Links to Info on Other CRT Topics

Negotiations

- BC CRT website - engage.gov.bc.ca/columbiarivertreaty
- Questions - columbiarivertreaty@gov.bc.ca

Ecosystem function integration

- June 2022 Info Session materials - https://engage.gov.bc.ca/columbiarivertreaty/2022/06/15/exploring-ecosystem-improvements-through-the-columbia-river-treaty/

Salmon restoration

- Columbia River Salmon Restoration Initiative – https://columbiariversalmon.ca/about/the-salmon/

Low water levels

- BC Hydro - southern-interior.info@bchydro.com or phone 250-365-4565

COLUMBIA River Treaty

Columbia River Treaty Socio-Economic Integration

Public Info Session – Kootenay System

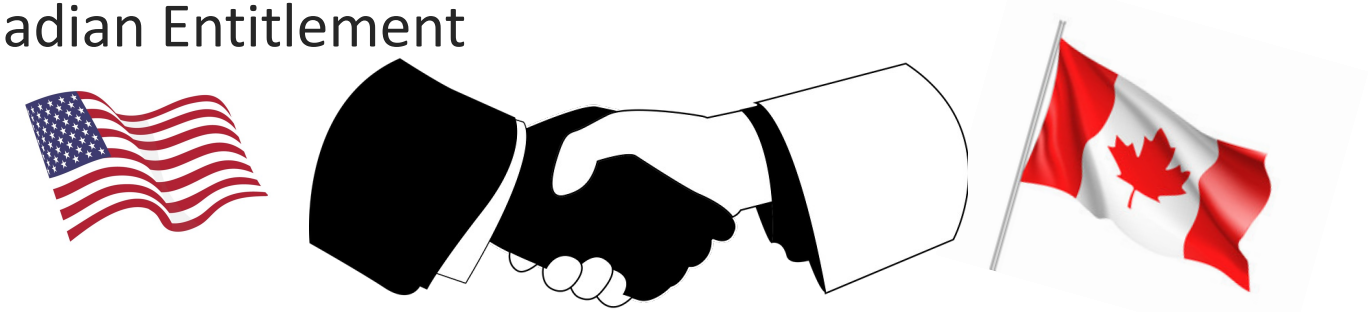
February 2, 2023

CRT SE Integration Team – Cindy Pearce, Lauren Rethoret, Ryan Macdonald, Avery Deboer-Smith

Background

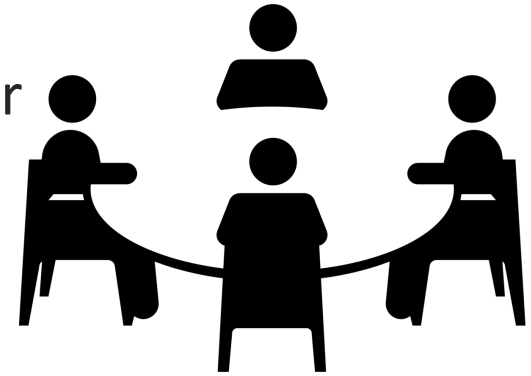
What is the CRT?

- Canada-USA transboundary water management agreement ratified in 1964
- Objectives are power generation and flood management
- Required Canada to build 3 dams (Duncan, Hugh Keenleyside, Mica) and allowed US to build Libby dam in MT, which creates a reservoir that floods into Canada and impacts downstream flows
- Inundated 110,000 ha of ecosystems, displaced over 2,300 people in approximately 30 small communities, impacted economic activities
- Provides benefits to BC through: a) one-time pre-payment for 60 years of assured flood risk management and 30 years of half of the incremental US downstream power potential – Canadian Entitlement; and b) annual delivery since 1995 of the Canadian Entitlement



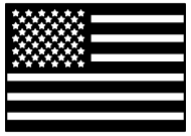
CRT Status

- Flood risk management shifts in 2024 to a more ad hoc 'called upon' approach
- In 2014, CRT Reviews in BC and the US Pacific Northwest recommended modernizing the Treaty, not terminating it – see the BC Decision
- Canada-US negotiations began in 2018
- Canada leads the Canadian negotiating team, with full participation of BC and regional Indigenous Nations (Ktunaxa, Syilx-Okanagan and Secwepemc Nations)
- See updates on the BC CRT website and sign up for the Newsletter



Why do this work?

CRT Negotiations Advisory Team (NAT) needs to understand:



How U.S. proposals for Treaty changes will impact Basin interests

How the Treaty can be modernized to increase flexibility for Canadian operations to improve conditions for B.C. Basin interests

What is the CRT LGC?

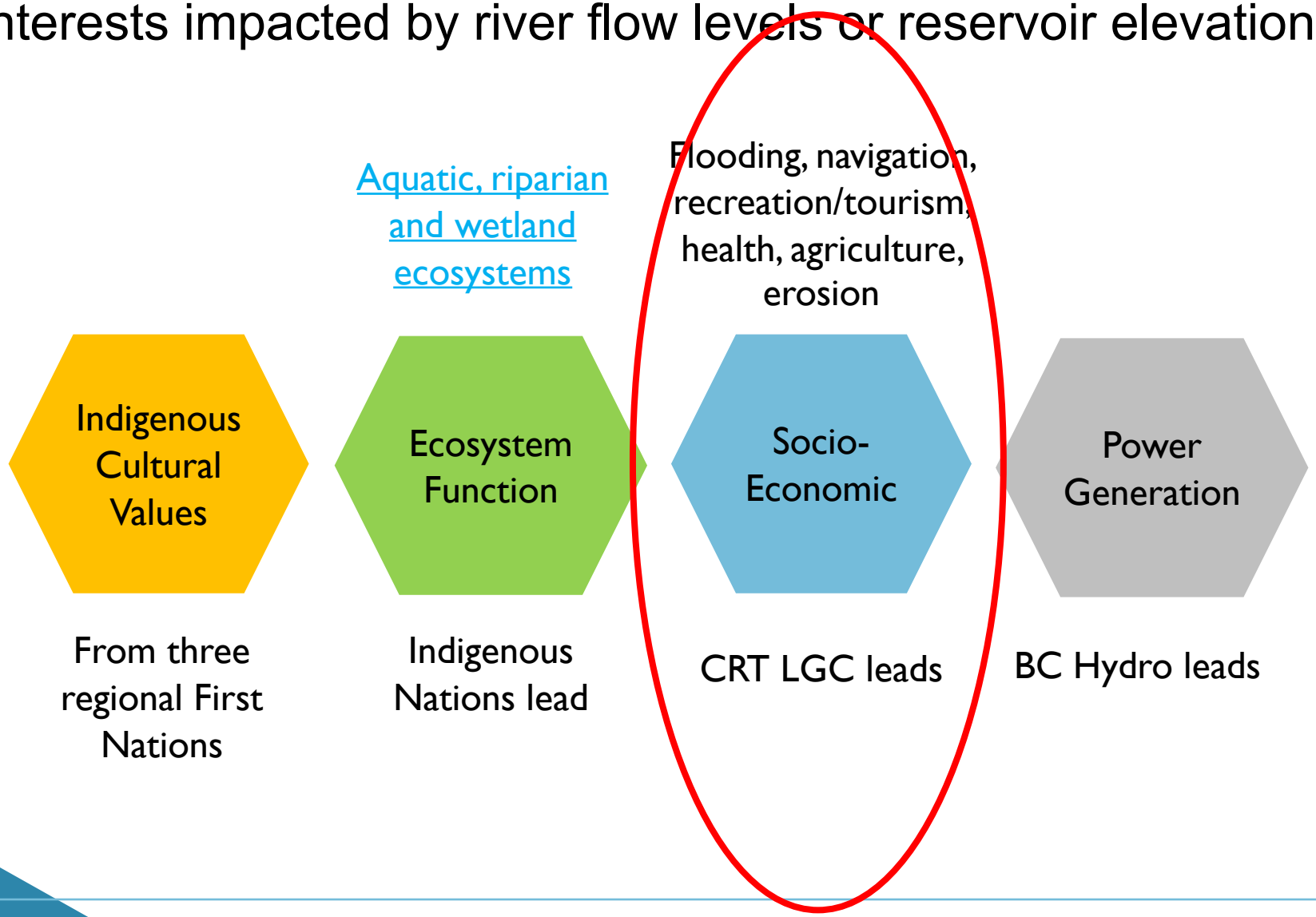
- Formed in 2011 to ***ensure the voices of Columbia Basin local governments and residents are heard in decisions related to the future of the Treaty***
- 10 elected officials – two appointed by each of RDCK, RDEK, RDKB, CSRD and one appointed by the Village of Valemount and AKBLG
- Provided Recommendations to governments in 2014 and 2021
- Ongoing contact with the Negotiating Team, BC CRT Team and CRT Indigenous Nations representatives
- Liaise with the BC CRT Team to resolve local concerns
- Lead the CRT Socio-Economic Integration work

CRT LGC website

Member list

CRT Related Basin Interests

- Interests impacted by river flow levels or reservoir elevations



CRT Modelling

What Matters

Indigenous Cultural Value

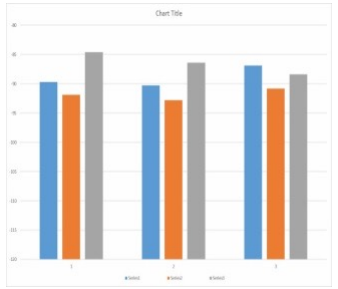
Ecosystem Function

Socio-economic

Power

Goals
Objectives
Performance Measures

River Management Model



Performance Measure Outcomes

Inform Negotiations

Alternative Hydro Operations - Scenarios

What is a Performance Measure?

