

# Fishery Mitigation Efforts for Grand Coulee Dam, 1939-2025

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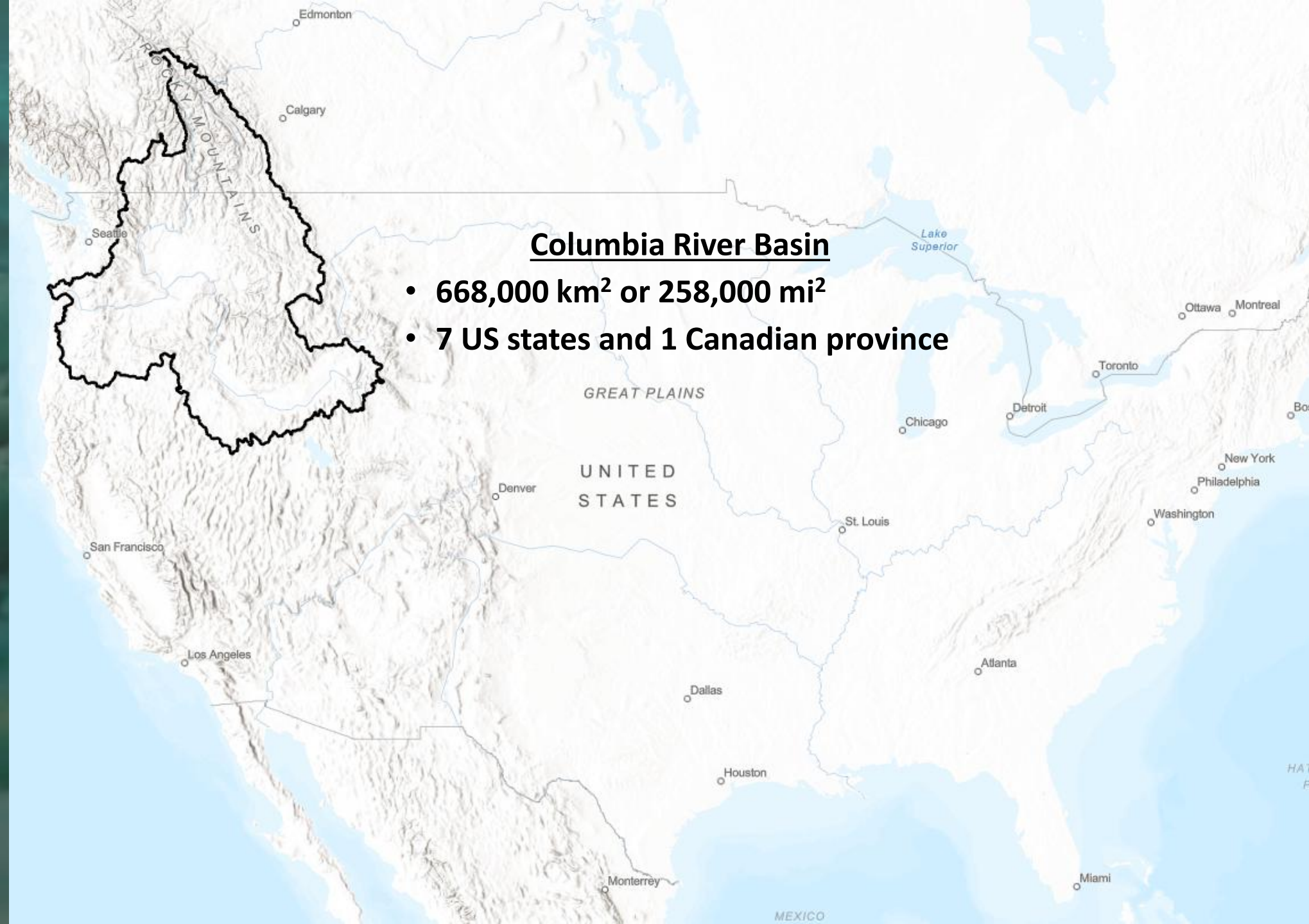
US Fish and Wildlife Service

