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CHINOOKAN PEOPLES

of the

LOWER COLUMBIA

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ABORIGINAL FISHERIES OF THE LOWER COLUMBIA RIVER

Virginia L. Butler and Michael A. Martin

Salmon has an iconic status in the Pacific Northwest, and both scholars and the general public traditionally have viewed it as the dietary staple of Northwest Coast Native people. Early 20th-century anthropologists named the Pacific Northwest the Salmon Area to highlight the primacy of this resource to Native economy and ways of life (Wissler 1917). Later 20th-century anthropologists theorized that the complex Native cultures seen at European contact—characterized by large population size, hierarchical social organization, and elaborate art—were made possible largely by the catching and storing of large quantities of salmon (e.g., Matson 1992).

Scholars have challenged this salmoncentric view on several fronts. First, analysis of ethnographic records has highlighted the diversity of resources used (Suttles 1990; Moss 1993), including the important role of plants (Deur and Turner 2005; see ch. 3 in this volume). In a recent test of the hypothesis that increasing salmon use was a driving mechanism for the development of cultural complexity, Butler and Campbell (2004) reviewed zooarchaeological records from multiple south-central Northwest Coast sites. While salmon remains were the most ubiquitous fish taxon and the dominant fish in about half the assemblages, other species (flounder, herring, and sculpin) dominated almost half. There was no evidence that salmon use increased in tandem with increasing cultural complexity.

Recent analysis of ethnohistorical accounts (Martin 2006) and fish remains from Lower Columbia River archaeological sites (e.g., Butler 2002a, 2005; Frederick 2007; Wigen 2009) offer an opportunity to evaluate the salmoncentric paradigm in this region of the Northwest Coast. The Columbia River system is known for its once-spectacular salmon runs. Before late 19th-century declines caused by overfishing and habitat destruction, 10 to 16 million salmon and trout representing six species migrated into the Columbia between March and October on their way to spawning grounds (NWPPC 1986). Given the vastness of the resource, there has been a tendency to assume that salmon was the *sine qua non* of indigenous peoples' way of life in the Columbia and elsewhere in the Pacific Northwest (e.g., Saleeby 1983; Lichatowich 1999; Beckham 2006; see also Hunn 1990).

The Lower Columbia River is here defined as the 230–kilometer (140–mile) section between the mouth and The Cascades, a large set of rapids now drowned by waters behind Bonneville Dam. We draw on two kinds of records to document aboriginal fisheries: 19th-century eyewitness accounts, mainly by explorers and fur traders, provide details on the types of fishes, the season and location of fisheries, and methods of capture and preparation (Table S4.1 online); and archaeological records, mainly from fish bones and teeth left by aboriginal fish harvesting and food preparation at villages and campsites, help document which fish were used at various times and places (Table S4.2 online). While archaeological records lack the detail found in historical records, they provide a much longer history of fisheries and are an independent record for fish use and human adaptations overall.

Together, the records show a complex picture of Columbia River fisheries. While salmon are prominently featured in 19th-century records, the capture, preservation, and trade in sturgeon and eulachon are also a critical part of the fisheries. During spring, the fisheries tended to target sturgeon over the spring chinook. The archaeological record also shows that salmon, sturgeon, and eulachon were heavily used and also the importance of minnow, sucker, and perhaps even stickleback, all of which are almost ignored in 19th-century accounts. These last fishes would have been most prominent in backwater areas of the Columbia River floodplain, a vast seasonally flooded wetland that represented an extremely productive resource patch with fish and other resources.

NINETEENTH-CENTURY ACCOUNTS

Most native fish species for the Lower Columbia reported in the current literature (Farr and Ward 1993; Wydoski and Whitney 2003) were part of the Native American fishery. Eyewitness accounts by explorers and natural historians (Lewis and Clark, Townsend, Douglas, Scouler, Wilkes), fur traders

(McDougall, Franchère, Stuart, Henry), and settlers (Swan) provide extremely useful details on traditional fishing between 1800 and 1855 as well as a starting point for interpreting the archaeological record of fish use (see Table S4.1). Epidemic diseases in the late 18th century and again in the 1830s reduced lower-river Indian populations by as much as 90 percent, which resulted in the loss of much traditional knowledge of fish and fishing. Thus the historic and archaeological records are especially valuable for showing the richness and complexity of fishing practices of Chinookan people.

The historical records have limitations, however. First, most were written during a time of dramatic change in people's lives on the lower river. Population losses would have affected social organization, tribal territories, access to fishing areas, production of fishing gear, and other aspects of life. Thus 19th-century practices may not reflect those of even a few decades earlier, much less several centuries. Also, many accounts are from fur-trade agents engaged in buying fish from Indians to provision their posts. The fish purchased were those that could be taken in and preserved and that were compatible with Euro-American tastes. The accounts were written through the filter of the Euro-American worldview that obviously carried certain prejudices, and most reports were made by visitors who were in the area only part of a year or who traveled in limited areas. Identifying fish species in 19th-century accounts can also be challenging (see Martin 2006). Recognizing these potential problems and biases, we have taken a critical approach in analyzing the records, seeking multiple, independent records for practices. We also view the short summaries below as hypotheses that can be investigated rather than as definitive accounts.

Salmonidae

The Columbia River is home to multiple species in the Salmonidae family, including anadromous runs of salmon and trout in the genus *Oncorhynchus* and nonmigratory forms of whitefish (*Prosopium*) and trout (*Salvelinus*). Species of *Oncorhynchus* were the most important food resource in the family, which includes chinook salmon (*O. tshawytscha*); coho salmon (*O. kisutch*); chum salmon (*O. keta*); sockeye salmon (*O. nerka*); pink salmon (*O. gorbuscha*), in limited numbers; steelhead trout (*O. mykiss*); and cutthroat trout (*O. clarki*). Except for some steelhead, adults in the genus die after spawning. Young salmon emerge from spawning sites and, depending on the species, spend from a few weeks to more than a year in freshwater before migrating to sea, where they live between two and seven years before returning to their natal stream to spawn and repeat the life cycle.

Until the declines in the 19th and 20th centuries, chinook salmon were far and away the most important salmon species to Columbia River commercial fisheries because of their abundance and size—in excess of 1 meter (3.2 feet) long and 6 kilograms (13.2 pounds). Columbia River chinook have three main runs: the spring run enters the Columbia from February to June; the summer run travels through the lower river from June through August; and the fall run lasts from mid-August through October (Fulton 1968, 1970). Most fish in the spring and summer runs do not spawn in lower-river tributaries but migrate through the main stem en route to distant upper-system spawning areas. An important exception is a portion of the spring run that ascends the Willamette River over Willamette Falls, which is passable only in high water associated with spring snowmelt. In contrast to the spring-summer runs, several populations of fall chinook migrate into and spawn in several Lower Columbia tributary rivers and streams—for example, Youngs River, Clatskanie, and numerous tributaries of the Cowlitz and Kalama Rivers (Martin 2006). Fish that make up the spring-summer run in the lower river are less reproductively mature than fall-run fish and have a fresher appearance and higher fat content.

