E6.0 CULTURAL RESOURCES

This chapter of the Klamath Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 2082) Exhibit E provides a report on the historical and archeological resources potentially affected by the Project as stipulated in Title 18 Section 4.51 (f) (4) of the U.S. Code of Federal Regulations (CFR):

The report must discuss the historical and archeological resources in the Project area and the impact of the Project on those resources. The report must be prepared in consultation with the State Historic Preservation Officer and the National Park Service. Consultation must be documented by appending to the report a letter from each agency consulted that indicates the nature, extent, and results of the consultation. The report must contain:

(i) Identification of any sites either listed or determined to be eligible for inclusion in the National Register of Historic Places that are located in the Project area, or that would be affected by operation of the Project or by new development of Project facilities (including facilities proposed in this exhibit);

(ii) A description of any measures recommended by the agencies consulted for the purpose of locating, identifying, and salvaging historical or archaeological resources that would be affected by operation of the Project, or by new development of Project facilities (including facilities proposed in this exhibit), together with a statement of what measures the applicant proposes to implement and an explanation of why the applicant rejects any measures recommended by an agency.

(iii) The following materials and information regarding the survey and salvage activities described under paragraph (f)(4)(ii) of this section:

(A) A schedule for the activities, showing the intervals following issuance of a license when the activities would be commenced and completed; and

(B) An estimate of the costs of the activities, including a statement of the sources and extent of financing.

E6.1 EXISTING CULTURAL RESOURCES AND FACTORS AFFECTING CULTURAL RESOURCES

E6.1.1 Environmental Context

The Klamath River bisects the Cascade Range, a geographic region characterized by a chain of large and recently active volcanic cones that extend northward from Lassen Volcanic National Park, in California, through Oregon and Washington and into British Columbia. However, the local environmental variability is high for the 65.5-mile-long stretch of the field inventory corridor (FIC) study area along the Upper Klamath River.

E6.1.1.1 Modern Conditions

The Project is embedded within a region that extends from Upper Klamath Lake, at an elevation of about 4,140 feet (1,262 meters) and within the basin and range topography, down through the steep gorge of the Klamath River canyons. At the lower end of the project FIC near Iron Gate dam, at an elevation of approximately 2,070 feet (about 630 meters), the topography transitions into the rolling, older ranges of the Siskiyou-Klamath Mountains.

The following is a review of modern conditions (geology, soils, hydrology, climate, flora, and fauna) within the Upper Klamath River region followed by a paleoenvironmental reconstruction based on local and regional research.

Geology and Soils

The geology of the Cascade Range (High Cascade Province) includes undifferentiated Tertiaryage volcanic rocks, including andesite, basalt, and volcanic conglomerates, as well as sandstone and mudstone. Complicating the geology are occasional exposures of the softer, shaley rocks of the Hornbrook formation. These Cretaceous-aged deposits of the Hornbrook formation, in places, include fossils of animals that lived in an inland sea that existed east of the Klamath Mountains (Alt and Hyndman, 1995). However, most of the rock in the rugged Klamath River Canyon represents river downcutting through rock deposited by volcanic activity of predominantly Miocene age (10 to 25 million years ago). In some places, such as near the Copco dam, volcanic activity was as recent as the Pleistocene. The predominantly basaltic rim of the Klamath River Canyon now towers nearly 1,000 feet above the continually downcutting river.

The Upper Klamath basin is at the western margin of the basin and range geological province that directly results from the fault-controlled uplift of generally north-south trending mountain ranges and downdropping of basins. This faulting dates to at least the Miocene. The uplifted mountains with their great relief relative to the valley floors are subject to extensive erosion, and as the erosion and uplift continue, the sediments flood into the basins (Fiero, 1986). Sediment in the Upper Klamath basin is hundreds, if not thousands, of feet thick, and the result is a broad plain, much of which is now converted to farmland or pasture.

Downstream, near the lowest segment of the project FIC, the geology fades from the volcanicdominated Cascade Range terrain into the older, metamorphic and plutonic rocks of the Siskiyou and Klamath mountain ranges. This transition to older rock basement generally occurs just downstream of Interstate 5, but some exposures are slightly upstream (Hickman, 1993). One theory places the Klamath Mountains as a faulted block, offset from the northern edge of the Sierra Nevada, that moved 60 miles to the west on a small tectonic plate (a microplate) more than 100 million years ago (Alt and Hyndman, 1995). The rich gold and precious mineral deposits sought by mid-nineteenth miners coincide with the upstream extent of these granitic and metamorphic rocks. Mining of economically valuable deposits, including gold, is not known for the immediate project area, but the influences of mining does extend upstream from the nearest deposits in the Henley area (less than 10 miles downstream of the Iron Gate dam).

Understanding the local and regional geology conditions was a necessary prerequisite to historical mining and agriculture interests, and this knowledge underpins archaeological

investigations with a better understanding of the lithic raw material potential available to prehistoric peoples in the local and regional landscape. In the Klamath River region, flaked stone tool manufacture included the use of chert¹ and basalt (both locally available) and obsidian. Local rock variability includes several forms of basalt capable of holding a cutting edge, and local andesites irregularly contain veins of amygaloidal opal and other cherts, presenting another potential prehistoric toolstone source (California Division of Mines and Geology, 1964).

The geographically closest known obsidian source is in the Medicine Lake Highlands, located more than 50 miles (80 kilometers) southeast of the Project area. Other important obsidian sources in the region include Spodue/Sycan, Blue Mountain, Massacre Lake, and the Warner Mountains, all of which are within a few hundred miles of the Upper Klamath River Canyon (see Mack, 1997; Sampson, 1985; Wilson et al. 1996).

Sediments in the region strongly reflect past Cascade volcanism. Soils range from shallow to deep, formed from colluvial and alluvial forces. Downstream, soils derived from extrusive or plutonic igneous rock are well drained, with surface layers of clay and clay loam. In the Klamath River Canyon, soils originate as colluvium, sometimes further weathered as alluvium. Local drainages have altered soils in several locations, forming poorly drained floodplains derived from igneous sources, with material weathered from andesite, basalt, tuff, and volcanic ash (Cahoon, 1985; Johnson, 1994; Soil Conservation Service, 1983).

Source materials incorporated into Upper Klamath basin soils include igneous sources (predominantly ash) with the addition of diatomaceous and other ancient seafloor sediments. On the low terraces within the project FIC, soils are very deep, moderately well drained to somewhat poorly drained, and sometimes slightly alkaline. In places, the soil is underlain by a hardpan at 20 to 40 inches below the surface. Floodplains have poorly drained silt loam, with relatively high water tables (within 2 to 6 feet of the surface, depending on local conditions) and slow permeability (Cahoon, 1985).

Hydrology and Modern Climate

The Klamath River represents the principal streamcourse in northern California, extending well into southern Oregon. The head of the Klamath River is Upper Klamath Lake (although the 1.25 miles between Lake Ewauna and Upper Klamath Lake are known as Link River), with Upper Klamath Lake fed by tributaries that include the Sprague, Williamson, and Wood rivers. After spilling out of Upper Klamath Lake, the river makes its way southwest into California, passing through the Klamath Mountains and six hydropower dams before reaching the Pacific Ocean, 263 river miles (423 kilometers) below Upper Klamath Lake.

In the Upper Klamath basin, irrigation projects and drainage canals replace the former influence of water movement through the Lost River, a drainage that both moved water into and out of the Klamath River. Formerly, the Upper Klamath River basin was dominated by more than 300,000 acres of natural wetlands, including tule marshes and other waterfowl wetland habitats. Approximately 80 percent of that acreage has been converted in the last century into irrigated

¹ Following Luedtke (1992), "*chert* is used as the general term for sedimentary rocks composed primarily of microcrystalline quartz, including flint, chalcedony, agate, jasper, hornstone, novaculite, and several varieties of semiprecious gems" [italics in the original].

farms and drained pastures (USFWS, 2003). The Klamath State Wildlife Area and Lower Klamath National Wildlife Refuge represent a small fraction of the former wetlands and are partially managed (on Miller Island) as controlled wetland ponds.

Downstream of the Upper Klamath basin, perennial tributaries of the Klamath River in the FIC project area include Spencer Creek (into J.C. Boyle reservoir), Hayden and Rock creeks (near the California/Oregon state line), Shovel and Long Prairie creeks (between the state line and Copco reservoir), and Beaver Creek (into the Copco pool). The largest tributaries in the FIC (Fall, Jenny, and Camp creeks) flow into the Iron Gate pool and immediately below the Iron Gate dam (Bogus Creek). In addition, several spring-fed and intermittent drainages influence erosion and add to the Klamath River flow, especially at times of heavy precipitation and spring runoff. Below Iron Gate dam, the river carries flows of more than 500 cubic feet per second (cfs) through the summer, with average peak flows during spring runoff approaching 4,000 cfs (Trihey and Associates, Inc., 1996).

Modern climate for the region ranges from semi-arid (in the Upper Klamath River basin) to a slightly more mesic setting downstream. This transition affects the animals and vegetation of the region, but climatically, the entire project area is within a zone of relatively extreme winter cold, when compared to other areas of the Far West (Hickman, 1993). At Klamath Falls, at the upper end of the project area, winter diurnal temperature averages range from 40 to 22 degrees Fahrenheit (F), while summer daily averages are a high of 86 degrees F and a low of 52 degrees F. Annual precipitation averages 13.5 inches, with 50 percent coming between November and March, and much of that as snow. Although at essentially the same elevation, but 20 miles downstream, the Keno weather station records winter average temperatures of 14 to 33 degrees F, summer averages of 82 to 48 degrees F, and 20.25 inches of precipitation per year, with two-thirds of it between November and March (OR NRCS, 2003).

Keno's record is similar to the Yreka record for annual precipitation, where historically (50-year average) this California town has received 19.5 inches of precipitation annually, with 70 percent of that falling between November and March. However, Yreka historically has lingering snow on the ground only in January, and then averaging only about 1 inch deep. Average daily temperatures in Yreka range from 90-degree-F highs to 50-degree-F lows in July and 44-degree-F highs to 25-degree-F lows for December. Precipitation follows the generalized Pacific-influenced pattern of moderately wet to snowy winters and dry summers.

Finally, southeast of the project area at an elevation of about 4,000 feet (1,220 meters) is Tulelake, California, where temperatures are similar to those at Klamath Falls. Daily summer highs average 85 degrees F (lows of 46 degrees F), while winter diurnal averages range between 40 and 20 degrees F. Precipitation is only 10.9 inches per year, with much less winter precipitation (and proportionally more of it as snow) than to the west in Yreka (CA NRCS, 2003). Sampson (1985) notes the Tule Lake region subfreezing winter conditions as limiting aboriginal people's winter resources and their inclination to travel away from winter village locations, an observation that may be projected to the entire project area.

Flora and Fauna

To facilitate understanding the importance of local flora and fauna to the peoples of the Upper Klamath River region, some of the more important species present in the Project area are described here briefly. Several researchers have spent considerable effort describing the use of plants and animals by local American Indians, and how the economic use of some species continued well into the historic period. For detailed information, the reader is encouraged to review other sources (such as Dixon, 1907; Gleason, 2001; Spier, 1930; Todt, 1997). Additional information about Native American use of economically important plants and animals will be included in the final tribal ethnographic reports (draft tribal reports are appended to the confidential FTR [PacifiCorp, 2004]).

The upriver portion of the FIC passes through the Upper Klamath River basin, a semi-arid shrub steppe and desert shrub region ringed by ranges supporting Ponderosa pine-associated vegetation (Franklin and Dyrness, 1973). However, the wetlands that dominated the region prior to reclamation projects greatly influenced the people, animals, and plant species. Important wetland species include tule (*Scirpus acutus*), cattail (*Typha latifolia*), willow (*Salix* spp.), cottonwood (*Populus* sp.), and yellow pond-lily (*Nuphar luteum*; wocus). In several locations, the invasive Himalayan blackberry (*Rubus discolor*) is a dense bank shrub.

On surrounding slopes in the Upper Klamath River basin shrub steppe and desert shrub, vegetation is dominated by big sagebrush (*Artemisia tridentata*) on deeper soils and low sagebrush (*A. arbuscula*) on shallower soils. Western juniper (*Juniperus occidentalis*) is the dominant tree species, and other common shrubs include rabbitbrush (*Chrysothamnus* spp.), mountain mahogany (*Cercocarpus ledifolius*), Sierra plum (*Prunus subcordata*), and bitterbrush (*Purshia tridentata*).

As one progresses downstream, entering the moister Upper Klamath River Canyon near Keno, the habitat rapidly changes into a Ponderosa pine (*Pinus ponderosa*) zone (Franklin and Dyrness, 1973). Other overstory species on the steep north-facing slopes in this zone include Douglas fir (*Pseudosuga menziesii*), lodgepole pine (*Pinus contorta*), Western white pine (*Pinus monticola*), Western larch (*Larix occidentalis*), incense cedar (*Calocedrus decurrens*), and several fir species (*Abies* spp.). Understory shrubs include Oregon grape (*Berberis* spp.), snowberry (*Symphoricarpos acutus*), squawcarpet (*Ceonothus prostratus*), manzanita (*Arctastaphylos* spp.), huckleberry (*Vaccinium* spp.), currant (*Ribes* spp.), and mountain ash (*Pyrus sitchensis*). Riparian margins and minor drainages include willow, blackberry, mountain ash, cottonwood and, rarely, aspen (*Populus tremuloides*).

On the drier, warmer, south-facing slopes are also Western juniper and an understory of rabbitbrush, mountain mahogany, bitterbrush, manzanita, buckbrush (*Ceanothus cuneatus*), serviceberry (*Amelanchier* spp.), poison oak (*Toxicdendron diversilobum*), blue elderberry (*Sambucus coerulea*), and big sagebrush. Gleason (2001) carefully chronicled the various economically important geophytes that grow on shallow soils in the Klamath River Canyon. Even farther downstream, transitioning as far upstream as the J.C. Boyle reservoir but most pronounced below the state line, vegetation converts to an overstory dominated by black, Oregon white, and live oaks (*Quercus kelloggii*, *Q. garryana*, and *Q. chrysolepis*). Ponderosa pine, sugar pine (*Pinus lambertiana*), bull pine (*P. sabiniana*), and western juniper are other important

overstory species, with a variety of shrubs similar to those on dry slopes upstream, form sometimes-dense chaparral. Below Copco reservoir the vegetation opens to oak savannah mixed with hard chaparral on steeper slopes. Oaks and Ponderosa and bull pine are the dominant overstory.

Within the waters of the Klamath River are several fish species that are extremely important to local people. In the lakes and drainages of the Klamath River system are four species of suckers: the Klamath largescale sucker (*Catostomus snyderi*), the Klamath smallscale sucker (*Catostomus snyderi*), and two species that have nearly disappeared and are federally listed as endangered (USFWS, 2003): the shortnose sucker and the Lost River sucker. Shortnose suckers (*Chasmistes brevirostris*) can live as long as 33 years and attain a length of 20 inches; at one time they were so abundant that canneries were built to package them for human consumption. Lost River suckers (*Deltistes luxatus*) can live to be 45 years old; they once were an abundant source of oil and were dried for human use.

Other fish species that were important prior to the twentieth century (before extensive logging practices and hydroelectric dams) were the seasonal runs of Chinook salmon (*Oncorhynchus tschawytscha*) and steelhead (*O. mykiss*) and resident rainbow trout. Steelhead ran in the winter and the summer. There previously was an annual autumn run of coho salmon, and spring Chinook would reach as far as the upper course of the Klamath River (Kroeber and Barrett, 1960) and tributaries of the Upper Klamath Lake. Other fish in the Upper Klamath River and adjacent perennial drainages include three species of lamprey eel (*Lampetra* spp.), chub (*Gila* spp.), speckled dace (*Rhinichthys osculus*), and sculpin (*Cottus* spp.), although the latter two generally are small and of limited economic importance.

