PUDDING RIVER WATERSHED HISTORY

INTRODUCTION

This chapter provides an overview of the historical conditions and changes over time within the Pudding River watershed. Elizabeth Orr and Scott Eden wrote the text. Jeff Brekas, Loy Cramer, Jerry Hinsvark, Scott McAleer, Mary Narey, Lori Webb, Anabell Prantl, and Marilyn Schlacter-Barner contributed information, photographs, and maps.

Three periods are covered in this account: the prehistoric time from 15,000 B.C. to the 1700's, when the Kalapuya Indians were the dominant people; the period of European contact from the 1700's to the mid-1800's, when explorers, fur trappers, missionaries and settlers appeared; and the interval from 1850 onward, when settlements were established and the modern economy, cities, and political structures took hold.

Chronology of Historical Events

15,000-6000 B.C.: Paleo-Indians arrive in the Northwest. End of the Ice Ages.

6000-4000 B.C.: Early Archaic Period.

4000 B.C.-200 A.D.: Middle Archaic Period. Camas, fish, and game provide food. A variety of tools utilized.

200-1750: Late Archaic Period. The bow and arrow are widely used.

1540-1770s: Spanish, English, Russian, and American explorers discover the Pacific Coast.

1778: Fur trading begins.

1781-83 Smallpox epidemic swept from Missouri to the Northwest. The Kalapuya population is reduced to below 3,000.

1792: Robert Gray discovers the entrance to the Columbia River.

1812: Donald McKenzie of the Pacific Fur Company travels through the area.

1813: Northwest Fur Company establishes a trading post three miles north of St. Paul.

1821: Northwest Fur Company merges with the larger Hudson's Bay Company.

1826: Ferry crossing established across the Willamette River two miles north of St. Paul.

1829: John McLoughlin, director of the Hudson's Bay Company, encourages the settlement of French-Canadians at Champoeg.

1830-33: Plague (flu or malaria) brought by a ship to the Columbia River further reduced the native population.

1834: Jason Lee arrives in the Willamette Valley to establish the Methodist Mission.

1843: A provisional government is organized by settlers meeting at Champoeg.

1845: Provisional land claims taken at present day City of Molalla. Molalla incorporated in 1913.

1846: Hudson's Bay Company withdraws from Oregon. Parkersville is founded by William Parker.

1847: Grafted fruit tree stock brought to the Willamette Valley.

1848: Oregon becomes a territory. Battle of Abiqua Creek.

1849: The California gold rush.

1850: First federal census finds that approximately 12,000 persons living in Oregon. The Donation Land Claim Act is passed, allocating 320 acres to each settler.

1852: Parkersville post office opens.

1854: Silverton founded. Incorporated 1892.

1855: Native Americans forced onto reservations at Grand Ronde. Silverton post office established.

1856: Aurora colony founded by William Keil on Mill (Deer) Creek near the mouth of the Pudding River .

1859: Oregon becomes a state.

1860: The census showed that seventy-five people were living in the City of Molalla.

1861: The Great Flood of December demolished Champoeg.

1865: The Silverton Fire burned a million acres in the Silver and Drift Creek drainages.

1869: 1,000 cases of measles reported in Salem.

1871: Hubbard platted. Woodburn post office opens.

1880: Narrow gauge Oregonian Railway Company, Ltd., established in Silverton.

1888: Woodburn's population grows to 500; violent wind storms damage the state house in Salem. Many trees down.

1890: In November the second largest Willamette Basin flood destroyed almost all bridges in the valley.

1893: A Scotts Mills and Mt. Angel post office opened; large historic oak cut down in Silverton. Silverton 'Red Sox' baseball team organized.

1893 to 1949: Annual or biennial floods.

1897: "Liberal University" operated briefly in Silverton.

1903: Telephone service begins in Molalla.

1906: Silverton Lumber Company incorporated.

1908: Donald sub-station established along the Oregon Electric Railway. Donald is incorporated in 1912.

1910: Barlow incorporated; telephone service in Mt. Angel.

1929: Forest fires sweep through Cascade foothills.

1933: Silver Falls State Park established, largely because of photographer June Drake. Many WPA works accomplished.

1936: A five-mile wooden pipeline for water supply built from Abiqua dam to Silverton.

1939: First wastewater treatment plant in Silverton.

1950: January snowstorms dumped thirty inches on Molalla.

1962: The Columbus Day storm with winds over 100 miles-per-hour did $170 million in damages.

1964: Severe flooding in December was not controlled by flood-control dams built throughout the Willamette Basin (1950's). There was extensive damage in Salem and Keizer where houses were submerged. Claggett Creek even reversed direction.

1971: Silverton reservoir built at old splash dam site on Silver Creek (near old townsite of Bargerville).

1974: Flooding high in February.

1996: Flooding, comparable to the 1964 flood. In Silverton over 100 people were evacuated and homes were damaged. The Pudding River at Aurora was one of seven in Oregon to reach record high levels.

PREHISTORIC PERIOD: 15,000 B.C. TO 1700s

Throughout the Willamette Valley, but especially within the Pudding River watershed, a variety of ancient bogs and swamps date back to the Pleistocene (Ice Age) Epoch over 12,000 years ago. At that time Cascade glacial activity poured water and sediment into the Willamette Basin, overwhelming the existing drainage network of small streams. Lake Labish, the largest of these wetlands, entended northeastward from Salem for almost ten miles. The lake represents the old bed and banks of the Willamette River before it moved to a new path north toward Wilsonville. Once this ancient stretch of the river was abandoned, a large lake developed, changing eventually into a marsh and bog. The peaty strata and anoxic conditions of this wetland have yielded the bones Ice Age animals such as elephants, sloth, sabre tooth cats, small rodents. Even a modern steam locomotive found its way into the bog (Photo 11). A similar marsh, following Mill Creek through Woodburn, is turning up fossil vertebrates as well. Both environments have been highly modified by drainage canals and agriculture as well as by urban development (Orr and Orr, 1999).

Paleo-Indians, who first appeared in the Willamette Basin, were descendants of the ancestral people who crossed the Bering Straits from Asia around 15,000 years ago. This was during the Ice Ages, when water, locked up into continental glaciers, exposed the land bridge across the Straits. The journey from Asia took thousands of years. Around 13,000 years ago, the first Indians reached the Northwest and dispersed evenly across the region and into the Willamette Basin. These were the Clovis big game hunters, named after the distinctive grooved spear points they used. For reasons that are unclear, the Clovis people

suddenly vanished about 11,000 years ago, but their demise may have been related to the simultaneous extinction of elephants, sloth, and other large mammals, on which they relied for food.

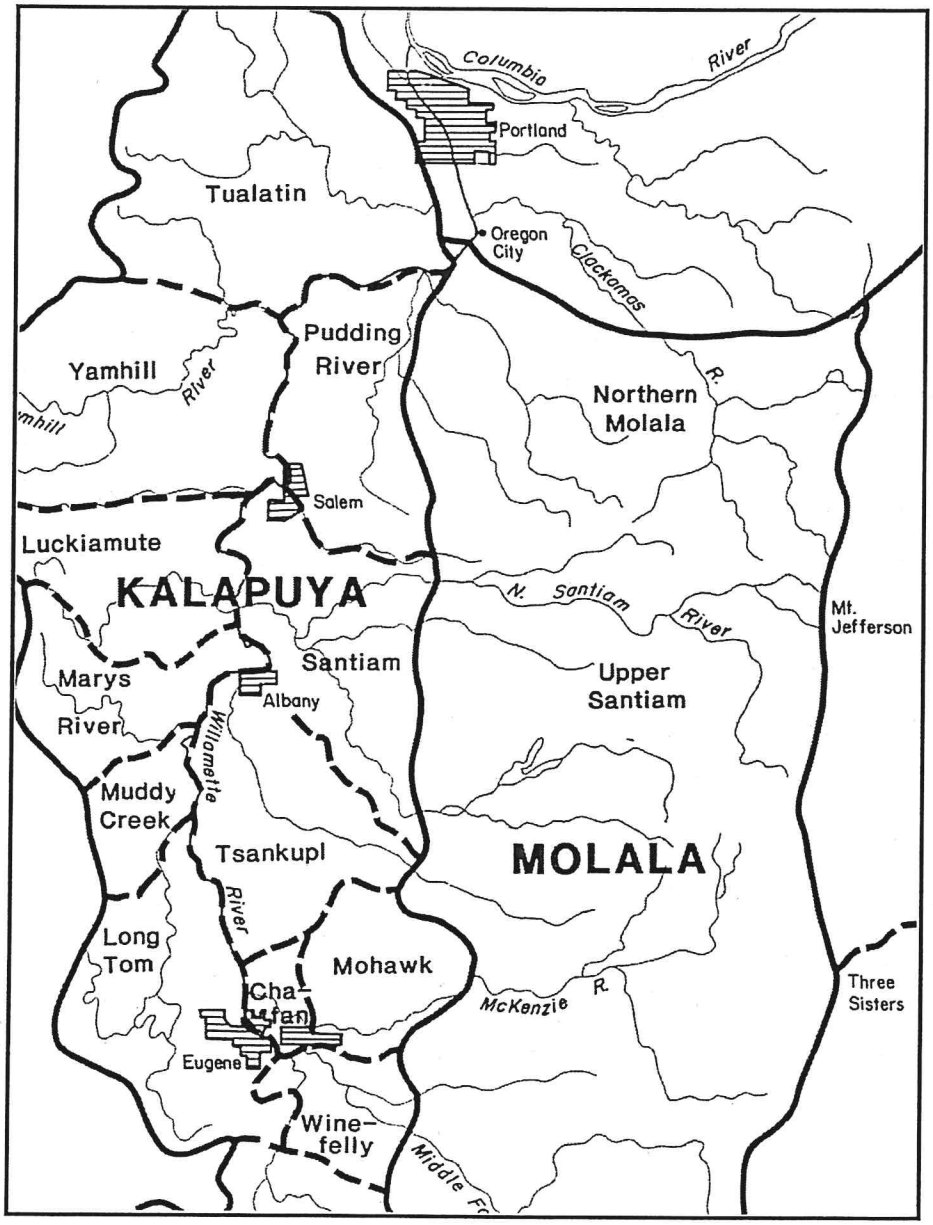
During this post-glacial period the climate was changing, becoming warmer and dryer. White pine and Sitka spruce, preferring cooler conditions, were declining, while Douglas-fir, ponderosa pine, and white oak increased. Interestingly, this knowledge of the changing climate was gained from fossil pollen studies taken from Lake Labish and Onion Flat near Salem (Aikens, 1984). Following a subsequent climate shift to more rain and cooler temperatures around 4,000 years before the present, Douglas-fir and ponderosa pine dominated the hills, while deciduous species occupied the valley floor. Camas lilies, hazelnuts, Oregon grape, salmonberry, elderberry and other plants were dispersed throughout wetlands or along streamsides.

Within the Willamette Valley, wild grasses dominated the open prairies. Lieutenant John Wilkes of the United States Exploring Expedition, who docked his ship at Vancouver in 1841, commented in his *Narrative*, "the prairies are at least one-third greater in extent than the forest; they were again seen carpeted with the most luxuriant growth of flowers … extending in places a distance of fifteen to twenty miles" (Wilkes, 1852). Explorers also remarked on the savanna-like conditions they encountered. In his *Journal*, Joel Palmer wrote that the, "courses of the Pole Alley (Molalla), Pudding and Santiam Rivers all are through open country with timber confined to scattered groves and streambank forests" (Palmer, 1847, p.179-185). He noted that open savannas, interspersed with white ash, willow, black cottonwood, red alder, and big leaf maple along the streambanks at lower elevations gave way to Douglas Fir, cedar, hemlock, and spruce on the foothills.

Only one prehistoric archaeological site in the Pudding River watershed has been thoroughly examined and published on, although artifacts can be found routinely along streams where Indians camped seasonally. At Hager's Grove on Mill Creek near Interstate-5 the inhabitants lived at two separate locations among the cottonwood, oak, ash, and willows. This site yielded stone artifacts in association with charcoal-filled hearths and ovens. A variety of large stemmed and side-notched projectile points, drills, mortars, hammerstones, and chips were uncovered, but no house structures were discovered. Camas bulbs and hazelnuts point to a spring and fall usage. Dated charcoal from the firepits ranges from 3,800 years before the present to the historic time, indicating a long period of occupation for Hager's Grove, equally lengthy intervals of abandonment were indicated. (Aiken, 1984, p.93; Pettigrew, 1980)

Eventually Paleo-Indians throughout Oregon evolved into separate tribes, each with their own language, habits, and customs. Grouped by language, there were two bands occupying the Pudding River watershed, whose territory was divided along the foothills of the Cascade Range. One tribe, inhabiting the lower Pudding, spoke the Kalapuya dialect and belonged to the Kalapuya family of the Ahantchuyuk band

(Aikens, 1984). They overlapped with Molalla language speakers, who lived to the east at the higher elevations. Although small in number, the Molalla band was widely distributed from Clackamas to Douglas County. Aggressive in nature, they traded for slaves with the Klamath Indians to the south and carried on warfare with their Cayuse neighbors to the east. The Mukanti band of the Molalla, near the present-day city of Molalla, followed the Old Indian Trail, or Klamath Trail, through the Santiam Valley near Mt. Jefferson and on across the Waldo Hills. The Klamath Trail crossed Silver Creek on its way north to the Columbia River, while another Indian roadway followed Abiqua Creek into the valley (Thayer, 1995). These pathways provided easy access northward to the Chinooks along the Columbia as well as to the settlers of French Prairie (Chapman, 1996; Down, 1926).



