

The Ghost Run of the Cowlitz

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Introduction

Everyone knows about endangered salmon these days. They are much in the news as the Northwest's poster child for the Endangered Species Act. But as far as our local history is concerned, it is not the salmon that reigns, but another, less understood, silvery migrant – the Columbia River smelt. In spite of their importance, though, the memory of smelt runs of the Cowlitz River, much like the run itself, seems imperiled of late. Who is now aware that in 1806 explorer Meriwether Lewis (of Lewis and Clark fame) described and sketched a smelt in his journal, hailing it as the best fish he had ever tasted?¹ Or that newsreels shot as early as 1919 carried news of the Cowlitz smelt run throughout the United States and abroad?² These tiny fish swam into the turbulent waters of our history and became a local hero – a symbol of plenty. But recently, like a ghost, the great run of Columbia River smelt -- once the largest run of eulachon in the world³ -- has vanished. Only a few scattered eulachon now make the migration up the Cowlitz -- a river that was once their fertile mother.

Since 1993, the returns to the Columbia River and its tributaries have been dismally low, yielding an average commercial harvest of just 90 tons. During 1940-1992, the average catch was a whopping 1,076 tons⁴. This year commercial fishing was especially poor; 10 pounds of smelt for one day's worth of gillnetting was considered a good catch. Altogether, no more than 6 tons of smelt were captured commercially. Accordingly, the Cowlitz fishery was closed to commercial fishing January 28 and to sport fishing February 2.⁵

What Is a Smelt?

Before we discuss why smelt are on the ropes, we must begin with what a smelt is and know its habits and life history. The Columbia River smelt's more elegant name is *eulachon*, derived from the Chinook Indian language. It is also known as candlefish because when it is dried and provided with a wick, it burns with a steady flame. Its scientific name, *Thaleichthys pacificus*, means "oily fish." Each eulachon begins its life as an egg that anchors itself to the riverbed with a small adhesive foot (peduncle).⁶ After about a month, the smelt eggs hatch, and as soon as the transparent fish emerge from their tiny pod, they are swept seaward by the rapid currents of the Cowlitz. Carrying a yolk sac for their seaward journey, the tiny smelt are at the mercy of all the river's currents as they sail past Astoria, past the Columbia River bar, and into the Pacific Ocean.

When they arrive in the ocean the eulachon find an environment marvelously rich with food. The food is produced when spring currents carry nutrients from the ocean's bottom to the surface to meet the sunshine, causing giant blooms of tiny plants called phytoplankton. Next, tiny drifting animals called zooplankton feed on the abundant phytoplankton, and as they eat, they multiply bringing another tremendous bloom that feeds animals higher in the food chain. These zooplankton are the staple food of the fledgling eulachon. Normally, when the young eulachon first arrive, the waters of the continental shelf are literally teeming with zooplankton.

Unfortunately, not much is known about the eulachon's location at sea. Most likely, they circle the nutrient-rich northeastern corner of the Pacific, following the counterclockwise circulation of the ocean (the Alaskan Gyre) much like salmon are known to do.⁷

The calculus of the smelt's life history is not kind. To maintain the smelt population, each female must produce an average of two offspring that survive to adulthood. Each female produces roughly 17-40 thousand eggs. This means that, for a population to be self-sustaining, the probability that a single egg produces a fish that survives to adulthood is between 1 in 8,500 and 1 in 20,000. You would not want to bet on those odds at the Multnomah Greyhound Park, but they're not bad compared to those that some sea life must endure. (A Pacific oyster's odds of living from egg to adult are about 1 in 25 million).

Eulachon, like their mammalian counterpart, the sperm whale (*Physeter macrocephalus*), are a machine for turning sunlight into oil. They spend three or four years at sea, harvesting the abundance of the ocean (driven by available sunlight off our coast), manufacturing their oils, before the urge to return home overcomes them. The oil makes this return possible and fruitful. Oil fuels their migration home against the power of the Columbia and is the source of energy that smelt pack into their eggs and milt for reproduction.

