



# Columbia River Treaty History and Treaty Review

On behalf of the United States Entity  
Summer 2012



## The Columbia River Basin



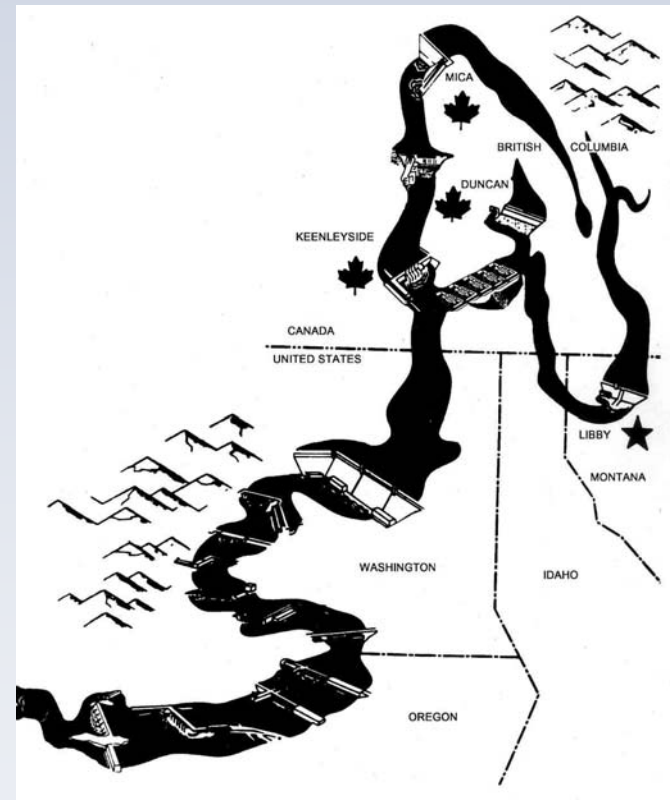
- Canada has 15% of the basin area, but contributes 35% of 134 million acre feet (Maf) average annual flow at The Dalles.
- Flow at Canadian border varies from 14,000 to 555,000 cubic feet per second (cfs), much wider variation (1:40) than Mississippi or St. Lawrence.
- Unregulated flow at The Dalles varies from 36,000 to 1,240,000 cfs a ratio of 1:34, compared to the St. Lawrence 1:2 and Mississippi 1:25 ratios.
- Columbia River basin has most hydropower capacity (~37 GW) in North America, but large variations in seasonal and annual natural flows that cause power and flood control regulation problems.

## **The Columbia River Treaty**

The Columbia River Treaty is an international agreement between Canada and the United States of America for the cooperative development and operation of the water resources of the Columbia River Basin for the benefit of flood control and power.

## Columbia River Treaty Benefits

- Canadian Treaty storage reduces flood flows, reduces spill, and shifts energy from low value time periods to high value time periods.
- The Treaty coordination between Canada and US on power and flood control provides \$100's million dollars of annual mutual benefits across the Columbia River Basin.
- The Treaty motivated infrastructure and governance development such as the electrical intertie to California, regional power preference legislation, added generators at most Columbia dams, and several regional power coordination agreements.