An 1851 map of the Willamette Valley by George Gibbs and Edmund Starling shows the relationship of the Molalla and Kalapuya tribes. (Aikens, 1986)

Kalapuya and Molalla speakers were hunters and gatherers, moving from place to place where they could harvest available natural resources. For subsistence they depended on digging bulbs, gathering acorns or wild nuts and berries, and on fishing and hunting. Each of these activities required the establishment of temporary camps at different seasonal locations. The camps were frequently near waterways where edible plants grew on the rich soils of the floodplain and fish filled the streams. Once camas flowers appeared in early summer along the banks of the Pudding River, the roots were pried out with sharpened sticks, roasted, pounded into cakes, dried, and stored for the winter. A wide variety of seeds and berries, wild onions, and nuts were also gathered in the fall and processed for storage. (Emmert, 2003). Fishing took place during spring and fall runs, although steelhead, trout, and eel were caught throughout the year. Anadromous fish may not have been a primary food source for the Kalapuyans, who relied on more of a variety of foods. Abundant game animals such as deer, elk, and riverine mammals, as well as the smaller rodents, squirrels, rabbits, and raccoons were generally available to supplement their diet. (Beckham, Minor, and Toepel, 1981; Robertson, 2002).

To a certain extent, the continuing presence of grasslands may have been sustained through repeated burning by the Indians. How frequently and how extensively fire was used is not clear, although a few of the early accounts by pioneers of French Prairie, Lake Labish and Howell Prairie (or Tachmool) suggest that the regular burning was practiced, possibly to remove thatch and provide grasslands for game. Tree ring studies, which show frequent charring from 1647 to 1843, with less fire occurrence after the arrival of Europeans, provide some evidence to support regular burnings (Aikens, 1984).

By the time the first settlers reached the Willamette Valley, epidemics as early as 1781 had destroyed over half of the Indian population, and by the 1830s "intermittent fever or ague" swept through whole villages. The attitude of many whites was reflected by that of Leslie Scott: "Always it will be a source of thanksgiving that the destruction of the Indians of the Pacific Northwest by disease spared the pioneer settlers the horror of a strong and malignant foe." (Scott, 1928, p.161). Calculations of the number of Kalapuyan bands vary. At the time of the Lewis and Clark expedition from 1805 to 1806, one account lists at least six bands, estimated at between 10,000 to 13,500 individuals, whereas another source gives only 3,000 Kalapuyans in 1780, but as many as sixteen or seventeen distinct tribes. By 1841, Charles Wilkes noted that only 400 or so Kalapuyans remained in the valley. The Superintendent of Indian Affairs listed just 123 Molallas throughout the valley by the 1850s. (Boag, 1992; Hussen, 1967; Wilkes, 1852; Palmer Papers).

In 1851, the surviving Molalla and Kalapuyans were forced by treaty to relinquish their lands and removed to reservation lands. (Minor, et al., 1980). While most came to reside at the Grande Ronde Reservation, some members were placed on temporary land claims along Abiqua Creek and the Pudding

River where they remained, died, and were buried. Their burial mounds have long since been leveled by cultivation (Hodes, 1932). Several "last" Kalapuyans have been recorded. Sam Fern, said to be the only remaining full-blooded Kalapuyan, died at Cottage Grove on September 5, 1919, at the age of forty-seven. However, Lize, a Kalapuyan from the Mohawk River valley, who died in Brownsville on August 25, 1948, aged one hundred, was also described as the last of her tribe. The last surviving leader of the northern Molalla was Indian Henry Yelkes, who "met death from unknown causes" in September, 1913. (*Molalla Pioneer*, September 25, 1913).

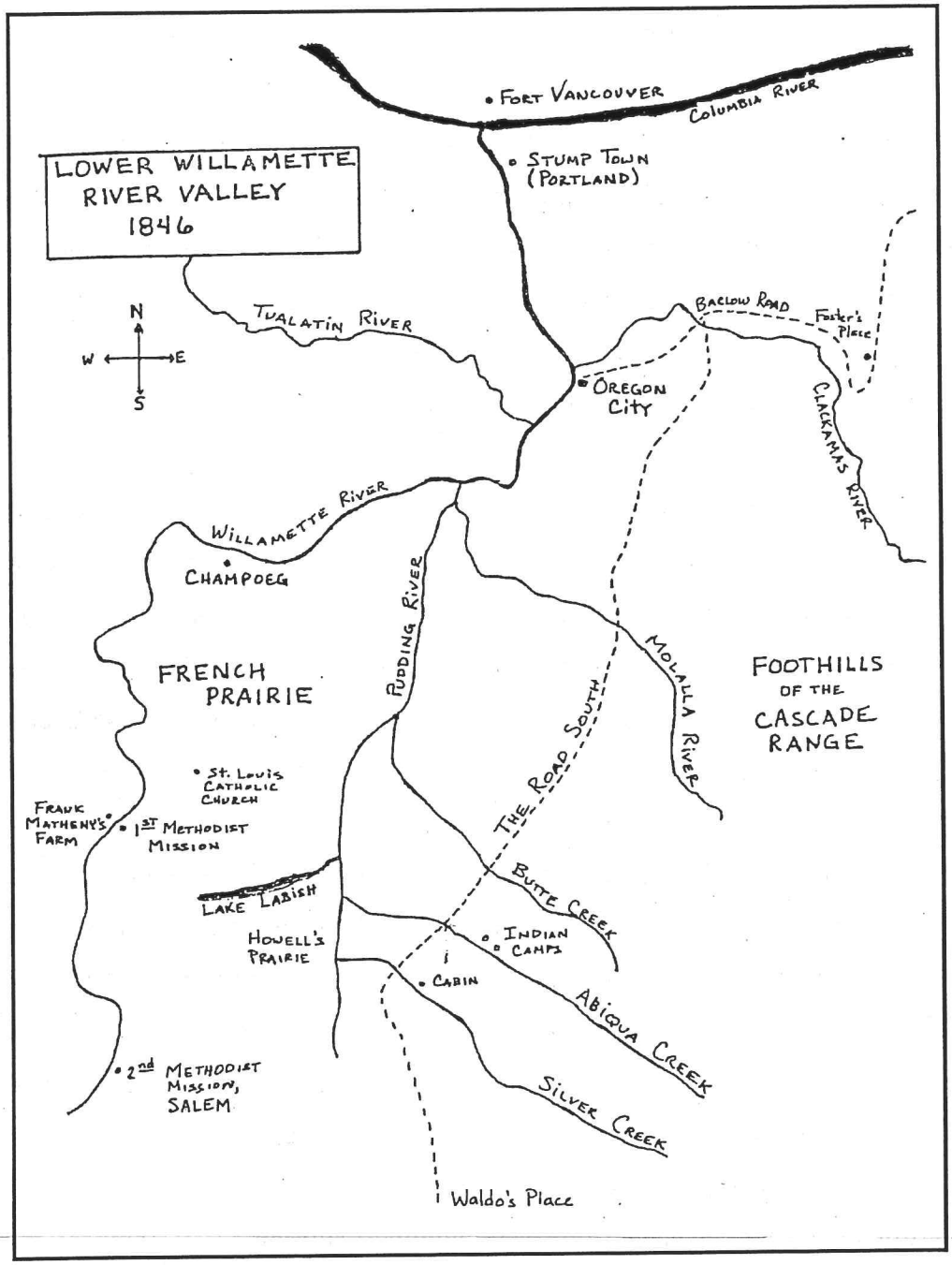
EUROPEAN EXPLORERS, FUR TRADERS, AND EARLY SETTLERS: 1700s to mid-1800s

The first Europeans to the Northwest were explorers and fur traders, who reached the coast in the late 1700's. Some wished to claim new territory for their governments, while others sought riches in trade goods. In the Pacific region, the whites found a wealth of fur-bearing animals, which they trapped and killed to the point of extinction during the succeeding century. By exploring inland waterways in search of otter, beaver, or marten, trappers played a major role in opening the unknown region of the Northwest. The fur seekers were followed by missionaries and then by permanent settlers.

There are several accounts for how the Pudding River was named. Judge J. Quinn Thornton wrote in his 1848 description of the far western frontier: "The Putin (pronounced *Put-in*, but corrupted to *Pudding*) has its source in the Presidents' Range of mountains (Cascade Mountains)" (Thornton, 1973, p.292). A second version, which deals with fur trappers, is the one most often cited. According to this account, in 1821 or 1822 two French-Canadian trappers, Joseph Gervais and Etienne Lucier, along with their families, were camped on the Pudding River, called Hons-u-cha-chac by the Indians, when a winter storm came up. Fortunately they were able to shoot an elk, from which their Indian wives prepared a favorite French dish called blood pudding. Afterward Lucier and Gervais named the stream *Riviere au Boudin*, or Pudding River. (McArthur, 1952, pp.500-501). A slight variation states that the river received its name from the "circumstances of a trapping party which had become bewildered and out of food; there they ate a pudding made from the blood of a mule which they killed." (Bancroft, v.1., p.72). In 1843 the river was designated by the Indian name, *Anchiyoke*, when the Champoeg District was created by the Oregon territorial government. However, the name, Pudding had already been used on Charles Wilkes' 1841 map, and it was never changed.

In 1829, Etienne Lucier persuaded John McLoughlin of Hudson's Bay Company to loan him seed to sow as well as wheat to feed his family. With McLoughlin's assistance, Lucier was able to break ground and plant crops near Champoeg, an area now called French Prairie (Lenzen, 1991). By helping the French-Canadians, McLoughlin was attempting to discourage American settlement south of the Columbia

River. Initially cultivating bottomlands along the Willamette, the French Catholics later moved inland to St. Louis and Gervais, where their culture flourished for twenty years. By 1838 there were twenty-six farms at French Prairie, and less than ten years later, this number swelled to eighty-three families. In 1841 the Hudson's Bay Company warehouse at Champoeg was recorded to store 30,000 bushels of wheat and 10,000 bushels of other grains.



Map 1. Early settlement map from "The Gold on the Pudding" by Annabell Prantl.

The earliest American pioneers in the Pudding River watershed were farmers, arriving with a wagon train in 1842, led by the famous Jesse Applegate. Even then, three agricultural communities were already operating in Marion County: the French-Canadians of French Prairie, the traders near Tualatin Plains in both Yamhill and Marion counties, and the Methodists near Salem (Lenzen, 1991). Among the wagon party were the members Howell and Waldo families, who drove a herd of cattle from their home in Missouri. These early settlers, as well others who came later, were able to claim 320 acres under the 1850 federal Donation Land Law. If accompanied by a spouse, the claimant could receive twice that amount of acreage. Before passage of the law, Marion County's population was 2,749 persons, while that of Clackamas County was 1,850. Within ten years of its enactment, the number of persons in Marion County rose to 7,088 and in Clackamas there were 3,446 residents (Lang, 1885, p.591).

With the blessing of the federal government, pioneers were actually claiming land already occupied by Native Americans, who were displaced from their traditional hunting and gathering locations by the newcomers. With the Americans and Indians occupying the same land and using the same resources, it was inevitable that settlers and the warlike Molalla would come into conflict. There are a number of versions relating what was called the "War on the Abiqua." In 1847 the Molalla leader, Crooked Finger, visited the adjacent Klamath and Modoc tribes, seeking support for an uprising against the whites. A "desperate Molalla," Crooked Finger had received his name from a deformed hand injured by a flint-lock rifle. Assembling perhaps 150 Indians, he felt confident enough to threaten local white families. Settlers along Abiqua and Butte creeks organized and armed themselves, and, when the hostile Indians attacked during the winter of 1848, the whites barricaded themselves in Richard Miller's cabin (near the present-day Miller Cemetery). After shots were fired on both sides, the Indians retreated. The following day the armed settlers, locating the Molalla camp by following tracks in the newly fallen snow, attacked and routed the Indians. "The entire engagement was long suppressed by the participant whites, for shame of the slaughter of women and children, for which a frontier ruffian seems to have been responsible" (Stern, 1966, p.239). After this event, the Klamath no longer visited their seasonal camps on the Abiqua. A bronze plaque commemorating the event was placed at the site. The sign was later removed to the Silverton Country Museum because of repeated vandalism (pers. comm. Ron English, Silverton Historical Society).