As the smelt return home, they enter rivers in concentrated schools that make them extremely vulnerable to capture. They are relentlessly pursued in their rivers of birth, which extend from the Klamath River in Northern California, north to the icy Nushagak River in Alaska.⁸

Eulachon Fishing and Use in Early Times

Since early times, when the North American continent was settled -- some 10,000 years ago -- the eulachon must have been captured and used in many ways. We do know

that indigenous people harvested the "oolachon" with dip-nets and giant combs. They continue to harvest smelt in British Columbia, southeast Alaska, and on the Olympic Peninsula (Queets River). They hung the fish on giant racks to dry, smoked them, and extracted their oil, filling boxes with eulachon "grease," about twenty-five gallons to the box.⁹ There being no butter, eulachon oil was used instead. The Kitimat Indians of British Columbia used it with practically all of their food and considered it the tastiest product of the sea.¹⁰

Eulachon grease was the main article of trade between the Kitimat and neighboring tribes. One box of grease could be bartered for four blankets, two beaver skins, or two boxes of dried halibut. Two boxes of grease had the value of one canoe. The price paid for a woman slave might be two or three boxes of grease.¹¹ (There are no more slaves among the Kitimat; all were returned to their native lands in before the turn of the century.¹²) Occasionally, during a potlatch ceremony, a native would throw a box of eulachon grease into a fire, causing brilliant flames to leap above the heads of the amazed onlookers. The host of the potlatch ordered this wanton destruction to demonstrate that it was nothing for a man of his means to burn his property.¹³ The process of drying and smoking the eulachon, as well as extracting its oil, was beautifully described and illustrated by Hillary Stewart in "Indian Fishing."¹⁴ An excellent account of Indian fishing for eulachon was written by John Keast Lord in 1866.¹⁵

As Europeans began to settle in British Columbia, they also dealt in the trade of precious eulachon oil.¹⁶ Some was shipped to Mother England and used as a medicinal oil (mainly a substitute for cod liver oil).¹⁷ A large oil export market, however, never materialized, because eulachon oil found such ready sale among the local Indians.¹⁸ Even

today there is a local demand for the oil, which is sold on the black market. In the 1970s, the price of oil from Alter Bay was as high as \$50 a gallon in a Vancouver Island market.¹⁹ There is a tremendous amount of oil contained in just one good smelt run. A good-sized sperm whale weighs 60 tons and produces 3,500 gallons of oil.²⁰ A good-sized commercial catch of smelt on the Columbia is 3,000 tons (in 1945) -- the equivalent in weight of 50 mature sperm whales -- which could yield roughly 30,000 gallons (10 gallons per ton) of oil using Native American methods of rendering.²¹

Dipping on the Cowlitz

When great schools of smelt push upriver to spawn, their procession is heralded by flocks of sea gulls that come to feast on the tiny fish. Sometimes sea lions and harbor seals join the feast, following the smelt far up the Cowlitz River.²² Of course, another predator hungry for smelt arrives to cash in: man.

During a large run, sports fishermen flock to the banks of the Cowlitz or Lewis Rivers, and sometimes the Kalama and Sandy Rivers, to fill a bucket with part of the silvery flood. For most, smelt fishing means learning to become expert at handling a dipnet -- a 10-foot pole with a hoop that is 16 inches in diameter to which a light net is strung. Standing along the shoreline, the fisherman swings his net upstream and plunges it into the swift current near the river bottom. The net is swept downstream a distance of about 12 feet, trapping whatever smelt lie in its path. "The big mistake most first-time dippers make is trying to scoop into the current," said Wolf Dammers, a biologist with the Washington Department of Fish and Wildlife. "They discover rather soon that the easiest and most effective way is to scoop the net slightly ahead of the current."²³

In good years, sports fishermen catch their limit of 20 pounds with one scoop of the dip-net. This ingenious method of fishing, which has remained unimproved for centuries, was borrowed from Native Americans. It is the method of fishing observed by the Lewis and Clark party in February 1806. "...[A] species of small fish which now begin to run, are taken in great quantities in the Columbia R. about 40 miles above us [the Cowlitz River] by means of skimming [sic] or scooping nets," wrote Lewis. Along the Cowlitz, European settlers adopted the method sometime before 1872, when the Kalama Beacon reported that Johnny McGrath of Camp Enterprise caught two barrels of fish within half an hour.²⁴ By 1892, commercial smelt fishing was already catching on, with an estimated catch of nearly 250 tons. In that year, the Wallace Brothers, fish dealers of Kalama, shipped a carload, or 10 tons of smelt to New York City, and had no trouble selling them.²⁵