Leavenworth, WA



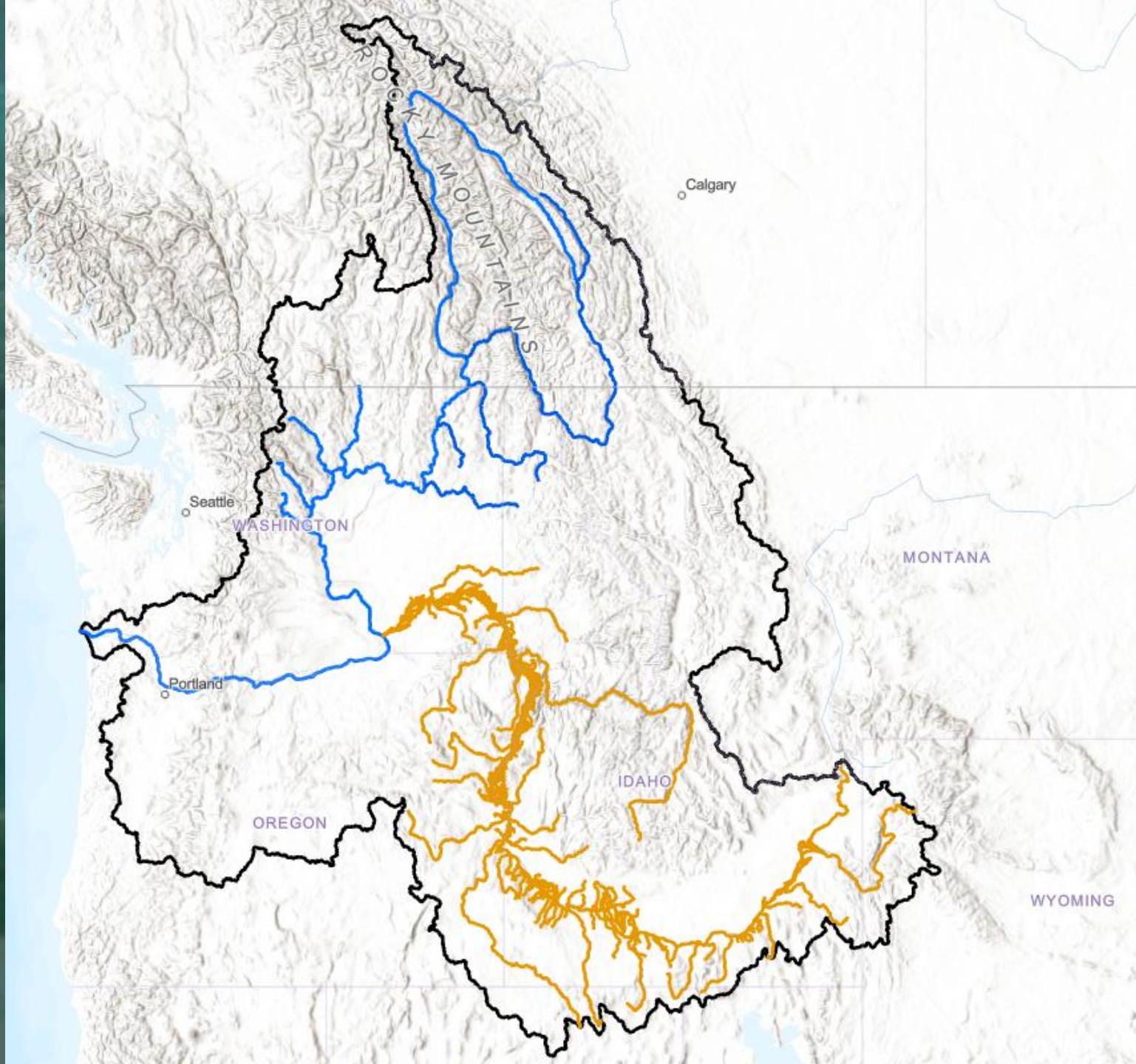
# Outline

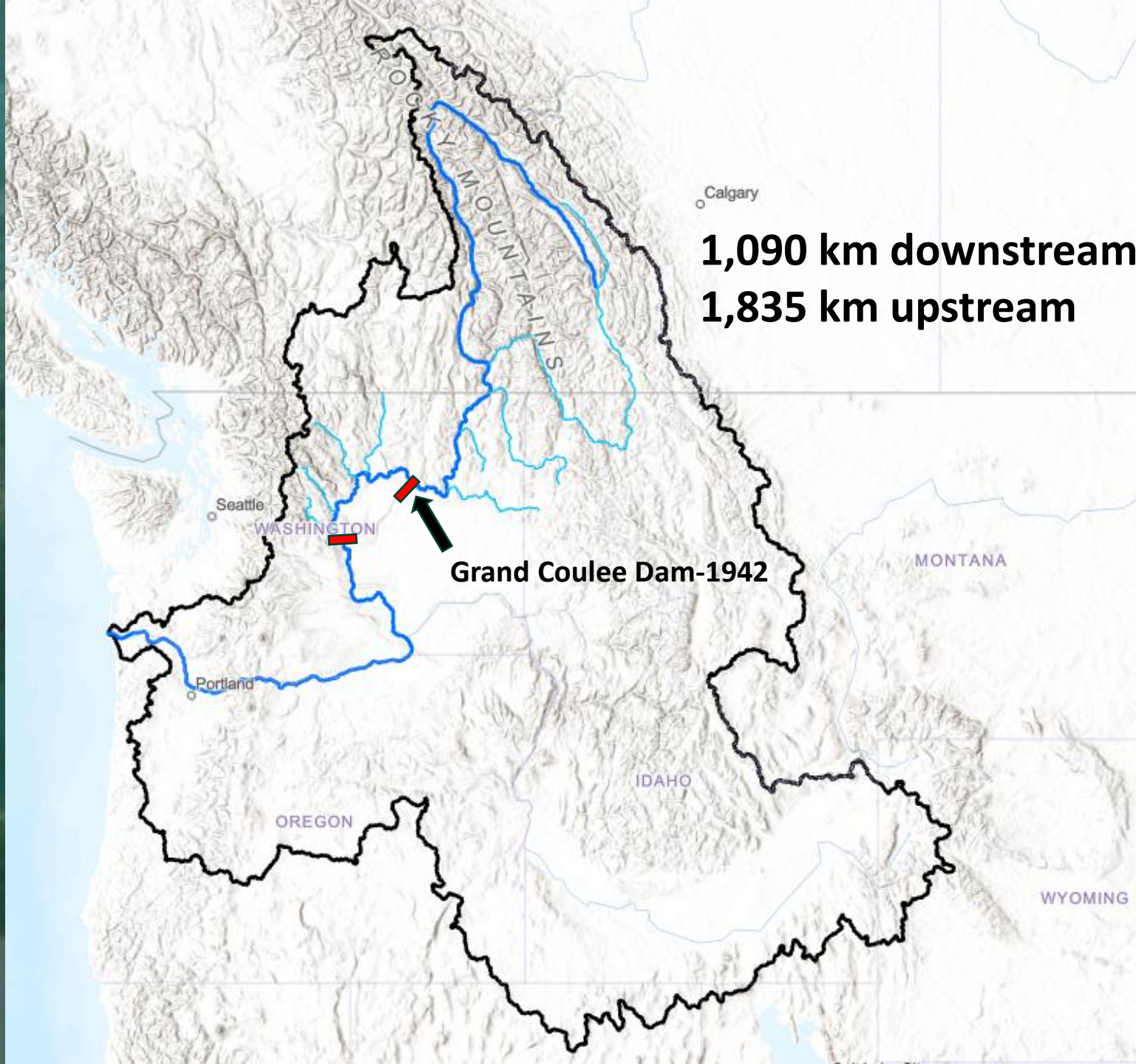
- Columbia River Overview
- Grand Coulee Dam Project
- Grand Coulee Fish Maintenance Project
- Mitigation for fisheries



