Appendix O – Klamath Basin National Wildlife Refuge Complex Cultural Resources Assessment

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Klamath Basin National Wildlife Refuge Complex

Cultural Resources Assessment

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Klamath Basin
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1. Introduction

This section discusses the cultural resources of five of the six national wildlife refuges that make up the Klamath Basin National Wildlife Refuge Complex (NWRC). The five refuges are Clear Lake Wildlife Refuge, Tule Lake Wildlife Refuge, Lower Klamath Lake Wildlife Refuge, Bear Springs Wildlife Refuge, and Upper Klamath Wildlife Refuge. Although it is a part of the NWRC, the Klamath Marsh Wildlife Refuge is excluded from this discussion because it was the subject of a separate CCP.

Based on archival research, two historic properties are known (i.e., are documented in confidential archives) to be on lands within the congressionally authorized boundaries of the Klamath Basin NWRC (excluding Klamath Marsh Wildlife Refuge), the Tule Lake Segregation Center and the Lower Klamath National Wildlife Refuge Historic District; both are currently listed on the National Register of Historic Places (NRHP). Also based on archival research, the following unevaluated cultural resources are known (i.e., are documented in confidential archives) to be on lands within the congressionally authorized boundaries of the Klamath Basin NWRC (excluding Klamath Marsh Wildlife Refuge): 112 recorded prehistoric sites (i.e., worked stone, stacked rocks, cleared areas, bedrock mortars, habitation sites, rock shelters, human remains, pictographs, midden, house pits, traditional use loci) and 28 recorded historic sites (i.e., rock enclosure, structural remains, refuse scatters, battlefields, repatriation locus, Civilian Conservation Corp (C.C.C.) activity loci, miscellaneous structures, railroad grade segment).

Protection measures for properties are keyed to determinations of each property's eligibility for inclusion in the NRHP. Historic properties listed on the NRHP and those determined eligible for listing or with an undetermined eligibility are of concern. Sites that have been formally determined as ineligible are excluded from consideration in future planning processes. The U.S. Fish and Wildlife Service (Service) is required to comply with National Historic Preservation Act Section 106 procedures to avoid adversely affecting historic properties and cultural resources with undetermined eligibility. If an area under consideration for management action has not yet been adequately inventoried for the presence or absence of historic properties, Section 106 requires that the Service identify as-of-yet-undiscovered or unevaluated potentially eligible historic properties.

2. Archival Research

Records and archival searches were conducted in California and Oregon to develop an overview of known cultural resources within the vicinity of the Klamath Basin NWRC. Extrapolating from that record, areas of cultural resource sensitivity were also identified. Additionally, a review of published books, articles, maps, and agency files was conducted in order to form a comprehensive perspective on cultural resources that may not be formally archived, but that could be affected by future Klamath Basin NWRC management activities.

Archival research included a search for information at:

- the California Historical Resources Information System
- the California State University, Chico, Special Collections Library
- the Modoc County Historical Society
- the California Register of Historical Resources (CRHR)
- the California State Historical Landmarks listing
- the California Points of Historical Interest listing
- the National Register of Historic Places
- the National Parks Service National Historic Landmarks Program
- the National Parks Service National Historic Trails
- Oregon-California Trails Association (OCTA)
- General Land Office (GLO) maps and records
- the Oregon Historic Sites Database
- Oregon State Historic Preservation Office (Oregon SHPO) archaeological files
- the Klamath County Historical Society Journals

3. Background

Historically, the Klamath Basin was dotted by approximately 185,000 acres of shallow lakes and freshwater marshes (U.S. Fish and Wildlife Service 2010a). Prominent lakes and marshes in the basin are Agency Lake, Klamath Marsh, Upper and Lower Klamath Lakes, Rhett (or Tule) Lake, Clear (or Wright) Lake, Goose Lake, Albert Lake, Summer Lake, Silver Lake, and Pauline Marsh. There are also a number of small water bodies in the upper reaches of the basin. Numerous depressions, now characterized as marshes and alkali flats, show evidence of former ponding. Major rivers are the Williamson, Sprague, Klamath, Link, Sycan, and Wood. Small perennial and intermittent tributaries, some without natural outlets, occur throughout the basin

The Klamath Basin NWRC provides a variety of habitats, including freshwater marshes, open water, grassy meadows, coniferous forests, sagebrush and juniper grasslands, agricultural lands, and rocky cliffs and slopes. This diversity of habitats and associated natural resources have enticed humans to travel, dwell, and subsist in the basin since as early as 12,000 (Siskin et al. 2009).

Descendants of the earliest inhabitants continue to practice their traditional ways. Contemporary Native American use of the Klamath Basin NWRC includes spiritual quests and the gathering of food, medicine, and basketry materials. The rivers, streams, and lakes still support runs of suckers and the water lily-*wokas* used by Native Americans. The Devil's Garden plateau provides *epos*-root (*Perideridia* sp.) and other plant-foods in addition to deer, antelope, and other game. The nearby mountains and highlands offer other plants for food, basketry, and medicine, and obsidian sources provide an abundance of glassy stone for tools and trade.

3.1 Historic Overview

By 1861, many battles between immigrants and natives had occurred along the Southern Route, or the Applegate Branch of the Oregon Trail. To quell dissent, the region of the Lost River Gap was considered for a military post (National Park Service 2001).

In March 1863, Major Charles S. Drew received orders from the Department of the Pacific to make a reconnaissance survey for the creation of Fort Klamath. After completing his survey, he chose the Wood River Valley near Upper Klamath Lake because of the lush grass that would provide feed for the cavalry horses and the many streams that would supply water (Stone 1990).

In 1864, the Klamath Tribes entered into a treaty (Treaty between the United States of America and the Klamath and Moadoc Tribes and Yahooskin Band of Snake Indians, Oct. 14, 1864, 16 Stat. 707) with the United States whereby it relinquished its aboriginal claim to some 12 million acres of land in return for a reservation of approximately 800,000 acres in south-central Oregon. This reservation included all of the Klamath Marsh as well as large forested tracts of the Williamson River watershed. Article I of the treaty gave the Klamath the exclusive right to hunt, fish, and gather on their reservation, and Article II provided funds to help the Klamath adopt an agricultural way of life. The treaty stated that the Tribes would have "secured" to them "the exclusive right of taking fish in the streams and lakes, included in said reservation, and of gathering edible roots, seeds, and berries within its limits."

The Modoc Indian War began in November 1872 when the United States Army and local militia forces tried to force Captain Jack's band of Modoc Indians, camped on Lost River, back to the reservation established for them in 1864. Unable to co-exist with their traditional enemies, the Klamath, who also occupied the reservation, the Modocs fled the reservation in 1865 to "The Stronghold," a vast lava bed honeycombed with outcroppings, caves, and caverns. They returned to the reservation briefly in 1869, but abandoned it by 1870 (Forest Community Research 2002).

Finally, in April 1873, the army was able to dislodge them from The Stronghold. The Modocs fled south, but, lacking supplies and horses and badly outnumbered, were defeated at Sorass Lake in northeastern California on June 1, 1873. After the defeat, every surviving Modoc who participated in the conflict was marched under guard to Fort Klamath. Six Modoc leaders, including Kintpuash, or Captain Jack, were shackled and held in the guardhouse, while 140 other Modoc men, women, and children were confined to a small stockade.

On October 3, 1873, the Modoc leaders were executed, following their conviction for killing General Edward Canby and other members of a U.S. Army peace commission held at Van Bremmer's Ranch. The remaining Modocs were then exiled to a reservation in Oklahoma or returned to the Klamath Reservation. (Beck and Haase 1974, National Park Service 2001)

After the Modoc Indian War, ranchers, farmers, and business people began to settle the area in earnest, and Klamath County was established on October 24, 1874 (*Herald and News* 1999).

For 20 years, the Klamath lived on their reservation under the terms of the 1864 treaty. In 1887, Congress passed the General Allotment Act (ch. 119, 24 Stat. 388 (1887), which fundamentally changed the nature of land ownership on the Klamath Reservation. Prior to this Act, the Tribe held the reservation land in communal ownership. Pursuant to the terms of the Allotment Act, however, parcels of tribal land were granted to individual tribal members in fee. Under the allotment system, approximately 25 percent of the original Klamath Reservation passed from tribal to individual ownership. Over time, many of these individual allotments passed into non-Indian ownership. In 1900, Fort Klamath was set aside as a recreation area, to be colloquially thought of as the "front door" to Crater Lake National Park. Before that change in status, it was allotted to the Indians, who removed many of the buildings. (National Park Service 2001)

In 1905, the Secretary of the Interior authorized the U.S. Bureau of Reclamation (Reclamation) to initiate the Klamath Reclamation Project for the reclamation of certain lakes and marshes of the Lower Klamath and Tule Lake areas to agricultural lands (U.S. Fish and Wildlife Service 2001). As the wetlands receded, the reclaimed lands were opened to agricultural development and settlement. Today, less than 25 percent of the historic wetlands remain (U.S. Fish and Wildlife Service 2010a).

Also in 1905 in support of the Klamath Reclamation Project, the States of California and Oregon ceded certain lands to the United States, including those under the Lower Klamath and Tule Lakes. As part of the Klamath Reclamation Project, Link River and Clear Lake dams, Lost River diversion, and a host of other dams, canals, and drains were constructed (U.S. Fish and Wildlife Service 2001).

On June 21, 1906, an act of Congress (304 U.S. 119) authorized the Secretary of the Interior to exchange unallotted lands in the reservation for the allotted lands earlier conveyed. The Secretary made an agreement with a land company, pursuant to which on August 22, 1906, it conveyed the

111,385 acres back to the United States; in return, the latter conveyed 87,000 acres of unallotted lands to the company. The Klamath Tribe claimed the transfer was made without fair compensation and contested the decision. The court stated that the obligation of the United States to make good on the plaintiffs' loss was a moral obligation, requiring that any further action be conducted by Congress in accordance with what it shall determine to be right because, except to the extent that Congress may authorize, the government's dealings with Indian tribes are not subject to judicial review (United States v. Klamath and Moadoc Tribes, 304 U.S. 119, 58 S.Ct. 799, 82 L.Ed. 1219 (1938)).

In the midst of the ongoing reclamation of wetlands in the basin, President Theodore Roosevelt recognized the importance of the wetlands to the waterfowl of the Pacific Flyway and established the Lower Klamath National Wildlife Refuge in 1908 by executive order. This was the first refuge established under the National Wildlife Refuge System (System). To conserve much of the basin's remaining wetland habitat, five additional refuges were eventually set aside.

In 1942, the Service and Reclamation entered into an agreement providing for the Service to have jurisdiction and control over the Tule Lake restricted sump, Service areas, and buffer areas to the extent required for wildlife refuge purposes, among other considerations (Weddell et al. 1998); and consistent with the needs of Reclamation's Klamath Project. This agreement responded to concerns that the Service did not have the authority to manage these lands for wildlife (and waterfowl) purposes because they were under the jurisdiction of Reclamation.

The next major change in the pattern of land ownership in the basin occurred in 1954, when Congress approved the Klamath Termination Act of August 13, 1954. Under this Act, tribal members could give up their interest in tribal property for cash. A majority of the tribe chose to do this. An express provision of the act continued the tribal members' right to fish on the former reservation land (Siskiyou County Board of Supervisors District Five 2010).

In 1958, the Service purchased approximately 15,000 acres of the Klamath Marsh, the heart of the former reservation, to establish a migratory bird refuge (Siskiyou County Board of Supervisors District Five 2010).

In 1961, the federal government purchased large forested portions of the former Klamath Reservation. This forest land became part of the Winema National Forest, under the jurisdiction of the U.S. Forest Service (Forest Service). The balance of the reservation was placed in a private trust for the remaining members of the Klamath Reservation (Siskiyou County Board of Supervisors District Five 2010).

Because the Upper Klamath, Lower Klamath, Tule Lake, and Clear Lake Refuges were within the jurisdiction of Reclamation's Klamath Project and were therefore still subject to reclamation, the Kuchel Act of 1964 was passed to effectively stop the conversion of wetlands to farm land, dedicating the refuges "to wildlife conservation and for the major purposes of waterfowl management, but with full consideration to optimum agricultural use that is consistent therewith" (U.S. Fish and Wildlife Service 2001).

In 1973, the federal government purchased additional forested tracts that had formerly been part of the Klamath Reservation to become part of the Winema National Forest under the jurisdiction of the Forest Service; to complete implementation of the Klamath Termination Act, the government

condemned most of the tribal land held in trust. Payments from the condemnation proceeding and sale of the remaining trust land went to Tribe members. This final distribution of assets essentially extinguished the original Klamath Reservation as a source of tribal property (Siskiyou County Board of Supervisors, District Five 2010).

In 1977, the Service and Reclamation entered into a new agreement for management of the lands leased under the System's farming program. Under the agreement, Reclamation manages the program with the Service retaining ultimate administrative control. (U.S. Fish and Wildlife Service 2001)

In the late 1980s and the 1990s, the listing of the shortnose and Lost River suckers in Upper Klamath Lake and the listing of coho salmon in the Klamath River, development of new scientific information, and heightened awareness of tribal trust obligations related to the Klamath River and Upper Klamath Lake required that the Department of the Interior review operations of the Klamath Project (U.S. Fish and Wildlife Service 2001).

Regional Solicitors for the Department of Interior issued legal opinions on July 25, 1995, and January 8, 1997, that recognized senior water rights of Klamath Basin Tribes and related requirements under the Endangered Species Act. The Klamath Basin NWRC was recognized to be entitled to federal reserved water rights, junior in priority, and to a portion of Reclamation's 1905 Klamath Project water right (U.S. Fish and Wildlife Service 2001).

In 1997, Congress passed the National Wildlife Refuge System Improvement Act, legislation that provides clear guidance for the management of the System. This law directs the Service to manage the System as a national system of land and waters devoted to conserving wildlife and maintaining the biological integrity of ecosystems. It also directs the Service to develop a Comprehensive Conservation Plan for each refuge.

Today, the Klamath Basin NWRC consists of six National Wildlife Refuges: Lower Klamath, Tule Lake, and Clear Lake Refuges in California and Bear Valley, Upper Klamath, and Klamath Marsh Refuges in southern Oregon. The Service manages these refuges to enhance wildlife and benefit the American people in coordination with other state and federal agencies.

The Service is the lead federal agency responsible for federally-listed species under the Endangered Species Act and for migratory birds. Agricultural water programs are coordinated under an agreement between the Service and Reclamation (U.S. Fish and Wildlife Service 2010b). The California Department of Fish and Game and the Oregon Department of Fish and Wildlife are the state agencies responsible for managing fish and wildlife resources in California and Oregon, including state–listed species.

Although the Klamath Tribe no longer holds any of its former reservation lands, the United States still holds title to approximately 70 percent of the former reservation lands. The balance of the reservation is in private Indian and non-Indian ownership, through either allotment or sale of reservation lands at the time of termination. The Klamath Tribe is currently negotiating for the return of former reservation lands.

3.2 Historic Context

This section summarizes historical research undertaken for the Klamath Basin region relative to past peoples and existing knowledge of chronology, settlement, subsistence, and regional interactions. Much of this section is excerpted from *Nature and History in the Klamath Basin* (Most 2003) and is reproduced with the permission of the Oregon Historical Society. Most's work was instrumental in providing a contextual baseline for developing specific research topics. Sections excerpted from Most 2003 are indented.