Kootenay Lake: Flooding Infrastructure Damage Example

Why?

Minimize damage to property and infrastructure.

Where?

Kootenay Lake

When?

Year-round

What?

Expected annual damage (in $) when water levels are at or above 1752ft (534m). Less is better.

Types of Performance Measures

Combined PMs – For initial scenario evaluation

Sub-measures – For specific interests for detailed scenario evaluation

- Ensure results for the combined PMs do not obscure negative results for specific interests

Kootenay Lake: Flooding Infrastructure Damage Example

Combined PM - Expected annual damage (in $) when water levels are at or above 1752ft (534m). Less is better.

Sub-measures

Elevation	Number of days at/above	Number of years at/above

Timeline

Nov 2020-Dec 2021
Collect Information
Community interest and SE PM data collected from a wide range of sources

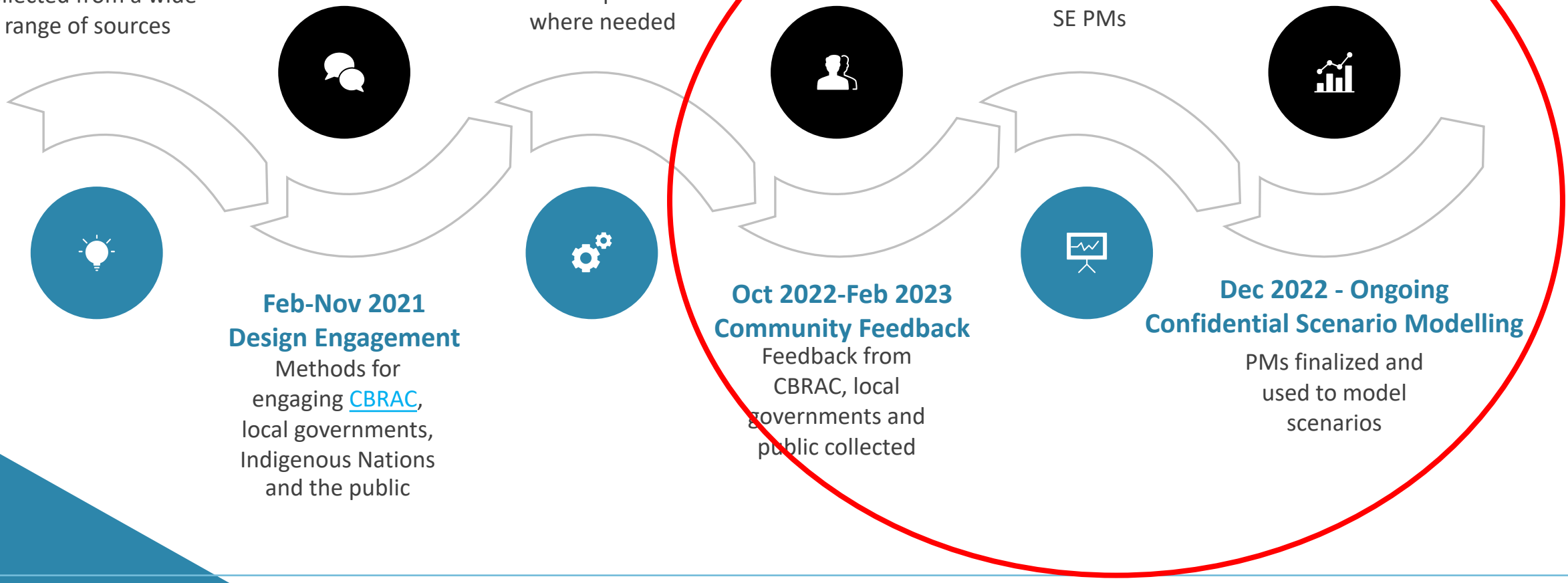
Feb-Nov 2021
Design Engagement
Methods for engaging CBRAC, local governments, Indigenous Nations and the public

May-Dec 2022
Develop PMs
Revise previously-used PMs based on new info and develop new PMs where needed

Oct 2022-Feb 2023
Community Feedback
Feedback from CBRAC, local governments and public collected

Nov 2022-Ongoing
SE PM Recommendations
Feedback reviewed/incorporated and LGC recommends SE PMs

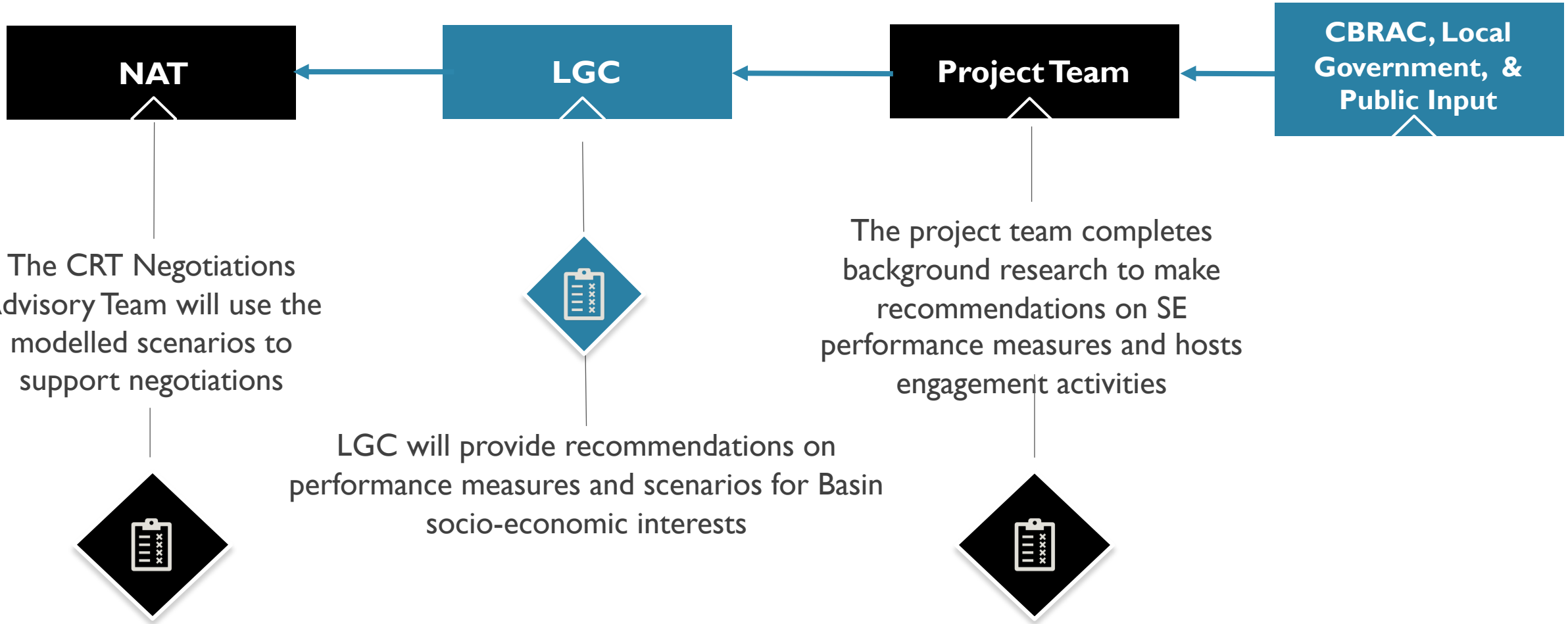
Dec 2022 - Ongoing
Confidential Scenario Modelling
PMs finalized and used to model scenarios



Draft CRT Socio-Economic Measures

Location	Flooding	Navigation	Recreation/ Tourism	Health	Agriculture	Erosion
Columbia						
Kinbasket Reservoir		X	X			?
Lake Revelstoke						
Arrow Reservoir		X	X	X	X	?
Lower Columbia River	X	New	X			
Kootenay						
Koocanusa Reservoir			X		X	New
Duncan Reservoir/Lower Duncan River	X		X	X		
Kootenay Lake	X	X	X			
Corra Linn to confluence						

