Lewis and Clark’s White Salmon Trout: Coho Salmon or Steelhead?
200 Years of Getting it Wrong

Part VI: Deschutes River to Lolo Pass

Bill McMillan, September 19, 2017

Note on the Research: The research related to the Lewis and Clark Expedition was often reliant on The Journals of the Lewis and Clark Expedition Online as edited by history professor Gary Moulton through the University of Nebraska Libraries Etext Center website (now the Center for Digital Research in the Humanities): http://lewisandclarkjournals.unl.edu/ This digital collection began in 2002 with 200 pages from the Nebraska Press edition of The Journals edited by Moulton (2002). It includes the journals of Capt. Meriwether Lewis, 2nd Lt. William Clark (considered by all on the expedition to be Capt. Clark and so used), Sgt. John Ordway, Sgt. Patrick Gass, and Pvt. Joseph Whitehouse. Since 2002, the Journals Online has been greatly broadened to include much beyond the original book to increase the available information for scholars and research. The website also includes notes below each day of the combined journal entries by the expedition members that provide names of animal and plant species and expedition locations with their references; access to drawings and maps made on the expedition as well as relevant ones of more recent origin; and other features of considerable interest related to the expedition. The Journals Online is worded in the original spellings and grammar used by each journalist that can be difficult to initially read in some instances. In the quotes used I minimally corrected each to more closely represent our modern spellings and grammar for easier reading.

Following Steelhead to Spawning Headwaters in the Bitterroot Mountains

The Corps of Discovery was hell-bent to return as soon as possible to St. Louis, despite knowing that they were preceding the primary food source of the Native people on their homeward route up the Columbia, Snake, and Clearwater rivers – spring Chinook salmon. Full knowing their dependency on the Native people to provide them with food in the Columbia Basin, they
nevertheless persisted in their hurry. Although it had great physical costs, nearly as great as on their prior route through the Bitterroot Mountains in the fall of 1805, they would unknowingly document the spawn timing and spawning locations of Idaho steelhead that would not be rivaled for 90 years until described by Barton W. Evermann (1896). However, there was much river and land to cover by the explorers after leaving Celilo Falls before reaching the Clearwater River in what is Idaho today.

On leaving uppermost Celilo Falls on April 21, 1806, the horse mounted members of the Expedition traveled up the north side of the Columbia and the rest of the Expedition members traveled by two canoes up the south side of the Columbia. Over the next several days they passed the Deschutes and John Day rivers, and discovered that in October they had missed seeing the entry of what is known as Rock Creek today, on the north side of the Columbia not far above the John Day River on the opposite side. In October Rock Creek had been unnoticeable, but in April it was described as a large creek. The Expedition camped near the 12 mat lodges clustered at its mouth. The location of the large village at Rock Creek suggests that it likely provided significant fish harvest opportunities in season that would have included steelhead during the spring flows. However, the only mention of fish is that the Native people all along were awaiting the arrival of the spring salmon (Chinook) which the Expedition continued to be ahead of. As a result the Captains traded for tribal members’ dogs which they and the men gladly consumed as a preferred food. It was also at Rock Creek that they traded for enough horses to pack the gear of the Expedition by land rather than the river.

On April 25th they stopped at a large village of 51-52 mat lodges with 700 Native people, which Sgt. Gass indicates had come to the Columbia in anticipation of the coming of the spring salmon. They traveled on another nine miles and camped for the night at what may have been Glade Creek (see notes in the Journals Online). The previous fall this same section of the Columbia River, between the Umatilla and John Day rivers, was described by Sgt. Gass on October 20, 1805:
We set out early; passed along a handsome part of the river; saw some pelicans and gulls. And as the shores are lined with dead salmon, there are abundance of crows and ravens. Vast quantities of these fish die at this time of the year.

Shores lined with dead salmon, as well as their scavengers, indicates great numbers of salmon had spawned in this long mainstem reach of the Columbia in October. What species were included can’t be determined from the description. At the minimum it would have been fall Chinook. However, both the Umatilla and Walla Walla rivers had historical chum salmon populations before they went extinct (Nehlsen et al. 1991). They may have also spawned in this section of the mainstem Columbia, their carcasses among the lines of dead salmon in 1805.

On April 26th they encamped opposite the mouth of the Umatilla River. While camped there, both Captains sketched the fishing tackle of “a little Indian boy” who used a bone (in absence of a hook) on a thin line to catch a number of 9-inch long chub. Capt. Lewis made a detailed description of body form, coloration, and fin ray counts (thought to be Columbia River chub, as indicated in the notes of the Journals Online) just as he had done for the white salmon-trout at Fort Clatsop, but with no accompanying sketch. The ability of a small boy to catch several fish on a self-made hook must have been somewhat humiliating to a party of grown men who frequently had difficulty capturing fish themselves, quickly and in sufficient numbers to survive.
On April 27th the Expedition passed what they called Mussel Shell Rapids due to the large beds of freshwater mussels described on October 19, 1805. Freshwater mussel procreation and dispersal is particularly associated with anadromous fish, as is their subsequent decline related to loss of anadromous salmonids in the Pacific Northwest. As described by Nedeau et al. (2009):

Shell middens in the mid-Columbia River watershed contain Margaritifera as the most common species but a recent survey in the same region found only Anodonta. Absence of western pearlshells could be the result of changes in water quality, or may be related to historic extirpation of their anadromous salmon hosts and the subsequent introduction of unsuitable fish hosts, such as nonnative bass.

... In environments where host fish are abundant, physical habitat is ideal, and human threats are minimal, M. falcata can attain very high densities (>300 per square yard), often carpeting the stream bottom ...

Recent conservation concerns about M. falcata closely mirror well-known stories of the decline of Pacific salmon fisheries ... Dams destroy many miles of free-flowing rivers, disrupt native fish communities, and may have contributed to the demise of many populations of western pearlshells.

M. falcata has been extirpated throughout much of the mainstem Snake River and Columbia River of Oregon and Washington ...