## Columbia River Treaty by Key Dates

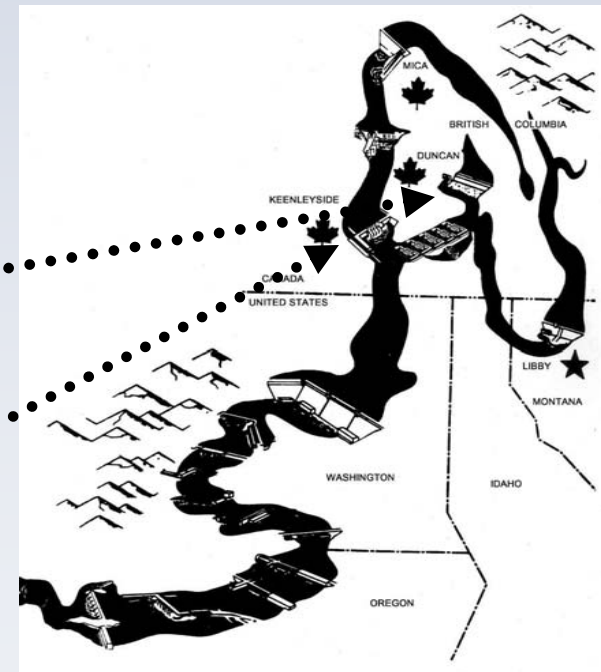
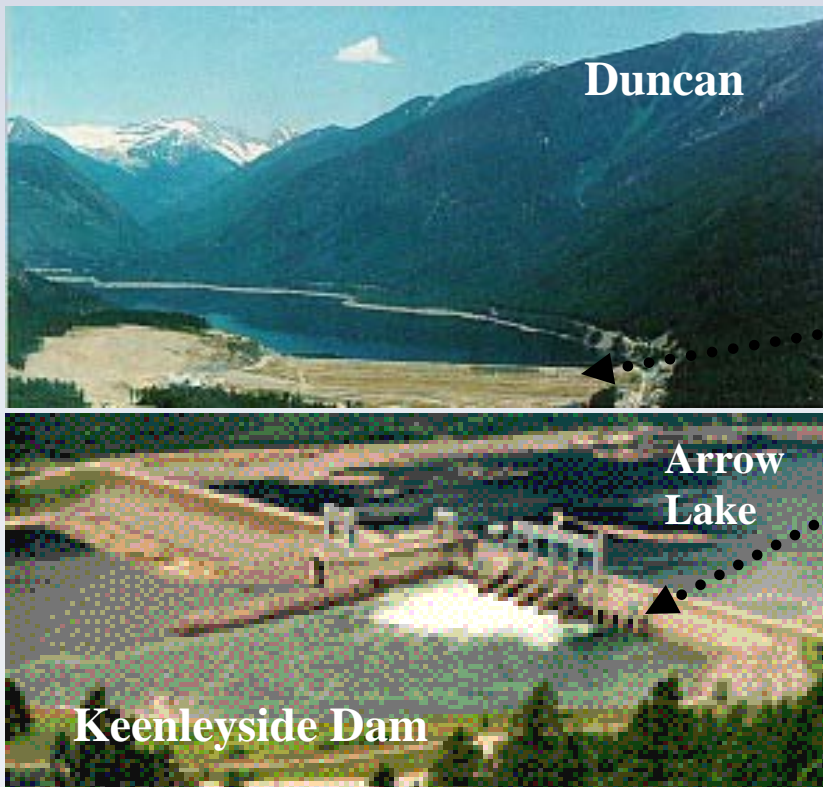
- **1909** – Boundary Waters Treaty
- **1933-42** – Grand Coulee Dam built
- **1943-44** – Corps of Engineers, International Joint Commission (IJC) begin Columbia River studies
- **1948** – Columbia River flood caused deaths, much property damage in both countries
- **1948-59** – Treaty analyses conducted, Treaty project site evaluations
- **1950** – Flood Control Act of 1950 (HD 531) authorization of the Federal Columbia River Flood Control System within the United States with appropriate interfaces for those parts of the basin within Canada.
- **1961-64** – Columbia River Treaty signed and ratified, plus sale of first 30 years' of Canadian Entitlement to the U.S.; Southern Intertie planning begun; Pacific Northwest Coordination Agreement signed; initial mid-Columbia party agreements signed
- **1964** – Canada-B.C. agreement cedes rights and responsibilities of Treaty to B.C.
- **1967-73** – Duncan, Keenleyside, Mica, and Libby dams completed
- **2003** – all Treaty Entitlement energy deliveries made to Canada (end of 30-year sale) now at the U.S.-Canada border
- **2014** – latest at least 10-year notice for termination of Columbia River Treaty in 2024 may be given by either Canada or U.S. if termination by 2024 is desired (may be later if a later termination date is desired)
- **2024** – earliest possible termination date for Columbia River Treaty (September 16, 2024)