Trapping. The first non-Native Americans in the Klamath Basin were "mountain men." Traveling from Fort Vancouver on the Columbia River, the western headquarters of Hudson's Bay Company, their objective was to trap as many beaver as possible. The purpose of this London-based company was political as well as economic: not only to sell beaver pelts but also to create a "fur desert" that would leave American trappers with no motive to enter the Oregon territory, which was then disputed between the United States and Britain. (Most 2003)

> Finan McDonald and Thomas McKay arrived in the Klamath Basin in 1825. Like many trappers of their time, they had close relations with Native people or were part Native themselves. An imposing Scotchman, six-foot-four with red hair and a beard, McDonald was married to a Spokane Indian woman. McKay's father was Scotch, his mother a Cree Indian, his wife the daughter of a Chinook chief. Influenced perhaps by the mountain men's ability to relate to Native people, Klamath Indians, upon encountering their party of thirty-two men, warned them to beware of the Indians to the south, the Modocs. (Most 2003)
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> The next year McKay returned to the Klamath Basin under the command of Peter Skene Ogden. Born in Quebec in 1794 to a Loyalist family that fled the American Revolution, Ogden had trapped beaver from the Great Lakes to the waters of the Columbia. This expedition consisted of two dozen mountain men, who did the hunting and trapping, and their Indian wives, who prepared game and cured hides. Upon reaching Klamath Marsh in December 1826, Ogden encountered what he called the "Clamitte Indian Village," using the Chinook name for the tribe. There Ogden obtained fourteen fish of a kind he had not seen before and nine dogs. Ogden named Upper Klamath Lake "Dog Lake" after his newly acquired food supply. Accompanied by two Klamath Indian guides, the party saw the Klamath River headwaters and looked over the lakes and marshes to the south. Although Ogden found the river disappointingly "destitute of Beaver," his men took hundreds of beaver pelts from its tributaries, the Shasta and Scott rivers, and from streams that flow into them. (Most 2003)
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> ***Exploration.*** In 1842, when hundreds of emigrants traveled the Oregon Trail to the Willamette Valley, almost all of the land between St. Louis and Oregon City remained unexplored and unmapped. John Charles Frémont, a

skilled surveyor and map-maker, took on the task of filling this gap. (Most 2003)

John Charles Frémont was a southerner. The son of a Virginia woman who left her older, first husband for a handsome French emigré, he grew up in Tennessee, Virginia, and South Carolina. It was Frémont's great fortune to have as his patron and father-in-law Senator Thomas Hart Benton, one of the most powerful politicians of the day. The senator favored a westward expansion of the United States that would wrest Oregon from the British Empire. Benton saw the need for scientific expeditions that fixed latitudes and longitudes and that reported on soil, streams, flora, fauna, and terrain with respect to the land's potential for productive settlement. He had the clout to make Congress fund this work and a son-in-law well able to carry it out. After his first expedition, which went as far as Wyoming, Frémont wrote a report that stimulated interest in westward emigration and built support for exploring beyond the Rockies. His second expedition brought Frémont into Oregon. Turning south from the Columbia and traveling along the eastern slope of the Cascade Range, Frémont's party of twenty-five men, accompanied by Indian guides, reached "a lake of grass" thirty miles north of Klamath Lake in December 1843. There they encountered members of the E'ukskni band of Klamath Indians. The E'ukskni lived in earthlodges, caught fish, and carried bows and arrows. Frémont's men kept a careful guard until they left the Klamath Marsh. Then, heading southeast toward Nevada, the explorers crossed the Sycan River, whose waters flow into Upper Klamath Lake, before spending Christmas Day on the banks of Lake Warner. (Most 2003).

On his expeditions to map the continent, Frémont needed the services of an able scout. Kit Carson, a mountain man who had covered much of the western territory trapping beavers for the fur trade, filled that bill perfectly. "Cool, brave, and of good judgment," Frémont said of Kit Carson in his memoirs, "a good hunter and a good shot; experienced in mountain life, he was an acquisition, and proved valuable throughout the campaign." In 1845 as he prepared to make his third expedition, Frémont knew that he would need Carson's services once again. Although the War Department considered Frémont's expedition "of a scientific character, without any view whatsoever to military operations," the explorer brought with him a well-armed contingent of sixty men, including Carson. When his party came to California, Frémont lingered for months before proceeding to Oregon, as if awaiting new orders. Camped beside Upper Klamath Lake, Frémont learned that a courier, Lieutenant A. H. Gillespie, was on his trail carrying messages from Washington, D.C. Immediately, the explorer formed a party consisting of Carson and nine other men to ride with him, beginning at daybreak, to meet the officer. That fateful encounter, which occurred in a glade at the lake's southern end, has long puzzled historians. Did Gillespie give Frémont instructions to invade California and wrest it from Mexico? His documents

did not say so, nor could Gillespie have known that war with Mexico had begun, but he might have told him that war seemed inevitable. Did John Charles Frémont, who had made impetuous decisions before, decide on his own to return to California, bringing a militia that would decide its fate? After questioning Gillespie, then staying up late by the campfire re-reading the letters, Frémont wrapped himself in his blankets, failing, for only the second time in his career, to post a sentry. Near dawn, the sound of an axe striking a man's head awakened Kit Carson, who sounded the alarm. Indians, probably Modocs who had followed Gillespie, rushed the camp. Fighting back, Delaware Indians of Frémont's party killed a leader of the war party and forced his men to flee. The next day, in retaliation, Frémont and Kit Carson attacked and burned a Klamath village, killing 14 men. "I had kept the promise I had made to myself," recalled Frémont, "and had punished these people well for their treachery, and now I turned my thoughts to the work they had delayed." (Most 2003).

Emigration. Traffic over the emigrant route grew in 1849, bringing gold-seekers as well as settlers. The following year, one Modoc assault at the northeastern shore of Tule Lake killed eighty people and inspired a name that would haunt the region: Bloody Point. This massacre gave the Modocs a reputation. Whenever Indians raided a miner's pack train, Modocs were blamed. In 1851, a band of Indians, possibly from the Pit Rivers Tribe, ran off with forty-six mules and horses that miners were bringing into the gold fields. A posse formed to retrieve the animals. Led by Ben Wright, a seasoned Indian fighter, these vigilantes sneaked into a Modoc village, captured women and children, and killed several men.

Modoc attacks at Bloody Point continued. A rescue party, led by Ben Wright, broke up one attack against a wagon train. In 1852, Wright set up camp near a Modoc village on Lost River. With his men hidden nearby, Wright walked into the village, a pistol concealed beneath his serape, and shot the headman. His men opened fire. Only five of more than forty Modocs escaped. The Ben Wright massacre put an end to the Modoc raids, but presaged the tragic Modoc War that broke out twenty years later. (Most 2003)

Treaty. As settlers filled the Upper Klamath Basin, fencing land and putting cattle out to graze, many feared raids by Indians. The Natives had lost access to country where they had hunted game and gathered edible plants. Many were starving. Ranchers and farmers did not want to fight, and with the United States embroiled in civil war, authorities did not want to contend with further massacres or an Indian uprising. (Most 2003)

A Modoc leader, Keintpoos, whom whites knew as Captain Jack, asked the presidentially appointed Indian agent, Judge Elisha Steele, to draw up a treaty. Judge Steele, however, lacked the authority to do this. He may have

known that Congress had rejected treaties made with numerous California tribes in 1851 and 1852, allowing their lands to be taken without compensation or legal claim. Nonetheless, Judge Steele made an agreement with Captain Jack to try to establish a reservation in the Tule Lake area. In return, Modocs were to stop stealing livestock. (Most 2003)

Back in Washington, D.C., the Office of Indian Affairs decided to negotiate a different treaty that would remove all of the Indians of the Upper Klamath Basin onto a reservation on the Oregon side of the border. Indian Superintendent J. W. P. Huntington convened over a thousand Indians at a place they called Council Grove, north of Upper Klamath Lake. In return for ceding their traditional territories—more than 20 million acres of south central Oregon and northeastern California, including an expanse of high desert country to the east of the Klamath Basin—Modocs, Klamath, and the Yahooskin Band of Northern Paiutes were to inhabit less than 2 million acres on lands historically occupied by the Klamath Tribe. No whites except for Indian agency employees and Army personnel were supposed to live there. In addition, the Indians were to receive thousands of dollars' worth of supplies over the next fifteen years, after which they were expected to become self-supporting. However, supplies did not arrive for several years—until the Senate ratified the treaty. Even after the goods came, the Indian agent failed to distribute them fairly or fully. As a result, Captain Jack's band of Modocs left the reservation, and the Treaty of 1864 helped to bring about what it was designed to avoid: an uprising, a massacre, and a full-scale war (Most 2003).

Fort Klamath. During the Civil War, the Oregon legislature asked Congress for a military post to keep the Indians of the Upper Klamath Basin under control. In March 1863, Major C. S. Drew surveyed the sites that had been recommended for the new fort. One was not far from the Applegate Trail, where emigrants needed protection; another, overlooking the Link River, lay within the boundaries of today's Klamath Falls; the third was in Wood River Valley north of Upper Klamath Lake. Although this northernmost site was farthest from Bloody Point where emigrants had been killed, Major Drew considered it the best. In addition to having abundant water, ample grass to feed horses and mules, and an extensive pine forest to provide fuel and building materials, this was where the Oregon Central Military Road met the trail between the Rogue River Valley and the mines east of the Cascades. (Most 2003)

Trout and mullet crowded the lakes and streams, and elk, antelope, ducks, geese, and other game offered hunters countless targets. Yet food became a problem once the fort was garrisoned. Long, snow-clad winters isolated Fort Klamath, blocking the supply routes from the California coast and the Rogue River Valley. Indians taught soldiers how to spear fish through ice, but winter fare was rarely fresh. Men dined on dry bread and potato meal, boiled

chunks of formerly frozen beefsteak, two-inch-thick squares of "mixed vegetables," and coffee. (Most 2003)

With Linkville—later renamed "Klamath Falls"—thirty-six miles to the south and Jacksonville 100 miles west across the mountains, loneliness and boredom plagued the soldiers. Some ran off, attracted by dreams of gold. If captured, a deserter was court-martialed. If found guilty, he was tattooed with a "D" on his left hip. (Most 2003)

The major problem the soldiers had to contend with was Indians leaving the reservation. Members of the Yahooskin "Snake" tribe ran off the year the treaty was signed. Captain Jack's band of Modocs left in 1870. Because the Modocs returned to their territory south of Klamath Falls, soldiers at the fort were poorly positioned to protect settlers from Indians and Indians from settlers (Most 2003).

Livestock. The lowlands in the Klamath Basin were good for grazing. After 1864, when local Indians were relocated to the Klamath Reservation, settlers, also known as "swamp grabbers," began to dig ditches and bring in cattle. N. B. Ball, a Kentuckian, kept 500 head on a 3,000-acre ranch in Butte Valley. John Fairchild had 3,000 head of stock on 2,700 acres nearby. (Most 2003)

The departure of Captain Jack's band of Modocs from the reservation and their return to their homeland in 1870 troubled the new residents of Modoc country. Some ranchers complained of broken fences and stolen cattle. They said that Modocs who came by their houses asking for food scared womenfolk and children. Other settlers, like John Fairchild and Henry Miller, befriended the Modocs. Contradicting those who claimed that Indians extorted them for "rent" in the form of hay for their horses, Miller maintained that he never paid them a nickel for his land. Instead, he hired them as herders. The rancher also rejected the notion that the Modocs were "hostiles," saying that they "are not more insolent to whites than whites are to whites." At a meeting convened by Major Elmer Otis, the Modoc headman Captain Jack (Keintpoos) announced: "We are willing to have whites live in our country, but we do not want them to locate. . . where we have our winter camps. The settlers are continually lying about my people and trying to make trouble." (Most 2003)

Modoc Indian War. Captain Jack knew that some ranchers were demanding that the Army round his band up and march them back to the reservation. But the trouble came from both sides. Shortly before the outbreak of the Modoc War, Indians stampeded George Miller's 300-steer herd as he drove them from his Langell Valley ranch to Arizona. (Most 2003)

With no order from General E. R. S. Canby, who commanded the Army's Department of the Pacific, or from Colonel Wheaten, who headed Oregon's District of the Lakes, Major Green sent troops from Fort Klamath to Lost

River to bring Captain Jack's band of Modocs back to the Klamath Reservation. The major made this dangerous move after a visit from the reservation sub-agent, Ivan Applegate. Applegate reported that settlers, desperate to get rid of the hundred or so Modoc "desperadoes," might attack Jack's camp on their own. (Most 2003)

When the Army entered the Modoc camp at daybreak, November 29, 1872, an attempt to disarm the Indians sparked an exchange of gunshots. At that moment, settlers came out of hiding and attacked Hooker Jim's village across the river. Several children, two men, and at least one woman died under fire. The rest of the Modocs fled, their destination a natural lavabed fortress south of Tule Lake. On the way, Hooker Jim and his men killed several settlers, including Henry Miller, who had befriended Modocs. Suddenly, war was inevitable. Against the Modoc band, the Army assembled a force of 330 men. Foggy weather and the rugged terrain, however, frustrated the first federal troops. The first assault on January 17, 1872, became a rout, with Modocs shooting at will. That battle left thirty-seven soldiers and civilian volunteers dead or wounded. Not a single Modoc was harmed. (Most 2003)

Knowing that the Army could not dislodge the Indians from their stronghold without great cost in lives, General Canby attempted to negotiate an end to the war. Canby favored a Modoc reservation on Lost River but was not authorized to offer one. While talks continued, the general brought more troops into the vicinity of the Indian stronghold. Failing to get the general to agree even to let Modocs stay in the lavabeds, Captain Jack yielded to pressure from Hooker Jim and other men who had murdered settlers. They feared being hanged as part of a peace agreement and insisted that Canby be assassinated during a negotiation session. On Good Friday, April 11, 1873, the Modoc leader shot General Canby dead. His men killed another peace commissioner, Reverend Eleasar Thomas, and wounded a third, Alfred B. Meacham. (Most 2003)

After Modocs attacked peace commissioners during negotiations, killing General Edward Canby and Reverend Thomas, General George Sherman ordered the tribe's "utter extermination." Shortly thereafter, the Army launched a new assault on the Indian stronghold. Troops cut off the trail between the lavabeds and Tule Lake, their water supply. That night, Modocs fled their natural fortress. (Most 2003)

One party of twenty-two warriors led by Scarfaced Charley did not go far. They ambushed Company E of the 12th Infantry, killing twenty-five and wounding sixteen men. Fears of an Indian uprising swept the countryside. Then four Modoc warriors surrendered. Hooker Jim and three others offered to lead the Army to Captain Jack/Keintpoos in exchange for amnesty. They finally caught up with him in a canyon near Willow Creek. (Most 2003)

The captured Modocs were kept in a stockade within Fort Klamath awaiting the tribunal. Six leaders went on trial. They had no defense counsel. Injured peace commissioner A.B. Meacham testified for the prosecution. Hooker Jim, turning state's evidence, said, "I have been a friend of Captain Jack, but I don't know what he got mad at me for." Captain Jack, speaking in his own defense, recalled going to the lavabeds with a few people after the raid on his Lost River camp. "I had never told Hooker Jim and his party to murder any settlers," he said. Jack added that the four turncoats "all wanted to kill the peace commissioners; they all advised me to do it." The tribunal sentenced Captain Jack and five other men to death by hanging. President Ulysses Grant commuted two of the sentences. After the executions, which occurred on October 3, 1873, the men whose lives Grant spared were imprisoned at Alcatraz. (Most 2003)

The other prisoners of war were put on a train to Oklahoma. At the time, Oklahoma was not a state; it was a territory set aside for Indians. Some Modocs still live there. Others are members of the Klamath Tribe in Oregon. (Most 2003)

Colonialization. In 1852, a brave nineteen-year-old Wallace Baldwin drove fifty head of horses from the Rogue River Valley into the Klamath Basin. He had packed only enough food for his trip along the Applegate Trail, and he had no gun. Klamath Indians helped him survive. They brought him game and taught him how to eat *epaw*, the tuber that was their potato. Baldwin found fertile ground for pasturing his horses and a sunny climate. Although it is unknown how long he stayed, the young man is considered the first non-Indian settler in Klamath country. (Most 2003)

Fifteen years later, George Nurse, a civilian who supplied Fort Klamath with goods, built a small store near the Link River and stocked it with a wagonload of trinkets and necessities. In May 1867, he established a ferry service across the Link River on the trail between the fort and Yreka, California. (Most 2003)

A saloon, a harness shop, and a United States Land Office were among Linkville's early attractions. A pack train brought supplies from Yreka; a stage service provided weekly mail delivery from Ashland. Travelers tied their horses to the hitching post in front of Nurse's Hotel. In 1873, the Modoc War made the town famous across the United States; journalists stayed in the hotel. By 1885, the population had climbed to 384. There were four saloons, three hotels, seven stores, three blacksmith shops, a butcher shop, one newspaper, four doctors, four lawyers, a telegraph office, a Presbyterian church, a flour mill, and a jail. Courtroom space was rented until 1888, when a courthouse and a new jail were built, each costing about $3,500. (Most 2003)

> In 1891, a fire wiped out the buildings near the river. The town was rebuilt, and with its renewal came a campaign to rename Linkville. Two years later, a new city charter named the town Klamath Falls. This name not only suggested a bigger town than any "ville" could be, it connoted the modernity of water power and electricity. Shortly thereafter a dam was built where the upper lake spills into the Link River, obliterating the falls at Klamath Falls. (Most 2003)

The area grew as settlers milled trees into lumber and drained wetlands for ranch and farm lands. With the introduction of water- and steam-driven mills in the 1860s, settlers could begin harvesting and processing the Klamath Basin's abundant timber resources. Water wheels powered the first lumber mills in the Upper Klamath Basin. Those were one-person operations that some of the earliest settlers used. It took them hours to turn a log into planks. Soon buildings clustered from the hillside on the north to the swamps on the south and east.