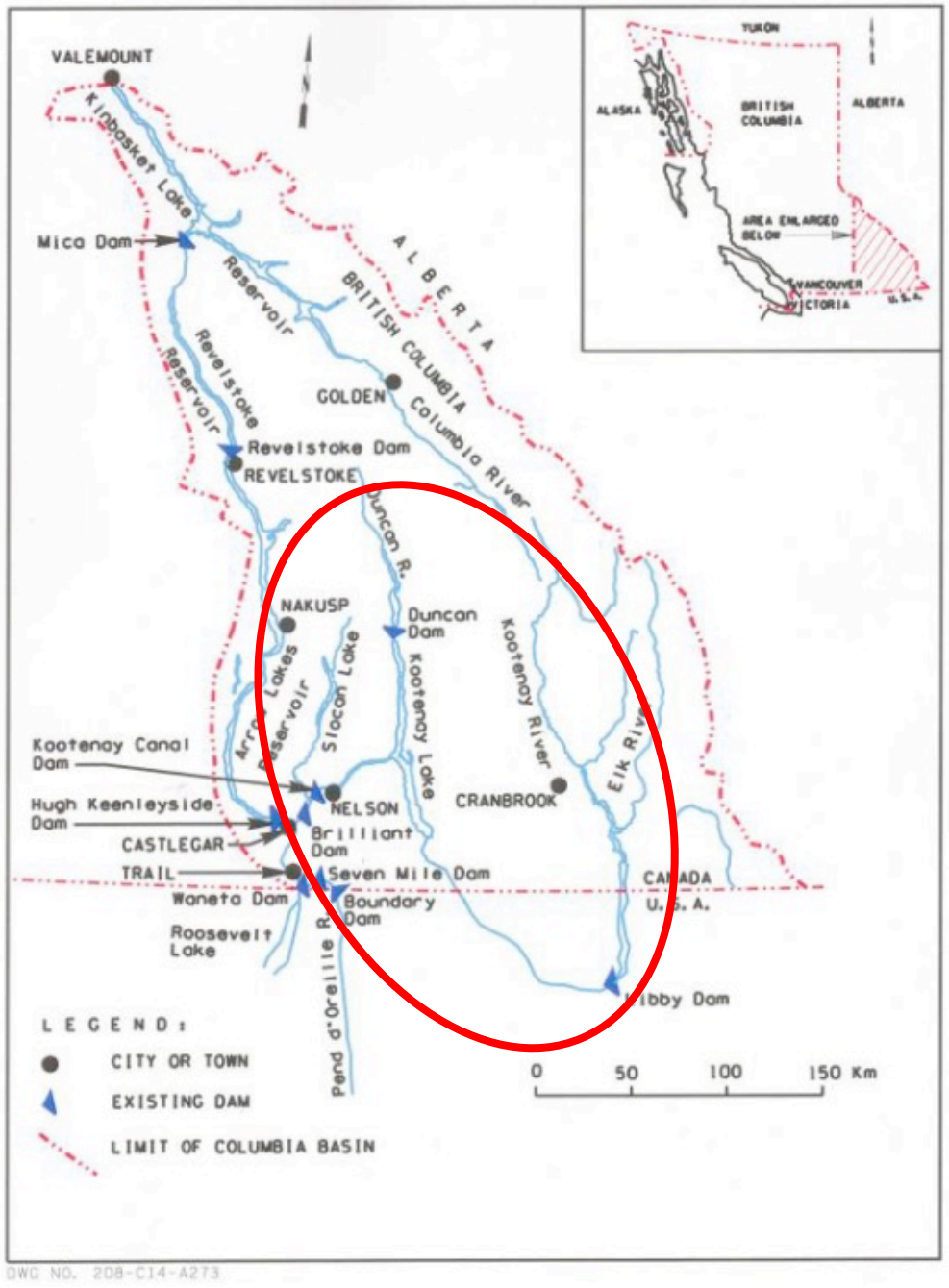
Summary



Revisions ongoing based on new information

Questions?

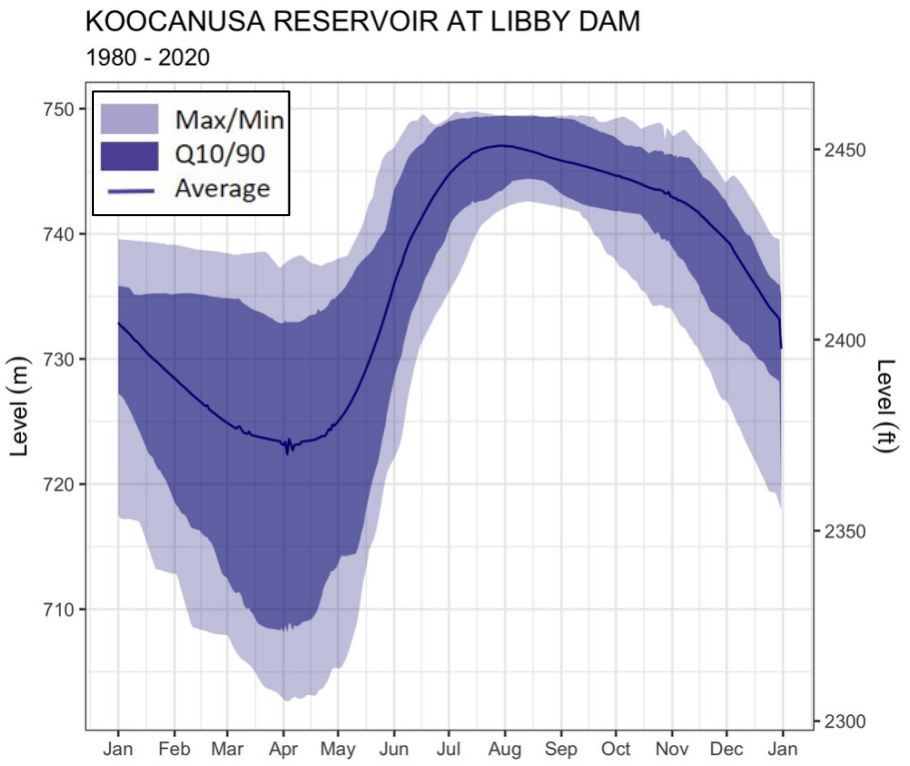
Socio-Economic PMs



Kootenay System Overview

Reservoir Elevations – result of inflows less dam outflows for:

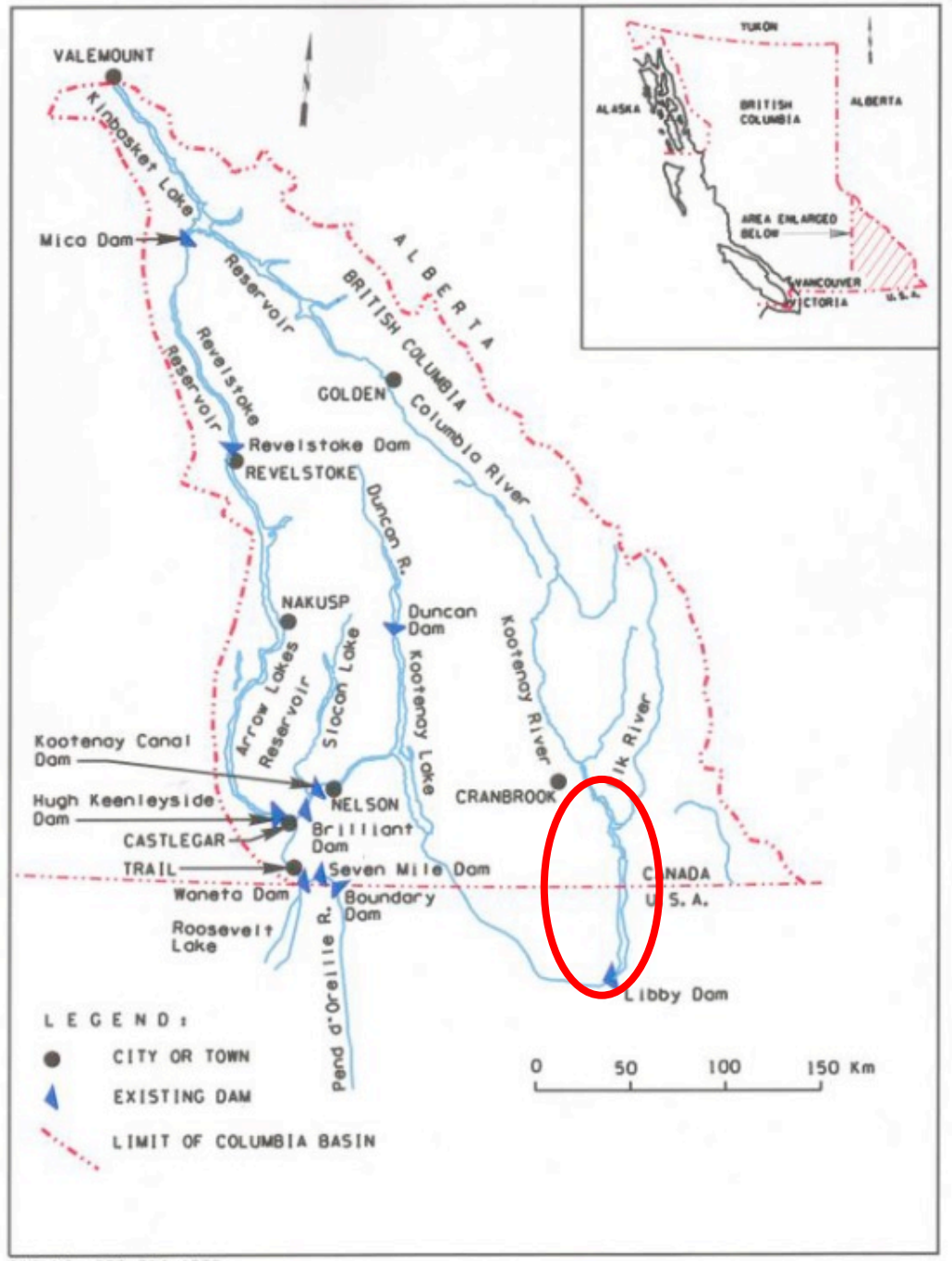
- CRT - flood risk storage, power generation
- Duncan Dam – Non-Treaty Storage Agreement and Water Use Plan (WUP)
- Domestic power generation
- *Libby Dam - US Endangered Species Act flows*
- *Kootenay Lake – International Joint Commission (IJC) Order*



Koocanusa Reservoir Quick Facts

'Transboundary reservoir'

- 67 km in BC; 140 km total
- Inflows – Natural
- Outflow – Libby Dam (US Army Corp of Engineers) in Montana, with power generation
- Storage – 5 MAF (million-acre-feet)
- Annual water level fluctuation – Up to 72 ft (22 m)



Koocanusa Reservoir CRT Socio-Economic Goals

- **Recreation/Tourism** - Maximize the community benefits from quality and diversity of recreation and tourism.
- **Grazing** - Maximize grazing opportunities within the reservoir drawdown zone.

