
- Role of TWG?
- Implementation team?

- Set period (5 years?)
- When data gaps/monitoring provides new information?
- Phase 2?
- Who review?



Data Gaps

PM data gaps:

- Side channels - improve PM
- Cheslatta turbidity - new PM
- Winter flow/ice (habitat/fish/aesthetics) – new PM
- Sturgeon flow trials – new PM
- Salmon habitat



Physical Works

Flow Decision

- Improved caribou calving ground access (LWD removal)
- Osprey nest relocation
- Side channel excavation
- Bank stabilization
- Cottonwood planting
- Instream fish habitat
- Side channel fish habitat/reed canary grass scarification
- Flood protection



Physical Works

Footprint

- Reservoir erosion

General improvement

- Tributary fish habitat
- Trib temperature
- Trib sediment input
- Trib fish access
- Reed canary grass
- Cheslatta outlet weir



Monitoring

Confirm flow change predictions

- Temperature
- Salmon
- survival of migrating adult salmon
- number of out-migrating juvenile salmon
- Flooding
- Caribou

Confirm Physical Works

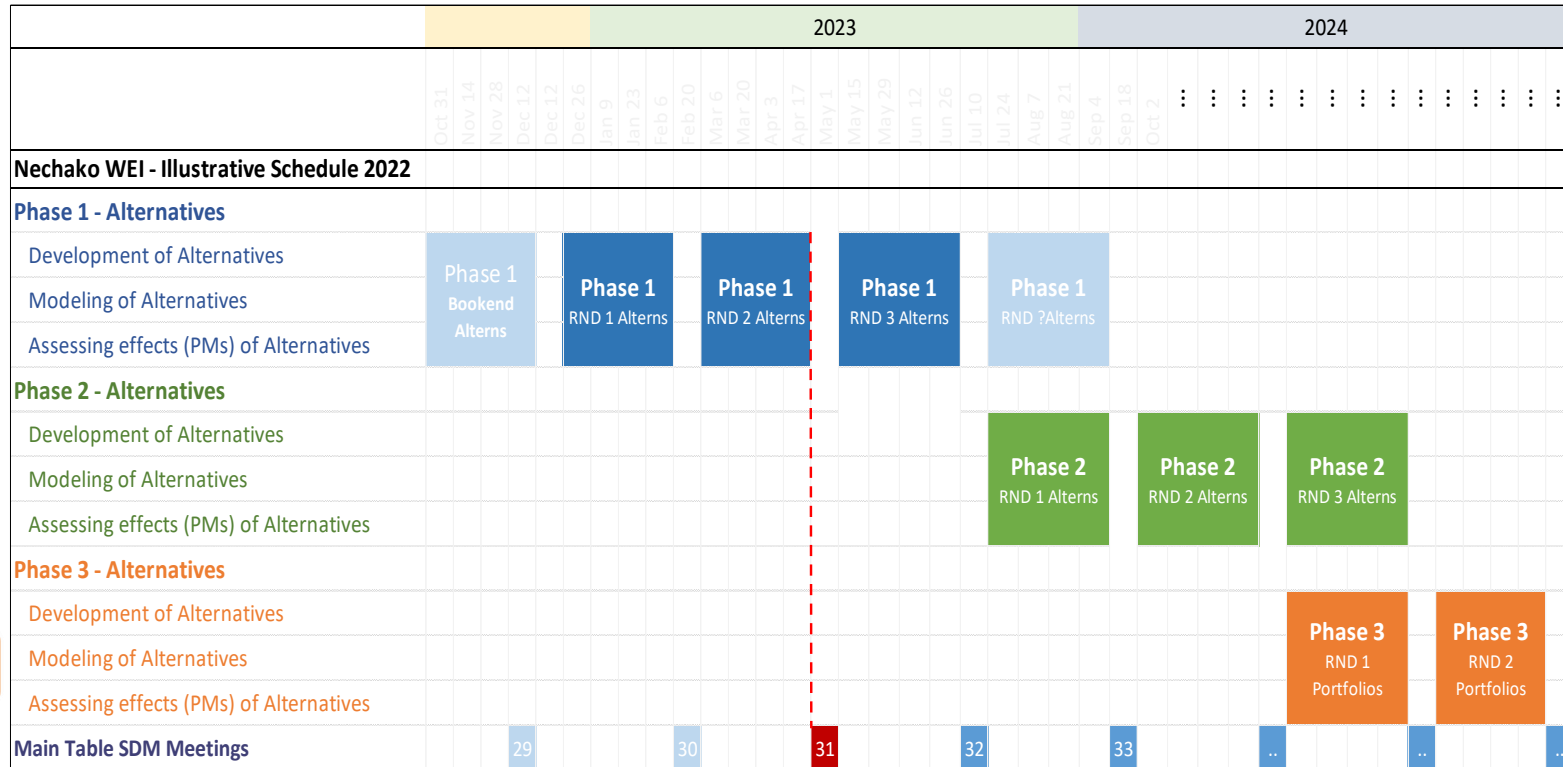
- Review results of instream fish habitat (railway rails/LWD)



