News Deeply
WATER DEEPLY

Salmon Are Booming in Oregon's Rogue River. Dam Removal May Be Why.

Eight obsolete dams have been removed or modified on the Rogue River over the past decade. Now its salmon help sustain commercial fishing, despite recent droughts that have devastated fish in other rivers.

By Matt Weiser
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Wimer Dam on Evans Creek, a tributary of the Rogue River in Oregon, during demolition in 2015. It is one of eight dams to be removed or modified in the Rogue watershed since 2008. Photo Courtesy Scott Wright, River Design Group

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After chasing salmon along the southern Oregon coast for 48 years, commercial fisher Duncan MacLean has developed a strong sense of who's who at the end of his hook. This year, he says, most of the Chinook salmon he's catching are likely from the Rogue River, where the state of Oregon and conservation groups have worked for years on one of the nation's largest dam removal programs.

"From everything we normally see, I would think that they are Rogue fish," MacLean said. "If you were to go back over history and look at the way the fishery resource acts, this is a good time for them to be showing up."

If he is right, MacLean is seeing the ultimate reward from all that restoration work: Wild salmon surging back in the Rogue.

All the data are not in yet, and may not be for several years. But Daniel Van Dyke, East Rogue District fishery biologist for the Oregon Department of Fish and Wildlife, said early indications confirm MacLean's assessment.

The results may hold important lessons for other Western rivers. That's particularly true on the Klamath River in California, a hydrologically similar watershed where three dams are targeted for removal.

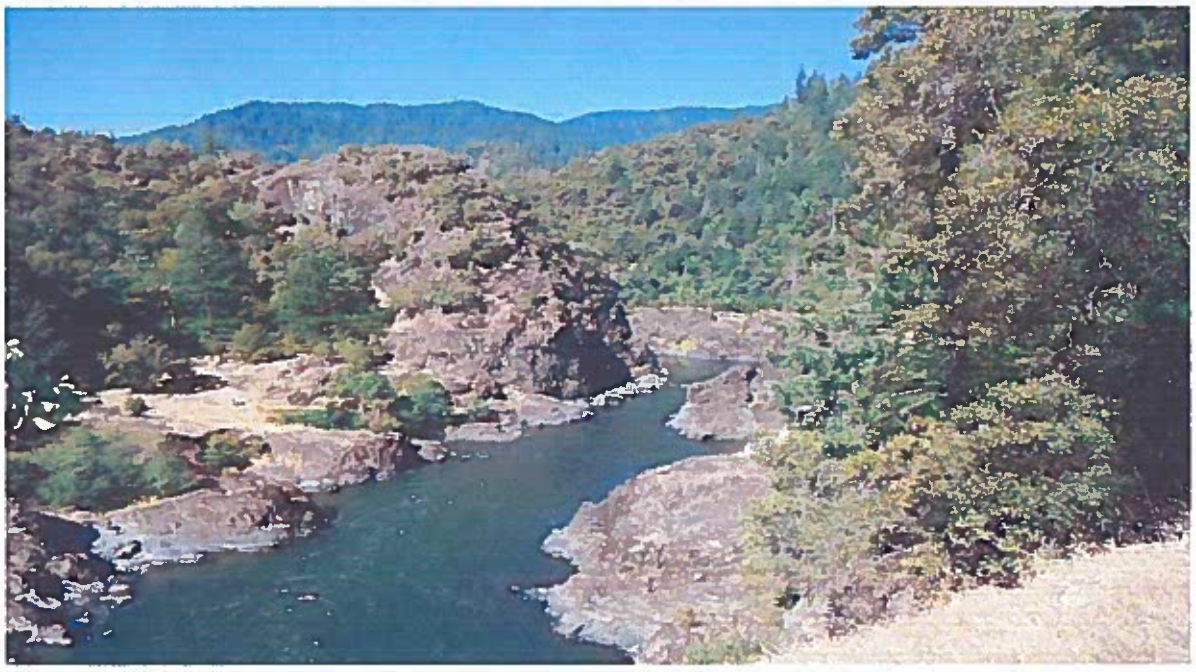
"I wouldn't be surprised if commercial fishermen are catching a lot of Rogue Chinook right now," Van Dyke said. "There are individual signs that are really looking encouraging, and I suspect are tied to the dam removal project."

Dams started coming down on the Rogue in 2008, and the work continues to this day. In 10 years, eight dams have been removed or modified for fish passage on the Rogue and its tributaries at a cost of about $20 million, said Jim McCarthy, Southern Oregon program manager at WaterWatch of Oregon, an environmental group that has played a large role in the process. The work has restored 157 miles of free-flowing river.

Most of the dams were relatively small barriers built for water diversions and had fallen into disrepair. The most recent, Beeson-Robison Dam, came down in 2017 on Wagner Creek.

Although the dam removals began 10 years ago, the full benefit to salmon populations has only been measurable over the last two years. That's because salmon have such long life cycles – usually three or four years spent in the ocean before returning to spawn in freshwater. This means the adult salmon being caught in the ocean now are the young of the first adults to spawn successfully in the free-flowing Rogue.

Van Dyke said it may take 20 years of data gathering before the dam removals can be declared a success for fish populations. But already some data paint a promising picture.



A section of the Rogue River in Oregon designated Wild and Scenic under federal law, just upstream of Blossom Bar, a notoriously difficult stretch of whitewater. Photo Courtesy of Jim McCarthy, WaterWatch of Oregon

For instance, the Rogue's fall Chinook salmon population has roughly doubled in each of the last three years, according to the Pacific Fishery Management Council, the interstate agency that sets salmon fishing quotas. Even more telling is that this period was a roller-coaster ride in terms of environmental conditions, including one of the most severe droughts in history followed by one of the strongest El Niño weather patterns.

