Dams, Salmon Migration, and Indigenous Culture in the Columbia River Basin

For centuries, Celilo Falls was a hub of salmon fishing and trade for dozens of tribes from near and far. Salmon returning from the sea to their birthplace to spawn became disoriented in the rushing waters of the falls, making them easy to catch with long nets and spears. Half a dozen tribes had permanent villages between the Falls and modern day The Dalles, Oregon, originating from as long as 11,000 years ago. Tribes flocked to Celilo Falls from all over the Western U.S., coming from as far as the Dakotas, Alaska, and Northern California to fish and trade.

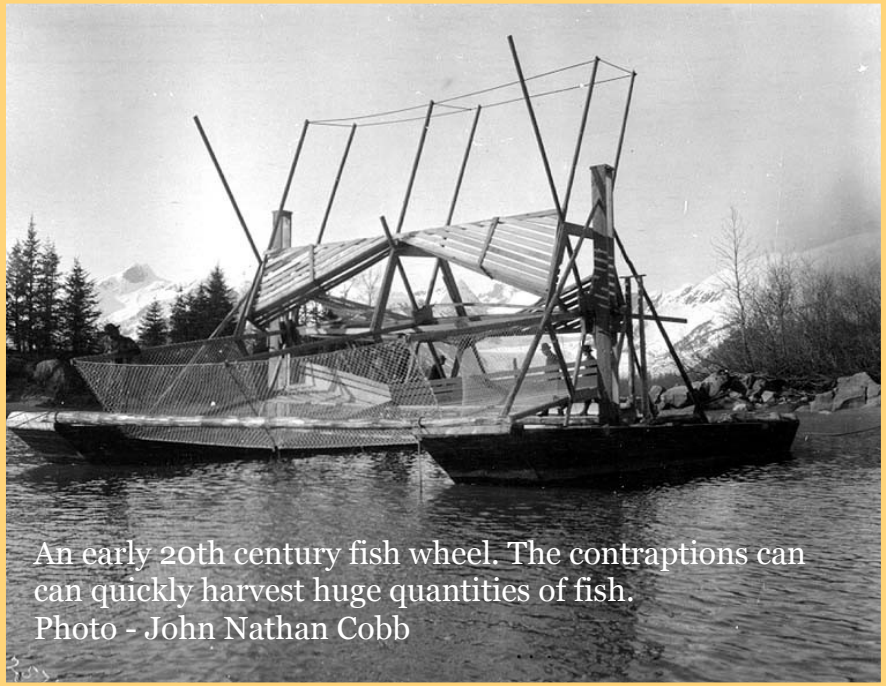
Celilo Falls was just one of many areas where Indigenous Tribes settled in the Columbia River basin. The incredible abundance of migrating fish in the Pacific Northwest provided these tribes with ample food, and their reliance on these fish led to a culture of respecting and honoring the gift that was salmon.

Fishing at Celilo Falls (also known as *Wy-Am*, the Sahaptin word for "echo of falling water"). Photo: *Matheny Collection, CRITFC*