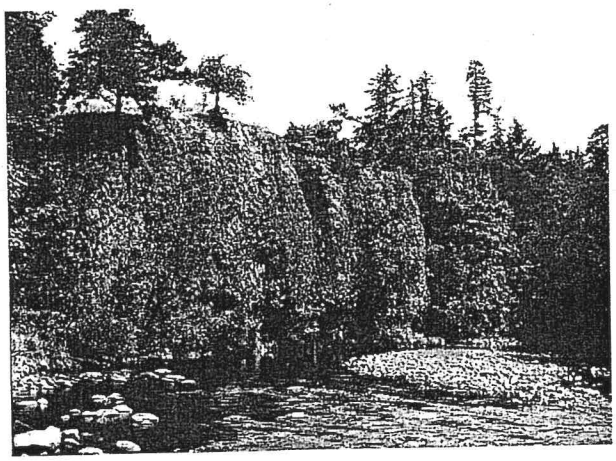
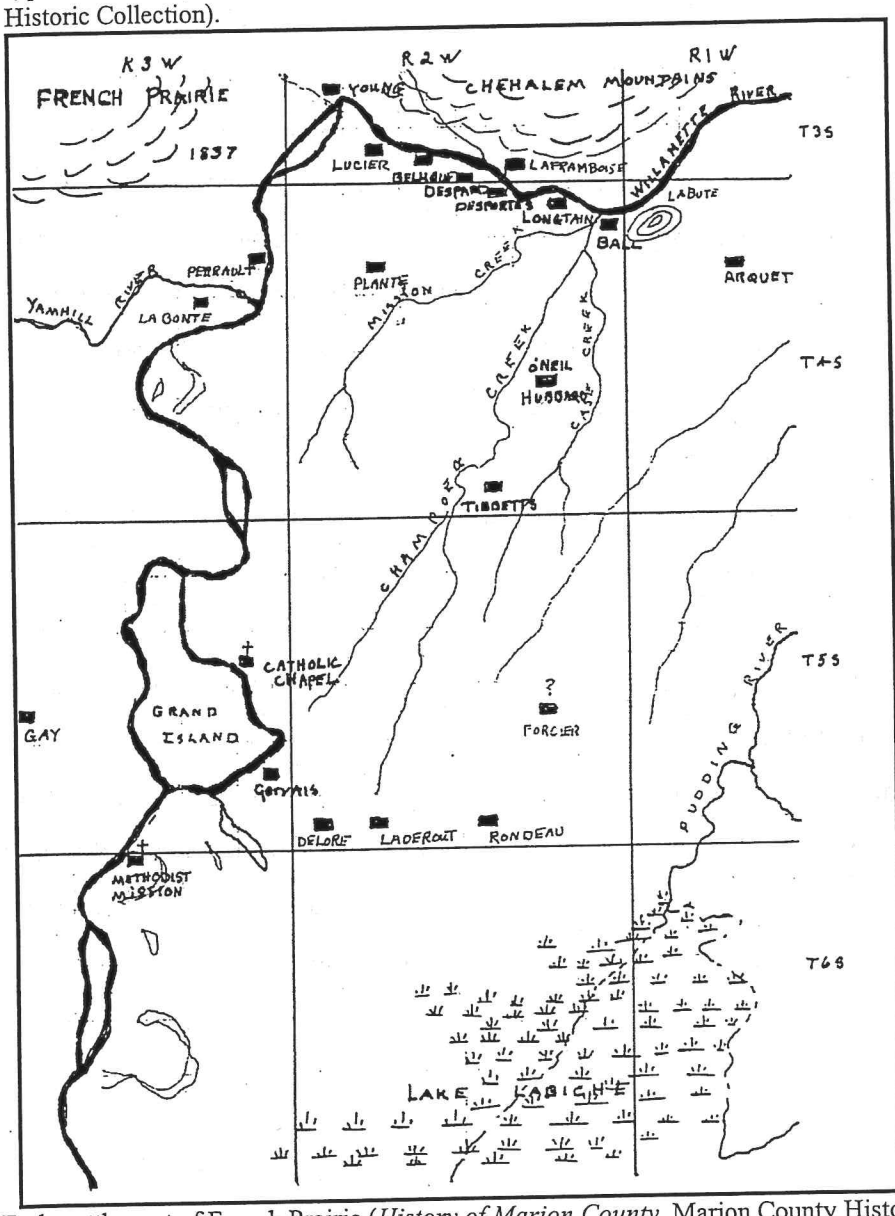


Photo 1, on the left, a 1954 photograph of "Indian Bluff" on Abiqua Creek is thought to show the site of the Battle of the Abiqua, and to the right, photo 2, is the photograph of the commemorative plaque. (Photos courtesy of the Salem Public Library, Ben Maxwell Historic Collection).



Map 2. Early settlement of French Prairie (*History of Marion County*, Marion County Historical Society, 1956-68)

PERMANENT SETTLEMENT: 1850's to the present period

As the "threat" and fear of Indians diminished by the mid-1800's and after the federal government passed legislation to encourage settlement, countless wagonloads of pioneers traveled westward. The Willamette Valley was the most sought-after destination, and, once there, emigrants clustered along waterways, placing their farms and homes on the fertile bottomlands. For each settlement, a flour or sawmill, powered by a waterwheel, was a necessity. In 1854 Silverton was founded; Hubbard was platted in 1871, Woodburn in 1871. Mt. Angel was settled in the 1850's, and Scotts Mills about ten years later. In 1852 the Parkersville post office opened.

The visionary Utopian society at Aurora was unique. Near the mouth of Mill Creek, Aurora Colony, or Dutch Town, was founded by the followers of William Keil in 1856. Named for Keil's daughter, its 600 industrious residents lived communally, farming on 14,000 acres and raising hogs, fruit, wine, and other foods, which made them self-sufficient. The Colony became famous for its artisans and musicians as well as for its hotel and excellent country food, making it a popular stopover for travelers between Portland and Salem on the Oregon & California Railroad.

Once the mineral hot springs along the Cascades became known for their curative qualities, a number resorts within the Pudding watershed developed as favored weekend destinations. Mineral Springs Farm or "Wolfer's Mineral Springs" on Mill Creek in Hubbard and Wilhoit Mineral Springs above Scotts Mills lured the "Clackamas County Elite" with their advertising brochures of "cute ... peaked roof huts, spacious log lodge, [and] the restful atmosphere and curative soda water." After the facility burned several times, Wilhoit Springs fell into disuse (McCormick, 1992, p.95).

Agriculture

As more Americans reached the Northwest, pioneers had to venture further into the forested upland in order to find unclaimed land. "They were woodland farmers, hunters, and raisers of livestock, in combination and skilled in the use of axe and rifle. Trees were raw material for their log cabins, and worm fences, and also an encumbrance of the ground, to be deadened, burned, or felled." (Sauer, 1962, p.2-3). To clear land, dense forests made way for the plow, a practice which produced great quantities of lumber at the same time enabling agriculture to become dominant industry. The valley is unique in that lush grasses grow year-round, reducing the need for storage to maintain stock. William Slacum, an early observer of the valley's settlement, proclaimed that the Willamette Valley was the best grazing country in the world, with its rich grasses available in the summer and winter (Vaughan, 1965).

The keeping of livestock and planting of crops were important to the success of each farm enterprise. The first cattle were brought in by the Hudson's Bay Company, while the Willamette Cattle

Company drove an additional 600 head into the valley from California in 1837. Several hundred meat cattle, also from California, reached Salem in 1842 (Smith, 1940). Settlers maintained their own herds, and farmers on French Prairie kept substantial numbers of horses and hogs, sheep, mules and oxen. Daniel Waldo and his family obtained sixty-eight head of cattle in 1843 to begin the first homestead in the hills around Silverton. In addition to cattle, sheep were raised for their wool. In 1880 there were 14,000 sheep in Clackamas County and 35,000 in Marion County. The practice of cultivating and enclosing small fields while allowing livestock to roam freely across the open prairies became the established land use pattern in the Willamette Valley. But with the development of towns such as Woodburn, Gervais, and Mt. Angel, fences were erected to keep the cattle away.

Farmers preferred the fertile open lands along the lower stretches of the Pudding River where only a few trees had to be cleared before cultivation could begin. Native grasses, impacted by both cultivation and grazing practices, were replaced by introduced vegetation. Wheat was the main crop planted, and by 1880 the number of acres in wheat was followed by that of oats, corn, and barley (Lang, 1885, p.585). In 1832, wheat became the currency of the day and could be credited for trade goods. Most of it was shipped by the Hudson's Bay Company to Russian posts in Alaska, even though some went to the Sandwich Islands (Hawaii) and to China. Over 40,000 bushels of grain were sent from Hubbard in 1878 (Corning, 1947).

The planting and marketing of other commodities such as hops, potatoes, fruits and nuts, and nursery crops began in the mid-1800s. Hops were first introduced to Oregon in 1865, and production reached its heyday twenty-five years later. By World War I, Woodburn led the world in acreage, at which time the camps of pickers were a common sight along the Pudding River. Nine bushel boxes sold for twenty-five to sixty cents each (Lynch, 1978; Marion Co. History, 1957). The spread of Downy mildew and the reduced availability of labor brought a decline in hop production after 1945. "Dimick" potatoes from the "early" or "shaker" stock of Michigan were introduced to Marion and Clackamas counties. In 1880, Clackamas County led the state in production with just over 200,000 bushels, whereas Marion was third behind Multnomah County with 154,000.

Oregon was said to excel as a fruit growing region. "Fruit trees will grow from six to eight feet the first year; bear fruit the second" (Lang, 1885, p.565). Joseph Gervais had apple trees on French Prairie as early as 1831 (Vaughan, 1965). In 1847, nurseryman Henderson Luelling of Milwaukie brought 700 grafted fruit trees from Iowa to provide the stock for many orchards in the Pudding River valley. About the same time, Ralph Geer began to plant and promote orchards in the Waldo Hills. Between 1910 to 1925 loganberry acreage rose to become the region's most important fruit crop, enabling Marion County to excell as the state's top producer. During 1916, over 71,000 gallons of juice were pressed at PHEZ,

Pheasant Fruit Juice Company, in Woodburn, one of the first Oregon manufacturer to begin a nationwide advertising campaign (Lucas, 1998). In addition to loganberries, both blackberries and strawberries were also planted and harvested regionally. In Silver Falls City, a short-lived community near Silver Falls, a grower recorded that he harvested 122 ½ tons of strawberries on his farm during one season in the 1920s (Sweger, 1980).

Throughout the years, the planting and production of several unusual farm crops came and went in, while others remained and expanded. At one time, Molalla led the west in growing teasel burrs for use in woolen mill machinery. In 1858 William Barlow brought black walnuts to the valley, and Jess Settlemier, the founder of Woodburn, operated one of the first nurseries there, while his father owned one in Silverton. During the 1930's, enough acres of Blue Lake pole beans were grown to supply both the Ray Maling cannery in Woodburn and the Silverton Canning Company. First introduced in 1923, the beans soon captured over thirty percent of the domestic market. For fifty years, the Salem district was the only producer of the Blue Lake beans, but by 1970 they were being grown in other parts of the country.

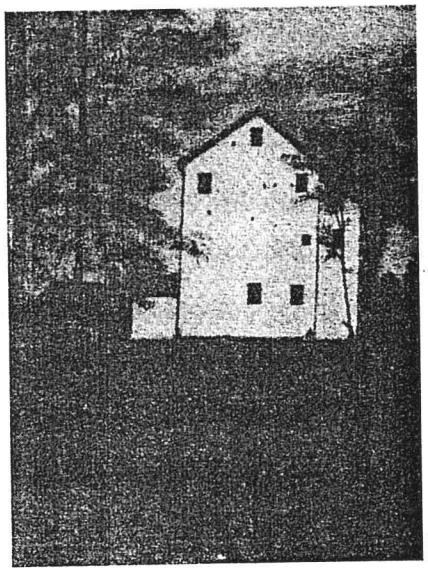
In the early twentieth century, flax became the top commodity within the lower Pudding River region. Raised to produce linen thread, Oregon flax was processed at the state penitentiary in Salem and at a mill in Mt. Angel. Mt. Angel emerged the center for the flax industry in the Northwest until after WWII, when demand decreased, and the mills struggled to find markets.

Once a hunting ground for Native Americans, Lake Labish was drained and converted to agricultural production in a process that began with the first settlers. Discovered in the mid-1800's by French trappers, Lake Labish took its name from the French word "la biche," meaning doe. An 1837 account by Lt. William Slacum tells of his visit to Lake Labish:

> *"The Pudding River on the east and the long Labiche swamp on the south made a sort of island basin out of the lake bed that had been laid down here in ancient times. It had been burned off regularly by the Indians in order to preserve grazing for game animals, so was covered with tall wild hay. A lacing of trees outlined the creeks, with occasional groves of fir and oak timber. Two main trails crossed it, one south from Fort Vancouver, the other west along the river from the Falls."*

The alteration of the lake and its wetlands environment provides an example of how pioneer farmers modified rich "beaver soils" to create opportunities for agriculture. Labish subsequently became famous for its crops of potato, onion, celery, lettuce, beans, and others (Marion Co. History, 1956).

The first attempt to modify the lake came in 1849 when William Parker constructed a dam across the Pudding River, backing up water into the lake for five or six miles, and storing water for his grist and saw mills. Anchored in the soft Pudding banks, his first two impoundments washed out, and he wasn't successful until constructing a stronger third one that was able to withstand winter floods. The Labish Drainage District, composed of upstream farmers, formed in 1904 and proposed to buy out Parker's eighty-year-old water right to the dam, but its offer was turned down by the new owners, the Wattier family. A court ordered the Wattiers to tear down the structure, but when they refused, it was dynamited by persons unknown. The dam was never completely rebuilt, although the argument over its presence continued through several further court hearings and many years.



