Washington State Department of Transportation (WSDOT) Fish Passage Program

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California Fish Passage Forum Webinar May 19, 2016



The Challenge:

• WSDOT is responsible for –

o7,056-mile long highway system

- WSDOT recognizes
 - Poorly designed/installed culverts can delay or block fish access to quality spawning and rearing habitat.
 - O Culverts and fishways can fail over time and become fish barriers.





What makes a fish passage barrier?





Fish Passage Barrier Culvert Conditions:

Excessive Water Surface Drop Kitsap Sun pho High Velocity **Shallow Water Depth** DFW photo WDFW phot WDFW photo shington State partment of Transportation

Other Fish Passage Barrier Conditions:



Trash Racks and Flap Gates





Culvert Plugged with Sediment or Debris





Vashington State Department of Transportation



Deteriorating Culverts



WSDOT Fish Passage Program

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Comprehensive Fish Passage Inventory	 Washington Department of Fish & Wildlife (WDFW) inventories fish passage barriers on WSDOT Highways. WDFW conducts Habitat Assessments to help prioritize barrier correction efforts.
1991-present	
Fish Passage Inventory Database	 WDFW maintains central data repository for culvert, GIS, fish use, and habitat information resulting from inventories. Locate, prioritize, select, implement, and monitor fish passage projects.
Dedicated Fish Passage Barrier Removal Program	 Stand-alone Projects (Dedicated Funding) Chronic Environmental Deficiency (CED) and Major Drainage Safety and Mobility Projects (larger transportation projects) Other partnerships and Grant Funding

WSDOT Fish Passage Program

- Partnership with WDFW starting early 1990's
- Fish barrier inventory & prioritization
- Statewide: 7,143 water crossings inspected
 - 3,623 were identified as fish bearing waters
 - 2,000 fish barriers identified





Fish Passage Barrier and Surface Water Diversion Screening Assessment and Prioritization Manual

2009



WASHINGTON DEPARTMENT OF FISH & WILDLIFE

HABITAT PROGRAM

Technical Applications (TAPPS) Division

• Updated in 2009

- Fish Passage Features
 - \circ Road Crossings
 - o Dams
 - o Fishways
 - o Natural Barriers
- Surface Water Diversions
- Habitat Assessment
- Prioritization





http://wdfw.wa.gov/publications/pub.php?id=00061

Prioritizing Culverts for Correction

Factors include:

- Habitat Gain quality and quantity
- Severity of the barrier
- **Species presence** number that benefit from the habitat
- Endangered Species Act species presence and number
- Cost of the project barrier correction costs cover a wide range: from solutions that modify existing culverts to those that replace a culvert with a bridge
- Coordination with others





Fish Passage Barrier Correction

- Prior to 1991, fish passage barriers were addressed during highway construction and maintenance projects as required by permit.
- Since then, WSDOT developed a program to
 - identify high priority barriers,
 - correct barriers with dedicated fish passage funds, and
 - correct barriers during transportation projects.
- Since 1991, WSDOT has
 - completed 291 projects opening up
 - 1,028 miles of potential upstream habitat.







Environment Maps & Data Search

Email updates M

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Projects

Project Info

Fish Passage

Business

Home

 Coordinating with Others

Traffic & Cameras

- Costs for Fish Barrier Removal
- Determining Culvert **Repair Priorities**
- Environmental Stewardship
- Federal Court Injunction
- Fish Barrier Correction Construction Process
- Frequently Asked Questions
- Fish Passage Responsibilities
- · Culverts as Barrier to Fish
- Number of Fish Barriers
- Fish Passage Contacts
- Working with Partners

Publications

- Barrier Correction Folio (pdf 1 mb)
- 2014 Annual Fish Passage Report (pdf 9.7 mb)

State highways cross hundreds of streams and rivers in Washington. At many of those locations, culverts are too small or otherwise inadequate to allow fish to migrate upstream and downstream as necessary for growth and reproduction. WSDOT has been working for more than two decades to correct these inadequate culverts to improve fish habitat.

Find Fish Passage Projects



Why is WSDOT fixing fish barriers?

- · Environmental Stewardship Related to Fish Passage
- Fish Passage Responsibilities
- Federal Court Injunction Related to Fish Passage

What makes a fish barrier?

Before Photo



US 97 culvert that blocked fish passage at Butler Creek, a tributary to the Little Klickitat River near Goldendale.

After Photo



US 97 at Butler Creek after the \$3.5 million barrier removal project was completed in April 2013.

