



Bonneville Dam Fish Passage Facilities

*A presentation to the MRC Delegation
by*

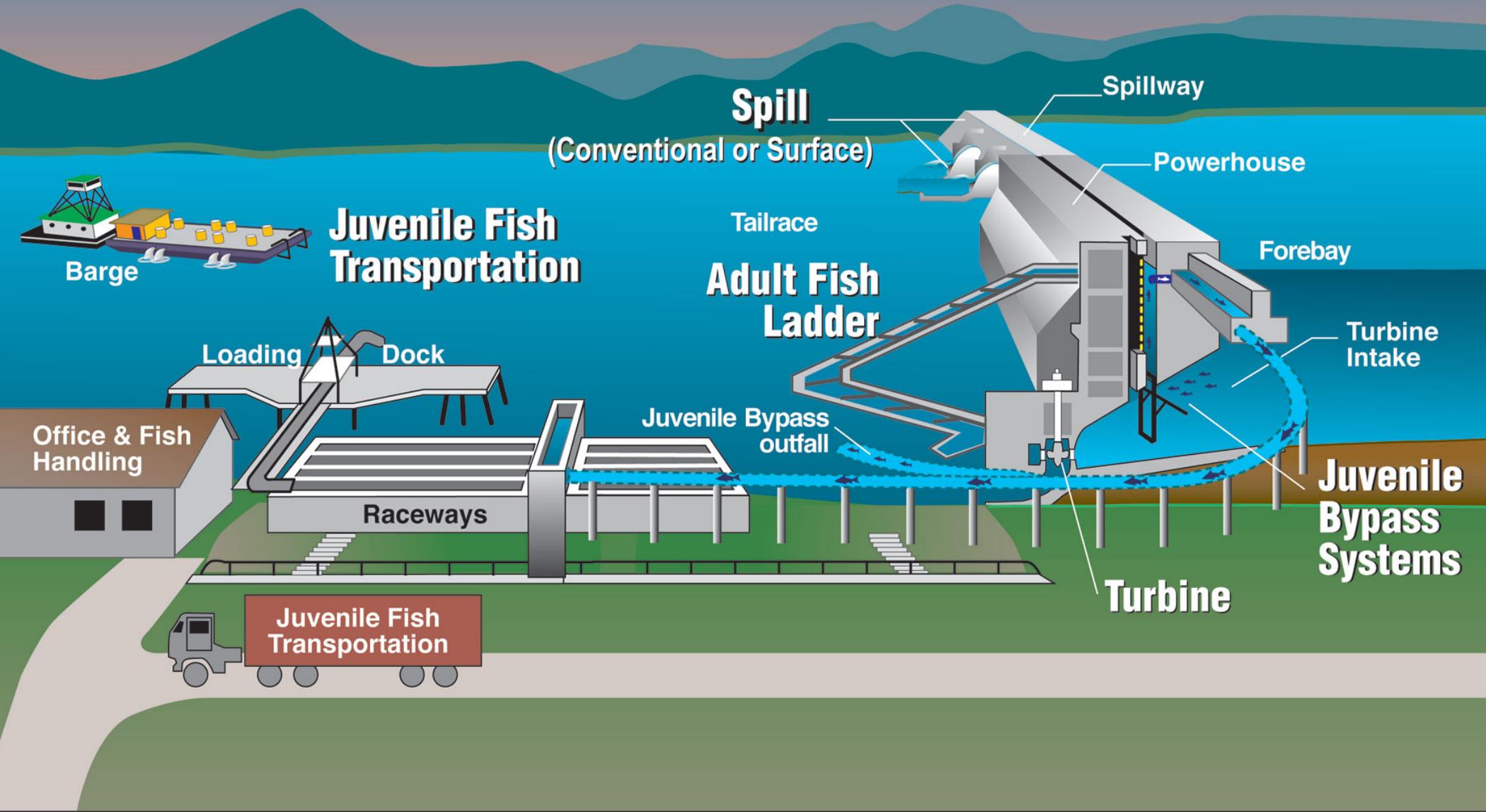
*John Kranda, Program Manager
Corps of Engineers Portland District
Northwestern Division
April 29, 2008*

Columbia River Basin

- Corps of Engineers Dams
- Dams owned by Others



Fish Passage Routes



Pacific Ocean

Seattle

Columbia R.

