

Reopening of the Columbia River Treaty and Restoring the Ecosystem



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The Columbia Watershed



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The Mighty Columbia

- ▶ Covers 259,000 square miles yet only 15% of territory in Canada
- ▶ 38% of average flow and 50% of peak flood waters comes from BC
- ▶ “Head drop” of 2690 feet from headwaters to sea—ideal for hydropower
- ▶ Regular flow fluctuation defined salmon
- ▶ Hydropower, not flood control, drove the creation of pre-CRT dams

Vanport Flood 1948



Because of extraordinarily heavy spring runoffs, Vanport was fifteen feet below Columbia River water level by the end of May 1948. On Memorial Day the dike broke. A wall of water wiped out the town, leaving almost 20,000 without homes and an estimated fifteen people dead.

From Oregon Historical Society

Columbia River Treaty

Hydropower and Flood Control

- ▶ US proposed dams too far downstream for BC to benefit
- ▶ Canada wanted dams but no market for hydro/flood control and “free flood control” to US
- ▶ Canadian protest led to 1959 IJC (formed by Boundary Waters Treaty) recommendations for shared use & benefits (to which US ultimately agreed) for use and sharing
- ▶ Treaty was signed in 1961; ratified in 1964
- ▶ Required Canada to build three new dams Mica, Arrow (Keenleyside), Duncan in B.C., (15.5 MAF of storage)

Treaty basics

- ▶ U.S. paid for construction costs & paid \$64.4 million for flood control
- ▶ 50/50 split of US hydro due to Canadian water releases (Canadian Entitlement) as much as \$350 million in energy & capacity
- ▶ Provided Storage for Libby in MT.
- ▶ Coordinated operation of Libby in Montana, and Grand Coulee in WA
- ▶ Maximizes power production and flood control

CRT Benefits from Coordinated Dam Operation

- Canada keeps min. 8.45 maf of flood storage: Downstream communities out of harm's way
- No peak flow over 600 kcfs at Dalles
- Increase of 73-923 aver annual MW :more power for public & industries
- Population influx into Columbia basin(20-40% in urban areas) since 1960
- Increased input into Columbia Irrigation Project
- Massive economic boom

Power Dependent Industries and Jobs



Evergreen Aluminum LLC

CRT Costs and Impacts

- ▶ Further damage to fisheries (Tribal and commercial)
- ▶ Damage to Tribal economies & cultures
- ▶ Impacts to Sage Steppe Wildlife habitat
- ▶ Changes to Coastal sediment processes and Impacts to Estuaries
- ▶ Recreational Changes

100 year decline of the Fisheries

- ▶ Estimated 16 million fish in Columbia
- ▶ Chief Joseph, Grand Coulee entirely blocked fish. No consideration of fish in CRT
- ▶ CRT dams' massive storage inverts normal hydrograph. Stress on outmigration
- ▶ 1995-1999 ESA listings of seven Columbia Basin salmonids: 6 threatened and Upper CR Spring Chinook endangered.
- ▶ Also white sturgeon downstream from Libby Dam and Pacific Lamprey



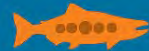
Chum Salmon

Columbia River (threatened)



Chinook Salmon

Snake River Fall (threatened)
Snake River Spring/Summer (threatened)
Lower Columbia River (threatened)
Upper Columbia River Spring (endangered)
Upper Willamette River (threatened)



Steelhead

Snake River Basin (threatened)
Lower Columbia River (threatened)
Middle Columbia River (threatened)
Upper Columbia River Spring (endangered)
Upper Willamette River (threatened)



Coho Salmon

Lower Columbia River (threatened)



Sockeye Salmon

Snake River (endangered)



White Sturgeon

Kootenai River (endangered)



Bull Trout

(threatened)

-  Canadian Dams
-  Federal Dams
-  Non-Federal Dams
-  Blocked Passage

Columbia River Basin



Treaty Impact on Tribes

- Ignored rights of US Steven's Treaty tribes and First Nation tribes under Section 35 of Constitutional Act to "usual & accustomed" fishing rights along Columbia and its tribs
- First Nations tribes additionally lost significant hunting, gathering and ancestral burial lands due to CRT storage reservoirs