Fish Passage Partners



ashington State epartment of Transportation www.wsdot.wa.gov/Projects/FishPassage

<u>Culvert Case</u> US v WA Background

- 1850's Stevens Treaties: Tribes ceded lands; reserved fishing rights.
- 1974 Boldt Decision: Treaties entitle Tribes to a fair share of fish, while ensuring habitat that supports fish.
- In **2001**, Twenty-one Western WA Tribes filed **suit against the State** claiming culverts were blocking substantial amounts of salmon habitat, thus reducing the salmon available for harvest.
- In **2007**, Federal District Court **Judge Martinez agreed to the claim** and said the State was in breach of the Tribes' treaty rights.
- In October 2009, the court convened a trial to determine what the remedy should be.
- On March 29, 2013, Judge Martinez issued a permanent injunction for the State to accelerate barrier correction within the case area.



US v. WA Culvert Injunction March 2013

- Who? State of Washington WSDOT, WDNR, WDFW, Parks
- Where? Case area

Western Washington WRIA's 1-23

Area subject to culvert injunction.

How many WSDOT barrier culverts?

- About 980 total including (as of August 2015)
- About 818 with Significant Habitat (>200 m upstream)
- * Corrected 21 injunction barriers since 2013
- * Correcting 20 injunction barriers in 2016





Injunction Requirements

- Fix WSDOT barriers blocking 90% of potential upstream habitat by March 2030.
- Correct culverts with <200 meters of upstream habitat at the end of their useful life or sooner as part of larger transportation projects.
- Bridge or stream simulation culvert corrections.
- Ongoing efforts to identify and assess barriers, monitor effectiveness, and maintain culverts.
- Coordinate all efforts with tribes.



Injunction Barrier Correction Standards

- Bridges full channel spanning bridges facilitate habitat connection for fish and wildlife
- Stream Simulation mimics natural stream channel processes throughout the culvert







Stream Simulation Culvert





Stand-alone Fish Passage Barrier Correction Project



BEFORE: SR 530 Fortson Creek, west of Darrington. Previous culvert had excessive outfall drop



AFTER: Fortson Creek with new stream simulation crossing



Stand-alone Barrier Correction Project



6 ft box with deficient fishway

• \$2.6 M cost

Before

- 2 miles habitat gain
- Chum, coho, steelhead, coastal cutthroat, & resident trout



SR 99 WF Hylebos Creek



New 20 ft wide structure

During

After

Correction as part of a project: SR 520 WB off-ramp Yarrow Creek



Before: 3.5' x 2.5' squash culvert

- Part of larger transportation project
- 2.8 miles habitat gain
- Sockeye, coho, steelhead, resident trout







After: 16' box

Corrections as part of a larger transportation project: SR 520





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Chronic Environmental Deficiency Project: SR 203 Coe Clemons Creek



Undersized culvert regularly plugged with debris requiring maintenance



After: culvert replaced with a 25 ft wide stream simulation culvert

Washington State Department of Transportation https://www.youtube.com/watch?v=nMixgoOOSoQ

What makes a successful fish passage project?

- Built according to plans:
- Bed material right size, well-graded, well-placed
- Critical elevations verified
- Proper wood placement
- Other habitat elements



Fish Passage Coordination

- WSDOT coordinates barrier correction efforts with private landowners, enhancement groups, state and local governments, tribes other entities.
- Fish Passage Barrier Removal Board in Washington
 2014 Legislation, HB 2251
 - WDFW, WSDOT, DNR, Governor's Salmon Recovery Office, Tribes, local governments participate
 - O Purpose is to develop statewide strategy based on maximizing habitat recovery through a coordinated, watershed approach
 - Streamlined permitting for fish passage projects



Partnership Example: I-5 Squalicum Creek

- WSDOT partnered with the City of Bellingham, WDFW, the WA Department of Ecology, and others to restore Squalicum Cr, which flows to Bellingham Bay.
- In 2013, WSDOT constructed an open, fish-friendly culvert to protect the existing I-5 bridges.
- In 2015, the stream was re-routed by the City of Bellingham under the I-5 bridges into an old, historic channel.
- This project will open up ~22 miles (35 km) salmon habitat.



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Before – twin culverts are a velocity barrier

After – stream flows through open culvert

SR 548 Terrell Creek



After construction – 2011

3 years after construction – 2014

- Good installation
- Dry bank most flows
- Natural streambed
- Still performing well





Fish Passage Monitoring





Wildlife Passage: an added benefit



Before - 1.22 meter (4 ft)



US 101 south of Aberdeen, WA



After – 4.9 meter (16 ft) constructed in 2009



US 101- Mosquito Creek

Wildlife Passage Benefits



Before - 3.2 meter (10.5 ft)

US 97 - Butler Creek





Goldendale, WA



US97 GOLDENDALE

US 97 - Butler Creek



Questions or Comments?



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