

Commercial Salmon Fishing in the Columbia River

By James Lichatowich and William L. Lang

Salmon fisheries have a long history in Oregon, going back to as many as 10,000 years—as long as salmon and humans have coexisted in the Columbia River watershed. Two archaeological sites of ancient fisheries, for example, one on the south-central northwest coast and the other on the northern Columbia Plateau, show “remarkable stability in salmon use” to at least 7,500 years. That lengthy record, scholars suggest, shows resilience in the ecological-human system. Natives maintained their long, sustainable relationship with Pacific salmon in part because they practiced subsistence fishing.

Salmon are an anadromous species that begin life in freshwater streams and rivers. After a short period of development, the young fish migrate to the ocean, where they spend between three and five years in salt water. They return as mature adults to their natal streams, where females deposit eggs in stream bottoms and males fertilize with sperm, thereby beginning another three-to-five-year odyssey of life. Pacific salmon—that is, the salmon that live in the North Pacific Ocean off the U.S. and Canadian coasts—die after spawning only once in their natal stream.

Native people tracked this life cycle and fished only until their food and trade needs were met, a practice enforced by strict mores against overharvest and waste. But resilience in the coevolved relationship between salmon and humans broke down in the mid-nineteenth century when EuroAmericans began arriving in the Pacific Northwest in large numbers and initiated commercial fishing on the Columbia River.

From Subsistence to Market-Driven Commercial Harvest The first American to attempt a commercial enterprise based on Columbia River salmon was Capt. John Dominis of Boston, who sailed into the river in 1829. He purchased salmon from Native people near Deer Island (river mile 78-81), salt-cured the fish in fifty-three empty rum hogsheads (large casks), and took it to Boston for sale. He was the first person to export cured Pacific salmon to the East Coast.

In 1832, Capt. Nathaniel Wyeth, another Bostonian, traveled overland to the lower Columbia to trade for furs and to salt-cure salmon for export. After his supply ship was lost at sea, he built a fort on Sauvie Island (river mile 87-101) and bought salmon from Native fishers, but he could not compete with the higher price paid by the British-owned Hudson's Bay Company. He left the Pacific Northwest after a year.

John McLoughlin, chief factor of the Columbia District of the Hudson's Bay Company, also exported Columbia River salmon. He shipped salt-cured salmon to Hawaii and Valparaiso, Chile, but the harvest of salmon was small, and shortages of salt and barrels limited the growth of a commercial salmon fishery. These problems had a solution, but the knowledge had not yet reached the Pacific Northwest.

In 1800, Napoleon Bonaparte launched a contest that would reward whoever developed a way to preserve food for his army. French biochemist Nicholas Appert won the contest in 1809 by demonstrating how meat and vegetables could be kept edible for several months through a sterilization process. In 1810, Peter Durand, an English merchant, patented a process to can salmon in metal containers. By the mid-nineteenth century, on the West Coast of the United States, the Hume brothers applied Appert's idea and Durand's invention to industrialize the canning of salmon.

Canning, an Industrial Operation William Hume moved from Maine to California during the 1849 Gold Rush, not to mine for gold but to mine silver salmon in the Sacramento River, which he sold in the area's fresh-fish markets. He returned to Maine in 1856 to persuade his brothers to harvest the Sacramento's huge salmon runs. Four Hume brothers—George, John, William, and Robert—and their friend Andrew Hapgood, a tinsmith with experience canning lobster and Atlantic salmon in Maine, began fishing for and canning salmon.

In their first attempt to can Pacific salmon, the brothers produced two thousand cases using Hapgood's homemade cans. The result almost killed the fledgling industry, as many cans exploded in the cooker and others leaked, causing the salmon to spoil. Initially, merchants were unwilling to

buy and sell the Humes's strange product, but then a San Francisco businessman paid them five dollars a case, including shipping.

The enterprise survived, but there was no future for the Humes's business in the region. The salmon population was declining in the Sacramento River and its tributaries, partly because gold miners were using high-pressure water cannons to wash whole hillsides into the river, causing massive habitat damage. The Humes had seen this before when habitat destruction diminished Atlantic salmon numbers in Maine rivers. So they moved to the lower Columbia River, beginning a process that would come to characterize the industry: move to a river, exploit the salmon, and move on to the next river.

The Hume brothers and Hapgood settled at Eagle Cliff, about forty miles upriver on the Columbia River in Washington Territory. In 1866, their first year at Eagle Cliff, they produced 4,000 cases of 48 one-pound cans of salmon. To illustrate the importance of the new industry, consider this: the salmon fishery on the Columbia in 1860 was worth \$13,450. In 1866, the first year the Hume-Hapgood cannery operated, the value of their 4,000 cases of canned salmon was \$32,000 (\$628,506 in 2024). There were eight canneries on the Columbia in 1873; ten years later, there were thirty-nine. In 1883, 629,400 cases of canned Chinook salmon were produced at a value of \$3,147,000 (\$100.8 million in 2024). A lucrative industry had been born.