Lower Monumental
Little Goose
Lower Granite

Lewiston

Ice Harbor

Tri Cities

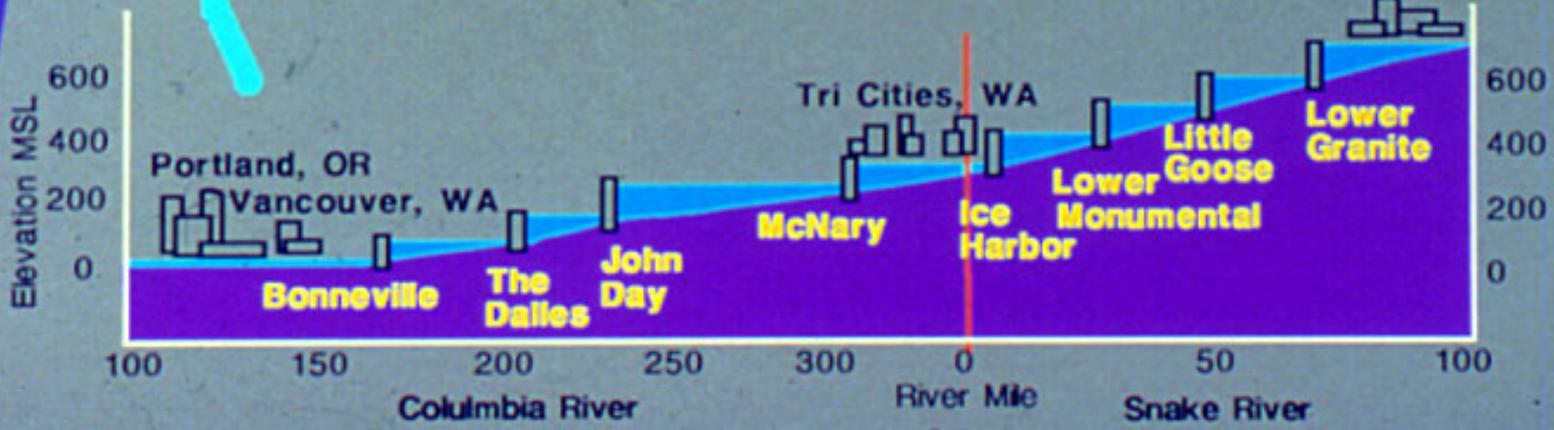
McNary

Bonneville

John Day

The Dalles

Portland





Juvenile Passage Improvements

- ❖ Objective: Improve passage efficiency and survival at the dams, through
 - Modifications to existing bypass systems
 - Spillway improvements
 - Surface collection/ bypass technology
 - Turbine improvements
 - Passage operations
 - ◆ Attraction flows, tailrace egress
 - ◆ PH/ spillway flow balancing