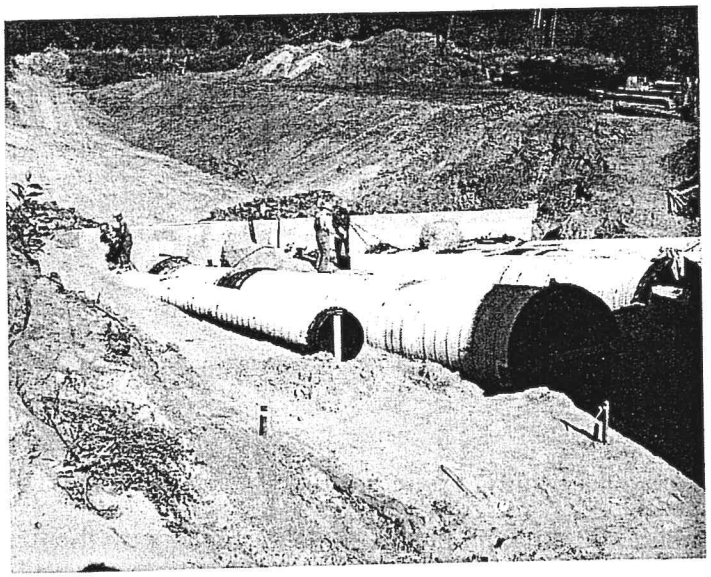


Photo 3, on the left, is an historic photo of a painting of the mill at Parkersville, which stood at the site until the 1930's. Photo 4, on the right, shows the construction of the pump station at Lake Labish in 1961 at the same location on the Little Pudding River. (Photos courtesy of Anabell Prantl and the Marion Soil and Water Conservation District)

Regular dredging, clearing, and wooden tiling were carried out to complete the conversion of the Labish wetlands to agriculture. In 1911, attempts to drain the lake by digging a ditch towards its western end were not successful, but four years later Madison Jones dug a channel from the east side, draining the middle section. Sandy Hayes brought in a steam dredge that was formerly used to find gold in California, and cleared out the lower end of the lake starting before, and finishing after, World War I.

Loy Cramer related that his mother, Inez Jones, was born in 1890 and recalled seeing elk feeding about Lake Labish prior to the time the lake was drained. He remembered that Madison (M.L.) Jones bought the lake bottom for fifty cents an acre from the state and hired Nels Severson to dynamite a large beaver dam on the Little Pudding River, which was holding water in the lake. Sometime after the turn of

Recreational swimming in the Pudding near Woodburn was not common after cannery operations were in full production.

The Silverton Canning Company on Front Street utilized the municipal disposal system for its by-products, but the antiquated facility was unable to handle the load, and a significant pollution problem was created in Silver Creek. In 1939, a new city disposal system was built as production continued to increase at the plant. After it became Kolstad's Canning Company in 1963, expansion of the plant was so extensive that all the available water was used up, making it necessary to install an eight-inch intake pipe running from Silver Creek. The increased pipe size brought a sewer overload at the wastewater treatment plant in 1966 during a particularly heavy corn and pumpkin run. In 1969, when operated by the Stayton Canning Company, it began disposing of 400,000 gallons of wastewater daily by field application to forty acres cultivated for hay near Hobart Road (Lucas, 1998).

During the depression, cannery profitability suffered as fruits and berries were bought for mere cents per pound. However, canning still remained one of the most reliable local employers. Home canning became the norm, and Marion County provided a mobile service to help home canners. During 1933, nearly all the communities in the Pudding River watershed were served by this mobile program that offered free materials and advice before it was dissolved in 1934.

TABLE 1 Canneries operating in the Pudding River Watershed (Adapted from Lucas, 1998)

Year	Location	Description
1889-1892	Woodburn	Woodburn Packing Co. was never financially successful.
1908-1915	Woodburn	Woodburn Canning Association forms and builds the Woodburn Cannery (later Woodburn Fruit Company) for berries, fruit, pumpkins.
1912-1925	Silverton	Land Products Company intended to start a cannery in Silverton but evidently decided just to grow and handle farm products.
1915-16	Salem/ Woodburn	Oregon Fruit Juice Co.(later Pheasant Fruit Juice Co., then PHEZ, then NW Fruit Product Co.) utilized the former Woodburn Fruit Company site.
1919-1927	Woodburn	Roy & Carl Graves Cannery. Derelict in the late 1920s was finally torn down in 1937. The site became the Woodburn Feed and Supply Company
1919	Silverton	Silverton Food Products Company purchased the Silverton Hops Grower's warehouse. It canned blackberries, strawberries and other fruit but became idle from 1932 to 1935.
1922-1938	Mt Angel	Mt. Angel Packing Company, a Co-Op, leased land from Southern Pacific
1922-23	Woodburn	Willamette Valley Canners
1924-1930	Woodburn	Oregon Packing Company processed pickles and strawberries. The plant was vacant for nine years before being torn down.
1924	Woodburn	The Young Street Plant was built by Woodburn Fruit Growers (later United Grower's) on old Livesay Sawmill site. Fruit and jam production.
1927 -1993	Woodburn	Ray-Brown Company cannery became Ray Maling Company (Bird's Eye), then General Foods in 1943, and finally AgriPac in 1987.
1929- 1935	Mt Angel	Libby, McNeill Pickle Plant leased Southern Pacific railway land and

		produced up to five rail cars daily for the Portland markets.
1933	Four Corners	Emile Aufranc opens a custom cannery on State Street near Salem.
1935-present	Silverton	Silverton Canning Company became Royal Canning in 1944, then Kolstad's Packing Company in 1946, and Stayton Canning Company in 1968. Finally it was Norpac, the Brucepac in1994.
1936-2000	Four Corners	Roland & Meryle West mushroom farm on State Street in Salem became West Foods, Inc. in 1947, Mushroom King in 1985, and Pictsweet in 1987.
1940-1988	Woodburn	North Marion Fruit Company opens a new plant. Another new plant is built in 1964.
1943 -1965	Aurora/ Woodburn	Roland Gottsacker opens the Butte Creek Pickle Company in 1950. It became Woodburn Enterprises in 1960.
1950	Mt Angel	Burger Packing Co. produced specialty soups in the early 1950s.
1952	Woodburn	Terminal Ice & Cold Storage warehouse was built at Ray Maling Cannery.
1955	Woodburn	Conroy Packing Company processed and froze berries on the site of the old Woodburn Fruit Grower's business. Became Kerr in 1990.
1960	Woodburn	Woodburn Enterprises pickle plant opens.
1963	Woodburn	J.M. Smucker plant produced jam and jellies in Woodburn until recently.
1968	Brooks	Mainline Foods opens; becomes Stayton Canning Company in 1973.

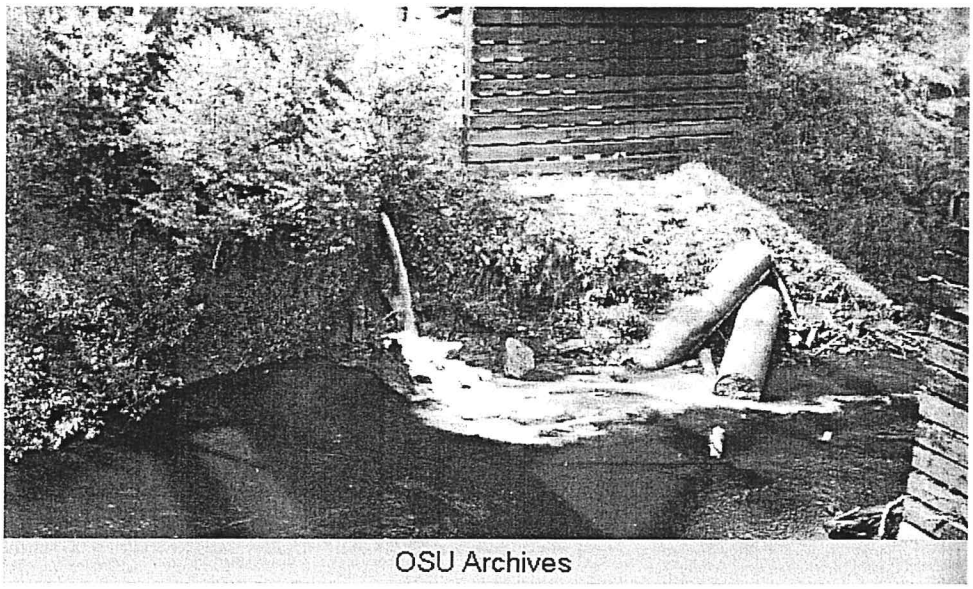


Photo 5, cannery waste from Bird's Eye in Woodburn falls directly into the Pudding River in 1964. (Photo courtesy Oregon State University Historic Archives)

Creameries and Dairies

Many of the first dairies began on farms where the cows grazed around the stumps of trees, which had been cut down. Because of its lush grasses and abundant water supply, the Willamette Basin was seen as providing endless possibilities for dairying. When the number of cattle increased, and farmers found themselves producing an excess of milk, they established neighborhood creameries for making butter and cheese from the surplus. Such was the case in Mt. Angel, when John Wunderlich converted part of his

buildings in order to manufacture butter and cheese in 1889. But modern facilities were lacking, and Wunderlich's efforts proved unsuccessful, as were several other attempts, until 1912 when farmers formed their own co-op, the Mt. Angel Creamery and Ice Company. About that time, a very successful creamery in Hubbard marketed "Mother Hubbard Butter," while Silverton had a number of dairy operations during the 1930s. In the late 1880s Marion County was among the top three producers of butter in the state at 224,000 pounds (Hodes, 1932; Marion Co. History, 1956).

Dairies have traditionally used nearby waterways to dispose of their effluent. Today only sewage lagoons are mandated by state law for processing, and dairies in the Pudding watershed spray their raw wastes onto fields. Growing up as a youth on the Little Pudding River, Rick Gerig recalled a creamery near Fruitland in the late 1930's discharged whey directly to the waterway. In spite of this, he noted that there was always good trout fishing in the Little Pudding River.

Natural Resources

Lumber and Dams

The immense forests of the Northwest played an important role in its settlement and economy. Initially simple logging and milling were a necessary part of the clearing and cultivation surrounding every permanent settlement, but in no time lumber manufacturing became one of the primary industries of the Pudding Basin. Sawmills appeared on virtually all tributaries of the Pudding, and towns such as Silverton quickly developed a timber-based industry. At one time close to seventy mills of all sizes operated throughout the region (Thayer, 1996, p.1). Small individual sawmills with dams were in operation on Mill Creek (1840's), Silver Creek in 1846, Butte Creek in 1847, Abiqua Creek in 1863, and on the Pudding River at Parkersville in 1848. A 12' concrete dam existed in 1848 on the upper Pudding River in Pratum at the Sunnyview road crossing that was used to mill the valley's first white flour at McAllister Mill. This Dam failed in 1911 and 1920 due to high water, once taking the Sunnyview covered bridge with it (Devries, 1994).

During the early years of white settlement, trees were felled near streams and floated downriver to the nearest mills. Those closest to streams were the first to be toppled into the water, but as loggers moved up hill, the trees were dragged to the river by oxen or mules. Whenever water levels were too low to move the logs, wooden crib log splash dams were constructed across the streambeds. Once the impounded water reached a sufficiently high level, the dam was pulled down and the water containing the logs sent downstream. Frequently the dams were permanent, with large gates that opened. Companies operating on Butte Creek frequently had very little water, so a series of splash dams were designed to carry the timber down from High Hill to a sawmill in Marquam. Three miles upstream of Monitor, the Mortison dam on

Butte Creek was in operation in 1917, another was placed on Coal Creek, and one was built at the falls at Scotts Mills (Beckham, 1990). In 1906, a dam on Abiqua Creek at River Mile 12, with a six-foot gate, was erected to fulfill a contract "to deliver 20 million board feet of logs to the .... mill on the Abiqua (two miles north of Silverton) a distance of about seven miles from our timber" (*Timberman*, 1903, p.11).

Saw and grist mills were already in operation by Dave Smith and George White at the site of the of the Aurora Colony, when William Keil first ventured there in 1856. The mills were located at the junction of Senecal and Ferrier (Mill) Creeks, upstream of their confluence with the Pudding River. In 1904, a water-powered electricity plant in Aurora was run by the Molalla Electric Light and Power Company," (Will, 1972; Marion Co. History, 1956).

Abiqua Creek, the most productive salmon and steelhead stream in the Pudding system, had a water intake dam on it for Silverton's drinking water since 1936. Originally a log crib dam, this dam was equipped with a fish ladder, but its effectiveness at allowing spring Chinook and winter steelhead to pass is dubious. The original dam near the Dunagan covered bridge was washed out in a flood during 1942, and a newer concrete structure was built in 1943 about 4,500 feet upstream (Hande, 2003), an endeavor that required a special permit from the War Department because of the scarcity of concrete (pers. comm., Steve Yoder, City of Silverton).