Looking North From Near The Kikomun Bridge

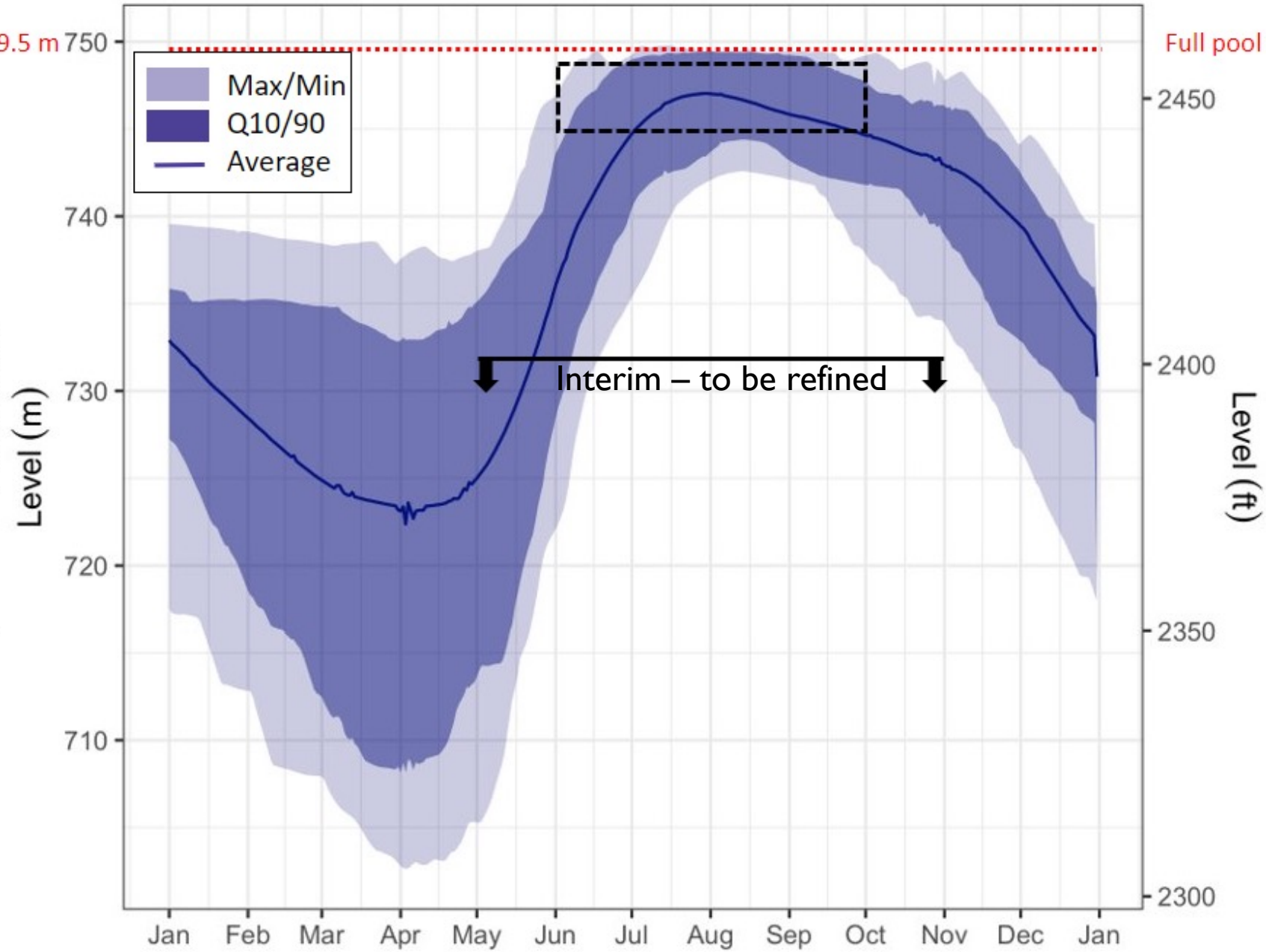
August 5, 2020 2,452 ft./747.4m

April 24, 2020 2,404 ft./732.8m

Thank you to Stewart Rood

KOOCANUSA RESERVOIR AT LIBBY DAM

1980 - 2020



Recreation and Tourism: # of days between 745.2-748.3m, Jun 1 to Sep 30

Grazing: Number of hectares above 732m May 1 to Oct. 31.

Recreation and Tourism: # of days between 2445-2455ft , Jun 1 to Sep 30

Grazing: Number of hectares above 2,401.6ft, May 1 to Oct. 31.

Koocanusa Reservoir Recreation/Tourism and Grazing

Objective	Location	Units	Elevation feet	Elevation metres	Season	Preferred outcome	Notes
Grazing	North end grazing licenses	No. of hectares/ year	Below 2,401.6	Below 732	May 1- Oct 31	More is better	• **Interim- to be refined** • Conflicts with Rec/Tourism • Grazing condition PM to be
Recreation/ Tourism	Reservoir	No. of recreation days/year	2445-2455	745.2-748.3	Jun 1 – Sep 30	More is better	• Preferred range shared by multiple interest groups • **Angler preference/ creel survey recommended**

Koocanusa – Recreation and Tourism

Sub-measures for access needs and preferences for individual activities, sites, and issues

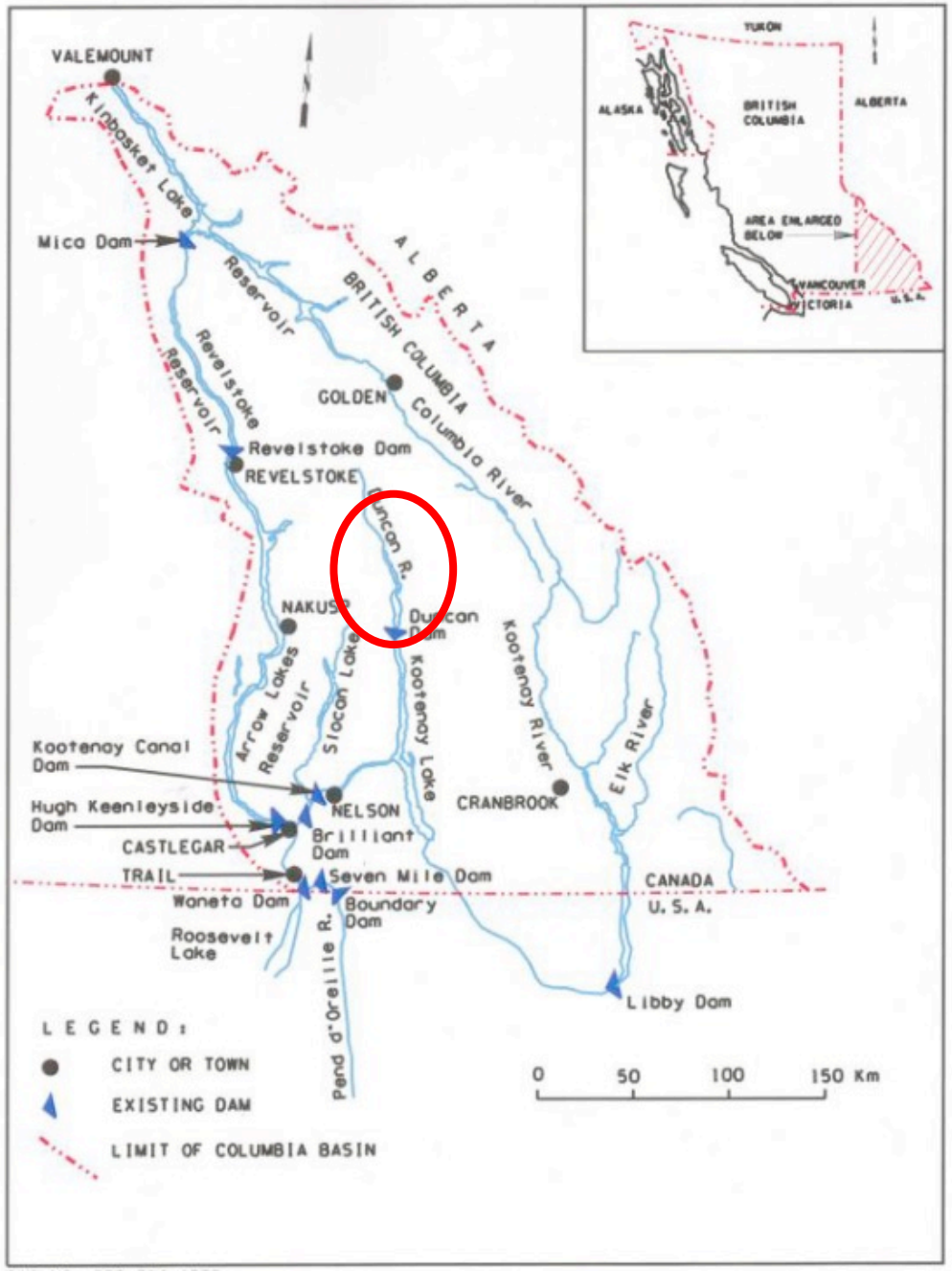
Sub-Measure Objective	Season	Flow Range
High water debris avoidance	Jun 1 – Sep 30	Below 2459ft (749.5m)
Motorized boating access – Big Springs	Jun 1 – Sep 30	2440ft (743.7m) and above
Motorized boating experience preference	Jun 1 – Sep 30	Above 2440ft (743.7m)
Kokanee fishing preference	May 24 – Sep 8	2435ft (742.2m) and above
General shore-based preference	Jun 1 – Sep 30	2434ft (741.9m) and above
Kokanee fishing possible	May 24 – Sep 8	2420ft (737.6m) and above
Houseboating possible	Jun 1 – Sep 30	2420ft (737.6m) and above
Motorized boating access - Yaqakxaqɬamki/ Kikomun Bridge	Jun 1 – Sep 30	2407ft (733.7m) and above