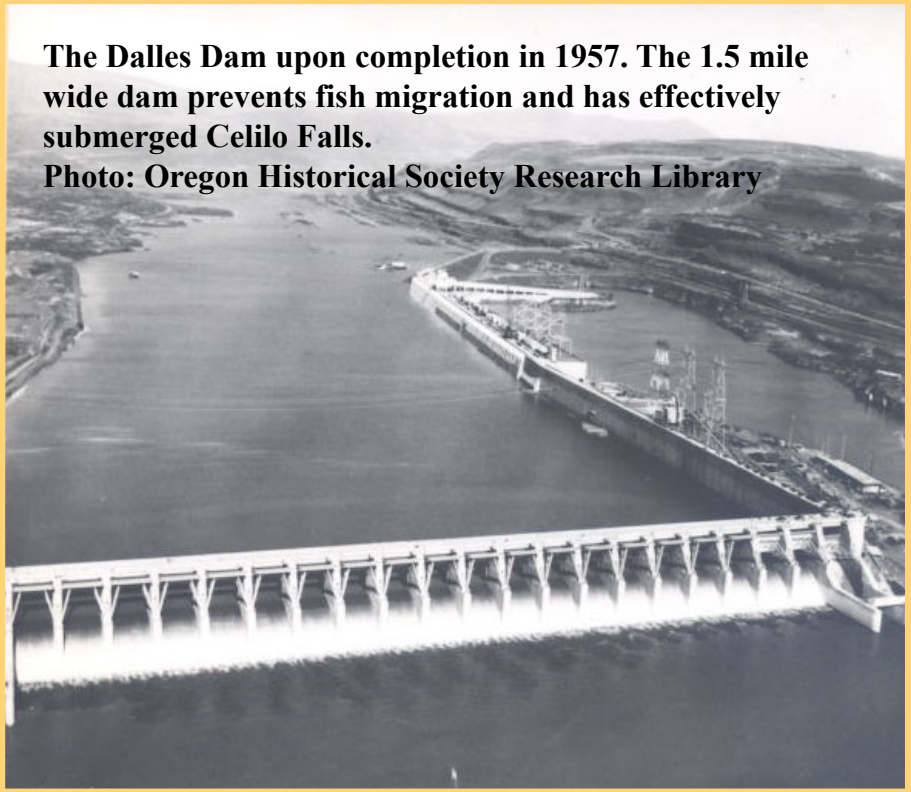
Before the 1900s, the mass migration of salmon and other anadromous fish was uninterrupted by any human influence. For thousands of years, salmon populations flourished, with up to 16 million individuals returning to the Columbia River alone.

Coho Salmon (*Oncorhynchus kisutch*)
Photo - Kate Spencer

The legend of Celilo falls and the migration of salmon in the Columbia river basin wouldn't last forever, unfortunately. European settlers began to appear, fishing alongside Indigenous tribes. It didn't take long before canneries were established on the banks of the Columbia river, unsustainably harvesting tens of millions of pounds of fish every year. The large influx of people flocking to the Pacific Northwest in the early 1900s required a harnessing of the area's most powerful resource - the river. Dams - used to provide electricity, safe passage for ships, and reservoirs for recreation and water availability - began construction. The fate of Celilo Falls would be sealed forever when the newly constructed Dalles Dam closed its massive gates on March 10, 1957, submerging the once legendary fishing site in just four and a half hours.



An early 20th century fish wheel. The contraptions can can quickly harvest huge quantities of fish.
Photo - John Nathan Cobb