Euro-American accounts of chinook salmon fishing on the lower river mention taking fish at two natural constrictions: Willamette Falls (for the spring run) and The Cascades (for all the runs). The fishery began as soon as the spring run arrived at both falls, varying yearly from early April to early May (Martin 2006) and continuing at The Cascades until October. Native Americans constructed elaborate wooden fishing platforms and walkways adjacent to and over narrow channels through which migrating salmon had to pass; at The Cascades, some channels were constructed by aligning boulders and rocks in rows as much as 15 meters (50 feet) long (Wilkes 1845:380). Fishermen scooped up fish using hoop nets that were about 1.2 meters (4 feet) in diameter mounted on a pole about 9 meters (30 feet) long (e.g., Wilkes 1845), and snagged them with gaffs (long poles with hooks fixed to the end). The productivity of this fishery was enormous. At Willamette Falls in 1841, it was estimated that one person could catch 20 large fish in an hour (Wilkes 1845:345).

Eyewitness accounts of chinook salmon fishing downstream of the falls using seines is less common. The description of beach seining for salmon in Baker Bay at the mouth of the Columbia in the late 1850s is the most detailed

(Swan 1972:137). Extremely large nets—30–180 meters (100–600 feet) long and 2–5 meters (7–16 feet) deep—made from spruce root or grass were deployed by several people working between the shore and in a canoe offshore. Floats tied to the net margin were made from cedar, and the base of the net was held down by notched round pebbles weighing less than .5 kilograms (1.3 pounds). Other observers simply mention that seines were used for salmon fishing (Martin 2006). One challenge to seining would be the net damage caused by trees and branches resting on the channel bed or shoreline; such debris would have been extremely common before flood-control measures were in place on the river. Upriver of The Cascades, seining occurred over sand or water-worn cobbles, free of sharp bedrock (Douglas 1959). The high costs associated with the manufacture and maintenance of nets may have limited their use, especially relative to fishing at the falls.

Historic accounts do not mention the construction and use of weirs to capture salmon or other fish on lower-river tributaries and streams, which is striking considering that weirs were used to capture salmon in Puget Sound rivers (Suttles and Lane 1990:489) and commonly used elsewhere on the Northwest Coast. Moss (2012:323–38) reports over 1,300 remains of ancient weirs from Oregon to Alaska. Archaeologists Gary Wessen and Richard Daugherty (1983) found remains of a weir on the south bank of Vancouver Lake, though freshwater fish and not salmon were the likely target. In 1841, the Wilkes Expedition described a weir on the Chehalis River, a drainage system north of the Columbia (Martin 2006).

Several accounts mention that chinook salmon were speared from canoes or in shallows from shore, using hooks or harpoon heads fitted on the end of a long pole. In some variations, the spear portion would be tied to the pole by a cord that would detach when the fish was struck, and the fish would be hauled in by the cord; in other cases, fish would simply be stabbed and hauled into the canoe. The spear fishery tended to target the fall-run fish that were migrating into lower-river tributaries to spawn. Fish were relatively concentrated and accessible at tributary mouths, allowing for a very productive fishery. In 1811, for example, a single fisherman from Chinook Village on Baker Bay was observed spearing 120 salmon in one morning (McDougall 1999:56).

According to 19th-century accounts, fish caught in the spring-summer run on the lower river were mainly consumed fresh and were not smoked or dried, whereas the fall-run fish were smoked. This practice was probably due to several factors. Fish in the spring-summer run contained much more fat than those in the fall run (Schalk 1986), and the timing of the spring-summer runs coincided with periods of higher rainfall and cooler weather; both conditions made it more difficult to preserve earlier running fish than later arrivals. Three eyewitness accounts indicate that the flesh from fall-run chinook was preserved inside residences, where fish were hung by the rafters and cured by the smoke and heat from hearth fires (Townsend 1999:256; Corney 1965:46; Swan 1972:111). An 1853 account describes fish being butchered and processed for storage at a camp on the Naselle River, apart from residences. This practice included separate curing of heads and tails, with the main part of the body sliced thinly and dried. Three other accounts note the production of dried salmon. Describing practices below Fort Vancouver (Work 1824) in 1824 and in 1853 at the mouth (Swan 1972:111), observers noted that dried or roasted salmon was finely broken up, pounded, and pressed into baskets and that oil and berries were added to the mixture. The third account, from 1836, noted that Indians produced pemmican from dried salmon, but we do not know the location (Parker 1967). Overall, though, there was much less salmon preservation on the Lower Columbia than in the arid regions upriver of The Cascades. No 19th-century accounts refer to the elaborate and extensive sets of drying racks such as at The Dalles. In fact, large quantities of dried chinook salmon were shipped downriver from The Dalles area for trade with lower-river Native people and fur traders (McDougall 1999:178, 188).

Salmonids other than chinook are mentioned less frequently in 19th-century accounts. Chum (or dog) salmon, which migrate into the Columbia from October through December, was noted by several observers, although usually for its local abundance in streams. Like fall-run chinook, chum enter freshwater ripe and ready to spawn, mainly in tributaries below The Cascades (Fulton 1970). With limited fat, chum salmon were smoked and stored (Stuart 1935:8). Several Euro-American visitors complained about chum as a food source; David Douglas (1959:239–40), for example, noted that it was lean like pine bark. Fish that were described as “small salmon” and “salmon trout” or “white salmon trout” may represent coho salmon and steelhead, but assignment of taxa to species is difficult (Butler 2004). Regardless of the taxon, their use was relatively minor. None of the 19th-century accounts appear to refer to fishing for either sockeye or pink salmon. While pink salmon was probably not abundant in the Columbia (based on commercial fishery records), the river supported large numbers of coho and sockeye salmon, and their limited mention in 19th-century accounts is surprising. There is also no mention in the accounts of capturing and using other resident salmonids, including whitefish or bulltrout.

Sturgeon

The northeast Pacific and Pacific Slope drainages are home to two species of sturgeon: white sturgeon (*Acipenser transmontanus*) and green sturgeon (*A. medirostris*). White sturgeon, which is more abundant than green sturgeon in the Columbia system, grow to about 6 meters (20 feet) and weigh about 580 kilograms (1,200 pounds), while green sturgeon are smaller, at about 2 meters (6 feet) and 160 kilograms (350 pounds) (Parsley et al. 1993; Wydoski and Whitney 2003). White sturgeon can live for as many as 100 years and they mature late, after 10 years, making them highly susceptible to overfishing (Rieman and Beamesderfer 1990). Both species migrate in and out of marine waters. Green sturgeon are mainly found in the estuary below river mile 38, while white sturgeon are found along the entire main stem to the headwaters of the Columbia and Snake River systems. Multiple 19th-century accounts indicate that Euro-Americans were familiar with both species but that they preferred the taste of white sturgeon.

Although white sturgeon were available throughout the year, particularly large numbers were taken from February to April, when the fish collected to prey on spawning runs of eulachon (*Thaleichthys pacificus*). Native Americans caught large quantities of sturgeon, including some to sell to fur traders. Between February and April 1813, for example, traders purchased at least 300 large fish to supply Fort Astoria, and the fort head suggested that the winter sturgeon fishery was sufficient to support 50 to 60 men for four months. During midsummer, fur traders purchased smaller quantities of white sturgeon from the fishery in Baker Bay (McDougall 1999).