The Upper Klamath River basin is sometimes called the "Everglades of the West," with 80 percent of the birds migrating along the Pacific flyway stopping at the basin to rest or feed. In addition, several national wildlife refuges welcome the largest population of wintering bald eagles (*Haliaeetus leucocephalus*) in the lower 48 states (USFWS, 2003). Two other common avian fishers include osprey (*Pandion halietus*) and belted kingfisher (*Ceryle alcyon*). Migratory and resident avian species are numerous, but common ones include loons and grebes (family *Podicipedidae*); white pelicans (*Pelecanus erythorhynchos*); cormorant (*Phalacrocorax* spp.); bitterns, herons and egrets (family *Ardeidae*); American coot (*Fulica americana*); rails (family *Rallidae*), gulls (*Larus* spp.), terns (*Sterna* spp.), and numerous species of swans, geese, and ducks (family *Anatidae*). Common upland birds in the region include turkey vultures (*Cathartes avra*), California quail (*Lophortyx californicus*), blue grouse (*Dendragapus obscurus*), ravens and crows (*Corvus* spp.), killdeer (*Charadrius vociferous*), several species of hawks and falcons (family *Acciptridae*), owls (family Strigidae), and a variety of songbirds (Peterson, 1961; Sibley, 2000).

As with many of the fish and bird species, several of the larger terrestrial mammals common to the Klamath River Canyon move seasonally between environmental zones. These include large game mammals such as mule deer (*Odocoileus hemionus*) and elk (*Cervus elephus*), in lesser numbers the American pronghorn (*Antiocarpa americanus*, on the shrub steppe of the Upper Klamath basin), and, in the past, bighorn sheep (*Ovis canadendis*, in the mountainous portions of the canyon). Other important larger mammals include mountain lion (*Felis concolor*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), marten (*Martes americana*), fox (*Vulpes fulca* and *Urocyon*)

cinereoargenteus), raccoon (*Procyon lotor*), porcupine (*Erethizon doratum*), black bear (*Ursus americanus*) and, in the past, grizzly bear (*Ursus arctos*), lynx (*Lynx rufus*), and gray wolf (*Canis lupus*) (Bailey, 1936; Ingles, 1965).

Smaller mammals are too numerous to list fully. Some commonly hunted in the past include rabbit (*Lepus* spp.), hare (*Sylvilagus* spp.), skunk (*Mephitis mephitis* and *Spilogale gracilis*), pica (*Ochotona principeps*), marmot (*Marmota fluvientus*), and several species of squirrel, chipmunk, pocket gopher, mouse, and kangaroo rat (Order *Rodentia*). Several mammals and one reptile species, the Western pond turtle (*Clemmys marmorata*), ply the waters of the Klamath River; these include river otter (*Lutra canadensis*), mink (*Mustela vision*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethica*), and fisher (*Martes pennanti*) (Bailey, 1936; Ingles, 1965). Interested readers are directed to Joanne Mack's compelling list of animals known to occur within or immediately adjacent to the Salt Caves locality that were of economic importance to American Indians or were recovered from regional archaeological sites (Mack, 1983).

E6.1.1.2 Paleoenvironmental Conditions

This brief paleoenvironmental discussion emphasizes the variability of climate throughout the Holocene. The cyclic climatic variability is based on variation in effective moisture.² In general, high effective moisture results in increased stream flows, soil development, and landform stability. In contrast, low effective moisture results in reduced stream flows, erosion, and soil deposition. Plants and animals respond to variations in effective moisture according to their needs. Based on relicensing studies and work by Gleason (2001), the preferred economic resources generally are patchy and tied to specific locations. Climatic change does not necessarily alter the location of resource patches; however, climatic change may have influenced the productivity of specific resources within the patches.

One of the earliest research papers on palynology (the study of fossil pollen) and paleoenvironmental conditions in western North America is based on work conducted in the vicinity of the Project area. Henry Hansen (1942), working in the Upper Klamath River basin with an interdisciplinary team led by Luther Cressman, conducted a groundbreaking study to illustrate the importance of relating climatic fluctuations and the histories of lakes and marshes to changing human populations. Since that time, little research into paleoenvironments is directly tied to this region. However, studies from surrounding areas can be incorporated to interpret general patterns of climate change and environmental conditions for the Holocene (Barnowsky et al. 1987; Mehringer, 1985; Thompson et al. 1993; Wigand and Novack, 1992).

In general, prehistoric climatic trends are difficult to segregate from the regular weather fluctuations between wet and dry, cold and warm, which are the historic norm for the Interior Northwest. Divisions based on climatic information generally are arbitrary markers. Notwithstanding a few prolonged droughts or generally wet periods, the Holocene is best characterized by fluctuations. The Holocene climatic summary presented here (Figure E6.1-1) incorporates both regional research (such as Carter, 1995; King, 1995; and Wigand, 1987) and

² For the purposes of this document, effective moisture is defined as the level of moisture retained in the hydrologic system. Effective moisture varies with precipitation and evaporation in association with temperature.

secondary literature (Todt, 1997). Figure E6.1-1 illustrates the known variations through time relative to modern conditions.

The Klamath River bisects the Cascade Range, a geographic region characterized by a chain of large and recently active volcanic cones that extend northward from Lassen Volcanic National Park, in California, through Oregon and Washington and into British Columbia. However, the local environmental variability is high for the 65.5-mile long stretch of the FIC study area along the Upper Klamath River.



Figure E6.1-1. Generalized paleoclimate trends in the Intermountain West.

Source: Davis 1982; Nials 1996.

Identifying Evidence of Micro-Environmental Variability and Paleoenvironmental Change in the Upper Klamath River Basin

Where archaeological sites are located is in part a function of the choices prehistoric peoples made in relation to the environment in which they lived. Specific locations may suggest a sense of "place" that reflects important cultural values, or locations may be selected on the basis of resource availability. To interpret spatial distributions of cultural artifacts, features, and other prehistoric human constructs, the nature of the site's environment must be documented. This includes identifying specific patches (locations of relative resource abundance) that contain potential subsistence resources. Another consideration is that the nature and type of cultural remains may indicate activities not logistically possible in the current environmental setting. In this instance, cultural remains may indicate environmental variability (relative abundance of modern plants, geology, solar exposure, etc.) at a site location should be documented, when possible.

Research Topics Relevant to This Issue:

- How are the micro-environments of the site and the surrounding areas best defined? (Microenvironments might include a spring and its associated vegetation in an otherwise arid or sparsely vegetated setting, or a site located on a particular rock or soil type [serpentine] that creates a unique micro-environment because only certain plants can grow on that particular rock or soil type.)
- What processes account for the formation of deposits within each site setting, and what implications do these processes have for identifying cultural resources?
- How does the micro-environment affect the preservation of organic materials, such as botanical or faunal remains? For example, a dry rock shelter that is free of water percolation may preserve remains that would not survive at a site exposed to the elements.
- To what extent are the modern micro-environmental categories representative of paleoenvironmental conditions, and what effect does this relationship have on predicting past environmental conditions?
- What is the spatial distribution of micro-environments in the Upper Klamath River basin?
- Is there a relationship between the distribution of certain site types and micro-environments? What environmental variable(s) might account for the relationship?

Data Sets Required to Address These Paleoenvironmental Issues:

- Temporally controlled (meaning at a fixed point in time), single-component (meaning a single event) faunal remains. An animal butchering or processing feature exposed in cut bank or erosional profile that is isolated (that is, not associated with a midden deposit) would be a time-fixed, single event and stratigraphically unmixed feature of unmixed faunal remains.
- Recognition and recordation of locations that may retain stratigraphically unmixed pollen or other macrofossil plant remains.

Although an oversimplification of the highly variable climatic patterning of the Interior Northwest, the three-part sequence of the Ernst Antevs (1955) continues to express the overall Holocene pattern: a cool-moist early Holocene (Anathermal), a xeric middle period (Altithermal), and a return to cooler, moister conditions (Medithermal).

At the end of the Pleistocene (ca. 12,500 before present [B.P.]), the Pacific Northwest and northern Great Basin pollen and packrat midden data reveal that tree lines were lower in elevation, by as much as 1,000 meters (3,280 feet) (Wigand and Nowak, 1992). This quickly changed during the initial Holocene, and drier conditions (but still wetter than today) caused a demise of the Pleistocene woodlands. A short hiatus in this progression (called the Younger-Dryas) provided a 1,000-year reprieve from warming temperatures.

By about 9,500 B.P., most pollen records illustrate that the conditions of the Holocene were mostly established over the entire American northwest (Barnowsky et al. 1987; Mehringer, 1985;

Wigand and Nowak, 1992; Thompson et al. 1993). Although the plant and animal mosaic prior to this time lacks a modern analog (whereby vegetation communities and the combination of animals who used them would not be known in today's world), by 9,500 B.P. the general patterning of plants, animals, and the peoples who exploited both were established in the Klamath River region.

What followed was likely the warmest period of the Holocene. Although effective moisture was highly variable (see Figure E6.1-1), overall moisture may not have decreased dramatically but, by shifting to a more summer pattern, snowpack and spring runoff dropped. At higher elevations of the Pacific and Interior Northwest, a temperature reduction probably was seen earlier than in the lowlands (Barnowsky et al. 1987; Mehringer, 1985). However, by about 8,000 to 7,500 years ago, relatively cold, dry winters and moist spring conditions are demonstrated in the pollen and packrat midden data of the region (Johnson et al. 1994). Periods of drought are punctuated by moist episodes and brief reexpansion of mesic species. Relative to the Klamath River with its constant source of water, the variability to available resources would likely have been limited to irregularities in local spring discharge and fluctuations in the relative abundance of patch resources, not a wholesale reduction (or increase) of species specific to the region.

During the mid-Holocene, the most dramatic impact would have been the eruption of Mt. Mazama (Crater Lake), which was. likely a series of up to four major eruptions over the span of 150 years (Mulineaux and Wilcox, 1980). Crater Lake is located less than 40 kilometers (25 miles) northwest of Upper Klamath Lake. Although the impact of these cataclysmic events was regionally devastating, the immediate project area probably saw little ash rain from these eruptions. Nevertheless, the pumice and ash from the terminal eruptions of Mt. Mazama flowed into the Upper Klamath Lake for centuries after the eruptions and probably affected the waters of the Upper Klamath River and its resources (including fish runs) for a long time period. Eruptions of Mt. Shasta to the south, at about 9,600 B.P. (Miller, 1980), also may have affected local inhabitants and resources, forcing short-term abandonment of certain areas. Volcanic activity in the Cascades, while intermittent, probably affected generations of prehistoric peoples at various times through the Holocene.

At about 4,000 B.P., a fairly moist, cool episode altered the climate pattern and signaled the onset of overall wetter winters. Grasslands likely expanded for a time, and river flow was likely high at spring runoff between about 4,000 and 3,500 B.P. Sometime after about 3,500 B.P., overall conditions in the Upper Klamath River region echoed that of today. Fluctuating weather and short-term trends in climate remained the norm, but the composite of species represented in the vegetation and faunal communities was relatively "normal." Since that time, and into the historic period, people have continued to adjust their behavior to these weather and climate vagaries.

Paleoenvironmental conditions influenced the range of possible cultural activities as people contended with the general aridity of the landscape. The restricted locations of reliable water— primarily in the Klamath River, small feeder streams, and springs—contributed to a subsistence base geared toward these water sources. Changes in prehistoric and historical land use likely were related to the variable environment and to cultural changes influenced by nonclimatic stimuli, such as technological change, trade, and conflict or competition with other peoples.

E6.1.2 Archaeological Resources

This section summarizes the available data on American Indians in the Upper Klamath River region. 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. Information on the chronological divisions identified and the cultural history for the region is summarized in Table E6.1-1. This section details archaeological research for the region relative to past peoples and existing knowledge on chronology, settlement, subsistence, and regional interactions.

E6.1.2.1 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: (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.

Table E6.1-1. Summar	v of chronology and	cultural history in	n the upper Klamath	River region.
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	General Characteristics of Periods/Phases					
Years B.P.	Upper Klamath River (after Mack, 1991)	Lower Klamath Lake/ Nightfire Island (after Sampson, 1985)	Pit River/Lake Britton (after Cleland, 1997)	Generalized Northern Great Basin settlement Strategies and Artifacts		
Pre- 7,500	(Not Named). Not well represented on the Klamath River. One Eden projectile point reported at 35KL18 (Big Boulder Village).	(Use not evident)	Paleoindian. Sporadic utilization of the region.	Paleoarchaic. Broad-spectrum hunters-gatherers. Surface sites retain only lithic tools. Clovis or Western Stemmed		
7,500	Secret Spring. Not well		Early Archaic. First evidence of substantial utilization. Earliest (Subphase A) sites are located on midslope terraces and benches above river. River sites used sporadically. Lithic site occupation increases late in the period (Subphase B), with the first pit houses on intermediate terraces. Clikapudi Side-Notched projectile points early, with Clikapudi Corner-Notched projectile points	Series projectile points, crescents.		
7,000	represented: one dated component from 35KL21 (Klamath Shoals midden) of bone and flake tools. General bone tool use.	2-Coot to 5-Scaup. Seasonal hunting, gathering, and fishing. Lakeside adaptation with waterfowl emphasis. Base on obsidian sourcing, economic		Early Archaic. Continued high mobility, but some evidence for tethered regional use. Lithic sites dominate assemblages.		
6,500 5,000	Basin. Substantial evidence for use of river terraces by generalized hunter-gathers. Humboldt Concave Base A, Northern Side-Notched and McKee Unifaces projectile points, a variety	ties were generally to the south. Evidence of early dog domestication. Large stemmed, large leaf-shaped, and Northern Side-Notched projectile point styles. 6-S&B to 10-MSFL. Conversion of		Large stemmed, Cascade and Humboldt (leaf-shaped), and Northern Side-Notched projectile points.		
4 500	of flaked and ground stone tools.	site to a semipermanent village with clay-lined pit houses. Intense use of	appear late.	Middle Archaic Deak in site		
4,000	fishing/river resources begins; sites are found both on river terraces and benches.	surrounding resources: netting, trapping, and plant resource processing. Increased use of upland arme early in this period	Middle Archaic. Increased use of habitation sites, peak utilization of lithic sites early (Subphase A), with overall peak in use of the Lake Britton area late (Subphase B). Diverse settlement pattern. Clikapudi Series projectile points	frequency early, and increases in site size later in the period. Generalized hunter-gatherer		
	Leaf-shaped Elko Series and Siskiyou Side-Notched projectile points. Specialized bone tools (including chisels, harpoon barbs, and other fishing gear) enter the	Elko Series projectile points dominate, made from a wide range of obsidian sources. Bi-pointed stones and stone pipes.		pattern with considerable diet breadth. Large dart points: Pinto (stemmed), Elko (corner- notched), and Humboldt Series.		
3,500	record.	(Abandonment)	continue.			
2,500 2,000 1,500	Canyon. Well represented, sites on a variety of landforms but with a riverine focus. First evidence of house pits in the canyon. Extra-local artifacts present. Lack of Euroamerican trade goods suggesting end of canyon's permanent occupation by the early 1800s.	 11-USFL to 12-TSFL. Use likely as a temporary fishing village with lighter surface houses, possibly reflecting regional increase in mobility. Continued use of dart points (Elko and Humboldt Series). 13-LAL to 15-UAL. Use of site as a 	Late Archaic. Considerable occupation, intensification at habitation sites. Riverine-oriented settlement pattern develops. Gunther Series projectile points introduced early in the period.	Late Archaic. Site frequency increases, but not site size. House pits evident. Likely increased population, with little change in general hunting-gathering patterns. Some tethering to specific wetland regions.		
1,000	Complexity of toolkit with Gunther and Rosegate Series arrow points and a variety of bone tools throughout. Subphase 1 (2,200 to 850 B.P.) includes shell beads, while Subphase 2 (850 to 350 B.P.)	temporary camp, with increased coastal and river trade contacts, but fewer obsidian sources used. Gunther Series projectile points dominate. Coastal shell beads and exotic trade goods.	Emergent. Riverine settlement pattern with intensification at sites next to the river. Reduced use of lithic sites away from river. Reduction in use of obsidian. Gunther Series points continue;	Some Elko Series dart points, but predominance of Rosegate (corner-notched, arrow) projectile points.		
750	sees introduction of Desert S-N projectile points, bone beads, pottery, and figurines (the latter two are lacking in Subphase 3).	(Abandonment)	Desert S-Notched introduced late in the period.	Late Prehistoric. Well represented in record. Possibly increased reliance on large game and mobility. Rosegate, Desert Side-Notched and other small arrow points.		
Historic (post- 1840s)	Introduction of Euroamerican technol homesteading, ranching, transportation mobility as economically viable option	logy and diseases to Indian people. Euroa n, rural development, and other historica ns.	americans and Indians begin to ranch a lithemes emerge and replace the use of	in the region. Logging, of specific villages or general		

In 1980, BLM surveys 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) (see Mack, 1991). Subsequent BLM land exchange surveys resulted in the identification and testing of several sites in this area (Oetting, 1996). Since 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).