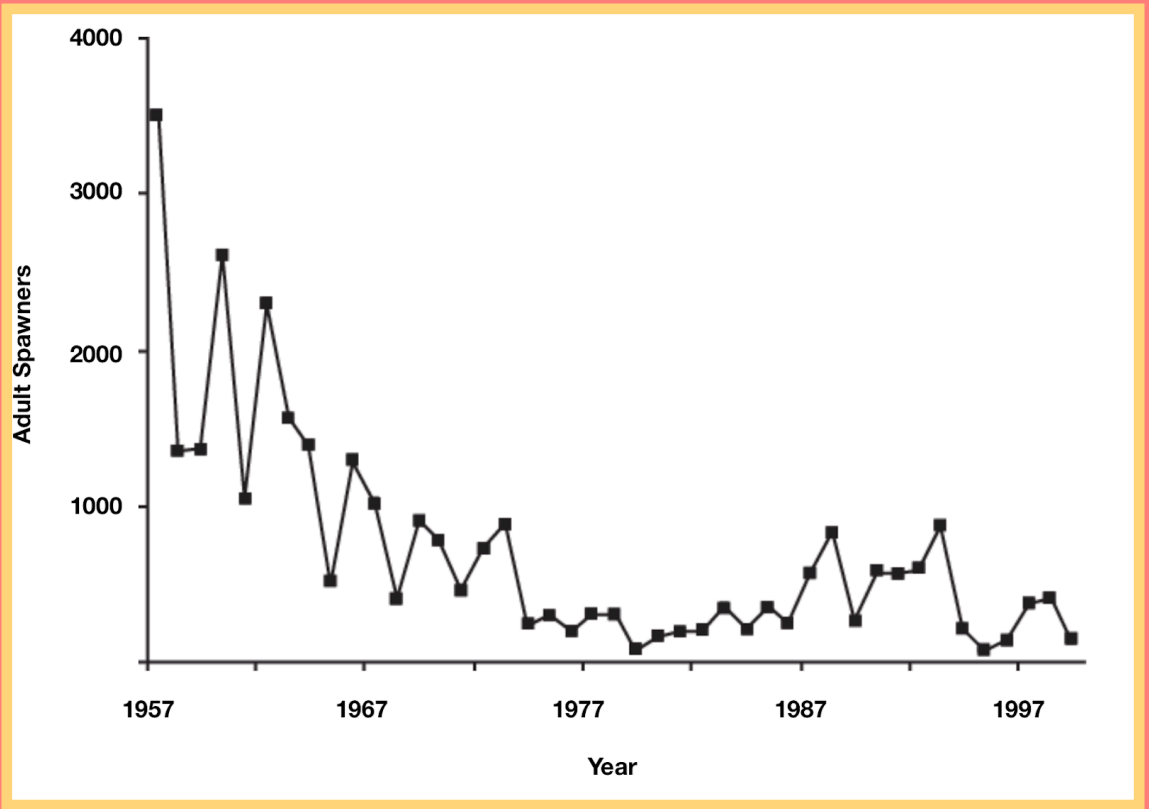


The Dalles Dam upon completion in 1957. The 1.5 mile wide dam prevents fish migration and has effectively submerged Celilo Falls.
Photo: Oregon Historical Society Research Library

The loss of Celilo Falls was nothing short of a tragedy for Indigenous tribes of the area. The epic roar of the falls gave way to a stifling quietude, signaling the disappearance of a water feature critical to the tribal culture of native peoples. After construction of The Dalles Dam, the government compensated the Nez Perce, Yakama, Warm Springs and Umatilla tribes for the loss of their fishing site, but the tribes lost their entire economic base and an integral part of their culture.

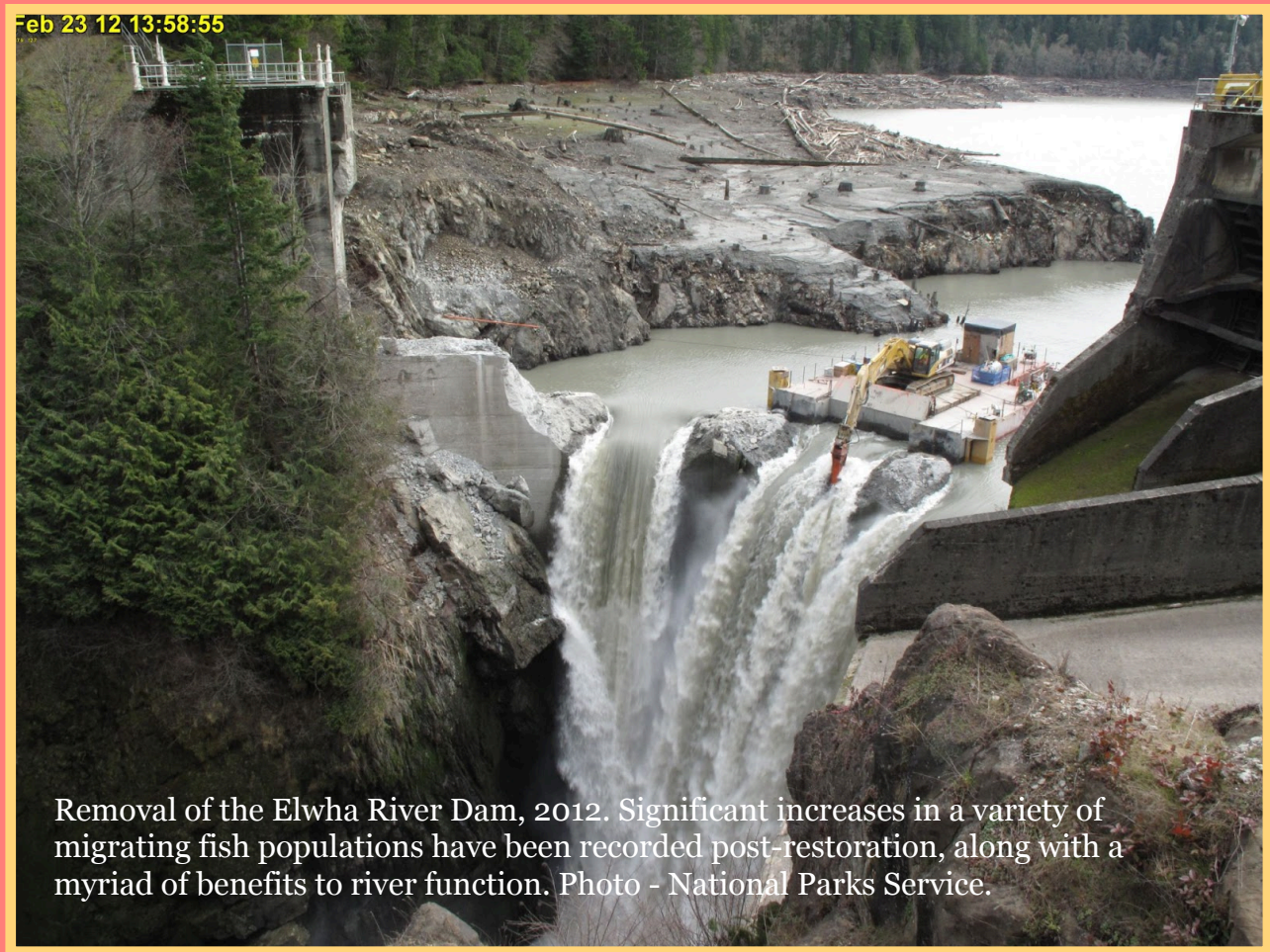
As of today, 14 population groups of Steelhead, Coho, Chinook, Chum, and Sockeye salmon are listed as either threatened or endangered. The drastic reduction in salmon populations is evident. Before colonization, between 10 and 16 million salmon returned to the Columbia river systems to spawn every year. Those numbers have changed: only 750,000 to 3 million salmon return, with 80% of those being salmon raised in fisheries. What's changed? For one, dams number more than 400 in the Columbia river basin alone. Dams create a plethora of issues for migrating salmon and other fish, the most obvious being the complete obstruction of once-unrestricted waterways.