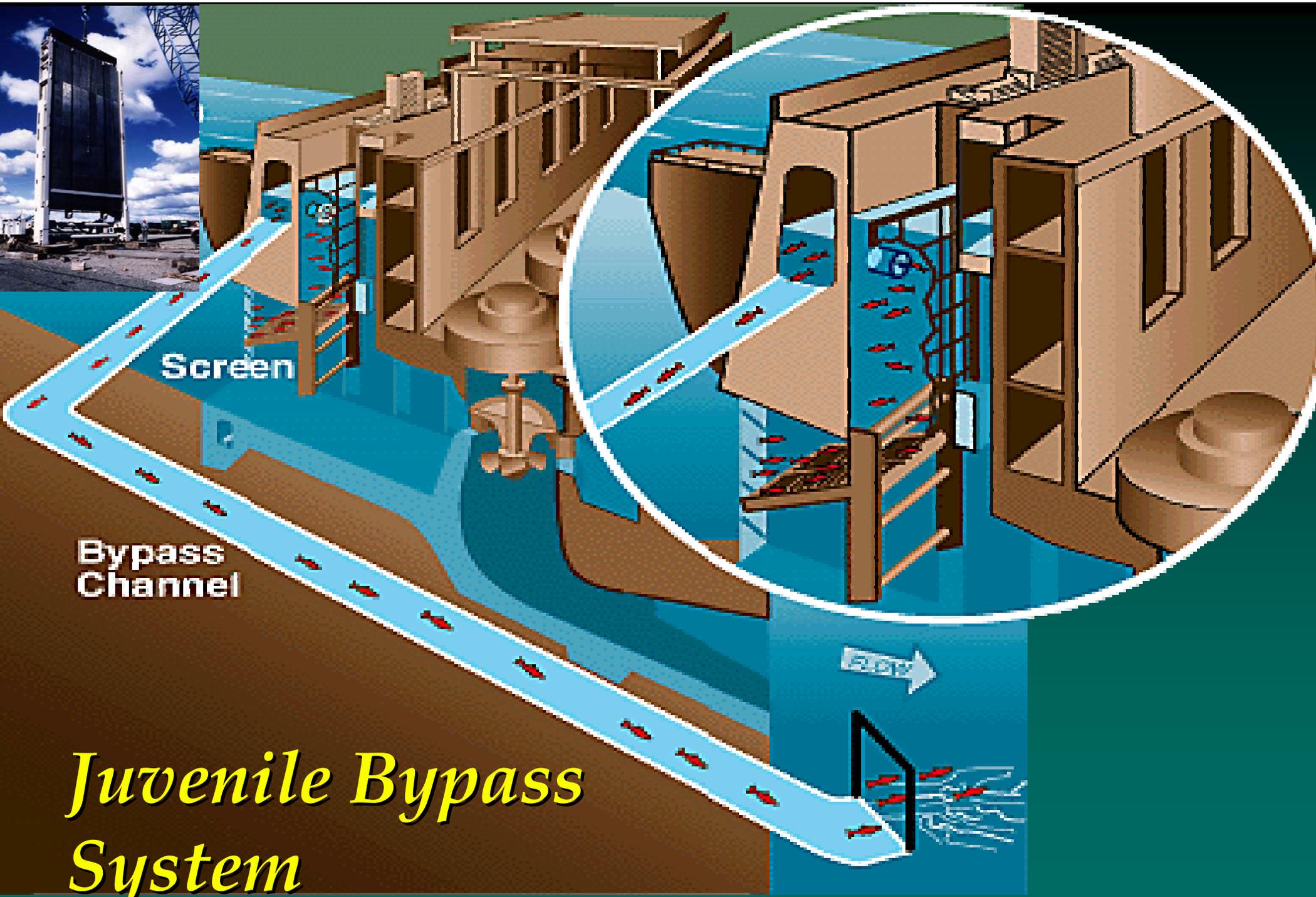




Existing guidance/passage systems

- ❖ **Screened bypasses at all projects except The Dalles**
 - Originally all with 20' long guidance screens
 - Now extended length screens (40') at some projects
 - Downstream migrant (DSM) channel and outfall in tailrace or further downstream