Silver Creek had a series of dams built two miles upstream from the mill site in Silverton at what was then called Bargerville. Two of these dams later generated electric power for Silverton. A concrete diversion dam, erected by the Oregon Milling Company in 1885, carried water from Silver Creek into an earthen flume to a flour mill. This seventy-five-foot-wide structure washed out in the flood of December, 1949 (Silverton Appeal Dec 26., 1949). In 1932, the Works Progress Administration erected a short concrete dam in Coolidge-McClaine Park as a backup water supply for Silverton. The present day Silver Creek reservoir was built in 1971, covering an existing nine-foot-high waterfalls, yet the backup water supply intake for Silverton remains at the lower dam.

The Silverton Lumber Company constructed a mill on Silver Creek in 1907. It operated successfully until it was sold in 1926. The company's annual cut was 30,000,000 board feet. In 1918, the Silver Falls Timber Company opened another rail timber yard in Silverton, and within a few short years the community led the Willamette Valley in timber production. Among the many small sawmills, John Brewer's company cut an estimated 500,000 board feet per year (Thayer, 1996, p.3-4; Silverton Comprehensive Plan, 1979).

The grist and sawmill at Scotts Mills, located on Butte Creek, was constructed in 1847 by French trapper Thomas McKay, but it passed into the hands of Robert and Thomas Scott some years later. (Silverton-Appeal Tribune/Mt. Angel News, July 27, 1988, p.8, Sect.1). A electricity producing plant was

also later operated at this site to provide power to Scotts Mills. Lima dam, an old wooden barricade on Butte Creek just upstream of Highway 211, was also most likely at a mill site. It was almost completely washed away at the time of a 1953 Oregon Fish Commission survey. Hartman dam, a concrete structure, also existed on Butte Creek about one mile upstream of Highway 211 until it was removed by the state Fish and Wildlife Department in the 1999 to facilitate fish passage. When surveyed in 1959, it was broken out and reported to be difficult for fish to pass.

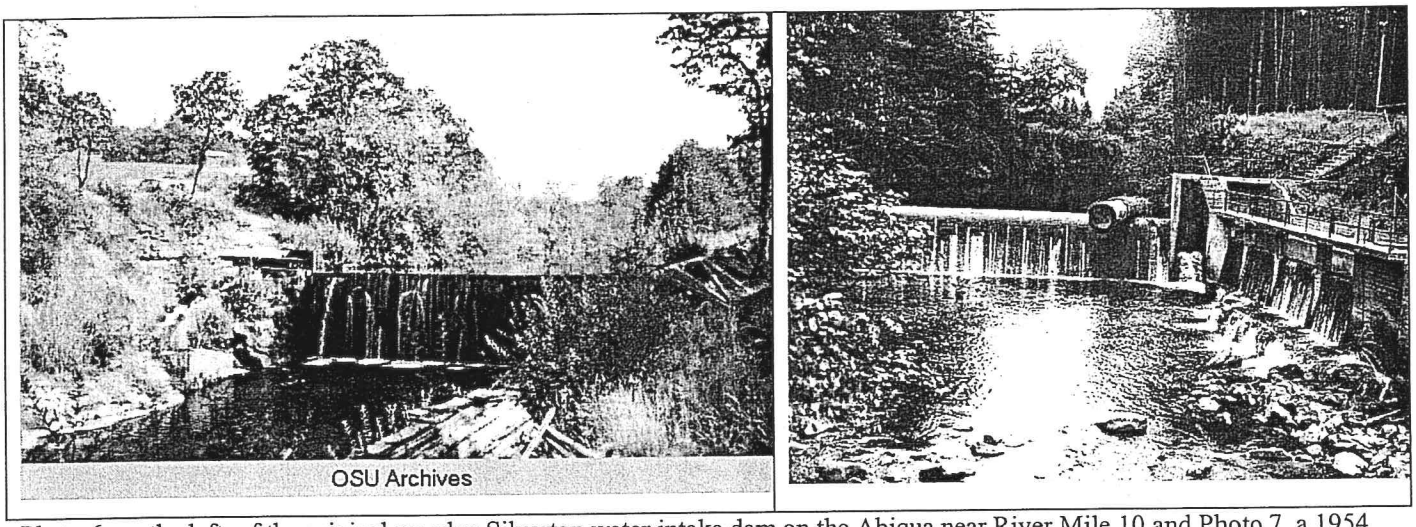


Photo 6, on the left, of the original wooden Silverton water intake dam on the Abiqua near River Mile 10 and Photo 7, a 1954 scene of the rebuilt concrete dam located 4,500 feet upstream. (Photos courtesy of Oregon State University Archives and the Salem Public Library, Ben Maxwell Historic Collection)

TABLE 2 Early mills operated in the Pudding River watershed

First Year	Location	Description
Pudding River		
1848-1912	Pudding River at Parkersville	Parker saw mill and later grist mills.
1878	Pudding River near Hubbard.	Jamieson and Bowden Mill.
unknown	Pudding River.	Kelly Mill.
1890	Pudding River near mouth of Silver Creek.	Lichty Sawmill.
1891-1905	Pudding River near mouth of Silver Creek.	Scharbach and Hollenback Mill.
1898-1925	Pudding River at Pratum	McAllister Flour Mill
Late 1930's	Pudding River near River Mile 17 (Whiskey Hill).	Miller Sawmill.
Silver Creek		
1846	Millford, Silver Creek.	Saw mill James Smith and John Barger.
1852	Silverton, Silver Creek.	Sawmill operated by Beuford Smith. 1853 Flour Mills.
1879	Upper Silver Creek.	Swartz Mill, Brewer Mill, Twin Falls.
1885-1932	Silverton, Silver Creek Concrete diversion dam near Cowing St (Ames Dam).	Oregon Milling Co., later Fischer Flour Mill (1898). 1st vertical style grist mill west of Mississippi. 1891-electricity supplied to Silverton.

1886	Silver Creek.	Johnson and Ek Mill.
1889	Upper Silver Creek, moved to Winter Creek 1896.	Arnold and Watson Mill.
1895	Silver Creek, RM 6.	Erwin Mill.
	Silver Creek, RM 12.	Arnett Mill (1903 Union Light and Power Co. power generating plant –Farnell, 1979).
1906	Silver Creek.	Lais Mill, Silverton.
1907	Upper Silver Creek, Silver Falls City.	Hostetler and Killian Mill.
1916-1938	Silver Creek, Silverton.	Silver Falls Lumber Co.
1918	Upper Silver Creek, Silver Falls City.	Neal Mill.
1925	Upper Silver Creek, Silver Falls City.	Carter Mill.
Butte Creek		
1847	Butte Creek at Scotts Mills.	Sawmill 1847, Grist Mill 1851 founded by Thomas McKay.
1853	Butte Creek, near Scotts Mills.	Bowman Mill.
1866	Butte Creek- site of original mills at the falls/dam in Scotts Mills.	Scott Sawmill (electricity generating turbine installed in 1908).
1897	Butte Creek at Monitor (RM 8).	Mortenson and Hanson Mill.
1917	Marquam, Butte Creek.	Sawmill owned by Bill Mortison with a dam on the Pudding three miles upstream of Monitor.
unknown	Butte Creek or tributaries (Scotts Mills area).	Bellinger Mill, Landwing and ShepardMill, Mortenson Mill, Kellis Mill, Pearson and Wenzel Mill, Parks and Becker Mill, Nelson Mill, Shepard Mill, Jacobson Mill, Kellis Mill, Wiebel Mill, Sowa Mill, Hempshorn Mill, Reynolds and James Mill, Syron and Van Annam, Bartnick, Kimick Mill, Groshong Mill, Johnson Mill, Wastenberg Mill, and Gieger Mills.
Rock Creek		
1901	Rock Creek	Bagby Mill at old Aurora Colony log ponds.
1925	Rock Creek	Fisher Mill.
Mill Creek		
1847	Pudding River at Aurora. Dam on Mill Creek.	White's Mill on Mill Creek. Saw and grist mills.
1850's	Hubbard, Mill Creek	Kester's Mill.
Little Pudding River		
1848	Parkersville, Pudding River at the Little Pudding River.	Sawmill and grist mill. Dam on the Big Pudding River backed up water into Lake Labish.
1878	Little Pudding River at RM 9	Schwartz and Woodward Mill.
Abiqua Creek		
1852	Near mouth of Abiqua Creek.	Hall Mill.
1863	Abiqua.	Hutton Mill.
	Between Eighty Creek and Powers Creek.	Stuckart and Minden Mill.
1893	Powers Creek	Smith and Opsend Mill.

unknown	Little Abiqua Creek	Charles Peterson Mill.
1910	Eighty Creek.	Brown Mill.
unknown	Powers Creek, Davis Creek.	Keith, Hadley Bros., Killion and Loar, Jungwirth, Powers Mill, Ross Mill, Hadley and Son Mill, Thomas Mill, Gordon Mill, Porter, and Minden Mills.
1945	Abiqua Creek.	Bartsch and Robbins Mill.
Other areas		
Prior to 1878	Simmons Creek (near Zollner Creek).	Near Mt. Angel, Mathias Butsch.

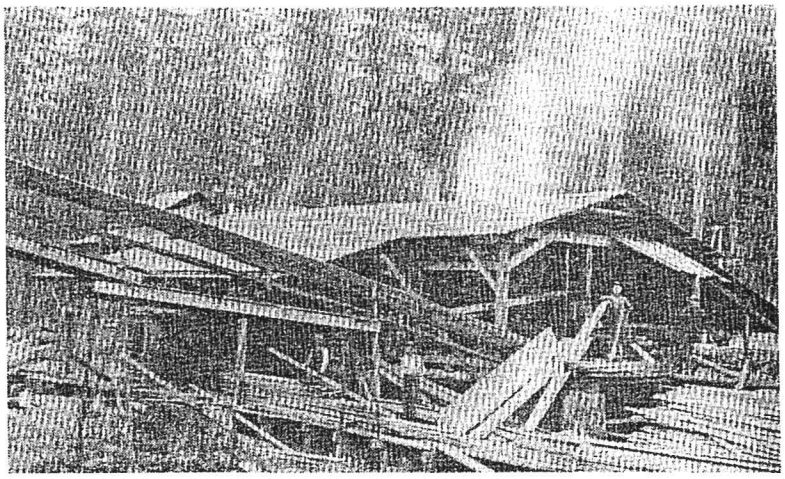


Photo 8, 1910 Livesay mill two miles east of Gervais on what is now Howell Prairie road. This mill was later moved to St. Paul then Woodburn, reaching production of 70,000 board feet until finally closing in 1966. (Photo courtesy of Annabell Prantl).

Historic log drives on Oregon's waterways are one of the criteria utilized by the state to determine whether a particular stream is navigable. When designated navigable, the streambed reverts from private to state ownership. In 1979, the Division of State Lands conducted preliminary studies of waterways throughout the Pudding River and concluded that log drives occurred on the following stretches: Rock Creek to RM 15.6; Butte Creek to RM 19.7 (plus Coal and High Hills Creek); Silver Creek to RM 14; Abiqua Creek above RM 8.8; the Pudding River to RM 26 and at RM 48 at the confluence with Silver Creek (Farnell, 1979).

Yet another test of navigability was whether the river had historically been accessed by ships. Based on findings of the division, the Pudding River was considered navigable to Parkersville. In 1852 William Parker had proposed to dredge the Pudding up to the Little Pudding to help transport goods for his mills. The Pudding River Transportation and Navigation Company was incorporated for this purpose, but the deepening was never accomplished. William Parker, with his fortune and influence, may well have

accomplished this feat were it not for his early death in 1859. The steamer 'Moose' was used on the Pudding as far as Irvin's Bridge (near Barlow) in 1860. Farnell noted that this accomplishment was only possible that year because the Pudding had changed course due to storm flows and drained directly into the Willamette, without first joining the Molalla as was commonly the case (Farnell,1979).

Fish

Fish have long been one of the Pacific Northwest's most abundant natural resources, but the modification of streams with dams, the reduction in flows, riparian alterations, pollution, poaching and over-fishing have all contributed to the drastic decline in their variety and numbers. Trout fishing has always been popular on nearly all tributaries of the Pudding River, but particularly on Butte, Abiqua, and Silver creeks.

Although low water passing over the falls near present day Oregon City may have limited salmon runs to the upper Willamette River, a spring run here was described in June, 1841, by Charles Wilkes of the U.S. Exploring Expedition. Wilkes was amazed at the tenacity of the Chinook when leaping successfully over the falls after repeated failures. In 1948, Chet Mattson of the Oregon Fish Commission noted that the proposed dams in the Willamette system would reduce the area in which spring Chinook were known to spawn by forty-eight percent. He pointed out that the Willamette system was very important to spring Chinook because the fish counts at Oregon City were nearly comparable in size to those at Bonneville, which encompasses the entire Columbia system (Mattson, 1948).

The early dams and logging practices likely had an extremely negative effect on the anadromous salmon populations in the basin. The excellent upstream habitat and flow of Silver, Abiqua and Butte Creek probably explain why they were noted for their excellent recreational trout fisheries, even if the anadromous runs were impacted by human activities. The anadromous salmon and steelhead on these streams may have re-established runs in the mid 20th century, when most of the mill dams were absent. The effects of the documented dams in addition to poorer habitat conditions for salmon and steelhead may explain why strong anadromous fish runs have never been associated with the Upper Pudding River, Drift Creek, Rock Creek, Mill Creek, Senecal Creek and the Little Pudding River. Some of these systems were cut off from upstream migration for periods in excess of five decades. For example; Albert Shoenborn, owner of Wilhoit Springs Resort, was interviewed by the Fish Commission in 1953, and stated that he had "never hear [*sic*] of salmon being present in Rock Creek during his 72 years residence." Yet Rock Creek and Drift Creek offer nearly the same Cascade foothill habitat conditions that can be found in the more productive systems of Butte, Abiqua and Silver Creeks.