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.

<u>Kawumkan Springs Midden and House Pits (35KL9).</u> 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 Kawumkan Springs midden 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.

<u>Williamson River Bridge (35KL677)</u>. 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).

<u>Nightfire Island.</u> 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' Altithermal-Medithermal climatic sequence (Grayson, 1972).

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).

<u>Tule Lake</u>. 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.

<u>Klamath River Bridge Cemetery (35KL1121).</u> 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).

<u>Keno Pictographs (35KL1901).</u> 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).

<u>Big Boulder Village (35KL18).</u> 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.

<u>Klamath Shoal Midden (35KL21).</u> This early site also was excavated 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; an *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.

<u>Border Village (35KL16).</u> This was another pit house village excavated 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 General Land Office (GLO) plat map of Township 41 South, Range 5 West, suggests American Indian use of the area into the historic period.

<u>Freedom Site (CA-SIS-1721).</u> 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).

<u>Iron Gate (CA-SIS-326).</u> This late prehistoric village site along the Klamath River was excavated in 1960. The site was radiocarbon dated to ca. A.D. 1400 to 1600, 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 1500 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 evinced by the house form and the presence of hopper mortars (Leonhardy, 1967).

E6.1.2.2 General Overview

The Project area 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).

The Handbook of North American Indians, Volumes 7 (Northwest Coast), 8 (California), 11 (Great Basin), and 12 (Plateau), miss the immediate Project area, relative to archaeology.³ A partial explanation is that the area is relatively void of synthesis and has had limited publication of research excavations (with the exception of work conducted by Mack and Gleason). Also, the archaeology of the area can be seen as having influence from and aspects of each of the surrounding regions.

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

During the Paleoarchaic period, the Project area was occupied by hunter-gatherers with a broadspectrum 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 bracketed 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.

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 turtle and large to small mammals. Burial practice was supine burials placed in rock-covered pits.

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):

³ For ethnographic groups in the project area, the Shasta and downstream groups are described in Volume 8 (California), while the Klamath and Modoc are presented in Volume 12 (Plateau).

• *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.

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 of 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). The Late Period includes two of the Upper Klamath River Canyon phases: the River and Canyon phases (Mack, 1991). Mack further divides the Canyon Phase into three subphases (see Table E6.1-1):

• *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 *Olivella* shell beads. Burial practice shifts to cremation with associated grave goods such as mammal-bone beads and elk antler spoons.

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

One of the most important tasks for the pedestrian field survey crew was to observe and record time-sensitive artifacts and contexts. A primary objective of observing and recording time-sensitive artifacts is to determine when a site or suite of sites was used or occupied. 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. Chronological data are especially important for the study area prehistory because they may help determine the initial dates of Klamath, Modoc, and Shasta settlement and changes over time. Individual sites may not address these topics, but they can provide information relevant for local and regional syntheses.

<u>Projectile Point Chronologies.</u> Because various styles of projectile points were developed and used by American Indians 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 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 alter 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 cornernotched 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, 1996) 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 seem 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.

<u>Radiocarbon Dating</u>. 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. Table

E6.1-2 lists the known radiocarbon dates for archaeological sites within Upper Klamath Canyon and in the immediate vicinity. The dates within the table are presented in order of oldest to youngest. Radiocarbon dates that have been corrected for new half-life are noted.

Radiocarbon Dates	Site Number	Site Name	Reference
$7646\pm400^{1},6065\pm400,\\1009\pm110^{1},1296\pm125^{1},\\990\pm110^{2}$	35KL21 (SC7)	Klamath Shoal Midden	(Cressman et al. 1961) (Cressman et al. 1962) (Mack, 1983) (Mack, 1991)
Ca. 6500 to 100	35KL8	Medicine Rock Cave	(Cressman, 1956) (Kresl et al. 1995)
$\begin{array}{c} 1540\pm100,930\pm90,2080\pm90,\\ 1420\pm90,2180\pm80,2340\pm100,\\ 2180\pm90,2210\pm110,1790\pm110,\\ 2220\pm90,6160\pm130,3470\pm80,\\ 3450\pm90,3040\pm100,3110\pm110,\\ 4070\pm100,3940\pm130,\\ 4260\pm100,4410\pm80,4750\pm110,\\ 4030\pm90,4500\pm110,3960\pm120,\\ 4140\pm110,4380\pm90,5750\pm130,\\ 6080\pm140\end{array}$	CA-SK-4	Nightfire Island	(Sampson, 1985) (Kresl et al. 1995)
6850 ± 80^3 , 2630 ± 50	35KL1459	Four Bulls Site	(Wilson et al. 1996)
7500, 5000	35KL9	Kawumkan Springs Midden Site	(Cressman et al. 1961) (Aikens et al. 1978) (Mack, 1991)
Ca. 1960 to 200	35KL778	Bezuksewas Village	(Aikens, 1993) (Kresl et al. 1995)
Ca. 1800 to 1000, 100	35KL677	Williamson River Bridge	(Aikens, 1993) (Kresl et al. 1995)
810±130 ¹ , 680±90 ¹ , 710±70 ¹	35JA189		(Mack, 1991)
660±90 ¹ , 580±60 ¹ , 700±80 ¹ , 490±120 ¹ , 810±70 ¹ , 1050±110 ¹ , 410±80 ¹ , 750±80 ¹	35JA100		(Mack, 1991)
690±901	CA-SIS-331	Rainbow Site	(Mack, 1991)
970±80, 580±100, 580±120 ¹ , 540±120 ¹	35KL16 (SC1)	Border Village	(Cressman et al. 1961) (Anderson et al. 1964) (Mack, 1983) (Jensen and Associates, 1987) (Mack, 1991)
580±60, 230±60, 210±80	35KL19 (SC5)	Frain South Field	(Mack, 1983) (Mack, 1991)
564±110 ¹	35KL18 (SC4)	Big Boulder Village	(Cressman et al. 1961) (Mack, 1983)
540±901	35JA27A		(Mack, 1991)
510±70 ¹	CA-MOD-250	Lorenzen Site	(Baumhoff et al. 1968) (Mack, 1988)

Table E6.1-2. Summary of radiocarbon dates in the upper Klamath River region.

Radiocarbon Dates	Site Number	Site Name	Reference
500±100, 400±75 ¹ , 510±75 ¹	CA-SIS-326	Iron Gate Site	(Leonhardy, 1961) (Leonhardy, 1967) (Mack, 1991) (Kresl et al. 1995)
410±60 ¹ , 2350-310 ¹	35DO182	Standley Site	(Mack, 1991) (Aikens, 1993)
330±60, 380±80, 400±50	35KL26 (SC12)	Men's Ceremonial Area	(Cressman et al. 1961) (Mack, 1983) (Mack, 1989)
330±80 ¹	35DO153	Narrows Site	(Mack 1991)
100±70	35KL20	Klamath Shoal Village	(Mack 1989)

Table E6.1-2. Summary of radiocarbon dates in the upper Klamath River region.

¹ Corrected for new half-life and Museum Applied Science Center of Archaeology (MASCA) correction factor.

² Radiocarbon dates for ceramic figurines from the Western Cascades (Mack, 1990).

³ Radiocarbon date based on a sample of freshwater mussel shell (Wilson et al. 1996).

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 Project area, 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 development 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 were deposited mostly north and east of Project area, but pumice flows extended to Upper Klamath Lake. 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).

<u>Other Means of Dating Sites.</u> 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 (Taylor, 1987). 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 Project area have not been the subject of intensive study. Regional ceramic studies in the Great Basin could provide baseline information from which a Klamath Canyon ceramic tradition could be built upon. 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.

<u>Regional Trade.</u> 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 Project area. 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 Project area during the Late Prehistoric (Mack, 1997).

<u>Rock Art.</u> 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).

<u>Research Topics Relevant to Chronology</u>. 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, multicomponent, or mixed-component site?
- Can distinct single-component loci be identified within multicomponent 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? (No formal site testing excavations have been conducted to date during the pedestrian surveys.)
- 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. (Note: Shasta representatives do not approve of any destructive testing of rock art panels.)
- 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 was anticipated to be the largest class of artifacts observed. Methods of description for these artifacts can vary, but the method used included descriptive attributes, and the macroscopic lithic analyses of site debitage followed a "non-typological approach" (Ingbar et al. 1989) that emphasized the collection of 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 will 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; USDA-SDS, 1992). 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 hand-held manos, pestles, and abraders are anticipated, as are anvil stones (metates 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

Distribution of Ethnic Groups, Precontact and Post-Contact

Accurate reconstruction of the precontact distribution of American Indian ethnic groups is a task that has defied the best efforts of ethnographers and other researchers for more than a century. It is beyond FERC regulatory mandates for PacifiCorp to adjudicate firm ethnic boundaries within or adjacent to the Project area of potential effect (APE). For a discussion of the Project APE, see Section E6.1.2.3.

As noted by Gleason (2001), settlements in the Klamath River Canyon have been attributed by various authors to historic ethnic groups of Upland Takelma, Klamath, Modoc, and Shasta. The issue of prehistoric ethnic attribution also proved to have an added political dimension as controversy began to surround Klamath Fall's licensing attempts in the 1980s for a facility located at Salt Caves, situated midway within the Klamath River Canyon. According to ethnographers and published sources, several American Indian groups (Klamath/Modoc, Takelma, Shasta, Karuk, Hoopa, and Yurok) used the Project area and regions downriver of the Project (Heizer, 1978).

One researcher suggests that Klamath/Modoc territory extended down the Klamath River to the vicinity of Shovel Creek, where Shasta territory started (Theodoratus et al. 1990). However, the federally recognized territory of the Klamath Tribes extends down the Klamath River to immediately west of Interstate 5. Gleason (2001) would suggest a Shasta presence upstream throughout the Upper Klamath River Canyon. Mack has, in her early reports (Mack, 1983), used artifact types to suggest Shasta or Takelma use in the upper canyon. The Karuk have occupied the river and its uplands from about Seiad downstream almost to Weitchpec (Bright, 1978). Yurok territory stretched from the Karuk boundary to the mouth of the Klamath River and along the Pacific coast (Pilling, 1978). The Hoopa occupied the lower valley of the Trinity River, the main tributary of the Klamath (Wallace, 1978).

To facilitate delineation of the distribution of precontact and post-contact American Indian ethnic groups in the Project area, PacifiCorp contracted ethnographers familiar with the Klamath Tribes and the Shasta Tribe to conduct (1) an ethnographic study that includes preparation of ethnographic "context" narrative, and (2) an "oral history" investigation with knowledgeable tribal elders familiar with the study area. For American Indians that lived downstream of the Iron Gate dam vicinity to the mouth of the Klamath River at the Pacific Ocean, PacifiCorp contracted with the Yurok Tribe Culture Department and an ethnographer recommended by the Karuk Tribes to prepare a general ethnographic context framework.

As acknowledged by a tribal representative during monthly meetings of the Cultural Resources Work Group (CRWG, a working group of tribal representatives and agency stakeholders and PacifiCorp and its consultants), exact precontact and post-contact ethnic boundaries are difficult to establish. Because overlapping use of portions of the Klamath River Canyon by Klamath, Modoc, and Shasta ethnic groups is known to have occurred, PacifiCorp did not anticipate that the contracted studies with the various tribes would produce a definitive answer to the longstanding question of which ethnic group used certain portions of the study area; rather, PacifiCorp anticipated that the contracted studies would present known and newly acquired information from "oral history" that will contribute to a better understanding of past occupation

and/or use of these areas by multiple ethnic groups at various times prior to contact. PacifiCorp has synthesized the results of these contracted studies in this Exhibit E.

Identifying the Prehistoric Distribution of Ethnic Groups

A key research domain addressed in this study is the identification of attributes of ethnic association relative to the distribution of prehistoric cultural resources in the Upper Klamath River basin. Identification of ethnic groups that lived in the study area can be achieved through archaeology and specialized subdisciplines.

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 to 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. An important goal of the pedestrian field survey was to observe and record ethnically diagnostic or culturally distinctive artifacts and materials that shed light on the ethnic association of study area sites and/or the nature of prehistoric trade and exchange systems operating in the study area.

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, for many of these villages were occupied year-round, and fishing continued through the winter months. The "winter lodges" consisted of semisubterranean 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 semipermanent 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.

The Shasta occupied pit houses in small (about two- to three-family) winter or year-round villages where creeks entered the Klamath and other rivers. The rectangular houses measured about 16 by 20 feet and were excavated to a depth of 3 feet. Roofs were steeply sloped and made from split-board planks. A fire pit was located at the center of each dwelling. Each village usually had a small sweat lodge made of arched willow branches and pine bark slabs and skins. Larger villages usually featured an assembly house. The assembly houses were of similar construction to the dwelling houses but on a larger scale, typically measuring 20 by 27 feet and excavated to a depth of 6 or more feet (Silver, 1978). When temperatures climbed in the spring, the Shasta people left their permanent winter houses for brush shelters in shady areas along the rivers. As fall came, they moved into the mountains where they sheltered in small conical bark

structures while they gathered acorns, before returning to the permanent village. The Shasta Valley Shasta also used multifamily conical dwelling houses throughout the year (Voegelin, 1942). This pattern may be anticipated in the Klamath River region as well.

Upper Takelma winter houses were rectangular and semisubterranean, with walls of vertically set boards and gabled roofs (Kendall, 1990). As with the Shasta peoples, the summer dwellings of the Upper Takelma were constructed from brush.

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.

The Shasta used a variety of resources, including plant products and wildlife. In April, they built fishing platforms at named locations and blessed them with ceremonies that used wild parsley (*Perideridia* sp.) (Theodoratus et al. 1990). They performed rituals to honor the first fish and piled rocks to form pools—again, at named locations—for running fish to rest in quiet waters. Rituals also accompanied fishing in the pools. The Shasta consumed fresh salmon and also smoked them to store for winter use. Other river resources included freshwater mussels, which were steamed in rock-filled earth ovens. Plant products, including bulbs, tubers, berries and seeds, came from the hillsides along the Klamath River during the warmer seasons (Theodoratus et al. 1990). Fall resource collection included acorn harvest and deer hunting in the mountains above the river valleys.

Upper Takelma resource use mirrors that of the Shasta and other Californian groups. The acorn was the primary food, in addition to other vegetable foods such as camas bulbs and various seeds and berries (Kendall, 1990). River resources and terrestrial mammal hunting supplemented the diet.

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 Indian 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 Project area?
- 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/micro-fossil 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 relative minimum number of individuals (MNI) and number of individual species present (NISP) frequencies in contingency arrays and by measuring the association and dependence between taxonomic categories and spatial location.

