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# Fish Passage Technologies at High-head Dams: A Review

Laura Robinson  
*Northwest Power and Conservation Council*

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# Fish Passage Technologies at High-head Dams: A Review

**International Fish Passage Conference  
June 2017**

**Laura Robinson  
Northwest Power and Conservation Council**

# Columbia River Basin




# Council responsibilities

- § **Protect and enhance fish and wildlife affected by hydroelectric dams in the Columbia River Basin**
- § **Assure an adequate, efficient, economical, and reliable power supply**
- § **Inform and involve the public**

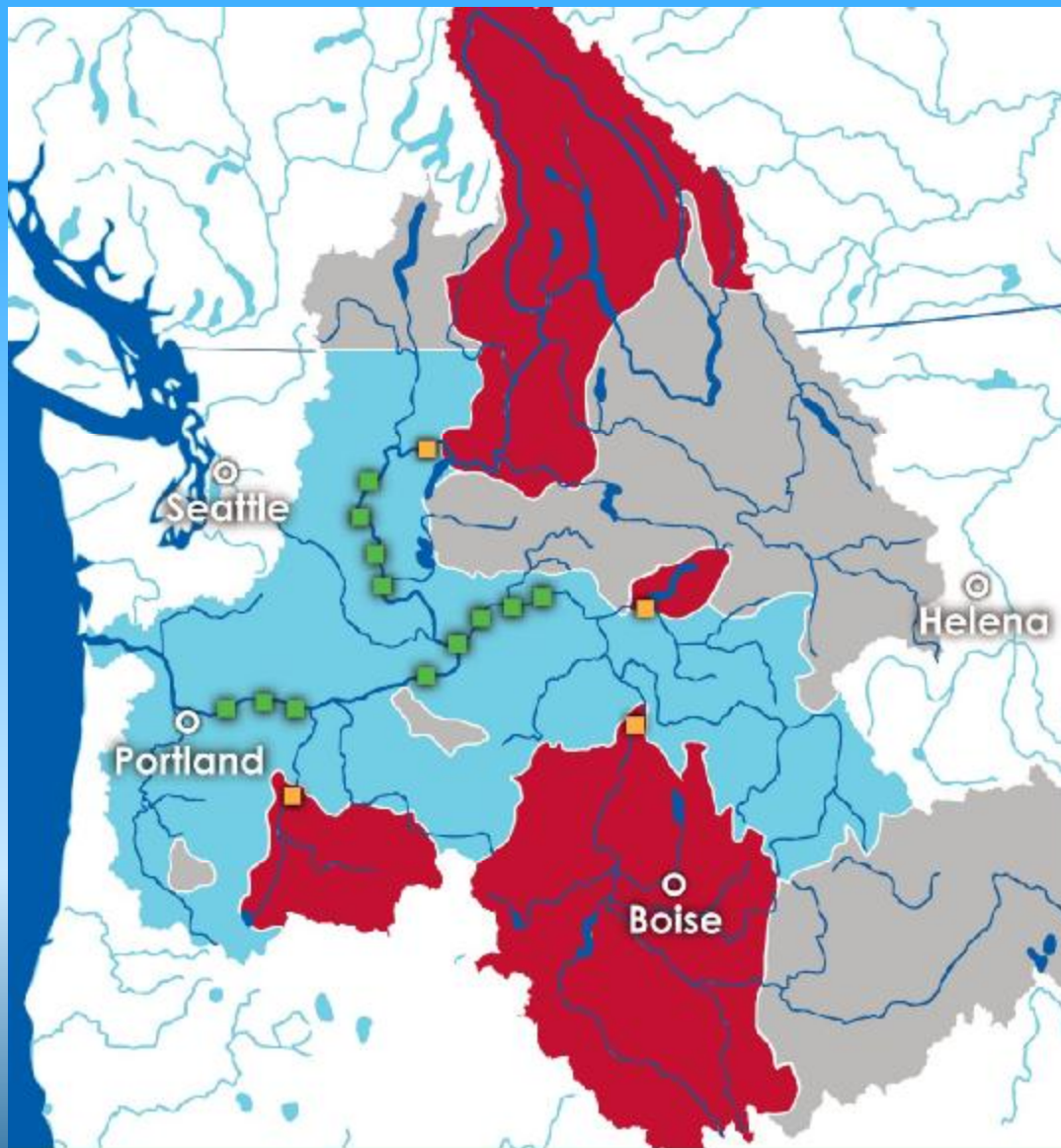
# Columbia River Basin Fish and Wildlife Program