In the early 1920s, when the naive Longview newcomers arrived, a veteran smelt fishermen of Kelso, Lee Galloway, apparently told them to use an old hat, a piece of burlap, a pitchfork, a screen door, or a bird cage to capture the smelt²⁶ We can imagine that the Kelsonians peered over the banks of the Cowlitz and rolled with laughter watching the greenhorns struggle against the current with their birdcages and hats while their Kelso neighbors netted tons of smelt with dipnets.

Commercial Fishing

But to the serious smelt fishermen, the arduous and sometimes dangerous labor of commercial smelt fishing, a fickle market, fickle quarry, and stiff competition were not at all humorous. "It is now estimated that by the close of the season," wrote R.G. Callvert in

1910, "the river will have yielded 200,000 boxes of smelt, each box weighing 50 pounds. This will represent an output of 10,000,000 pounds or 5,000 tons and as smelt average about eight fish to the pound, it means the marketing of 80,000,000 fish."²⁷ Then, there were 500 two-man boats used in the smelt industry of which only 75 were powerboats.²⁸ Mostly at night, a pair of men would row their boat into position along the crowded Cowlitz, drop anchor, and begin the back-breaking labor of scooping smelt from the river bottom until their craft was filled. On a good night, two strong men would bring in one ton of smelt (45 boxes). As of 1910, the largest known catch for two men in one night was 3.1 tons of smelt (125 boxes).²⁹

Conditions were dangerous. Many of the fishermen suffered from "smelt poisoning," a very painful condition thought to be caused by fish slime that penetrated the flesh through a scratch or cut in the skin.³⁰

Sometimes a boat would leave with two fishermen and return with one. In 1915, according to the *Kelsonian*, fishing under crowded conditions led to "a number of narrow escapes from smashing boats in collisions with other boats or snags."³¹ On 2 February 1909, Lee Galloway's brother, John, disappeared at night and was never found. He dropped anchor in the Cowlitz with Frank Vandermost near Hill's Mill, dipped twice, and on the third dip fell into the river and was swept away. He was no novice. He was one of the oldest, most experienced, and best-known fishermen on the river.³² Two years before his death, he and a partner caught 52 boxes, or nearly 1.5 tons of smelt, in less than an hour.³³

What did the fisherman have to show for all his labor and grit? Not much. In the early days of the fishery, dipping equipment was inexpensive and unlicensed. A large

number of fishermen entered the fishery, creating a glut in the smelt supply that quickly led to lower prices. This forced fishermen to work for less than a living wage, especially later in the season.³⁴ The best a fisherman could hope for would be to catch smelt in large numbers early in the season before prices plummeted. In 1910, at the beginning of the season, a 50-pound box would fetch \$5; within a month, as the markets became saturated, its price would fall to \$0.50.³⁵ The drive to get fish to the market earlier eventually led to gillnetting smelt in the mainstem Columbia. The idea was to catch the smelt before they arrived in the Cowlitz River and get the smelt to market before prices dropped. The smelt would, if running, bring a welcome profit to the salmon fishermen during the lean winter months. The gill-netters must have angered dipnetters who could only watch while their hopes for profits disappeared with the early mainstem Columbia catches. When fish would fail to arrive in the Cowlitz, some blamed the gill-netters, claiming that they disturbed the advance run by catching the lead fish. This, some dippers claimed, caused the smelt to mill around in small schools from the mouth of the Columbia to a few miles above the Cowlitz.³⁶

Although there were several attempts to organize the smelt fishermen to combine selling forces, limit supply, and make prices uniform, there is no indication that it was ever successful. In 1909, the Columbia River Smelt Association was organized. According to the *Kelsonian* in 1909, "The people of Kelso will welcome such an organization among the fishermen, as it has always been a greatly deplored fact that they receive such low prices for their fish." The very next year, despite the organization, as usual prices fell from \$5.00 to \$0.50 per box.^{37,38}

As another remedy for the fickle market, the Kelso Commercial Club sought to increase demand through an extensive public relations campaign. "The people of Kelso," said the Club, "could take upon themselves a little campaign of education which will tell the outside world the wonders of the industry, the method of catching the fish, their habits, etc."³⁹ Thus began the smelt boosterism that would grip Kelso and Longview alike.