> ***Timber/Lumber.*** To build Fort Klamath, the U.S. Army brought a steam-driven mill across the Cascades from Jacksonville. It operated from 1863 to 1870 and turned out up to 3,000 board feet per day. The Treaty of 1864 promised "one saw-mill . . . and all the necessary tools and materials for the saw-mill" for the use of the Klamath Tribes. In 1870, the Klamath Agency built a mill that produced boards until it burned down in 1911. (Most 2003)
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> In 1877 William Moore built a mill on the Link River that was able to produce 10,000 board feet per day. Thirty years later his sons opened a mill on the shore of Lake Ewauna, between the Link and the Klamath rivers, that turned out 50,000 board feet daily. But the harvest of logs had hardly begun. The timber industry in Klamath County took off after 1909 when the Southern Pacific Railroad line came to Klamath Falls. (Most 2003)
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> As the fruit industry in California expanded, ponderosa pine was increasingly in demand to make boxes. The Ewauna Box Company, which started work in 1912, became the second largest box factory in the United States. (Most 2003)
>
> In 1929, the Weyerhaeuser Timber Company built a huge modern timber mill near Klamath Falls. Its location by the tracks enabled the Weyerhaeuser mill to run year-round. Other mills like the Collier outfit on Swan Lake had to shut down each winter because its horses were unable to haul lumber through the snow to the railroad to get the product to market.

The timber industry has played a major role in the shaping of the economics and landscape of the Klamath Basin, particularly the northern reaches of the Klamath Basin NWRC, which is more forested than other portions of the complex. Throughout the 19th century, timber harvesting was a relatively small-scale operation, producing lumber mostly for local consumption. As water transportation and railroad infrastructure became available, the small-scale operations expanded or disappeared, and large-scale lumber companies, some with East Coast and Great Lakes operational bases, began acquiring large swaths of timberland (Conway and Wells 1994).

The technology of the lumber industry went through several changes during the 19th Century. The tree felling and bucking processes remained the same, a labor-intensive job requiring trees to be cut down with crosscut saws, double-bit axes, wedges, and springboards (Rajala 1989). The yarding and transportation processes tended to change from water- and animal-powered modes to mechanical and steam-driven modes (Rajala 1989). Steam "donkeys," a steam-powered winch for pulling logs to a yarding area, replaced oxen and horses. Logs previously floated downstream on rivers and streams, or hauled by oxen or horses to sawmills, were now transported by logging railroads (Rajala 1989).

Prior to mechanization, mills were small and portable, having to be erected at, or near, the harvest area. Later, logs could be rafted, flumed, or hauled to large-scale permanent industrial mills. The edges of Klamath Basin waterways, with their flat shorelines and still waters, were good places to build mills because logs could be floated to the mills and stored in natural ponds.

Shipping. In 1867, lumber from the Klamath Agency sawmill was purchased by George Nurse to build his store and hotel on the Link River in present-day Klamath Falls. He transported the lumber on rafts across Upper Klamath Lake and down the Link River to his building location. This method of transporting lumber quickly became the method for transporting timber from the reaches around Upper Klamath Lake to the many small sawmills that dotted the landscape around the Link River, Lake Ewauna, and Klamath Falls at the turn of the 20th century (Donnelly 2003a).

In 1877, the Moore Mill, built by William Moore, began operation on the west side of Link River just north of the Link River Bridge in Klamath Falls (Bowden 2002). The sawmill produced lumber from logs that had been rafted from a lumber camp on the western shore of Upper Klamath Lake south to Linkville (later renamed Klamath Falls in 1892). The Moore Sawmill remained in operation until 1907 (Lamm 1944). By 1908, the Ackley Brothers were shipping lumber and hay by raft and barge to Ady, on Lower Klamath Lake, the temporary railhead at that time (Bowden 2002, Helfrich 1965).

John C. Fremont, in 1835, was the first to document watercraft in the Klamath Basin when he noted Indian canoes on Upper Klamath Lake. The first non-native boats to be described in the Klamath Basin were boats (or a boat) either built by Ben Wright's militia, or commissioned by the militia in 1853, to pursue fleeing Modocs adept at water travel (Helfrich 1965).

When Fort Klamath was established in 1863, the supplies had to be brought in from Jacksonville, Oregon, by pack trains of mules and horses over the old Rancheria Trail, which crossed the mountains just north of Mt. Pitt. Later, to shorten the long trek around Klamath Lake, some square rigged "wind jammer" barges were built, one of which was 10 feet by 40 feet, and another 16 feet by 60 feet, to carry the freight from the location of the present Rocky Point Post Office to the old Agency Landing. These barges were sailed on the open lake and propelled by pike poles when on the streams. They were later owned and used by Daniel G. Brown in connection with his ranch at the head of Crystal Creek (Anonymous 1947).

Eventually, as colonialists began to settle the region, ferries were constructed. A newspaper item in the December 31, 1862 *Yreka Semi-Weekly Journal* states: "A ferry has lately been placed at the emigrant road crossing on Lost River…. Considerable travel is expected over this road and ferry towards the Humboldt next spring, and also towards John Day, Powder, and Boise rivers. A bridge has been built over the slough (Lost River Slough, south of present day Henley) for the accommodation of the travel to the Northern mines…" (Helfrich 1965).

An article in the May 19, 1865*Yreka Semi-Weekly Journal* states, ". . . Bob Whittle lately transported 1300 pounds of freight in a boat on the Klamath Lakes towards Fort Klamath. The freight was taken to the lakes from Yreka, and is the first attempt of the kind ever made" (Helfrich 1965).

In 1866, at the head of the Link River, on the old emigrant trail there, a small boat was installed for the use of the Pony Express, designed to carry men and horses only, and just long enough to accommodate a wagon without oxen. At that time the Pony Express, carrying dispatches twice a week between Fort Klamath and Henley (near present day Hornbrook, California) crossed Link River at the outlet of Upper Klamath Lake.

In 1867, George Nurse, founder of Linkville (later called Klamath Falls), ran a permitted ferry across Link River, at approximately the location of the present bridge on Main Street. At about the same time, Wendolen Nus built a cabin and ran a ferry across the river about two miles south of the present city of Klamath Falls, on the east side of Klamath River (Shaver et al. 1905).

Three other early ferries, reported to have plied the Klamath Lakes by 1868, included that of C. J. Dorris, who in 1868, had planned, and maybe built, a ferry on Lost River near to where he ran his cattle; Killibrew's Ferry (made obsolete by construction of Topsy Grade) ran across the Klamath River in Siskiyou County, upstream from Fall Creek, and now is subsumed under the waters of California Oregon Power Company's Reservoir; and there was a ferry at Keno, about one-fourth of a mile below the present highway bridge, or at about the location of Power Company dam below the bridge (Helfrich 1965). Also in 1868, it is reported that Fort Klamath soldiers used "a Whitehall boat" to transport vegetables from their garden at the lower end of Upper Klamath Lake (i.e., Burnetts Point) (Applegate-Good 1941).

The first powered boat in the Klamath Lakes region, built in 1871, made only its maiden voyage before being grounded and thrashed in a storm. It was built by Samuel Grubb, then an employee of the Klamath Reservation. It was a flat bottomed scow about 16 feet by 40 feet for hauling freight across the Upper Lake from Pelican Bay to Kowasta. This boat was propelled by a two-horse treadmill (Applegate-Good 1941).

It appears that at least two boats were probably used to help supply the military campaign during the Modoc War of 1873. Also, at least one boat and several canoes were used to transport soldiers wounded in the fight (Applegate-Good 1941).

In 1872, a small sailboat operated on the Klamath Lakes between the head of the Link River and points north, on the Upper Klamath, Agency Lake, and Williamson River. The keel-bottomed boat, possibly forty feet long and ten feet wide, was owned and operated by a former sailor named Moody. The boat was named either the Mary Moody (for the owner's Indian wife), or Maggie Moody (for Mr. Moody's daughter). Freightage at that time was limited to lumber bought from the Indian Agency and hauled to Linkville, some goods for the stores at the Indian Agency and at Fort Klamath, and, at times, military supplies for the Fort (Applegate-Good 1941).

About 1876, Joe Ball, who was living with an Indian wife, became the owner of the M. Moody, and he continued to operate the boat until about 1879, when H. M. Thatcher and Sykes Worden built the first steam boat on the Upper Klamath Lake, the "General Howard." This steamer, 65 feet long, with 12 foot beam, drawing four and a half to eight feet of water, with 40 horsepower engine and four foot

propeller, was built to tow logs from Pelican Bay for the saw mill just built on Link River by W. S. Moore and sons (Anonymous 1947, Applegate-Good 1941).

In 1880, George Loosley and George Nurse bought the General Howard. About a year later, George Loosely bought George Nurse's share.

Associated with George Loosley in the boat business was his brother, John F. (Fred) Loosley (Applegate-Good 1941). In 1884, the two built a flat-bottomed stern wheel boat called the City of Klamath to navigate Wood River (Applegate-Good 1941). The machinery for the boat was salvaged from the General Howard (Anonymous 1947).

About 1897, the Lottie C., another small steamboat or launch which had been operating on the Klamath River between Keno and Klamath Falls, was moved to Upper Klamath Lake. It was owned by a man named Clanton and later operated by Bird Loosley (Anonymous 1947).

In the late 1890s and early 1900s, there were several small boats, mostly barges equipped with steam engines and stern wheels, to do necessary freighting and towing on the lake. These were operated by Baldy Richardson, Louis Dennis, Bert Wilson, Dan Griffith, and others. They bore names like Oregon, Hobson, Alma, Mud Hen, Hornet, Hooligan, North Star, and Eagle (Anonymous 1947).

In the summer of 1904, the largest steamboat to ever ply the lake, the Winema, was built by John Totton and Harry Hansberry, experienced steamboat men from the Columbia River. It was propelled by twin steam engines connected directly to the stern wheel. After her spring 1905 maiden run, a daily schedule was established. The Winema called at every accessible point on the lake, hauling freight of all kinds, and passengers. Each Sunday the boat would be loaded to capacity for a big excursion. The Winema served for many years, being destroyed by fire in 1925, as she lay in drydock in Klamath Falls (Anonymous 1947).

In 1909, the Mazama, a small twin screw steamboat, was put into operation. It ran from Klamath Falls to the town of Fort Klamath, up Wood River, a narrow and very crooked stream (Anonymous 1947).

Also, in the early 1900s, it became popular for people living adjacent to the lake to have personal gasoline-powered boats; each residence had a launch. These boats varied in size from a rowboat powered by a small engine to cruiser cabin launches 35 to 40 feet long (Anonymous 1947).

As the lumber industry on the lakes expanded, a need for more dependable tug boats was apparent, and in 1910 Anton Wickstrom and John Linman built the Modoc. In 1914, after Wickstrom and Linman dissolved their partnership, Captain Linman built the second towboat, the Wasp, 13 feet by 50 feet, with a draught of 26 inches. The machinery for the Wasp had formerly been used in a boat on Tule Lake.

Captain Wickstrom had started a sand business in 1909 to meet the requirements of a rapidly growing city. He towed barges up the lake to the mouths of Williamson River and Wood River, where he delivered sand sucked from the lake bottom. His boat, the Eagle, was steam propelled. During the years that followed, Captain Wickstrom expanded his business to include the hauling of volcanic cinders from Coon Point on the west side of Klamath Lake (Anonymous 1947).

In 1905, the Klamath Navigation Company had built the steamer Klamath on Lake Ewauna for hauling freight and passengers from Laird's Landing to Klamath Falls. It was a double-decker freight and passenger boat with a screw propeller, 75 feet long and 18 feet wide. When the railroad was completed into Klamath Falls, the steamer Klamath was no longer needed for this run and was moved to Upper Klamath Lake for passenger service. Pelican Bay Lumber Company later bought the steamer to use in towing logs to their mill (Anonymous 1947).

Although the Upper Klamath Basin had a rich amount of timberland, shipping the lumber to markets outside the immediate region was complicated by the lack of substantial transportation infrastructure. Freight and wagon roads were generally inadequate for hauling loads of lumber to the nearest railhead near Weed, California, a trip of over 60 miles. Rather, until a railhead was built at Linkville (Klamath Falls), logs were transported as rafts towed by barges (Helfrich 1965). With the development of good highways, motor cars, and trucks, railroading and boating on Klamath Lakes decreased until today only a few pleasure boats and small diesel-powered tow boats are to be seen where the larger craft were once prevalent.

Roads and Trails. Isolation and poor transportation delayed the settlement of the Klamath Basin. The Basin needed good transportation routes over the Cascade Range to the Rogue River Valley and Willamette Valley, and also to railroad points in Northern California to maintain the vitality of towns and homesteads.

> In 1846, Jesse and Lindsay Applegate, together with Leon Scott, headed a party to locate a less dangerous route to the Willamette Valley. Rather than bring families, oxen, and wagons over the Blue Mountains and along the daunting Columbia, the new route would lead emigrants through the southern mountains of the Cascade Range. The road that Scott and the Applegates built went through the Nevada desert, passed Goose Lake, Tule Lake, and Lower Klamath Lake at the California-Oregon border, crossed the Cascades into the Rogue River Valley, then headed north toward the pioneers' destination. (Most 2003)
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> The new road proved to be no easy detour. The first winter that the Applegate Trail was open for emigration came early and caused great suffering. This was the fatal winter of 1846–1847 when the Donner Party came to grief crossing California's Sierra Nevada. It was also unfortunate that the Applegate Trail passed through the homeland of the Modocs. One band of Modocs ambushed emigrants at a place on the edge of Tule Lake that became known as Bloody Point. Although the Applegates built their trail to bring settlers north into Oregon, as soon as word of gold in California reached the newly established settlements, that road became jammed with colonialists rushing south. Trying to stop the flow of emigrants, Modocs attacked wagon trains. Their weapons, however, could not stop the smallest and most lethal invaders: in 1847, at least 150 Modocs died of smallpox. (Most 2003).

The Applegate Road, west of the Klamath Basin, is followed roughly today by Oregon State Highway 66.

When Fort Klamath was established in 1863, the supplies had to be brought in from Jacksonville, Oregon, by pack trains of mules and horses over the old Rancheria Trail, which crossed the mountains just north of Mount McLoughlin (Anonymous 1947). This "Oregon Military Road" parallels Upper Klamath Refuge's western boundary, within 0.1 mile of the refuge.

As time progressed and settlers moved into the Klamath Basin, better roads were established and Linkville (Klamath Falls) was founded (Anonymous 1947). By the end of the nineteenth century, a number of wagon roads radiated from Klamath Falls. All of these roads were used by wagons (i.e., "buggies," freight wagons) at one point or another, and some were used by stagecoach. Roads that joined the Klamath Basin with major outside population centers were of prime importance because new settlers and much-needed commodities were moving over them. Once roads were put into passable condition and as new settlements expanded, a number of stage and wagon routes were established.

The stages carried passengers, mail, and light freight; wagons were responsible for hauling heavier, bulkier freight. The chief purpose of the various routes was to connect Linkville (later named Klamath Falls) with points of the Southern Pacific Railroad (e.g., at Ashland in the Rogue River Valley and at Ager, Thrall, and Montague in California). Other routes reached Lakeview via Bonanza and Bly and Dorris and Alturas in California. The dates of established routes in the vicinity of the Klamath Basin are outlined in Helfrich (1977):

- ***1870***. A stage line from Linkville to Lakeview via Bonanza and Bly (skirting the northern edge of Upper Klamath Lake). This route was probably the route reconnoitered by Captain C. S. Drew from Fort Klamath in March 1864 in search of a road to the Owyhee River and to eastern Oregon after gold was discovered in the area.

- ***1871***. Three routes listed: one from Yreka (within 2 miles of the southwestern boundary of Lower Klamath National Wildlife Refuge); one from Portland via Eugene using the 1863 Oregon Military Road (parallels the western boundary of Upper Klamath National Wildlife Refuge, within 0.1 mile of the refuge); and one from Portland via the Dalles (skirting the western edge of Klamath Marsh and the eastern shores of south Upper Klamath Lake).

- ***1875***. The stage from Ashland to Linkville ran twice a week.

The routes for wagons and stages changed rapidly as new roads were opened or old roads were improved. However, the greatest development of stage and wagon roads occurred after the turn of the century as the population expanded and as roads were improved before the coming of railroads and automobile.