Aboriginal Treaty Right to Fish Means Nothing if the Fishery is Imperiled



Impacts on fish and wildlife from Loss of Estuary habitat

- ▶ Columbia estuary is 20% smaller than historically
- ▶ Hydropower regulation reduced spring freshets into estuary by 200k cfs—reducing both off channel habitat and impacting food web
- ▶ Decreased sediment transport likely increased erosion of Columbia delta
- ▶ Reduced sediment and freshets reduced plume in delta—critical transitional habitat for juvenile fish

Loss of re-sedimentation



Recreation Impacts from CRT

- ▶ Development of reservoir areas. Real Estate, Boating and Tourism in Kootenay BC
- ▶ Sports fishing of resident fish-rainbow and bull trout
- ▶ However—reservoir fluctuations due to draw downs leave docks dry, sand and dust problems

Many straws in the Columbia



Reopening the CRT

Not just hydropower and flood control

- ▶ Water supply for growing cities
- ▶ Endangered Species Act
- ▶ Irrigation
- ▶ Climate Change

Biggest Change Legally—Tribal Interests and Environmental Laws

Tribal Interests & The CRT

- ▶ 15 Columbia Basin Tribes' common views
- ▶ Substantive goal: restore fish to Upper Col.
- ▶ Participatory goal achieved: 5 representatives on SRT
- ▶ Government to Government discussions and management of fishery
- ▶ Consistent with First Nations' petition to IJC to reopen 1940 Grand Coulee approval
- ▶ Restoration of Ecosystem Function

Reexamination of the Treaty:

- ▶ Treaty doesn't end automatically. Earliest option to terminate 9/16/2024—with ten year notice
- ▶ In 2024, Canadian entitlement to half incremental downstream benefits of hydro system ends
- ▶ In 2024, US "lease" of flood control storage in BC ends—reverts to US "called upon" flood assistance with "effective use first" --draw down US reservoirs throughout basin for floodwaters.
- ▶ JOINT STUDIES IN PREPARATION—followed by second iteration studies

Recommendations & Studies




- ▶ Iteration 1: Focus on Hydro and Floods
- ▶ BPA and ACE target date: Sept. 2013
- ▶ Climate Change (and impacts on floods)
- ▶ Meeting BiOp (when BiOp is in Flux)
- ▶ Defining What Called Upon Flood Control Is
- ▶ Defining What Effective Use Is?
- ▶ What is Restoration of Ecosystem Function