- § **First adopted in 1982**
- § **Largest regional fish and wildlife mitigation program in the United States**
- § **\$300 million in FY 2016**
- § **Review and revise at least every five years in a public process**
- § **Becomes part of the NW Power Plan**

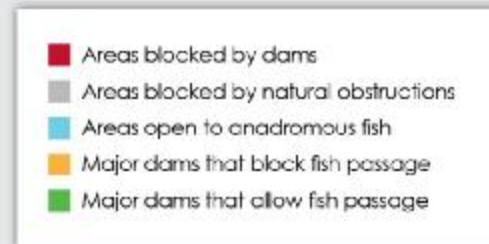


# Columbia River Basin Fish and Wildlife Program 2014

**A Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, supported by mitigation across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem.**

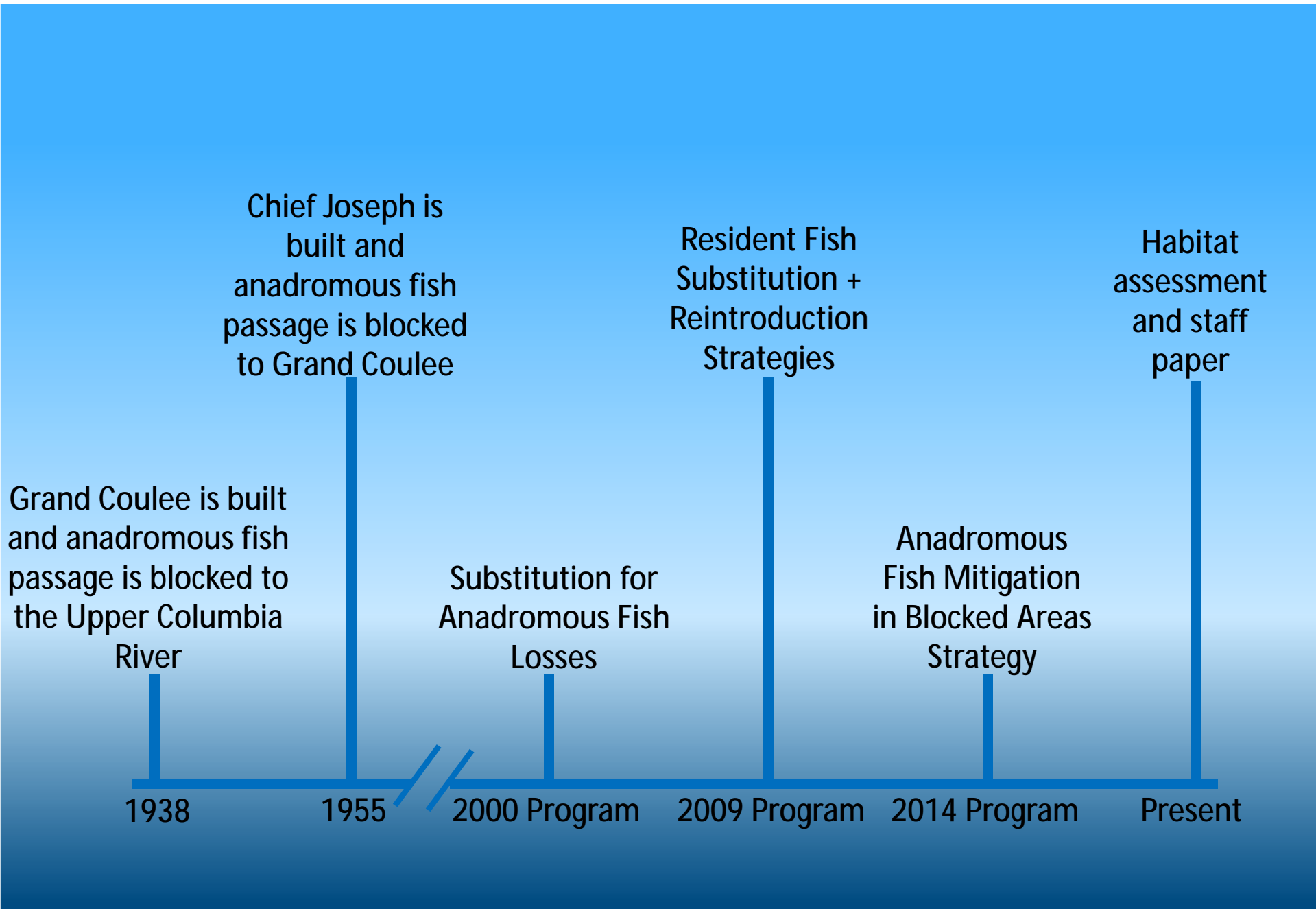


Of the original salmon and steelhead habitat available in the Columbia River Basin, **55 percent** of the area and **31 percent** of the stream miles have been blocked by dam construction.



Map of the **Columbia River Basin**