It was likely western pearlshell mussel beds that Capt. Clark described at the mid-Columbia in 1805 with subsequent naming of Mussel Shell Rapids. Neither the rapids nor the mussels exist there today, being the location of McNary Dam as completed in 1954.
They camped that evening at a Walla Walla village of 15 large mat lodges a little below and opposite the Walla Walla River. At this point the spring time steelhead story for the Columbia near the Snake River and continuing on into the Bitterroot Mountains begins. At this village the Expedition was fed a combination of 1-3 pound “mullets” (likely suckers) and “a few salmon trout of the white kind,” as described by Capt. Lewis. Sgt. Ordway further adds, “fresh salmon trout.” This description indicates that silvery, fresh, salmon trout (steelhead) were present in latter April, a period when upper Columbia Basin summer-run steelhead are typically in darker spawning colors – not silvery. Were these fresh entry summer steelhead, as are those of the Columbia River tributaries below Celilo Falls, that would not spawn until the following year – or otherwise summer steelhead of the previous fall that overwintered in the Columbia and somehow retained silvery coloration? There is no knowing today, but it is one of the more intriguing steelhead descriptions made by the two Captains.

On April 29th the men and the Expedition baggage were transported across to the north bank of the Walla Walla River and would resume travel overland from the Walla Walla River to the Clearwater River by a regularly used “road” of the Native people that would shorten their return by an estimated 80 miles or more. They camped overnight near a fish weir built across the Walla Walla about a mile above the Columbia. Capt. Lewis provides the best description of the weir, and Capt. Clark made a quick sketch of it:

This weir consists of two curtains of small willow switches matted together with four lines of withes of the same materials extending quite across the river, parallel with each other and about 6 feet asunder. Those are supported by several parcels of poles placed in the manner before described of the fishing weirs (on August 21, 1805 at the Lemhi River). These curtains of willows are either roled at one end for a few feet to permit the fish to pass or are let down at pleasure. They take their fish which at present are a mullet only of from one to five lbs., with small seines of 15 or 18 feet long drawn by two persons; these they drag down to the weir and raise the bottom of the seine against the willow curtain. They have also a small seine managed by one person it bags in the manner of the scooping net; the one side of the net is confined to a semicircular bow of half the size of a man’s arm and about 5 feet long; the other side is confined to a strong string which being attached to the extremities of the bow forms the cord line to the semicircle.

The Walla Walla weir drawing by Capt. Clark

The Walla Walla River as described by Capt. Lewis at this location:

The Wallah-wallah river discharges itself into the Columbia on its S. side 15 miles below the entrance of Lewis's river or the S. E. branch ... This is a handsome stream about 4½ feet deep and 50 yds. wide; its bed is composed of gravel principally with some sand and mud; the banks are abrupt but not high, tho’ it does not appear to overflow; the water is clear. The Indians inform us that it has its sources in the range of mountains in view of us to the E and S. E.
From this description it can be determined that the river rarely flooded, the water was very clear, and the bottom was mostly gravel; in other words, an ideal salmon and steelhead spawning stream. John Kirk Townsend (1839) further confirmed its great use by spawning salmon in his description of the Walla Walla River at some point further upstream on September 2, 1834:

> At about noon we struck the Walla-walla river, a very pretty stream of fifty or sixty yards in width, fringed with tall willows, and containing a number of salmon, which we can see frequently leaping from the water...

Wilkes (1845) describes the use of a weir on the Walla Walla between July 8 and 13, 1841:

> The Indian mode of taking salmon was witnessed at this place. It consists in the erection of a fish-weir of basket-work, supported by poles. This is placed across the stream, in the form of an acute angle. This barrier dams the water sufficiently to create a little fall. The salmon swim up the river at night, and when they reach the barrier, they jump over the low side, which is down stream, but are unable to leap the higher one. A little before daylight, the Indians spread their nets, carefully avoiding to disturb the fish about the weir, and take all those that have been ensnared. These usually amount to about twenty-five.

Subsequently the Walla Walla went into great decline. Stone (1885) described the futility of considering the Walla Walla for hatchery egg taking by 1883 due to what he felt was primarily overharvest related to commercial fishing:

> Although several persons have recommended the Walla Walla as a good river for our purpose, and although in times of high water many salmon run up this stream, it is nevertheless...too small a river to conduct any large operations on in the way of collecting salmon eggs... a river of this size would not carry a sufficient volume of water to induce salmon enough to enter it to furnish any great number of eggs in these times of canneries...

By 1936 the Walla Walla River was all but done as a salmon spawning stream with only some steelhead remaining as found in surveys by the U.S. Fish and Wildlife Service (Nielson 1950):

> The average width varied from 100-150 feet near the mouth to 30-60 feet in the upper sections. The discharge into the Columbia...at the time of survey was about 100 cfs. From the mouth of the river to Mission Bridge (31 miles) the gradient is flat and the stream is very sluggish. There are no suitable spawning areas in this section, and the flow during the summer irrigating season is extremely low because of extensive diversions. However, the entire section above Mission Bridge (25 miles) contains excellent suitable spawning areas estimated to total 320,000 square yards, or in excess of 80 percent of the stream bed. There is, however, a peculiar condition present in the main river channel in this section...for...2 1/2 miles below the Freewater bridge the river is absolutely dry during the summer of a period of from 2 to 4 months, effectively blocking the upstream and downstream passage of fish. This is partly due to irrigation diversions and partly to an absence of heavy sub-soil in the area. It is reported that at no time since the late 1880s has there been a flow of water through this section during the summer...this stream section...may go dry as early as May 15 in some years and in others as late
as July 15...at the time of survey steelhead trout were being caught in the main river above and below Mission bridge. However, the present runs do not compare in size with those that entered...in former years...The last chinook salmon run of any importance was reported in 1925. These fish ascended the river in May and early June, but it would be practically impossible for them to do so today under the present system of water use...largely responsible for the decline in the runs of chinook salmon ....

Although both Captains only mention the taking of suckers in the Walla Walla weir on April 29th, Sgt. Ordway further notes:

*These Savages have weirs made of willows across this little river where they catch large quantities of Salmon trout, Suckers, &C.*

Whether they were the white or dark form of salmon trout (or both) is not mentioned. The tribal village near the Walla Walla weir consisted of 51 lodges. Clark estimated 350 Native people gathered to dance that night, of which about 100 were from a visiting Yakima tribal village (notes from the *Journals Online*) and 250 from the Walla Walla village.