### Columbia River Basin

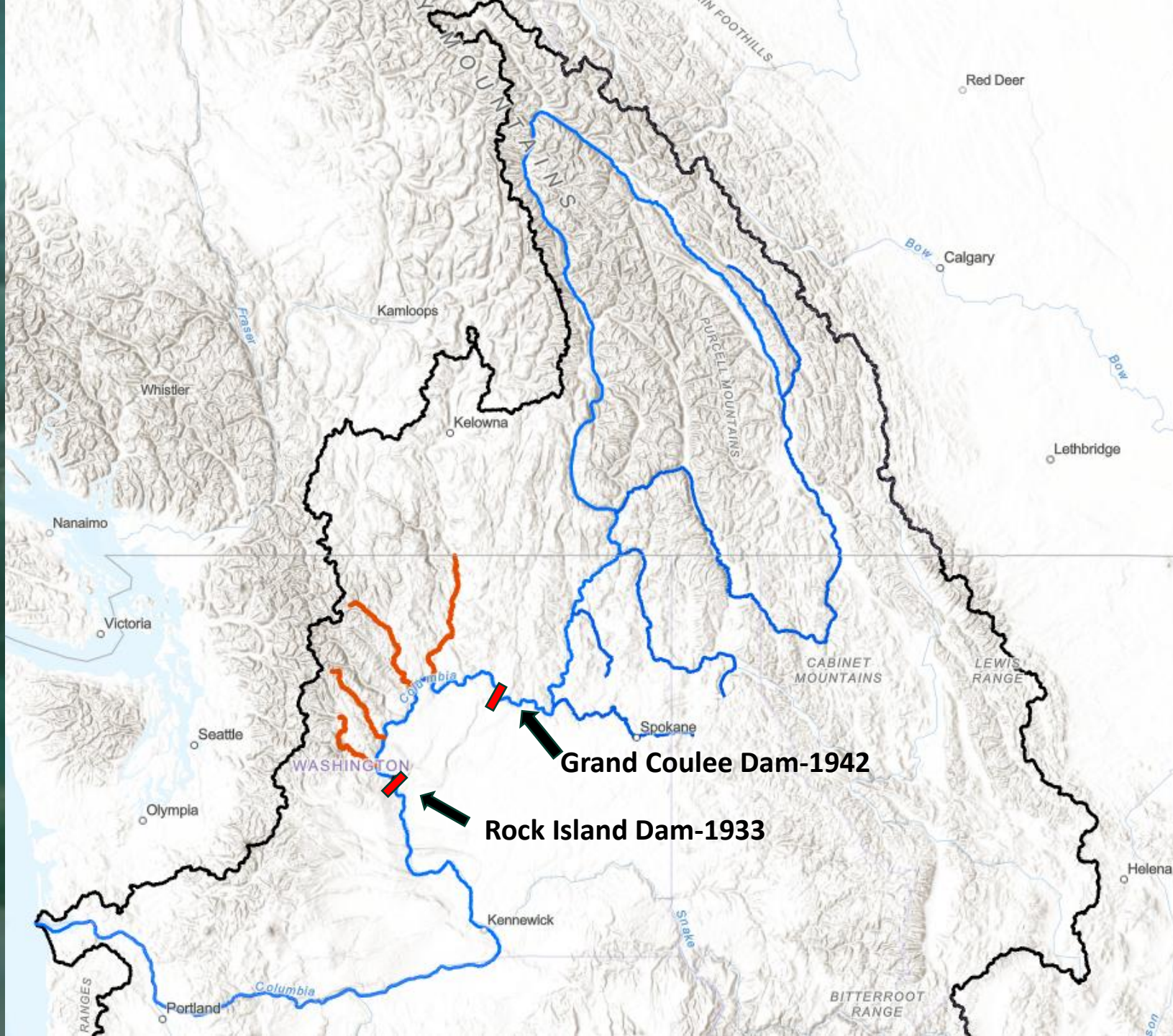
- 668,000 km<sup>2</sup> or 258,000 mi<sup>2</sup>
- 7 US states and 1 Canadian province