## General Treaty Provisions

- The Treaty required Canada to construct and operate three large dams (Mica, Arrow, and Duncan) with 15.5 million acre-feet (Maf) of storage in the upper Columbia River basin in Canada for optimum power generation and flood control downstream in Canada and the U.S.
- The Treaty allowed the U.S. to construct and operate Libby dam with 5 Maf of storage on the Kootenai River in Montana for flood control and other purposes. Libby creates power and flood control benefits downstream in Canada and the U.S., and these benefits have no payment requirements.
- U.S. and Canada are to share equally the downstream power benefits (DSB's) produced in the U.S from the operation of Canadian Treaty storage.
- The Administrator of the Bonneville Power Administration (Chair) and Division Engineer of the Northwestern Division USACE (Member) are the U.S. Entity that implements the Treaty. The Canadian Entity is B.C. Hydro and Power Authority.

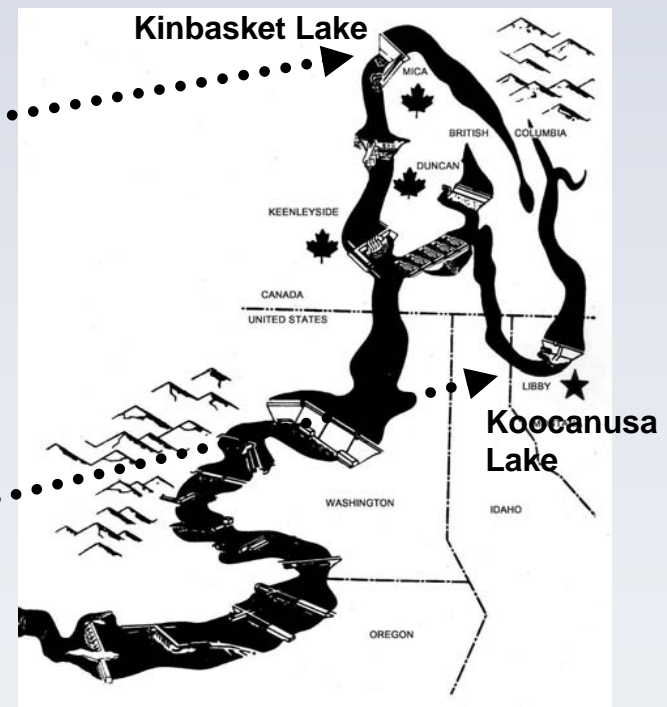
## Duncan and Arrow

	<u>Completed</u>	<u>Treaty Storage</u>	<u>Non-Treaty Storage</u>	<u>Generator Capacity</u>	<u>Dam Height</u>
DUNCAN	1967	1.4 Maf	None	None	130 ft.
ARROW	1968	7.1 Maf	.25 Maf	185 MW	170 ft.



## Mica and Libby

	<u>Completed</u>	<u>Treaty Storage</u>	<u>Non-Treaty Storage</u>	<u>Installed Capacity</u>	<u>Hydraulic Capacity</u>	<u>Dam Height</u>
MICA	1973	7.0 Maf	5.0 Maf	1740 MW	40 KCFS	650 ft.
LIBBY	1973	5.0 Maf	None	604 MW	25 KCFS	370 ft.