As previously indicated in Part I of this Lewis and Clark series of essays, salmon consumption per Native tribal person, if half of their sustenance depends on salmon/steelhead, may have been 800-1,000 pounds per year (about 2-3 pounds per day). This was further confirmed in Part II of this series as found in the provision of 3 pounds of salmon per day, per “servant class” employee.
at Fort Vancouver in 1843 and 1845. If the 250 tribal people at the Walla Walla weir were the primary group dependent on salmon/steelhead at the Walla Walla River itself, about 200,000-250,000 pounds of salmon and steelhead would be required to sustain them per year. This would represent 20,000-25,000 salmon/steelhead consumed if the average were 10 pounds per fish. If required sustainable escapement was at least equal to tribal harvest it would represent run sizes of at least 40,000-50,000 salmon/steelhead. This does not take into account that the greater Walla Walla Nation was 1,000-1,600 people (see Part 2. Estimate of the Western Indians in the Journals Online https://lewisandclarkjournals.unl.edu/item/lc.jrn.1805-1806.winter.part2#lc.jrn.1805-1806.winter.part2.01). More than the 250 people at the weir were undoubtedly dependent on Walla Walla River salmon and steelhead at some times of the year.

Former salmon returns to the Walla Walla River became greatly depleted after about 1925, but both Chinook and coho remained in small numbers in the Touchet River (one tributary) until at least 1957 (Thompson and Haas 1960). Steelhead were the primary remaining anadromous species, mostly limited to the upper basin. By 1990 native summer steelhead were all that remained, a small fraction of their former numbers (CFUIR 1990), coho, chum, and Chinook extinct (Cramer 1990). From 1977 to 1987 an estimated 1,090-1,817 summer steelhead annually returned to the Walla Walla, all wild until 1983/84 when Washington Department of Game hatchery steelhead returns began. No accurate historical estimates exist, but it was thought that steelhead formerly numbered about 4,000-5,000 fish (Howell et al. 1985). The historical period referred to is likely 1957-58 when the Walla Walla sport catch was 1,852 steelhead in Washington alone, the Oregon catch unknown (Eldrid and Douglas 1960). The total would have been over 2,000 Walla Walla steelhead caught by Washington/Oregon sportsmen, escapement at least equal. It is a very low figure compared to evidence from the historical era of Lewis and Clark based on the consumptive needs of the Walla Walla people. The wild Walla Walla steelhead returns from 2007-2016 averaged 956 fish (WDFW 2017a), 19-24% of that in the 1950s.

There are no historical estimates for spring Chinook run-sizes or any other information due to their early extinction. The results from hatchery spring Chinook reintroductions into the Walla Walla River have been marginal and science reviews have questioned the justification to invest $11 million of public monies for planned construction of an on-site Walla Walla spring Chinook hatchery with habitat constraints that may not support both natural production and the harvest plans by the Umatilla Tribes (Rudolph 2013). The nine year geometric average was only 142 natural spawning adult returns, a six year average of only 288 hatchery adult returns from plants of 250,000 smolts (smolt-to-adult return rate of only 0.24%), and with declining returns since a brief peak of 1,200 spring Chinook at the Walla Walla in 2010 (80% hatchery). At this time returns of less than 1,000 wild summer steelhead and less than 200 wild spawning spring Chinook would provide 2-3%, or less, of the salmon/steelhead needed to sustain the Walla Walla tribe in 1805/06 along with sufficient escapement needs for spawning.

On April 30th the Expedition left the fish weir camp on the Walla Walla River, traveled 14 miles northeast across a plain with dunes of windblown sand 15-20 feet high, and made camp on the Touchet River, a Walla Walla tributary heading in the Blue Mountains east of the main river. Capt. Lewis described the Touchet as “navigable for canoes; it is deep and has a bold current.” Its stream banks were lined with cottonwood, birch, red willow, wild rose, and other shrubs, a
welcome contrast to the “poor and sandy” plain. Sgt. Gass described the south side of the Touchet as having rich soil covered with grass. A beaver and an otter were killed, the former eaten by the Expedition (along with dogs that had been purchased), the latter eaten by the Native people that accompanied them. The next day they continued another 26 miles up the Touchet River, the valley getting broader and more timbered as the elevation rose. Sgt. Gass described what they saw:

*The higher we go up the creek the cotton-wood, is more large and plenty; and the plains beautiful.*

Capt. Lewis described the country as similar to that of the plains of the Missouri but for the absence of the vast herds of buffalo and elk. Sgt. Ordway described beaver as being plentiful, an animal that would be pursued to near extinction within 35 years thereafter, but would slowly begin to recover.

They continued up the Touchet another 19 miles on May 2nd noting that the valley became ever broader, the soil richer, the stream banks and hills more forested with timber, including pine, and with abundant beaver and otter along the creek and tributaries. On May 3rd they came to the Tucannon River and had lunch. As described by Capt. Lewis:

*This creek is about 12 yds. wide pebbly bottom low banks and discharges a considerable body of water ... the bottoms of this creek are narrow with some timber principally Cottonwood*
and willow ... The hills are high and abrupt. The land of the plains is much more fertile than below, less sand and covered with taller grass...

As brief as this description is, the “pebbly bottom” is consistent with the indication that in May and June of 1915 some 30,000 spring Chinook were counted past a dam that was present at that time in the lower Tucannon River near Starbuck (Parkhurst 1950). This was long after upper Columbia and Snake River salmon and steelhead collapsed after 1882 (McDonald 1895). At the time of Lewis and Clark they would have been substantially more abundant than in 1915. By the time of U.S. Fish and Wildlife Service surveys in June of 1935 only 3,000 spring Chinook were counted, 10% of the count 20 years earlier. In 1957 there was a count of 4,300 wild spring Chinook. The most recent 5-year average is 170 wild spring Chinook spawners counted at a hatchery trap along with 162 hatchery origin spring Chinook spawners passed upstream (WDFW 2017b). In 1999 it was estimated that only 4 wild spring Chinook escaped to spawn and 156 hatchery origin spawners as found in spawning surveys and carcass counts. Today there is less than 0.6% of the wild spring Chinook spawning in the Tucannon River as there was in 1915, and 4% of what there was as recently as 1957. Although there is no reliable information regarding steelhead numbers today (WDFW 2017c), in 1935 there was “a considerable run of steelhead” but not nearly as abundant as in earlier years (Parkhurst 1950).

