

Recent Example of Dam Removal in the West

Elwha and Glines Canyon Dams, Elwha River, Washington

The Elwha and Glines Canyon Dams on the Elwha River in Washington were removed in 2012 and 2014, respectively. To date, the project is the largest dam removal and river restoration project implemented in the United States. The project has led to a wide range of ecological, economic, and cultural benefits, including opening 70 miles of the Elwha River in northwestern Washington for fish passage.

Dams at a glance:

Location:	Elwha River; 10 miles southwest of Port Angeles, WA
Year Built:	1913 (Elwha Dam) and 1927 (Glines Canyon Dam)
Year Removed:	2012 (Elwha Dam) and 2014 (Glines Canyon Dam)
Dam Type:	Concrete
Size:	Elwha Dam: 105 ft high (created former Lake Aldwell)
Glines Canyon Dam:	210 ft high (created former Lake Mills)
Dam Owner:	Department of the Interior
Cost:	\$325 million for removal and restoration

Former Lake Aldwell, 2010



Photo Credit: Steve Ringman/Seattle Times

Former Elwha Dam site on Elwha River, 2016



Photo Credit: Steve Ringman/Seattle Times

Background:

- Before the dams were built, the Elwha River was home to thriving salmon and trout runs.
- The flood hazard from potential dam failure and harm to the Lower Elwha Klallam Tribe was first highlighted through a failed safety inspection in 1978 following a FERC license application in 1973.
- The removal of the Elwha and Glines Canyon Dams was a result of the Elwha River Ecosystem and Fisheries Restoration Act and environmental impact studies which concluded that dam removal was the best option to restore fisheries on the Elwha River.

Benefits:

- Fish species that benefit from dam removal include Chinook, chum, pink, sockeye, Coho, and steelhead. Other species that benefit from the project are Dungeness crabs, clams, and birds.
- In the first season after dam removal, more than 4,000 Chinook spawners were counted above the former site of the Elwha Dam, which is the highest count in 30 years.
- 400 sockeye salmon were counted in 2012 after the removal of the Elwha Dam. In 2013 and 2014, the count increased to 800 and 1,100, respectively.
- In the middle of the Elwha and its tributaries, Coho salmon produced approximately 32,000 outgoing salmon fry (young salmon) in 2014, a stark contrast from the absence of Coho in this location before dam removal.
- Between 2013 to 2015 in the middle of the Elwha River, Chinook redd (spawning nest) counts increased by 350 percent, and steelhead redd counts increased by 300 percent.
- By the second year after dam removal, the seafloor near the mouth of the river had risen by about 33 feet, creating a new delta, further contributing to habitat diversity.

On-going management:

- Contractors for the National Park Service and the US Army Corps of Engineers continue to work to address certain impacts of dam removal, through removal of steel, concrete rubble, and other debris from the river, and treatment of sediment-laden water at the Elwha Surface Water Intake Facilities.
- More than 320,000 plants, mostly trees and shrubs, have been planted along with 6,000 pounds of seeds to revegetate the former Lake Aldwell, above the Elwha Dam and Lake Mills above Glines Canyon Dam.
- On-going monitoring, implementation of mitigation measures, and adaptive management will be critical to continued project success.

Former Lake Mills above Glines Canyon Dam, 2012



Photo Credit: Double Click Productions

Site of Former Lake Mills, 2016



Photo Credit: Double Click Productions

Elwha River at the Strait of Juan de Fuca, July 2012



Photo Credit: Double Click Productions

Elwha River at the Strait of Juan de Fuca, June 2015



Photo Credit: Double Click Productions

Resources:

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3. Headwater Economics. Dam Removal: Case Studies on the Fiscal, Economic, Social, and Environmental Benefits of Dam Removal, p. 14. October 2016. headwaterseconomics.org/wp-content/uploads/Report-Dam-Removal-Case-Studies.pdf.
4. Howard, B. 2016. River Revives After Largest Dam Removal in U.S. History. National Geographic, June 2, 2016. news.nationalgeographic.com/2016/06/largest-dam-removal-elwha-river-restoration-environment/.
5. Gottlieb, P. 2017. Park Service to continue operating Elwha water facility, but future remains uncertain. Peninsula Daily News, August 8th, 2017. <http://www.peninsuladailynews.com/news/park-service-to-continue-operating-elwha-water-facility-but-future-remains-uncertain/>
6. National Park Service, US Department of the Interior. Elwha River Ecosystem Restoration Implementation, p. 117-118. July 2005. <https://www.nps.gov/olym/learn/nature/loader.cfm?csModule=security/getfile&PageID=136240>