Sturgeon were captured using hook and line, net, gaff, or spear. At least some sturgeon angling was configured as a set line, where a series of baited hooks on leaders or secondary lines spaced at about 3.7 meters (12 feet) apart was attached to the main line. Fishers fixed a line to the shore using a large rock weighing 7–8 kilograms (15–16 pounds) and stretched the line away from shore using a float anchored to the river bottom with another rock (Franchère 1967). Individual fish were netted in a funnel-shaped net, 1.5–2 meters (5–6 feet) wide, 3–4 meters (10–12 feet) long, with a white lure at the end. Two men in a canoe, holding lines connected to the net, drew the net along the channel bottom. When they felt movement in the net, the fishermen closed it, trapping the fish (Franchère 1967:112–13). In the Baker Bay summer fishery, fishers speared sturgeon from a canoe with a single toggle harpoon. One eyewitness reported that this method was used by specialists who had the knowledge to locate the fish and the strength to land it without tipping over the canoe (Swan 1972). Finally, sturgeon may have been collected on the beach or in nearshore shallows. In fall 1805, a local Indian told William Clark that beached sturgeon and other fish were obtained in this way (Lewis and Clark 1990:121).

People on the lower river prepared and sold fish fresh and smoke-cured. For smoke-curing, a sturgeon was sliced into large pieces and suspended from rafters in houses. Ten to 12 pieces were sold in "bales." On April 19, 1812, Duncan McDougall (1999) purchased 10 to 12 bales for Fort Astoria, which he hoped would last until the salmon arrived in May.

Eulachon

Eulachon, also known as candlefish or smelt, is distributed from northern California to the Bering Sea. A relatively small, short-lived (~3 years), anadromous species—about .14–.20 meters (5–8 inches) long—eulachon live most of their lives in inshore marine waters. Adults migrate in dense schools short distances up rivers to spawn in winter and early spring (Wydoski and Whitney 2003); about a month after eggs are laid, larvae hatch and drift downstream to saltwater to begin the cycle again. At one time, the Columbia River had the largest run of all eulachon rivers (Biological Review Team 2008). Prime spawning areas included the lower reaches of the Sandy, Lewis, Kalama, and Cowlitz Rivers and limited sections of the Columbia's main stem. Peak times for the run were in February and March (Wydoski and Whitney 2003), but fish were noted entering the river as early as December and as late as April.

Historical records suggest that annual run size was variable, both overall and in particular tributaries. The Cowlitz River, for example, once supported a large commercial eulachon fishery; over 3 million pounds were recorded in 1932 alone (Smith and Saalfeld 1955). Hudson's Bay Company reports, however, record runs that were absent or limited in the Cowlitz River between 1835 and the 1850s (Hinrichsen 1998), and eulachon did not spawn in the river in eight years between 1910 and 1954 (Smith and Saalfeld 1955). A compilation of commercial fishery landings between 1888 and 2008 also shows highly variable harvest levels (Biological Review Team 2008), which provides a crude measure of variability in the run. According to George Suckley's (1860b) account on the southern end of Vancouver Island, eulachon "are very abundant in certain seasons, but nearly always a season of abundance is followed by three or four years of scarcity. Further northward they are constantly abundant" (348). The causes of the fluctuation are not clear, although changing ocean conditions are thought to contribute (Biological Review Team 2008). Overall, eulachon may not have been a dependable resource in particular locations.

Lower Columbia River Indians captured eulachon using either a rake or a scoop net. Alexander Henry (1992) described the rake as a "pole about 10 feet long and two inches thick, on one side of which was fixed a range of small, sharp bones like teeth, about one inch long, one-fourth of an inch asunder, the range of teeth extending six feet up the blade" (683). Fish were impaled on the "teeth" as the rake was swept back and forth in the water. In both 1806 and 1812, large quantities of eulachon reportedly were taken with "scooping" nets (Lewis and Clark 1990:346; Stuart 1935).

Fish were consumed fresh, but most descriptions refer to smoke-curing. In 1806, Meriwether Lewis wrote: "the natives run a small stick through their gills and hang them in the smoke of their lodges, or kindle a small fire under them for the purposes of drying them. they need no previous preparation of guting &c and will cure within 24 hours" (Lewis and Clark 1990:378). At Cathlapotle (45CL1) on the Lewis River, he saw large quantities of eulachon strung on small sticks, arranged in large sheets, and hung suspended by poles in the roofs of houses (Lewis and Clark 1991:27).

Native people of the Lower Columbia apparently did not render eulachon for oil, a common practice of First Nations people in coastal British Columbia, where the oil is a prized item in trade and community events (Swan 1880). Across all 19th-century accounts, only missionary Samuel Parker (1967), who visited Fort Vancouver in 1835–36, refers to eulachon oil. Given the lack of corroboration from other accounts, it is unlikely that oil was produced in the region.

Almost all historic accounts between 1804 and 1813 highlight the eulachon fishery, its abundance, and its value to Native Americans and Euro-Americans involved in the fur trade. The fishery was strongly seasonal, targeting upriver migrating adults moving into spawning grounds of lower rivers during the late winter-early spring. Observers reported seeing "immense numbers" (Stuart 1935:30), "Great quantities" (Lewis and Clark 1990:346), and "many canoes" (McDougall 1999:72) of eulachon being transported. Actual quantities of fish caught and traded can be estimated from 1810s fur-trade accounts, which report the purchase of dried eulachon by the "fathom," a six-foot length of fish strung head to tail. In 1813, one agent purchased 353 fathoms from Native fishermen (McDougall 1999), about three tons of fresh fish (Martin 2006).

Lamprey

While at least three species of lamprey (sometimes known as eel) are found in the Pacific Northwest (Smith and Butler 2008), the Pacific lamprey (*Entosphenus tridentata*) is the largest (lengths of .75 meters [2.5 feet]) and most commonly recognized and was likely the species most sought by Native people of the Lower Columbia. The Pacific lamprey has a complex life history, reaching adulthood in ocean waters and then migrating into freshwater between April and June to spawn. Eggs are laid in stream gravels; larvae emerge, leave the nest, and then burrow into silt/mud, where they spend four to six years before migrating out to sea to mature before returning to freshwater to repeat the cycle.

Lamprey were not traded to Euro-Americans, although three 19th-century observers commented on the fish. In June 1845, Charles Wilkes (1845a:346) noted large numbers of lamprey ascending Willamette Falls, but no one was fishing for them. Others reported that lamprey were smoked and stored in Native American camps. In April 1834, Dr. John Townsend (1999:210) saw lamprey in an Indian lodge near the confluence of the Willamette and Clackamas Rivers, downstream from Willamette Falls; he reported thousands of lamprey were being smoke-cured in lodges on Hamilton Island near The Cascades in July. In 1812, Robert Stuart (1935) mentioned lamprey but did not include a location.