From the Tucannon River they followed up Pataha Creek, one of two tributaries where Tucannon wild steelhead are now thought to spawn (WDFW 2017c). With a cold storm of mixed rain, hail, and snow blowing at their backs they ascended the hills to a high plain and camped midst a grove
of cottonwood where Sgt. Gass indicated there was a spring. The next day they crossed over a high plain and then followed down Alpowa Creek to the Snake River about 7.5 miles below the entry of the Clearwater River. Their route from the Walla Walla encampment to the Snake River is largely the route of Highway 12 today, a “road” the Native people had used for centuries.

They took breakfast at a lodge of six families just upstream of the entry of Alpowa Creek. The site of this lodge was found to have been occupied for 6,000 years prior to inundation by Lower Granite Reservoir (notes for May 4, 1806 in the Journals Online). Described by Capt. Lewis as “miserably poor” for lack of food due to the salmon not yet having arrived, these Nez Perce people shared what they had with the Expedition members. Perhaps not entirely oblivious to the hardships the intrusion of over 30 additional mouths caused Native people, the pace of the Expedition’s travels was the foremost consideration and often required complete reliance on them for subsistence. Also there were times when they did not have the ingrained savvy to subsist for themselves when game was not available and their advanced firearms were useless. This resulted in their dependency on the know-how of what they largely considered wretched savages, rather than human cultures supremely adapted to the lands they occupied in alternating periods of bounty and deprivation.

Three miles further up the Snake River they came on two Nez Perce lodges where help was provided to cross the river as a means to best travel up the Clearwater River to the Nez Perce
village where they had left their horses the prior autumn.

On May 5th they camped at the entry of Collins Creek (Potlatch Creek, or sometimes called Potlatch River, today) to the Clearwater River. At their creek encampment there were two lodges, one with 8 families, and the other the largest they had yet seen at 156 feet long and 15 feet wide. Made of mats and straw it held at least 30 families. The Expedition was tired and hungry. The tribal people provided a form of bread and some dried roots, but they wanted dogs or horses to eat. In some desperation they insisted on being provided food in trade for medicinal care from Capt. Clark for which he had gained a reputation among the Native people. Much of what Capt. Clark provided seemed more smoke and mirrors, so to speak, but often it did seem to result in some healings – not unlike, perhaps, the placebo effect that continues to occur in modern medicinal treatments. By the next day, they had gained the trust of this village and were provided a horse to kill and eat along with other food in trade for medical treatments, as the Captains had demanded.

On May 6th it was noted that the Clearwater River was much higher than the previous fall and rising fast with snowmelt, and apparently Potlatch Creek as well. Capt. Clark provided a description of the creek as it was in the spring of 1806:

_The natives have a considerable Salmon fishery up Colters Creek. This Stream extends itself to the Spurs of the Rocky Mountain and in much the greater part of its course passes through a well timbered pine Country. It is 25 yds. wide and discharges a large body of water. The banks [are] low and bed formed of pebbles._

The upstream Indian fishery that Capt. Clark referred to on Potlatch Creek was likely at one of two areas where tribal fishing implements were found in archaeological digs at Arrow Beach and also at the junction of the East and West Forks of Potlatch Creek (Resource Planning Unlimited, Inc. 2007). It was apparent that it provided a major food source in the way of salmon and steelhead that sustained the large village at its mouth, and others further upstream.

There were at least 38 families at the mouth of Potlatch Creek, which included the largest single tribal lodge they encountered anywhere west of the Rockies. If there were 5-6 people per family (including elders), at 38 families it would minimally mean 190-228 people as limited to those at the creek mouth. As previously indicated, the formula to determine salmon/steelhead consumption would be: 2-3 pounds of fish per person, per day, multiplied by 365 days, results in 138,700-249,660 pounds consumed per year. If the average were 10 pounds per fish at least 13,870-24,966 salmon and steelhead were consumed per year for just those people at the mouth of Potlatch Creek. At least double that would be required for spawning escapement with minimal annual run-sizes of about 28,000-50,000 combined salmon and steelhead. This does not take into account the Native population that apparently lived further up Potlatch Creek.

Parkhurst (1950) described the Clearwater River as it was during U.S. Fish and Wildlife Service surveys in the latter 1930s:
The Clearwater River system formerly supported large runs of Chinook and silver salmon and steelhead trout. These runs have been greatly depleted in recent years, and the silver run has been completely exterminated. The Clearwater has vast potential salmon producing capacity, and it was intended that this stream system be given a high priority in any program for salmon rehabilitation in the Snake River basin.

Spring Chinook, coho, and steelhead also historically returned to Potlatch Creek (Witt 1954). However, by the time of the U.S. Fish and Wildlife Service surveys in September of 1938 half the streambed was found dry, and the uppermost 27.5 miles of the 50 mile stream length was considered unusable for salmon spawning and were not further surveyed (Parkhurst 1950). What remained in the lower 22.5 miles had water temperatures of 70°-76°F, the entire streambed was covered with silt and algae, and combined with the high water temperatures it was considered unsuitable for salmon. No evidence of salmon or steelhead was found, and none reported by residents. However, it was thought that the uppermost section that was not surveyed still had some steelhead and resident trout. Fulton (1968; 1970) confirmed that steelhead were still present in the upper third of Potlatch Creek and that spring Chinook had formerly used the upper two-thirds of the stream basin.

Lower Potlatch Creek still remains lacking in usable habitat for salmonids (photo). An extensive inventory of Potlatch basin in 1984 found few if any juvenile steelhead in the lower mainstem, or other salmonids, and instead had a predominant population of non-native smallmouth bass (Johnson 1985). However, several upper watershed areas continued to produce wild steelhead,
and still do despite challenging habitat conditions. The largest adult steelhead return in recent years was considered to be about 1,000 (Demick 2015), and juvenile steelhead have adapted by outmigrating from the upper watershed a year earlier than normal to find better habitat downstream.

Former large populations of coho and Chinook were considered to have been extirpated from the Clearwater Basin as a result of an inadequate fish ladder at Lewiston Dam completed in 1929. Idaho Department of Fish and Game reintroduced spring Chinook parr from the Salmon River Basin into the Clearwater in 1948 after two more fish ladders were added to the dam in 1940 (Witt 1954). Although fish passage remained difficult, 19 spring Chinook were counted past Lewiston Dam in 1954 as evidence of some recovery success (Pirtle 1958). Unlike salmon, steelhead adequately passed Lewiston Dam. In 1951, 1952, and 1953 the steelhead counts were 3,693, 4,770, and 5,623 respectively for those years (Witt 1954), but the counts leapt upward from 1958 to 1969 ranging from 17,330 to 43,196 annually (Miller 1987). Presumably this also reflected the general trends for wild steelhead at Potlatch Creek, although but a small percentage of the Clearwater Basin total. North Fork Clearwater steelhead were thought to represent 50-60% of all steelhead entering the Clearwater River (Miller 1987). Clearwater Basin steelhead declined, however, after work began at Dworshak Dam on the North Fork Clearwater and initiation of taking steelhead broodstock there for Dworshak National Fish Hatchery began in 1969. Lewiston Dam steelhead counts for 1970-1972 ranged from 14,600-15,691, but the counts ended after October 1973 (Miller 1987), the year Lewiston Dam was removed.