**1,090 km downstream**  
**1,835 km upstream**

**Grand Coulee Dam-1942**



**Grand Coulee Dam-1942**

**Rock Island Dam-1933**



# Grand Coulee Dam-History

An aerial, black and white photograph of the Grand Coulee Dam site. The image shows a wide river flowing through a deep, rugged canyon. The surrounding landscape is characterized by steep, rocky slopes and a network of smaller tributaries. The dam's location is visible as a narrow constriction in the river's path.

- 1918: Idea of a dam
- 1932: Reports by Bureau of Reclamation and Corp of Engineers completed
  - Power revenues would fund irrigation and flood control
- 1933: Grand Coulee Dam authorized
- 6,000 jobs

# Grand Coulee Fish Maintenance Project

- 1939: Board of Consultants Report
- 1939: The Grand Coulee Fish Maintenance Program initiated
- 1939: Began trap and haul operation at Rock Island Dam





168 meters (550 ft) tall  
1,592 meters (5,223 ft) wide  
2<sup>nd</sup> Largest concrete structure  
(Three Gorges Dam 1<sup>st</sup>)

# Power

- 9<sup>th</sup> largest hydropower producer worldwide
- Largest US producer 6,809 MW



# Irrigation

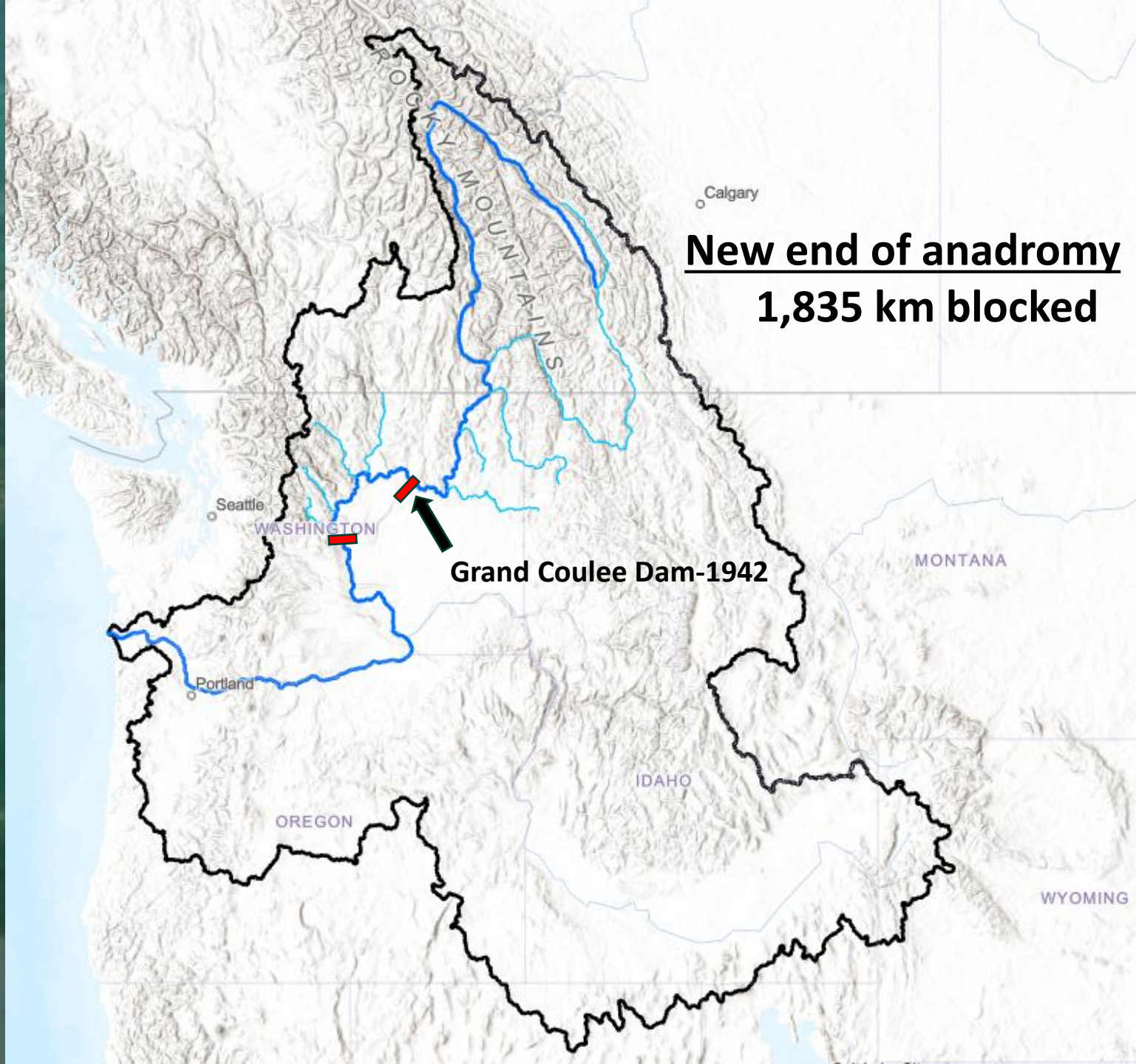
- 530 km (330 mi) major canals, lakes and reservoirs
- 3,220 km (2,000 mi) secondary canals