Restoring Ecosystem Function

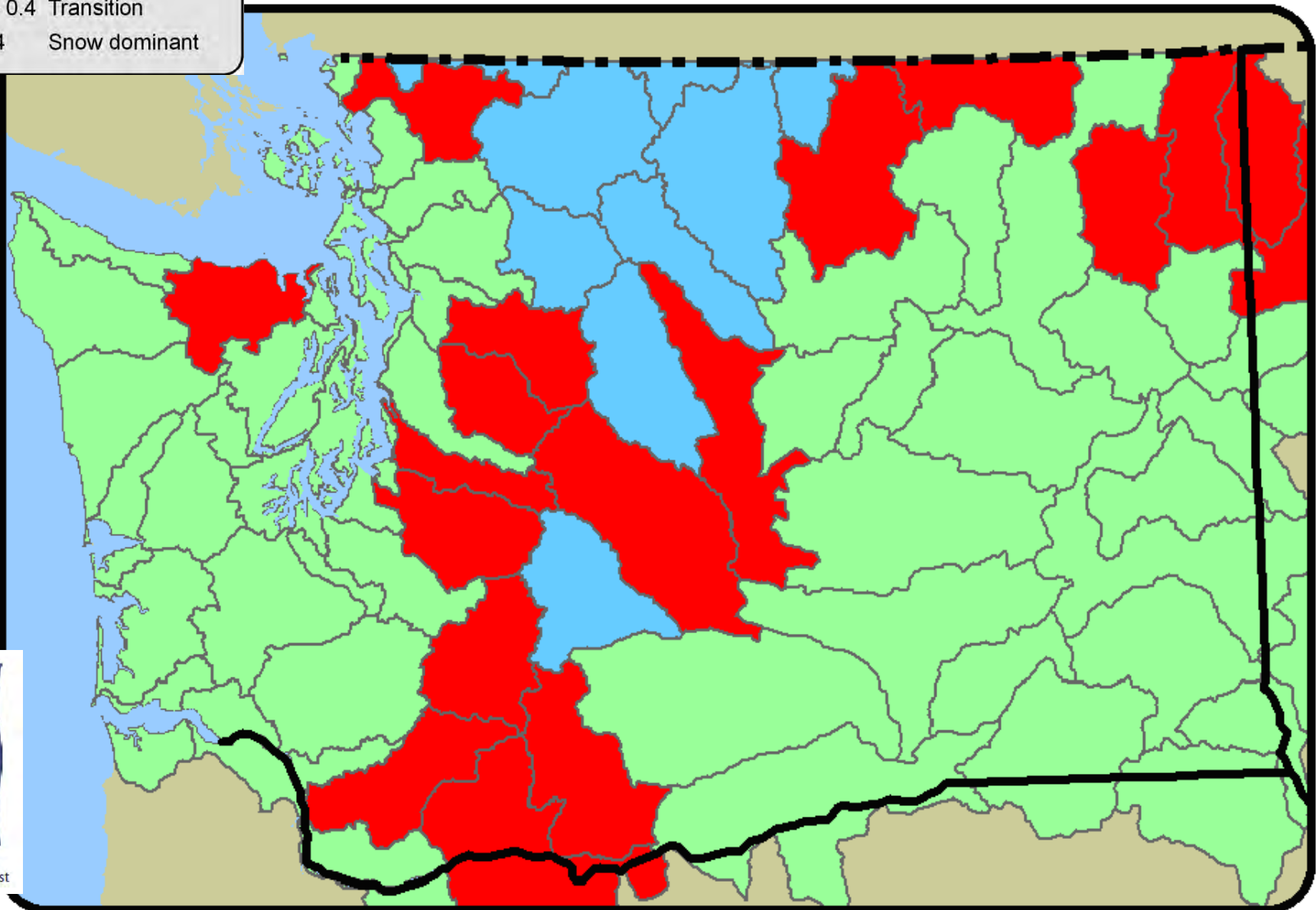
- ▶ Entities studies underway—3 options
- ▶ E1. More normal spring peaks in hydrograph
- ▶ E2. Increasing reservoir refills to stabilize summer reservoirs for fish
- ▶ E3. Use 2-3 MAF from BC to assist summer migration
- ▶ We can think bigger....and have to...