Coho went extinct throughout the Snake River Basin by 1987, the last lone coho passing Lower Granite Dam in 1986 (Harrison 2016). Clearwater coho went extinct long before that. The spring Chinook reintroduced from the Salmon River in 1948 apparently did not sustain themselves. Spring Chinook from the Salmon River were planted into the Selway River (upper Clearwater tributary) in 1968, and coho eyed eggs from the Little White Salmon and Washougal River salmon hatcheries were planted into hatching channels of Crooked River (in the South Fork Clearwater watershed) by Idaho Department of Fish and Game the same year (Hoss 1970). However, these reintroduction attempts also failed. In 1995 the Nez Perce Tribe began coho plants in the Clearwater Basin (Harrison 2016). Subsequently 87 coho passed Lower Granite Dam in 1997, the first return to the Snake Basin since extinction in 1987. The coho returns destined for the Clearwater gradually increased to a sudden peak in 2014 of a little over 18,000 adults past Lower Granite Dam, but have since declined: 1,449 adult coho in 2015 and 2,841 in 2016. The reintroduction efforts have included coho plants into Potlatch Creek. In 2005 a weir at Potlatch Creek counted 105 coho, and 54 coho redds were subsequently counted in the stream basin that year (Everett 2005).

Potlatch Creek today has at best 1,000 wild steelhead, a few hundred naturally spawning hatchery origin coho, and with no evidence found in available literature of any existing spring Chinook – all in all, just 3-5% of historical run-sizes of 28,000-50,000 salmon and steelhead remain today from what was minimally required to sustain the Nez Perce village at the mouth of Potlatch Creek in 1806.

Continuing up the Clearwater for two days, on May 7th the Expedition crossed the Clearwater to the south side, went up the hills to a plain, and then descended down a steep grade to what they
called Mosquito Creek due to the abundance of that insect (thought to be Big Canyon Creek as called today, south of Peck, Idaho). Further up the creek about a mile they made camp near six recently abandoned lodges, including what Sgt. Ordway indicated to be a “weir.” The next day Capt. Clark described steelhead smolts migrating downstream he got at the fish trap:

On the Creek near our Camp I observed a kind of trap which was made with great pains to catch the small fish which pass down with the stream. This was a dam formed of stone so as to collect the water in a narrow part not exceeding 3 feet wide from which place the water shot with great force and scattered through some small willows closely connected and fastened with bark. This mat of willow switches was about 4 feet wide and 6 long lying in a horizontal position, fastened at the extremity. The small fish which fell on those willows was washed on the willows ... until taken off &c. I caught or took off those willows 9 Small trout from 3 to 7 Inches in length. Soon after I returned from the fishery an Indian came from a fishery of a similar kind a little above with 12 Small fish which he offered me which I declined accepting as I found from his signs that his house was a short distance above, and that those fisheries afforded the principal part of the food for his children.

A large steelhead population apparently spawned and reared in Big Canyon Creek with enough outmigrating smolts to have recently supported six Nez Perce lodges as well as the lodge of the family just upstream in the spring of 1806. Despite the large numbers of smolts targeted by the fisheries as a vital food source in April/May, sufficient numbers survived to result in a sustainably large steelhead population.

From May 8th-10th the main party traveled along a plain atop a divide between Little Canyon Creek and the Clearwater River heading southeast toward today’s Kamiah, Idaho. They had recovered most of their horses and equipment left with the Nez Perce the previous fall at their “Canoe Camp” across from where the North Fork Clearwater enters the mainstem west of today’s Orofino, Idaho. They were ominously told by the Nez Perce that the mountains remained deep in snow and with no grass for the horses, according to Sgt. Gass, not passable for “a moon and a half.” They could see the snow covered mountains for themselves. To make matters worse it snowed through the night of May 9th with 8 inches on the ground the next morning. At 4:00 pm they descended the 600 feet from the hilltop plains to the valley of today’s Lawyer Creek and made camp with the Nez Perce.

The large lodge at Lawyer Creek was 150 feet long enclosing 24 fire pits and twice as many families, and if need, 100 available fighting men. The tribal village had little enough food for themselves but managed to provide the Expedition with roots and a dried salmon-trout (steelhead). But the Captains feared that the men’s stomachs would not adjust to a diet of roots and requested if it might be possible for them to kill a horse or two, and which the Nez Perce provided them two fat young horses to eat.

Presumably the dried salmon trout they were provided came from the creek. Fulton (1970) indicated that Lawyer Creek, despite “low flows and turbid water caused by silt,” had a small run of steelhead that persisted. No mention of spring Chinook has been found in any report. However, Capt. Clark indicated the following while at the Lawyer Creek camp on May 11, 1806:
These natives take their fish in the following manner to wit. A stand small stage or wharf consisting of sticks and projecting about 10 feet into the river and about 3 feet above the water on the extremity of this the fisherman stands with his gig or a scooping net which differ but little in their form [from] those Commonly used in our Country. It is formed thus [a drawing not provided]. With those nets they take the suckers and also the salmon trout and I am told the salmon also.

The large lodge of the Nez Perce, about 3 miles up Lawyer Creek from the Clearwater River, would suggest the creek formerly had a large population of steelhead, suckers, and “salmon,” the latter of which to the Captains was the Chinook, all of which were caught by dip net or spear from platforms.