Dams without fish-passage infrastructure (such as fish ladders) completely barricade migration both upstream and downstream, creating situations that make it impossible for fish to return to their birthplace to spawn or to the ocean to feed. Dams submerge ancient salmon habitat, such as the case at Celilo Falls.



Decline in spawning populations of Chinook salmon (*Oncorhynchus tshawytscha*) after the completion of four Lower Snake River dams. Chart modified from Malmqvist and Rundle, 2002.

They alter salmon habitat in other ways as well - dams create large areas of still water where water used to flow quickly and freely, which raises water temperature behind the dam and reduces dissolved oxygen. These two factors hinder salmon growth and reproductive ability. The figure to the left shows how Chinook salmon populations decreased after the four Lower Snake River dams were erected in the 1960's.



Removal of the Elwha River Dam, 2012. Significant increases in a variety of migrating fish populations have been recorded post-restoration, along with a myriad of benefits to river function. Photo - National Parks Service.

Before the Columbia River basin was colonized, Indigenous tribe elders and Chiefs applied basic rules of stewardship to the Celilo Falls fishing area. They allowed fishing only after the First Salmon Ceremony in mid April, where proper thanks was given to the Salmon for the sacrifice that they gave to feed the people. Every day, the time for fishing was signaled by the blowing of a whistle in the morning and evening - no fishing was allowed at night. If a fisherman fell into the falls - an often perilous spill - all fishing ceased for the day. Visiting tribes were given as much fish as they could carry on their journey home, and the rest belonged to the fishermen and their families.

In the year 2023, the culture of those living in the Pacific Northwest has changed immensely. The Columbia river basin is an important hotspot for carbon-neutral energy production - around 40% of the hydroelectric energy production in the entire United States occurs in this basin alone. As carbon emissions continue to rise, finding carbon-neutral energy resources is paramount to maintaining functioning Earth systems. At the same time, increasing salmon runs every year should be a priority to land managers and shareholders. Salmon are a keystone species whose survival affects the health of forests and rivers themselves. Deadbeat dams which no longer supply a significant amount of carbon-neutral energy or lack fish passage infrastructure must be breached if salmon are to continue to survive in the Columbia river basin. A balance must be struck between hydroelectric power creation and Indigenous tribes who have lost an important element of the culture that once thrived along the banks of the Columbia.

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