As early as the 1940's, the decreased production of spring Chinook in the Pudding River was documented as the increasingly polluted and warmed water in the river proved lethal to trout and other salmonids (Dimick, 1945). Following the 1947 spring Chinook run on the Abiqua, it was estimated that just fifty fish, from the total of 12,040 that spawned, survived (Fulton, 1970). Crayfish, actually arthropods, have been noted to be historically abundant in most tributaries of the Pudding, and a commercial crayfish operation that supplied restaurants was once active in Parkersville (Pers. Comm. Annabell Prantl). Arthropods and freshwater clams are no longer found in abundance in the lower gradient areas of the basin.

Introduced competition from summer steelhead and coho came with the fish ladder was constructed at Willamette Falls. Coho were also introduced directly by the Fish Commission into Abiqua Creek, beginning in 1958. 11,500 Coho were stocked into Davis Creek, a tributary of the Abiqua, in 1983 (Hunt, 1983). Introduced Brook trout to high lakes in the system have not been observed in the mainstem creeks. All introduced warmwater fish known to the Willamette system probably inhabit the lower reaches of the Pudding River basin.

Pacific lamprey eels have been observed on Abiqua Creek and Butte Creek by residents Fish Commission biologists. These primitive anadromous fish were important food and cultural resources to Native Americans, but little is known of their current distribution.

Wildlife

John Bagby, whose family built a cabin in the Butte Creek area, wrote around 1905:

> *"I shall first try to tell you the names of different animals that roamed this wilderness of the west. They are the brown and black and cinamon bear, the cougar, wildcat, lynx, large timber wolf, coyote or prairie wold, martin, beaver, fisher, ottar, mink, muskrat. The elk and deer and Spanish and wild cattle. A few other small not worth mentioning. The diferent animals I have spoken of could be seen in the day time as they was very numerous ... and the deer would come in at night ... and father would take the gun and mother the pich torch and shine there eyes and father would kill plenty of deer"* (McCormick, 1992, p.79).

At the time of European contact, both elk and deer were numerous throughout western Oregon. Botanist David Douglas remarked, "The Elk ... is plentiful in all the woody parts of the country. Originally the elk inhabited the western slope of the Cascade Mountains." Of the two deer species, black tailed preferred the forested uplands, whereas the white tailed was found in lowlands near waterways.

Again Douglas found the deer most common "more especially in the fertile prairies of the Cowalidsk and Multnomah (Willamette) Rivers" (Douglas, 1914, p.155, p.90). Bear, cougar, beaver, wolves, muskrat and other animals were noted by fur trappers such as Gabriel Franchere: "Our guide informed us that up this river (Willamette) about a day's journey there was a large waterfall and beyond it the country abounded in beaver, otter, deer, and other wild animals" (Franchere, 1967, p.50). The lucrative trade in furs that was enjoyed by the Hudson's Bay Company in the early days dwindled as many fur animals were trapped out and fashions changed. A bounty was agreed to on wolves, lynx, bear and panther in 1843 after a meeting at Joseph Gervais's house on French Prairie (Oregon Historic Quarterly, pp. 176-210, 1912).

Ron Antoine remembers trapping beaver and muskrat in the 1950s between Saratoga and Waypark bridges on the Pudding River and sending the uncured pelts to Sears, Roebuck, and Company by mail for $8 and $1 respectively. He says area youth would also strip chittum bark (*Cascara*) from trees near Silver Falls City and Mt. Angel to sell it for making laxative powder. Lewis Walker recalled trapping mink and muskrat on the Pudding River around 1939 when he was about 10 years old. After World War II, he bought a surplus inflatable boat and rafted the river, hunting for mallards and canvasbacks. Grouse and band-tailed pigeon were abundant, while flocks of migratory waterfowl inhabited the lowland streams and wetlands in autumn.

Mining and minerals

Coal deposits within the watershed represent what was a line of vegetation along the ancient ocean shoreline. Coal was discovered at Scotts Mills in 1907 and at Wilhoit Springs in 1915. On Butte Creek, the Oregon Diamond Coal Mining and Development Company leased private land owned by Isaac and Mary Commons and set to work drilling and sinking a shaft near where the Scotts Mills city park is today. The coal was of low grade, high in ash, and was burned to be spread on the fields for potassium. Only a small amount was mined before the company shut down. Another coal mine was located four miles east of Pratum, which had the advantage of a railroad spur line. Silver was once found on Silver Creek, and nearby on the Molalla River the discovery of gold in the mid-1800s sent a number of claimants to that region. During the 1920s, shell limestone was strip-mined from a small quarry near Marquam and crushed to be used for agricultural lime. An oil derrick was built in Pratum in 1908, but never struck oil and may have been built only for the purpose of collecting shares from investors (Devries, 1994).

Transportation

Horseback, canoes, paddlewheels, and steamboats were the only practical means of travel during the days of settlement, and it wasn't until the development of roadways and a rail line that urban growth

made significant progress. While early commerce depended solely on ports along the Willamette, the building of inland roadways and railroads was of great importance to commerce, linking farm produce and natural resources to outside markets.

Roadways and bridges

New arrivals found few roads and mostly unsurveyed lands. Instead of following east-west or north-south survey lines, as was the case in the Midwest, the first roadways often jogged around the boundaries of original land claims. This practice led to some strangely configured roads, since the individual claims of the early pioneers were sometimes laid out in a haphazard manner, often with irregular shapes. Geographic landmarks also dictated where roads were placed. The Barlow Road or Old Immigrant Road was an alternate toll wagon route from The Dalles south of Mt. Hood through Clackamas County that was established in 1844. It provided an optional way of travel for settlers not wishing to pay the high tolls and risk the danger of rafting down the Columbia River. Present day highways still bear the name Barlow Road at Elliot Prairie, which is bounded by Rock Creek and Butte Creek.

As early as 1844, the Oregon legislative assembly provided for a road to "cross Molalla River at Wright's farm, thence to pass the farm of Daniel Waldo, thence southward." Again, in 1854, the territorial government allocated money for a road "commencing at Salem in Marion County and run from thence on the nearest and most practical route to the house of Samuel Allen on Abicaw Creek." In the Willamette Basin, the main route of transportation was the Territorial Road that followed the eastern edge of the valley from Oregon City through Silverton to Lebanon and Brownsville. The road crossed Silver Creek north and west of the future town, which had yet to be platted. In 1855 the road was modified to pass by "Charles Rondeau in Marion County." This was near Central Howell (Down, 1926, p.231).

The California Stage Company operated daily stage coaches between Sacramento and Portland beginning as early as 1860, with stops at Brown's (south of Salem), Salem, Waconda (Gervais), Barlow and Dutch Town (Aurora). The trek took six days to cover the 710 miles. The route between Parkersville and Brooks, which is now called Waconda Road, was known as Brown's Cow Path (Marion Co. History, 1962, 1956). A road from Butteville to a ferry on the Pudding River was established in 1852. Early Euro-American settlers also utilized some of the traditional trails of the native people, which include parts of highways 99, 213, and 211. A camp site at the natural springs near Chemeketa in Salem was already linked to a trail running east to the Cascades, which later became State Street (Marion Co. History, 1957). In 1860, the Pacific Highway (99E) from Sacramento to Portland provided a more direct route to Portland, by-passing Parkersville (Farnell, 1979). This route was graveled in 1910, making it passable during the rainy season (Pers. Comm., Prantl).

A number of covered bridges once existed in Marion County. The Scotts Mills bridge spanned Butte Creek; the Main Street or Johnson bridge and the James Street bridge both crossed Silver Creek (1911); the Silver Creek bridge crossed Brush Creek; the Easson Bridge was on the Pudding River at Parkersville; The Sunnyview Road bridge on the Pudding at Pratum; the Dunagan bridge near the Silverton water supply dam spanned Abiqua Creek; the Coleman and Schlader bridges were also on Abiqua Creek (1917); and a bridge over the Pudding on what is now Highway 211 east of Woodburn existed from 1907 to 1940 (Marion Co. History, 1956). Another covered bridge at Barlow near the mouth of the Pudding River survived from 1915 to 1952, and Irwin's bridge was built to replace the ferry near the future townsite of Aurora. Today, the only remaining covered bridge in Marion County is the Gallon House bridge on the Abiqua between Silverton and Mt. Angel, which has been repeatedly rebuilt after flood damages. This structure takes its name from long ago when liquor was sold in gallon containers.

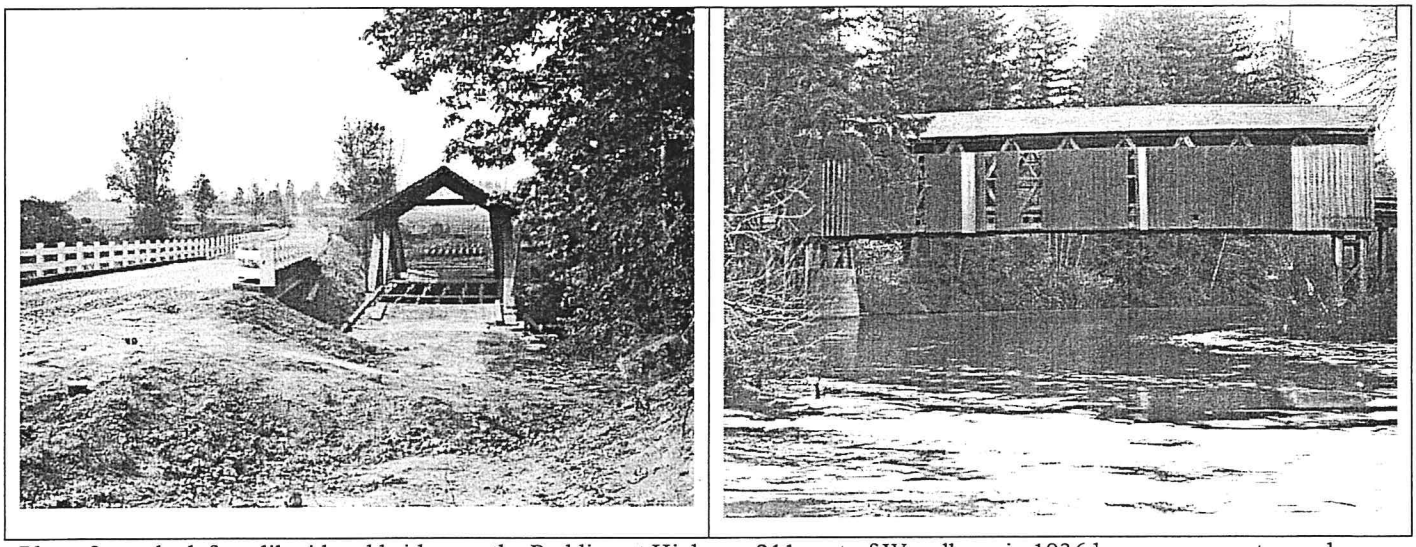
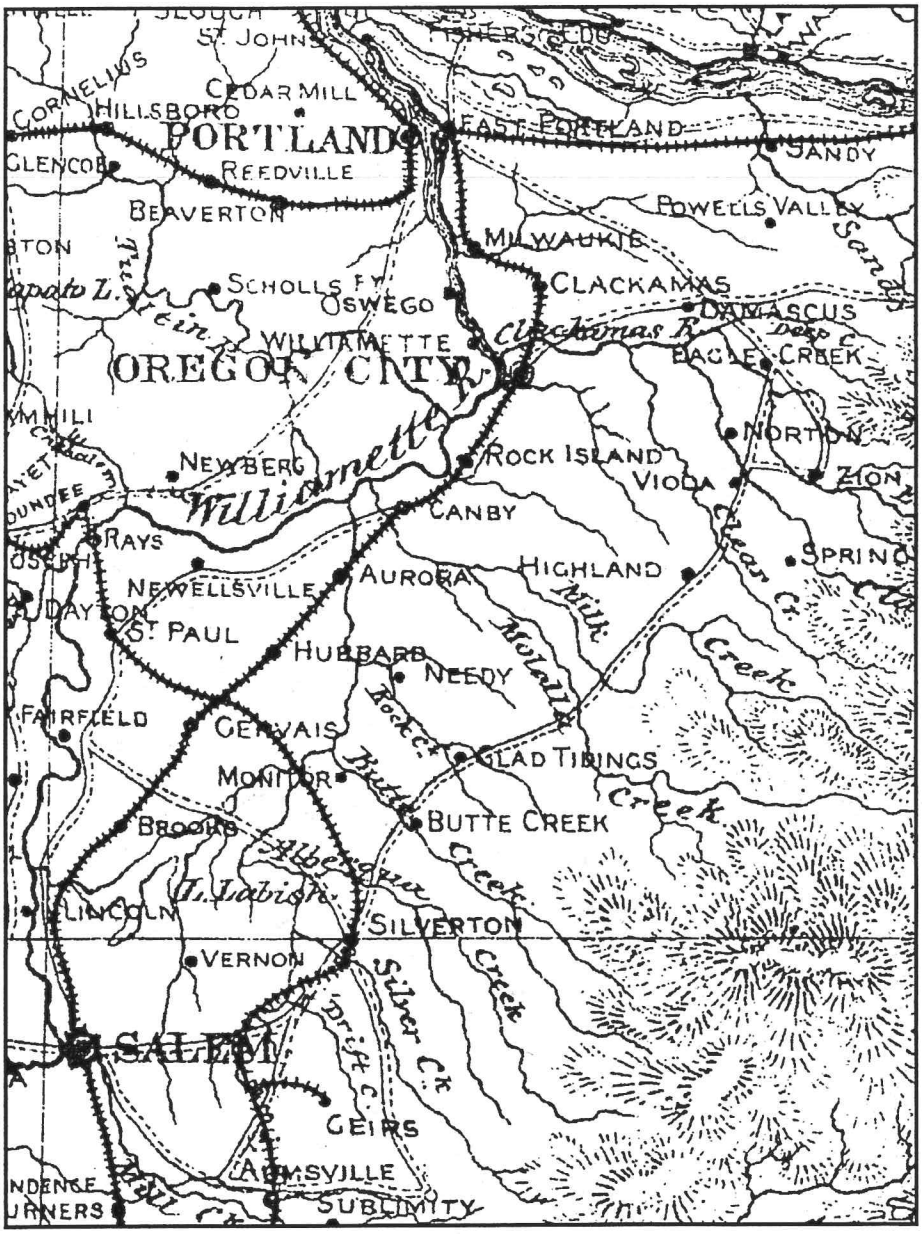