On May 13th the Expedition moved camp. Having again been forewarned that it would be at least a month until the mountains were passable, the Nez Perce suggested a campsite on the opposite side of the Clearwater River from Lawyer Creek to hunt and fish and to await the melting of the snow from the mountains. Sgt. Gass described Lawyer Creek as they traveled down it to the Clearwater, where they camped overnight before crossing:

At noon we proceeded down the branch, which has a good deal of cotton wood, willow, and cherry tree on its banks; and is a bold rapid stream, about 15 yards wide.
With the aid of a Nez Perce canoe, they crossed to the north side of the Clearwater the next day. Downstream about half a mile they came to an ancient Tribal village site. It had a convenient excavation about 4 feet deep and 30 feet in circumference and around which they made “tents of sticks and grass” to house themselves and gear for an extended stay. Capt. Lewis described their location and optimistic prospects on May 14th:

*Our situation was within 40 paces of the river in an extensive level bottom thinly timbered with the longleafed pine. Here we are in the vicinity of the best hunting grounds from Indian information, are convenient to the salmon which we expect daily and have an excellent pasture for our horses.*

The salmon, as throughout the spring of 1806, were late in arrival, but the hunting proved good with a number of grizzly bear killed. The bears had greatly varied color combinations (including black with white mixed) that Capt. Lewis termed “variegated bears.” He correctly identified them as but one species, despite the many colors.

On May 17th the lodge the Expedition members had inadequately built flooded with rain overnight, and while hunting in the hills Sgt. Pryor found the snow to be very deep. Capt. Lewis recorded his impatience in an anxious wait for mountain snowmelt:

*I am pleased at finding the river rise so rapidly, it no doubt is attributable to the melting snows of the mountains; that icy barrier which separates me from my friends and Country, from all which makes life esteemable.— patience, patience—*

On May 18th the Nez Perce began to build a lodge for fishing on the Clearwater opposite the Expedition’s camp, in preparation for the salmon, including a platform built out 10 feet into the river from which to dip net salmon when they eventually arrived. In fact, later that same day one of the Expedition members took part of a salmon from an eagle – the first sign of their return.

The Expedition remained at the Clearwater campsite across from Lawyer Creek until June 10th. Having depleted the area of bear, deer, and grouse – and without salmon – they were reduced to eating roots and their horses. However, on May 22nd several of the men who went out hunting in the highlands between the Clearwater and the mountains purchased two salmon trout (steelhead) of very red coloration, likely taken in Lolo Creek by the Nez Perce. Capt. Lewis provided further information about Clearwater steelhead life history, as provided by two Nez Perce, and differences in spring Chinook run-timing to the Snake River as opposed to the Clearwater:

*Two Indians who were just arrived at our camp informed us that these salmon trout remained in this river the greater part of the winter, that they were not good at this season which we readily discovered, they were very meager. These Indians also informed us that there were at this time a great number of salmon at no great distance from hence in Lewis’s river which had just arrived and were very fat and fine, they said it would be some [time] yet before they would ascend this river as high as this place.*

On May 23rd Sgt. Ordway indicated that the Natives had caught 3 salmon that day, and on May 26th one of the Expedition members saw a salmon in the Clearwater River. The river was
continuing to rise fast and the snow in the mountains was visibly diminishing.

![Brilliant red coloration of overwintering Clearwater Basin 40 inch wild male steelhead (photo by Steve Pettit)](image)

The Nez Perce lodge 3 miles up Lawyer Creek was among the largest recorded by Lewis and Clark. Presumably its location was associated with salmon and steelhead abundance in season. The lodge was indicated to have 48 families, and if 5-6 per family it would house 240-288 people (that it included 100 warriors suggests even more) that depended much of the time on Lawyer Creek salmon and steelhead. At 2-3 pounds of fish per person per day it would require 175,200-315,680 pounds to sustain them annually, or 17,520-31,568 combined salmon and steelhead. At least an equal number would be required for spawning escapement to be sustainable. However, after May 13th the Expedition was located 3 1/2 miles distant from the Nez Perce village up Lawyer Creek and whatever fishing activities occurred went unrecorded. Fishing was occurring on the mainstem Clearwater near their encampment beginning May 18th, but with relatively little success as yet. Apparently the main Clearwater fishing encampment was composed of some of those Nez Perce that had previously been camped up Lawyer Creek. The fishing methods described for both the creek and the river were the same – a platform built 10 feet out from which to work a dip net. What proportion of their subsistence on salmon and steelhead was provided by the creek, and otherwise by the river, is not possible to determine from the Expedition journals.

At the end of May, as usual, a daily summary of weather and other notes for the month was recorded. (In this instance the Journals Online are taken from the notes of Capt. Lewis, of which it is noted Capt. Clark’s sometimes differed.) It was apparent that the Clearwater River was alternately rising and falling from May 16th onward: it rose 6.8 feet, and fell 1.2’, with a total rise in water of 5.6 feet. By the end of May it was above the highest water mark that had
occurred on the Clearwater River in 1805. The Nez Perce told them that it would crest still higher before it would finally subside after the peak of the snowmelt. The two Captains further recorded information about the differences in salmon returns to the Clearwater River as opposed to the Snake River:

(May 12th) ... the salmon have arrived at the entrance of the Kooskooske [Clearwater] in great numbers and that some were caught yesterday in Lewis's River [Snake River] opposite to us many miles above the entrance of that river. From this village of the broken arm Lewis's River is only about 10 miles distant to the S.W.— the Natives also inform us that the salmon appear (much) many days sooner in Lewis’s River above the entrance of the Kooskooske than they do in that stream.

(May 17th) ... the Indians caught 3 salmon at their village on the Kooskooske above our camp some miles. They say that these fish are now passing by us in great numbers but that they cannot be caught as yet because those which first ascend the river do not keep near shore; they further inform us that in the course of a few days the fish run near the shore and then they take them with their skimming nets in great numbers.

(May 26th) ... the dove is cooing [mourning dove, as indicated for the date in Journal Online notes] which is the signal as the Indians inform us of the approach of the salmon. The snow has disappeared on the high plains and seems to be diminishing fast on the spurs and lower region of the Rocky Mountains.

The return of the salmon in the spring of 1806 seems to have been one of continual delay, perhaps a result of the very wet winter experienced at Astoria and a long transition to spring that included numerous days of heavy rainfall and even lowland snow. However, there were also normal differences, as indicated by the Native people, such as the migration of spring Chinook being many days earlier up the Snake River than the Clearwater River. These are important differences indicating stocks of spring Chinook with differing characteristics. This is the earliest record of salmon that remains to historically draw from prior to the subsequent effects of Euro-American colonization in the Columbia Basin.