Watershed Classification

Ratio of April 1 SWE to
October - March Precipitation

-  < 0.1 Rain dominant
-  0.1 - 0.4 Transition
-  > 0.4 Snow dominant




Historical



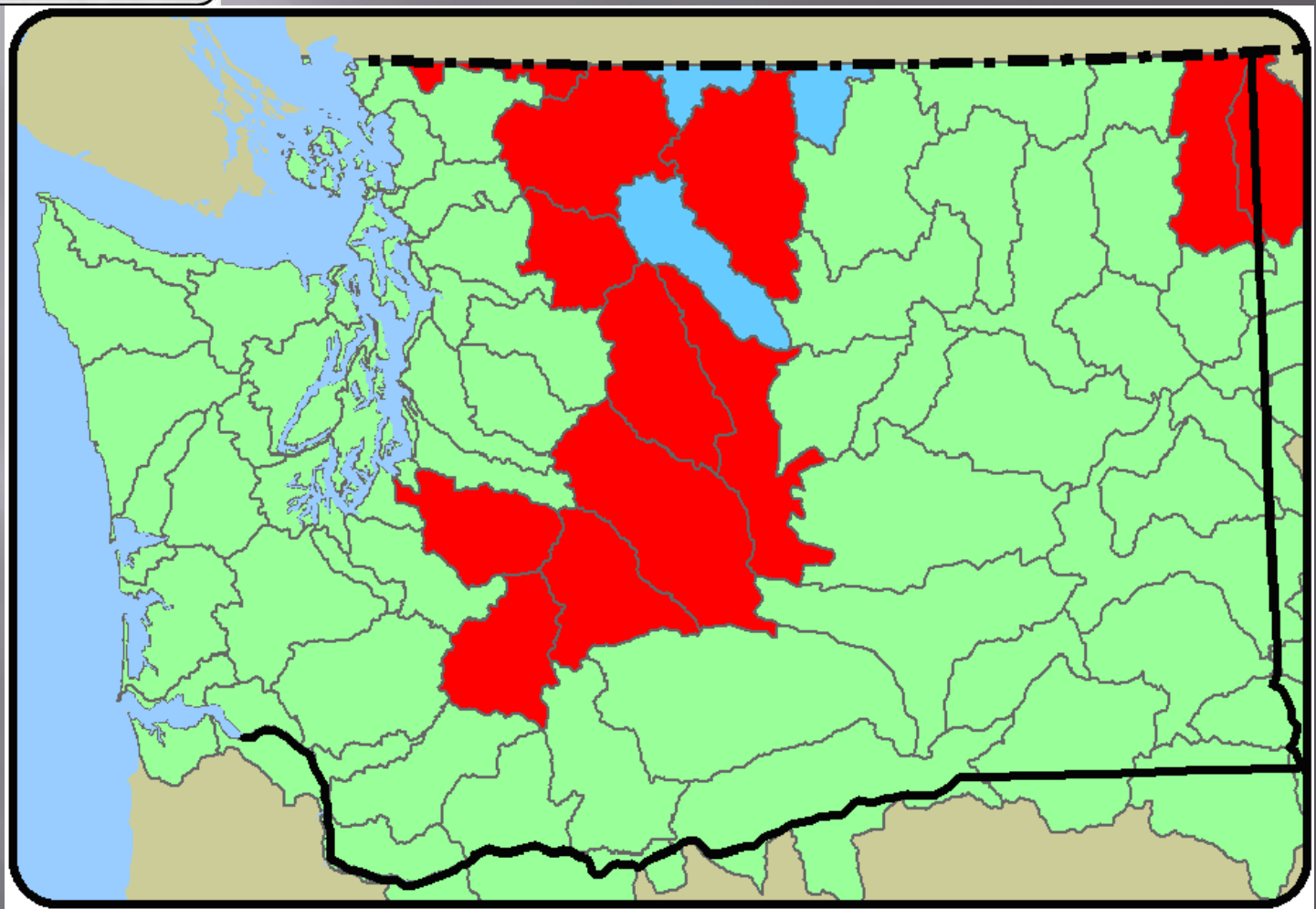
Climate Science
in the Public Interest

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2040's



Climate Change

- ▶ Increased temperatures, diminished snowpack; increased and earlier precipitation.
- ▶ Less groundwater infiltration; more flood events
- ▶ Earlier summers, higher temps will increase water storage demands for agricultural, municipal and other needs
- ▶ Greater risk of flooding and greater water demands

New CRT Needed

- ▶ Intensive damming of River requires future coordinated operations for all purposes
- ▶ Likely more US responsibility for flood event & increased likelihood of flood events
- ▶ Increased water demands
- ▶ Treaty responsibility to Tribes
- ▶ Increased pressure on salmon recovery efforts

Future CRT: Mechanism for future adaptations

- ▶ Preserving and protecting tribal treaty rights to fish through their direct participation in new CRT
- ▶ Restoring Ecosystem Function beyond Iteration 1 models of 1 maf for migration and meeting Bi-Op.
- ▶ True compensation and Ecosystem Function restoration—basin wide, multi-national restoration of fish to Upper Columbia and BC
- ▶ Recognizing that adapting to climate change will require changes to energy use, agriculture if we still want rivers, salmon and population growth

Future CRT: Mechanism for future adaptations

- ▶ Setting long-term goals for restoration of fish and fish habitat and ecosystem function
- ▶ Introducing salmon above Grand Coulee—engineering outmigration
- ▶ Looking regionwide and incremental steps: Opening up the Similkameen as an example
- ▶ Factoring in region-wide changes to energy: potential of wind as base load
- ▶ Improving sediment flows downstream to restore estuary

Thank you from CELP.
Columbia Wetlands,
last free-flowing reach in British Columbia

