

Accelerating Fish Barrier Correction: New requirements for WSDOT culverts

KEY TAKEAWAYS

- WSDOT has worked for more than two decades to improve fish passage and reconnect streams in support of restoring fish populations and economic benefits for communities that depend on commercial and recreational fishing.
- To date, WSDOT has completed 282 fish passage projects statewide, providing access to more than 970 miles of potential habitat upstream and downstream.
- A U.S. District Court injunction requires WSDOT to correct 825 fish barriers with significant habitat by 2030. To meet this requirement, WSDOT will need to correct 30 to 40 culverts each year between 2015 – 2030.
- Our current preliminary estimate for meeting the injunction is \$2.4+ billion, or \$310 million per biennium. The current funding level, \$36 million in this biennium, is not sufficient to meet the requirements of the injunction.

WSDOT has been working for many years to remove fish passage barriers. A federal court injunction, issued in March 2013, requires the state to significantly increase the effort for removing state-owned culverts that block habitat for salmon and steelhead.

What is the current status?

There are 1,982 barriers to fish passage in the statewide highway system and 1,537 have significant habitat (more than 200 meters upstream). Working with Washington Department of Fish & Wildlife (WDFW), Washington State Department of Transportation (WSDOT) has completed a total of 282 fish passage projects statewide as of 2013. Collectively, these improve access to more than 976 miles of potential habitat upstream. WSDOT completed 13 fish barrier correction projects in 2013. Two projects need additional work by others

before fish can utilize the upgrade. Ten more fish barrier correction projects were completed in 2014.

How are barrier culverts corrected?

Fish barriers are corrected:

- As part of larger transportation projects.
- Through stand-alone projects to fix high priority barriers using Fish Passage program funding.
- As part of maintenance activities where only limited work is needed.

In the 2013-15 biennium, approximately \$36 million will be spent on stand-alone projects that correct fish passage barriers. In addition to these projects, other larger highway projects will correct barriers that are within the boundaries of those projects.

What is changing?

A U.S. District Court injunction (part of the U.S. v. WA culverts case) requires the state to correct hundreds of culverts in western Washington by 2030.*

WSDOT currently has 989 culverts that apply to this injunction, with 825 of them having significant habitat.

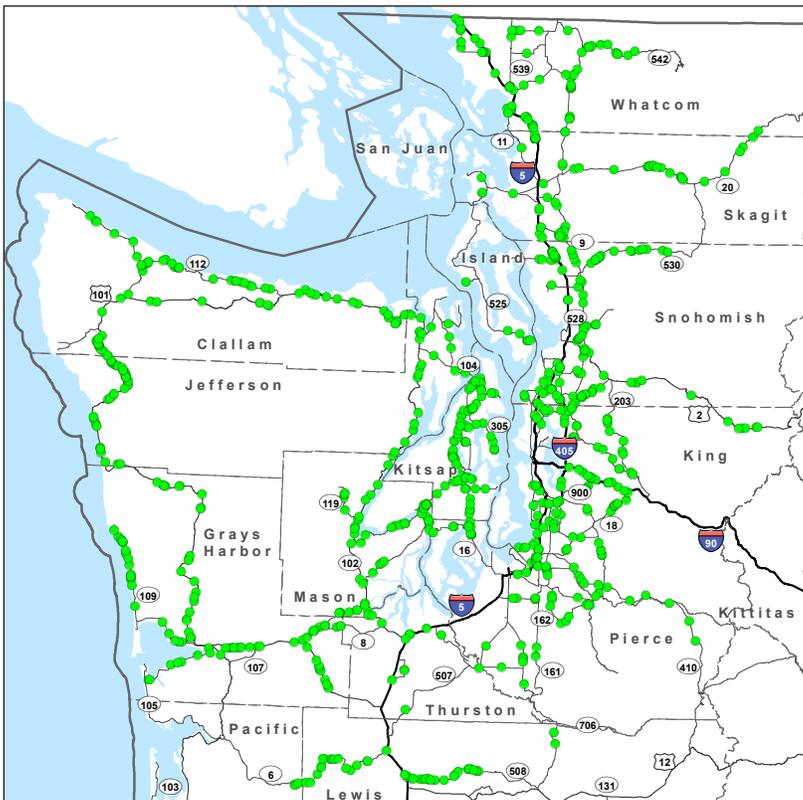
To meet the requirements, WSDOT estimates it will need to correct an average of 30-40 culverts each year between 2015-2030.