Identifying Prehistoric Site Function and Organization by Site Type

Sites, whether single, multicomponent, 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 the Project archaeologists and members of the CRWG. 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, Klamath seasonal base camp, Shasta permanent village, or Klamath permanent/seasonal village)
- Bedrock mortars or other milling features (such as groundstone)
- Rock art and/or spiral rock alignment or stacked rock sites (isolated or in association with the three site types above)
- Lithic quarry/source
- Burial/cremation grounds, cemeteries, or isolates

Site types that do not fit these categories may exist and will be classified based on their recorded patterns. These may include cultural heritage 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
- Paleo-environments
- Physiography and geomorphology
- Geochronology, sedimentation, and stratigraphy

Previous research domains have identified several data requirements that have implications on interpretations of site function and classification of site type. Two data sources (obsidian hydration and lithic tool wear pattern analyses) are being considered, although no artifact collection was conducted for the initial field work (limited to the pedestrian survey).

Obsidian hydration dates may help identify components at sites in the study area. Singlecomponent 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. Multicomponent sites, representing three or more similar or different activities or events through time and space, are subject to the same restrictions on interpretation as twocomponent 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 to determine 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. This section of Exhibit E will be expanded once the tribal reports have been finalized, following oral history interviews and data collection by tribes in the study area. Of interest will be data on food harvest, life-crisis events, and curing. Special spaces believed to hold supernatural qualities include 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 concern that are to be cared for and protected from disturbance.

The appearance of Euroamericans 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).

E6.1.2.3 Area of Potential Effect (APE) and Field Inventory Corridor (FIC)

In the course of study and in the interim between the draft license application and this final application, PacifiCorp has refined the proposed Project. The proposed Project begins at the J.C. Boyle Development and continues downstream to the Iron Gate Development. The Spring Creek diversion is now included in the proposed Project as part of the Fall Creek Development. Several other tributaries and access roads have also been added to the proposed project boundary. The East Side, West Side, and Keno developments are no longer part of the proposed Project.

Cultural resource studies for federal Projects typically start by determining the area where the proposed Project has the potential to affect cultural resources, or area of potential effect (APE). Because of uncertainties and considerable disagreement among tribes and agency stakeholders regarding how far Project effects to archaeological resources extend, the APE was not delineated before archaeological pedestrian surveys commenced. Instead, a field inventory corridor (FIC) was delineated in consultation with the CRWG, and surveys were conducted within the FIC. Following final determination of the proposed Project, the APE was delineated in December 2003 (see Appendix E-6A). The APE includes all proposed Project hydropower facilities, recreation sites, proposed wildlife enhancement lands, and river reaches between Project developments. The criteria used to define the APE consists of all lands within the current FERC Project boundary under the existing license, all lands within the proposed FERC Project boundary for the new license, and river reaches below each Project development. Many of the CRWG members, including the tribes, feel the APE should be considerably larger than described above. While the pedestrian survey within the FIC covers the majority of the APE, the Spring Creek diversion and several tributaries and access roads within the proposed FERC boundary will be surveyed in the summer of 2004.

A pedestrian survey on lands within the FIC that had not been previously surveyed to adequate modern standards was conducted by PacifiCorp's archaeological consultants, with the exception of inaccessible private lands, private lands the field crew was denied permission to access, and some lands managed by the U.S. Bureau of Land Management (BLM) that BLM may survey in the future. Private lands that were not inventoried are limited to the upper canyon areas in Oregon and below the Keno reservoir. Private lands below the J.C. Boyle dam were inaccessible and could not be safely surveyed, even if permission to access the areas had been granted to the

field crews. Both the 2-mile stretch of the Klamath River between J.C. Boyle reservoir and the Keno dam within the FIC (but on private lands) and portions of the inaccessible private lands are inside the Project APE.

A small portion of BLM land in Oregon below J.C. Boyle dam to the J.C. Boyle powerhouse was inventoried by PacifiCorp's archaeological consultants in June 2003. Also, as part of its River Management Plan, the Klamath Falls BLM Resource Area Office conducted a pedestrian survey of properties controlled by the BLM and located within the Klamath River corridor.

Within the Klamath River Canyon, BLM coordinated with other private entities, including tribes and PacifiCorp, and completed additional work within the FIC. The remaining accessible reaches on BLM-managed lands were surveyed by a BLM-hired consultant in late 2003. Pedestrian survey results are expected to be released in 2004 (sometime soon after submission of Exhibit E to FERC). The BLM Klamath Falls Resource Area archaeologist has indicated that the results of the BLM survey will be provided to PacifiCorp once they are available.

Once a site was discovered within the FIC, the crews tried to collect adequate information to prepare a site report on state site forms and, if possible, to propose a preliminary assessment of the site's National Register of Historic Places (NRHP) eligibility. If a preliminary NRHP eligibility assessment could not be made, the results of the survey will be used by PacifiCorp and the Cultural Resources Work Group (a working group of tribal and agency stakeholders, PacifiCorp and its consultants) in 2004 to suggest future field or archival work that would be necessary to determine NRHP eligibility.

The CRWG defined the FIC to encompass the current FERC Project boundary, riparian and hydrologically connected areas along Project-affected reaches, and culturally sensitive lands within the Klamath River Canyon from ridgetop to ridgetop (rim to rim). Relicensing studies (see Section E6.1.6 and the river geomorphology portion of Section E3.0 of this license application) indicate that ramping rates and flows within PacifiCorp's control from Iron Gate dam have little to no effect on downstream riverbank erosion beyond Interstate 5. Therefore, PacifiCorp does not propose any additional cultural resource field work beyond the lower FIC, at Iron Gate hatchery just a short distance downstream from Iron Gate dam.

The FIC is shown in the confidential Cultural Resources Final Technical Report (FTR) (PacifiCorp, 2004) filed with FERC as part of PacifiCorp's application. The FIC and other confidential archaeological data presented in the FTR are protected from public disclosure by law (Section 304 of the National Historic Preservation Act; Section 9(a) of the Archaeological Resources Protection Act; Executive Order 13007; Section 6254.10 of the California State Government Code and other authorities).

As of December 2003, archaeological properties in the project FIC included 165 sites. An additional 158 isolated finds also were recorded in 2002 and 2003. Results from the archaeological field inventories are discussed in the following two sections, for both the prehistoric and historical periods.

E6.1.3 Inventory of Prehistoric-Period Cultural Resources

Results from the prehistoric investigations include prehistoric sites from a variety of chronological periods, with variable functions, and further information for understanding the prehistoric settlement, subsistence, and trade in the immediate region. Owing to the sensitive nature of this information, it is considered confidential and is available only to appropriate parties. Specific data that direct discussion of regional research questions are summarized in the Cultural Resources FTR (PacifiCorp, 2004). These include information on prehistoric artifacts from both archaeological sites and isolated finds recorded in the FIC.

E6.1.4 Inventory of Historical-Period Cultural Resources

Historical-period archaeological resources and standing structures were encountered during archaeological inventory. These include historical-period sites and sites that include both a historic and prehistoric component. Historical themes represented at these sites include logging, utilities, settlement, ranching, irrigation, and transportation. Owing to the sensitive nature of this information, it is considered confidential and is available only to appropriate parties. Specific data are summarized in the Cultural Resources FTR (PacifiCorp, 2004).

E6.1.5 Traditional Cultural Properties and Ethnology

Indian uses of the Klamath River drainage and its natural resources developed over many centuries. The tribes—Klamath, Modoc, Yahooskin Band of Snake Indians, Shasta, Hoopa, Karuk, and Yurok (see Figure E6.1-2)—resided in the Klamath River drainage since time immemorial. They learned to efficiently use the natural bounty of their territories, basing their culture—including lifeways and ceremonial practices—on hunting, fishing, and gathering. The Klamath Hydroelectric Project falls within the territory of the Klamath, Modoc, Yahooskin, and Shasta and also affects the Klamath River, which is of central importance to these tribes and to the downriver Karuk, Hoopa, and Yurok tribes.

Strong social, cultural, and economic ties have always linked the tribes of the Klamath Basin, based in large part on a shared reliance of the region's rivers and associated resources, particularly salmon. This reliance extends well beyond subsistence and commerce to the cultural and social fabric of their societies, as evidenced by their traditional ceremonial and spiritual practices, which focus on the rivers and the fish, wildlife, and vegetation they support. For the Indians of the Klamath River region, interaction and identification with the natural environment so defines everyday and spiritual life that the river's degradation has had a profoundly devastating impact on their cultures.

Salmon far exceeds other resources in its importance to the diet and culture of the Klamath River tribes (Swezey and Heizer, 1977; Warburton and Endert, 1966). Abundant salmon has always been an important measure of tribal well-being, where feasting is not simply an exercise in eating, but has deep-rooted connections to the vitality of the earth and a traditional connotation of community health (Gunther, 1926). The timing and cycle of many tribal economic, social, and religious practices has followed the seasonal and geographic variations in fish runs, particularly the arrival of the year's first salmon. Despite natural variations in the size of the semiannual salmon runs, in times past the tribes could usually obtain enough salmon for their people. The

abundance of fish once supported by the region's rivers is well documented. Fishing was highly efficient (Swezey and Heizer, 1977), owing to the natural abundance of fish and to native technology that enabled both intensive use of the fisheries and adequate propagation of the fish species (Roberts, 1982).

The tribes shared a spirit of cooperation in their use of the region's fishery resources. For example, salmon runs historically were protected by a very strict series of traditional laws and practices prohibiting over-fishing and ensuring that only the amount needed by tribal communities was taken. Fish weirs were opened for an extended period during harvest time to allow upstream people to receive a share of the salmon and to ensure that adequate numbers of salmon could reach their spawning grounds. Other traditional management activities included the clearing of smaller tributaries to facilitate fish migration. Traditional tales that have been passed on by the elders warned against eating too much and wasting food, lest it run out, and the tribes' belief systems have stated that the salmon would be withheld if they were abused or mistreated (Lewis, 1994).

The Klamath River fisheries have been an essential part of the economy of the region's tribes since before the arrival of Euroamericans and continue to be so today. The sharing, trading, and consumption of fish were so important that fishing places were acquired as property. Food preservation methods were developed, allowing fish to be stored throughout the year and transported over great distances. Trade, which involved both necessities and luxuries of native life, existed because of the variation in available local resources. Fish were traded in substantial volume, enabling the tribes to acquire food, raw materials, and manufactured goods. Although salmon runs upstream currently are blocked by Iron Gate dam, salmon continues to be an important economic resource for the Klamath River tribes living downstream and an important cultural resource for all tribes living in the Klamath River drainage. Currently the Klamath Tribes are pursuing efforts to have the salmon restored to the Upper Basin of Klamath and Agency lakes and the Williamson, Sprague, Sycan, and Wood rivers. The Klamath Tribes believe that it is the responsibility of PacifiCorp and the federal government to restore this valuable cultural and economic resource.

E6.1.5.1 Klamath Tribes

Information on the Klamath Tribe generally includes the Modoc tribe and the Yahooskin Band of Snake Indians who, since the signing of the Klamath Treaty of 1864, constitute the Klamath Tribes. In the Klamath Treaty of 1864 with the United States, the Klamath, Modoc, and Yahooskin Band of Snake Indians aboriginal territory is described as follows:

Beginning at the point where the forty-fourth parallel of north latitude crosses the summit of the Cascade Mountains; thence following the main dividing-ridge of said mountains in a southerly direction to the ridge which separates the waters of Pitt and McCloud Rivers from the waters on the north; thence along said dividing-ridge in an easterly direction to the southern end of Goose Lake; thence northeasterly to the northern end of Harney Lake; thence due north to the forty-fourth parallel latitude; thence west to the place of beginning.


Figure E6.1-2

11 x 17

back

Most of the following information comes from Stern's (1998) summary article in the Handbook of North American Indians. Anthropologists classify the language of the Klamath and Modoc into the Plateau Penutian family (Stern, 1998).

Klamath ancestral territory stretched from the southern boundary of the Deschutes River watershed east to encompass the Sprague River, as well as Sycan River and Sycan Marsh (Berreman, 1937; Spier, 1930). On the west, the Klamath occupied up to and into parts of the Cascade Mountains; to the south, their territory included the Klamath Valley downriver as far as Shovel Creek, below the Oregon and California border (Spier, 1930). Spier identified five geographic subdivisions of winter villages, as listed by Berreman (1937) and discussed by Stern (1998):

- Klamath Marsh-Williamson River group: located on the southern margin of Klamath Marsh and the Lower Williamson and Sprague rivers (about 34 villages, plus four to five villages on the upper Sprague and Sycan rivers)
- Agency Lake group: located on Agency Lake and the northern arm of Klamath Lake (one village and one hamlet)
- Lower Williamson River group: located close to the mouth of Williamson River (about seven villages)
- Pelican Bay group: Pelican Bay district on the west side of Klamath Lake, Four Mile Creek, and the marsh north of the lake (about eight villages)
- Klamath Falls group: located along Klamath Lake south of Modoc Point (about 14 villages)

Modoc territory is described by ethnographer Verne Ray (1963):

The western line was that of the Cascade Divide, extending from the summit of Mt. Shasta northward to within two or three miles of the present California-Oregon border. The northern boundary ran from this point northeasterly to the region of Hildebrand and Yainax Butte, continued easterly to the region of small lakes south of Quartz Mountain, and southeasterly to Goose Lakes, again at the Oregon-California border. The boundary emerged from the lake at its southern extremity, then followed a southeasterly direction to Mt. Shasta. Goose Lake was shared with the Yahuskin Paiute.⁴

The western line of the Cascade Divide that extends northward from Mt. Shasta to within 2 or 3 miles of the California-Oregon border is in the approximate location of Iron Gate dam. In addition, the areas known as Hildebrand and Yainax Butte are located near the small town of Sprague River, Oregon. Prior to contact with Euroamericans, the Yahooskin shared the eastern territory of both the Klamath and Modoc aboriginal lands. However, for the most part they inhabited the Great Basin area beginning on the southeastern shore of Goose Lake and northeasterly to Harney Lake; then north to the forty-fourth parallel, then west to an area south of Bend, Oregon; and then southeasterly to the southwest shore of Goose Lake. With the signing of the Klamath Treaty of 1864, the Klamath and Modoc tribes and the Yahooskin Band of Snake

⁴ The Yahooskin Band of Snake River Indians.

Indians were moved onto what was known as the Klamath Reservation. Within the Klamath Reservation lies the headwaters/watershed for the Klamath River. The Williamson, Wood, Sprague, and Sycan rivers all lie within the boundaries of the Klamath Reservation, within which Klamath tribal members have reserved the right to hunt, fish, and gather.

Overview of Klamath, Modoc and Yahooskin Cultural Practices

Klamath tribal members continue to use various resources from their territory, moving in an annual round of fishing, gathering, and hunting. Prior to the establishment of the Klamath Reservation they favored permanent winter villages where fishing could take place during the coldest months and lived in varied-sized settlements that lined the area's waterways. Permanent villages were never totally abandoned, housing elderly and disabled people throughout the year and periodically receiving stores of harvested resources for use during the winter's period of snows and primarily dormant resources.

Villages included various types of structures, such as earth lodges for families and extended families, along with tule and cattail mat wickiups that were used for cooking, housing the aged, and other activities. Semisubterranean sweat lodges, summer sun shades, and storage pits also were common elements found in villages. Cremation grounds lay near larger villages.

The Klamath used tools made from a variety of materials, including obsidian and cryptocrystalline stones for projectile points and cutting blades and volcanic stones for pounding (mortars and pestles) and grinding (manos and metates) work. Men wedged planks out of ponderosa pine trees to cover winter lodges. They burned the pine logs and hollowed out the charcoal with elk antler picks and wedges to make shovel-nosed dugout canoes. The men also worked juniper and yew wood to make bows. Arrow shafts came from reeds, while mountain mahogany produced foreshafts, spears, and digging sticks for women to gather roots. Women twined baskets and cordage from nettle fibers, Indian hemp, tule, cattail, willow, and other plants. Tule and cattail twine made household containers and some items of clothing, while willow shoots made burden baskets. Women tanned hides to make warmer clothing.