Irrigates  
720,000  
acres





**New end of anadromy**  
**1,835 km blocked**

**Grand Coulee Dam-1942**

# Mitigation

Estimated 1933-1938: 134,000 adult fish

48,600 Chinook

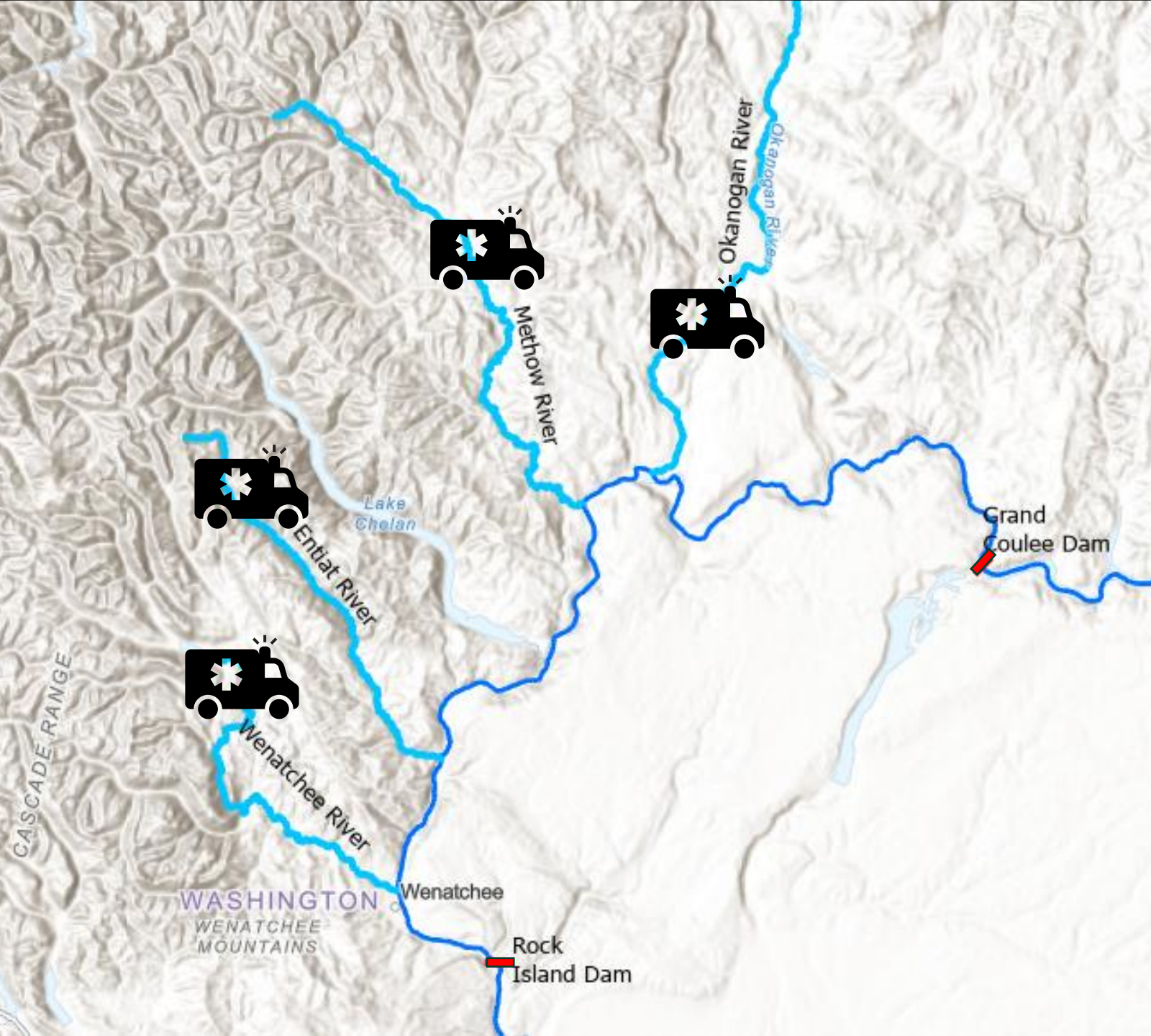
79,700 Sockeye

5,500 steelhead

Coho not considered

1) Trap and haul

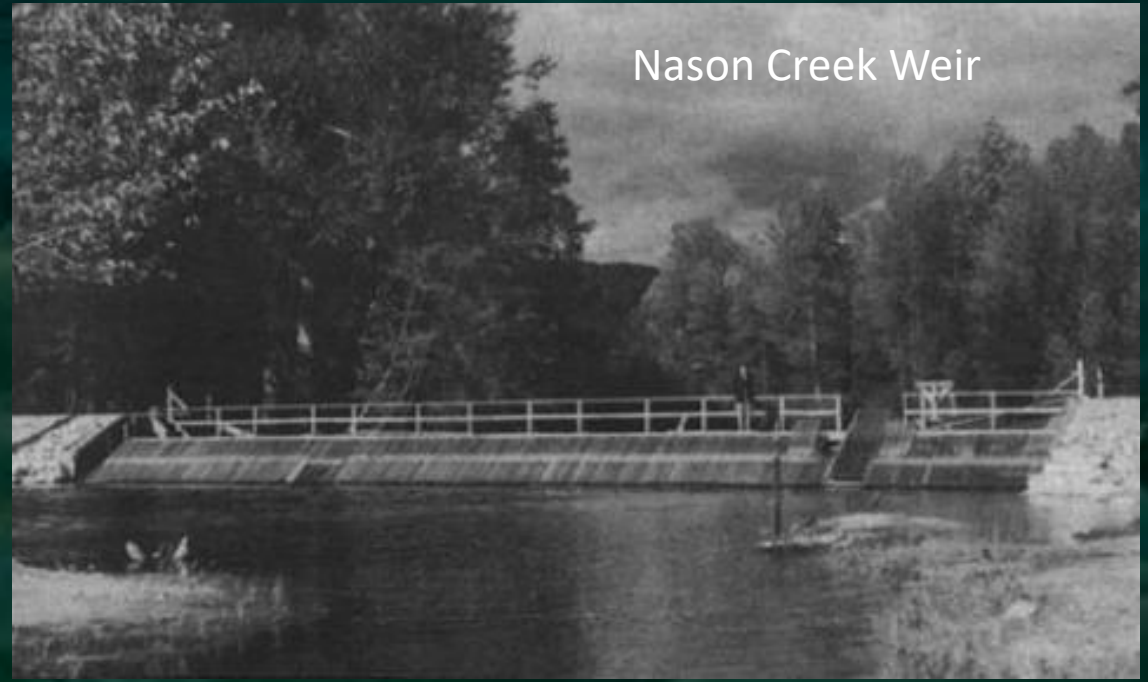
Major tributaries between Rock Island and Grand Coulee highly degraded



8 fish trucks  
1,000 gallons each



Nason Creek Weir



Offloading fish into  
Wenatchee River habitat



Scientific monitoring