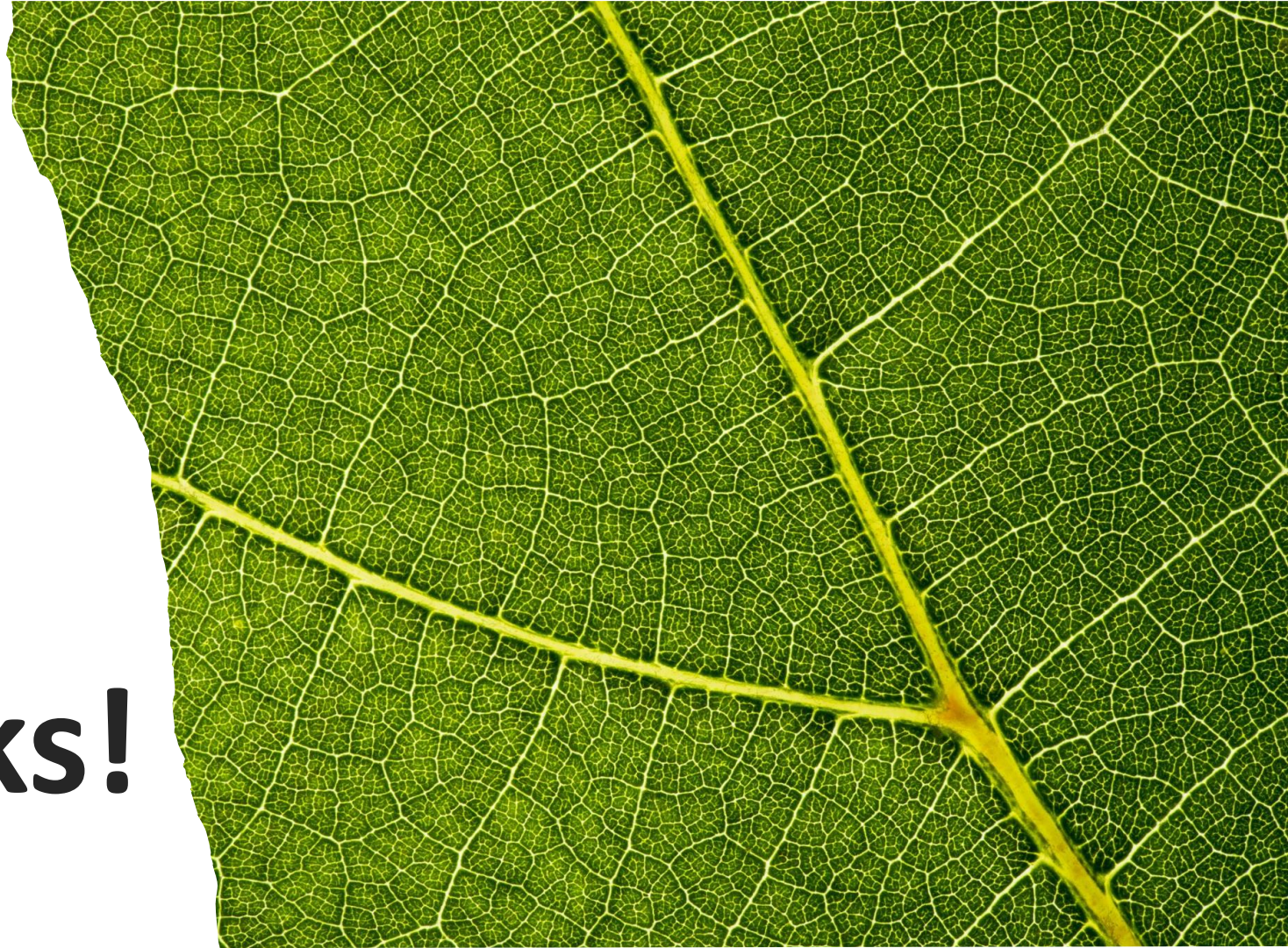
Next Steps

Next Steps

Draft Workplan:



Thanks!



Spare Slides