Questions?

Duncan Reservoir/River Quick Facts

'Smallest CRT reservoir'

- 45 km
- Reservoir inflows – Natural
- Outflow – Duncan Dam (BC Hydro – no power generation)
- Lower Duncan River inflows – Duncan Dam regulated flows and natural flows from Lardeau River and Meadow Creek
- Storage – 1.4 MAF (million-acre-feet)
- Annual water level fluctuations – Up to 98 ft (30 m)



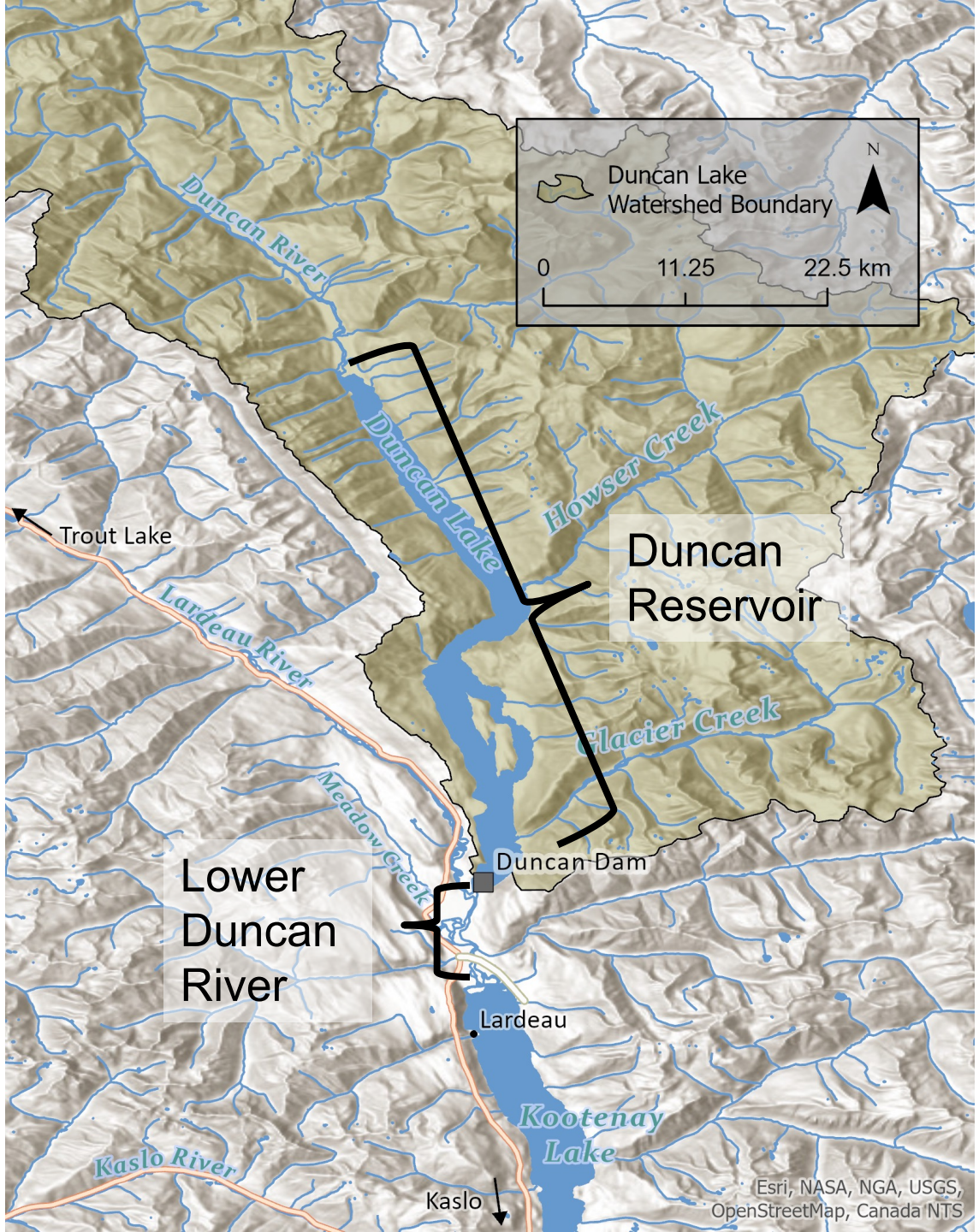
Duncan Reservoir/River CRT Socio-Economic Goals

Reservoir

- **Recreation/Tourism** - Maximize the quantity and quality of the recreational experience, including reservoir access and visual aesthetics.

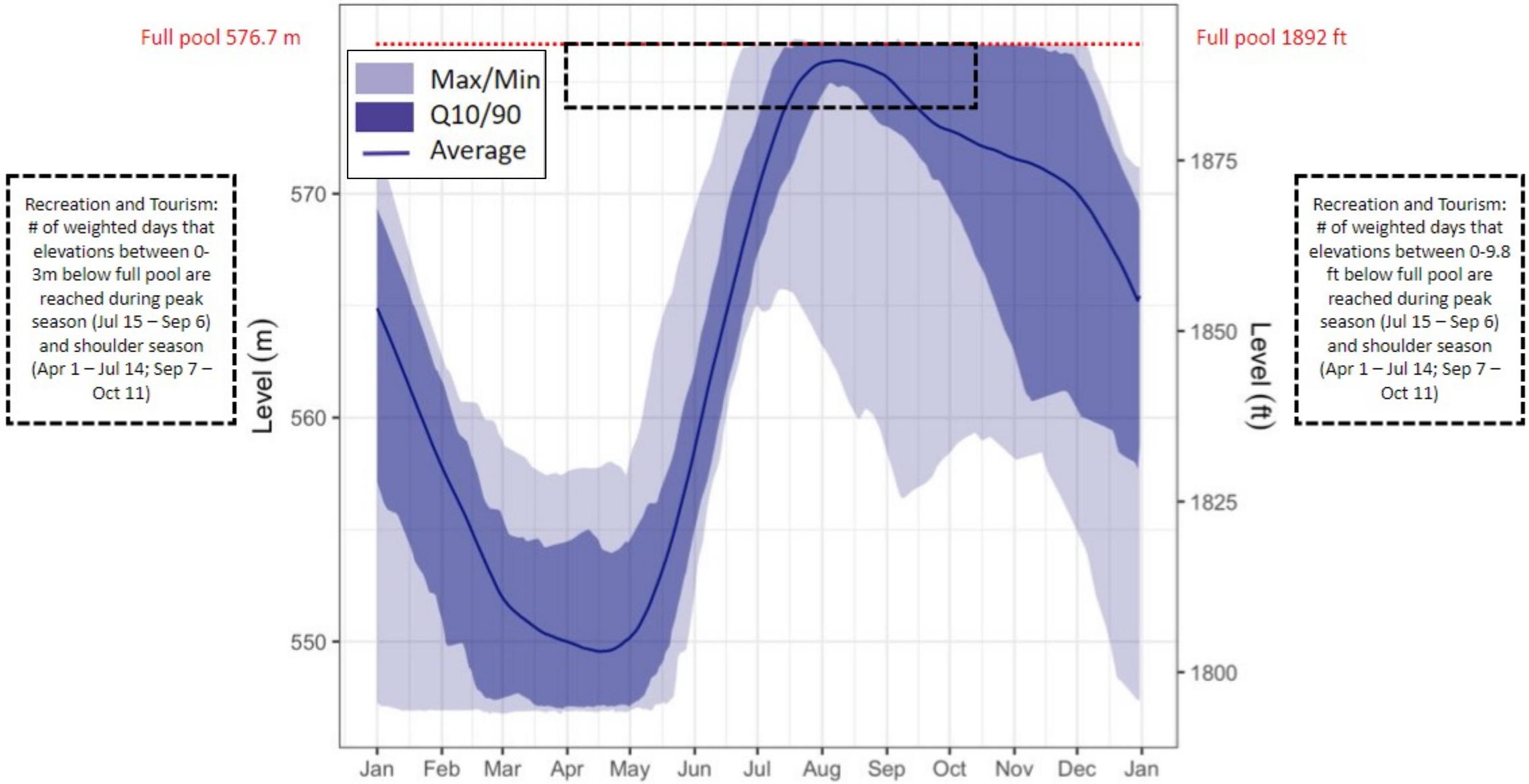
Lower Duncan River

- **Flooding** - Minimize the flood damage to people and property.
- **Mosquito nuisance and health risks** – Further research needed