Key aspects of the lamprey's biology and ethnographic accounts from the Upper Columbia (Close et al. 2004) suggest that the fish were likely intercepted during their late spring and summer spawning migration. They are not fast swimmers and tend to mass at waterfalls, where the steep gradient and current reduce their upstream travel speed. To ascend the falls, lamprey crawl up rock surfaces, using their suckerlike disc mouths to adhere to the rock face, and then slowly creep up and over the walls. Native fishers picked lamprey off the surfaces by hand or using a hook (Close et al. 2004). It is likely that fishers used similar approaches on the lower river.

Miscellaneous Fish

Nineteenth-century accounts note the taking and trade of a few mainly saltwater fish that enter and sometimes reside in the lower river near the mouth, such as flatfish—for example, starry flounder (*Platichthys stellatus*, Pleuronectidae), surfperch (Embiotocidae), and herring (*Clupea pallasii*) (Martin 2006).

The absence of a herring fishery is especially notable. Herring are common in the lower river (Monaco et al. 1990); fish spawn within 55 kilometers (88 miles) of the mouth (Lassuy and Moran 1989). In the 1850s, Swan (1972:27) observed a herring fishery in Willapa Bay, but not in Baker Bay or other places nearby. A reference to *Clupea* by John Scouler (1905), based on a fish that Indian children had caught near Fort Vancouver in 1825, is suspect, as the description and position of the teeth suggest the fish is a cyprinid (minnow family).

Resident freshwater fishes, including multiple species of minnow—northern pikeminnow (*Ptychocheilus oregonensis*), peamouth chub (*Mylocheilus caurinus*), chiselmouth (*Acrocheilus alutaceus*), and dace (*Rhinichthys* sp.)—and largescale sucker (*Catostomus macrocheilus*), are abundant in the lower river and backwater lakes and channels. Both minnows and suckers prefer relatively warm, slow-moving water. Suckers are mainly herbivores, grazing on algae and aquatic vegetation, while minnows tend to be more carnivorous, consuming a variety of invertebrates and fish species. Minnows are commonly thought to be very small fish, when in fact body size varies between large species such as the northern pikeminnow, which can reach more than .5 meter (1.6 feet) long and weigh over 10 kilograms (22 pounds), to medium-sized fish such as the chiselmouth and the peamouth chub, typically attaining 30 centimeters (1 foot), to small dace and shiners (*Richardsonius* sp.), which reach .1 meter (4 inches) in length. Largescale suckers can weigh as much as 3 kilograms (6 pounds).

These fishes are scarcely mentioned in 19th-century accounts, yet their remains are abundant in archaeological sites. One certain reference was made by a member of the Wilkes Expedition (1845:366), who observed a sucker at Willamette Falls in June 1841. On May 11, 1825, at about 10 kilometers (6 miles) below Fort Vancouver, John Scouler (1905) saw "Indians drawing their net ashore and among the variety of fish it contained I selected two species of *Cyprinus*" (175). A few observers mentioned the taking of "small fishes" that could include at least some of the minnow-sucker species. Lewis and Clark (1990:211) noted that small fishes were taken in spring and summer with a scoop net. In 1818, Corney (1965:153) reported that in summer Chinookan people "catch sturgeon, and salmon, and a variety of small fish." On May 22, 1833, HBC trader William Tolmie (1963) encountered a group of Indians on a Columbia River tributary (perhaps the Cowlitz River) traveling to Willamette Falls for the spring salmon fishery. "They subsist," he wrote, "at this season [on succulent stems] & on small fish" (186). Minnows and suckers spawn during late spring and early summer, and adults congregate in the shallows of streams and lakes, spending several days to several weeks on the spawning grounds, when they would have been most concentrated and easiest to catch.

While the lower-river ethnohistoric sources are ambiguous on minnow and sucker fisheries, these fishes have always been important in upriver Plateau fisheries (Hunn 1990; Hewes 1998; Post 1938). Many of the species were taken with specialized gear during the spring before migratory salmon runs arrived (Hunn et al. 1998). Sahaptin speakers have an intimate knowledge of local fish, including names for suckers and a variety of minnow (Hunn 1980). Sucker seem to have been especially revered, with several Plateau groups having rituals associated with its seasonal arrival in late spring (Post 1938), much like the First Salmon ceremony.

Another fish well represented in archaeological deposits is the threespine stickleback (*Gasterosteus aculeatus*), a small-bodied (~.11 meters [4 inches] long), spiny species that is the only member of its family found in Pacific Slope drainages from southeast Alaska to Mexico (Lee et al. 1980). Stickleback are usually found close to the bottom in rivers, lakes, and streams, commonly in association with aquatic vegetation. They can occur in large schools, and fishery researchers have netted hundreds in one net haul (e.g., Hinton et al. 1990). Over 60 nonhuman predators (including coho and some other salmonids, minnow, sturgeon, waterfowl, and mammals) consume stickleback (Reimchen 1994), which introduces some ambiguity in interpreting their role in human subsistence.

Summary

The ethnohistorical accounts highlight several things. First, the fisheries were highly seasonal and localized. Beginning in February and continuing through early April, Native fishers targeted eulachon, the earliest species to migrate into the river system. Sturgeon moved in to prey on eulachon, and fishers took advantage of the food chain and harvested sturgeon, too, which continued until May (and into the summer in some areas). The persistent use of sturgeon in the spring, despite the arrival of the spring salmon run in March, is noteworthy. Native fishers did not take salmon when the fish first entered the Columbia but waited until the runs arrived at Willamette Falls and The Cascades, from early April until early May. Information from these two areas may have signaled the presence of abundant fish and initiated the use of beach seines on the lower river.

Over the summer and fall, fishers continued to harvest salmon at The Cascades and began to target runs in lower tributaries in the autumn, using seines and harpoons rather than weirs. The primary sturgeon fishery was between Oak Point and Fort Vancouver, overlapping the main eulachon fishing areas. Willamette Falls and The Cascades were prime areas for the spring chinook salmon run, and eyewitness accounts of the preservation of sturgeon and eulachon (as flesh, not for oil) are as frequent as those for salmon. Salmon storage focused on the fall chinook run. In some years and in some tributaries, the eulachon run was much reduced, suggesting the fish would not have been a dependable resource.

THE ARCHAEOLOGICAL RECORD

While archaeological fish-bone records lack the rich detail of ethnohistory, they give us a way to trace the use of fish back thousands of years. They also provide a record of fisheries just before and during the time of Euro-American record keeping, providing a cross-check on ethnohistoric accounts. Like ethnohistory, archaeological records have limitations. For example, most of the archaeological fish records are from the Portland Basin, since most archaeology and faunal analyses have focused there, so our look back in time draws mainly from this section of the river. Also, what bones we have to study are affected by such factors as bone preservation and how bones are collected at archaeological sites, identified to fish type, and then tabulated in the laboratory.