Smelt Boosterism and Missing Runs

During the 1923 Pageant of Progress, Longview's first birthday celebration, Kelso's float proudly featured a giant smelt. The float proclaimed in large letters "Kelso: Home of the Columbia River Smelt." By 1956, the Kelso Chamber of Commerce modified this slogan to "Kelso -- Smelt Capital of the World," and posted it on two eight-by-sixteen foot billboards placed at the north and south entrances of the old Highway 91.⁴⁰ The smelt run was a featured topic on the radio show "Northwest Theater of the Air."⁴¹ Smelt festivals were held. Kelso legionnaires packed a 32-pound box of the 1948 smelt run and airmailed it to President Harry Truman, who graciously received the smelt along with a speech from U.S. Senator Harry Cain extolling the virtues of smelt.⁴²

Longview also got into the act. Every year, the Associated Student Body of Lower Columbia Junior College elected a queen from the freshman class to rule over the annual run of the Eulachon on the Cowlitz River.⁴³ The queen and her court were treated to a photo shoot with local smelt fishermen and a box of freshly caught smelt. In 1944, the eulachon became so scarce in early March that queen Ruby Anderson [then Alexander]

had to settle for a photo with smelt bought from a local store.⁴⁴ In other years, like 1950-51, the smelt pulled a no-show.

But smelt runs have never been dependable. "Some fifty years ago," wrote London naturalist John Keast Lord in 1866, "vast shoals of eulachon used regularly to enter the Columbia; but the silent stroke of the Indian paddle has now given place to the splashing wheels of great steamers, and the Indian and the candle-fish have vanished together."⁴⁵ Lord, like so many others who followed him, was misled by the fickleness of the smelt. Despite the splashing wheels of steamers, the smelt reappeared in the late 1860s, just after Lord wrote their obituary notice. The smelt were simply away on an extended (30-year) leave of absence. According to historian Duncan Stacey, Hudson's Bay Company documents describe very low returns in the Columbia River from about 1835 to 1865.⁴⁶ This might explain why William A. L. McCorkle, who settled in Lexington in 1850, wrote that he did not observe smelt in the Cowlitz until 1867.⁴⁷

In the years when they do return, the smelt sometimes avoid the Cowlitz, choosing to run in the Kalama or Lewis Rivers instead.

As people wearied of the truant smelt runs, smelt boosterism gave way to resignation -- too many rain dances with too little rain. Many times the celebrations had to be held without the guest of honor. The smelt festivals ended, the eulachon queen abdicated her throne, and the smelt capital of the world became "City of Friendly People."

⁴⁸ Kelso and Longview have apparently given up on the smelt run. Is resignation warranted?

Perhaps yes. In 1993, the total eulachon landings declined sharply and have remained low ever since. This decline is due to lack of fish, not a lack of fishing effort. In

1997 and 1998, the fisheries were closed by the Washington Department of Fish and Wildlife.⁴⁹ Since smelt can only live for four years, it is clear that if little or no fish return for four years, they are either extinct or nearly so. There would need to be tremendous survival of the relatively few juvenile fish during these slim years for the smelt population to rebound. Washington State biologists are not at all optimistic. The low returns we have seen recently are clearly unprecedented in the record of yearly catches since 1938. The total catch between 1938 and 1992 averaged 1,077 tons and dipped below 260 tons just once (in 1984). Since 1992, by contrast, the total catch has been consistently lower than 260 tons, ranging from a high of 257 tons in 1993 to a low of just five tons in 1996.

Reasons for Declines

Are we confronted with extinction of smelt, 30-year failure of the fishery, or is this just a small run of failures? We know that before 1993 absences were fairly common. Looking only at the Cowlitz River catches since 1938, there were several years prior to 1993 when the smelt were absent or so few as to yield no catch: 1950, 1951, 1965, and 1977. There were additional years when the harvest was disappointingly low (less than 50 tons): 1938, 1949, 1959, and 1979.