Canning operations became highly mechanized, allowing cannery owners to convert salmon to cash at a faster and faster rate. The growing labor force was dominated by Chinese workers, but Japanese and Scandinavian laborers were also hired, as were women. Canneries operated on every river with a salmon population large enough to keep the cannery line supplied with fish (Table 1).

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The supply of caught fish increased markedly when canneries installed fish wheels in the river's fast-moving shallows. The larger wheels could be as tall as 60 feet, with wooden paddles that churned through the river current scooping the fish from the water into wire baskets that carried the fish around the wheel to be dumped into a fish box. The fish were collected, by usual practice, using a speared pike. The contraptions were efficient and lethal to salmon, and over 70 of them operated along the lower Columbia River at the height of the canning industry.

Before the canneries and fish wheels were built, the salmon used in salt-curing were largely supplied by Native fishers, but the shift from a few thousand barrels of salted salmon to several hundred thousand cases of canned salmon required a significant expansion in the commercial harvest. The increase in demand for canned salmon attracted EuroAmerican fishers, who gradually displaced Native fishers. The change was more than a displacement of Native fishers for white fishers; it was also the displacement of a subsistence harvest economy with a capitalist market-driven economy. The difference would have disastrous consequences for both salmon and Native people.

The increased demand for cannery salmon affected the attitude toward overharvest and waste. In 1883, when Mont Hawthorne arrived in Astoria to learn the canning business, he noticed the putrid smell of rotting salmon and cannery scraps that lined the river. The waste appalled him, but he would learn that it was economically efficient for the canneries to buy extra salmon to ensure they would not run out of fish and idle hundreds of workers. Hawthorne later recalled throwing five hundred large salmon off the end of the dock every other night. The goal of economic efficiency unrestrained by regulations created enormous waste.

Many fishers and cannery owners on the Columbia River were from New England. They knew from experience that salmon were vulnerable to excessive harvest, waste, river development that blocked migration, and degraded habitat. They were also aware of the U.S. Fish Commission's policy that investing a small amount of money in hatcheries would yield better results than investing in protecting habitat and regulating the fishery. For their part, the fishers and cannery owners wanted to adopt any technology that would eliminate regulations and promise a continuing supply of fish.

The Decline of Wild Fish, the Role of Hatcheries, and the End of Canneries On January 22, 1877, a public letter signed by more than 170 fishers, cannery owners, and industry representatives appeared in the Portland Oregonian. Hatcheries are "the only protection we want for the future prosperity of this important business," they wrote. "We would respectfully remonstrate against...any law preventing [us] from taking fish from the Columbia River at any particular time or in any particular manner."

The first Oregon fish hatchery was built on the Clackamas River in 1877. For the next eighty-five years, hatcheries were relied on to mitigate the problem of the declining salmon population even though they failed to consistently maintain the supply. During the 1930s, 1940s, and 1950s, hatcheries were used to compensate for the negative effects on fish runs from dams constructed on salmon rivers.

Fishers employed five types of harvest gear on the Columbia to supply fish to the canneries: gill nets, beach seines, set nets, fish wheels, and traps. Competition among fishermen favoring one type of gear over another led them to support laws or initiative petitions against the use of specific gear. In addition, Oregon and Washington enacted different sets of fishing regulations, causing headaches with enforcement on the Columbia and its tributaries. In 1908, for example, lower Columbia River gillnetters filed an initiative petition to prohibit all fishing except hook-and-line upstream of the Sandy River, essentially eliminating commercial fishing on the upper river. The commercial fishermen above the Sandy River responded with their own petition to eliminate net fishing at night (lower Columbia gillnetters fished only at night, when the salmon couldn't see their nets). Oregon voters approved both initiatives, throwing commercial fishing on the Columbia into chaos. The commercial fishery on the Oregon side of the river was closed, but it remained open on the Washington side, forcing the two state legislatures to draft a uniform set of regulations.

Throughout the region south of the Fraser River in British Columbia, the total annual number of cases of canned salmon peaked and then declined before 1910. By 1920, the commercial harvest of salmon in the Columbia River was in steep decline, the result of excessive harvesting and habitat degradation on spawning streams. In 1932, the Oregon Fish Commission concluded that, based on data collected over fifteen years, approximately 50 percent of the salmon habitat in the Columbia Basin had been lost.