# Anadromous Fish Mitigation in Blocked Areas Strategy

*Investigate reintroduction of anadromous fish above Chief Joseph and Grand Coulee dams to mainstem reaches and tributaries in the United States.*

# Phased science-based approach

*\*The Council, in collaboration with other relevant entities, will decide whether to move forward between each phase\**

## § Phase I:

§ Evaluate passage studies

§ Assess habitat above Chief Joseph and Grand Coulee

§ Continue regional dialogue

## § Phase II:

§ Design

§ Test

§ Conduct further studies

## § Phase III:

§ Implement reintroduction

§ Becomes a permanent part of the program

# Review of fish passage studies at high-head dams



Cle Elum Dam, Yakima River, Washington



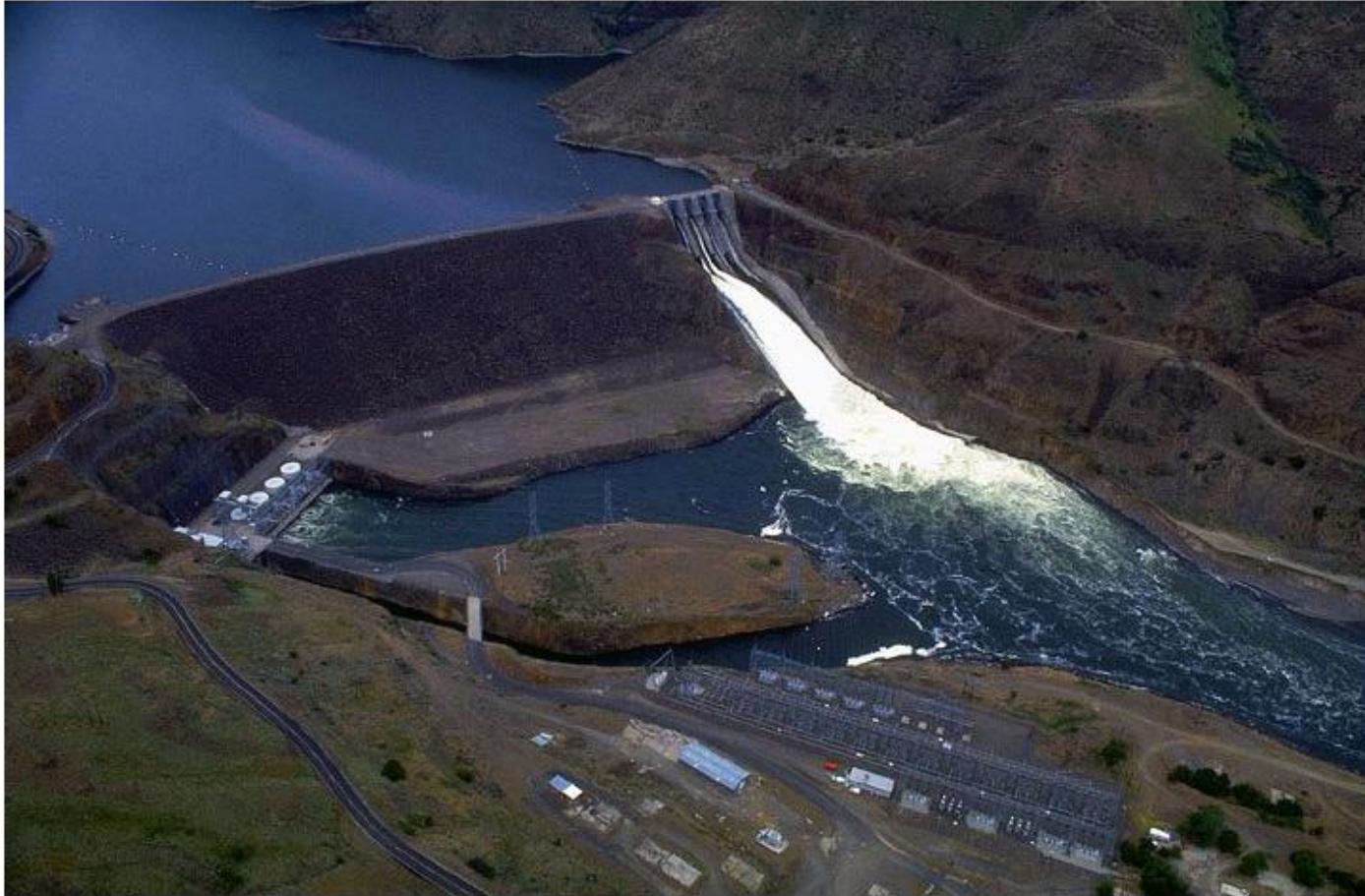
Grand Coulee Dam, Columbia River, Washington