Railroads and Industrial Logging. The first railroad to penetrate the Klamath Basin was built in 1901–1902 from Thrall (in vicinity of Laird's Ranch, within or adjacent to the southern end of Lower Klamath Wildlife Refuge), California, on the main line of the Oregon-California Line (Southern Pacific) for the purpose of serving the lumber mills. Southern Pacific then began construction of a railroad from Abner Weed's industrial sawmill in Siskiyou County, California, to Klamath Falls in 1906 (passing within 0.3 mile of Bear Valley National Wildlife Refuge), incorporating Weed's already existing railroad logging railroad (Bowden 2002). This generated economic development in Klamath Falls as several companies organized and opened mills during this time.

Since construction of the railroad was proceeding quickly, the California Fruit Canners (an association of California fruit and vegetable canning and drying companies and their subsidiaries) established a box factory in Klamath Falls in 1908 and began producing wooden boxes for shipping fruit on the rail lines. (Bowden 2002, History San José 2010)

In 1904, Weyerhaeuser began logging unclaimed timber in the vicinity of Klamath Falls. In 1908, the company had 158,000 acres of active timberlands. The company had cruised the timber long before harvesting, awaiting construction of the railroad before establishing its sawmill four miles southwest of Klamath Falls. (Donnelly 2003b)

In 1909, Southern Pacific completed the rail line from Abner Weed's mill in California to Klamath Falls. By 1911, this line had dead-ended 40 miles north at Kirk (making it partially contiguous with a portion of the Upper Klamath Wildlife Refuge eastern boundary), making the rail line a branch and not the hoped for through-line. (Donnelly 2003b)

Soon after, the Oregon, California & Eastern Railroad (OC&E) was formed, with the intent to connect the region to mainlines and open up more lands for timber harvesting opportunities. Construction of rail lines for the OC&E from Klamath Falls to Sprague River was completed in 1923. (Moore 2010)

Eventually, six other lumber companies began railroad logging operations off the main line, using the OC&E to ship their logs from their decks to Klamath Falls and the many sawmills and factories. By 1948, Weyerhaeuser Timber Company was the only company in the area using rail lines to harvest and haul timber (Moore 2010). During this period, the region was connected to Alturas (1929) and Bieber (1931) in California and Eugene (1926), Bend (1927), and Sprague River (1923) in Oregon by various competing railroad companies (Tonsfeldt 1990).

The improved transportation infrastructure created a boom in lumber companies and timber felling activities. A partial list (Lamm 1944, Tonsfeldt 1990, Bowden 2002, Zilverberg 2002) of companies operating in the northern portion of the Klamath Basin NWRC and reflecting the boom in timber operations includes:

- Ackley Brothers Lumber Company 1904–1943 (taken over by Modoc Lumber Company in 1943)
- Algoma Lumber Company 1911–1943
- Big Lakes Lumber Company 1917–1947
- Blocklinger Lumber Company 1918
- Cascade Box Factory 1930
- California Fruit Canner's Association 1908–1912 (plant eventually purchased by Klamath Manufacturing Company)
- Chiloquin Lumber Company 1912–1947
- Ellingson Timber Company
- Ewauna Box Company 1912
- Klamath Manufacturing Company 1912–1929 (Klamath Lumber and Box Company 1929-1942) (DiGorgio Fruit Corporation 1942)
- Knapp Sawmill 1916–1918 (purchased by Modoc Lumber Company)
- Long Lake Lumber Company 1904

- Lamm Lumber Company 1914–1944
- Pelican Bay Lumber Company 1911–1947
- Shaw-Bertram Lumber Company 1920–1934 (became Modoc Lumber Company)
- Modoc Lumber Company 1946–1995
- Sprague River Lumber Company 1919
- Weyerhaeuser 1900-1992

Many of these companies were small operations, some were shell companies of larger conglomerates and conflicted owners, and a few eventually grew to be considerable economic forces in Klamath County. Many were unable to survive the economic ups and downs of the 1920s and 1930s. If small operations experienced a catastrophe such as a fire (which was a common occurrence), they were sometimes economically devastated and unable to rebuild. While in operation, most of these lumber companies located their mills along the shores of Upper Klamath Lake, Lake Ewauna, Link River, and Lower Klamath Lake. From this vantage point, the companies were able to use water power for transporting logs to their saw mills. This technique was also used during the era of railroad logging.

Throughout the early decades of the 20th century, Weyerhaeuser had been occupying timber tracts throughout the region. Although the company had vast holdings of timber waiting to be cut, the construction of a mill was delayed until a minimum of two rail lines serviced the area. In 1928, the completion of the connecting line to Bend, Oregon, began the process of establishing operations. Weyerhaeuser built a large sawmill and subsidiary operations plants including dry kilns, a box factory, and a planing mill south of Klamath Falls on the west side of Lake Ewauna (Donnelly 2003b). The sawmill opened in 1929 and the other operations opened quickly thereafter.

The early years of the 20th century were years of labor unrest, at times erupting in violence. In 1917 the Martins Brothers flour mill in Klamath Falls was destroyed by arson, an act attributed to sabotage by an Industrial Workers of the World Union (IWW) member (*Evening Herald* 1917). The IWW, created in 1905, had a strong presence in the Northwest forests in the early 1910s, with organized strikes and work slow-downs in an effort to improve lumber camp conditions and create eight-hour work days (Rajala 1989). However, the U.S. government began to prosecute the union members under various laws (Rajala 1989).

Many mills and box factories closed during the Great Depression. In the few years before the United States became embroiled in World War II, the need for lumber on the international market gave a boost to the local economy. After WWII, strong economic growth, affordable mortgages, and an increased demand for housing stimulated the lumber industry (Conway and Wells 1994). This economic boom continued until the mid-1960s, when an economic slowdown coupled with the burgeoning environmental movement and changing forest management practices and regulations reduced the demand for and profitability of lumber (Conway and Wells 1994).

The technology of the lumber industry changed during this time. The technology of the lumber industry changed during this time. The chain saw was invented in the first half of the 20th century and became widely used by the late 1930s in the process of tree felling and bucking. The yarding and transportation processes continued to be by railroad, although trucks began to be used (Rajala 1989). These technological improvements expanded the area of timber available for ready harvest, reduced labor, and reduced the time from harvest to consumer.

3.3 Reclamation, Agriculture, Homesteading

High desert homesteaders often had to rely on unpredictable water sources that flourished and disappeared with the changing of the seasons. In order to sustain the dream to populate the western high desert, the federal government had to initiate programs that would provide irrigation, flood control, land reclamation, and water storage for the homesteaders.

> In 1902, Congress passed the Newlands Act, establishing the Reclamation Service, later renamed the Bureau of Reclamation. At the beginning of the twentieth century, the nationalization of waterways to provide irrigation, flood control, water storage, and power addressed the problem of supporting the West's growing population. One of the first projects of the new Bureau of Reclamation helped settlers farm lands where water *interfered* with cultivation: the marshy, lake-rich terrain of the Upper Klamath Basin and the Lost River drainage. (Most 2003)
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> In order to drain the lakes and marshes and develop a system for moving these waters, Reclamation required the states of Oregon and California to cede to the federal government state rights and title to the region of Tule Lake and the Lower Klamath Lake. Originally, the reclaimed lands were to be sold in 80-acre homesteads. Payments would then subsidize reclamation of other lands. Yet Reclamation neither pressed farmers for their payments nor penalized those who farmed more lands than were allowed. New congressional appropriations provided what Reclamation needed to generate new projects; and, in the Klamath Basin, to build headgates, irrigation canals, ditches, sumps, dams, reservoirs, hydroelectric turbines, and pumps to move the water. (Most 2003)
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> In 1909 three members of the Czech Colonization Club in Omaha, Nebraska, investigated western lands in search of a region suitable for farming. After their journey, Land Committee member Vaclav Vostrcil recommended "the project in Klamath Falls, Oregon for our Czech settlement." Vostrcil expressed his belief that "this country has before it a big future. Lumber for building is cheaper here than in other western countries and water power guarantees the industry of small business." Another sign of the region's big future was the railroad, which had come to Klamath Falls only three months earlier. The undeveloped lands, the Czech farmer reported, sold for thirty dollars per acre, but "everyone has to buy their water rights from the government. These rights cost thirty-five dollars per acre and are payable in ten years without interest." (Most 2003)
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> Frank Zumpfe, who had traveled with Vostrcil on the selection tour, returned to Nebraska and immediately brought his family to the Klamath region. Zumpfe bought sixty-eight acres near Tule Lake. There was a large house and a broken-down barn on his previously cultivated land. Before the year was out, fifty members of the Czech Colonization Club had bought Klamath

Project land. Meeting in the Zumpfe house, the Czechs established a settlement, the town of Malin, which they named for a kind of horseradish that grows in Czechoslovakia. People of Czech descent continue to live in Malin and elsewhere in the Upper Basin. Grandchildren and great-grandchildren of Colonization Club members farm Klamath Project lands today. (Most 2003)

The railroads, wanting to populate their right-of-way in order to carry more freight and raise revenues, advertised that "rainfall follows the plow." When the "Enlarged Homestead Act" of 1909 offered 320-acre land claims to those who would irrigate the desert, speculators started selling future oases near places like Lakeview to gullible easterners. Those who found a lake near their land were the fortunate ones. "The homesteaders had no chance," recalled R. A. Long in his book *The Oregon Desert*. "A homestead is supposed to be farmland—but the desert isn't farmland. Rainfall can drop to as low as five inches a year, which won't raise any known crop. So they were poor, deluded persons. But they were not beaten, bitter, or downtrodden. Against all reason they were happy. . . to a man, they remember their homestead days as the happiest time of their lives." Irrigation drawing waters from Goose Lake helped some homesteaders make a living on the land in the twentieth century. An ironic result is that the lake is no longer visible from Lakeview. (Most 2003)

By 1915, the Klamath Water Users Association had persuaded President Wilson to reduce the Lower Klamath Lake refuge from 80,000 acres to 53,600. Meanwhile, the Bureau of Reclamation used the Southern Pacific railbed as a dike to block overflow from the Klamath River that refilled the shallow lower lake. Its waters quickly evaporated under the abundant sunlight of the Upper Basin. By 1922, a 365-acre pond was all that remained. (Most 2003)

Nesting colonies of migratory wildfowl disappeared. Lands east of the lake became infested with grasshoppers, whose soaring population could no longer be arrested by birds and American Indian gathering. Peat soils started to burn, raising clouds of ash that obscured the skies of Klamath Falls. On October 26, 1922, the Klamath Evening Herald proclaimed: "DUST CLOSES SCHOOLS. Storm Held Worst in History of City: Housewives Aroused!" Finley described what was once Lower Klamath Lake as being "a great desert waste of dry peat and alkali." (Most 2003)

President Calvin Coolidge responded by establishing the Tule Lake National Wildlife Refuge in 1928. In the 1940s, the Bureau of Reclamation built a 6,000-foot tunnel through Sheepy Ridge and pumped runoff water from the Tule Lake Basin up sixty feet into the Lower Klamath drainage. This feat of engineering refilled the wetlands, and birds began to return. By the fall of 1955, an estimated 7 million birds visited the Lower Klamath and Tule Lake

refuges, offering innumerable wildlife images for photographers in the Finley tradition. (Most 2003)

Civilian Conservation Corps. In Oregon and throughout the U.S., the Civilian Conservation Corps (C.C.C.) provided much-needed jobs during the depths of the Great Depression. Within the Upper Basin there was a C.C.C. project at Crater Lake, building the infrastructure of the national park there; an Indian C.C.C. on the Klamath Reservation, making trails and doing forest maintenance; two Fish and Wildlife camps at the Tule Lake and Clear Lake wildlife refuges; and two Bureau of Reclamation (BOR) camps on Klamath Project lands. (Most 2003)

C.C.C. Camp BR-41 was quartered two miles north of Merrill, Oregon. Everyday projects included building water control structures of timber and concrete, digging ditches, clearing weeds, and killing rodents. The excavation of J Canal required jack hammers and dynamite; to line the canal workers poured hundreds of cubic yards of concrete. There was emergency work as well. C.C.C. crews fought forest fires like one that scorched Stukel Mountain north of Klamath Falls. When a dike broke and flooded the Tule Lake sump, one crew rapidly repaired the dike; other men, hauling grain from the fields, saved the harvest. (Most 2003)

The daily routine was inspired by the military. Men rose at 6:00 a.m., ate at 6:30, and policed their barracks and camp before starting work at 8:00. At 4:00 p.m., a retreat ceremony signaled the close of the work day. On-the-job training in such tasks as road construction and laying pipelines was available. (Most 2003)

Mr. I. L. Williamson, who conducted a vocational training conference at BR-41, explained to the camp's technical personnel how to teach their skills. Presentation, he said, means that an instructor has to "Tell 'em, Show 'em, Ask 'em, Let 'em talk." Application means, "Let 'em try it." (Most 2003)

All of the men took a course in first aid. Twice a week enrollees from the two BOR camps attended night school in Tulelake, taking classes in reading, writing, spelling, landscape gardening, auto mechanics, history, geography, photography, and journalism. The C.C.C. educational advisor found "a surprising high percentage of enrollees at both camps were illiterate." (Most 2003)

After World War I, Klamath Project plots were given to veterans who applied for them. In the 1920s and 1930s there was more Project land than people who wanted to farm it. (Most 2003)

National Historic Landmark 0600210 "Tule Lake Segregation Center."
During World War II, the U.S. War Relocation Authority (WRA) built ten detention centers to detain Japanese Americans living variously throughout

> the West Coast region of the United States. One of these covered 1,100 acres of Klamath Project lands. The government raised 1,000 buildings within a month, detaining 18,000 Japanese Americans at its peak within the Tule Lake War Relocation Authority (WRA) Camp. (Most 2003)

Tule Lake was the largest and longest-lived of the ten camps built by the civilian War Relocation Authority (WRA) to house Japanese Americans removed from the west coast of the United States and imprisoned under the terms of Executive Order 9066 (Most 2003, National Park Service 2006). Many local farmers resented the fact that they lost farming land they were leasing for use of the detention center (Kameda 2010, Most 2003). The camp lacked basic privacy and freedom to come and go as one pleased (Kameda 2010, Most 2003); its toilets and showers were unsanitary (Most 2003).

The government called the concentration camps, to which most mainland Japanese were sent, "Assembly Centers" and "Relocation Centers." The army rarely referred publicly to Japanese American citizens, but called them, instead, "non-aliens." Although Franklin Roosevelt was willing to call the camps what they were—concentration camps—in press conferences, American officialdom has resisted this usage. (Daniels 2002)

As the war progressed, the Roosevelt Administration wanted Japanese Americans to serve in the armed forces and began the process of allowing some people to leave the detention centers. First, their loyalty had to be established. All detainees received a long, ambiguously worded questionnaire. Honest answers reflecting the camp experience made many fail the test. Because the Tule Lake Camp had a high rate of those labeled "disloyal" and because it had the size to accommodate more people, it became a camp for "disloyal" (Kameda 2010, Most 2003).

In 1943, Tule Lake was converted to a maximum security segregation center for evacuees from all the relocation centers whom the WRA had identified as "disloyal" (Kameda 2010, Most 2003, National Park Service 2006). Consequently, it had the most guard towers, the largest number of military police, eight tanks, and its own jail and stockade (National Park Service 2006).

> In October 1943, a truck overturned, killing one Tule Lake inmate and injuring others severely. After the camp director refused permission for a funeral service, prisoners went on strike. The WRA brought in strikebreakers from other camps to harvest crops. When the national head of the WRA came to Tule Lake to assess the situation, a mob of more than 5,000 greeted him. Considering the camp out of control, he sent in armed forces with tanks and tear gas. (Most 2003)

In November 1943, the Tule Lake camp was taken over by the army and continued under martial laws until January 1944 (National Park Service 2006).

> For most of the following year, 350 Japanese Americans were interrogated and confined in a newly built stockade within the larger internment camp. No charges were ever filed against them, no hearings or trials took place. In protest, the Japanese government canceled a prisoner-of-war exchange agreement with the U.S. (Most 2003).

The protest from the Japanese government and protests from the California Chapter of the American Civil Liberties Union eventually led to the release of all prisoners held in the stockade (National Park Service 2006).

More historic buildings survive at Tule Lake internment camp than at any of the other "relocation" centers. The extant stockade jail, large sections of the original barbed wire fence, and many of the buildings constructed to house the military police survive to testify to the high security that defined the segregation center. Penciled graffiti inscribed by prisoners survive in the jail. An almost unaltered recreation building and a complex of industrial buildings also survive; there are few examples of either building type remaining at any of the other detention centers. (National Park Service 2006).

This detention center, unique because it became the largest of the ten WRA camps and because it was used to detain those labeled as "disloyal," was designated a National Historic Landmark in February 2006 for its national importance in the historic context of Japanese Americans in World War II (National Park Service 2006, Kameda 2010). In December 2008, this site was declared a National Monument by Presidential Proclamation (Kameda 2010).