Photo 9, on the left, a dilapidated bridge on the Pudding at Highway 211 east of Woodburn in 1936 has a new county road bridge beside it. Photo 10 (1945) on the right shows the "Red Bridge" at Barlow on the Pudding River. (Photos courtesy of the Salem Public Library, Historic Ben Maxwell Collection)



Map 3. 1881 U.S. Army Corps of Engineers map showing major wagon trails and railroads in the watershed.

Railroads

The presence of railroads in the Pudding Basin brought an immediate increase in prices of farm property since the rails were able to serve large areas of once isolated lands. Failure of a rail line to reach a frontier community frequently meant the town declined, but the presence of the rail line brought expanded development. Rail lines reached towns inaccessible by roads during the winter time when travel was all but impossible because of muddy conditions.

After years of political wrangling, the Oregon & California Railroad reached up the Willamette Valley from Portland to Salem in 1870, and ten years later a narrow gauge railway was built through Woodburn to Silverton and on to Turner (Marion County History, 1957). A disagreement as to whether

the proposed 1881 railway would run through Gervais or Woodburn was decided by the Oregon Supreme Court, and the subsequent a route eventually ran through Woodburn, making it a rail hub.

A north-south and east-west rail route, connecting Ray's Landing on the Willamette River, ran eastward to Silverton and southward to Coburg. The railroad operated with both a narrow gauge track and woodburning locomotives, while speeds were kept below twelve miles per hour by regulations (McKay, 1980). Other local stops on this line included St. Paul, Foise (between St. Paul and Woodburn), Woodburn, McKee, Mt. Angel, Downs, Macleay, and Shaw. From 1885 to 1888 this line was extended from Dundee into Portland, after which the Southern Pacific bought the line as a feeder and upgraded it to standard gauge. By the early 1900s, Mt. Angel had become the central shipping point for Scotts Mills, Marquam, Wilhoit, and Monitor after the railroad by-passed those communities. (Hodes, 1932). Many Chinese coolies were utilized for railroad labor, and one worker, Young Ying, a native of China, decided to remain and live in Mt. Angel. He was ninety-two years old when interviewed by Sister Ursula Hodes in 1927. A spur line was built to connect Pratum and Salem in 1912.

The Oregon Electric Railway opened a direct line from Salem to Portland in 1908, covering the stretch from St. Paul to Wilhoit along Butte Creek as well. The locomotive was powered by a 33,000 volt feeder line from the Oregon City hydroelectric plant. Originally operated by the Portland Railway, Light, and Power Company, the plant ultimately became Portland General Electric. The Wilsonville railway bridge across the Willamette was part of this project (Collins, 1997).

Several years later, the Portland, Eugene, & Eastern Railway Company ran an electric railroad from Oregon City to Molalla, which eventually continued to Mt. Angel and Silverton (Chapman, 1996). In Silverton, the railway followed the early wagon road along the east bank of Silver Creek and down Water Street to the flour mill. By the turn of the century, warehouses, hotels, a door factory, and other shops had been located near the railroad tracks, establishing this as the center of the community (Mceachern, 1990, p.111-112).

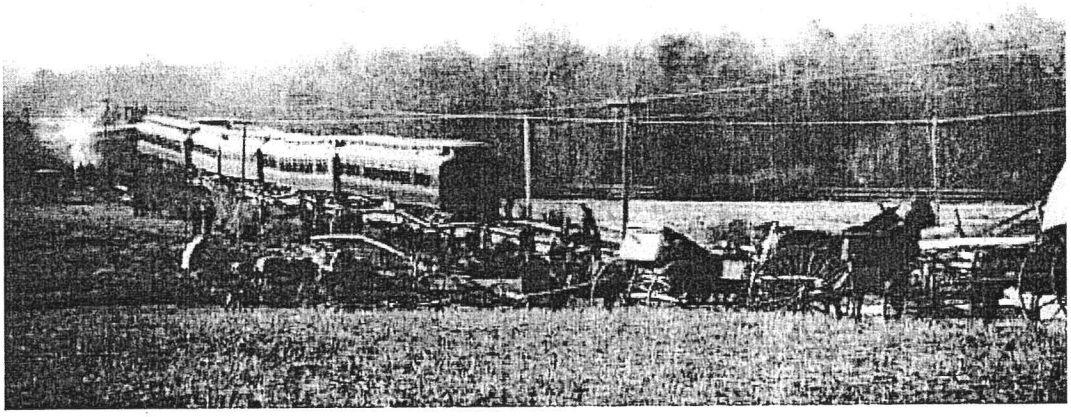
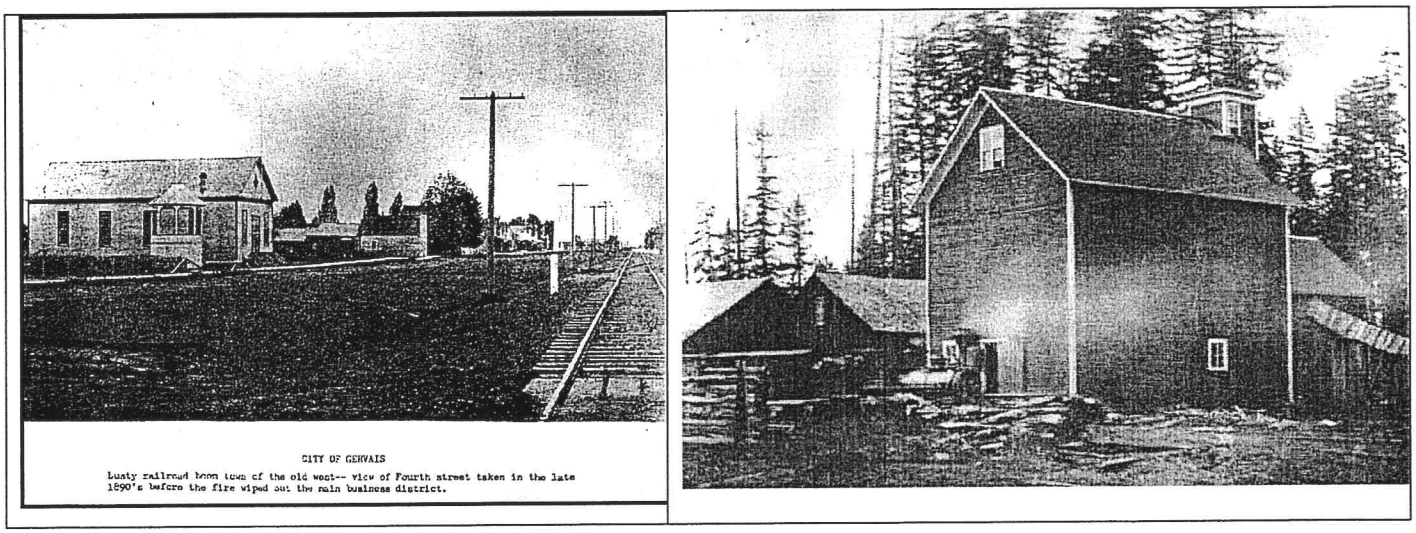


Photo 11, a train wreck in 1891 at Lake Labish is a testimony to the instability of the lakebed's peat soils. The engine was never recovered. (Photo courtesy of the Salem Public Library Historic Collection)

An extensive system of logging railroads, built by the Silverton Lumber Company during the 1920's, replaced the use of splash dams for moving logs, common until then on Silver Creek. These lines also extended up Abiqua Creek, Powers Creek, and then to Silver Creek Falls (Thayer, 1995). As with other timber companies in the valley, it contracted with the Southern Pacific Railroad to freight its lumber to the larger markets.



On the left, Photo 12, is an 1890's photograph of the Oregon & California railroad and City Hall at Gervais, and on the right, Photo 13, from 1891 of the Macleay Station west of Silverton with a steam locomotive hauling lumber. (Photos courtesy Annabell Prantl and the Salem Public Library, the Ben Maxwell Historic Collection).

CONCLUSION:

Urbanization followed on the heels of the transportation system, although growth in the Pudding Basin was not as great as that elsewhere in the northern Willamette Basin. Some villages solidified into

permanent communities, whereas others dwindled and vanished. By 1880, Clackamas jumped close to 10,000 persons and Marion to 15,000. By the early 1900's, Mt. Angel's population was 936, reaching 1,300 by the middle part of the century; Silverton had 2,200 persons in 1900 and 3,000 by 1950; Woodburn went from 1,600 to 2,300; Stayton from 650 to 1,500; and Salem from 17,600 to 43,100. In the year 2000, Mt. Angel's population had almost doubled; Silverton reached 6,700 persons; Woodburn went to 16,500; Stayton was at 6,660; and Salem had 126,500 persons.

Businesses diversified considerably as well, expanding from those just handling farm produce. Whereas 250 cannery railcars were shipped out of Silverton annually, and fifteen to twenty lumber railcars left daily during the peak timber production in the early 1900's, today Silverton boasts antique stores, coffee houses, and clothing outlets alongside the traditional farm-based industries. In Mt. Angel, a water bottling company and upscale furniture shop typify the trend toward a changing economy, while in Woodburn a large factory outlet mall is one of the most popular shopping sites in Oregon. However, farming and logging remain the basic economy in the Pudding Basin. Over the years farms have become smaller in acreage and farm products more diversified. Cereal grains have been displaced as the main cash crop by the raising of nursery plants.

But by the 1930's urbanization along with agriculture and logging practices, which had continued for one hundred years, had taken their toll on the waters of the Pudding River. The Willamette and its tributaries, such as the Pudding, were highly polluted. "There is considerable pollution ... from municipal and industrial wastes, which are emptied into the streams without treatment. As a result the waters of these rivers are becoming less and less fit for recreational use, and pollution has already become a menace to fish life" (Oregon State Planning Board. Report, 1935, p.24). After World War II, the use of chemical fertilizers, pesticides, and herbicides as well as the practice of spray irrigation seriously affected the water quality and quantity of this region. Fertilizers and pesticides either leach into groundwater aquifers or are drained by tiling directly into ditches and streams. The heavy use of chemicals, for example, has given Zollner Creek the distinction of being one of the most polluted streams in the United States. Pesticide detections in Zollner Creek include atrazine, simazine, nitrites, and diuron (Rinella, Frank, and Janet, Mary, 1988). Nitrate concentrations in surface waters and some shallow wells are often well above drinking water standards, and the Pudding has been identified as contributing the highest annual average pollutant load to the Willamette (Oregon Department of Environmental Quality, 1995, p.3-12).

Even though the Pudding River basin hasn't been as extensively developed as the Tualatin Valley, those cities and industries, which developed here, had their own impact on the resources. Historically, towns and businesses used rivers as sewers to dispose of their waste. Such was the case locally, where urban, as well as industrial and private effluent, was piped directly into tributary streams or wetlands. In

1939 a fisherman on Silver Creek in Silverton noted the abundance of sewer lines that drained directly into the creek (Hande, 2003). It wasn't until the Oregon State Sanitary Authority, the precursor to the Oregon Department of Environmental Quality, was created that the state began to abate the pollution of its waters. By the 1960's most regional urban and industrial sources had constructed substantial treatment facilities to process sewage. Under provisions of the federal Clean Water Act of 1972, states and communities are mandated to develop programs to assure the integrity of the nation's waters. Up to this point, no one had seen the need to conserve or preserve such a bountiful resource as Oregon's waters, which were viewed as flowing in an endless supply.