DUNCAN RESERVOIR AT DUNCAN DAM

1967 - 2020



Recreation and Tourism: # of weighted days that elevations between 0-3m below full pool are reached during peak season (Jul 15 – Sep 6) and shoulder season (Apr 1 – Jul 14; Sep 7 – Oct 11)

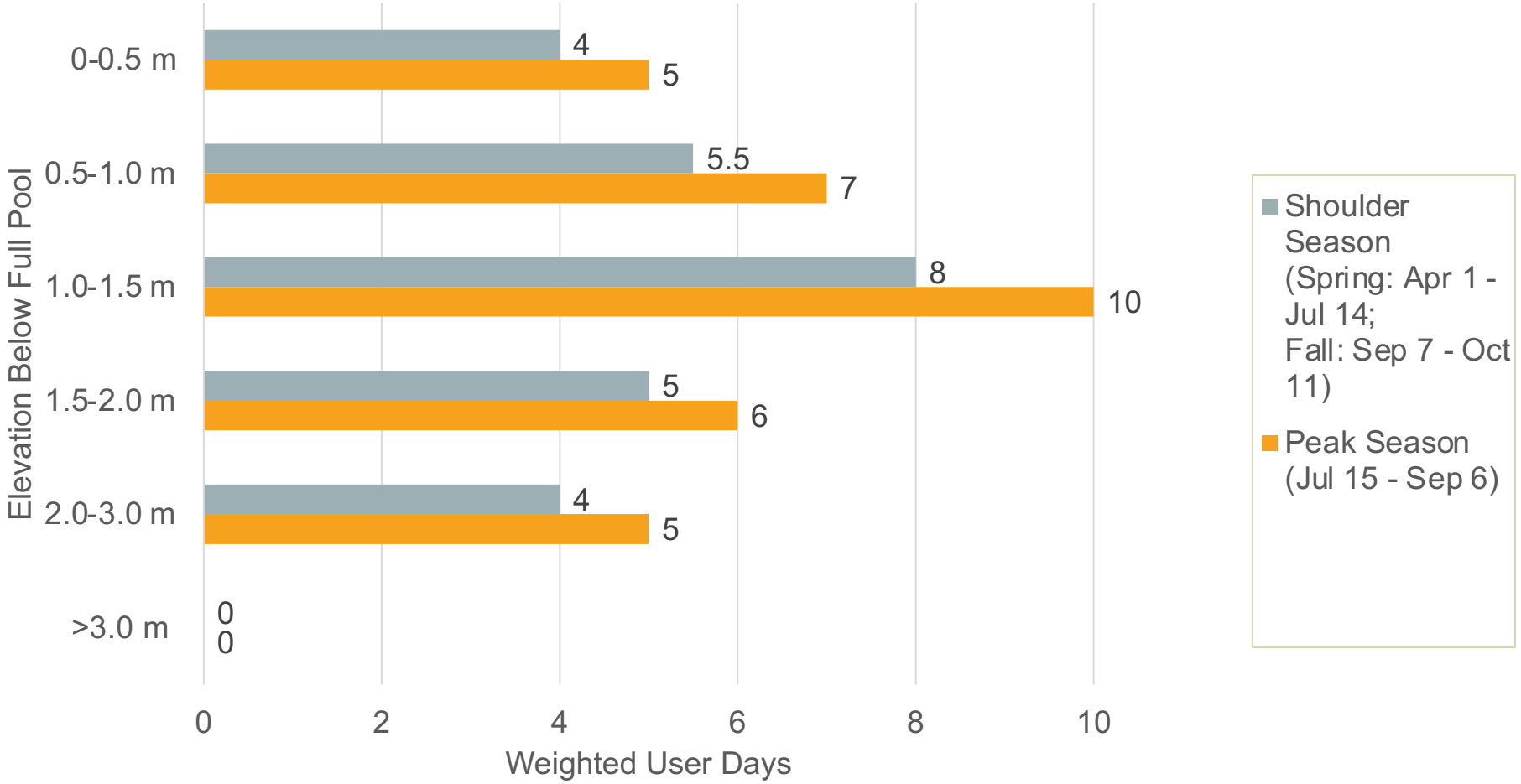
Recreation and Tourism: # of weighted days that elevations between 0-9.8 ft below full pool are reached during peak season (Jul 15 – Sep 6) and shoulder season (Apr 1 – Jul 14; Sep 7 – Oct 11)

Duncan Reservoir – Recreation and Tourism

Objective	Location	Units	Elevation		Season	Preferred outcome	Notes
			Feet	Metres			
Recreation/ Tourism	Reservoir	Weighted days/ year	0 – 10 below full pool	0 - 3 below full pool	Spring shoulder: Apr 1- July 14; Peak: July 15 – Sept 6; Fall shoulder: Sept 7- Oct. 11	More is better	• Continues weighted days from WUP • Season from local reps

Sub-measure		
Objective	**Season**	**Elevation Range**
High water debris avoidance	Apr 1 – Oct 11	1891ft (576.4m) and above

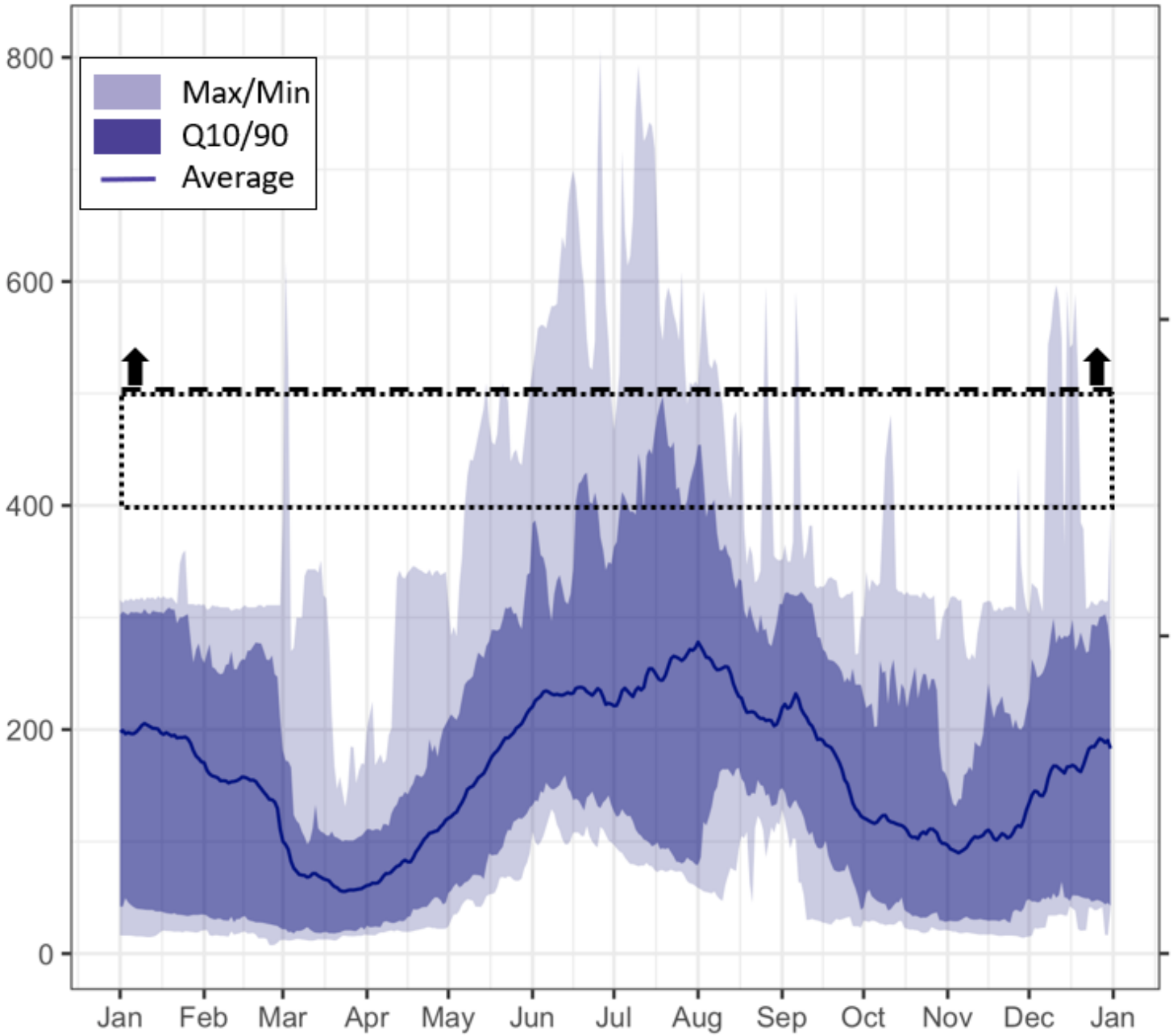
Duncan Reservoir – Recreation and Tourism