> ***The Lottery.*** World War II veterans competed for Klamath Project farms by participating in a lottery. Those who won got a great deal. In addition to providing free land and supplying water, the government compensated for the low prices farmers received for many crops. As a result, the Klamath Basin remains one of the few regions in the United States where families, rather than agribusiness corporations, run the farms. By the end of the twentieth century, there were approximately 1,400 farms on the Klamath Project, cultivating up to 210,000 acres (Most 2003), making agriculture an important mainstay to the local economy. (Most 2003)
>
> ***Post World War II.*** As the postwar-demand for farm products grew, the Klamath Basin supplied potatoes, alfalfa, barley, onions, and other goods, with wildlife refuges doubling as farmland. A similar demand for wood products stimulated growth in the timber industry and spurred the termination of the forested Klamath Reservation. The decline of several wild fish species precipitated a crisis over water use in the Klamath Basin. When the U.S. Bureau of Reclamation cut off water to Klamath Project lands, irrigators and conservationists grew politically polarized even as some farmers and ranchers restored wetlands and practiced efficient irrigation methods. (Most 2003)

While Klamath Falls is the economic hub of Klamath Basin, smaller towns are also affected by visitation and farming on the refuges (U.S. Fish and Wildlife Service 1998). The Klamath Basin NWRC attracts visitors from a wide geographic area due to the great diversity and numbers of wildlife observed there and because of the excellent opportunities for waterfowl hunting on the refuges.

4. Ethnographic Overview

The ethnographic territory of the Klamath, Modoc, and Yahooskin peoples include the modern boundaries of The Klamath Basin NWRC. The Yahooskin are primarily located near Clear Lake. The Klamath and Modoc cultural lifeways are remarkably similar; both groups shared markedly similar linguistic, religious, subsistence, and settlement patterns.

Overall, the Klamath, the Modoc, and the Yahooskin people, who occupied the basin prior to colonization, relied on seasonally available lacustrine plant and animal resources. All three groups, and theoretically perhaps other Native Americans who preceded them, used and depended on a variety of resources in what is now the Klamath Basin NWRC.

Their rock art, both rock paintings (pictographs) and carvings (petroglyphs), are found on cliffs and in caves throughout the Klamath Basin NWRC. Remains of many village sites, rock-works, artifacts, and burial sites have also been found.

Two basic types of *art on rock* are known to be present variously throughout the Klamath Basin NWRC: pictographs and petroglyphs. Pictographs are figures that are painted on rock surfaces. Petroglyphs, in contrast, are figures carved or pecked into the surfaces. Other Native American *rock work* expected within the Klamath Basin NWRC are stacked rock cairns, emplaced rocks, prayer seats, hunting blinds, defensive blinds, rock rings, and areas cleared of rocks.

There is no solid evidence suggesting the age of the rock art in Klamath Basin NWRC; however, researchers (Heizer and Clewlow 1973) have offered some tentative dates that appear to be reasonable. They believe that the pictographs in the area date from about 500 A.D. to 1600 A.D. at the latest (from approximately 380 to 1480 years ago). This latest date is based on the fact that common design elements of the local Native American culture in the historic period are not found (e.g., the horse and other objects introduced by white settlers) in rock art of the Klamath Basin NWRC. It has also been noted that inquiries made to surviving Native Americans in the early part of the century produced no information on the rock art or its creators; hence this knowledge must have passed away in the intervening centuries since its last use. Heizer and Clewlow also concluded that the pictographs were done at a later date than were the petroglyphs in the region.

4.1 The Modocs

The Modoc Indians traditionally occupied both sides of what is now the California-Oregon border. Prior to contact with colonial invaders, the Modocs established permanent camps on and around what are now Tule, Lower Klamath, and Clear Lakes. Their camps near what is now known as the Lost River consisted of groups of temporary domed huts made of tules. Along the waterways they gathered bird eggs, roots and berries, and fish from spring spawning runs. With the coming of summer and the end of the fish runs, the Modocs moved to higher elevations to establish mountain hunting camps from which they hunted mule deer. They gathered nuts and berries from pine trees and manzanita bushes found only at those elevations.

Modoc villages were generally located along Lost River, Lower Klamath Lake, and around the Tule Lakes. A list (Access Genealogy.com 2010a) of ethnographically documented Modoc townsites include:

- ***Agawesh***, at Hot Creek and lower Klamath Lake
- ***Chakawech***, near Yaneks (see in list below), on Sprague River
- ***Kalelk***, on the north shore of Tule (Rhett) Lake
- ***Kawa***, at Yaneks on Sprague River
- ***Keshlakchuis***, on the southeast side of Tule (Rhett) Lake
- ***Keuchishkeni***, on Hot Creek near Little Klamath Lake
- ***Kumbatuash*** (co-inhabited with Klamath), southwest of Tule (Rhett) Lake, extending from the lakeshore to the lava beds
- ***Leush***, on the north side of Tule (Rhett) Lake
- ***Nakoshkeni***, at Lost River and Tule Lake
- ***Nushaltkagakni***, at the headwaters of Lost River near Bonanza
- ***Pashka***, on the northwest shore of Tule (Rhett) Lake
- ***Shapashkeni***, on the southeast side of Little Klamath Lake
- ***Sputuishkeni***, on Lower Klamath Lake
- ***Stuikishkeni***, on the north side of Little Klamath Lake
- ***Waisha***, on Lost River, 3 or 4 miles northwest of Tule (Rhett) Lake, and near the hills that culminate in Laki Peak
- ***Wachamshwash***, on Lost River near Tule (Rhett) Lake, in Klamath County
- ***Welwashkeni***, on the southeast side of Tule (Rhett) Lake, at Miller's Farm
- ***Wukakeni***, on the east side of Tule (Rhett) Lake
- ***Yaneks*** (co-inhabited with Klamath and Yahooskin), along middle Sprague River, Lake County
- ***Yulalona*** (co-inhabited with Klamath), at the site of the present Linkville

The Modoc acquired an unfortunate reputation from frequent conflicts with colonialists. In 1864 the Modoc and the Klamath together ceded their territory to the United States and retired to Klamath

Reservation but they were never contented there and made persistent efforts to return to their old country. Finally, in 1870, a chief named Kintpuash, better known to the Whites as Captain Jack, led the more turbulent element of the tribe back to the California border and refused to return. The first attempt to bring the runaways back precipitated the Modoc War of 1872-73. After the war, part of the tribe was then sent to Indian Territory (Oklahoma) and placed on the Quapaw Reservation and the remainder on the Klamath Reservation. (Access Genealogy.com 2010a)

4.2 The Klamath

The Klamath, who call themselves *Maklaks*, are closely related to the neighboring Modoc Indians. Both the Klamath and the Modoc speak the Lutuami language, which has been assigned to the Klamath-Sahaptin family of the Pneutian phylum. Originally, the Klamath were situated in an area which abounded in marshes and streams (Martin 2006). According to Stern (1965), they lived in a relatively isolated position, with the Cascades to the west, hills to the south and east, and rather harsh territory to the north. The Klamath were first contacted by Euroamericans in 1826. Subsequent settlement and colonialization caused the Klamath to cede most of their aboriginal homeland to the U.S. Government in 1864, and, together with the Modoc and Paiute, they were placed on the Klamath Reservation. Due to extensive intermarriage and migration, the Klamath constituted an "ethnic minority in the communities where they resided, even within the reservation" (Clifton and Levine 1963). There were 2,118 members of the Klamath Tribe in 1955, and 40 percent of them lived off the reservation. As of 1963, 70 percent of the members were less than one-half Indian, and less than one-sixth were full-bloods (Clifton and Levine 1963). In 1954, the membership voted for termination of federal administration of the reservation (Martin 2006).

The Klamath derived most of their subsistence from rivers and marshes. Fish was the staple of their diet, and pond lily seeds were also important. Roots were gathered to some extent. Deer and other game were of minor dietary importance.

The principle Klamath villages were in and around the Klamath Marsh, along the Williamson River, at Chiloquin and around Agency Bay (Portland State University History Department 2001). Apparently each house contained more than one nuclear family, and there was usually some relationship between the members of a household. There was a slight tendency toward patrilocality, and some of the richer men had more than one wife. (Martin 2006)

Permanent winter settlements of earth and mat lodges were located on the banks of rivers. They ranged in size from "several score" to one or two lodges (Martin 2006). In the early spring, the people left the villages for fish runs. In the summer, small bands of two or three families occupied the prairies to collect roots and berries and other edible plants. Toward the end of the summer, the pond lily seeds ripened and the people gathered together at the marshes to harvest them. They returned to the same winter villages year after year. It has been estimated that, aboriginally, the Klamath numbered between 800 and 1,400 (Martin 2006).

There were five or six geographical divisions of the Klamath. The largest one was in the vicinity of Klamath Marsh. Other groups lived in the vicinity of Agency Lake, the lower Williamson River, Pelican Bay, Klamath Falls, and the Sprague River Valley. There was some tendency toward endogamy within these divisions, but there was no political unity. (Martin 2006)

Warfare, feuds, and slave raiding took place between the subdivisions of the Klamath and with non-Klamath. Some reports state that the Klamath conducted slave raids yearly against the *Achomawi* and other Pit River Indians. Kroeber (1953), however, felt that these reports were very exaggerated.

Headpersons of the villages were people who had acquired prestige. Most of Spier's (1930) informants indicated that shamans were of greater importance to the community than the headpersons. (Martin 2006)

Every Klamath sought spiritual power in vision quests, which took place at life crises such as puberty and mourning. The spirits primarily are in the form of nature spirits or anthropomorphic beings. Shamans are people who have acquired more spiritual power than most. (Martin 2006)

Shamanistic performances, during which the shamans became possessed, were the main form of ceremonialism among the Klamath. These performances were held in the winter and lasted five days and nights. In addition to curative functions, the shamans' services could be invoked at any time during the year for such purposes as prophesy, divination, or weather control. Klamath mythology is dominated by the culture hero *Kemukemps*, a trickster figure who created men and women. (Martin 2006)

Klamath ethnographic territories were centered near annual settlement locations throughout the Klamath Basin, including the northern portion of Lower Klamath Lake, Upper Klamath Lake, Klamath Marsh, Agency Lake, and Crater Lake. Communication and trade carried Klamath peoples as far north as The Dalles along the Colombia River and as far south as the Tule Lake Basin. The river drainages of the Sprague, Rogue, and Deschutes Rivers were also considered important seasonal extensions of the Klamath territory. Modoc ethnographic territories were centered near the Lower Klamath Lake Basin and the Tule Lake Basin, with the largest annual settlements located near Lost River. Modoc territories spanned as far east as Goose Lake and included Medicine Lake to the southeast. Tribal boundaries and territories remain the subject of a heated debate amongst ethnographers, especially as diverse resource procurement and trade as well as culturally defined rights to land access have blurred rigid intertribal boundary establishment. Both Klamath and Modoc peoples used extensive trade routes and were notorious for venturing into neighboring Native territories for resource procurement and for capturing slaves who were often used for commodity in trade relationships with tribal groups to the north. [For more on ethnographic territories, see Gatschett 1890, Barrett 1910, Kroeber 1916, Spier 1930, Cressman 1956, and Stern 1998).

Resource procurement was centered on permanent bodies of water, perhaps most notably the Upper and Lower Klamath Lakes, Klamath River, Williamson River, Deschutes River, and Lost River and their tributaries. Seasonal variability of fish species lent itself well to the Klamath-Modoc exploitation of fishing resources year-round. Salmon (king/Chinook salmon, *Oncorhynchus tschawytscha*, and the silver/coho salmon, *O. kisutch*), sucker fish (Lost River sucker, *Deltistes luxatus*, and shortnose sucker, *Chasmistes brevirostris*) and trout (redband trout, *Salmo newberrii*) were the most common varieties fished for food. The establishment of weirs and the use of fishing lines, hooks, and nets were common fishing techniques. Other freshwater resources included freshwater mussel species (*Anodonta* and *Margaritifera*), waterfowl, and a wide variety of plant species, including yellow pond-lily (*wokas, Nuphar polysepalum* and *Nuphar lutea*), cattails (*Typha latifolia*), and tule reeds (*Schoenoplectus* and *Scirpus*). Many species of grasses, berries, pine trees, mushrooms, and other herbaceous plants were also collected seasonally for a wide variety of

purposes. Although both populations also practiced seasonal hunting of migratory herds of deer, antelope, and elk, the Klamath peoples relied more on fishing than hunting. Where available, muskrats, otters, beavers, rabbits, and other small fauna were also used as food and material resources.

Settlement practices of the Klamath and Modoc reflected their different methods of resource procurement, with the Klamath tending to focus more on fishing resources and the Modoc tending to focus more on game hunting. Both Klamath and Modoc peoples practiced a seasonally based settlement pattern that was dependent on weather and the seasonal availability of food and material resources. The Klamath typically would establish permanent winter villages that were used by returning families year after year. General village affiliation was determined by these winter villages, often composed of several patriclans. Each domicile was constructed to hold a minimum of 12 to 20 individuals, often representing extended and/or joint families related through a patrilineage. Klamath village members would often return from temporary campsites established in higher altitudes in late August or early September, corresponding with the ripening of the yellow pond lily seed bulbs, a staple food source that was collected and prepared in a wide range of recipes, depending on the quality and content of the seed harvest. Winter settlement allowed for the gathering, drying, and processing of the *wokas* seeds, which were then stored for later use, especially as temperatures in the Upper Klamath Lake Basin dipped below freezing during the coldest months of winter (Coville 1904).

Typically, Klamath winter houses were semi-subterranean structures to a depth of three to four feet, with semi-conical elongated roofs, made of log support beams and rafters, covered with woven tule mats and sod or piled earth for insulation, and overlapping planks for roofing materials. Winter houses were built large enough to house several individuals and to provide storage of food and other important material items. Houses varied in size from 12 to 35 feet in diameter, depending on the size of the family and the social position of its members. Often shamans would have larger houses, as large as 50 feet in diameter, to accommodate religious functions. In the spring, these winter houses were dismantled. Sometimes a similar structure would be constructed for residence during the remainder of the year, having a more open plan with woven tule mats providing the main exterior. Summer houses were typically built either at ground surface or in shallow one to three foot pits, and had a circular floor plan. Each village also constructed auxiliary structures, including menstrual huts, granaries, cook houses, and sweat lodges.

Other forms of Klamath material culture have been well documented in the archaeological record of prehistoric and contact-period populations. Connected to their seasonal sedentism and the process-intensive lifeways, Klamath peoples manufactured groundstone implements, including metates, manos, pestles, mortars, and distinctive double-horned mullers; flaked stone implements, such as bifaces (spearheads and knife blades), projectile points (atlatl darts, spear heads, and arrowheads), drills, core tools (choppers), flake tools (scrapers); and bone and antler implements, such as wedges, awls, and stone-flakers (Gatschett 1890). Klamath populations also were adept at basketry, constructing various items from numerous species of tule, cattail, and grasses, including bowls, hats, carrying vessels, storage vessels, winnowing trays, gambling trays, ladles, seed beaters, and fishing nets (Barrett 1910, Heizer and Whipple 1951, Spier 1930). On the Upper Klamath the preferred boat form was the hollowed-out log canoe, while on the Lower Klamath and Tule Lake, tule reed rafts were preferred. Of particular interest are the occasional discoveries of "*henwas*," anthropomorphic

stone figures, often found in pairs, said to represent spirits used particularly by shamans (Carlson 1959, Spier 1930). Other forms of material culture related to beliefs in the supernatural include numerous panels of both pictographs and petroglyphs and concentrations of rock stacks, cairns, and alignments, all related to vision/power quest activities (Caldwell and Carlson 1954, Chartkoff and Chartkoff 1984, Spier 1930).

The Klamath belief in the supernatural centered around two generalized characterizations of supernatural beings: spirits and ghosts. Spirits were generalized supernatural beings who had not taken human form, but were often referents of various kinds of fauna and climatic occurrences typically present within the environment of the Klamath. Although spirit beings could not be classified as deities per se, they did have the effect of altering natural events, such as bringing storms, causing earthquakes, and generally providing cause for empirically visible anomalies in the weather and landscape. Typically, it was to these spirit beings that those undergoing vision/power quests would supplicate themselves in order to receive power via altered states of consciousness and dreaming. These supernatural beings provided an example through the stories told about them for important social constructions such as ethics, mores, taboos, and general causal explanations. Some examples include Thunder, Falcon, Crow, Weasel, Mink, Dwarf Old Woman, and, *gmok'am'c* (the Creator), the Klamath culture hero (Spier 1930, Stern 1998). Ghosts were perceived as being those supernatural beings who after having been humans during life had neglected their passage to the Land of the Dead to the west, and had remained within reach of living human populations, coveting their lives. (Spier 1930, Spencer 1952)

The primary religious specialists for the Klamath and Modoc were shamans. Shamans maintained roles as community curers and ritual specialists, often afforded a special and heightened social regard due to their liminal relationship with the supernatural. Shamans obtained their powers via a direct relationship with the supernatural, often procured after extensive and repeated vision/power quest rituals. The shaman's power was viewed as great enough to influence the weather and predict future events. Shamans often also worked with various assistants who would serve as interpreters during singing, or to supplicate supernatural beings to provide their influence to the shaman's requests. The cold and dark winter season would lend itself to shamanic performances of myth.

