

WSDOT Fish Barrier Correction:

MOVING FORWARD, CONNECTING HABITAT

SR 99 West Fork Hylebos Creek culvert replacement:



Hylebos Creek project – BEFORE

This culvert at the State Route 99 crossing of the West Fork Hylebos Creek was a barrier to fish passage because of high water velocities and an outfall drop that was too high for fish to jump.

There are about 1,976 barriers to fish passage in the highway system statewide and 1,528 have significant habitat (more than 200 meters upstream). Correcting fish passage barriers in an important part of the state's effort to protect and restore salmon runs and meet legal responsibilities.

Improving fish passage: part of the job

WSDOT corrects barriers:

- As part of highway improvement projects.
- Through stand-alone projects to fix high-priority barriers using Fish Passage Program funding.
- Through maintenance when limited scale work can fix a passage problem.

Making progress on removing barriers

To date, WSDOT has:

- Completed a total of 303 fish passage projects statewide.
- Improved access to more than 1,000 miles of potential habitat upstream.



Hylebos Creek project – AFTER

A new 10-foot high, 20-foot wide, 96-foot long box culvert was constructed in 2015 at a total project cost of \$3.7 million. The new culvert is designed to mimic a natural stream channel and properly sized to handle peak creek flows. It restored fish passage to 2 miles of upstream habitat for fish.

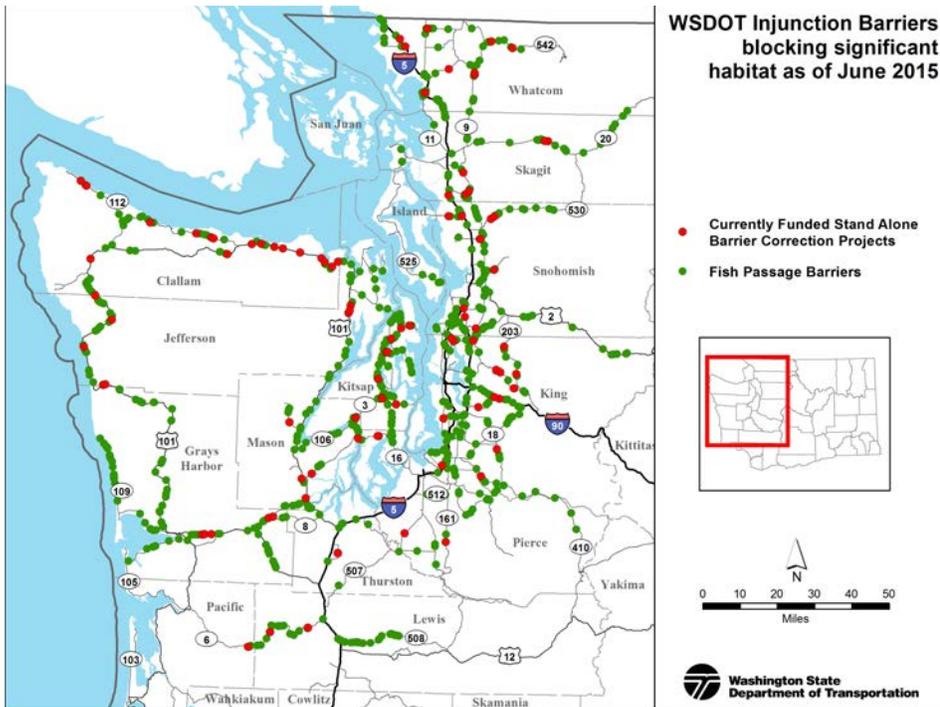
In the 2016 construction season, WSDOT will correct 21 additional fish passage barriers, improving access to more than 77 miles of stream habitat.

Funding increasing but more is needed

In the 2015-17 biennium, approximately \$87.5 million will be invested in stand-alone projects that correct fish passage barriers. In addition to these projects, other highway improvement projects will correct barriers within the boundaries of those projects.

In 2013, U.S. District Court injunction (part of the U.S. v. WA culverts case) requires the state to correct hundreds of culverts in the western Washington "Case Area" by 2030.* This is estimated to cost more than \$2.4 billion.

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



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 within the red box on the inset map.