We reviewed all fish faunal records reported in archaeological sites from The Cascades to the mouth of the Columbia (see Table S4.2). Faunal records were summarized at the most minute taxonomic level allowed by published records, such as species or genus, but most quantitative comparisons use family-level groupings (see Table S4.3). Remains of salmon and sturgeon generally can only be identified to the family level (Salmonidae, Acipenseridae); many of the remains from minnows and suckers cannot be distinguished from each other, so we used a joint family category (Cyprinidae/Catostomidae). To quantify fish representation, we used the number of identified specimens (NISP), which is the tally of the complete bones or bone fragments identified to a given taxon (species, genus, family). Bone fragmentation can affect this measure, but similarity in bone preservation among sites suggests that this factor is minor, with a few exceptions. Sampling, particularly the size of the mesh used during field excavation and lab work, greatly affects the kinds and abundance of fish types recovered. When large mesh screens are used—6.4 millimeters (.25 inch)—the remains of fish like salmon and sturgeon tend to dominate; tiny fishes such as eulachon and stickleback are mainly retrieved in 1– and 2–millimeter mesh screens. Because Columbia River sites have been sampled using various mesh sizes, we needed to control for this factor by only comparing assemblages recovered with the same mesh size (for detail on the methods used, see Appendix, online).

The chronology for human occupation on the floodplain is short, with most site deposits dating to the last 800 years. We assigned faunal records to one of a four-part chronology based on radiocarbon dates and artifact types unique to particular time periods: Merrybell, 600 BC–AD 200; Multnomah 1, AD 200–1250; Multnomah 2, AD 1250–1750; and Multnomah 3, AD 1750–1835 (Pettigrew 1981). The presence of Euro-American trade goods, for example, was used to define postcontact occupations (here set at AD 1750). Several sites cannot be included in temporal comparisons, given stratigraphic mixing and limited attention to separating out time units. Only a handful of sites have deposits dating before and after Euro-American contact, making it difficult to track change across that important period of time.

Results

The 29 archaeological sites in the study area that report fish remains are clustered in three main areas: 4 at the river's mouth, 20 in the Portland Basin, and 5 at The Cascades (see Table S4.3). More sites than these have been excavated in the region, but fish remains have been consistently studied only since 1995. As elsewhere in Northwest Coast archaeological sites (Butler and Campbell 2004), the frequency of fish remains far exceeds that of mammal or bird remains at most sites, highlighting the importance of fish to the diet of lower-river peoples.

Fish faunal records from the region show that sturgeon, eulachon, and salmonids are common. Salmonid remains are rarely identified as to species, but their size indicates they are mainly from anadromous forms of *Oncorhynchus* and species such as chinook, coho, steelhead, chum, and sockeye (e.g., Butler 2002a, 2005). The archaeological records also contain year-round freshwater residents—two species of sucker, six species of minnow, sculpin [Cottidae], stickleback, and sandroller (*Percopsis transmontana*)—and several mainly saltwater fish taxa that enter the lower estuary—herring, shark, surfperch, flatfish, rockfish (*Sebastes* sp.), and Pacific jack mackerel (*Tra-*

churus symmetricus). The only taxon mentioned in 19th-century accounts that is missing from the archaeological record is lamprey. Because this fish lacks true bones and teeth, its absence must be partly linked to preservation. Still, lamprey have toothlike structures made of keratin (much like fingernail) on their oral disk, and lamprey remains are found in stomach contents of predatory fishes and birds. Perhaps with better knowledge of anatomy and analysis of fine screen samples, their remains will be found in the future (Smith and Butler 2008).

Using the fish bone record to study past fisheries assumes that fish remains truly reflect human activities, which may not be the case. Of particular concern is the origin of the small and extremely abundant remains of fish such as stickleback and eulachon that may have arrived as stomach contents of predators that were caught by people. Sturgeon and northern pikeminnow prey heavily on small fish, and several mammal species found in project sites—such as black bear (*Ursus americanus*), river otter (*Lontra canadensis*), and harbor seal (*Phoca vitulina*) (Saleeby 1983; Lyman 2008)—eat fish. Because humans build fires and cook food, we began our evaluation of the origin of the small fish by comparing the frequency of burned bone across fish taxa in three project sites that had been sampled using 1– or 2–millimeter mesh (Butler 2000b, 2002a, 2005).

In all three sites, the proportion of burning is much less for eulachon and stickleback than for sturgeon, salmon, and minnow-sucker (Table 4.1). At Cathlapotle and St. Johns (35MU44/46), 5 percent or less of stickleback and eulachon remains had been burned, whereas between 17 and 57 percent of the large fish remains are burned. At 35MU117, more of the small fish remains had been burned than at the other sites, yet the frequency is still between half and six times less than for the larger taxa. We could argue, then, that people did not fish for and use stickleback and eulachon, but there are other explanations. The burning data could be interpreted to mean that people simply processed and disposed of large and small fish in different ways. It also may be that since burning makes bone more brittle (Stiner et al. 1995), burned remains of eulachon and stickleback are more susceptible to disintegration than burned bones of larger fish.

Eulachon was a regular part of 19th-century aboriginal fishing and likely was part of earlier fisheries. Stickleback may have been fished or may have been part of the by-catch in a backwater netting strategy. While stickleback is not mentioned in any Columbia River ethnohistoric documents, it is a traditional food and source of dog food in the Yukon-Kuskokwim Delta of

TABLE 4.1. Proportion (% NISP) of burned bone by fish family group and site, based on 2 mm or 1 mm mesh samples

FISH FAMILY	CATHLAPOTLE (45CL1)	ST. JOHNS (35MU44/56)	35MU117
Salmonid	43.5	56.6	24.7
Sturgeon	27.4	12.2	88.3
Minnow-Sucker	23.4	17.6	56.5
Eulachon	2.0	0.2	13.6
Stickleback	0.3	5.5	12.5
Total NISP	2,475	2,501	1,956

southwest Alaska (Alex Nick, US Fish and Wildlife Service, personal communication to Butler, July 2003). Jones (2006) reports that Iñupiat people of northwest Alaska eat stickleback "in times of need or catch them for dog food when nothing bigger is available. They are very fat, so as they cook the oil rises to the top and looks good enough to eat. They can be dipped out in quantity at certain times in some places" (267).

Rigorously interpreting the role of these species in past economies is difficult, and more research on this topic is sorely needed. Based on the large quantity of eulachon and stickleback remains recovered from 25 liters of bulk samples at St. Johns, Butler (2005) projected that over a half million remains each of eulachon and stickleback were present in the entire excavated sample, which was only a small fraction of the site deposits. At Cathlapotle, just a single soil sample provided about 2,000 stickleback bones, representing 430 individual fish (Butler 2002b). These small but superabundant fish represent a potentially enormous source of protein for humans or their dogs that could have been obtained through targeted fisheries or incidental by-catch.

To evaluate the importance of salmon in Lower Columbia fisheries, determine whether fisheries changed over time, and examine spatial trends in fish use along the river, we focused on remains from 13 sites, two of which (Pumphouse and Cathlapotle) were divided into two time units, for a total of 15 assemblages. Thirteen of the 15 assemblages are from the Portland Basin, and two are from the river mouth.