"If a person could keep track of all the theories about those smelt," opined the *Daily Kelsonian-Tribune* in 1928, "the so-called Philadelphia lawyer would look like a simple-minded person."⁵⁰ The reasons given for smelt disappearances are indeed many. They include: El Niño, the eruption of Mount St. Helens, large incidental catches of eulachon in the coastal shrimp fishery, pollution,⁵¹ dredging, straying to other rivers, water

that is too cold or too warm, a sandbar at the mouth of the Cowlitz,⁵² seal and sea lion depredations^{53,54}, and gill-netters⁵⁵.

Some of the reasons for the disappearances seem logical, others plain silly. In 1915, when the smelt failed to appear in the Cowlitz, choosing to enter the Kalama River instead, a reporter wrote, "Some think the Democrats are the cause and other lay the strange freak to plain cussedness on the part of the fish."⁵⁶ The fact is, even more reasonable explanations do not stand up to careful scrutiny. Let's take the example of El Niño.⁵⁷ It sounds like a promising explanation for smelt declines. "Scientists suspect that the notorious El Niño has walloped smelt," wrote *Oregonian* reporter Brian Meehan. "These plankton feeders are susceptible to El Niño's warming trend, which disrupts the ocean's food chain by thwarting the upwelling of cold, nutrient-rich water."⁵⁸

Let's run a quick test of this hypothesis. Over the past 60 years, there have been five strong El Niños. If the theory is correct, El Niño has had its greatest effect on the young smelt migrating to sea, and therefore we would expect that the harvest of smelt returning 3-4 years after each El Niño would be smaller than the mean return for all years. However, the mean catch during years affected by El Niño was 1,264 tons and the mean catch overall was 980 tons. This means that El Niño appears -- if anything -- to be not bad, but good for smelt!

Pollution has also been blamed for poor returns of smelt in the Cowlitz. As early as 1927, their mysterious absence led county game warden Chester Leichardt to test waters for harmful chemicals released by Pacific Strawboard and Paper Company.⁵⁹ In 1951, a group led by Wendell Smith, state Fisheries Department fish biologist, seriously tackled the question of whether pollution was responsible for vanishing smelt runs.⁶⁰ The

published results of their work were not released until 1955. By that time, the smelt were already rebounding from their 1949-1951 slump. Always, when people believed the smelt would not again return, they did.

Smith and his colleague Robert Saalfeld concluded that it could not be determined "whether the absence of smelt in the Cowlitz during 1949, 1950, and 1951 resulted either wholly or in part from pollution. It is significant that failures occurred during the early 1900s when the quantity of industrial discharge was certainly below that occurring recently." In their experiments, however, they did notice that smelt avoided industrial wastes and recommended there was "merit in keeping pollution to a minimum."⁶¹ This must have seemed impotent advice, even in the 1950s, before the Clean Water Act of 1972. But often this is the best science can offer in fisheries research. Eventually, the smelt population itself answered their research question. Despite the water pollution of the '50s, the Cowlitz smelt population rebounded tremendously, with a harvest of more than 1,000 tons in 1958.

The Washington Department of Fish and Wildlife (WDFW) may have recently discovered one of the major reasons for the decline of smelt -- bycatch. Bycatch is the killing of fish that are not the target of the fishery. Smelt are caught incidentally in the shrimp trawl fishery. Trawls are large, open-ended drag nets pulled through schools of shrimp. According to the WDFW, "High levels of by-catch of eulachon in the shrimp fishery have been reported in certain areas of the ocean ranging from northern Oregon to the southern end of British Columbia."⁶² If this truly is a major problem causing the recent smelt decline, it may be politically difficult to solve because it would mean curtailing the shrimp fishery.