All members could practice vision/power quest, and most had their first experience at puberty. Males more frequently performed the ritual. However, women did also, mostly after menopause had begun. It was imperative for those who were to become shamans to perform the ritual. The power quest ritual required swimming in deep pools and eddies of rivers, and generally avoiding the feeling of being afraid. The ritual consisted of spending time alone for several days, sleeping at night exposed to the elements, fasting, swimming in various standing and running bodies of water, running, piling rocks, and dreaming. Conscious awareness of dreams was stressed and the messages that they portended were thought to be messages from supernatural realm. An especially auspicious sign was the occurrence of a nosebleed or hemorrhage, which was taken as a sign that one had had contact with the supernatural. Information was translated into songs, which were sung publicly later, often accompanied by dance. It was the song that was the conduit for the power gained by the person. (Bradbury et al. 2004)

4.3 The Yahooskin

The Yahooskin are a Yuman-speaking band of Shoshoni who, prior to 1864, roved and hunted with the Walpapi about the shores of Goose, Silver, Warner, and Harney lakes and in Surprise Valley and Klamath Marsh, where they gathered *wokas* for food. In 1864 they became party to the treaty of Klamath Lake by which their territory was ceded to the United States and they were placed on the Klamath Reservation, established at that time. With the Walpapi and a few Paiute who had joined them, the Yahooskin were assigned lands in the southern part of the reservation, on the Sprague River at about Yainax, where they have since resided. Gatschet, who visited them about 1884, says they were then engaged in agriculture, lived in willow lodges and log houses, and were gradually abandoning their seasonal subsistence-gathering strategy and becoming more sedentary on the reservation. (Access Genealogy.com 2010b)

5. Prehistoric Overview

Based on archaeological evidence (Tribal historians and others may cite more ancient occupation), the prehistory of the Klamath Basin dates as far back as 12,000 to 13,000 years ago. There are several patterns of cultural adaptation generally recognizable in the prehistoric chronology (Siskin et al. 2009). Archaeological resources identified to date within the Klamath Basin NWRC consist of pre-historic, historic, and multi-component sites containing both pre-historic and historic elements. The following pre-historic chronology is presented as an overview of the types of pre-historic resources located within the Klamath Basin NWRC.

5.1 Paleoarchaic (12,000 to 7,000 B.P.)

During the Paleoarchaic period, the Klamath Basin was occupied by hunter-gatherers with a broad-spectrum subsistence economy geared toward large game animals and supplemented by fish, birds, and plants. High seasonal and annual mobility, low population densities, and a technology geared toward maximum flexibility define these people (Ames et al. 1998). The oldest site in the region is the Fort Rock Cave site in south-central Oregon. This site was excavated by Luther Cressman in the 1950s and has produced radiocarbon dates of between 13,200 and 10,200 B.P. (Aikens 1993); however, the charcoal that produced the earliest dates may not be cultural in origin (Ames and Maschner 1999). From within the Upper Klamath River Basin, the oldest reliable radiocarbon date is from the Klamath Shoal midden site (35KL21), dating to 7,700 years ago.

5.2 Early Archaic (7,000 to 4,500 B.P.)

Most of the archaeological evidence for early human occupation within the Klamath River canyon extends back to the beginning of the Early Archaic (Mack 1983 and 1991). This period saw the first appearance of semisubterranean house pits in the Plateau region, indicating that some people were adopting a less mobile lifestyle. The Early Archaic corresponds to the Secret Spring Phase and the Basin Phase (Mack 1991):

- Secret Spring Phase (7,500 to 6,500 B.P.). Artifacts typical of this phase include large stemmed or lanceolate projectile points, knives, gravers, scrapers, and some cobble and ground stone tools, including abraders or grinding slabs.

- Basin Phase (6,500 to 4,500 B.P.). Typical artifacts of this phase include ground stone tools, large leaf-shaped and broad-necked projectile points (Humboldt Concave Base, Northern Side-Notched) indicating atlatl technology, utilitarian items (portable mortars, mullers, and stone bowls), cores, gravers, knives, scrapers, and unifaces. Faunal remains include turtles and large to small mammals. Burial practice was supine burials placed in rock-covered pits.

5.3 Middle Archaic (4,500 to 2,500 B.P.)

The shift toward sedentary life appears at Nightfire Island about 4,000 years ago. The Middle Archaic saw an increase in the exploitation of riverine and marsh environments (salmon and root

species), as indicated by an increasing presence of milling stones and pestles at sites. The Middle Archaic includes the River Phase (Mack 1991):

- River Phase (4,500 to 2,500 B.P.). Artifacts typical of this phase include broad-necked corner-notched and side-notched projectile points (Class 28, Elko series, Gold Hill Leaf, Siskiyou Side-Notched), many types of ground stone tools, bone and antler tools (chisels and wedges), and specialized fishing gear (bone harpoon barbs and net sinkers). Faunal remains at sites of the River Phase tend to be dominated by riverine resources. Burial practice shifts to flexed burials.

5.4 Late Archaic/Late Prehistoric (2,500 to 200 B.P.)

Several major changes occurred during the Late Period, including the widespread appearance of pit houses, the shift to heavy reliance on fishing (specialized fishing gear included net sinkers and harpoons with barbed points), the use of storage pits for salmon, camas exploitation, and the development of seasonal ("winter village") land use patterns. It is at this time that the bow and arrow were adopted (indicated by the presence of small corner- and side-notched projectile points at sites). Site patterning suggests that a gradual shift toward the exploitation of riverine and marsh aquatic resources occurred during this period. Logistical camps were in use in the area by about 2,000 years ago, as evidenced by the Williamson River Bridge site. Extensive trade networks became important by at least 1,500 years ago, as suggested by obsidian tools present in the Nightfire Island artifact assemblage derived from sources as distant as the Warner and Quartz mountains, 110 to 120 miles away (Aikens 1993). Mack (1991) clarifies that the Late Period includes two of the Upper Klamath River Canyon phases: the River and Canyon phases (NOTE: Mack further divides the Canyon Phase into three sub phases):

- Canyon Phase (2,500 to 200 B.P.). This phase includes each of the sites with house pits in the Klamath Canyon. Typical artifacts of the phase include small, narrow-necked projectile points (Desert Side-Notched, Gunther, and Rosegate series) indicating the adoption of the bow and arrow, specialized mullers for processing wocus, numerous bone tools, and Olivell shell beads. Burial practice shifts to cremation with associated grave goods such as mammal bone beads and elk antler spoons.

6. Archaeological Resources

This section, based on Federal Energy Regulatory Commission (2007) studies for the region, summarizes the available data on American Indians in the Upper Klamath River and Basin regions. Previous work by Mack (1983, 1989, 1991) and others (Gleason 2001, Hannon and Olmo 1990, Leonhardy 1967, Oetting 1996) in the Klamath River canyon; previous work by researchers in the Upper Klamath Lake and Upper Klamath Basin regions (Cressman 1956, Sampson 1985), and past research in immediately adjacent areas (Aikens and Jenkins 1994, Cleland 1997, Fagan et al. 1994, Nilsson 1985, Oetting 1993, Raven 1984, Ritter 1989) provide a contextual baseline for developing specific research topics. This section details archaeological research for the region relative to past peoples and existing knowledge on chronology, settlement, subsistence, and regional interactions.

6.1 History of Archaeology in Region

The earliest archaeological work in the region was conducted in 1935 at the excavation of Fern Cave in northern California by D. H. Canfield and J. C. Couch (Moratto 1984). Luther Cressman dominated regional archaeological investigations for the next 20 years. From 1938 to 1940, Cressman excavated several sites in the Klamath Lake Basin and introduced a cultural-historical interdisciplinary approach to the archaeological research of the region, stressing the discovery of areal patterns and their chronologies. He defined three cultural phases (horizons) for the lower Klamath Lake region as: (1) *the Narrows* (10,000 to 7,500 B.P.), which was characterized by willow-shaped projectile points and associated with extinct fauna, (2) *Lairds Bay* (beginning ca. 4,000 B.P.), which was characterized by large side-notched and corner-notched projectile points, and (3) *Modoc* (1,500 to 1,000 B.P.), which saw a reduction in the size of projectile points (Moratto 1984).

In the late 1950s, Cressman directed the University of Oregon's John C. Boyle dam excavation program. At Rock Shelter Site 35KL13, the excavations recovered cultural materials similar to the Kawaumkan Springs midden site in Klamath Basin, plus three fragments of poorly fired pottery (Gleason 2001).

Surveys and excavations associated with the proposed (but never constructed) Salt Cave reservoir were undertaken by the University of Oregon in 1961 to 1963. The surveys identified 12 canyon sites, of which three were test-excavated (including Big Boulder Village 35KL18, where significant quantities of pottery were recovered).

Additional survey and testing followed in the 1980s when a new proposal to construct Salt Cave dam was under consideration. Twenty sites in the Klamath Canyon were test-excavated during the course of an attempted (but not completed) FERC licensing process for the proposed Salt Cave dam.

In 1980, BLM surveys (Mack 1991) along the Klamath River in California resulted in the recordation of two pit house village sites: the Freedom site (CA-SIS-1721) and the Laubacher site (CA-SIS-2241). Subsequent BLM land exchange surveys resulted in the identification and testing of several sites in this area (Oetting 1996). Beginning in 1992, Mack and her students conducted archaeological research in the Upper Klamath River watershed, excavating at least 12 sites, including temporary

camps, lithic scatters, and other nonvillage site types (Gleason 2001). Most of the recent work in the canyon has been conducted pursuant to cultural resource management projects (Gleason 2001).

6.2 Selected Regional Sites

Results from several larger excavations and data sets available from sites in the region provide a good sample of the range of recorded human use patterns found in and near the Upper Klamath River. These sites and others have influenced the general overview developed by archaeologists.

Kawumkan Springs Midden and House Pits (35KL9). This site, located northeast of Upper Klamath Lake, was excavated by Cressman in 1956. The site was originally estimated to date from 6,600 B.P. but has more recently been determined to date to about 4,200 B.P. (Aikens and Minor 1978). Cressman showed that the subsistence economy practiced early in the occupation of the Kawumkan Springs midden site was similar to Northern Great Basin culture, but over time the economy gradually shifted toward dependence on fish and on the exploitation of wocus (evinced by the use of special mullers) (Mack 1991). Thus, the Kawumkan Springs midden site data demonstrate the split in local cultural development away from the Northern Great Basin patterns.

Williamson River Bridge (35KL677). This fishing station site, northeast of Upper Klamath Lake, was excavated by the University of Oregon (Cheatham 1991). The site included a shell midden with a hearth and several concentrations of fire-cracked rock. One of the concentrations was radiocarbon dated to 1,810 B.P., another to 70 B.P., and the midden to 1,600 B.P. Historic artifacts present at the site and additional radiocarbon dates indicate that the site had two occupations: a prehistoric occupation dating between 1,800 and 100 B.P. and a historic occupation dating to about 100 years ago. Three wooden posts near the hearth feature were interpreted as part of a fish-drying rack. Faunal analysis revealed that 84 percent of the remains are fish (96 percent suckers), 15 percent are mammals (mostly ground squirrel and domestic dog), and 1 percent are birds. Analysis of freshwater mussel shells (4,500 individuals represented) indicates that the season of death was between mid-April and mid-June, corresponding to the annual sucker spawning runs (Aikens 1993).

Nightfire Island. Johnson excavated this prominent site located on the shores of Lower Klamath Lake in 1969. The site has a long sequence of occupation (ca. 6,000 years). Johnson identified a deeply stratified occupation deposit (maximum 3 meters deep) with the full range of activities represented in the rich assemblage. Recovered artifacts include woodworking tools; hunting, butchering, and hide preparation tools; grinding implements; burials; and domestic structures. Faunal analysis demonstrated that animal exploitation continued unabated throughout the site's occupation, contradicting Antevs' (1955) Altithermal-Medithermal climatic sequence (Grayson 1973). Grayson suggested that the assumed long, hot drought of the Altithermal in the Klamath Basin had little effect on environment or culture at the Nightfire Island site (Moratto 1984). On the other hand, Sampson (1985) interpreted site data to represent an adaptation to the changing lakeshore environment. Sampson suggested that the site function shifted from an intermittently occupied campsite (6,000 to 4,300 years ago) to a sedentary village (4,300 to 3,000 years ago) and back to a campsite (post-3,000 years ago). X-ray fluorescence (XRF) analysis of nearly 300 obsidian artifacts from the site shows changing regional interactions, with people of Nightfire Island demonstrating greater contact with groups living to the north and east, prior to their adoption of the bow and arrow. Aikens suggested

this represented a response to local competition that forced the Nightfire Islanders to look to outlying sources for obsidian (Aikens 1993).

Tule Lake. Robert Heizer excavated the cave sites at Petroglyph Point on the shores of Tule Lake in northeast California in 1942. As a result of the excellent preservation in the cave, the recovered artifact assemblage contained many perishable items, including Olivella beads (spirelopped and saddle types), Haliotis shell blanks, seed beads, basketry (single- and plain-twined), matting fragments, cordage, bird bone beads, worked antler, and a wooden bow fragment (Heizer 1942). However, Heizer concluded that the assemblage was not very old, probably dating to the ethnographic era. The surrounding area reportedly also contained crevice burials, cremations, and caches that were excavated by private collectors.

Klamath River Bridge Cemetery (35KL1121). This village site, located near the city of Klamath Falls, was excavated in 1993 by the University of Oregon. The village included an adjacent cemetery that, based on projectile point styles and shell bead types and frequencies, was occupied sometime between A.D. 300 and 1500. Exotic materials present at the site indicate the regional interactions with groups in northern California (Tasa and Connolly 1997).

Keno Pictographs (35KL1901). This rock art site is located in the Upper Klamath River canyon near the town of Keno. The site includes a diverse collection of images that is believed to demonstrate regional interactions between Klamath/Modoc and Shasta peoples (Ritter 1999).

Big Boulder Village (35KL18). This pit house village was excavated by the University of Oregon from 1961 to 1963 as part of the proposed Salt Cave reservoir project. One occupational floor was radiocarbon dated to ca. 560 years ago (Mack 1983). Several burials were recovered from the midden portion of the site, with both flexed and extended burials present. The artifact assemblage at this site is typical of late prehistoric assemblages in the region.

Klamath Shoal Midden (35KL21). This early site was also excavated by the University of Oregon from 1961 to 1963. The site contains the earliest reliable evidence of occupation in the Klamath canyon (7,700 years ago). Bone tools, unifacial flake tools, and turtle and mammal bone represent the early occupation. The site's extensive midden represents a later occupation, producing radiocarbon dates of ca. 1,330 to 1,040 years ago. Artifacts recovered from the midden include projectile points (mostly Gunther and Rosegate series, with Alkali stemmed also present) and other chipped stone tools; Olivella shell beads; a Haliotis pendant; ground stone tools (hopper mortars, pestles, and metates); steatite pendants and a pipe; and fired clay objects. Cultural features include burials, stone-lined cache pits, and rock and bone clusters (Mack 1983). These artifacts and features represent the intensive use of this site, with additional sites in the area that echo this local settlement intensity.

Border Village (35KL16). This was another pit house village excavated by the University of Oregon from 1961 to 1963 as part of the Salt Cave reservoir project. One occupational floor was radiocarbon dated to ca. 600 years ago, and a fish weir was recorded in the river channel immediately downstream of this site's location. The predominant projectile points recovered at the site are Gunther-barbed, with other artifacts typical of the late prehistoric period also present, including more than 400 pottery sherds, many with twined basketry impressions. In addition to the extensive artifact assemblage, numerous faunal remains were recovered, including fish (salmon, chub, and suckers), deer, antelope,

elk, mountain sheep, beaver, porcupine, small rodents, jackrabbit, cottontail, river otter, grizzly bear, mountain lion, and red fox (Mack 1983). An 1874 GLO plat map of Township 41 South, Range 5 West, suggests use of the area into the historic period.