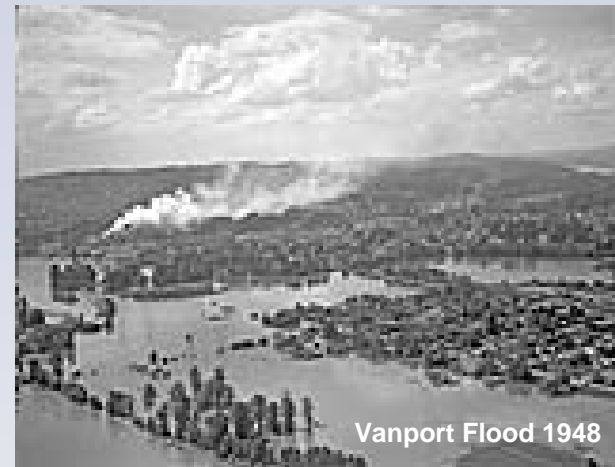
## Treaty Power Provisions

- Canada must operate 15.5 Maf of their Treaty storage for optimum power generation downstream in Canada AND the United States.
- U.S. must deliver electric power to Canada equal to one-half the estimated U.S. power benefits (Canadian Entitlement) from the operation of Canadian Treaty storage, currently worth about \$250-\$350 million annually.
- Province of B.C. owns Canadian Entitlement, and BPA (on behalf of the U.S. Entity) delivers the power based on daily schedules set by B.C.
- Owners of five Mid-Columbia non-federal hydro projects deliver 27.5% of Canadian Entitlement to BPA for delivery to B.C.



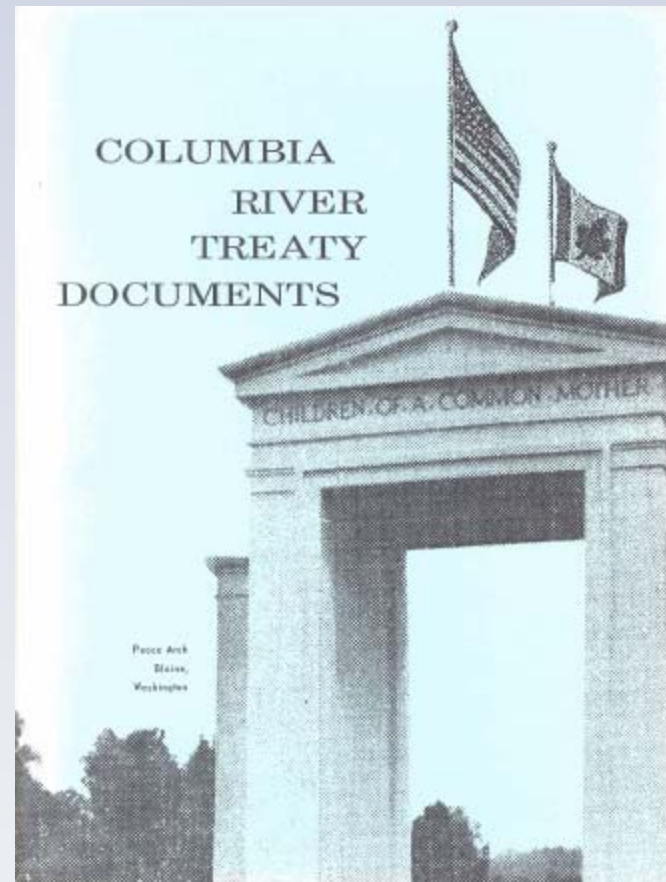
## Treaty Flood Control Provisions

- Canada is obligated to operate 8.45 Maf of reservoir storage (increased to 8.95 Maf in 1995 due to reallocation of Mica/Arrow storage) under a flood control operating plan that attempts to eliminate, or if not possible then reduce, all flood damages in both Canada and the U.S.
- Canada must also operate all additional storage on an on-call basis (as requested and paid for). This has never been used to date.
- As the dams were completed, the U.S. paid Canada \$64.4 million for one-half the present worth of the expected future U.S. flood damages prevented from 1968 through 2024.
- This U.S. purchase of 8.45 Maf of flood control operation expires in 2024.



## Why conduct a Treaty 2014/2024 Review?

- The Treaty has no specified end date; however, either nation can terminate most of the provisions of the Treaty as early as Sep 2024, with a minimum 10 years' written notice.
- Current assured annual flood control operating procedures will end in 2024, independent of the Treaty termination decision.



Portland Flood 1996

## **Columbia River Treaty 2014 / 2024 Review**

### **Description**

Studies jointly conducted by USACE and BPA on behalf of the U.S. Entity in collaboration with regional Sovereigns and stakeholders to evaluate the benefits and costs associated with alternative Treaty futures.