WSDOT culverts in the federal case area

The dots represent all 818 WSDOT-owned barriers that the 2013 federal injunction requires correcting by 2030. Red dots represent barriers that are funded and will be corrected in the next six years. Green dots represent remaining barrier culverts in the injunction case area requiring correction. For some of these, with smaller amounts of habitat upstream, replacement may be deferred until the end of useful life of the culvert.

Replacement culverts and bridges must span streams

To meet current standards for fish passage, barrier culverts must be removed and replaced with a bridge or a new culvert large enough to fully span the channel and simulate natural stream flow, gradient and bed configuration inside.

Funding

- In 2013-15, WSDOT spent approximately \$27 million correcting fish passage barriers.
- In 2015-17, WSDOT will spend \$87.5 million on stand-alone fish passage projects.
- Our current general estimate for meeting the injunction is \$2.4 billion, an average of \$310 million per biennium.
- Under current law, including the recent Connecting Washington funding, WSDOT has \$527.3 million allocated to fish passage through 2031. This level of funding helps address the largest habitat barriers and is estimated to improve access to 50 to 55 percent of the habitat currently blocked.



Juvenile coho salmon

Mobility for adult and juvenile fish

Young fish need passage as well as returning adults. Juvenile salmonids can spend up to two years rearing in freshwater before they migrate to the sea. During this time they need access to smaller stream and wetland areas where they can grow and evade predators.

Many culverts that are now barriers were built under former methods that did not reflect the current understanding of juvenile fish migration needs. Due to their smaller size, juvenile fish require more gentle conditions for migration than adult fish returning to spawn.

Bridges and stream simulation culverts allow for more natural channel conditions and better accommodate the needs of juvenile fish.



SR 112 Coville Creek – BEFORE



SR 112 Coville Creek – AFTER

Cost drivers in fish barrier correction projects

As described in previous folios, WSDOT is employing a number of tools, such as practical design and partnerships to leverage efficiencies and cost savings in the design of barrier corrections. For the 40 projects currently in design, projects range from \$2 million to \$20 million, with an average cost of \$5.7 million.

Added complexity and cost factors to meet the injunction requirements may include:

- Extensive grading of the channel to mimic a natural streambed
- Construction staging to keep traffic moving with minimal disruption; projects cost more when roads are kept open during construction
- Bridge design elements to meet standards for traffic load and seismic resiliency
- Limited construction periods to adhere to in-water work restrictions
- Public safety features including guardrail, barrier, striping and signing



Precast sections of a new fish passable culvert being placed at Twanoh Falls Creek on SR 106 during a temporary road closure in 2013.

Efficiencies in fish barrier project design

- WSDOT utilizes designated fish passage design teams to bring specialized expertise to these projects.
- WSDOT is working with permitting agencies to streamline the permit process for our fish passage projects and looking at other time saving opportunities. 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 best value.
- 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.



In 2015, a six-foot round culvert on Lake Creek was replaced with a bridge for \$2.5 million. This project located near Lake McMurray crossing State Route 9 at milepost 42.36 provides coho salmon, steelhead, bull trout, searun cutthroat and resident trout access to 10 miles of upstream habitat.

'Culvert Case' background

The State of Washington, the federal government and 21 tribes have been involved in litigation related to the 1974 Boldt Decision, involving the tribes' right to a "fair share" of the anadromous fish harvest.

In 2007, the U.S. District Court found in favor of the tribes and declared that the right 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.

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.



This barrier on SR 307 at Dogfish Creek will be replaced in 2016.

Leveraging investments with partnerships

WSDOT coordinate fish barrier corrections with partners to gain bigger benefits for fish habitat.

One example is near Poulsbo, on Dogfish Creek and its tributaries.

- **Eight fish barriers have been corrected by WSDOT, the city of Poulsbo, Kitsap County and private landowners.**
- **Collectively, this improves access to about 5 miles of stream habitat**
- **Most work started in the lower watershed and is working upstream. The city and county invested knowing the state was correcting its fish barriers.**
- **In 2016, WSDOT will correct a barrier culvert crossing of Dogfish Creek on State Route 307, opening an additional 4.9 miles of habitat.**

MORE INFORMATION

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