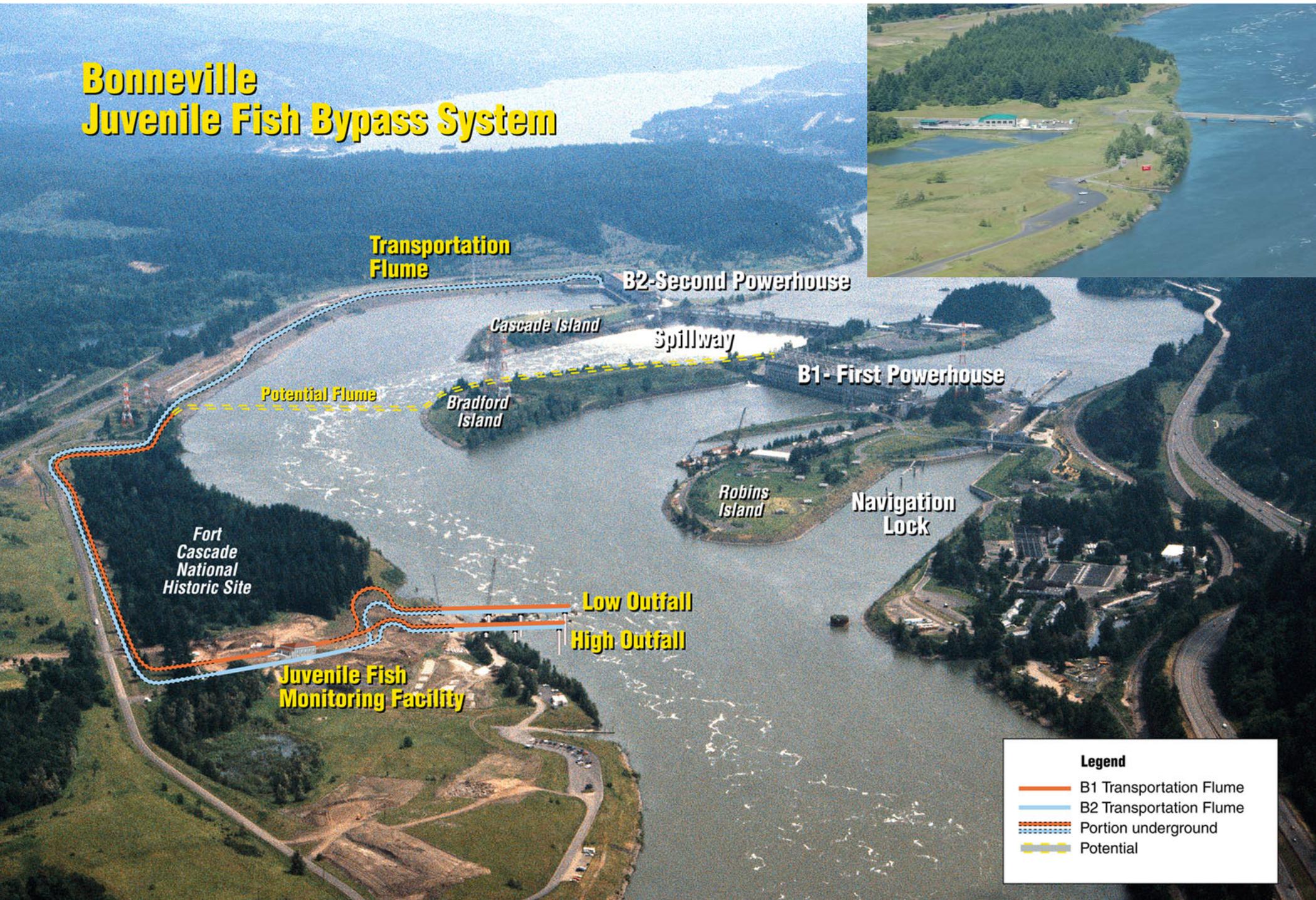
Screen

Bypass Channel

Return

Juvenile Bypass System

Bonneville Juvenile Fish Bypass System





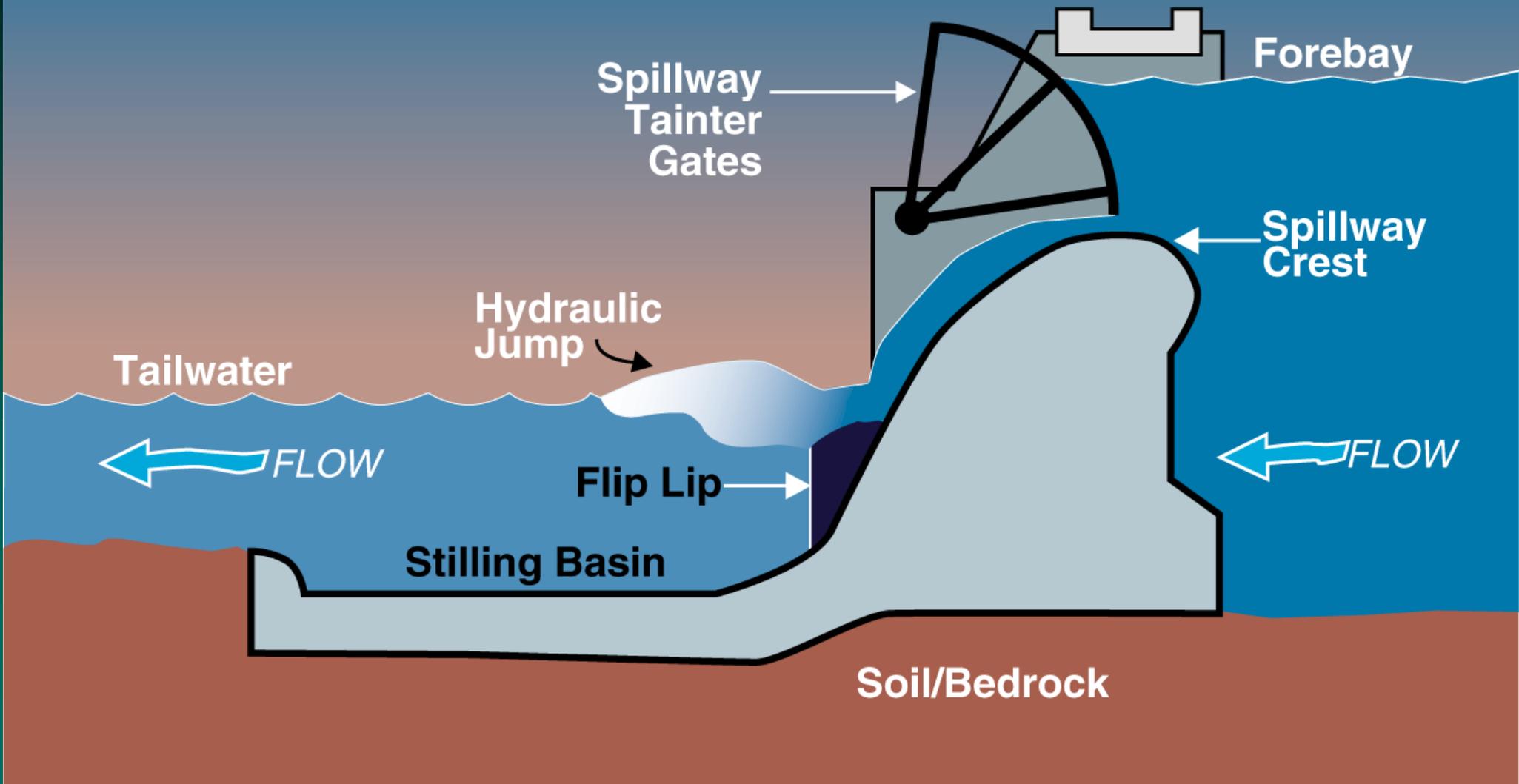
Spill/Gas Abatement

❖ Background/issues

- Spill believed to be effective juvenile passage route
