



Fish and Wildlife

For decades, the Agencies have implemented fish and wildlife conservation, protection, and mitigation activities throughout the Columbia River Basin utilizing various authorities:



Project Authorities include fish and wildlife conservation as a project purpose.

The **Northwest Power Act** requires hydropower operators to provide for fish and wildlife protection, mitigation, and enhancement activities in a manner that provides equitable treatment with the other purposes.

Fish and wildlife activities in response to **the Endangered Species Act**, and **the Clean Water Act**; and for cultural resources protection under the **National Historic Preservation Act**.

Federal government **treaty and trust** responsibilities to Columbia Basin tribes also support fish and wildlife mitigation and enhancement.



System Operations Affect Many Fish and Wildlife Species in the Basin

- ▶ Anadromous (ocean going) fish like salmon, steelhead, and lamprey
- ▶ Resident (non ocean-going) fish like bull trout, burbot, and Kootenai River white sturgeon
- ▶ Wildlife species affected by inundation from reservoirs, such as mule deer, waterfowl, song-birds, and elk



Deer and Waterfowl Bull Trout White Sturgeon Burbot



Pacific Lamprey Streaked Horned Lark Salmon Elk

Operations and other actions to benefit fish and wildlife are science-based, relying on biological monitoring to adaptively manage and prioritize actions.



Dam and Reservoir Actions

- ▶ Operational Actions
 - Flow augmentation
 - Spill, transport, ramping rates
- ▶ Configuration Actions
 - Adult and juvenile passage
 - Water quality features

Predation

- ▶ Birds, sea lions, fish

Habitat

- ▶ Tributary
- ▶ Estuary

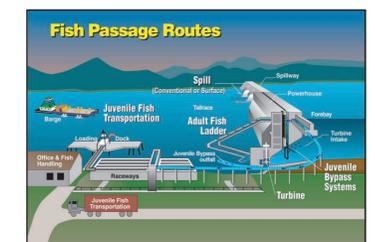
Hatchery Management and Reform

- ▶ Ongoing hatchery management plans
- ▶ Additional hatcheries and modification of structures

Dam Operations and Configuration Improvements for Anadromous Fish Species

Juvenile Salmon Passage

- ▶ Surface passage systems
- ▶ Turbine intake screened bypass system improvements
- ▶ Turbine improvements
- ▶ Juvenile fish passage spill
- ▶ Juvenile fish collected in screened bypass systems are transported via barge or truck from the uppermost three dams on the Snake River to below Bonneville Dam



Adult Fish Passage

- ▶ Fish ladders at all eight lower Snake and lower Columbia River dams provide upstream passage
- ▶ Ladder temperature improvements at Lower Granite and Little Goose dams
- ▶ Lamprey passage improvements

Flow Augmentation and Temperature Control

- ▶ Water stored in reservoirs at Grand Coulee, Libby, Hungry Horse, and Dworshak is released in summer to augment naturally low summer flows
- ▶ Cool water stored in Dworshak Reservoir is released during the summer to moderate temperature in the lower Snake River.

