

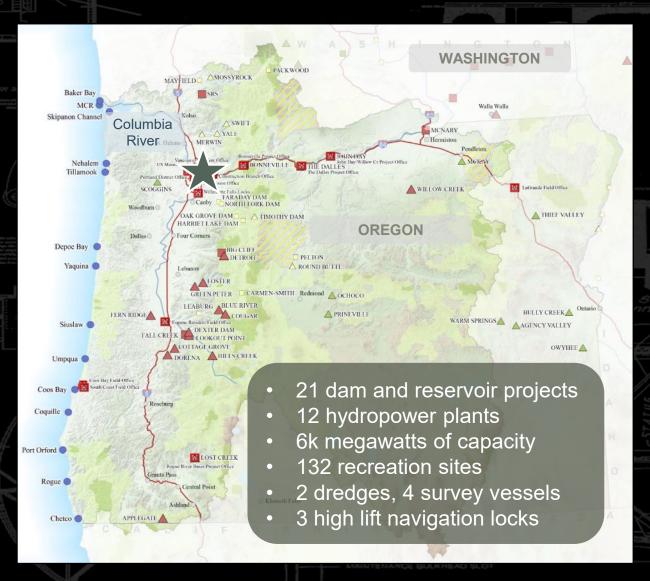
PORTLAND DISTRICT U.S. ARMY CORPS OF ENGINEERS WILLAMETTE FISHERIES SCIENCE REVIEW



WHAT IS THE US ARMY CORPS OF ENGINEERS?

The Corps provides Seattle District engineering solutions for our Nation's toughest New England Europe challenges. Portland District St. Paul District Walla Walla District • 34,000 civilians and Omaha District District **350** military personnel Chicago In more than 130 countries District Rock Island District Philadelphia Sacramento District District Baltimore District 9 divisions District Huntington 43 districts around District Kansas City District Norfolk St. Louis District the world District Wilmington District Nashville District Los Angeles District Little Rock Tulsa District Memphis District Albuquerque District Charleston Northwestern Division Dept. of Defense South Pacific Division Savannah Vicksburg District Mobile District Southwestern Division District Marine Air Force Army Navy Mississippi Valley Division Corps Ft. Worth District Great Lakes & Ohio River Division New Orleans Corps of District South Atlantic Division Galveston District **Engineers** North Atlantic Division Jacksonville Gulf Region Afghanistan Alaska Honolulu Pacific Ocean Division District District Engineer District Northwestern Gulf Region Division/ Division Afghanistan Engineer District Portland District Korea Japan Afghanistan Puerto Rico & The U.S. Virgin Islands

WHAT MAKES UP THE PORTLAND DISTRICT?



We are 1,500 civilians and 6 military officers.

We are...

- mechanical engineers.
- civil engineers.
- structural engineers.
- electrical engineers.
- geologists.
- hydrologists.
- biologists.
- archeologists.
- ecologists.
- And many, many others.



US Army Corps of Engineers ⊚ Portland District



OUR MISSION & BUSINESS LINES

Providing Engineering Expertise



Technical Centers of Expertise

- Hydroelectric Design Center
- Welding & Metallurgy HDC
- Roller Compacted Concrete

Nationally-Recognized Knowledge and Experience

- Coastal engineering and computational fluid dynamics (CFD) modeling
- State-of-the-art hydrographic survey work
- Climate change studies
- Ecosystem restoration of aquatic habitat
- Fish passage planning and design at both run of river and high head dams

Navigation





Water & Flood Risk Management



Environmental Stewardship



Recreation



Regulatory

Hydropower



Emergency Management



International & Interagency Support



Tribal Coordination



PURPOSE OF WFR: RESEARCH TO INFORM ACTIONS ADDRESS EFFECTS OF WILLAMETTE OPERATIONS ON ENDANGERED FISH

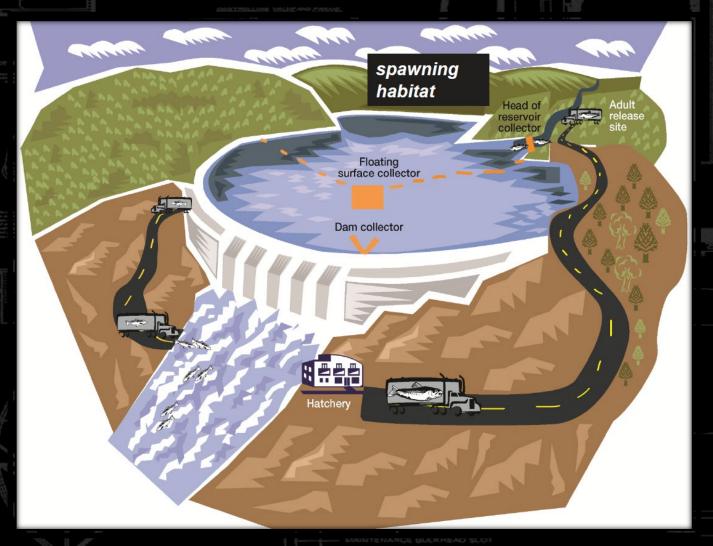
- Since 2008, ~\$100M invested (average \$9M annually)
- Willamette Fisheries Science Review, annually since 2010
 - 2019 meeting highlights:
 - Emerging research: copepod effects on juvenile Chinook salmon
 - Updates: Cougar & Detroit downstream passage designs
 - New Foster spill weir year-1 results
 - Middle Fork fish passage research plans; reservoir survival estimates
 - Tools for refining flow and temperature management







PURPOSE OF WFR: ADDRESS EFFECTS OF WILLAMETTE OPERATIONS ON ENDANGERED FISH



A Lifecycle Approach to reestablish fish above dams, and improve conditions downstream

- · Upstream fish passage
- Downstream fish passage
- Flow and water temperature management
- Hatchery management
- Habitat improvements





RECENT ACCOMPLISHMENTS

Passage for endangered fish











New Spill Weir, Foster Dam (2018)



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WILLAMETTE FISHERIES
SCIENCE REVIEW