- higher spill = higher gas saturation levels
- water quality standard = 110% maximum saturation
- cannot meet standard
- Fish agencies have pushed waiver to 120% saturation



Cross Section of Spillway Tainter Gates & Flip Lip

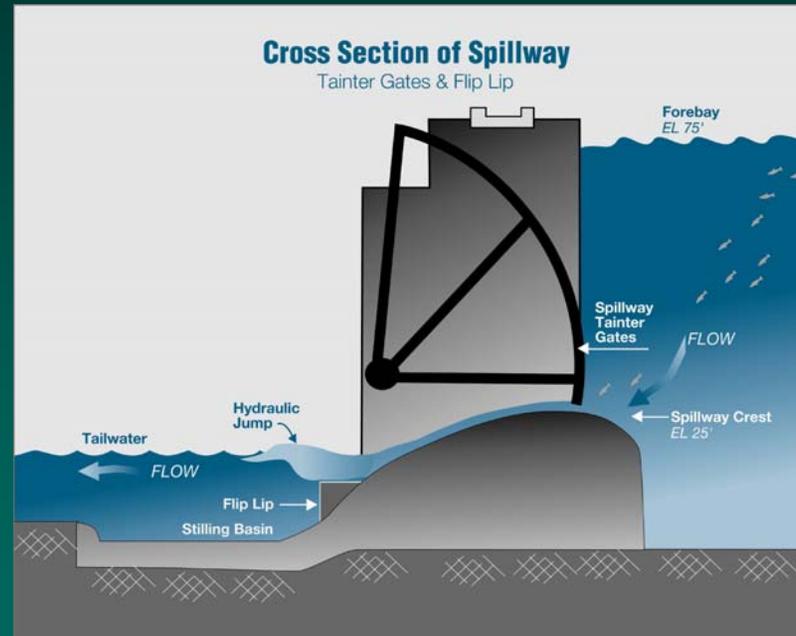
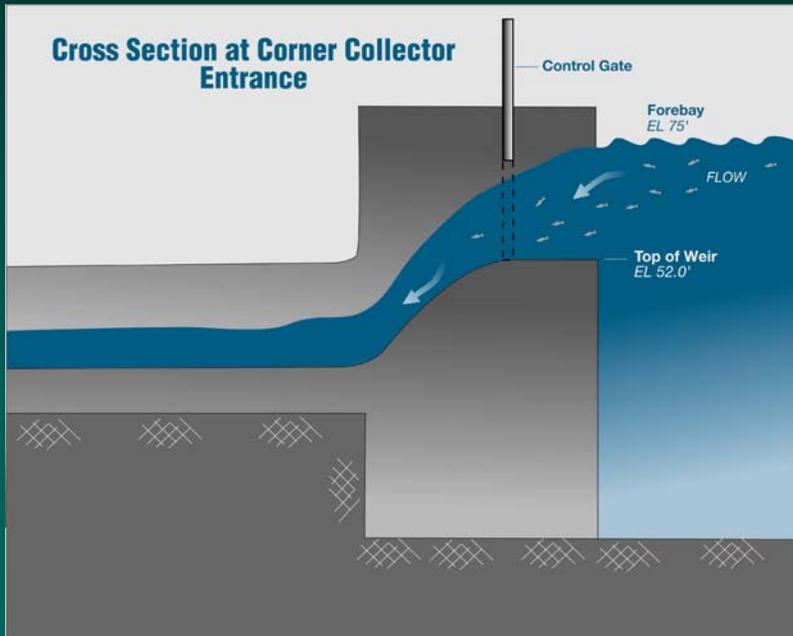