- Barrier culverts need to be removed and replaced with bridges or 'stream simulation' culverts.
- Estimated cost for this work is \$310 million per biennium.
- Program costs estimated at \$2.4 billion.
- Expanded coordination with tribes is also an important aspect of implementing this injunction.

*Refer to the back page of this publication for more information on the U.S. District court case.

WSDOT culverts in the case area

The dots below represent all WSDOT barriers with significant habitat upstream in the case area. Significant habitat is defined as a section of stream having at least 200 meters of habitat without a natural barrier.



Replacement culverts and bridges must span streams

WSDOT has been directed to use bridges or “stream simulation” design to correct culvert barriers. Stream simulation design is a method to simulate natural stream channels. Existing culverts must be removed and replaced with new, larger structures. New crossings are constructed wider than the existing stream channel width and sloped at a similar gradient as the existing natural stream.

More information on fish passage design can be found in WDFW’s manual: *Water Crossing Design Guidelines*, online at: wdfw.wa.gov/publications/01501



A 2.5 foot culvert was replaced with a 12 foot bottomless culvert. It was constructed in 2012 at an unnamed tributary to the Pysht River on SR 112 near Port Angeles for \$1 million.

REQUIREMENTS

- September 2013 – prepare a list of case area barriers in consultation with the tribes.
- October 2016 – WDFW, Department of Natural Resources (DNR) and State Parks and Recreation Commission (State Parks) to fix all their barrier culverts.
- March 2030 – WSDOT’s deadline to fix barriers with 200 meters or more of upstream habitat.
- Avoid the crossing, where possible; build a bridge; or use stream simulation design for new culverts and corrections.
- WSDOT will correct culverts with less than 200 meters of upstream habitat at the end of their useful life or sooner as part of larger transportation projects.
- WSDOT can defer corrections up to 10 percent of the total blocked upstream habitat to the end of the culverts’ useful life.
- Ongoing effort to identify and assess barriers, monitor effectiveness and maintain culverts.
- Implementation will require expanded tribal coordination which is currently underway.

Before



After



A 5 foot barrier culvert at Fortson Creek was replaced in 2012 with this 18 foot culvert at milepost 42.99 on SR 530 for \$1.8 million.

WSDOT ACTIONS

- WSDOT has developed four specialized fish passage design teams in North Central Region, Olympic Region, and two in Northwest Region.
- Teams are designing 23 fish passage projects to be ready for advertisement in the 2015-17 biennium; an additional 11 could be ready for ad in 2017-19 — if funding is provided.
 - The teams will scope an additional 75 fish passage projects for future design work.
 - Teams will increase efficiency by working exclusively on fish passage projects.
- WSDOT and WDFW are partnering using the Lean process to gain efficiencies.
- WSDOT is working with permitting agencies to streamline the permit process for our fish passage projects and looking at other time saving opportunities.

FUNDING GAP

- In 2013-15, WSDOT is spending approximately \$36 million correcting fish passage barriers that are stand-alone projects, in addition to the barriers that will be fixed as part of larger highway projects.
- Our current preliminary estimate for meeting the injunction is \$2.4 billion or \$310 million per biennium.
- WSDOT does not have authority to re-allocate funds, and funding of this magnitude is not available under current appropriations from the Legislature. WSDOT's 2015-17 budget request to the Governor includes \$80 million per biennium for this program. This level of funding will begin to address the largest habitat barriers, and is estimated to achieve 55-65 percent habitat restoration in 15 years, which is the time period the court has outlined to address barrier correction.

