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River Revives After Largest Dam Removal in U.S. History

Fish are thriving and the environment has been reshaped following a major dam removal project in Washington State.



The freshly freed Elwha River meanders through a former lakebed.

PHOTOGRAPH BY JASON JAACKS, NATIONAL GEOGRAPHIC CREATIVE



By **Brian Clark Howard**

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In August 2014, workers completed the largest dam removal project in U.S. history, as the final part of the 210-foot-high (64-meter-high) Glines Canyon Dam was [dismantled on the Elwha River](#) in northwestern Washington State.

The multistage project began in 2011 with the blessing of the U.S. National Park Service, which administers the surrounding Olympic National Park. The goal was to remove unneeded, outdated dams and restore a natural river system, with presumed benefits for fish and other wildlife.



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Indeed, salmon have already returned to the Elwha after nearly a century of absence, and other fish and marine creatures are thriving.

But the restoration hasn't just been about the river channel itself, says [Anne Shaffer](#), a marine biologist with the nonprofit Coastal Watershed Institute in nearby Port Angeles, Washington, and a Ph.D. candidate at the University of Victoria in Canada. (Watch [spectacular time-lapse video of another Northwest dam coming down.](#))

Shaffer has been working on the Elwha system since the early 1990s, with a particular focus on what's called the

"nearshore environment." This is an ecological zone of aquatic habitat along the shoreline that "offers refuge and feeding areas for fish and other organisms that helps them transition from freshwater to marine habitat," says Shaffer.

Nearshore environments include deltas and estuary systems near the mouths of rivers as well as seagrass beds in shallow water.

In the case of the Elwha, studying and managing this vital area can be a bit tricky, Shaffer notes. Unlike most of the river, this area is not part of Olympic National Park and so is threatened by nearby development.



After the Dam Watch how the largest dam removal project in U.S. history resulted in the dramatic restoration of a river's ecosystem.



We spoke with Shaffer about the impact of the dam removal and the importance of the nearshore habitat.

People might not immediately associate the removal of dams on a river with what happens in the ocean nearby. Why is that connection important?

A number of the species and processes that are central to the health of the Elwha watershed rely on the nearshore. Salmon require a healthy nearshore environment or they won't make it. So do herring and smelt, which are critical prey for salmon, as well as killer whales and many birds.

At the same time, a river system is often the primary source of sediments, which define and build the nearshore habitat, and nutrients and wood, which support life. When you throw in a couple of dams, you create a fish passage barrier and you lock up sediment and wood. So the Elwha nearshore has been starved for a hundred years, and it was significantly impaired.

Since the dams were removed, what has changed in the nearshore?

It was really surprising to us how fast things changed. We have seen an increase in good habitat by about a hundred acres (40 hectares) and an immediate response in the fish community. We found new species coming to the area within weeks of the dam removal starting.

We're now into the second year post-dam removal. The seafloor near the mouth of the river has risen by about 10 meters (33 feet), creating a whole new delta. The estuary had been badly reduced because of sediment starvation, but its return has been incredible to watch. ([Learn more about the dam removal movement.](#))

What species of fish have been affected?

We've seen a recent increase in the number of young Chinook salmon. Coho salmon have also seen a spike, as have chum salmon, bull trout, and steelhead. Eulachon also showed up in the estuary for the first time in a long time, and in abundance. (These small fish are [so oily they can be lit on fire](#), and they are an important food source for many animals.)

Have the fish resulted in other changes to the environment?

Yes. There is new habitat for Dungeness crabs, clams, and other species. For birds it's been twofold. The new delta has formed a resting area for gulls. And the boom in fish has led to a fantasia of birds feeding on them.

We're also seeing a beautiful beach develop from all the new sediment coming down the river. The shoreline has gone from rough cobbles that looked like a lunar landscape to a fine sand that rivals any beach in the Northwest.

Has the dam removal caused any negative impacts?

There were a few kelp beds just off the river's mouth that were immediately covered with sediment, but overall there is much more good habitat now. I'd say the impacts have been all positive overall.

Is there a risk the newly renewed area will get developed?

Yes. It's not in the national park, and a local community is expressing interest in the new beach. New people are moving in, and they are building closer to the water's edge. That can lead to issues with toxic stormwater runoff and erosion, so that's a real worry for us.

What have you learned from the Elwha that might apply to other potential dam removal or restoration projects?

We hope to inform others so they know how to do dam removals to optimize the nearshore environment. You need to let the sediment come to the shore. Let that restoration happen. ([Learn about other dam removal projects.](#))

The other thing is to look at dam removal in its entirety, including what happens to the nearshore, and make sure that is a restoration priority.

This interview has been edited for length and clarity.

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