# Mitigation

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48,600 Chinook

79,700 Sockeye

5,500 steelhead

Coho not considered

2) National Fish Hatcheries  
Mitchell Act did not quantify mitigation production





# Leavenworth National Fish Hatchery

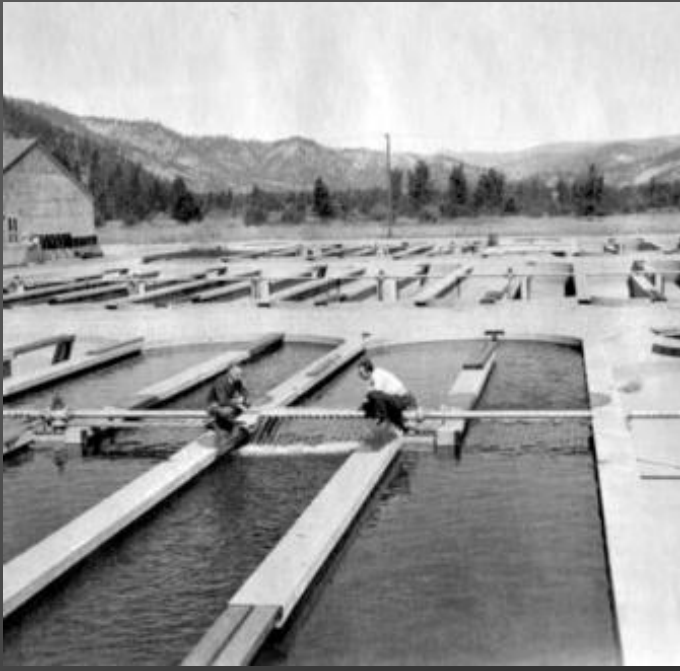




# Leavenworth National Fish Hatchery

- **1942 –1969** raised many salmonids, sizes and methods
- **1970 –present** raised spring Chinook
  - Production goal 1.2 million yearlings
- **Water Issues:** Moving to recirculation system