Many of the same fish taxa are present at the sites (Table 4.2). Of the large fish taxa, salmon is present in all 15 assemblages, while minnow and sucker

TABLE 4.2. Ubiquity (frequency of occurrence) of fish taxa in Lower Columbia River assemblages (excludes assemblages ≤ 50 NISP and those with unknown recovery or analytic methods)

FISH TAXA	UBIQUITY
15 assemblages, all mesh sizes	
Salmon and Trout (Salmonidae)	15
Sturgeon (*Acipenser* sp.)	13
Sucker (Catostomidae)	14
Minnow (Cyprinidae)	14
Pacific Sandroller (*Percopsis transmontana*)	2
Right-eyed Flounder (Pleuronectidae)	2
Rockfish *(Sebastes* sp.*)*	2
Pacific Jack Mackerel *(Trachurus symmetricus)*	2
Herring (*Clupea pallasii*)	1
Shark (Elasmobranch)	1
Surfperch (Embiotocidae)	1
8 assemblages (1 or 2 mm mesh)	
Eulachon (*Thaleichthys pacificus*)	6
Stickleback (*Gasterosteus aculeatus*)	8

are found in all but one assemblage and sturgeon is present in all but two. For the eight assemblages sampled using 1– or 2–millimeter mesh, stickleback is present in all eight, while eulachon is found in six. Thus, many fish taxa are widespread throughout the 15 assemblages. Several species associated with marine waters and the lower estuary—herring, shark, surfperch, flounder (including starry flounder), and rockfish—are present only at sites at the river's mouth, at Indian Point (35CLT34) and Station Camp (45PC106). Pacific jack mackerel and sandroller were recorded in only two assemblages. Jack mackerel is primarily a marine fish, known to enter the lower river as far as Astoria, so its presence at Indian Point is not surprising (Minor et al. 2008). Its presence at Meier (35CO5), however, 120 kilometers (75 miles) upriver, suggests that the fish was traded or transported there by village occupants (Frederick 2007). The identification of tui chub (*Gila bicolor*) at Cathlapotle and Meier is noteworthy. This species has been found in eastern Washington

TABLE 4.3. Rank-order abundance (frequency of assemblages in which taxon is ranked highest) in Lower Columbia River assemblages (excludes assemblages with ≤ 50 NISP and unknown recovery or analytic methods)

SAMPLE TYPE*	FISH FAMILY	ABUNDANCE	
>6.4 mm. mesh			
8 assemblages	Salmonid	2	
	Sturgeon	2	
	Minnow-Sucker	4	
>3.2 mm mesh			
5 assemblages	Salmonid	1	
	Sturgeon	1	
	Minnow-Sucker	3	
>2 mm mesh			
3 assemblages	Salmonid	1	
	Sturgeon		
	Minnow-Sucker	1	
	Eulachon	1	
	Stickleback		
>1 mm mesh			(exclude stickleback)
7 assemblages	Salmonid	1	(2)
	Sturgeon		
	Minnow-Sucker		(4)
	Eulachon		(1)
	Stickleback	6	

* Site assemblages were subdivided by time unit and mesh size. For sites sampled using nested screens (e.g., 6.4 and 3.2 mm or 2 and 1 mm), comparisons are not completely independent of each other (e.g., the >3.2 mm mesh sample includes remains from 6.4 and 3.2 mm mesh).

(Wydoski and Whitney 2003), and the remains in the Lower Columbia may reflect trade.

When assemblages are compared based on rank-order abundance, minnow-sucker is the most abundant fish type in most assemblages, including the 1–millimeter mesh samples when stickleback is excluded (see Table 4.3).

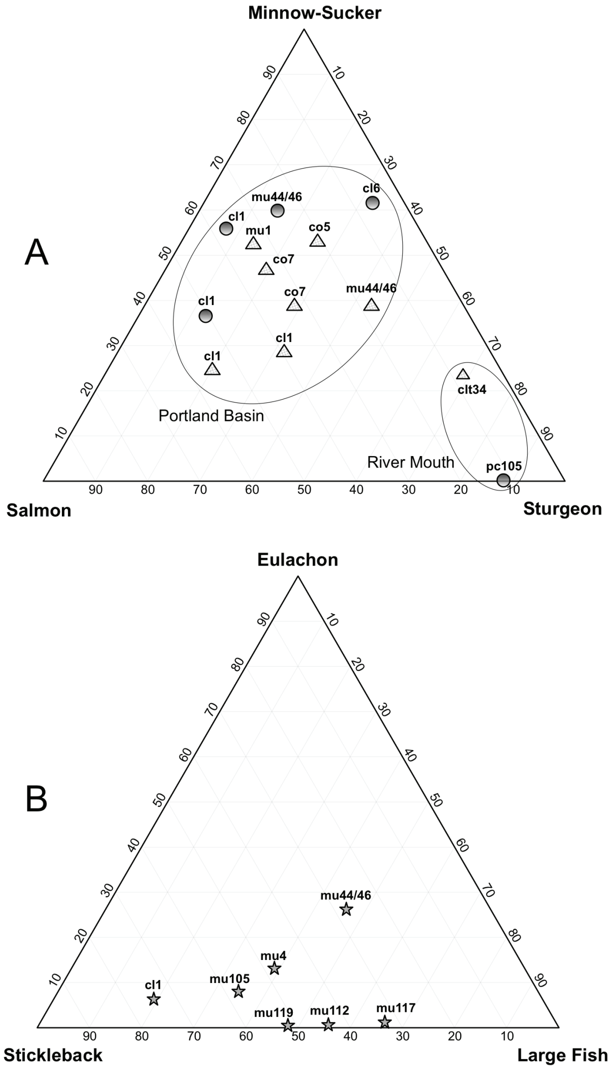

FIGURE 4.1. Ternary plot showing proportional representation of three taxa (Figure by Gunnar Johnson)
Note: Points falling in the central part of the triangle indicate similar proportional representation and a fairly even fishery; those values falling inside the corners indicate dominance of a particular taxon. A) 6.4 mm mesh (triangle), > 3.2 mm mesh (closed circle) minnow-sucker, salmon, and sturgeon. Subareas of Lower Columbia distinguished mainly in sturgeon representation. B) 1 mm mesh samples, eulachon, stickleback and "large fish" (salmon, sturgeon, minnow-sucker) representation. All sites are in the Portland Basin.

Sturgeon and salmon are most abundant in a few assemblages, but overall the records highlight the prominence of minnow-sucker. Furthermore, remains of sucker tend to be much more common than remains of minnow. At St. Johns and Indian Point, sucker remains are over twice as common as those of minnow. The primary species of sucker present in the lower river and in regional archaeological sites is the largescale sucker, so this species must have been important in lower-river fisheries.

Site records for the large mesh samples also show that the Portland Basin supported a relatively generalized fishery in contrast to the river mouth, as shown in the ternary graph (Figure 4.1A), which plots percent frequencies of the three main fish types (salmon, minnow-sucker, sturgeon) along independent axes, from 0–100 percent. Portland Basin sites again are dominated by minnow-sucker, but sturgeon, salmon, or both represent between 15 and 50 percent of site assemblages, suggesting that all the larger fish were important fisheries. The two sites at the mouth indicate a specialized sturgeon fishery, with Station Camp (the remains of a Chinookan village on Baker Bay across the river channel from Astoria) mainly represented by sturgeon remains. The village was occupied exclusively during the fur-trade era (Wilson et al. 2009), and it seems likely that it functioned in part as a processing site for the sturgeon trade. Sturgeon also dominates the Indian Point assemblage; the timing of occupation spans the last several hundred years, so records cannot be linked directly to the fur trade.