Having left on May 27th, Sgt. Ordway and two other men returned from their mission to the Snake River for salmon, as described by Capt. Lewis on June 2nd:

About noon Sergt. Ordway, Frazier, and Wizer returned with 17 salmon and some roots of cows; the distance was so great from which they had brought the fish that most of them were nearly spoiled. These fish were as fat as any I ever saw; sufficiently so to cook themselves without the addition of grease; those which were sound were extremely delicious; their flesh is of a fine rose color with a small admixture of yellow.

The fish described were clearly spring Chinook, not only for their early timing but also by their high fat content and flavorful taste. These were the “Royal” Chinook so prized by early cannery operations on the Columbia River (Seufert 1980). They were caught about 20 miles below the entry of the Salmon River into the Snake River at a turbulent rapids described by Sgt. Ordway as nearly equal to the Great Falls of the Columbia (Celilo Falls).

On June 3rd Capt. Lewis lamented the lateness of the salmon returning to the Clearwater as a
reliable source of food and the continuing need to wait until mid-June before attempting the mountain passage:

... if possible lay in a stock of meat and then attempt the mountains about the middle of this month. I begin to lose all hope of any dependence on the Salmon as this river will not fall sufficiently to take them before we shall leave it, and as yet I see no appearance of their running near the shores as the Indians informed us they would in the course of a few days. I find that all the salmon which they procure themselves they obtain on Lewis's River, and the distance thither is too great for us to think of sending after them ...

On June 10th the Expedition packed up and finally left their camp near Lawyer Creek. The previous day the Clearwater River was indicated to be 6 feet lower than when they had arrived nearly a month before. This was evidence that much snow had melted from the mountains, but the Nez Perce continued to warn them there was still too much snow for the horses to find grass to feed on. Nevertheless, they moved 12 miles to a prairie of Camas lilies along Jim Ford Creek, where they had also camped the previous fall. It at least provided some movement and positioned them for mountain passage over the mountains via the Lolo Trail. Capt. Lewis described what is known as Weippe Prairie on June 12th:

... our camp is agreeably situated in a point of timbered land on the eastern border of an extensive level and beautiful prairie which is intersected by several small branches near the bank of one of which our camp is placed. The quawmash [Camas lily] is now in bloom and from the color of its bloom at a short distance it resembles lakes of fine clear water, so complete is this deception that on first sight I could have sworn it was water.

On June 15th the Expedition embarked on their path to the Bitterroot Mountains going up Lolo Creek and then up a tributary, Eldorado Creek, where they camped after a hard 22 mile day on a rain-slickened trail littered with fallen timber. It was just a taste of what was to come, as described by Capt. Lewis on June 16th on reaching Hungry Creek, a branch of Fish Creek that is tributary to the Lochsa River:

The snow has increased in quantity so much that the greater part of our route this evening was over the snow which has become sufficiently firm to bear our horses ... it lay in immense masses in some places 8 or ten feet deep. We found much difficulty in pursuing the road as it was so frequently covered with snow. We arrived early in the evening at the place that Capt. C. had killed and left the flesh of a horse for us last September. Here is a small glade in which there was some grass, not a sufficiency for our horses but we thought it most advisable to remain here all night as we apprehended if we proceeded further we should find less grass ... Hungry Creek is but small at this place but is deep and runs a perfect torrent; the water is perfectly transparent and as cold as ice.

And, at last, they hit the wall of what the Nez Perce had forewarned them of on June 17th, again as described by Capt. Lewis:

We proceeded down Hungry Creek about seven miles passing it twice; we found it difficult and dangerous to pass the creek in consequence of its depth and rapidity; we avoided
two other passes of the creek by ascending a very steep rocky and difficult hill ... this hill or rather mountain we ascended about 3 miles when we found ourselves enveloped in snow from 12 to 15 feet deep even on the south sides of the hills with the fairest exposure to the sun; here was winter with all its rigors ... if we proceeded and should get bewildered in these mountains the certainty was that we should lose all our horses and consequently our baggage instruments perhaps our papers and thus eminently risk the loss of the discoveries which we had already made if we should be so fortunate as to escape with life ... under these circumstances we conceived it madness in this stage of the expedition to proceed without a guide ...

For the first time the Captains had to admit defeat, and to retreat rather than go forward, during the Expedition. They backtracked to the prior location on Hungry Creek, and then further back to Eldorado Creek where there was sufficient grass for the horses and to subsist on hunting until a Nez Perce guide could be found. However, it would prove to be fishing, not hunting, that would sustain them the coming several days – steelhead, meager as they may be, at the very end of their spawning season.

Capt. Clark on June 18th:

After dinner we proceeded on to Collin's Creek [Eldorado Creek, a tributary of Lolo Creek] and encamped in a pleasant situation at the upper part of the meadows ... We sent out
several hunters but they returned without having killed anything. They saw a number of salmon in the creek and shot at them several times without success. We directed Colter and Gibson to fix each of them a gig in the morning and endeavor to take some of the salmon ... we hope by means of the fish together with what deer and bear we can kill to be enabled to subsist until our guide arrives.

Capt. Lewis on June 19th:

Our hunters were out very early this morning, they returned before noon with one deer only. The fishermen had been more unsuccessful, they returned without a single fish and reported they could find but few and those they had tried to take in vain. They had broke both their gigs which were of Indian fabrication made of bone. I happened to have a pointed piece of iron in my pouch which answered by cutting in two pieces to renew both gigs. They took one fish this evening which proved to be a salmon trout much to our mortification, for we had hoped that they were the salmon of this spring arrival and of course fat and fine. These trout are of the red kind they remain all winter in the upper parts of the rivers and creeks and are generally poor at this season.

Capt. Clark added:

Gibson killed only one fish which we found to be the salmon trout of the dark species. This fish was of the common size pore, and indifferently flavored ... This evening Several Salmon trout were seen in the creek, they hid themselves under the banks of the creek which jutted over in such a manner as to secure them from the stroke of our gigs nets and spears which were made for the purpose of taking those salmon trout.

By June 20th the Expedition members began to more effectively catch the steelhead in Eldorado Creek, as described by Capt. Clark:

Our giggers also turned out with 2 gigs a bayonet fixed on a pole, a scooping net and a snare made of horse[hair]. Near the ford of the creek in a deep hole we killed six Salmon trout & 2 others were killed in the creek above in the evening.