Recreation quality weightings with new recommended seasons

DUNCAN RIVER BELOW LARDEAU RIVER

1963 - 2020



Flooding (Extensive Flooding): Total number of days when average flow ≥500 m3/sec

Flooding (Low Lying Areas): Median number of days per year across all years when flow levels are between 400 to <500 m^3/sec

Flooding (Extensive Flooding): Total number of days when average flow ≥1640 ft3/sec

Flooding (Low Lying Areas): Median number of days per year across all years when flow levels are between 1312 to <1640 ft^3/sec

Lower Duncan River - Flooding

Objective	Location	Units	Flow* cfs	Flow* cms	Season	Preferred outcome	Notes
Flooding - Low lying areas	Length of reach	Days/ year	14,126 – 17,657	400-500	Year round	Less is better	• Seepage occurring and risk of flooding with rain event
- Extensive flooding	Length of reach	Days/ year	Above 17,657	Above 500	Year round	Less is better	• Extensive flooding of low lying areas and industrial site

* cfs – cubic feet/second; cms – cubic metres/second

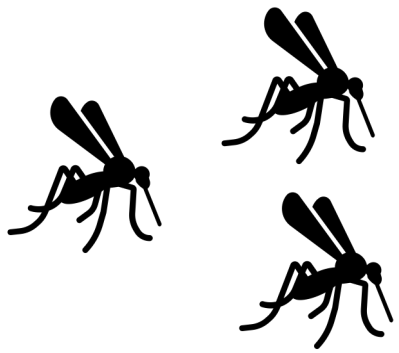
Sub-measures		
Flow (kcfs)	**Total no. of days flow is reached**	**No. of years when flow is reached**

- Based on Water Use Plan – Dated photo verification needed

info@crtlgc.ca

Duncan Reservoir – Mosquitoes

- Research team has reviewed available information and consulted related parties
- There are gaps in available information that prevent a confident understanding of:
  - how dam releases affect mosquito presence at various points in the season, and
  - how that presence translates to a nuisance or health risk for local residents
- ***A performance measure is not recommended at this time***
- ***Resolving information gaps would require additional research which is not funded at this time***

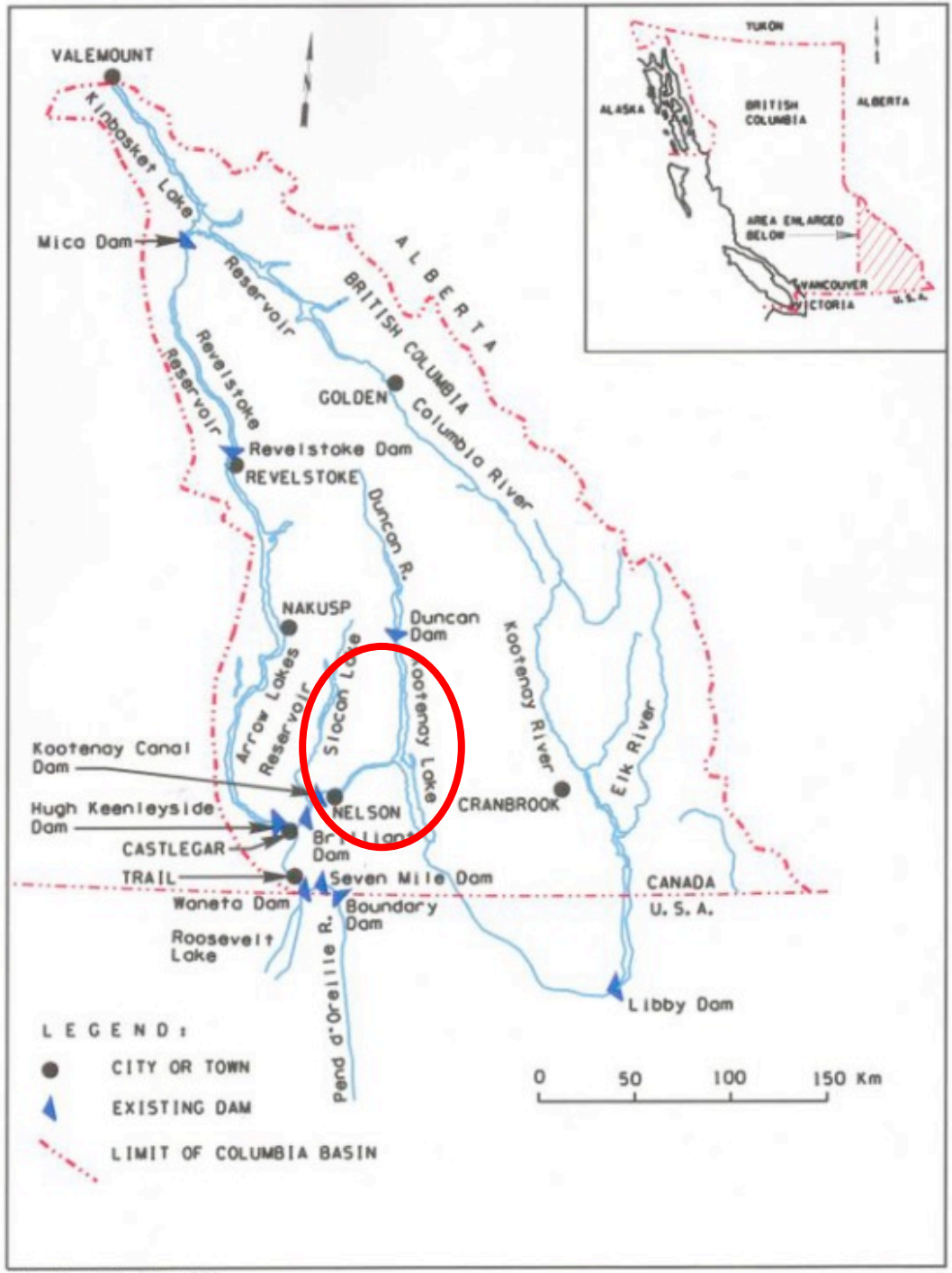


Questions?

Kootenay Lake Quick Facts

'Lake or reservoir'

- 104 km
- Inflows – Regulated by Libby Dam (~44%) and Duncan Dam (~16%) and natural inflows from the watershed between these dams and the lake outflow (~40%)
- Outflow – Corra Linn Dam (Fortis); regulated by IJC Order, must be consistent with CRT
- 0.8 MAF million-acre-feet
- Annual water level fluctuations – Up to 16.5 ft (5 m)



Kootenay Lake CRT Socio-Economic Goals

- **Flooding** - Minimize flooding of property and infrastructure.
- **Navigation** - Minimize disruptions to commercial navigation and transportation.
- **Recreation and tourism -** Maximize the community benefits from the quality and diversity of recreation and tourism.
- **Creston dike management** - Support farming and wetland protection by minimizing pumping costs during critical times.