Surface collection/ bypass

- ❖ **Alternative to bypass systems or conventional spill**
- ❖ **Benefits**
 - Pass more fish with less water
 - Reduce delay/predation
 - Reduce passage stress, injury, mortality

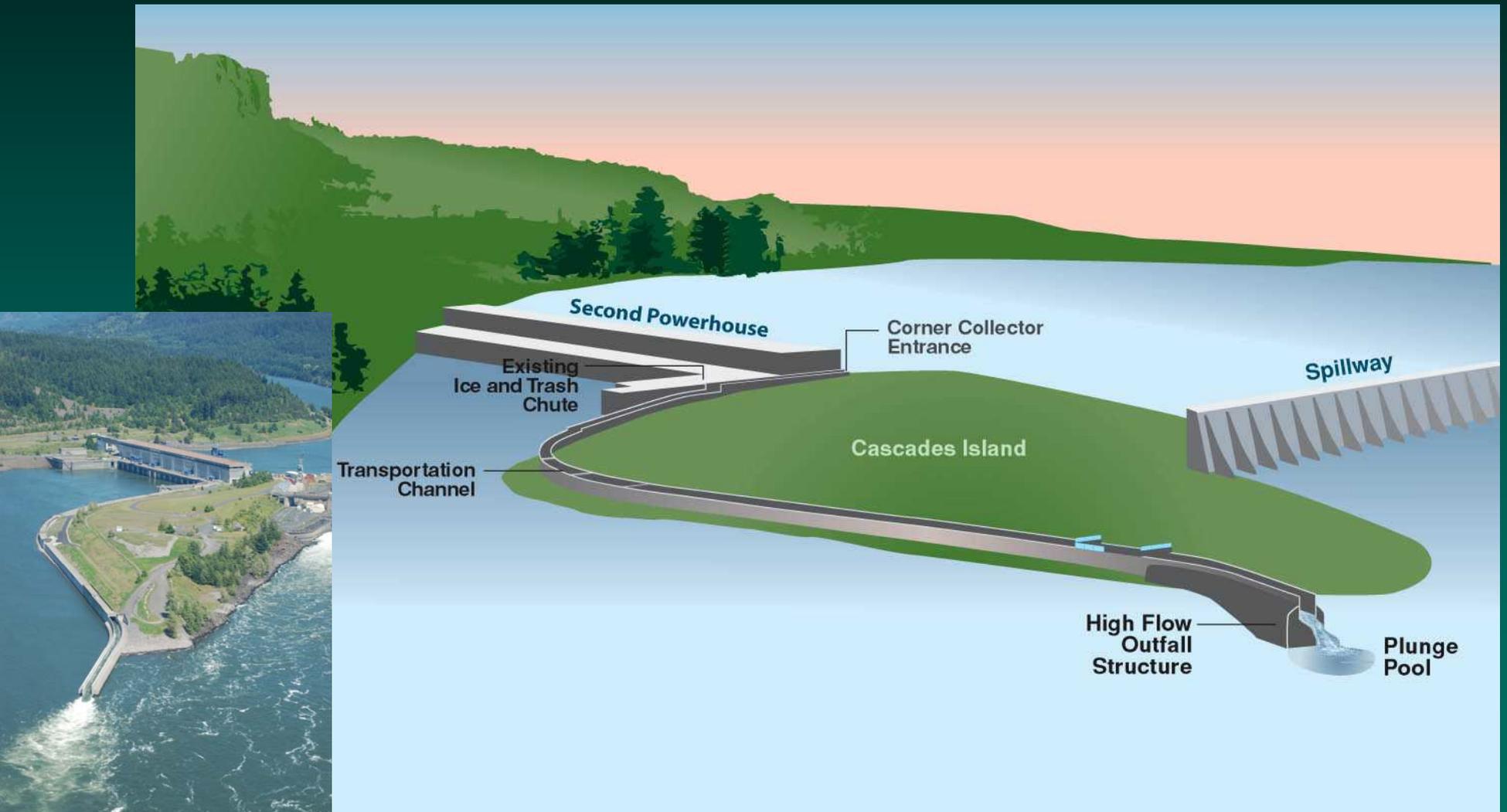
Surface Bypass vs. Spillway Passage



*Bonneville B2 Surface Bypass
(Corner Collector Entrance)*



Bonneville B2 Surface Bypass (Transportation Channel)