The Klamath considered fall to be the beginning of the year, when they rebuilt their winter lodges, celebrating with a dance and feast. They constructed the winter lodges above shallow pit excavations that ranged from 12 to 35 feet in diameter and 1 to 4 feet deep, raised a post frame, and covered it with planks or poles, mats, and earth, with a central roof entrance. Owned by wealthier leaders, the earth lodges housed several families. Mat lodges, which were distinguished by lighter construction and a side entrance, also were used in winter, as wickiups sometimes were. Wickiups were light frameworks of branches, covered with mats or, later, cloth.

Fish, the primary foodstuff, could be taken almost anywhere in Klamath territory. The Williamson River is one where fish can be caught year-round. For this reason the greatest number of settlements cluster on the river. The runs of fish began in the early spring and lasted well into the fall (Spier, 1930). Prior to the construction of the Klamath Hydroelectric Project dams on the Klamath River, salmon ascended the rivers twice a year, once in June and again in the autumn (Gatschet, 1890; Spier, 1930). Paiute peoples (Yahooskin Band) used salmon prior to and after Euroamerican contact and continued to do so until construction of the Klamath Hydroelectric Project.

As winter brought deep drifts of snow, the Klamath relied on supplies stored in communally excavated pits. They also jack-lighted waterfowl and fish where lake waters remained unfrozen and fished in these locations and through holes in the ice. Hunters used snowshoes to go after deer and elk. Parties of hunters attacked hibernating bears in their dens. During winter, the Klamath shared tales of legendary times that were useful in instructing children on correct behavior and in entertaining listeners. Shamans working together conducted ceremonies for the winter solstice.

Klamath men, with some assistance from women, fished throughout the year from the banks or from canoes using long-handled dip nets, spears, harpoons, and some hook-and-line angling. In fish drives, individuals drew triangular nets on A-frames or purse nets through the water by foot or from canoe or tule boat, while others drove fish toward them. Gill nets also were drawn between canoes or set out in shallow water, while traps were set in swift streams to catch trout. Stone barriers on some streams caused eddies that facilitated fishing. The legendary Klamath world changer Gmukumps built the barriers during legendary times. Women pounded dried salmon to make *kamalsh*, a dietary staple for the Klamath and Modoc (Deur, 2003).

A ceremony to celebrate the return of *c'wam*, or Lost River suckers, and other fish species was held at *gomeski*, a place on the lower Sprague River, where Gmukumps is said to live. The fish made large runs up the Williamson, Sprague, and Lost rivers near the end of March (Klamath Tribes, 2003). Lost River suckers, shortnose suckers (*qapdo*), and salmon (*c'iyals*) have been very important staple foods for the Klamath, Modoc, and Yahooskin people.

Most Klamath left their winter villages in early spring to begin their seasonal round of harvest activities. During the warmer months of the year, people used small, tule and cattail mat-covered wickiups. Sturdier summer lodges, used where longer activities took place, consisted of plank-covered wooden frames with a side entrance. In March, people harvested the run of large suckers in Upper Klamath Lake. They dried the fish on the branches of pine saplings and sometimes pounded the dried fish into a meal and bagged it for storage and later use.

As the spring sucker run subsided, Klamath and Modoc women turned their attention to digging ipos (*Carum oregonum*) roots, gathering waterfowl eggs, and scraping the cambium layers of young ponderosa pines for food. The Modoc placed more emphasis on the desert parsley (*Lomatium canbyi*) than the Klamath did. By late spring, women dug camas bulbs in wet meadows, baking them in earth ovens and sun-drying them for storage. Men hunted waterfowl and game animals.

Summer was the season when women harvested the staple *wocas*, the nutritious seeds of the yellow pond lily, at Klamath Marsh, Sycan Marsh, Tule Lake, Lower Klamath Lake, and other water bodies. They processed the seeds for soup and flour. A shaman conducted a ceremony at the beginning of the harvest. Women also collected cattail roots for drying and grinding into meal while men were hunting. They took waterfowl with set nets and by shooting from canoes. They also caught a variety of small mammals.

In fall, the Klamath gathered chokecherries, serviceberries, Klamath plums, pine nuts, blackberries, and gooseberries. They dip-netted whitefish and then moved into the western Cascades high country as huckleberries ripened. Women dried the berries before fires, while men

hunted deer and elk and trapped furbearers. Deer hunting methods included stalking and driving the animals into the lakes, rivers, or confined spaces where they could be clubbed by women in canoes or shot with bows and arrows. The meat was dried for storage (Spier, 1930).

Each Klamath group of villages maintained one or more places for cremation, where ashes of the dead were covered with soil and rocks. Individuals dying away from home might be interred within piles of rocks or cremated and returned to the cremation ground. Particular sweat houses, said to have been built by Gmukumps, and one hot spring served to cleanse the mourners.

The Klamath afterworld lies westward beyond a legendary mountain. There, spirits live in an order that reverses earthly life; they occasionally return to earth as ghosts and sometimes take away grieving relatives or friends. More local spirits dwell in uninhabited mountainous areas, especially in the waters. They sometimes take on the form of birds, animals, reptile, fish, plants, and natural phenomena, as well as legendary anthropomorphic figures such as Little Boy, Little Old Woman, elves, giants, and others.

In legendary times, the changer Gmukumps or Mythic Old Man peopled the world, which had been transformed to its present form by Gopher. Gmukumps built stone fish dams and mourners' sweat houses and also created pictographs. The Klamath first sucker ceremony took place at Gmukumps's former dwelling. He is thought to be responsible for earthquakes. Other prominent figures include Pine Marten, Mink, his spoiler brother Weasel, Split-Boy, Skunk, Little Boy, and Raven.

The Klamath sought supernatural power by visiting places where sacred beings resided and gained their power through ritualized activities such as running and piling stones. Particular powers dwelt in certain places. Klamath and Modoc parents sent boys, and girls, on a power quest when they reached puberty. Fathers sometimes sought power at the birth of a child or death of a wife or child, and those mourning kinsmen did the same. Seekers of power often sought specific competence such as luck in hunting or fishing, war, love-making, gambling, footracing, or curing. Seekers of power went alone into the mountains for 5 days to fast, pile rocks, wrestle with trees, run, perhaps take sweat baths, and climb hilltops to sleep. Power might come in the form of a dream or a visit by the spirit, followed by the seeker waking with blood in his mouth or nose and a personalized spirit song in his ears.

Specifically, shaman, mourners, and gamblers sought power by swimming in the deep river eddies. During the day, the seeker sweats and fasts, waiting in the brush until nightfall. He then goes to the river and dives to the bottom in search of the spirit. He must not be frightened even if he sees something moving under the water. He prays before diving, "I want to be a shaman. Give me power. Catch me. I need the power." Sometimes he comes up unconscious, blood streaming from this mouth and nose (Spier, 1930).

Shamans performed important ceremonies in midwinter gatherings, first-fruit rites for wocas gathering, and other occasions. They provided spiritual and practical support during warfare. Men and a few post-menopausal women could become shamans and needed to undertake multiple quests to acquire more powerful and larger numbers of spirits.

Novice shamans received their initiations together in midwinter ceremonies. Over a 5-day period, helpers worked with shamans to call spirits, interpret the messages they gave through the shaman, and lead the audience in singing the shaman's sacred songs. The shaman danced and performed magic. Shamans, with their assistants, also cured lesser illnesses by laying on hands. They addressed greater problems by sucking out one or more disease objects. Various spirits helped in diagnosis or in finding lost objects when shamans were called on to act as clairvoyants or to help in controlling weather conditions.

Even before the appearance of Euroamericans in the early 1800s, the Klamath had received horses and guns, which facilitated their mobility. They extended their trade up to the Columbia River and raided the lands to the south to obtain slaves and goods. The Klamath began traveling to the Willamette Valley to work for American settlers. Pressure from American officials resulted in the designation of leaders and creation of factions between those influenced by the whites and others who rejected such influence. Both the Klamath and the Modoc, along with the Yahooskin Band of Northern Paiutes, signed the Klamath Lake Treaty of 1864, ceding most their territory—except for a much smaller reservation of land—and rights, including those to hunt, fish, gather, and access water.

Experienced traders, the Klamath took up freighting as an economic enterprise, started ranching cattle, and also processed and sold lumber on and off the reservation. People continued the subsistence activities as best they could, also using government annuity rations and working for the whites. Government officials worked to suppress shamanism as well as nativistic movements such as the Ghost Dance of 1870, while supporting the development of a Methodist mission. Despite these efforts, the Klamath Tribes exhibited considerable and well-documented persistence in their ceremonial and social traditions, particularly as they related to site-specific and resource-specific traditions. In an effort to turn members of the Klamath Tribes into farmers; in the 1890s the federal government allotted tribal members, lowland reservation lands suitable for farming and opened some upland forest to non-Indian logging.

Non-Indian logging provided income to the Klamath but undermined their work at cattle raising and other pursuits. Although the influx of whites in mill towns reduced the Indians to a minority in their own communities and subjected them to racism, over time the Klamath achieved economic self-sufficiency in their lands, paying for the government services they received. In controversial legislation in 1954, Congress terminated its trust relationship with the Klamath Tribes and the reservation; this resulted in a majority of the members withdrawing from the tribe and receiving a portion of tribal holdings. The trust account created for the rest of the members was later liquidated. Termination created devastating hardship for the Klamath in many ways, including the loss of their reservation, tribal government, and tribal identity; the withdrawal of federal services, assistance, and tax-free status; the loss of many cash settlements and property to opportunistic whites; the difficulty of assimilating into the non-Indian community; and the emigration to cities of unsupported Indians who were unprepared to seek manufacturing work.

In 1974, the federal government condemned thousands of forest acres that had been the Klamath Reservation homeland and subsistence areas so that the forest land could be added to the Winema National Forest (Klamath Tribes, 2003; Ruby and Brown, 1992). During the latter part of the 20th century, the Klamath sued the federal government for compensation for loss of their treaty-ceded lands, mismanagement of reservation land and resources, to obtain recognition of

the tribes' rights, and other reasons. As resource and land development increased through the 20th century, the Klamath experienced large-scale degradation of the habitat and resources that once sustained their culture. Salmon were extirpated from the vast majority of their traditional territories, suckers have been listed as endangered species, and the populations of deer and wocas plants have been decimated. The Klamath Tribes' once-staple fishery of suckers has been reduced since 1986 to a single fish each year for ceremonial use. The overallocation of water has severely reduced its availability for natural habitat and resources.

The Klamath accomplished restoration of federal recognition of their tribal status in 1986 and began to rebuild their tribal government, economy, and community. Except for the reservation, other treaty rights remain, supporting the Klamath Tribes, which include the Modoc and the Yahooskin Band of Paiutes. For the tribal council, the Natural Resources Department conducts activities to protect natural resources and related treaty rights and restore the ecosystem. The Culture and Heritage Department works through tribal specialists to protect, preserve, and enhance traditional cultural values (Klamath Tribes, 2003). The Culture and Heritage Department's work includes language instruction, tribal ceremonies, culture camp for tribal youth, and resource gathering trips. One program component cooperates with government agencies, landowners, and developers to protect ancestral and sacred sites and landscapes. The Culture and Heritage Department has plans to operate a tribal museum and interpretive center. The tribe has taken over administration of health and education services for its members. Powwows and the World Championship Klamath All-Indian Invitational Basketball Tournament take place in Klamath territory. Following their cultural value of industriousness, the Klamath Tribes today pursue a variety of economic enterprises through their Economic Self-Sufficiency Plan

Klamath Ethnographic Study

Dr. Douglas Deur, consulting anthropologist, prepared the draft Klamath Tribes summary report (Deur, 2003), which focused on identifying sites and potential Project impacts on them in an area defined by the Klamath Tribes that emphasizes their traditional salmon fishing. The study area included the Klamath River riparian corridor between Link River and Iron Gate dam. In addition, Deur (2003) included areas upstream, such as sites on the Lost River, Upper Klamath Lake, Klamath Marsh, the Sprague River, and the Williamson River—sites that are important to the Klamath Tribes and are believed by the tribes to be affected by the Project. Klamath River corridor sites below Link River, especially in the Klamath River canyon, also are important to the Klamath Tribes, but information on traditional activities and sites was too diffuse for Deur to identify potential traditional cultural properties (TCPs) except Big Bend (although the whole area may warrant TCP status on a larger scale). Deur (2003) excluded from study any sites located downstream of Iron Gate dam because his Klamath informants offered little information about that area and because that area was being addressed in studies conducted by the Shasta, Karuk and Yurok tribes.

Deur's methods included literature review, ethnographic interviews and participant-observation ethnographic field work, and site visits. The work is based on formal and informal interviews with 32 tribal members. Deur's (2003) interviews focused on three points:

- Interviewees' knowledge of traditional cultural sites and practices from Link River to Iron Gate dam
- Interviewees' knowledge of Klamath and/or Modoc anadromous fishing stations and traditions in this area of the Klamath Basin (that no longer has anadromous fish runs, largely because of dams and hydroelectric facilities)
- Other information interviewees felt was salient to the understanding the items above, including, but not limited to, historical changes in the uses of certain sites and the present-day cultural significance of these sites to Klamath Tribes members

Upon completion of interviews and field visits, Deur analyzed the compiled information for content and recurring themes, focusing on the enduring uses and cultural importance of particular sites. He applied NRHP evaluation criteria to the sites and identified potential TCPs on the basis of their mention by multiple tribal consultants as possessing distinctive historical and cultural attributes, integrity, and enduring importance, including historical use for salmon procurement. Two categories of traditional salmon fishing stations were not included, although they also might meet NRHP criteria. These were historically important salmon-fishing stations that are not visited today and not described as holding other cultural significance, and those that are used for other fish resources or that received less emphasis in tribal consultant interviews.

Klamath tribal consultants identified traditional sites and activities throughout the Klamath River corridor. These included villages located at salmon fishing sites and/or villages associated with secondary resource procurement areas, ceremonial sites, and burials. The upper end of the corridor was very important for Klamath and Modoc occupation and use but has lost much of its integrity owing to a long history of Euroamerican development. The Klamath River Canvon, especially downstream from the confluence with Spencer Creek, was reported to have been an important center of settlement, salmon procurement, trade, and intertribal social activity. Klamath and Modoc traded products from the interior (obsidian and dried venison) with Shasta, Karuk, and downriver tribes in exchange for dentalium money shells, olivella (olive shell) and clamshell beads, and other maritime products. Slaves also were traded and raided from down the river. Events associated with the Modoc War in the 1870s took place in the Klamath River Canyon. While the Klamath River Canyon retains importance to the Klamath Tribes and is the setting for ceremonial and resource-harvesting activities, the culturally important places are geographically diffuse, leading Deur to conclude that the entire canyon area may warrant consideration as part of a historical district; however, Deur identified only the Big Bend area specifically as a potential TCP.

The Klamath Tribes study identified 10 sites that meet the criteria for designation as TCPs, three of which (Big Bend, Link River, and Miller Island oxbow) are located within the Project area of potential effect and seven of which are located upstream of it. Five of the sites that meet the criteria for designation as TCPs (Chiloquin Forks, Braymill/Cave Mountain, Beatty Springs, Knapp's Dam/Williamson River Canyon, and the mouth of Wood River) are important traditional salmon fishing stations. Three other sites that meet the criteria for designation as TCPs (Klamath Marsh/Wocus Bay, Olene Gap, and Rocky Ford) are included, according to Deur (2003), "to illustrate the broad distribution of potential lacustrine and riparian TCPs in the upper

reaches of the Klamath Basin that might warrant inclusion within a broadly defined 'riverscape' historical district."