# Innovation

- Raised many species, but focused on Spring Chinook 1970- present
- Rearing methods: Foster Lucas -> Flow through -> Partial Recirculating Aquaculture (PRAS)

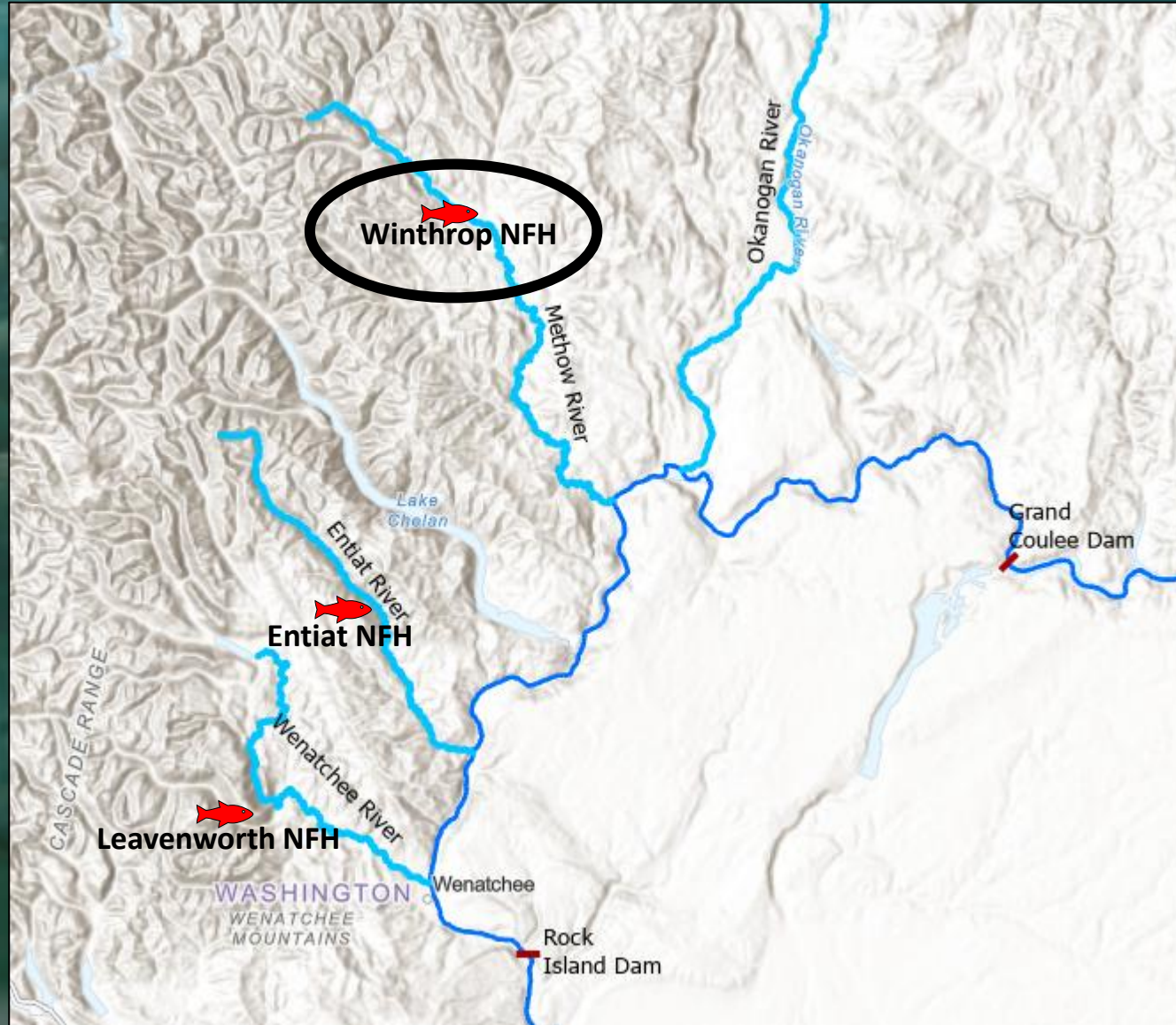


A close-up photograph of a person's hands holding a large rainbow trout in a stream. The fish is held horizontally, showing its full length. It has a dark, spotted back and a vibrant pinkish-red stripe along its side. The water is clear and blue, with some rocks visible at the bottom.

# Winthrop National Fish Hatchery

A black and white photograph of a large, single-story brick building, likely the Winthrop National Fish Hatchery. The building has a long, low profile with a flat roof and several windows. A flagpole stands in front of the building. In the background, there are mountains and a tall evergreen tree. A car is parked on the right side of the building.