One approach to a stream simulation designed culvert is a bottomless culvert placed over a created streambed that mimics natural conditions.



Before – A 4-foot round steel culvert at Mosquito Creek on US 101.



After – A 4-foot-round culvert was replaced with a stream simulation designed culvert that is 16 feet wide at Mosquito Creek on US 101 just southwest of Montesano. This new culvert provides habitat connectivity for deer and other animals as well as 2.2 miles of upstream habitat for fish for \$1.4 million in 2009.

It's not a simple fix...



Before – An 11 foot culvert at US 97 at Butler Creek near Goldendale..



After – The 11 foot culvert was replaced with a 65 foot bridge at Butler Creek at milepost 21.35 in 2012 for \$3.5 million.

Efficiencies in fish barrier project design

- WSDOT engineers are incorporating elements of practical design in fish barrier correction projects for efficiency and cost savings. The goal is to meet the need for the project at the least cost.
- Efficiencies can be achieved through structure design, bundling multiple projects in close proximity, using prefabricated elements and other design decisions.
- These decisions allow us to gain efficiencies and reduce costs in contracting processes and construction mobilization, while also limiting the impacts to highway users.



SR 106 Twanoh Falls culvert installation.

Culvert litigation background

Numerous WSDOT-owned culverts are fish passage barriers and were built to convey water under state highways. They were installed decades before we knew about the needs of fish. WSDOT has worked with WDFW since 1991 to correct these barriers to improve and extend the habitat available to fish. However, funding to address this problem has dictated that fixing all of the barrier culverts would span several decades, at best.

What is the basis of the culvert litigation?

In 2001, 21 tribes filed a “Request for Determination” asking the U.S. District Court to find that the state of Washington has a treaty-based duty to preserve fish runs, and sought to compel the State to repair or replace culverts that impede salmon migration to or from spawning grounds. This is directly related to the 1974 Boldt Decision, involving the tribes’ right to a “fair share” of the anadromous fish harvest.

In 2007, the court found in favor of the tribes and declared that the right of taking fish, secured to the tribes in the Stevens Treaties, imposes a duty upon the State to refrain from building or operating culverts under state-maintained roads that hinder fish passage and thereby diminish the number of fish that would

otherwise be available for tribal harvest. The court further declared that the State currently owns and operates culverts that violate this duty.

In 2013, the court issued an injunction that requires state agencies to correct barrier culverts. WSDOT-owned culverts that are subject to the injunction and are required to be replaced no later than 2030, total over 800.

Who is involved?

Plaintiffs: U.S. Government and 21 American Indian tribes [Lummi, Nooksack, Swinomish, Upper Skagit, Sauk-Suiattle, Stillaguamish, Tulalip, Muckleshoot, Puyallup, Nisqually, Squaxin Island, Skokomish, Suquamish, Port Gamble S’Klallam, Jamestown S’Klallam, Lower Elwha Klallam, Makah, Quileute, Hoh, Quinault, and Yakama].

Defendants: State of Washington [WSDOT, DNR, WDFW, and State Parks as landowning agencies].

*The court case applies to all Watershed Resource Inventory Areas (WRIA) in western Washington, with the exception of those that flow into the Columbia River and Willapa Bay. The watersheds covered by the court case are highlighted on the map upper right.



Areas applicable to culvert injunction.



This 40 foot bridge was constructed in 2010 at Chain-Up Creek on SR 542 to replace a 5 foot barrier culvert at milepost 38.98 just east of Maple Falls for \$1.3 million.



This 21 foot culvert was constructed in 2011 at an Unnamed Tributary to South Branch Big Creek on US 101 to replace a 6 foot culvert at milepost 102.14 north of Hoquiam for \$1.1 million.

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