Deur's information demonstrates the cultural importance of these places for a variety of traditional uses and sites, including settlements; fishing, hunting, and resource gathering; burial or cremation of the dead; petroglyphs; legendary and oral history associations; ceremonial and religious activities; social gatherings; historical event and figure associations; and youth education.

Deur's report demonstrates that salmon constitute a sensitive cultural resource (SCR) and are important for a variety of reasons. Salmon have figured into the diet and economy as a staple and as a focus for intra- and intertribal social gatherings and trade. Use of these fish maintained the health of the Klamath Tribes, and salmon have been featured in legends, teachings, and religious and ceremonial observances. Salmon retains importance to the Klamath Tribes in that the salmon-fishing stations are used for ceremonies and for education of tribal youth. Tribal members participate in ritual activities aimed at "bringing back the salmon"; the Klamath tribal government explores legal and administrative options to achieve this goal; and its Natural Resources Department works on ecosystem restoration (Deur, 2003). Other SCRs include suckers, trout, mullet, freshwater shellfish, waterfowl species and birds' eggs, deer, wocas, and tules, among others.

Archival and ethnographic research revealed several ethnographic places of the Klamath Tribes located within or near the Project area. Included among the consulted documents were the ethnographic site survey forms prepared for the City of Klamath Falls (1985) as part of the proposed Salt Caves Hydroelectric Project. Research included oral history interviews and site verification in the field. Theodoratus et al. (1990) conducted a comprehensive review of the ethnographic literature, archival materials, and historic documents pertaining to the Project area. Several known sites within Klamath Canyon were visited as part of this work. A summary of Klamath Tribes ethnographic places is included in the confidential FTR (PacifiCorp, 2004).

The Klamath Tribes' report discusses Project impacts in terms of how the facilities have historically impeded anadromous fish passage to numerous traditional fishing stations, inhibiting the use of those sites for salmon fishing (Deur, 2003) and other traditional cultural activities and reducing site integrity. Health problems have been attributed to the loss of the aboriginal diet, which included ready access to salmon. The loss of social and ceremonial activities surrounding salmon has prompted tribal consultants to suggest, according to Deur (2003), that "the impediment of salmon passage essentially 'killed a way of life.""

Tribal consultants expressed particular concern about the impacts of Project operation in the Klamath River corridor, especially about traditional use of the Link River TCP. They state that Project infrastructure creates physical and visual impacts that detract from ceremonial and other uses. Expanding these facilities would further threaten the integrity of traditional uses and the Link River site. Frequent flood events could exacerbate the erosion of culturally important archaeological sites at the Big Bend TCP. Tribal consultants also would be concerned about the impacts of any expansion of Project infrastructure along the canyon rim at Big Bend. The reduction of natural seasonal fluctuations of water levels has affected the production of culturally important plants such as wocas and tules.

Deur's (2003) consultants suggested some protection, mitigation, and enhancement measures. These include changing the current management of Project facilities to restore salmon populations in the upper Klamath Basin (which could allow the resumption of traditional fishing and other cultural activities, thus increasing and ensuring the integrity of the associated sites). These also include avoiding expansion of (or even reducing) Project infrastructure at Link River, which would protect or increase the site's integrity. Finally, restoring seasonal water level fluctuations to near historical baseline conditions would enhance the persistence of wocas, tules, and other important plants.

The continued absence of salmon in the Upper Klamath Basin continues to diminish the integrity of sites that meet the criteria for designation as TCP's. In addition the absence of salmon in the Upper Klamath Basin continues to erode the traditional lifeways, economy, health, and culture of the Klamath, Modoc, and Yahooskin peoples.

E6.1.5.2 Shasta

Much of the information on the Shasta provided here is summarized from Silver (1978), which in turn comes from Dixon (1907), Voegelin (1942), and Holt (1946). Shasta groups are Hokan-speakers, resident in northern California and southern Oregon. One of the names for this group comes from the Oregon Shasta of Jackson and Klamath counties and translates as "from down the canyon." Shasta groups share a common language and an aboriginal territory that includes part of the watershed of the Klamath River and its Shasta, Scott, and Salmon River tributaries. While practices differed between the Klamath River and other Shasta groups, information here focuses on the Klamath River Shasta, called the Wiruhikwaiiruka or Kammatwa (Daniels, 2003). Shasta territory consists largely of river systems located above an elevation of about 2,500 feet in forested mountainous areas. People along the Klamath River tended to locate their winter villages where streams flowed into the river. Villages had recognized territories with areas for each family, including fishing places with fish weirs along the Klamath, from Hamburg (California) downriver. Hunting territories also were held privately over the long term, in contrast to tobacco-growing plots and acorn-gathering trees, which were claimed only for brief periods.

Rectangular, excavated winter dwellings housed one or more families for the cold months. These houses measured about 16 by 20 feet and were built over an excavation 3 feet deep. They featured a steep roof, dirt sidewalls, and boards on the end walls. In spring and summer, the Shasta used brush shelters; for the fall acorn harvest, people lived in single-family bark houses and camped during forays into the mountains to hunt.

In addition to residential houses, large villages also contained a central, larger assembly house, constructed similarly to the dwelling house. Assembly houses measured about 20 by 27 feet and were built over an excavation about 6½ feet deep. They had an almost flat roof, dirt sides, and split-board walls. Villages along the Klamath River supported a men's sweathouse, which was similar to an assembly house but smaller and differently arranged at the door and the interior. Families owned small, dome-shaped sweat houses made of willow poles covered with slabs of pine bark and skins, which could be used by women for periodic cleansing.

The Shasta obtained a wide variety of foods from their territory, including plant products, mammals, fowl, fish, amphibians, and insects. Staples consisted of deer and acorns. Other game, where available, included bear, elk, antelope, Rocky Mountain sheep, rabbits, beaver, otter, and small mammals. Procurement methods were varied. Men tracked game animals and drove them into enclosures, smoked them out, and also used falls and traps. They used bows with foreshaft arrows armed with obsidian points for large game (and in war), while hunts for small game and birds employed headless, single-shaft arrows or those tipped with wooden heads or bone points. For deer and bear, hunters followed ritual activities and left offerings of paint and tobacco to foster success. Group hunts involved ceremonial praying, singing, and dancing.

Fishermen employed several types of nets, weirs and traps, hook and line, and spears. Anadromous runs included spring/summer Chinook salmon, starting in April, steelhead in August, and winter coho and chum salmon in early October (Daniels, 2003). The Klamath River Shasta waited to catch salmon until a member of a minority Shasta group called the Kammatwa caught the first one and performed a ritual. People could then catch and process the fish for storage but could not eat them until the Karuk performed the White Deerskin Dance ceremony. Fishers also took suckers, eels, crayfish, and turtles. In spring, women and children dove for mussels along the Klamath River, and women caught fish in basket traps. The Shasta traded with the downriver Karuk and Yurok to obtain clam, *haliotis*, and *dentalium* shell for ornaments and other uses.

Women collected a variety of foods in the warmer months, including roots, bulbs, seeds, berries, insects, and grubs. In addition to acorns and pine nuts, important roots and bulbs included epos, redbells, brodiaea, and tiger lily bulbs. Women collected wild celery, wild parsley, and wild rhubarb for fresh eating, drying, or both. Other vegetal foods included blackberries, elderberries, wild grapes, chokecherries, manzanita and madrone fruits, plums, and grass seeds. Nuts consisted of acorns from black, white, and canyon live oaks, along with those tan oaks that were traded from the Karuk and Yurok. Other nuts included those from gray, ponderosa, and sugar pine, as well as hazelnuts. Plant harvesters used grapple or straight poles in acorn and pinecone gathering, and digging sticks for roots. They stored dried goods in excavated pits and indoors in baskets and sacks.

Shasta stone tools included obsidian projectile points, knives, and scrapers; cylindrical pestles; soapstone receptacles; and serpentine pipe tips. People made scrapers, awls, wedges, stone working tools, and fish gigs from bone and antlers. They fashioned spoons from elk kneecaps and deer skulls. The Shasta worked deerskins well, making rawhide containers for seeds and small roots, as well as seed beaters. They carved pipes, food paddles, spoons, and digging sticks from wood. Men made arrows and sinew-backed bows from wood.

The Klamath River Shasta obtained most of their canoes from the Karuk or Yurok, although they hollowed sugar pine logs by burning to make canoes that were used along the river as far up as Gottville (California). The Shasta both imported and made baskets, using closework and openwork twining. Cordage and netting came from wild hemp, and deer snares from iris fiber.

The Shasta conducted war by raiding hostile villages to avenge such crimes as murder, rape, witchcraft, or an insult to a headman. Members of the war party selected the leader and held

dances before and after their raids and during negotiations for peace settlements. In addition to obsidian points, warfare equipment included armor of elkhide or woven sticks.

Important Shasta rituals included those for puberty, war dances, and initiating doctors. The Shasta sometimes attended Karuk, Hoopa, and Yurok dances. People performed personal rituals to bring luck in hunting deer, fishing, and love; to gain protection from grizzly bears and rattlesnakes; and to make rain.

The Shasta saw most sicknesses and injuries, except for colds, as caused by "pains," hatred, or ill will. Pains are spiritual forces existing in mountains and rocks, celestial bodies, and in a variety of animals; pains cause disease, death, and trouble. Doctors or shamans, who were almost always women, could cure these problems. Nightmares and dreams told individuals that they had the power to cure and came to them during a trance in which they learned their spiritual force and song.

Novice doctors trained by performing private and public winter dances. Doctoring paraphernalia included skins of deer, silver-gray fox, wolf, coyote, fisher, and otter; eagle tail and wing feathers; and yellowhammer and woodpecker tails. Equipment consisted of a pipe; red, blue, and yellow paint; and a special buckskin. Doctors and their assistants performed public curing ceremonies over two or three nights, during which the doctor sang and danced, blowing tobacco smoke over the patient to diagnose the problem. Upon determining the location of the "pain," the doctor sucked at it and recovered the object in her hand, then danced and disposed of it. Special doctors treated bites from rattlesnakes and grizzly bears. Doctors also could be hired to kill an enemy by shooting a "pain" into him, find missing persons and articles, and determine persons responsible for a killing. Outside shamanism, women also used herbs to care for illness and injuries.

Early Euroamericans participating in the gold rush and the Rogue River Indian wars of 1850-1857 pushed the Shasta from their fishing, hunting, and occupation sites by burning villages and shooting the people. A treaty made in 1851 but never ratified by Congress established a reservation in Scott Valley. During the Rogue River Indians wars, the Shasta in California helped those in Oregon, and in 1856 those remaining were removed to the Grand Ronde and Siletz reservations in Oregon. As contact with non-Indians continued to damage their traditional way of life, the Shasta welcomed the religious revivalist movements of the 1870 Ghost Dance, with its Earth Lodge and Big Head Dances, passing them on to other nearby groups, including the Karuk.

Between 1870 and World War II, most Shasta people in the Project area lived at the Frain Ranch or leader Bogus Tom Smith's Rancheria (Daniels, 2003). They continued the subsistence activities that were possible, conducted subsistence gardening, and worked as laborers on ranches. The Shasta visited among a number of rancherias for opportunities to speak their language, participate in community life, and receive support from family and friends.

Shasta Ethnographic Study

Brian Isaac Daniels, consulting anthropologist, prepared the draft preliminary Shasta TCP study, which discusses many important Shasta ethnographic places within or near the Project area

(Daniels, 2003). Daniels reviewed ethnographic information, archival documents, and existing oral histories to meet the following objectives:

- Assess the significance of Shasta cultural resources (TCPs/SCRs) within the study area, including their potential eligibility for listing in the NRHP, and recommend measures to be taken for the appropriate management of culturally important resources
- Identify and describe Klamath Hydroelectric Project effects on the Shasta Nation
- Prepare "public documents" for the relicensing process and the Shasta Nation and Tribe (Daniels, 2003)

Daniels also conducted oral history interviews with interviewees selected in consultation with the Shasta Tribe, Inc., tribal historian, Betty Hall.

Daniels' ethnographic sites include pre- and post-contact habitation, hunting, fishing, gathering, and spiritual/ceremonial sites. Additional archival and ethnographic research revealed a few more Shasta places of cultural significance. Shasta ethnographic places are summarized in the confidential FTR (PacifiCorp, 2004).

Although Daniels had not yet analyzed the ethnographic data sufficient to recommend TCPs and SCRs, his draft report points to the importance of certain sites. The Bogus Tom Rancheria has been important to the historical survival of Shasta people, including the Ghost Dance ceremonials (Daniels, 2003). Important salmon fishing sites included Wah'ah-ye and Po'-gas'koo' (Daniels, 2003). The Project area was the scene of dances associated with the Ghost Dance of 1870: "the *kimpi tcaduweu*, or Big Head regalia associated with the later manifestations of the Ghost Dance after 1874 were stored in a sweathouse near Copco" (Daniels, 2003). The Project area is important in contemporary spiritual activity, including vision quests, and is associated with the beginning of the Shasta people (Daniels, 2003). The subsistence and religious importance of salmon suggests that they constitute an SCR (Daniels, 2003).

Daniels had not yet analyzed Project impacts on TCPS or SCRs, or made recommendations for PM&E measures. He reported that the formation of Copco Reservoir submerged at least five village sites (Choo-pah^{'ch}-took, Ik'kweek, Tah-her'-ruk-kwe, Ho'-a-te-took', and Ah-soon-nah-ko-witch'-e-rah) (Daniels, 2003), and alterations to the river from mining and dams severely affected the salmon (Daniels, 2003).

E6.1.5.3 Karuk, Yurok, and Hoopa

The Karuk, Yurok, and Hoopa occupy territory downriver from the Klamath, Modoc, and Shasta, sharing a similar way of life, with relations and contacts (Wallace, 1978). Karuk territory stretches along the middle part of the Klamath River watershed, while Yurok territory runs along the lower part of the Klamath River to its mouth at Requa and along the Pacific Ocean coast, and the Hoopa homeland is the lower Trinity River drainage, the largest tributary of the Klamath River. The Karuk have a distinctive language that anthropologists group with the Hokan language family (Bright, 1978); Yurok language has been classified in the Algonquian family (Pilling, 1978). The Hupa language is part of the Athapaskan family (Wallace, 1978).

The Karuk, Yurok, and Hoopa share the distinctive northwestern California culture, and they are connected by marital, ceremonial, and trade ties. Many of their cultural sites and traditional activities have focused on the Klamath River (the Trinity River for the Hoopa), where they occupied winter villages and harvested salmon and other fish. Their annual rounds included harvesting acorns from oak groves and hunting in the upland areas, and the groups supplemented their diets by gathering a variety of plant products and hunting birds and small animals. Yurok subsistence differed in drawing on rich shellfish, fish, and sea mammal resources from the ocean and bays. Winter villages contained a number of plank houses, each with one or a few families, along with sweat houses and burial places. The tribes maintained communal fish weirs for use with the annual salmon runs.

The Karuk, Yurok, and Hoopa have conducted ceremonies, including the First Fish ceremony in spring, the Fish Dam ceremony in mid-summer, and the White Deerskin and Jump ceremonies held in fall every 2 years. The cultural significance of the Klamath River system and its sacred localities are represented in many of these ceremonies. Religious sites on the river are ancient and were designated by spiritual deities at a time beyond living memory. The tribes' ceremonies are of unique importance not only to the three tribes but to other Northwest California Indians as well. Prayers are directed toward the well-being of everyone, and food served is shared with all who attend.

In two major ceremonies celebrating world renewal, the White Deerskin and Jump ceremonies, the tribes honor the earth and the creator for providing sustenance and the continuance of the people (U.S. Fish & Wildlife Service et al., 1999). The White Deerskin ceremony is conducted at places along the Klamath River and its tributaries and involves river travel. The White Deerskin ceremony is held from late August into September, depending on the river and its waters. The Jump ceremony follows after the conclusion of the White Deerskin ceremony. The tribes bring salmon they have caught at their fishing sites to share with the participants and attendees and offer them for the ceremony. The Boat ceremony forms part of the White Deerskin ceremony, celebrating the flows and health of the rivers.