Bonneville B2 Surface Bypass (Corner Collector Outfall)





Conventional Spill

Temporary Spillway Weirs

McNary Dam

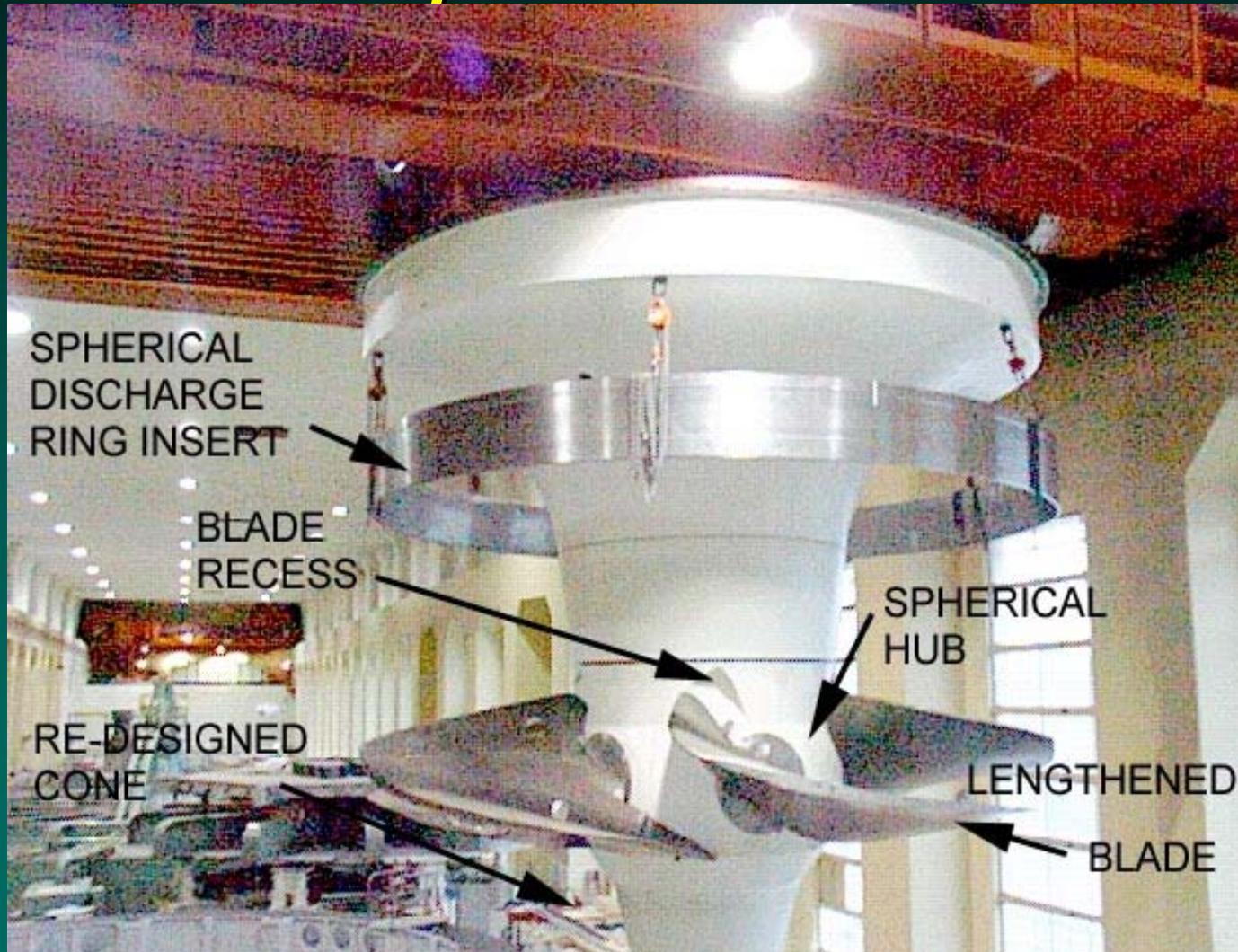


Turbine Survival Program

❖ Objectives

- Research causes of turbine mortality/injury
- Optimize operation of existing turbines
- Investigate “fish friendlier” turbine runner designs
- Potential to incorporate into future PH rehab projects