Est. 1940





# Winthrop National Fish Hatchery

- **1942–1976** Raised many salmonids
- **1977–Present** Raised spring Chinook
  - Production goal is 400K yearlings + 200k eggs to Colville Confederated Tribes
- **1997–present** Raise steelhead as a conservation species
  - Production goal is 200K yearlings





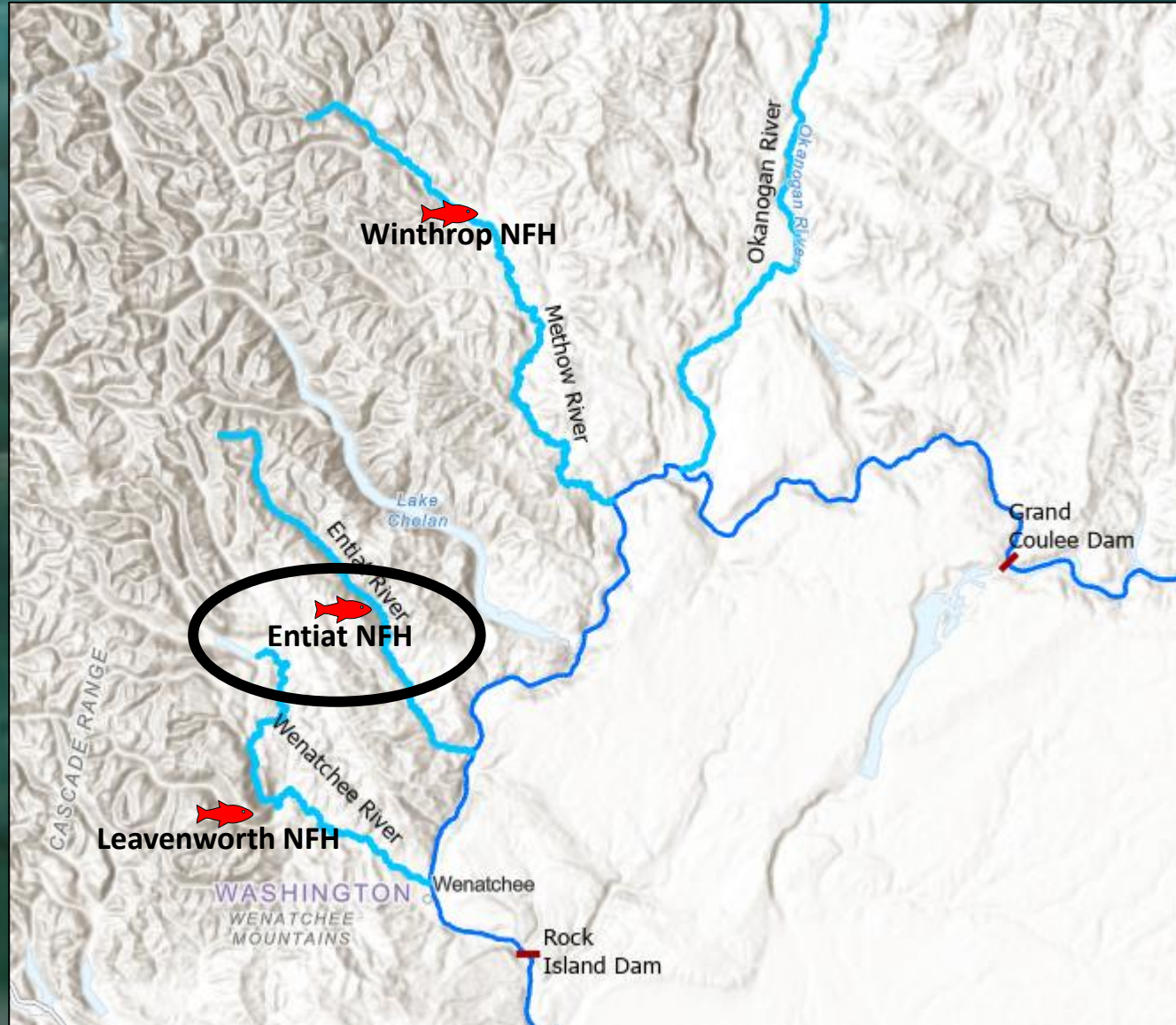
# Entiat National Fish Hatchery



Established 1940

Pioneered fish health research





# Entiat National Fish Hatchery

- **1940–1973** Raised many salmonids, mainly Chinook and Rainbow Trout
- **1974–2007** Entiat NFH raised spring Chinook
- **2009–present** Raise summer Chinook
  - Full production goal of 400K yearlings



# Summary

- Blocked 1,850 km of habitat upstream of Grand Coulee Dam
- Estimated production loss of 134,000 adult salmonids in 1939
- Created 3 fish hatcheries to mitigate for loss, not offset, no goal set
- Currently produce 2.2 million yearlings, results in 15,000 adult returns



# Lessons Learned

- Hatchery production never compensated for habitat loss
- No production goals were set
- No evaluation procedures were given
- Society made a trade



# Thank you.

Collaborators:

- Bill Gale
- Matt Cooper
- Jason Romine