This year, the population of Rogue Chinook in the ocean is estimated at 462,800 fish. That's only about 20 percent less than the estimate for the Columbia River, a much larger but heavily dammed river.

"The recent returns, in the context of the poor environmental conditions, are signs that restoration is having an impact and is producing more fish on the Rogue," Van Dyke said. "So that's really encouraging."

At least two things make dam removal projects unique in Oregon.

First, the state itself maintains a priority list of dam removal projects. This lends a stamp of legitimacy to dam removal efforts and helps focus money and effort, McCarthy said.

Second, Oregon has unique laws ensuring that water is dedicated to environmental flows. One requires water rights associated with hydropower projects to revert permanently to instream flow if the water goes unused for hydropower generation for five years. This helped in the case of Gold Ray Dam, a defunct hydroelectric dam demolished on the Rogue in 2010.

As a result, dam removal projects in the state often come with dedicated water for fish and other aquatic life. It's a double bonus for habitat restoration.

"The Rogue is more resilient because of the additional flows and barrier removal," said McCarthy. "We think it's the combination. And we hope we can replicate that in other rivers. It's a formula for resiliency amid climate change that will benefit everyone who depends on healthy rivers."

MacLean is one of those. He pilots his boat north every year, all the way from his home in Half Moon Bay, California, in hopes of meeting his quota for Chinook salmon, one of the most prized wild-caught fish on the Pacific Coast.

"Oregon fishing has been part of my routine for a long, long time," he said. "I couldn't be happier for the Rogue River, and for its inhabitants, to see what's going on here. And I wish California and Washington would follow Oregon's lead."

Rivers recover natural conditions quickly following dam removal

October 08, 2014

The study this story is based on is available online: http://bit.ly/1rdQ4wL

CORVALLIS, Ore. - A study of the removal of two dams in Oregon suggests that rivers can return surprisingly fast to a condition close to their natural state, both physically and biologically, and that the biological recovery might outpace the physical recovery.

The analysis, published by researchers from Oregon State University in the journal PLOS One, examined portions of two rivers - the Calapooia River and Rogue River. It illustrated how rapidly rivers can recover, both from the long-term impact of the dam and from the short-term impact of releasing stored sediment when the dam is removed.

Most dams have decades of accumulated sediment behind them, and a primary concern has been whether the sudden release of all that sediment could cause significant damage to river ecology or infrastructure.

However, this study concluded that the continued presence of a dam on the river constituted more of a sustained and significant alteration of river status than did the sediment pulse caused by dam removal.

"The processes of ecological and physical recovery of river systems following dam removal are important, because thousands of dams are being removed all over the world," said Desirée Tullos, an associate professor in the OSU Department of Biological and Ecological Engineering.

"Dams are a significant element in our nation's aging infrastructure," she said. "In many cases, the dams haven't been adequately maintained and they are literally falling apart. Depending on the benefits provided by the dam, it's often cheaper to remove them than to repair them."

According to the American Society of Civil Engineers, the United States has 84,000 dams with an average age of 52 years. Almost 2,000 are now considered both deficient and "high hazard," and it would take $21 billion to repair them. Rehabilitating all dams would cost $57 billion. Thus, the removal of older dams that generate only modest benefits is happening at an increasing rate.

In this study, the scientists examined the two rivers both before and after removal of the Brownsville Dam on the Calapooia River and the Savage Rapids Dam on the Rogue River. Within about one year after dam removal, the river ecology at both sites, as assessed by aquatic insect populations, was similar to the conditions upstream where there had been no dam impact.

Recovery of the physical structure of the river took a little longer. Following dam removal, some river pools downstream weren't as deep as they used to be, some bars became thicker and larger, and the grain size of river beds changed. But those geomorphic changes diminished quickly as periodic floods flushed the river system, scientists said.

Within about two years, surveys indicated that the river was returning to the pre-removal structure, indicating that the impacts of the sediment released with dam removal were temporary and didn't appear to do any long-term damage.

Instead, it was the presence of the dam that appeared to have the most persistent impact on the river biology and structure - what scientists call a "press" disturbance that will remain in place so long as the dam is there.

This press disturbance of dams can increase water temperatures, change sediment flow, and alter the types of fish, plants and insects that live in portions of rivers. But the river also recovered rapidly from those impacts once the dam was gone.

It's likely, the researchers said, that the rapid recovery found at these sites will mirror recovery on rivers with much larger dams, but more studies are needed.

For example, large scale and rapid changes are now taking place on the Elwha River in Washington state, following the largest dam removal project in the world. The ecological recovery there appears to be occurring rapidly as well. In 2014, Chinook salmon were observed in the area formerly occupied by one of the reservoirs, the first salmon to see that spot in 102 years.

"Disturbance is a natural river process," Tullos said. "In the end, most of these large pulses of sediment aren't that big of a deal, and there's often no need to panic. The most surprising finding to us was that indicators of the biological recovery appeared to happen faster than our indicators of the physical recovery."

The rates of recovery will vary across sites, though. Rivers with steeper gradients, more energetic flow patterns, and non-cohesive sediments will recover more quickly than flatter rivers with cohesive sediments, researchers said.

This research was supported by the Oregon Watershed Enhancement Board, the National Oceanic and Atmospheric Association and the National Marine Fisheries Service. It was a collaboration of researchers from the OSU College of Agricultural Sciences, College of Engineering, and College of Science.