The Jump ceremony also is held for the good of the world, has its own dance steps, songs, and regalia, and involves daily feasting. The completion of the Jump ceremony signals a blessing for the year to come, that everyone may be satisfied with small quantities and have their needs met. Both the White Deerskin and the Jump ceremonies depend on a healthy Klamath River system for fish, basket materials, bathing, and ambiance. The flows of the rivers are also a central element of these dances as they influence the dancers' ability to travel the rivers as did their ancestors.

The Brush Dance is held to cure a sick baby or child. The dance name is based on part of the ceremony, which requires filling quivers with willow brush that grows along the river. At Brush Dances there are designated camps for the Yurok, Karuk, and Hoopa people. The Hoopa traditionally bathe in the Trinity River each morning of the dance, and baskets made with materials from along the river are used in the ceremony. The purpose of the Flower Dance is to train a girl who has just reached adolescence to lead a good life as an adult woman. The girl traditionally bathes at sacred places in the river during training in the Flower Dance ceremony (Bennett, 1994).

The Karuk, Yurok, and Hoopa have engaged in trade along the Klamath River corridor, in which products of marine and lower river areas moved upriver to the Shasta, Klamath, and Modoc, while goods of the Plateau environment moved downriver toward the coast.

Karuk Ethnographic Study

The Karuk ethnographic study was withdrawn from use in this document per the request of Ron Reed, Karuk Tribal representative to the FERC relicensing process, to Todd Olson/PacifiCorp on February 3, 2004. This report and its findings are not provided because it has not been approved for inclusion by the Karuk Tribe. PacifiCorp will work with the Karuk Tribe to obtain their final report when the report is approved.

Yurok Ethnographic Study

Kate Sloan, Yurok tribal archeologist, prepared the tribe's draft ethnographic inventory (Sloan, 2003). Her work involves a review of Yurok cultural values and ethnographic literature as well as interviews with six Yurok elders that provide contemporary views of the traditional cultural importance of the Klamath River.

Sloan's (2003) work identifies the Klamath River as "the foundation of Yurok cultural, economy, and tradition." Important natural features associated with the river include water, fish, gravel bars, rock promontories and canyon walls, and willow/riparian, riverside, and upslope vegetation. Cultural features consist of ceremonial places, fishing places, domestic use of gravel and rocks, ritual use of rock promontories and canyon walls, gathering and use of vegetation, and habitation and burial sites. Other elements include views, boat and trail transportation, communications, oral history, and the presence of river-related elements in the Yurok language.

Sloan (2003) concludes that Yurok culture, like that of other tribes of the Klamath River basin, relies on the fishery and a healthy riverine ecosystem that is based on adequate flows of highquality water. The river is such a basic and pervasive presence that it bears no proper Yurok name, instead being identified by the characteristics of flowing and the temporary fish-harvest dams that were placed seasonally across the river at certain locations. Almost every part of the Yurok way of life is associated with the river, including the origin of fish, proper methods for taking them, how the river is to flow, death passage ceremonies, the locations of fish dams and ceremonies, and the transmission of Yurok culture to youth (Sloan, 2003). Because the Yurok have depended on the river for all aspects of their life, they feel bound by the directives of the Creator, regarded as Indian law, with a responsibility for good stewardship of the river and its resources. Sloan concludes that "healthy habitat, adequate and high quality water flows, and sustainable and abundant fish populations are of critical importance to Yurok culture" (Sloan, 2003).

Hoopa Ethnographic Review

Hoopa use of the Trinity River and its salmon and other resources developed over a long period of time, as evidenced by the complexity of their religious ceremonies and practices. Salmon returning to the Trinity River must pass through the lower Klamath River and are affected by conditions there. Excerpts from the Trinity River Environmental Impact Statement (U.S. Fish

and Wildlife Service, U.S. Bureau of Reclamation, Hoopa Valley Tribe, and Trinity County, 1999) provide most of the information used here.

The Hoopa and their traditions have developed in intimate connection with the Trinity River, which provides the foundation of their cultural and social way of life and is of unique value to the Hoopa (Risling, 1997, as cited in U.S. Fish and Wildlife Service et al. 1999). The river is a source of food and also provides basket materials, fish net materials, and a means of transportation for economic, social, and religious activities. The river is integral to the Hupa language and its oral tradition and represents the binding force of their community. People cooperated in the construction and use of fish dams to harvest the fall salmon run. All of the traditional Hoopa villages were built along the Trinity River, and even rocks from the river are used for traditional practices.

The White Deerskin, Jump, Flower Dance, and Brush Dance ceremonies exemplify the importance of Trinity River flows to the Hoopa people, including their material and social wellbeing. The continued practice of ceremonies represents an important means for keeping tribal members who live off the reservations connected to their culture and families. The Hoopa report that, while these dances and other religious ceremonies have prevailed in modern times, the decline of the Trinity River's health has made their practice increasingly difficult for Hoopa medicine people, dancers, and others. Salmon runs have been greatly reduced, as has the abundance of willow brush and other basket-making materials The adverse impacts of an unhealthy river extend beyond the fisheries to religious ceremonies, affecting—among others—tribal elders, newborn infants, and future generations.

In the past, federal regulations governing fishing on the Hoopa Valley and Yurok Reservations have permitted the taking of fish for ceremonial purposes even when the fisheries were closed to harvest. The poor condition of the in-river fishery in recent times has in some instances forced the Hoopa and Yurok to scale down or cancel some ceremonies or to purchase fish from sources off their reservations to feed those who attend the ceremonies. Without enough salmon, many do not come back; in addition, the planning of ceremonies—once a time to appreciate nature's abundance and a time of spiritual celebration—often brings significant anxiety (Nelson, 1996, as cited in U.S. Fish and Wildlife Service et al. 1999).

E6.1.5.4 Riverscape Regulatory Analysis

Dr. Thomas Gates, the Yurok Tribal Heritage Preservation Officer, prepared the draft regulatory analysis (see Appendix E6-B) for a potential NRHP-eligible Klamath River Ethnographic Riverscape (Gates, 2003). Districts are one of the five types of historic properties defined by the National Park Service, and cultural landscapes are one of the five kinds of districts. Further, there are five kinds of cultural landscapes; the ethnographic landscape type best fits the Klamath River corridor. Gates (2003) argued that the Klamath riverscape is a type of ethnographic landscape (hence, it is a type of historic property). He pointed out that river-associated historic properties have included bridges and dams that represent the concept of dominating or conquering rivers (by going across rivers with dams and bridges), while the riverscape would commemorate the river as a linear strip of relationships between people and river dynamics.

Gates reviewed literature about cultural landscapes because a cultural riverscape would be a type of cultural landscape, focusing on ethnographic landscapes, or landscapes "associated with a contemporary group because of the group's traditional relation to the landscape" (Gates, 2003). This analysis also addressed how a riverscape can apply to the Klamath River by discussing the identification of contributing landscape elements, the definition of boundaries, and the differences between cultural resources and natural resources. Gates provided a comprehensive bibliography, a literature summary, and a riverscape thematic outline.

Gates (2003) summarized the currently available guidelines for the identification and management of cultural landscapes, National Park Service programs for cultural landscapes, and important features about landscapes that have been identified under these programs. Both natural and cultural resources can be included in the definition of a cultural landscape, including plant communities and wildlife (Gates, 2003). Water and fish would be considered contributing elements to the ethnographic riverscape. An ethnographic riverscape report, as described by Gates (2003) would involve the following:

- Research to identify the continuum of historic period(s) (ethnographic overviews and synthesis)
- Research to identify historic-period(s) association(s) that contribute to understanding the riverscape's significance (oral histories)
- Surveys or inventories to identify contributing elements of historic-period associations
- Preparation of an existing conditions statement(s) for the landscape as a whole and for contributing elements
- Identification of those contributing elements that are less than adequate for contributing to the integrity (location, setting, design, materials, workmanship, feeling, and association) of the landscape as a whole

An Ethnographic Riverscape Management/Treatment Plan would articulate how the eligible ethnographic riverscape would be managed or treated in relation to preservation, rehabilitation, restoration, and reconstruction (Gates, 2003). By comparing the desired historic-period context(s) and the existing conditions, managers could plan a course of action to bring existing conditions into conformance with the desired continuum of historic-period context(s). As Gates (2003) explains, where there is a close fit between historic-period contexts and existing conditions, preservation becomes the management or treatment guideline. Where there is a significant difference between historic-period contexts and existing conditions (and it is desired to bring the two into conformance), reconstruction becomes the management or treatment guideline.

Gates (2003) discussed seven types of contributing elements: spatial organization and patterns; topography; vegetation; wildlife (including fish); circulation; water features; and sites, structures, and objects. Boundaries might be based on some combination of concepts such as watershed, viewshed, contributing element habitat, flood event, river under reservoir, land trails, arbitrary political boundaries, and arbitrary negotiated boundaries. Gates also discussed possible survey

inventory strategies and cultural input into the management of natural resources within a potential ethnographic riverscape.

Integration Report

PacifiCorp has contracted with the Klamath River Inter-Tribal Fish and Water Commission to produce an integration report that would be based on the results of the draft (or final) tribal studies produced on the Klamath, Shasta, Karuk, Hoopa, and Yurok tribes as well as the draft ethnographic riverscape regulatory analysis produced by Dr. Gates (Appendix E6-B). The integration report will discuss common themes among the Klamath Basin tribes and provide a basinwide overview, evaluation, and assessment of broad tribal concerns about basinwide water management and its effects on historic properties. The report also will discuss how those effects relate to the regulatory framework of historic properties. An important outcome of the document will be a description of the impacts to traditional cultural practices and/or traditional-to-current Indian culture that can be ascribed to the Project and its continuing operations. The integration report will provide recommendations for further study and the justification for conducting such studies. A potential ethnographic riverscape would fall within the jurisdiction of several agencies and many private land holdings. Therefore, the report also will address future studies or actions that could be undertaken by PacifiCorp and/or the federal agencies and states with jurisdiction in the basin (U.S. Army Corps of Engineers [USACE], U.S. Bureau of Reclamation [USBR], BLM, U.S. Forest Service [USFS], FERC, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Department of Commerce, Oregon, and California) whose actions are potentially affecting historic properties. Once the integration report is available (in the spring of 2004), it will be submitted to FERC as Appendix E6-C of the license application.

E6.1.6 Effects to Cultural Resources from Processes Related to Geomorphology

As part of ongoing consultations with tribes and agency stakeholders, tribal and agency CRWG members raised numerous concerns regarding erosion at various cultural resource sites and the role the Project may have in causing erosion to these sites. Studies of the Project's effects on geomorphology in and below the Project area were conducted and are presented in Section 6.0 of the Water Resources FTR. In response to CRWG concerns regarding Project-related geomorphic affects to cultural resources, PacifiCorp sponsored a 3-day field trip and site reconnaissance with Project geomorphologists and members of the CRWG. Representatives of the Klamath, Shasta, Karuk, and Yurok tribes participated in the October 20-22, 2003, field trip. The field trip had the following objectives:

- To provide the CRWG with a general overview of the goals, objectives, methods, and results of the geomorphology studies
- To give CRWG members an opportunity to identify specific sites of concern in the field
- To share information pertinent to the locations, characteristics and extent of sensitive cultural resource sites that may be affected (or are being affected) by Project facilities or operations that change or alter local and/or regional patterns of hydrology and geomorphology
- To make a qualitative and—where possible—quantitative assessment of potential project impacts at several specific cultural resource sites of concern

• To discuss potential additional studies that could more accurately characterize possible Project impacts on cultural resource areas

The field trip began upstream of Iron Gate dam. Locations visited on the first day included Lake Ewauna near Washburn Road, J.C. Boyle reservoir at the Spencer Creek confluence, and two locations in the J.C. Boyle peaking reach. The second day included similar visits primarily between Iron Gate dam and the Shasta River confluence (the Osburger site downstream of Iron Gate dam, the U.S. Geological Survey [USGS] flow gauge at the Iron Gate fish hatchery, the confluence of the Shasta and Klamath rivers, and the confluence of Ash Creek and the Klamath River). The final day included purely qualitative investigations of sites between 50 and 100 miles downstream of Iron Gate dam. Specific locations visited on the third day included the Ukanom Creek confluence, the Rock Creek confluence, the Ishi Pishi Falls area, and the Fish Camp area. The results of these field investigation are summarized below, in order from upstream to downstream.

E6.1.6.1 Lake Ewauna/Keno Reach near Washburn Road

The group observed and discussed geomorphic processes on river left just upstream of the Washburn Road bridge. Tribal representatives are concerned that sensitive cultural sites are exposed when Keno reservoir is drawn down (as part of Project operations). Prior to construction of Keno dam, this area was a patchwork of dry upland and marsh. Keno dam inundation eliminated a significant portion of the emergent vegetation. Thus, when drawdowns occur, flow over unvegetated fine sediments can disturb and expose fine sediments and expose sensitive cultural resource sites.

Because this reach was relatively wide and gently sloping (low-gradient) before Keno dam became operational, sediment transport dynamics did not change significantly with the completion of Keno dam. However, riparian vegetation characteristics may have changed significantly as a result of the inundation. Therefore, direct Project impacts on geomorphology and sediment transport are not a major factor in the degradation of cultural resource sites in this reach. Rather, project impacts on riparian vegetation, coupled with current operations in this reach (i.e., reservoir drawdowns) appear to be the major concern with respect to cultural resource sites.

E6.1.6.2 J.C. Boyle Reservoir at Spencer Creek Confluence

The group examined the Spencer Creek delta area and the reservoir margin downstream of Spencer Creek on river right. Tribal representatives indicate that the Klamath river channel was narrower before the dam inundated this area. Therefore, without the Project, sites immediately adjacent to the riverbank would have been vegetated and less exposed to disturbance. Similar to the Lake Ewauna location described above, cultural resource sites are exposed during drawdowns of J.C. Boyle reservoir.

Because the river in this area is now a reservoir, the historical channel planform has been significantly altered throughout the inundated area. This has altered the characteristics of riparian vegetation and changed sediment transport dynamics. All bedload and some fraction of the suspended sediment load from upstream is now stored in the reservoir. Cultural resource sites

immediately adjacent to the historical channel are now unvegetated and covered by a layer of sediments that varies in thickness throughout the J.C. Boyle reservoir. The combination of these two project impacts has led to the exposure of cultural resource sites during reservoir drawdown periods.

E6.1.6.3 J.C. Boyle Peaking Reach at Frain Ranch Area

The group examined and discussed an archaeological site partially eroded during the 1997 flood (11,400 cfs at this location). The river flow was about 1,350 cfs at the time of the site visit (almost half of the Project capacity of 300 cfs with two turbines running). The lower extent of the site erosion was about 3.5 feet above the water surface elevation. Recent high water marks indicate that even at the full Project capacity (3,000 cfs), the lower extent of the erosion would have been about 2.5 feet above the water surface. It appears that this site could have been in a back eddy during the 1997 flood and that erosion may have been exacerbated by complex, recirculating currents. The group also examined several locations near the Frain Ranch area that were primarily affected by off-road vehicle use rather than river geomorphology.

Although sediment transport dynamics in this reach have changed as a result of the Project, in this specific case, as with other sites similarly situated in relation to the active river channel, it is unlikely that the erosion is a direct result of Project effects on geomorphology or sediment transport. Rather, erosion of the site in question occurred during a flow that was well beyond the control of Project facilities and would probably have occurred even without the Project. Given the coarse nature of the sediment immediately adjacent to the active channel at this site (boulders and coarse cobble), it is also unlikely that erosion was exaggerated as a result of bank saturation and discharge associated with peaking operations. A tall, steep bank on river left in the vicinity of these two sites did exhibit some undercutting and erosion, perhaps accelerated by Project impacts on geomorphology and sediment transport (i.e., peaking operations). However, no historic properties are present on this feature. Sites very close to the active channel could be affected by Project impacts on geomorphology and sediment transport, but additional study would be required to determine if such fine-scale impacts exist.