### **Purpose**

Enable the U.S. Entity to make an informed recommendation, in collaboration with the regional sovereigns and stakeholders, to the U.S. Dept of State by September 2013 as to whether or not it is in the best interest of the U.S. to continue, terminate, or seek to amend the Treaty.

### **Authorization**

Columbia River Treaty executed between the U.S. and Canada in 1964 authorizes the U.S. and Canadian entities to conduct studies necessary to implement the Treaty.

## Post-2024 Power Operations

### If the Treaty continues as is:

- Coordinated annual planning of an optimum U.S. and Canadian power operation continues
- U.S. continues to deliver Canadian Entitlement
- Certainty in Canadian storage operations through Treaty planning and coordination



### If the Treaty is terminated:

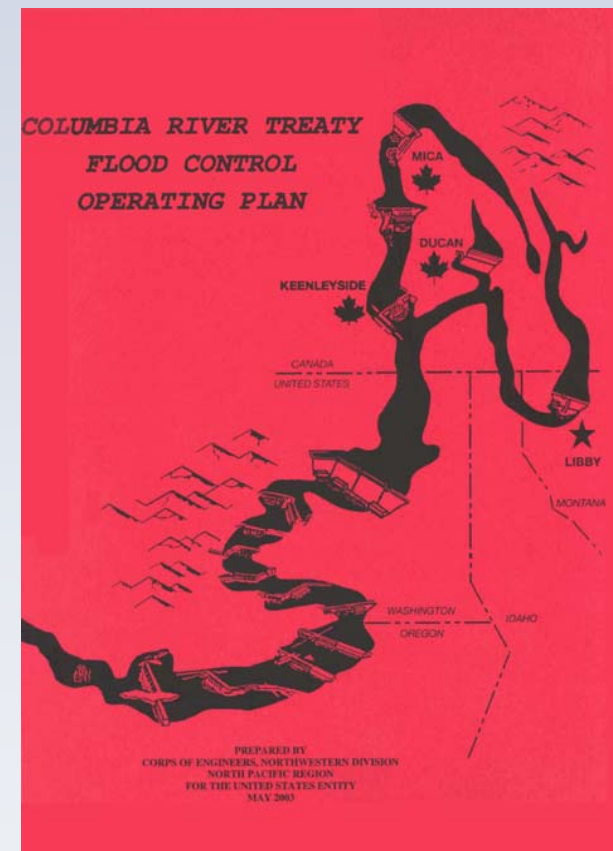
- B.C. will operate Mica, Arrow, and Duncan for the benefit of Canada (subject to Boundary Waters Treaty), except for Called Upon flood control operations. The U.S. will continue to coordinate with Canada on the operation of Libby.
- Canadian Entitlement will cease to exist



## Post-2024 Flood Control

### Regardless of Whether the Treaty Continues or is Terminated:

- Flood control provided by Canadian projects transitions to a “Called Upon” operation after 2024 for the life of the projects
- U.S. requests for called upon storage limited to potential floods that cannot be adequately controlled by all related (effective) U.S. storage
- Canada to provide no greater degree of flood control after 2024 than prior to 2024
- U.S. must pay for operating costs and any economic losses in Canada due to the Called Upon operation



Portland Flood 1996

## **Columbia River Treaty 2014/2024 Review Program Scope**

### 1. Work Completed to Date

- a) Phase 1: U.S./Canadian Entities Joint Technical Studies (public release July 2010)
- b) U.S. Entity Supplemental Studies (public release Sept 2010)
- c) Iteration 1 Studies complete (public release June 2012)

### 2. Work Currently Underway & Planned

- a) Regional Engagement with Sovereign and Stakeholder Interests
- b) Coordination with U.S. Departments of State, Energy, and Defense
- c) Additional Technical Analysis
- d) Evaluation of Treaty Alternatives

### 3. Regional Recommendation

- a) Expected to be issued by the U.S. Entity to Department of State, governments in the Fall of 2013.