Freedom Site (CA-SIS-1721). This pit house village site was excavated in 1994 and 1995 (Mack 1995 and 1996). An extensive assemblage of lithic materials was recovered from the site, including a variety of flaked stone tools, net sinkers, hopper mortar bases, hand stones, pestles, grinding slabs, and other ground stone tools. Also recovered were bone and antler tools, charred plant remains, a few sherds of very delicate pottery, and fragments of wooden house structural elements. Projectile points recovered by the excavations (including Gunther series, Desert Side-Notched, and Rose Spring Corner-Notched types) suggest a site occupation and use between 400 to 150 years B.P. (Mack 1996).

Iron Gate (CA-SIS-326). This late prehistoric village site along the Klamath River was excavated by the University of Oregon in 1960. The site was radiocarbon dated to ca. A.D. 1,400 to 1,600, with Gunther Barbed and Desert Side-Notched projectile points dominant. The excavation results included the reconstruction of a conical, bark-covered house measuring 5 to 6 meters in diameter, a size that is considered atypical for the ethnographically known Shasta, who occupied rectangular houses. Leonhardy concluded that rectangular houses were introduced sometime after 1,500 A.D. (Leonhardy 1967). The Iron Gate site probably is transitional between the central California and the Klamath Lakes/Columbia Plateau culture areas, with the California emphasis evidenced by the house form and the presence of hopper mortars (Leonhardy 1967).

The Klamath Basin is considered to be part of a region of overlapping or blending cultural traits from the California, Great Basin, and Plateau culture areas. Therefore, the following generalized overview draws upon information from each of the surrounding cultural areas. The chronology is organized by Paleoarchaic, Early Archaic, Middle Archaic, Late Archaic, and Late Prehistoric periods. Data specific to the Klamath River canyon supplements the overview where applicable. A generalization that can be made is that Klamath material culture tends to be more Plateau-like, while Shasta material culture is more inclined toward sharing patterns with the California cultures (Spier 1930).

6.3 Identifying Temporal Variability in Human Use of the Upper Klamath River Basin (Chronology)

Chronological studies are important to determine site-specific chronology, to compare and contrast occupational histories with other sites in surrounding areas, and to test the validity of current culture history sequences for the Klamath River region. Some chronological issues documented recently (Federal Energy Regulatory Commission 2007) are relevant for the present study, and are synthesized in this section. Chronological data are especially important for the study area prehistory because they may help determine the initial dates of Klamath and Modoc settlement and changes over time. Individual sites may not address these topics, but they can provide information relevant for local and regional syntheses.

Projectile Point Chronologies. Because various styles of projectile points were developed and used by Native Americans throughout the Holocene, they are useful as relative time markers. Archaeologists create regional projectile points typologies to assign these artifacts to particular periods of time. According to Rouse (1960), projectile points follow conceptual modes (ideas and

standards which artisans expressed in the artifacts) and procedural modes (customs followed in making and using artifacts). These modes create inherent flaws in typological classification. The prehistoric "artisans" frequently altered a projectile point to facilitate tool reuse and maintenance, thus creating a danger of temporal assignments based on specific characteristics of surface observed artifacts or fragments (Flenniken and Raymond 1986).

Thomas (1986) contends that the potential for error does not result in diagnostic artifacts being useless as time markers. "Projectile points provide the single best way to monitor temporal change in the surface assemblages" of an area (Thomas 1986) and often they are the only source for making temporal assignments. In addition, projectile points also reflect subsistence practices. While projectile points can be used as hafted knives, others, by their very form, function best when thrust. Thus, projectile points may suggest site function (e.g., a hunting station, hosted hunters, or the location of hunting tool preparation).

Mack's projectile point typology for the Klamath Canyon is based on work in the Great Basin by Thomas (Mack 1991) and includes various attributes with relatively well-defined metric criteria and visually intuitive attributes. The Upper Klamath Canyon typology includes 30 individual point types and classes. Each point has a minimum of three measurement attributes, while most have four or more, including the visually intuitive attributes. The age estimates associated with each point style are not necessarily correlated with local radiocarbon dates; however, based on regional data, these point styles provide a relative age of site occupation.

For thrusting darts dating to the Early Archaic (Basin Phase), Beck suggests that the gradual shift from the combined use of corner-notched and side-notched points to the use of strictly corner-notched points reflects the technological superiority of corner-notching, which produces a point that is more resistant to breakage at the haft (Beck 1995). If observed variation in projectile point assemblages over time and space relate to function rather than style, the utility of projectile point chronology is reduced. A "long" chronology views gradual change and broad temporal ranges for individual point types. Conversely, Thomas (1981, 1986) takes a "short" chronology perspective, reflecting more reliance on style to indicate time.

In an attempt to "shorten" the chronology, Mack discusses problems with earlier Klamath Basin projectile point chronologies, particularly the Gunther Series, which she considers too broadly defined; the series covers about 2,000 years, or the entire period in which the bow and arrow was used. Mack makes a distinction in the Klamath Canyon projectile point typology between the Gunther Barbed and Gunther Stemmed points: Gunther Barbed appear to be more recent, while Gunther Stemmed seems slightly older (Mack 1991). Although not a "long" perspective, a more conservative one would be to accept Gunther as simply post-dating 2,000 B.P.

Radiocarbon Dating. Radiocarbon measurements always are reported in terms of years before present. This figure is based directly on the proportion of radiocarbon found in the sample. It is calculated on the assumption that the atmospheric radiocarbon concentration has always been the same as it was in 1950 and that the half-life of radiocarbon is 5,568 years. However, because the rate of production of radiocarbon in the earth's atmosphere is not constant, dating errors independent of statistics or laboratory procedures are caused by variations in the sun's magnetic field, and dates can vary as much as several hundred years. The general practice is to obtain four or more radiocarbon

dates on a specific feature to identify the occurrence of the error. For radiocarbon dates to be accurately used as calendar ages, the dates must first be calibrated.

Tephrachronology. Trace element characterization uses microbe analysis to determine the source of volcanic glass shards found in sediments, which often can be linked to dated eruptions. In the Klamath Basin, the catastrophic eruption of Mt. Mazama (Crater Lake) had major impacts; while the eruption has not been specifically linked to the lowering of Lower Klamath Lake, this is possibly the case. The eruption probably temporarily "killed" the Klamath River and its tributaries by filling the drainage systems with pumice and silt and raising the water temperature. Not only would these cataclysmic events eliminate nearly all life within the river, the events certainly would have slowed down the reestablishment of stable salmon runs in the Klamath River watershed. Salmon require clear flowing drainages with clean gravel for successful spawning (Butler and Schalk 1986). Mazama ash has been radiocarbon dated in numerous contexts to 6,850 B.P. Thick layers of ash from the eruption covered nearly all of Oregon. A Mazama pumice lens is present within basal clays at Nightfire Island (Sampson 1985), and Mazama ash was identified at the Four Bulls site (35KL1459) (Wilson et al. 1996). For a complete listing of regional tephra layers derived from moderate to large eruptions during the late Pleistocene and Holocene, refer to the summary prepared by A. M. Sarna-Wojcicki et al. (1991).

Other Means of Dating Sites. Other dating techniques, such as inorganic carbon dating and measuring hydration rinds of obsidian artifacts, are considered less reliable than organic radiocarbon dating. Radiocarbon dates derived from freshwater shell often are much older—sometimes thousands of years older—than dates from other materials, such as charcoal, within the same deposit. For instance, age estimates often are corrupted when the shell is in proximity to limestone deposits or artesian springs (Federal Energy Regulatory Commission 2007). Still, shell dates are useful as an additional broad-scale age estimate for site use. Chatters' (1986) comparison of matched charcoal/shell dates in the Columbia Plateau suggests that shell and charcoal dates from the same contexts are statistically similar in the early to middle Holocene, but they diverge after about 5,000 B.P. For Chatters' study to apply to the Klamath Basin, shell and charcoal dates from the early to middle Holocene need to be examined (Wilson et al. 1996).

Radiocarbon dates were obtained from regional ceramic figurines from the Klamath Shoal midden site (Mack 1991). To date, ceramics in the Klamath Basin have not been the subject of intensive study. Regional ceramic studies in the Great Basin could provide baseline information upon which a Klamath Canyon ceramic tradition could be built. In the northern Great Basin, pottery is a late phenomena, thought to originate in the south, with the technology moving north within the last 500 years (Madsen 1986). In the Pacific Northwest, pottery is generally unknown. However, in the area defined by Mack (1990) from the Cascades of southern Oregon and northern California, pottery dates to approximately 1,100 to 350 B.P. and is generally not used for cooking but rather for serving food (Mack 1990). This is a separate pattern from Shoshone and other brownwares in the Great Basin and may suggest technological innovation in the Rogue, Klamath, and Pit River drainages distinct from Great Basin pottery use. X-ray fluorescence analysis has been effectively used to build on the chronological sequence in the Pit River region of northeast California (Cleland 1997). At the Four Bulls site, XRF analysis indicates continuity in the use of northeastern obsidian sources (especially Spodue Mountain) through time (Wilson et al. 1996). Since 1979, Mack has been compiling obsidian study results for the Upper Klamath River. XRF analysis has shown that the obsidian in the Upper

Klamath River Canyon comes from 11 distinct sources. The majority of the 207 sourced specimens come from the Medicine Lake Highlands, which are located 34 to 46 miles to the southwest (Mack 1997). Non-Medicine Lake Highlands sources include Spodue Mountain and Buck Mountain; the latter is located about 97 miles from the Klamath Basin. Preliminary age estimates suggest that Medicine Lake Highlands was the primary source of obsidian in the Upper Klamath River drainage before the Late Prehistoric period; however, finished obsidian tools from other sources were introduced in the Klamath Basin during the Late Prehistoric (Mack 1997).

Anthropologists study rock art to help understand the ritual and symbolic lives of the makers of the art. Reoccurring images or themes are often regarded as regional style and are used by anthropologists to make generalizations about the groups of people who occupied an area. Rock art studies in the Klamath Basin began with Julian Steward and Luther Cressman in the late 1920s and 1930s. Early writers stressed a Great Basin influence on regional rock art, while more recent studies have emphasized the similarity to Columbia Plateau rock art traditions (Ritter 1999). The Keno Pictograph site in the Upper Klamath River Canyon is considered to be of prehistoric age and part of the southern Plateau rock art tradition (Ritter 1999). Due to a number of factors, including site location and the style of art represented at the Keno Pictograph site, the Klamath/Modoc peoples are assumed to be the artists. A common form of rock art found in the Klamath River Canyon and throughout the Sierra Nevada is cupules or rain rocks. These shallow depressions pecked into boulders and other exposed rocks are considered to represent places of supplication for some desired effect, with each pit made as an accompaniment to an individual prayer. Repeated use may lead to entire surfaces of boulders that are covered with cupules, sometimes in circular or linear arrangements (Meighan 2000).

Research Topics Relevant to Chronology. Research topics relevant to the identification of temporal variability in human use of the Upper Klamath River Basin (chronology) include the following:

- What kinds of archaeological data are best suited to characterizing temporal variability?
- What is the nature of the relationship in stylistic variation of projectile points between those known from the study area and those known from the Upper Klamath River Basin and adjacent Lower Klamath and Great Basin regions?
- To what extent do archaeological data from the study area resolve the apparent differences among various chronological sequences?
- Is there evidence in the Upper Klamath River Basin of an extension of Basin Phase (circa 4,500 to 2,500 B.P.) artifacts and behavior, into the Canyon Phase (which begins around 2,500 B.P.) and through the three subphases until historic times?
- What is the nature of settlement and land use during the Basin Phase (a phase that generally lacks radiocarbon-dated sites from the Klamath Canyon [Mack 1991] and in the regions of south and central Oregon)?
- With respect to discovery and recordation of prehistoric sites, other relevant research questions include the following: What is the chronological range of occupation or use of each single-component, multi-component, or mixed-component site?

- Can distinct single-component loci be identified within multi-component sites? Can these loci be placed in chronological order using available data?
- Do the temporally diagnostic artifacts correlate with the absolute chronology (available through radiocarbon techniques, dendrochronology, etc.)?
- Is there evidence of demographic change (change in the group using a site, or evidence of change in a people's trade associations) through time in the artifact assemblages at villages or other sites?
- Do the temporally diagnostic artifacts correlate with the fortuitously visible or exposed site stratigraphy (as seen in cut banks, erosional profiles, or spoil from rodent burrows) to provide a rate of deposition and a determination of site integrity?
- Is occupation "continuous," or are distinct periods of disuse or abandonment present?
- Is the site chronology similar to other known sites in the region?
- Is a protohistoric component present?
- Do the obsidian data (sourcing and hydration) obtained from waste flakes and nondiagnostic artifacts produce a chronology? Are these data comparable to other data sets (such as diagnostic artifacts, obsidian sourcing and hydration of diagnostic artifacts, and radiocarbon samples)?
- Do the chronological data, particularly from obsidian hydration and radiocarbon dating, allow an assessment of the stratigraphic integrity of the site deposits?

Data sets required to address these chronological issues include the following:

- Stratigraphic information, which may include relative age estimates of landforms
- Radiocarbon age estimates (if later subsurface testing is conducted)
- Tephrachronology age estimates (if later subsurface testing is conducted)
- Stylistic variation in projectile points, pottery and/or other baked or fired clay objects and figurines, beads and ornaments of shell or bone, abraded and/or ground stone implements, and other time-sensitive artifacts (if present and observed and recorded).
- Stylistic variation in rock art may be chronologically ordered (relatively dated) using rock art dating techniques, including measurement of patinated (oxidized) surfaces on petroglyphs and accelerator mass spectrometry (AMS) radiocarbon (C-14) dating of organic paint pigments on pictographs.
- Functional variation is known to occur within a specific temporal range, such as that known for house types, basketry, or art. Because these dating techniques measure different events,

the age estimates derived from one may be used to evaluate the age estimates derived from another.

Identifying Variability in Lithic Technology in the Upper Klamath River Basin. Archaeological sites often retain little information other than their modern environmental setting and lithic artifact assemblage. Archaeologists must investigate lithic technology to place a site into a local or regional context. The study of the Upper Klamath Basin lithic technology has focused on determining the nature of flaked and ground stone procurement and manufacturing activities represented by both the artifacts and manufacturing waste. Lithic technology that produced flaked and ground stone artifacts has been studied through morphological inspection; raw material classification, sourcing, and frequency analysis; and a limited metric analysis of formal artifact types and debris. The raw material types were reviewed with respect to interpretations of aboriginal preference and local and regional trade networks. The artifact data to be collected were detailed in the field methods section of the work plan. Flaked stone assemblages from archaeological sites were divided into two main categories: worked flaked stone and debitage. Debitage is "residual lithic material resulting from tool manufacture [or maintenance]" (Crabtree 1982) and includes both unmodified flakes and shatter. Worked flaked stone includes objects from which flakes have been intentionally removed. These include flake tools, bifaces, projectile points, and cores. Flake tools include both expedient flake tools, used without formal edge modification, and formally retouched, heavily curated flake tools such as "thumbnail scrapers." Bifaces are flaked stone tools that have ventral and dorsal surfaces displaying overall surface modification through flake removal. Surface modification was not limited to edge treatment. Bifaces are often classified according to the five-stage scheme created by Errett Callahan (1979): Stage I is a minimally worked piece of stone with at least two (but typically very few) dorsal flake scars, while Stage V is a distinctly retouched, finished biface tool. Mack's (1991) knife typology includes nine distinct types defined by both metric measurements and intuitive attributes. Either method may be employed, with Callahan's focused on understanding the level of reduction of the tool (or tool preform), while Mack's system provides descriptive categories for the final tool only. Lithic debitage appears to be the largest class of artifacts to be anticipated. Methods of description for these artifacts can vary; methods should include descriptive attributes and emphasize debitage attribute data (i.e., platform type, dorsal cortex cover, dorsal flake scar count, size grade, raw material, etc.) that are relatively free of interobserver error (Carter and DeBoer 2002).

Ground stone, faunal, sediment, marine shell, and other materials should be classified by appropriate technological or descriptive manuals that allow for clear, concise, and repeatable classification of cultural artifacts and associated deposits (Dugas et al. 1995, Grayson 1973, Hughes and Bennyhoff 1986). With ground stone analyses, attributes of function relate to shape, use wear (number of facets and facet profile, outline, and measurement), use wear surface patterning and intensity, and artifact size (Dugas et al. 1995). Forms such as handstones, pestles, and abraders are anticipated, as are anvil stones (millingslabs and mortars) and shaped rock bowls, disks, and other objects. Recorded metric and morphological data allow for an approximation of ground stone function.

Research topics relevant to lithic technology include the following:

- What lithic assemblage(s) and manufacturing techniques (including types, range, and variability for both chipped and ground stone materials) are present?