On June 21st the Expedition reluctantly retreated back to the Camas lily fields and better hunting at Weippe Prairie on main Lolo Creek. En route they met up with two Nez Perce who initially agreed to guide them across the Bitterroot Mountains. Indeed the hunting proved exceptional. The next day 8 deer and 3 bear were killed, and one expedition member was sent back to the Clearwater River camp near Lawyer Creek to procure spring Chinook that were, at last, being caught in considerable numbers. From the time of reaching the lowermost Columbia River in November of 1805 the evidence suggests that the Expedition experienced what may have been a La Niña event (Holland 2008), a period when cooler-than-average sea surface temperatures occur in the central and eastern tropical Pacific Ocean and Pacific Northwest temperatures are often cooler than normal and wetter (Mass 2009). They endured a winter of great rainfall, continuing lowland snowfall into June, higher spring flow in the Clearwater River than prior years, and the lingering deep mountain snowpack. It may similarly explain the lateness of the
return of spring Chinook as indicated by the Native people throughout the Columbia in the spring of 1806.

On June 23, Sgt. Gass and two other men were dispatched to follow the two Nez Perce who decided to leave them in hopes of being able to follow them and blaze the trail across the Bitterroots for the rest of the Expedition to follow. They caught up with them at the prior camp on Eldorado Creek where the two Nez Perce caught another 2 salmon trout – a total of 11 which had been caught all together over several days at this one location on the creek.

There were no specific fisheries indicated at Lolo Creek, its tributary Eldorado Creek, Fish Creek, or its tributary Hungry Creek. However, it was apparent that the Nez Perce occasionally fished these creeks for steelhead in the spring, and that the Expedition successfully managed to gig (spear) them despite the steelhead being described as hiding beneath the cover of streamside logs and vegetation. The difficulty in capturing salmon or steelhead using this fishing method was previously indicated at the Lemhi River in Part I of this series. It would require considerable numbers of steelhead being present in order to effectively gig them. It is known today that Lolo and Fish creeks have adult steelhead whose age and size reflects that generally considered to be older, larger steelhead commonly known as B-run steelhead of the Columbia/Snake basins, but whose run-timing is earlier and more reflective of A-run steelhead that are considered younger, and smaller in size (Copeland et al. 2017). Fish Creek has had a weir operated on it since 1992. The largest steelhead escapement to it in that time was 494 wild steelhead in 2011 (Stark et al. 2016). Similarly complete data was not found available for Lolo Creek, but historically it can be expected that both creeks had large populations of wild steelhead much greater than the ~500 fish in best years today, as would be necessary for effective gigging, that occurred in latter June of 1806 at Eldorado Creek (tributary of Lolo Creek).

Back at the Weippe Prairie camp, it was found that three noted, and reliable, Nez Perce had volunteered to accompany them back across the Bitterroot Mountains and beyond to the Great Falls of the Missouri. The anxieties of gaining a timely passage over the snow covered mountains was finally past. They retraced their route over the next few days back to the mountain with deep snow that had resulted in their retreat on June 17th. The snow as measured on June 26th at the same location had melted nearly 4 feet from that of 9 days earlier. The three Nez Perce guided them without error up and down the difficult mountain terrain to a camp on the south side of a mountain slope where the snow had melted to expose abundant grass for the horses and where there was a spring for water. It was all but a matter of knowing the land from many travels through it as learned by the Nez Perce.

On June 27th, Capt. Lewis sang his praise, their passage over the Bitterroots nearly completed via the Lolo Trail – the first Euro-American exploration of the Columbia Basin, and descriptions of its salmon and steelhead, at an end:

... on an elevated point we halted by the request of the Indians a few minutes and smoked the pipe. On this eminence the natives have raised a conic mound of stones of 6 or eight feet high and on its summit erected a pine pole of 15 feet long. From hence they informed us that when passing over with their families some of the men were usually sent on foot by the fishery at the entrance of Colt Creek in order to take fish and again met the main party at the Quawmash.
glade on the head of the Kooskooske River [upper Lochsa River]. From this place we had an extensive view of these stupendous mountains principally covered with snow like that on which we stood; we were entirely surrounded by those mountains from which to one unacquainted with them it would have seemed impossible ever to have escaped; in short without the assistance of our guides I doubt much whether we who had once passed them could find our way to Travellers Rest in their present situation for the marked trees on which we had placed considerable reliance are much fewer and more difficult to find than we had apprehended. These fellows are most admirable pilots; we find the road wherever the snow has disappeared though it be only for a few hundred paces. After smoking the pipe and contemplating this scene sufficient to have damp the spirits of any except such hardy travellers as we have become ...

Epilogue

On June 29, 1806, Lewis and Clark and the other Expedition members, along with the Nez Perce that accompanied them, celebrated their passage over Lolo Pass by bathing in what is now known as Lolo Hot Springs in Montana. While still being in the greater Columbia Basin, they were now in the Bitterroot/Clarks Fork drainage to which salmon/steelhead passage is denied by natural waterfalls. The historical baseline left by Lewis and Clark for steelhead and salmon from the Lemhi River to Fort Clatsop, and back to the headwaters of the Clearwater River, remains from which to make important comparisons today.

In the case of steelhead their observations were particularly accurate, a major reason being that steelhead were present the full extent of their time in the Columbia Basin from August of 1805 through June of 1806. It provided them the opportunity to view the life history of the adults throughout that time, from initial sea entry, to passage at Celilo Falls, and on upstream to their most distant spawning grounds. The 11 months of steelhead observations gradually revealed that the “white” (silvery) and “dark” (red) forms of steelhead were but one species whose colors altered according to time spent in freshwater, and/or approach to spawning. The considerable confusion about the white and dark forms of salmon trout, as discussed at Fort Clatsop, was increasingly clarified in the combined journals of the Expedition members en route back up the Columbia and its tributaries from April through June of 1806.

However, with the untimely death of Meriwether Lewis, via gunshot on October 11, 1809 (whether murder or suicide still unknown), there would be no complete write up of the botanical and zoological findings he had been trained for, as intended by Thomas Jefferson. As a result, what he may have written up about steelhead, as represented by the white and dark forms of salmon trout, will never be known beyond what was recorded in the journals during the 11 months of experiencing them in the Columbia Basin. Nevertheless, what remains is considerable and documents the growing knowledge of Lewis and Clark throughout their time in the Basin regarding the life history of steelhead.
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