Turbine Improvements - Minimum Gap Runner





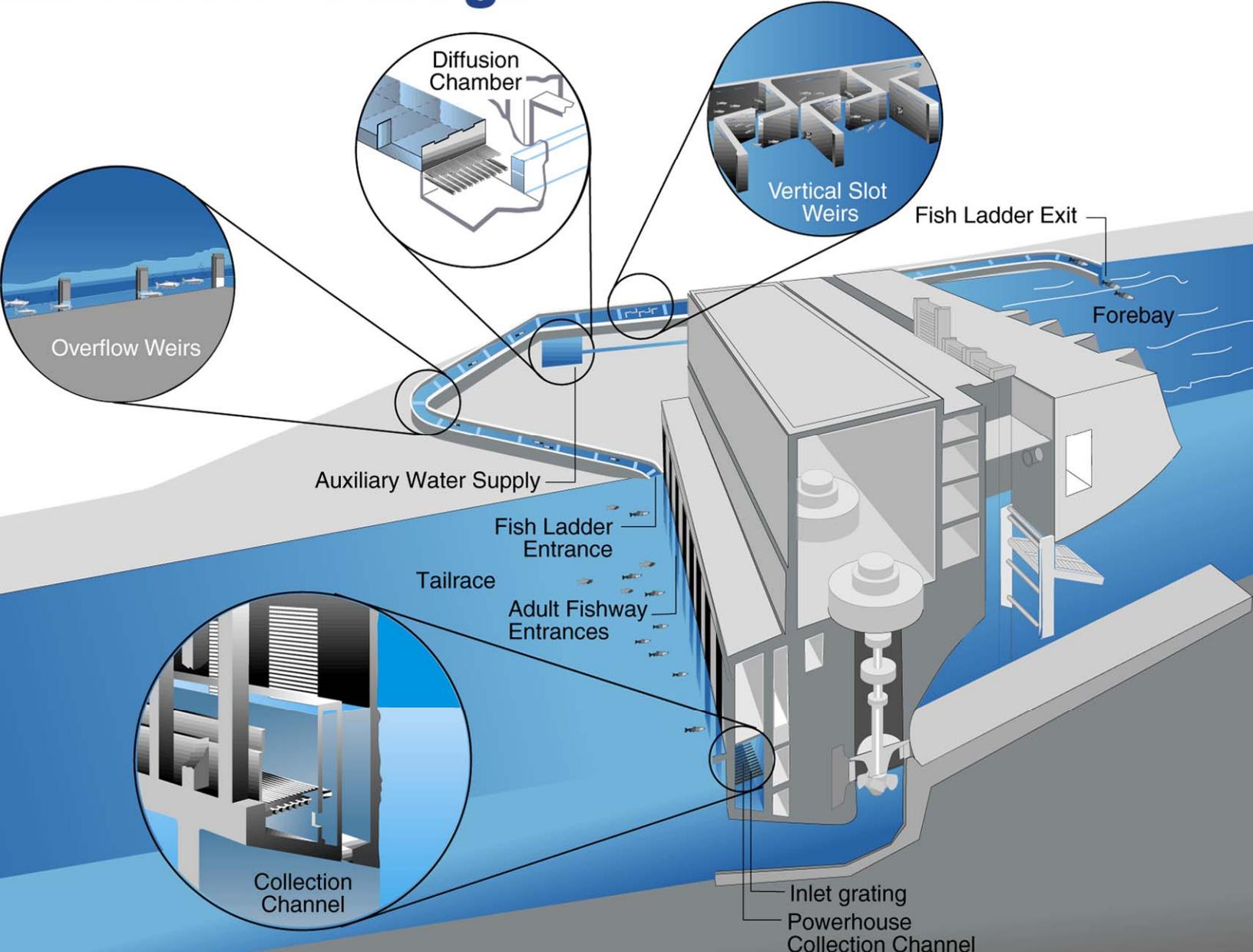
Adult Passage Improvements

- ❖ Generally, good adult passage performance at the projects
- ❖ Modifications to meet passage criteria
 - Assure reliable flows through fishways and fishladders
 - Reduce/avoid migration delays & risks
 - Evaluate fallback issues





Adult Fish Passage







Bonneville Dam Adult Passage - Pinneped Controls

- ❖ Numbers of sea lions approaching and feeding at Bonneville Dam continues to grow
- ❖ Consuming approximately 4% of the run (2007)
- ❖ Concern for disruption to efficient adult passage and additional predation if allowed in or near fish ladder entrances
 - Installed racks in ladder entrances
 - Employing acoustic deterrents near entrances
- ❖ Harassment and removal efforts by other agencies





Questions