- Do the lithic assemblage(s) and manufacturing techniques change through time?

- If chronological variation in lithic manufacturing techniques and raw material preference is present, do the metric and nonmetric (primary, secondary flakes, etc.) attributes of whole flakes change over time?

- Are lithic quarries or workshop and activity areas present, and do these change over time?

Data sets required to address lithic technology issues include the following:

- Comparative tabulations of lithic raw material types found at each site

- Recordation of lithic artifacts made from raw material of nonlocal origin

- Tabulations of lithic debitage platform, dorsal cortex cover, and dorsal flake scar count for at least a representative sample of these artifacts found at each site

- Metric and morphological recordation of formal artifact attributes

6.4 Distribution of Ethnic Groups, Precontact and Post-Contact

Accurate reconstruction of the precontact distribution of Native American ethnic groups is a task that has defied the best efforts of ethnographers and other researchers for more than a century. Identification of ethnic groups that lived in the study area can be achieved through archaeology and specialized subdisciplines.

Identifying the Prehistoric Distribution of Ethnic Groups. Important attributes of ethnic association can be expressed in ethnically diagnostic artifacts and rock art. For example, a distinctive muller is strongly associated with occupation or use by prehistoric and protohistoric Klamath Tribes. Ethnically diagnostic projectile points, beads and ornaments of shell or bone, pottery, or other implements and/or stylistically diagnostic artifacts can also be useful "ethnic signatures." Obsidian procurement and exchange studies have advanced over the past few decades to enable archaeologists to recognize an ethnic signature by the frequency distribution/relative proportion of source-specific obsidian artifacts and debitage. Artifact inventories in the study area can be inspected and compared for the presence of "nonlocal" materials. Obsidian source analysis, if artifacts are collected, can be used in conjunction with hydration analysis to provide a chronological/location record of obsidian use at the sites. Debitage data can be reviewed for evidence of manufacturing for a surplus in excess of inferred local immediate needs. Hydration dates can be cross-checked against available absolute dates to assist in developing the chronological data to interpret the ethnic signature of any recognized trade patterns.

Ethnic association also can be viewed in rock art panels and the presence of certain design motifs that correlate to known cultural groups living in the area at the time of European contact. Ethnic signatures may also be recognized in house pit or other (spiral) rock alignments or structural remains.

Research topics relevant to ethnic distribution include the following:

- What materials indicative of trade are present?

- What is the point of origin of the "trade" commodities?
- How many obsidian sources are represented at each site?
- Do the obsidian sources change over time in terms of absence/preference and quantity? Can any changes be correlated with artifact style changes?
- Can any site be identified as a center for exchange or manufacturing of trade items or raw materials? How does the trade network represented at a site compare with other sites in the area?
- If protohistoric period sites can be identified, are any materials or sources unique to ethnic territories or cultural groups?
- Are any ethnically diagnostic artifacts present? If so, do they appear consistent with the function of the site where they are observed (e.g., a Klamath muller found in a village site or at a plant processing station), or do they appear to be anomalous (curated) trade goods seemingly functionally unrelated to the site?
- Are any ethnically diagnostic structures or features present?

Data sets required to address ethnicity issues include the following:

- Comparative tabulations of lithic raw material types found at each site
- Presence of local-, regional-, or foreign-origin culturally or ethnically diagnostic artifacts
- Presence of culturally or ethnically diagnostic rock art panels
- Recognition of distinctive house pit layout or geometry that may be culturally or temporally diagnostic.

Settlement Patterning. Klamath/Modoc "winter" villages were located along the shores of lakes, including Lower Klamath Lake, and streams, including Lost River, outside the study area. "Winter" is a misnomer, as many of these villages were occupied year-round and fishing continued through the winter months. The "winter lodges" consisted of semi-subterranean pit houses measuring from 12 to more than 35 feet in diameter and provided shelter for multiple families. The houses' central four-post frames were covered with planks and matting and then covered with earth (Stern 1998). Entrance into the pit houses was gained through a roof hatchway, which doubled as a smokehole. The Klamath/Modoc occupied spring settlements at semi-permanent camps during sucker fishing. Smaller mat lodges with side entrances or *wickiups*, some reaching diameters of 10 feet, provided shelter at these established camps (Stern 1998). Later in the season, the Klamath/Modoc peoples moved to the locations where wild parsley roots were dug. Summer movements were made for a number of gathering, fishing, and hunting activities. Additional moves were made to hunt at higher elevations in the fall. Small, portable *wickiups* were the main form of shelter during this time of the year.

Resource Use. Important resources for the Klamath/Modoc included sucker fish, waterfowl, and wild parsley roots. For the Klamath, fishing was a year-round activity; the Modoc focused their fishing on the seasonal fish runs (Stern 1998). A variety of fishing practices were employed, including dip nets, gill nets, spears, purse seines, A-frame nets plied from canoes or rafts, stone weirs, and angling with hook and line (Stern 1998). Other resources included various plant products, particularly camas and wocus, and deer, antelope, mountain sheep, and trout.

6.5 Identifying Resource Use (Subsistence) and Settlement Patterning

Settlement systems and accompanying subsistence strategies have been the topic of considerable interest in terms of regional research in northern California and southern Oregon. Settlement, subsistence, and seasonality studies are important in determining why and when sites were occupied (seasonally) and what economically valuable resources were used and/or exploited. The topics are functionally interrelated because the prehistoric people in the region were hunter/gatherers who relied on available seasonal resources and scheduled their subsistence in response to resource availability.

Subsistence and settlement patterns can be discerned from careful examination of the archaeological sites that reflect past use of the area. Site types expected to be present include major village sites, short-duration campsites, sites used for special resource procurement or processing of vegetal or faunal resources (fishing and/or fish processing, drying, and smoking stations, plant gathering/processing stations such as bedrock mortar complexes, and hunting and meat butchering camps), raw material quarry sites (for the acquisition and initial reduction of suitable tool stone), food or equipment storage sites (talus storage pits, dry rock shelters and caves, acorn granaries and storage pits), rock art and/or ceremonial or religious sites (pictograph and/or petroglyph panels, rain rocks, and baby rocks), burials and cemeteries (and cremation sites), and structures or former structures (rock walls, hunting blinds, cairns and piles, fish weirs, house pits, sudatories or sweathouses, cooking hearths or smoking racks, rock rings/sleeping circles/temporary brush shelter support circles, and rock spirals and other geoglyphs). The expected site types and the observed artifactual evidence can contribute information about prehistoric subsistence and settlement patterns.

Research topics relevant to subsistence and settlement include the following:

- In light of previous work in the area, how do the artifact assemblages observable on the surface of the archaeological sites represent subsistence and settlement?
- What is the functional variability among archaeological assemblages relative to the distribution of prehistoric cultural resources?
- What was the subsistence economy at the sites in the study area and did it change through time?
- Does the subsistence regime correlate with a specific season or seasons?
- Can the subsistence activities be correlated with specific intra-site locations?

- Can a specific season or seasonal round be determined from the range of subsistence activities represented at sites in the Klamath Basin?

- How are the various site types distributed across the study area landscape? Does site type distribution illustrate specific settlement patterns or systems?

- If macroscale mobility is indicated, is this correlated with climatic change?

- What are the predominant faunal and vegetal resources associated with the archaeological sites? Can their ecological zones be determined? Are there changes in species exploitation over time?

- Do the results of previous faunal, palynological, and macrobotanical studies suggest substantive differences in resource exploitation among different site types? Does the discovered site show evidence of deposits capable of yielding faunal or other macro/microfossil remains?

- Do the results of the paleoenvironmental studies indicate relationships among the populations of the various sites (that is, macroscale mobility on a seasonal, annual, or multiannual basis)?

- Are faunal/botanical remains present?

- Can subsistence activities be correlated with specific cultural groups? Are the subsistence activities specific to certain areas? Do the subsistence activities fluctuate through time and space?

Data sets required to address these settlement and subsistence issues include the following:

- Correlation of site location with important subsistence resources (fish, economically important plants, upland game trails, etc.) to help determine site type and function and the role of the site in the local settlement system

- Inventory of observable artifacts and features that reveal site type and function and the role of the site in the local subsistence and settlement system(s)

- Correlation of site location with information provided from tribal oral history studies to reveal site type and function and the role of the site in the local subsistence and settlement system(s)

- Inventory of observable ecofacts (such as faunal remains, rocks foreign to a site but not culturally modified, etc.) that reveal site type and function of the site in the local subsistence system

Data sets required to address subsistence, settlement, and seasonality research questions require observation and recordation of ecofactual and artifactual remains present at each site. These data can be used to examine patterns of transhumance (seasonal movements of peoples related to subsistence practices), gathering and hunting behavior, and site placement with respect to local resources.

A subsistence framework can be constructed using any available faunal, macrobotanical (seeds, stems, leaf parts, etc.), and paleoenvironmental data. Comparisons can be made against the available ethnographic record. Attempts to determine seasonality can be made through the analysis of the faunal and macrobotanical information.

Settlement patterns can be analyzed by examining site placement and spatial patterns of seasonally dependent cultural remains among different sites. Specialized data collection, if undertaken in conjunction with subsurface testing, can yield faunal, palynological, and macrobotanical samples. In addition, the evaluation of certain artifact types (projectile points, bifaces, ground stone, etc.) may provide data for inferences on the subsistence practices and seasonality of sites by the prehistoric inhabitants of the area. The faunal analysis, if conducted, can provide qualitative and quantitative summaries of the archaeofaunal assemblage.

Interpretations of hunting behavior, food processing, seasonality, and paleoenvironmental life zone reconstruction may result from the analysis. Faunal analysis may also provide information on intra-site task differentiation by comparing the frequencies of the relative minimum number of individuals (MNI) and number of individual species present (NISP) in contingency arrays and by measuring the association and dependence between taxonomic categories and spatial location.

6.6 Identifying Prehistoric Site Function and Organization by Site Type

Sites, whether single, multi-component, or mixed, are microcosms of cultural activities and use. Sites come into existence for a variety of reasons but are generally related to sociodemographic and ceremonial/religious purposes (including settlement, subsistence, and economics). Interpretation of site function relies on the type, amount, and arrangement of cultural material observed and available for analysis and comparison by cultural resource specialists and knowledgeable sovereign diplomats.

Archaeological material may be arranged in clusters (associations) or dispersed vertically or horizontally throughout a site. These arrangements allow the identification of activity areas or loci.

Research topics relevant to site function and organization include the following:

- What is the function(s) of each site? What activities were conducted? Can multiple use or functions be identified?

- Does the site belong to a specific physiographic area (that is, correlation of site type with geographical area) or geological area? (For example, are village sites confined to riparian or marsh areas?)

- Can the site be placed into a regional network? (For example, allowing for resource availability and environmental factors, lithic scatters and temporary camps should be interrelated and located within a geographically restricted zone.)

The interpretation of site function and functional significance depends on the interpretation of the kind and context of cultural materials found at each site. Any activity loci at each site should be

identified on the basis of the interpretation of individual artifacts and assemblages, as well as other factors.

The majority of the recorded prehistoric site types include the following:

- Lithic scatters
- "Habitation debris" (for example, temporary camp, seasonal base camp, permanent village, or permanent/seasonal village)
- Bedrock mortars or other milling features (such as groundstone)
- Rock art and/or spiral rock alignment or stacked rock sites
- Lithic quarry/source
- Burial/cremation grounds, cemeteries, or isolates

Site types that do not fit these categories may exist and should be classified based on their recorded patterns. These may include cultural heritage (e.g., Traditional Cultural Properties) sites such as resource gathering places, places of legendary and important historical events, or spiritual sites such as power places (rain rocks, springs, and others), sweat places, and religious event places.

The use of the site as the basic analytical unit has the potential to yield data on the following:

- Settlement patterns
- Subsistence patterns
- Economic pursuits
- House construction and use
- Lithic technology
- Chronology
- Domestic organization and practices
- Floral and faunal communities
- Paleoenvironments
- Physiography and geomorphology
- Geochronology, sedimentation, and stratigraphy

Previous research domains have identified several data requirements that have implications for interpretations of site function and classification of site type. Two data sources (obsidian hydration and lithic tool wear pattern analyses) are useful. Obsidian hydration dates may help identify components at sites in the study area. Single component sites reflect a single use. Two-component sites, representing two similar or different activities or events in time and space, are more difficult to interpret than single-component sites; as a result, only general function or chronological placement may be possible from the data obtained.

Multi-component sites, representing three or more similar or different activities or events through time and space, are subject to the same restrictions on interpretation as two-component sites. Mixed-

component sites have a wide range of hydration readings from both surface and subsurface contexts, indicating disturbance and lack of integrity.

Wear pattern analysis can be a useful means of determining the function(s) of formed tools and unmodified debitage. In addition to sample size, edge damage caused by frost heaving, cattle trampling, abrasion from the site matrix, and numerous other factors (including the brittle nature of obsidian) suggests that wear pattern analysis of either artifacts or debitage from the sites would be inconclusive.

Spiritual Practices. Spiritual practices of the Klamath River tribes have been based on the concept of spiritual or supernatural power that permeates the environment (including the weather, rocks, springs, trees, and animals) and that is mediated by a shaman (Theodoratus et al. 1990). Legends explain the relationships of the powers and human beings. Spiritual practices vary and often incorporate special spaces believed to hold supernatural qualities, including topographic features in remote settings. These places have been used in spirit quests to obtain special powers.

Certain plants thought to posses supernatural qualities have been used in curing ceremonies. The local American Indians (Klamath/Modoc and Shasta groups) used hot springs along the Klamath River and also cremated and/or buried the dead near the river. Areas where human remains have been deposited, including burials, cremation grounds, and cemeteries, are places of special traditional use that are to be cared for and protected from disturbance.

The appearance of non-native colonialists and settlers in the Klamath Basin greatly disrupted Indian groups, killing large numbers of people through introduced diseases, dislocating those who lived, introducing new technology, and eventually forbidding the practice of native religious practices and language in non-Indian schools. One reaction to the dislocations was the adoption of revitalization movements, such as the Ghost Dance of 1870 (Hagan 1988).

6.7 Summary of Relevant Cultural Resources

Clear Lake National Wildlife Refuge. To date, archived cultural resources known to be within the congressionally authorized boundaries of the Clear Lake NWR consist of 11 recorded prehistoric sites (i.e., worked stone, stacked rocks, cleared areas, bedrock mortar) and 1 recorded historic site (i.e., rock enclosure). Although the area on and around the Clear Lake NWR was used extensively by Native Americans, and there are an abundance of cultural resource sites, there have not yet been any nominated for inclusion onto the NRHP.

Tule Lake National Wildlife Refuge. To date, archived cultural resources known to be within one mile of the congressionally authorized boundaries of the Tule Lake NWR consist of 57 recorded prehistoric sites (i.e., habitation sites, rock shelters, human remains, pictographs, midden, worked stone, stacked rock, bedrock mortars, house pits, ground stone, traditional use locus, cleared areas) and 12 recorded historic sites (i.e., structural remains, refuse scatter, battlefields, repatriation locus, C.C.C. activity loci, Tule Lake Segregation Center). Although the area on and around Tule Lake was used extensively by Native Americans and there is an abundance of cultural resource sites, only one site has thus far been determined eligible for the NRHP, the Tule Lake Segregation Center. The Tule Lake Segregation Center is unique because it became the largest of the ten WRA camps and because it was used to detain those labeled as "disloyal." It was designated a National Historic Landmark in

February 2006 because of its national importance in the historic context of Japanese Americans in World War II (National Park Service 2006, Kameda 2010). In December 2008, this site was declared a National Monument by Presidential Proclamation (Kameda 2010).

Bear Valley National Wildlife Refuge. To date, no archived cultural resources are known to be within the congressionally authorized boundaries of the Bear Valley NWR.

Lower Klamath National Wildlife Refuge. Lower Klamath NWR is currently listed on the NRHP as an Historic District which recognizes it as an early example of an American attempt at preservation of natural wetlands and wildlife for the future. There are numerous archaeological sites on the Lower Klamath NWR, which is located in both rural northeastern California and southern Oregon. To date, archived cultural resources known to be within the congressionally authorized boundaries of the Lower Klamath NWR consist of 44 recorded prehistoric sites (i.e., worked stone, habitation sites, human remains, groundstone, traditional use locus, bedrock mortars) and 14 recorded historic sites (i.e., historic debris scatters, one NRHP District contributing site, 10 NRHP District contributing structures). Although the area on and around the Klamath Marsh was used extensively by Native Americans and there is an abundance of prehistoric cultural resource sites, none have thus far been nominated for inclusion onto the NRHP.

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