KOOTENAY LAKE AT QUEENS BAY

1995 - 2020

Flooding (Structure Damage): Estimated annual damage when water levels ≥ 534m

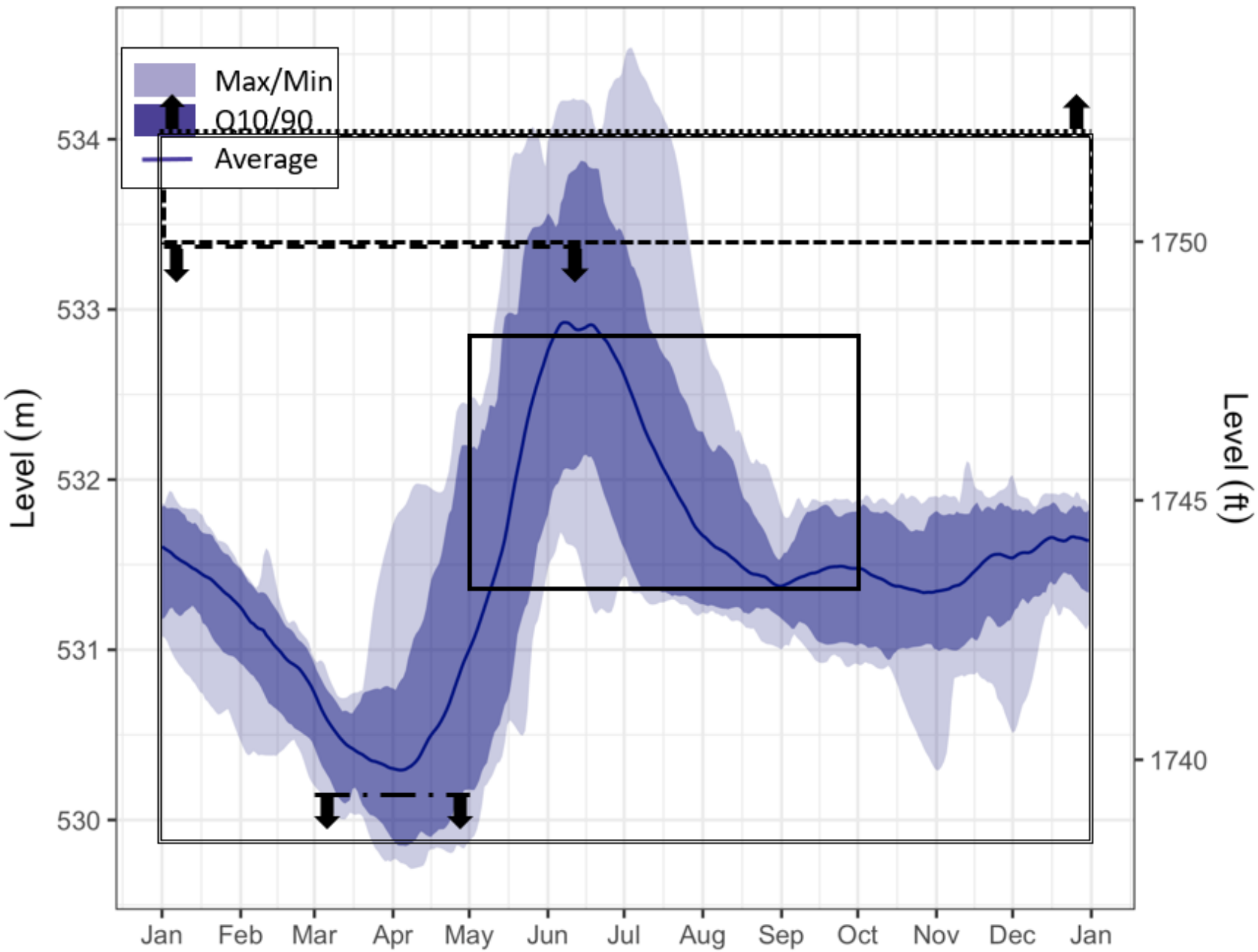
Flooding (Low Lying Areas): Median number of days per year ≥ 533.4 to 534 m

Navigation: # days per year between 529.8 and 534 m

Dike Management (Preferred Operational Days): # of days below 533.4 m, Jan 1 – Jun 15

Recreation and Tourism: # of days per year between 531.4 and 532.8 m, May 1 – Sep 30

Dike Management (Spring Dry Days): # days below 530.1 m, Mar 1 – Apr 30



Flooding (Structure Damage): Estimated annual damage when water levels ≥ 1752 ft

Flooding (Low Lying Areas): Median number of days per year ≥ 1750ft to <1752ft

Navigation: # days per year between 1738 and 1752 ft

Dike Management (Preferred Operational Days): # of days below 1750 ft, Jan 1 – Jun 15

Recreation and Tourism: # of days per year between 1743.4 and 1748 ft, May 1 – Sep 30

Dike Management (Spring Dry Days): # days below 1739.2 m, Mar 1 – Apr 30

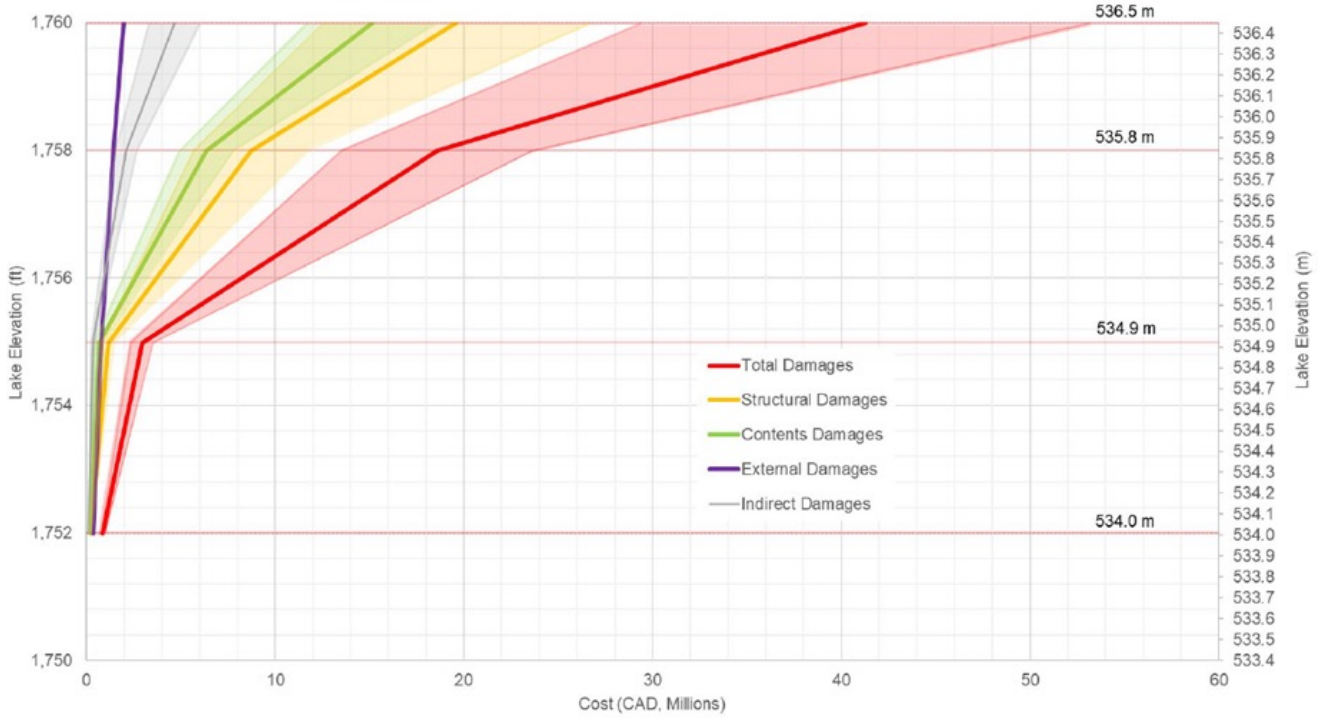
Kootenay Lake - Flooding

Objective	Location	Units	Elevation		Season	Preferred outcome	Notes
			Feet	Metres			
Flooding - Low lying areas	Lake	Days/ year	1750 - 1752	533.4 - 534	Year round	Less is better	• Based on recent high water events
- Structure damage and transportation limits	Lake	Damage ($)	Above 1752	Above 534	Year round	Less is better	• Inhabited structures damaged and ferry operations impacted

- Damage estimate based on RDCK Flood Impact Study (2020)
- Photo verification needed for initial low lying area flooding elevation

Kootenay Lake – Flooding

Expected Annual Damage Curve



Sub-measures

Elevation	Total no. of days elevation is reached	No. of years when elevation is reached
≥1755'		
1754-1755'		
1753-1754'		
1752-1753'		
1751'-1752'		
1750'-1751'		

Kootenay Lake Navigation and Recreation/Tourism

Objective	Location	Units	Elevation		Season	Preferred outcome	Notes
			Feet	Metres			
Navigation	Lake	Days/year	1738-1752	529.8 - 534	Year round	More is better	• Based on ferry operational limits
Recreation/ Tourism	Lake	Days/ year	1743.4 – 1748	531.4 - 532.8m	May 1- Sept 30	More is better	• Minimum elevation – IJC Order maximum lake level from freshet to Aug 31 • Maximum elevation - leaves area for beaches and stays below low lying area flooding level • **Dated information – user surveys needed**

Kootenay Lake – Recreation and Tourism

Sub-measures for access needs and preferences for individual activities, sites, and issues.

Sub-Measure Objective	Season	Flow Range
Motorized boating access	May 1 – Sep 30	1744ft (531.6m) and above
Motorized boating experience preference	May 1 – Sep 30	1744ft – 1749 ft (531.6m – 533.1m)
Beach access	May 1 – Sep 30	1754ft (534.6m) and below
Beach experience preference	May 1 – Sep 30	1744ft – 1754ft (531.6m – 534.6m)

Kootenay Lake – Creston Dike Management

- **Interim** – Reviewing with Creston Valley Floodplain Management Partnership – revisions needed
- Based on results of 2013 technical meeting of floodplain operators for CRT Review Technical Studies

Objective	Location	Units	Elevation		Season	Preferred outcome	Notes
			Feet	Metres			
Preferred operations days	Lake	Days/year	Below 1750	Below 533.4	Jan. 1 – June 15	More is better	• Dike and pump system works best
Spring dry days	Lake	Days/ year	Below 1739.3	Below 530.1	Mar 1- Apr 30	More is better	• Allows movement of farm equipment

Questions?

Next Steps

Please Provide Your Feedback

More information: https://www.crtlgc.ca/copy-of-crt-socio-economic-pm-s-for-r

Survey Link: https://www.surveymonkey.com/r/public-crt-se-pm

Feedback Deadline: February 19, 2023

Please remember:

- Interests must be related to **river flows or reservoir levels** to be assessed in the CRT modelling
- This is a **long-term endeavor** – we won't get it all right in this phase and there will be revisions over time

Questions?

Thank you!

More questions? Email info@crtlgc.ca