Grand Coulee Dam, Columbia River, Washington



Upper Baker Dam, Baker River, Washington



Brownlee Dam, Snake River, Idaho

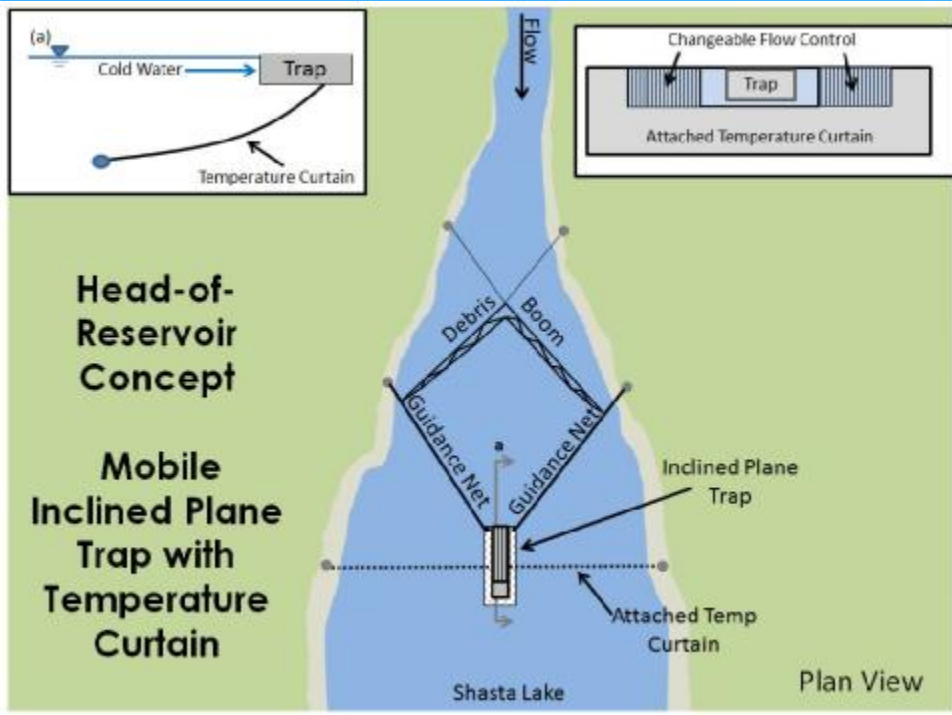


Swift Reservoir and Dam, Lewis River, Washington



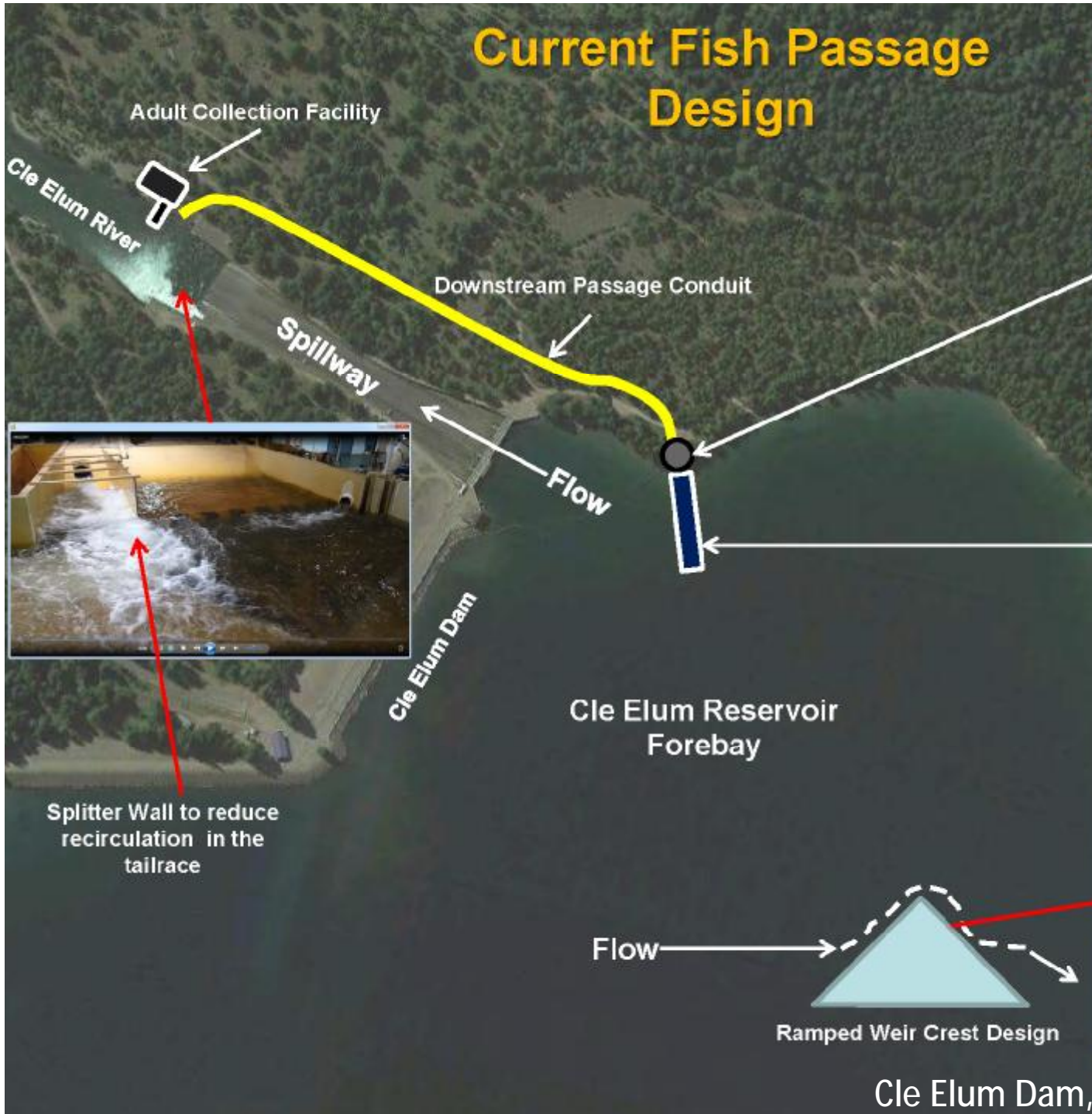


Pelton-Round Butte Fish Collector, Deschutes River, Oregon

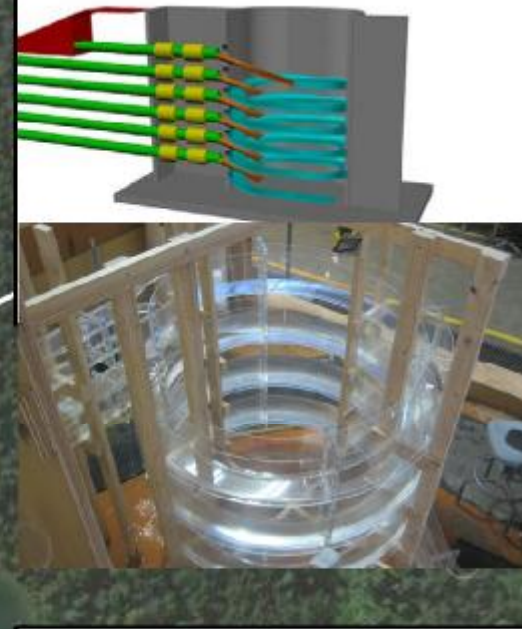


McCloud River, Shasta Reservoir, California

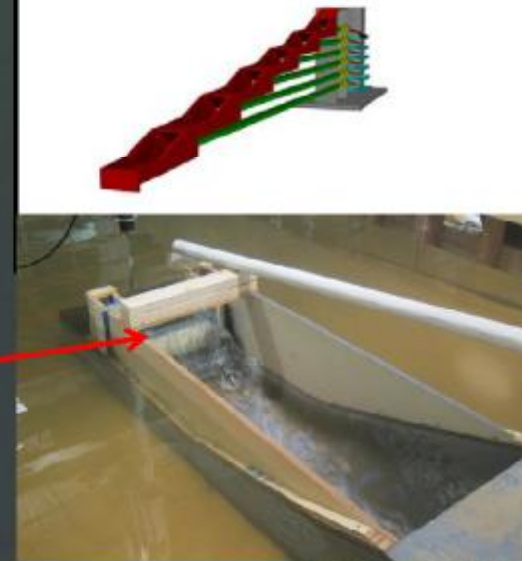
# Current Fish Passage Design



Helix Conduit Structure



Inlet Structure



Cle Elum Dam, Yakima River, Washington

# Other sites reviewed

- § North Fork Dam, Clackamas River, OR
- § Willamette Projects (Detroit, Cougar and Fall Creek), Willamette River, OR
- § Conowingo Dam, Susquehanna River, PA
- § Chehalis River, WA
- § Cowlitz Falls and Mossyrock dams, Cowlitz River, WA
- § Cushman Hydroelectric Project, Skokomish River, WA
- § Englebright and New Bullards Bar dams, Yuba River, CA

# Emerging technologies



# Six key concepts in planning for high-head fish passage

- § **Allow adequate time for evaluations**
- § **Learn but do not compare**
- § **Understand the differences**
- § **Stay up to date**
- § **Collaborate with all relevant parties**
- § **Consider developing a decision framework**