Irrigation for agriculture dominates the regional water picture, utilizing both groundwater and streams. Numerous small farm dams and deep wells contribute to the low surface flow and the impaired water quality, both serious problems in the watershed. Common practices such as the "big gun" and sprinkler spigots, where a stream is shot into the air, can result in a forty percent water loss due to evaporation during hot summer days. Because there are more new wells, along with the upgrading and deepening of existing ones, groundwater levels are dropping drastically. Municipalities such as Mt. Angel, dependant on groundwater, are finding their wells going dry. Two simultaneous consequences have resulted: the surface flows, tied into the groundwater level, diminish, while brackish water, from a deeper formation, rises to contaminate the aquifer. In 1992 sections around Mt. Angel, Stayton, Sublimity, Wilsonville, and Salem were declared ground water limited by the Oregon Water Resources Department. Under this designation, new drilling and water use can be restricted as a means to conserve the resource. Attempting to maintain the groundwater level, the department can prohibit the penetration of the basalt aquifer.

Advances have been made to improve water conditions in Oregon. The passage of Senate Bill 1010 by the Oregon Legislature in 1993 was a step in the direction of regulating farm practices "for the purposes of protecting water quality." (Oregon Department of Agriculture SB 1010 Planning Program, 1999, p.4). The bill is to encourage voluntary adoption of management practices in order to reduce water quality violations on farm lands. The Forest Practices Act was passed in 1971 to maintain and protect water resources and aquatic habitat. This regulation prohibits the acidic waters of log ponds from being flushed into the river, and the tons of sawdust, formerly dumped directly into the streams, go to other uses. Loggers commonly removed vegetation from the streambank, thus exposing the once-shaded water to direct sunlight, but the aim now is to preserve these riparian areas.

In spite of these practices and regulations, the waters of the Pudding Basin remain in impaired condition. Recently a worker at the Mt. Angel treatment facility remarked that, "The processed waste water from this plant is cleaner than the river (Pudding) into which it is piped." This sad commentary on

the condition of the river and its tributaries should not be allowed to remain unchanged (Orr, pers. comm. May, 2003).

BIBLIOGRAPHY

Aiken, Melvin, 1984. Archaeology of Oregon. U.S. Bureau of Land Management, 128p.

Almquist, Paul., comp., Silverton country and Scotts Mills area sawmills. 1846-1981.

Bancroft, Hubert H., 1888. History of the Pacific States of North America. Vols. XXIV and XXV (Oregon vol.I, and vol.II).

Beckham, Don. 1990. Swift Flows the River, Log Driving in Oregon. Salem Public Library. Salem, Oregon.

Beckham, Stephen, Minor, Rick, and Toepel, Katheryn, 1981. Prehistory and history of BLM lands in west-central Oregon: a cultural resource overview. Eugene, University of Oregon Anthropological Papers 25, 350p.

Bibby, Duane, 2000. The Pioneers of Lake Labish, A Pioneer's Dream. Brooks, Oregon, Sons of Labish, 100p.

The Columbia River and Oregon Timberman, December 5, 1903.

Chapman, Judith, 1995. Rooted in History. Timber Then & Now, Molalla Pioneer supplement, Nov. 15: 4-6.

Chapman, Judith, 1996. Early Pioneers of the Molalla Settlement. *In*: Pioneers: Molalla, 1843-1900. Reprinted in Molalla Pioneer supplement, Dec. 1996: 7-12.

Clark, Robert, 1927. History of the Willamette Valley, Oregon. Chicago, S. J. Clarke Publ., 2 vols.

Cole, Michael. 2003. Lower Molalla River and Milk Creek Assessment. 114p. Portland, Oregon.

Collins, Greg and Kathleen. 1997. *An Oak Grove on French Prairie.* A History of Donald, Oregon.

Corning, Howard. 1947. Willamette Landings. Ghost Towns of the River. Portland, Oregon Historic Society, 261p.

Devries, Miriam. 1994. Pratum. Available at Marion County Historical Society, Salem, Oregon.

Dimick, R.E., 1945. The Fishes of the Willamette River System in Relation to Pollution. Bulletin Series No. 20. Oregon State College, Corvallis, Oregon.

Douglas, David, 1914. Journal kept by David Douglas during his travels in North America, 1823-1827. London, W. Wesley and Son.

Down, Robert H., 1926. A history of the Silverton County. Portland, The Berncliff Press, 268p.

Emmert, Irene. 2003. Molalla Kate. Molalla Pioneer, March 19:6.

Farnell, James E., 1979. Molalla-Pudding rivers navigability study. Salem, Division of State Lands, 38p.

Franchere, Gabriel, 1854. Narrative of a voyage to the northwest coast of America in the years 1811, 1812, 1813, and 1814. Cleveland, The Arthur H. Clark Co.

Fulton, Leonard. 1970. Spawning Areas and Abundance of Steelhead Trout and Coho, Sockeye, and Chum salmon in the Columbia River Basin- Past and Present. US. Dept. of Commerce. NMFS. Washington D.C.

Gervais, Oregon. Centennial Celebration Commemorative Booklet. 1978.

Hande, Jack. 2003. Volume 1. Silverton Stories from the 1920's-30's and 40's. Collected and edited by Jack Hande. Hande Hus Publishing Co. Silverton, Oregon.

Hodes, Sister Ursula, 1932. Mt. Angel, Oregon 1848-1912. Eugene, University of Oregon, 62p.

Hunt, ... Survey Notes, 1983. Salem, Oregon Department of Fish and Wildlife. ?P.

Hussen, John, 1967. Champoeg: place of transition. A disputed history. Portland, Oregon Historical Society.

Jones, S.R. n.d. Annals of the S.W.R Jones family. Provided by Loy Cramer, Gervais, Oregon.

Lang, H., ed., 1885. History of the Willamette Valley. Portland, George Himes Book Printer, 902p.

Langille, W., 1943. Silver Creek Falls, Oregon's premier state park. Paper available from the Friends of Silver Falls State Park.

Lenzen, Connie. 1991. Genealogical research in Oregon, originally published in the National Genealogical Society Quarterly, Volume 79, Number 1, (March), pp.33-55.

Lucas, William. 1998. Canning in the Valley. Salem Public Library. Salem, Oregon.

Lucia, Ellis. 1965. Wild Water, the Story of the Far West's Great Christmas Week Floods. First Edition. Portland, Overland West Press.

Lynch, Vera, 1973. Free land for free men, a story of Clackamas County. n.p., Artline Publ., 680p.

Mackey, Harold, 1974. The Kalapuyans; a sourcebook on the Indians of the Willamette Valley. Salem, Mission Mill Museum Assoc., 165p.

Marion County Court Records. 1862. Book IV of Deeds, Page 779. James W. Flack Grantors to William T. Doak Grantees, legal description of property, mill works, and dam on the Big Pudding River formerly owned by William Parker, founder of Parkersville.

Marion County History, 1956 Vol. 2. Marion County Historical Society, Salem Oregon.

Marion County History, 1957 Vol. 3. Marion County Historical Society, Salem Oregon.

Marion County History, 1962-65 Vol. 8. Marion County Historical Society, Salem Oregon.

Marion County History, 1965-68 Vol. 9. Marion County Historical Society, Salem, Oregon.

Marion County Mechanics Lien Record Book II, pp.145, 154.

Marion County Mechanics Record Book III, p.284. Marion County Circuit Court Judgement Roll No. 8465, Marion County Courthouse, Salem.

Mattson, Chet. 1948. Fish Commission Research Briefs. Volume 1, number 2. Portland, Oregon.

---1952. Survey reports of the Willamette River and its tributaries. *In*: Willis, et al.1960. Environmental Survey Report Pertaining to Salmon and Steelhead in Certain Rivers of Eastern Oregon and the Willamette River and its Tributaries. Part II. Survey Reports of the Willamette River and its Tributaries. Fish Commission of Oregon, Clackamas, Oregon. US Dept. of Interior Contract No. 14-17-001-178.

McArthur, Lewis, 1952. Oregon geographic names. Portland, Binfords and Mort, 686p.

McCormick, Gail, 1992. Our proud past. Bend, Maverick Publ., 234p.

Mceachern, Philip, 1990. Silverton: the morphology of an Oregon town. Eugene, University of Oregon PhD.

McKay, Harvey. 1980. St. Paul, Oregon 1830-1890.

McKay, Harvey, 2004. The Kalapuyans. A sourcebook on the Indians of the Willamette Valley. Mission Mill Museum Society. Salem, Oregon.

Minor, Rich, et al., 1980. Cultural resource overview of the BLM Salem district, northwest Oregon: Archaeology, ethnography, history. Eugene, University of Oregon. Anthropological Papers 20, 198p.

Oregon Department of Agriculture, 1999. SB 1010 Planning program; enforcement and compliance process and procedures. 15 p.

Oregon Department of Environmental Quality. 1992-1995. Willamette River basin water quality study.. Prepared by Tetra Tech, Portland, various pagings.

Oregon Historic Quarterly Volume XIII, 1912. William Slacum's Report on the Oregon Territory, pp. 176-210. Available at Salem Public Library, Salem, Oregon.

Orr, Elizabeth, and Orr, William, 1999. Geology of Oregon. Dubuque, Kendall-Hunt Publ., 5th ed., 254p.

Palmer, Joel, 1847. Journal of travels in the Rocky Mountains, 1845-46. Cleveland, The Arthur H. Clark Company.

Palmer Papers. Census returns on various western Oregon Indian bands and tribes. AX 57 21/8. Special Collections, Knight Library, University of Oregon, Eugene.

Pement, Jack, 1974. Oregon Historical Vignettes. Binford & Mort Publishing. Portland, Oregon.

Pettigrew, Richard, 1980. Archaeological investigations at Hager's Grove, Salem, Oregon. Eugene, University of Oregon Anthropological Papers 17.

Prantl, Annabell. 1994. The Gold on the Pudding. A fact based novel of the settlers in Parkersville. Gervais, Carlana Publishing Co.

Rinella, Frank, and Janet, Mary, 1998. Seasonal and spatial variability of nutrients and pesticides in streams of the Willamette basin, Oregon, 1993-95. U.S. Geological Survey, Water Resources Investigations Report 97-4082-C), 57p.

Robertson, Margaret. The Kalapuya of the Upper Willamette Valley. Posted with permission by Kevin Mathews, 2002 http://neighbors.designcommunity.com/notes/1374.html.

Salem, Oregon. Public Works Department, 1968. Storm Drainage Study. Preliminary Comprehensive Trunk Plan.

Sauer, Carl., 1962. Homestead and community on the middle border. *Landscape*, v.12, no.1, pp.3-7.

Scott, Leslie, 1928. Indian diseases as aids to Pacific Northwest settlement. Oregon Historical Quarterly, v.29, pp.144-161.

"Silver Creek, Center of City's History." 2004. Silverton Area Chamber of Commerce

Silverton, Oregon. Comprehensive Plan, 1979. CH2M Hill and City of Silverton Public Works.

Smith, Warren. 1940. Physical and Economic Geography of Oregon. University of Oregon Press. Eugene, Oregon State Board of Higher Education, 318p.

Stern, Theodore, 1966. The Klamath tribe; a people and their reservation. The American Ethnological Society, Monograph 1.

Swegle, Blanche, 1978-79 "We Were There, by the People." Volume I. Solicited Interviews and Letters Silver Falls State Park History Project.

---1980-81 "We Were There, by the People." Volume IV. Solicited Interviews and Letters. Silver Falls State Park History Project.

Thayer, Mildred, 1995. Silverton Country History.

Thornton, J. Quinn, 1973. Oregon and California in 1848. New York, Arno Press, v.1 and 2.

Towle, Jerry C., 1974. Woodland in the Willamette Valley: an historical geography. PhD., University of Oregon, Department of Geography, 159p.

U.S. Army Corps of Engineers, Portland District, Flood Plain Information: Willamette River, Molalla River and Pudding River. n.d.

Wilkes, Charles., 1852. Narrative of the United States Exploring Expedition. Vol.2. 326p.

Will, Clark. 1972. The Story of Old Aurora in picture and prose 1856-1883.

Willis, Raymond. 1960. Environmental Survey Report Pertaining to Salmon and Steelhead in Certain Rivers of Eastern Oregon and the Willamette River and its Tribuaries. Part II. Fish Commission of Oregon, Clackamas, Oregon.

Taylor, G.H., and R.R. Hatton. The Oregon Weather Book. Oregon State University Press, Corvallis, Oregon.

Vaughan, Thomas. 1965. Oregon Historic Quarterly, Volume XVI, #1, Joseph Gervais, A Familiar Mystery Man pp.331-362. Available at Salem Public Library, Salem, Oregon.

Zenk, Henry B., and Rigsby Bruce. 1978. Molalla. *In*: Sturtevant, William, Handbook of North American Indians, Washington, D.C., Smithsonian Institution, v.12, pp.439-445.

Maps:

Map 1. Aikens, 1986. Distribution of Kalapuya group territories east and west of the Willamette River; Molalla Territory in the western Cascades. Fig. 5.15.

Map 2. Prantl, Annabell. 1994. The Gold on the Pudding. A fact based novel of the settlers in Parkersville. Gervais, Carlana Publishing Co.

Map 3. History of Marion County. Early Settlement map of French Prairie. Marion County Historical Society, Salem Oregon. 1965-68 Vol. 9.

Map 4. U.S. Army Corps of Engineers. Office of the Chief, 1881. Title??? 2nd edition.