



# The Daily Astorian



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## Dam removal enhances fish passage

Federal, state, county agencies work together to reopen three miles of prime salmon, trout spawning grounds along the South Fork Klaskanine River

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Photo courtesy of the North Coast Watershed Association  
Tod Jones, left, and two colleagues watch as a coho salmon attempts to leap over the water diversion dam that used to block spawning grounds on the South Fork Klaskanine River recently.

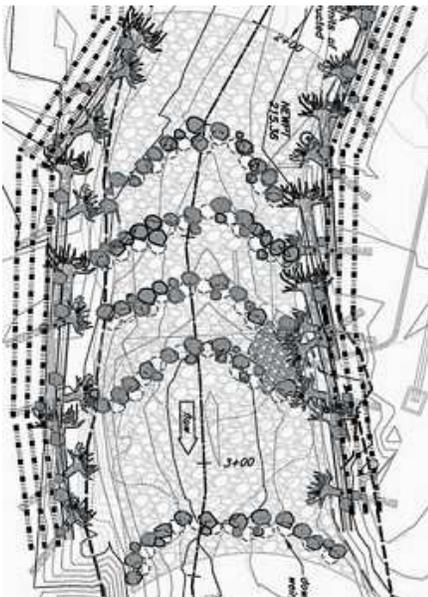
OLNEY - In their instinctive quest to reach spawning grounds, fish in rivers throughout the state clash with walls of water tumbling over dams.

Now one of those barriers, a dam three miles from Olney, has disappeared after it was turned to rubble.

A lazy bend on the South Fork Klaskanine River has become a construction site this summer as a team of federal, state and county agencies collaborate with contractors, volunteers and nonprofits to reopen more than three miles of prime salmon and trout spawning grounds.

Officials say the \$300,000 project is an example of how water needs, conservation concerns and reclamation goals can be achieved with a single solution.

"We are hoping this will be a starship example of how to deal with all these dams and replace them with more environmentally friendly structures," said Chad Cherefko, a soil conservationist for the Natural Resources Conservation Service.



Since 1980, wild fish swimming upstream in search of calm waters for spawning and habitat have encountered a dam four miles from where the river system empties into Youngs Bay, south of Astoria. It was constructed to divert water through an underground pipe to the nearby South Fork Klaskanine Hatchery.

Redirected water poured from the side of the dam and over a screen designed to keep debris from traveling to the hatchery. It was also supposed to allow fish to slide into a conduit that returned to the river downstream.

But young salmon were often trapped there, unable to slip past sticks and leaves piled on the screen.

When the river was low, adult fish moving upstream couldn't clear the dam. High water gave them a fighting chance to conquer the structure, but other fish were blocked throughout the year.

"One of the main factors inhibiting fish recovery is access to spawning and rearing grounds," said Tod Jones, who initiated the removal and works for Clatsop County Fisheries Project. "Juvenile salmon were almost completely blocked by the dam."

Courtesy of the Natural Resources

*Conservation Service*

NRCS engineer Sean Welch produced computer models of the river to test a newly designed water diversion system. The rock weirs shown in this detail of the final plans will reduce erosion, create fish habitat, provide access to spawning grounds and send water through a diversion channel to a nearby hatchery. Tree trunks along the banks will provide further protection for fish.

The disrupted flow of the river also affected fish habitat above and below the concrete structure. Currents created by water plunging over the dam caused erosion and eliminated calm areas along the banks, where fish naturally rest. Sediment, which would normally flow down the river and out to estuaries, was also blocked. Removing it was a constant maintenance concern.

The hatchery was built to supplement the severely decimated wild fish population. Clatsop County Fisheries Project officials said the facility has been a success, producing 1.5 million fish annually, but the diversion dam serving it was causing problems for the river's wild chinook, coho and chum salmon, and steelhead trout.

A more fish-friendly solution needed to be found to supply the hatchery with water.

Jones initially proposed a new fish ladder. But the U.S. Army Corps of Engineers rejected the proposal, encouraging a plan that resolved erosion and sediment issues.

Federal and state agencies also wanted to see a more comprehensive fish passage solution.

After researching different options, Jones and others proposed using rock weirs - bands of rocks that look more natural than dams. The idea was enthusiastically supported by regulators.

"We've always been concrete and rebar guys, but that just doesn't pass muster anymore," said Natural Resources Conservation Service engineer Sean Welch, who designed the project.

"Dams only allow for a single use," said Troy Laws, an assistant fish biologist for the Oregon Department of Fish and Wildlife. "This approach allows for multiple uses, and the fish can freely pass back and forth over it."

Welch built a computer model of the river and began placing virtual rocks across it to study the resulting currents and water levels. The model allowed him to arrange the rocks so that fish can leap over them or swim between them underwater, regardless of water conditions. The design will also push currents into the middle of the river, reducing erosion and providing calm water habitat along the banks. Sediment will flow freely through the structures.

Over the length of a football field, a total of eight weirs will run the width of the river from bank to bank. The first weir pushes needed water to a new, longer diversion channel. The remaining structures will keep currents centered and provide habitat pools at the river's natural gradation.

"This uses materials that are more natural. It provides good passage solutions and still provides the purpose, in this case diverting water. You'll definitely have a healthier and more naturally functioning stream," said Tom Stahl, an ODFW fish passage coordinator.

ODFW designed and built an advanced screen capable of filtering debris without trapping young fish. The screen will operate in the diversion channel where it splits to send fish downstream and water to the hatchery.

The river was recently redirected into the completed diversion channel. Fish were stunned with electricity and released above the construction site. The old dam was crushed and removed by an excavating machine. Contractors and project leaders are now positioning the weirs in the river. Tree trunks along the river will provide protection for fish, and the banks will be replanted with saplings.

The project will be completed within a week, and as the construction site heals over the coming years, the river will adapt to its new components.

"Other people will look at it and not really know what it's all for," said Stahl. "You're going to see pools, and the rocks will create cascades and rapids over them."

Welch said the South Fork project is an example of how river management goals have become more broad over the past decade.

"We now try to accomplish a whole gamut of resource concerns rather than just one objective," he said.

Several agencies and businesses provided reduced-cost labor, donations and volunteer efforts and won grants to cover the project's price tag.

The Columbia River Estuary Study Taskforce and the North Coast Watershed Association, a community-based habitat restoration group, were awarded state and nonprofit grants to help fund the dam removal. The organizations are also working to reopen other barriers on Columbia River tributaries in the area.

Watershed Association Coordinator and CREST employee Lori Lilly said that dams are not the only obstacles blocking fish passage. She said culverts and levees also restrict habitat, and in some cases, municipal water rights allow cities access to 100 percent of a river's water.

"We have to find a balance between water needs and habitat," said Lilly. "There needs to be more education on conservation options."

Dam removal projects are occurring with more regularity, and several more are slated throughout the Northwest in the near future.

"Values have changed," said Chris Hyland, a project manager for the Walla Walla, Wash., District U.S. Army Corps of Engineers. "You'll see a lot of dams removed because people are prescribing fish passage where, by all accounts, there should have been fish passage to begin with."

He said that safety, maintenance and the cost of meeting more demanding federal licensing requirements also drives dam removal.

Officials collaborating on the South Fork project said water needs and restoration don't always need to battle for supremacy in rivers.

"We all want to see a more biological approach to engineering. It's a win-win for everybody, especially the fish," said Welch.

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