Conclusion

As we stand here in 1998, we need to take a hard look at the Columbia River smelt. It is not unheard of for a species as numerous as smelt to disappear forever. One need look no further than the passenger pigeon (*Ectopistes migratorius*) -- a migratory bird hunted to extinction by man. In the early 1800s, billions of these birds inhabited eastern North America; migrating flocks blackened the skies for days. As settlers pressed westward, however, the pigeons were slaughtered by the millions each year. By 1870 the species was declining rapidly. It disappeared altogether in 1914 when the last known representative died in the Cincinnati Zoo.⁶³

On the other hand, perhaps biologists and fishermen have cried wolf too many times, and the smelt have played us for fools all along -- returning in large numbers just when we have given up all hope. This is a common dilemma for wildlife managers and biologists. Regardless of our education and experience, fish continue to make us look like buffoons, unable to tell how well fish stocks are faring let alone predict the future. Like weathermen, we learn humility in the face of blown predictions and ensuing public ridicule. Where we stand now, we do not know whether the smelt are another passenger pigeon or just temporarily in decline because of the natural ebb and flow of population. Although some have written off the smelt run, others of us, fix our eyes upon the taunting, rushing waters, ready to strike when a giant apparition, our Cowlitz smelt run, reappears.

Figure 1. The ups and downs of the Cowlitz River commercial catch of smelt 1938-1998. (Data Source: Washington Department of Fish and Wildlife). Note the many years when there was no catch. In those years smelt failed to materialize in the Cowlitz.

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Dedication. To my Dad and brothers who allowed me, when no older than five, to tag along with a bucket while they dipped smelt from the Cowlitz. And also, to my two-year-old son, Christian. May he one day plunge a dip-net into the Cowlitz and pull up 20 pounds of smelt (when it is legal to do so).

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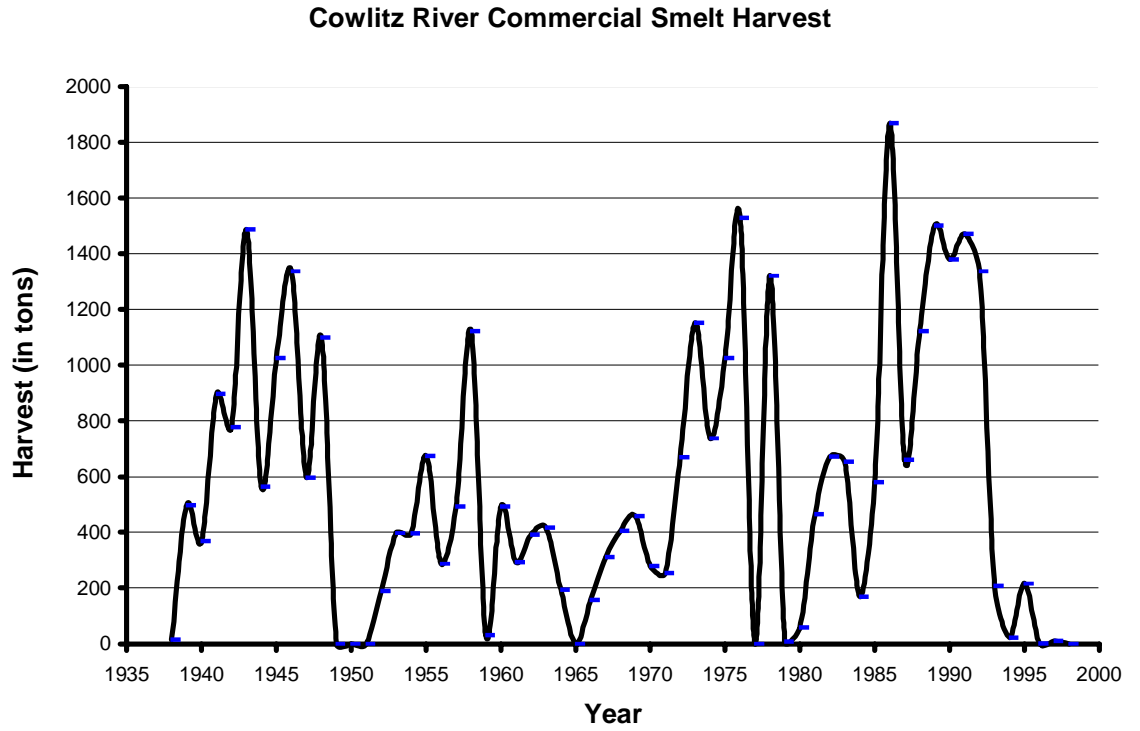


FIGURE 1