A ternary plot for the >1–millimeter mesh samples (Figure 4.1B), all from the Portland Basin sites, highlights the prominence of stickleback and large fish (= salmon, sturgeon, minnow-sucker combined) and the relative scarcity of eulachon. The St. Johns site is represented by close to 30 percent eulachon, but eulachon is represented by few or no remains in three nearby assemblages (35MU119, 35MU117, 35MU112). All of these sites are located on backwater channels near what is now the Columbia Slough and Smith-Bybee Lakes, which are characterized by slow-warm water not typical of eulachon spawning habitat. Eulachon likely was caught elsewhere and transported to the villages and camps by canoe.

Finally, we looked to see if there were any patterned changes in fish use possibly associated with changes in environmental conditions that might improve conditions for some fish over others or in the cultural system such as increase in population, development of new technologies, and changes in settlement pattern. We plotted the relative frequency of the main taxa within each assemblage by time period. The record from the 6.4–millimeter mesh

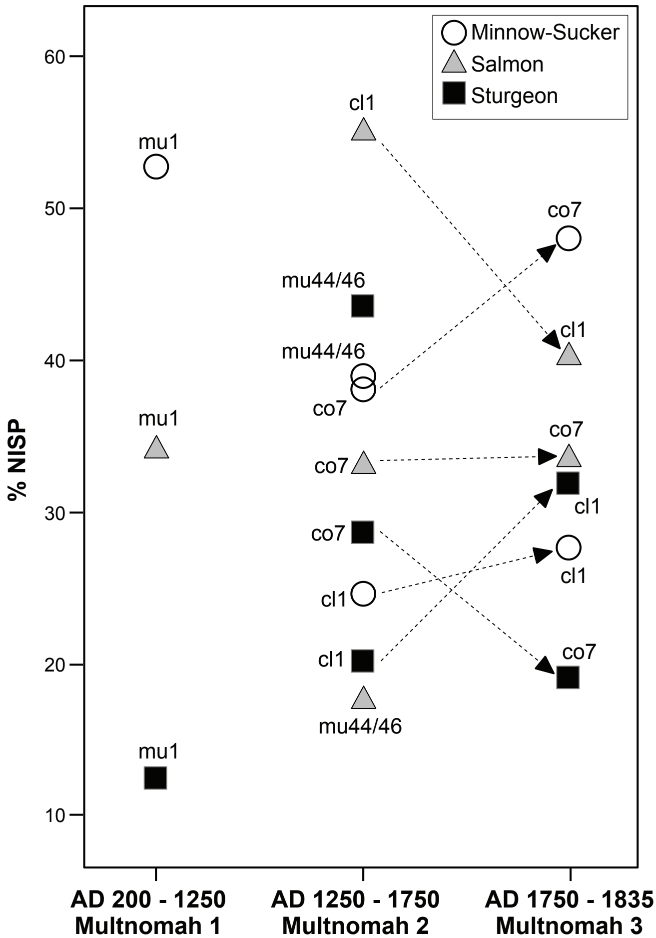

FIGURE 4.2. Relative frequency of taxa by Portland Basin site and time period in 6.4–mm mesh samples (see Map 1.2 for key to sites; figure by Gunnar Johnson). Dashed lines connect site assemblages from two time periods.

screens shows no trends at all (Figure 4.2; not shown, similar lack of patterning with 3.2–millimeter mesh samples); and the frequency of salmon, sturgeon, and minnow-sucker varies as much between sites in a given time period as it does between time periods. At the same time, the >1–millimeter mesh samples show a directional change in representation of eulachon and stickleback, namely increase in both over time (Figure 4.3). Eulachon is extremely uncommon in sites dating to the earliest two time intervals and then shows

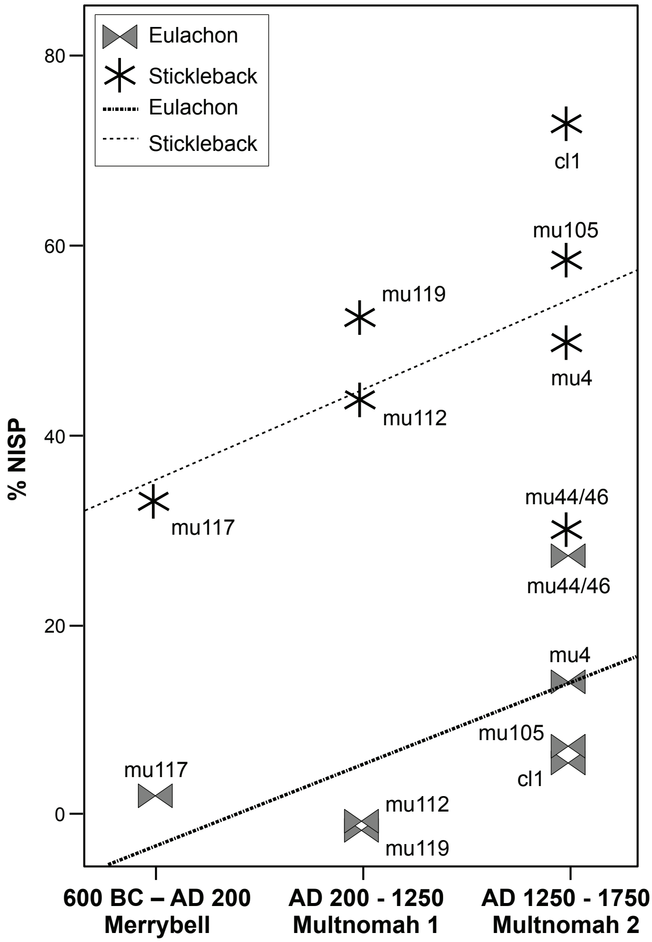

FIGURE 4.3. Relative frequency of small fish taxa by Portland Basin site and time period, >1 mm samples (see Map 1.2 for key to sites; figure by Gunnar Johnson). Best-fit regression line drawn for each taxon.

higher representation in Multnomah 2 (AD 1250–1750). Stickleback frequency also increases over time (except with St. Johns, in Multnomah 2).

Discussion

There is no question that Lower Columbia Indians relied on a great mix of fishes, including seasonal migrants (sturgeon, salmon, eulachon) and year-round residents (several species of minnow and sucker and possibly stickleback). Given the small number of well-dated assemblages, it was difficult to discover if salmon use increased over time, in line with arguments that increased salmon use contributed to the development of cultural complexity. On the one hand, the variation within time periods overwhelms any temporal trend for the relatively large-bodied fishes (minnow-sucker, sturgeon, salmon). On the other, the records from fine-mesh screening show an increasing proportion of eulachon and stickleback. Putting aside questions about cultural origins for a moment, these records suggest that lower-river people increasingly exploited these small fish, which provide lower return (calories/unit effort) than larger fish (e.g., Broughton 1994; Ugan 2005). This trend is a classic example of resource intensification, wherein human populations increase their use of local, lower-ranked resources to accommodate increasing populations that have to make use of such resources because of actual or per capita declines in higher-ranked resources (Cohen 1981). More sampling of fine-mesh samples from well-dated contexts is needed, but the results are provocative.