# Thanks!

**Laura Robinson**

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**Staff paper:**

**[www.nwcouncil.org/fw/anad/2016-14/](http://www.nwcouncil.org/fw/anad/2016-14/)**

**Northwest Power and Conservation Council  
website: [www.nwcouncil.org](http://www.nwcouncil.org)**







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River Basin  
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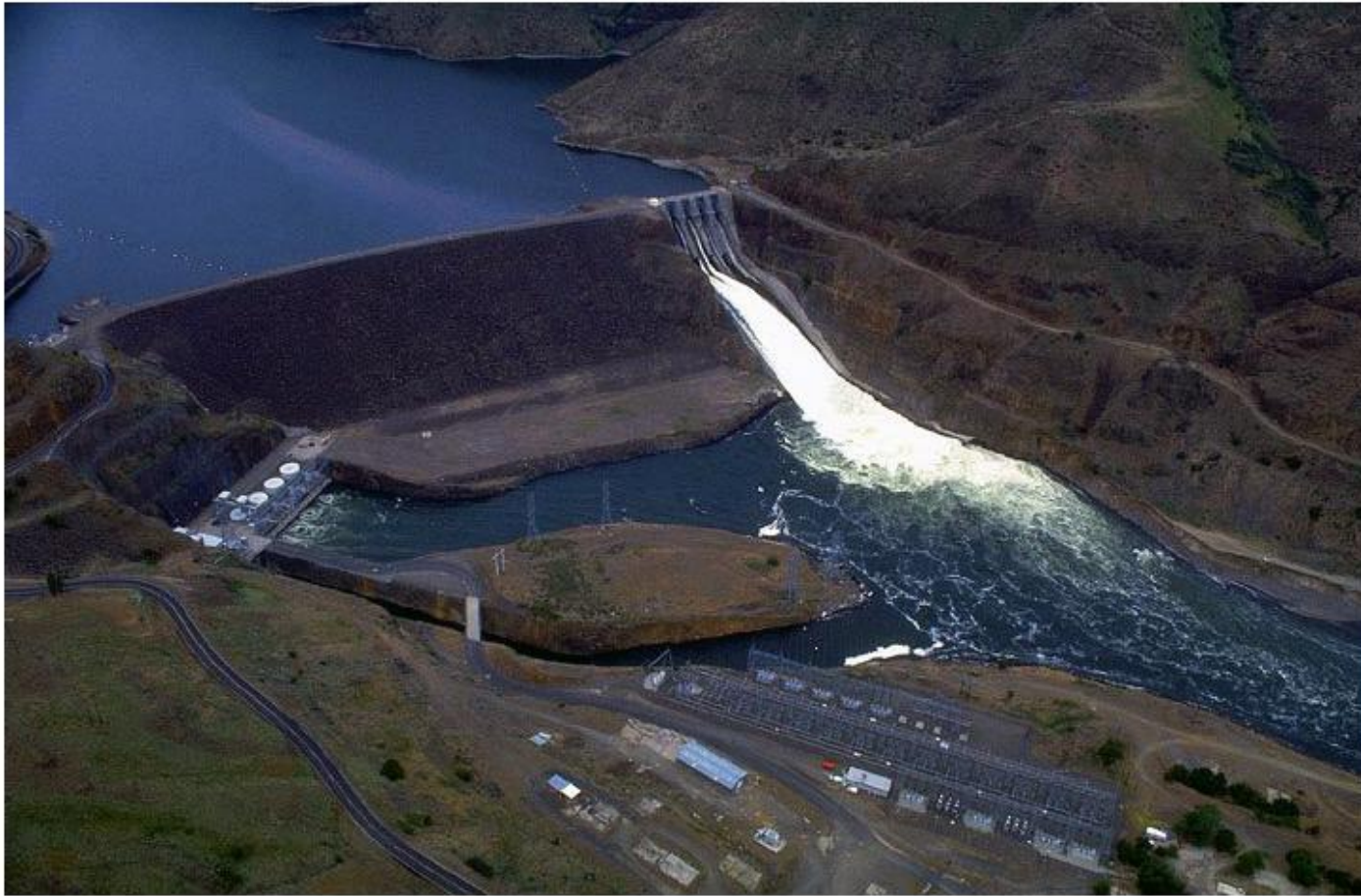