In 1918, the U.S. Congress approved an interstate compact between Oregon and Washington to regulate salmon harvest on the Columbia. Oregon eliminated fish wheels in 1927 and all other fixed fishing gear (traps and set nets) in 1948. Washington eliminated traps, fish wheels, set nets, and seines in 1935, allowing gill-net fishermen to remain on the lower river. Commercial fishing in Oregon's coastal streams was terminated in 1956 because of diminished fish runs. The last major cannery on the Columbia River closed in 1980.

Commercial Fishing Moves to the Ocean When F. J. Larkin moved to Portland in 1898, he brought with him an idea that would transform the commercial salmon fishery: eliminate the picturesque butterfly sails used by Columbia River gillnetters and replace them with gasoline engines. Over the next nine years, half the boats operating out of Astoria, at the mouth of the Columbia, were powered by gasoline engines, giving fishers more power and control. The engines also gave them a new way to practice an old way of fishing: trolling.

By 1915, five hundred trollers were fishing for salmon off the mouth of the Columbia in the Pacific Ocean; by 1920, there were two thousand. The technique was a highly effective way to catch salmon, and it created management problems that persist to the present day.

With the arrival of the ocean troll fishery, salmon from Oregon rivers might be harvested in Alaska, British Columbia, or Washington before they reach their home stream. In the ocean, salmon live with fish from different rivers and from populations that have varying life cycles and reproductive productivity. When these fish are exposed to troll fisheries, there is no control over which species are harvested. This raises several regulatory problems and questions. For example, what is the country or state of origin of a salmon caught in the ocean? When a troll fishery from one state or country intercepts salmon spawned in a different country or state, is the originating country or state owed compensation? In mixtures of strong and weak specie stocks, how do managers ensure that weak stocks are not overharvested? How do salmon fishers avoid harvesting small, immature

salmon? Treaties and federal and state regulations have addressed some of these problems, but many remain unresolved.

The Case of the Coho The story of the coho salmon harvest in the 1970s is an example of how complex it is to manage salmon fishing. The Oregon Production Index (OPI) is an estimate of the abundance of coho salmon from California, the Oregon Coast, the Columbia River, and southwest Washington. Prior to the late 1950s and early 1960s, state and federal salmon managers believed that the OPI was largely made up of wild coho salmon because few hatchery-bred coho survived after their release. In 1960, however, the number of hatchery coho salmon increased. For the first time in eighty years of hatchery operations, coho became self-sustaining in 1962, and hatcheries no longer had to harvest wild coho salmon for eggs.

While some biologists recognized that ocean conditions might have played a role in the abundant return of hatchery-origin coho, it was generally believed that improved hatchery practices, better disease control, and more nutritious feed were the primary reasons. Many salmon managers believed they had achieved a permanent solution to the supply of salmon.

The number of coho salmon, nearly all spawned in hatcheries, peaked in 1976 at 4.1 million fish. Managers let the fishers harvest more coho, which overharvested the wild coho. They also allowed the number of commercial fishing licenses to increase from 2,565 in 1960 to 8,566 in 1978. In 1976, however, a strong El Niño changed the ocean environment and caused a collapse in the coho salmon fishery, dropping the number of fish from 3.7 million in 1976 to one million in 1977. Twenty years later, in 1997, only 28,000 coho were harvested. Because the commercial fleet had grown so dramatically, managers were under pressure to maintain high harvest rates even as the supply was collapsing.

In 1998, Oregon's coastal coho were listed as a threatened species under the federal Endangered Species Act. Eventually, research conducted by the Oregon Department of Fish and Wildlife showed that after the shift in ocean conditions, hatchery-origin coho survived at a much lower rate than their wild cousins. Allowing the overharvest of wild salmon and relying on hatchery salmon was the opposite of what the agencies should have done and may have led to the threatened status of coho.

Working toward Sustainability The U.S. Congress passed legislation in 1976 that governed the marine fishing industry—the Magnuson—Stevens Fisheries Conservation and Management Act—and the management of commercial fisheries changed radically. The act focused on sustainable fishing in marine environments within 200 miles (an increase from 12 miles) of coastal littorals the protection of habitat to benefit fish propagation, and the monitoring of fish food safety for consumers. Fishing regulations in marine and riverine environments were carefully monitored, and fishing seasons for sports fishing and commercial fishing were set based on projections of sustainable fish harvests.

The reauthorization of the Magnuson-Stevens Act in 2007 established annual catch limits, developed market-based management strategies, emphasized a scientific review of studies, and addressed illegal and unregulated fishing and bycatch (that is, using harvest methods that avoid the capture of unwanted species). In 2018, an amendment to the act addressed the development and collection of recreational fishing data, all in an effort to ensure that fish—and the people who make a living catching them—can continue to coexist.

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