Both 19th-century eyewitness accounts and archaeological records show important areas of overlap and contrast. Both types of records highlight the salmon, sturgeon, and eulachon fisheries, which extend back at least 2,900 years (Butler 2000b; Ellis 2000). There is a major discrepancy, however, between ethnohistorical and archaeological records regarding the use of minnow-sucker, which is prominent in archaeological samples from the Portland Basin but not explicitly documented by Euro-Americans. Two main hypotheses explain this discrepancy. One relates to sampling bias, namely, that these resident fish species were prominent in the early 19th-century Lower Columbia fishery in some locations but that Euro-Americans simply did not observe them. Most eyewitness accounts date before the 1830s, and most observers were traveling on the main channel of the river, recording activities downstream of the Portland Basin. Most of the archaeological sites are located off the main river channel, on or near backwater lakes and distributary channels, places that 19th-century travelers may have visited only rarely. Some support for the sampling bias hypothesis can be drawn from the mid-Columbia, where 19th-century observers also scarcely mentioned the minnow-sucker fishery. Our understanding of the importance of these fisheries comes from 20th-century Native informants (Hunn 1990), not ethnohistory.

Another hypothesis suggests that fishing for minnow and sucker became less common after Euro-American contact. This hypothesis draws on logic from foraging models, which suggest that return rate (calories/unit effort) for the backwater fishes is lower than that for salmon and sturgeon (Butler

2000a). Lower-river people may have made increasing use of such "lower-ranked" resources as human populations grew and filled the landscape in the centuries before contact. With human population growth and competition for food resources, there would have been fewer sturgeon, salmon, and other higher-ranked resources available for human consumption, forcing people to increase their use of lower-ranked resources. Conditions would drastically change with the arrival of Euro-Americans, especially because of disease and the great decline in Indian populations. Foraging theory would predict that human populations would shift their fishery toward higher-ranked resources, as there would be reduced predation on and competition for them. In turn, fishing for lower-ranked fishes would diminish.

While the second hypothesis is appealing, it has flaws. It assumes that minnow and sucker would be lower-ranked foods relative to fishes such as salmon and sturgeon. This assumption may not be correct, especially if one takes into account the potential productivity of the Columbia River floodplain, where minnow and sucker would have been abundant and accessible. Prior to the major changes in the hydrology of the Columbia (dam construction, dikes, draining projects), the productivity of the floodplain in the Portland Basin may have been enormous. During the spring floods, sturgeon, minnow, sucker, and other fish would get swept into the backwater areas, becoming stranded and relatively easy to procure. The biomass of all resident fish in a given area of Vancouver Lake (the largest lake in the Portland Basin), for example, was over 10 times that in the Columbia River (Knutzen and Cardwell 1984). The fishes occupying the lower-river floodplain today are dominated by nonnative fishes such as carp (*Cyprinus carpio*), bass (*Micropterus* sp.), sunfish (*Lepomis* sp.), and crappie (*Pomoxis* sp.) (Butler 2004), so biomass estimates are undoubtedly affected by such changes to the local ecology. Nevertheless, it is reasonable to hypothesize the high productivity of the backwater habitat—especially if one considers the range of other resources occurring there that were important to Native peoples, including wapato (*Sagittaria latifolia*) and aquatic mammals such as beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*).

Research in other parts of North America highlights the resource potential of backwater environments. Analysis of thousand-year-old fish bones from an archaeological site in the marshy backwaters of the lower Sacramento River shows that Native peoples favored resident freshwater fishes over salmon and sturgeon even though those fishes were common in the river system prior to 19th-century losses (Schulz and Simons 1973). Ethnographic sources (McKern, in Schulz and Simons 1973) describe families of Patwin Indians who specialized in obtaining fish from sloughs and lakes. The relatively high productivity of seasonally flooded backwater areas of the Lower Mississippi River Archaic tradition is another example (e.g., Fagan 2005; Limp and Reidhead 1979).

At least for now, we think that the limited attention that Euro-Americans gave this fishery may be related to sampling and that the use of the backwater truly did decline over the 19th century, especially after the 1830s, the time of major malaria outbreaks. During this period of population loss and social upheaval, Native American populations ceased to occupy and to seasonally use backwater areas, which also happened to be prime habitat for *Anopheles*-carrying mosquito.

CONCLUSIONS

The indigenous fishery on the Lower Columbia targeted virtually all native fish species in the river. Salmon (mainly chinook) was important to aboriginal subsistence, but other fishes were, too. Anthropologists have given salmon a primary role in explaining cultural complexity, despite growing evidence that Native American lifeways and cultural adaptations were highly variable across the Pacific Northwest (e.g., Monks 2007; McMillan et al. 2008). We are not sure why this salmon paradigm is so deeply rooted in our collective psyche, but the sooner we shake it off, the sooner we will develop conceptual frameworks that take us closer to understanding indigenous lifeways and adaptations, in all their myriad forms.

Nineteenth-century Native fishers used a range of strategies and tactics to acquire and process fish, including the gear used to catch and transport fish; the social organization necessary to produce and maintain gear; and work parties to intercept fish at particular locations and times, process it for storage or immediate use, and transport it to villages for consumption or trade. Fishers took advantage of seasonal spikes in the numbers of spawning salmon and eulachon and caught predators like sturgeon that moved in for the eulachon. Large quantities of salmon, sturgeon, and eulachon were preserved and traded. Some gear allowed for the mass capture of eulachon and salmon, and sturgeon were netted, hooked, and speared from canoes. Eyewitness accounts especially highlight the productivity of the salmon fisheries at Willamette Falls and The Cascades, where fishers took advantage of the natural geological constrictions that slowed and directed fish movement and built elaborate wooden platforms and stone channels that increased access to migrating fish.

Archaeological records already tell us that salmon, eulachon, sturgeon, and several species of minnow and sucker were part of the lower-river fisheries as far back as 2,900 years ago. To put these bone records into a fuller context of fishing strategies, however, requires additional analytic frameworks and analysis. We need to more systematically examine the link between fishing-related artifacts (e.g., bone points, so-called net weights) and fish species to document capture methods. Such knowledge would inform us about the economic and social context of fish capture and use and tell us how they changed over time and varied by environment. Studying distributions of fish remains and associated artifacts and features within sites will help us further understand the social context of animal resource use (e.g., Huelsbeck 1994; Grier 2006). We also need to investigate how to archaeologically recognize fish processing and storage (e.g., Hoffman et al. 2000; Smith et al. 2011), given the implications of food storage on economic and social matters. Identifying the salmonid species represented in archaeological sites would be worthwhile, using ancient DNA analysis (Yang et al. 2004). Salmonid species are highly variable in their life history, run times, food values, and ease of preserving, and lumping salmon and trout remains into one category keeps us from learning how lower-river people used each species. We need to collect bulk samples for fine-mesh screening to retain remains of very small fish such as eulachon and stickleback. Stickleback remains have also been recovered in Fraser River sites (e.g., Casteel 1976), so this question extends beyond the Columbia River.

Lower-river Native peoples had an extraordinarily rich and complex fishery, extending back several thousand years. Future work will add even more to our understanding of the enduring relationships between people and fishes on the Lower Columbia River.