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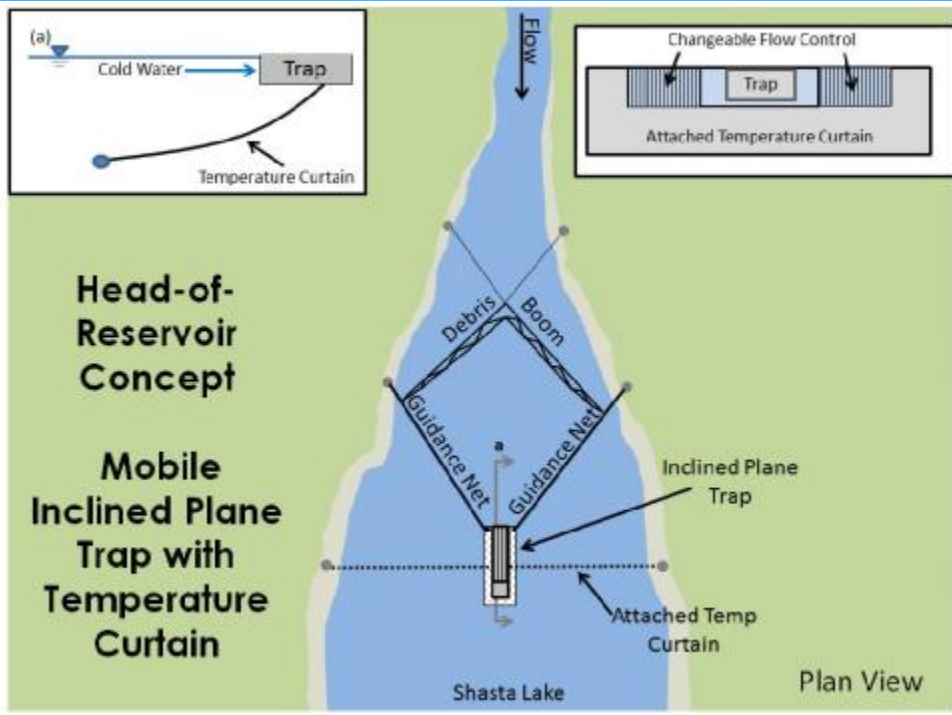
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Brownlee Dam, Snake River, Idaho



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McCloud River, Shasta Reservoir, California

# Emerging technologies







Pelton-Round Butte Surface Collector, Lake Billy Chinook, Oregon