E6.1.6.4 Klamath River Downstream of Iron Gate Dam at Osburger Site

The group explored and discussed conditions around the Osburger site, where there are two historic houses relocated from the former town of Klamathon. The houses currently sit on a terrace about 30 feet above the water surface elevation. The channel banks in this area are sandy, with a zone of angular large cobble and small boulders protruding through the fine sediments approximately 1.8 feet above the active channel water surface elevation. Evidence of erosion (and associated bank protection) was observed at the base of a steep slope below the houses and about 38 feet away from and 9.8 feet above the active channel edge and water surface elevation, respectively. The erosion at this site also occurred during the 1997 flood (20,500 cfs at this location). The flow at the time of the site visit was 1,350 cfs, which did not appear to be actively eroding banks or mobilizing the bed.

A scour hole was observed immediately upstream of a large boulder on a small terrace adjacent to the active channel in this area. The scour hole appears to be from flow significantly greater than 1,800 cfs. Extensive cow hoof disturbance was observed along the terrace with the large

boulder. The group discussed the fact that there is no peaking in this reach. The group also discussed ramping rates downstream of Iron Gate dam. When flow in this reach is more than 1,750 cfs, the ramping rate must be less than 350 cfs/day. When flow is less than 1,750 cfs, the ramping rate must be less than 250 cfs/day.

While there has likely been some coarsening of bed sediments immediately downstream of Iron Gate dam since it was constructed, it seems unlikely that Project effects on geomorphology and sediment transport are responsible for the erosion at the Osburger Site. Similar to the locations observed in the J.C. Boyle peaking reach, the erosion at this site seems to have occurred in an area that could be a back eddy during high flow. In addition, the flow during the event that caused the erosion (20,500 cfs) was well above the range of Project control (1,800 cfs maximum controlled release). It seems that the influence of natural local controls during high-magnitude floods is primarily responsible for the erosion that has threatened cultural resources in this area.

E6.1.6.5 USGS Gauge Downstream of Iron Gate Fish Hatchery

This located was visited to illustrate relationships between different return-period flows and geomorphic features. The group discussed return intervals, flows required to mobilize the active channel bed and generate significant erosion, and gauge data available for the Klamath River and other river systems. No cultural resource sites are known to be present in this area.

E6.1.6.6 Klamath River at Shasta River Confluence

The group observed the Shasta River confluence (on river left) from Highway 96 across the river. The primary active channel of the Shasta River enters the Klamath River at the downstream end of the delta deposit at this confluence. A Yurok representative believes that the primary channels of the Shasta River and other tributaries (Omagar River, Bear Creek, Pine Creek, etc.) have all recently shifted from the center of the deposit to the downstream end of the deposit. Further, the representative indicates that Pine Creek is no longer directly connected to the mainstem Klamath because of a large-gradient change at the confluence (i.e., the bed of Pine Creek is much higher than the bed of the Klamath River). This condition could be a significant barrier to fish passage.

The geomorphology study did not identify changes in the movement of active channel paths through confluence delta deposits as a Project impact on geomorphology and sediment transport. Detailed studies would be required to determine whether some systematic change has occurred and whether such a change could be linked to Project operations.

Large floods still occur downstream of Iron Gate dam, and sediment trapped in project reservoirs appears to be replenished rapidly downstream of Cottonwood Creek. Based largely on these observations (and the geomorphology and sediment transport studies that confirmed them), tributary aggradation or mainstem degradation downstream of Iron Gate dam are not identified as project impacts on geomorphology and sediment transport. Natural variations in tributary sediment delivery are the more likely cause of restrictive points at tributary confluences that impede fish passage.

E6.1.6.7 Klamath River at Ash Creek Confluence

The group briefly observed and discussed the characteristics of the mainstem Klamath and riparian areas near the confluence with Ash Creek from the historic truss bridge that spans the Klamath River off Highway 96. Ash Creek enters the Klamath River through a culvert under Highway 96 just upstream of the bridge. An extensive and deep side channel area on river left was observed, and the group concurred that this was most likely a result of past mining excavation. The group also observed extensive tailings piles on the banks on river left.

Observations at this site suggest that past mining impacts have had a significant impact on channel geomorphology and sediment transport, and potentially on cultural resource sites. Project impacts on geomorphology and sediment transport did not appear to have major impacts at this site and were not discussed by the group.

E6.1.6.8 Klamath River at Ukanom Creek and Rock Creek Confluences

The group briefly observed the Ukanom Creek confluence on river left from Highway 96 on river right. A large landslide just upstream of the confluence (in the Ukanom drainage) was observed and provided an example of a large episodic delivery of sediment from a tributary. Tribal representatives indicated that several long, deep pools downstream from this confluence had been filled by fine sediment and no longer provide cold-water habitat for migrating salmon.

The group also observed the Rock Creek confluence with the Klamath River on river right from Highway 96 on river left. Here again, flow through the delta formation at the confluence may have shifted recently to the downstream end of the delta. The gradient of Rock Creek appeared relatively gentle near the confluence, and visible reaches were heavily forested and meandering.

Project facilities have led to some sediment starvation, especially in reaches immediately downstream of Iron Gate dam. Project operations (i.e., elevated summer base flows) may have also increased fine sediment transport. Furthermore, large winter and spring floods still occur, so it is unclear why deep pools in the Klamath River in this area might be filling with fine sediment differently than before the project. The geomorphology study results indicate that direct project impacts are overwhelmed by natural processes (tributary flows and sediment loads) and controls and continued impacts from past main-channel and tributary mining activities downstream of the Shasta River confluence.

E6.1.6.9 Ishi Pishi Falls

The group listened to a Karuk tribal leader describe "Kutty Mene," the Karuk land around Ishi Pishi Falls. This area is the site of the Karuk "World Renewal" ceremony and was the largest Karuk settlement on the Klamath River. Karuk oral histories suggest that floods much larger than the 1964 flood have occurred on the Klamath in recent centuries. Despite this perceived reduction in recent flood flows, tribal representatives noted increases in the recent rate of erosion that they believe are correlated with the construction and operation of Project facilities. Specifically, a ceremonial pond in this area nearly failed and drained during the 1997 flood. Also, the erosion rate observed by tribal representatives at the "Deer Skin Dance" site has apparently increased over the past 25 to 50 years. A steep erosion face near "Little Ike's" village

site on the opposite bank (river right) also has been observed by tribal representatives to be eroding at a faster rate in recent generations. The tribal leader also indicated that over a similar time frame, fine sediment has filled pools throughout the area because there are no longer spring freshet flows. In addition, tribal representatives noted that fresh willow growth on gravel bars (the growth that produces the best basket materials) has become less common in this region recently. A Karuk Tribe consultant noted that the observational science of the tribes has been overlooked in assessing Project impacts.

The results of the geomorphology study indicate that Project impacts on geomorphology and sediment transport are largely overwhelmed by natural sediment supply (which increases dramatically downstream of Cottonwood Creek) and increases in flow this far downstream of the lowest Project dam and reservoir. Because the degradation of cultural sites has occurred during extremely high-magnitude events (e.g., the 1997 flood), during which a wide range of other natural processes occur (e.g., the massive landslide on the mountain downstream of Ishi Pishi Falls on river left), it is extremely unlikely that Project impacts on geomorphology are the cause of the potential increase in recent erosion rates observed by tribal representatives. Further analysis would be required to determine whether any fine-scale Project impacts exist in this area.

E6.1.6.10 Fish Camp

The group explored and discussed near-channel and upland areas around the large sand terrace called Fish Camp on river left. The terrace was significantly above the active channel water surface elevation on the day of the site visit and was separated from the active channel by large boulders. The group observed a debris line from the 1997 flood that was at least 40 feet above active channel water surface elevation on the day of the site visit. A slump was present just above the debris line that could have been caused by fluvial or hillslope erosion during the 1997 flood. Because the cultural resources site degradation was associated with flows well beyond the control of the Project, it is unlikely that direct Project impacts on geomorphology or sediment transport could be linked to the observed erosion.

E6.1.6.11 Summary of Results

Tribal representatives expressed concern that Project impacts on geomorphology have exacerbated degradation of cultural sites both upstream and downstream of Iron Gate dam. However, the erosion at the cultural sites visited was associated with flow events well beyond the range of control of Project facilities. While there has definitely been a change in sediment transport dynamics associated with the Project in some reaches of the Klamath River, it is unlikely that the erosion issues identified downstream of Shasta River are due to Project impacts. Furthermore, the erosion of cultural sites observed in the reaches upstream of Iron Gate dam did not appear to be directly linked to the Project impacts on geomorphology and sediment transport identified in the geomorphology study. Many of the other observed problems (e.g., tributary delta changes, etc) appear to be due mostly to natural processes, and it would require significant, long term-study beyond the scope and timeline of this relicensing to determine whether some systematic change is occurring, and if so, how that change can be linked to Project operations.

E6.1.7 Historical Resources

This section provides a historical context for evaluating historical resources and summarizes the major historical themes beginning with Euroamerican exploration and settlement through the modern period.

The relationship between land and people in the Klamath watershed, and the culture that results, is emblematic of the history of settlement in much of the West. As western commentator William Kittredge frames the issue, the story of the Klamath basin is one of watershed politics—from suckers to salmon to ranchers and the water and hydroelectric facilities that bind them all together. It is also about power and conflict, both literal and metaphorical (Blake et al. 2000). As in many areas of the West, in the Klamath basin the issues of yesteryear—such as transportation, agriculture, and industry—linger as questions today.

The following narrative traces the themes of historical settlement for the region encompassing the Klamath Hydroelectric Project corridor. Given the interconnected nature of economic, social, and environmental themes in the history of the project corridor, and the Klamath basin more broadly conceived, the narrative is presented chronologically, beginning with European exploration of the region and extending through settlement, the era of federal reclamation projects at the turn of the twentieth century, and on to the controversies of the present. For a detailed historic context of the hydroelectric generation facilities of the Klamath River and its tributaries in the project corridor, see George Kramer's Historic Context Statement, Klamath Hydroelectric Project FERC No. 2082 (Appendix E6-D).

E6.1.7.1 Euroamerican Exploration

It is not entirely clear which non-Indian first entered the Klamath basin. By some accounts, Hudson Bay trapper and Scottish immigrant Finan McDonald ventured through the Williamson River area near Klamath Marsh north of the project area in 1825-1826 (Hopkins, 1977). Others cite Peter Skene Ogden's 1826 expedition of Hudson Bay Company trappers as the first Euroamerican exploration. This expedition originated at Fort Vancouver. Ogden and company probably explored the rim of the Upper Klamath River Canyon en route to the Rogue River drainage and probably traded goods with the Shasta tribe. On January 13, 1827, Ogden and about three dozen men—not to mention an entourage that included approximately 100 horses, a number of the trappers' wives, equipment, and servants—camped near the Link River. Following Ogden's foray, three other trapping parties explored the Klamath region en route to the Rogue River drainage.

These trapping forays were followed by scientific expeditions to the Klamath River region between 1841 and 1855, including the Wilkes expedition of 1841, the John C. Fremont expeditions between 1843 and 1846, and the R.W. Williamson and H.L. Abbot expedition of 1855. Also, the San Francisco-based Klamath Exploring Expedition set out in 1850 to reconnoiter the Klamath, Rogue, and Umpqua watersheds in search of gold and potential settlements. These groups reportedly spread diseases to tribes and treated local people with violence and disrespect, setting the stage for future conflicts between newly settling Euroamericans and settled American Indians. These conflicts included the Modoc War of 1872-1873 (Bartoy, 1995; Klamath County Historical Society, 1984; Meinig, 1998).

E6.1.7.2 Early Settlement, 1850-1905

Following nearly three decades of visitation by fur traders and explorers, the 1850s saw sustained Euroamerican settlement along the Klamath watershed. With their fertile soil, level terrain, and abundant water sources, these areas attracted the first ranching and agricultural development (Bartoy, 1995). Downstream, many Klamath River prospectors stayed in the area, settling in communities such as Henley (Cottonwood), Gottville, Happy Camp, and Somes Bar (Nilsson and Greenway, 1985). The region was also seen as holding great timber wealth and as a critical travel corridor for those seeking minerals. Accordingly, the white settlers and explorers who passed through the Klamath River region did so for many of the same reasons as other emigrants throughout the West: for the opportunity to start a new life, out of scientific interest, for economic opportunities, and to establish transportation routes. As in other regions, transportation routes and their associated infrastructure helped ensure future development.

Transportation

Completion of the Southern Emigrant Road, otherwise known as the Applegate Trail, marked one of the first major transportation developments in the Klamath basin area. This route, established by Lindsay and Jesse Applegate in 1846, roughly followed the path of present-day State Highway 66 between Keno and Ashland. Gold was discovered in 1851, and the city of Yreka, southwest of the project corridor in California, was founded. Following that and similar discoveries in the surrounding area, the Applegate Trail—connecting Fort Hall, Idaho, to Oregon's Willamette Valley—became a popular route for would-be prospectors, as did other roads and trails that served as emigrant trails and routes between southern Oregon goldfields and northern California. The Applegate Trail also served as an alternate route for those emigrants seeking to avoid the Oregon Trail to the Willamette Valley, with its treacherous navigation of the Columbia River west of The Dalles and its costly toll road skirting the base of Mount Hood.

By 1873, O.A. Stearns' Southern Oregon Wagon Road eclipsed the primitive Applegate Trail, greatly improving mobility between Keno and Ashland. However, while the first settlers arrived around 1860, it was not until the 1870s and completion of the Topsy Grade Road that significant development occurred in the Klamath basin (Bartoy, 1995; Blake et al. 2000; City of Klamath Falls, 1986; Hills et al. 1996; Historical Research Associates and Amphion, 1996; Hopkins, 1977; Klamath County Historical Society, 1984).

Early routes between Yreka and the Upper Klamath basin included the Ball Mountain Road, built in the 1860s, and a pack train route on the north side of the Klamath River. The Topsy Road, which could accommodate wagons, was completed in 1875 and traversed the country on the south side of the river between Yreka and Linkville (Klamath Falls). The road was rebuilt twice during the 1880s, and it served as the principal stage and mail route between these two areas. Stage stations along Topsy Road—notably Chase, Overton, Way, and Beswick stations— attracted travelers and settlers (Bartoy, 1995; Follansbee et al. 1988). Nilsson and Greenway (1985) note that Beswick (at Klamath Hot Springs) also served as a stage stop in the late 1880s for a wagon road that crossed the Klamath River at that location. Until U.S. Highway 97 was completed in the mid-twentieth century, Topsy Road hosted the only mail, freight, and stage line linking Yreka and Klamath Falls (Terry and Goebel, 1996). By 1875, biweekly stage service connected Ashland and Linkville (Hopkins, 1977).

As important as ground transportation was to settlement in the region, settlers also depended on Klamath River waterways to move people and goods. In the late 1860s, George Nurse established a ferry crossing of the Link River, which was in use until a bridge replaced it in 1869. Though a boat powered by a two-horse treadmill was used to haul freight on Upper Klamath Lake as early as 1871 (followed by the sailboat *Mary Moody*), a decade passed before steamboats began plying the waters of Upper Klamath Lake and Lake Ewauna. Moreover, given the rugged condition of road between Keno and Klamath Falls—with reports of mud "deep enough to mire a saddle blanket"—passengers and freight oftentimes transferred to boats at Keno, navigating the waters rather than clawing through mudholes. In 1889 the sternwheeler *Mayflower* was constructed and put into operation hauling logs from Keno to upriver sawmills.

During the 1910s the use of tugs became popular on Upper Klamath Lake to haul logs or move barges laden with sand and volcanic cinders. Besides freight hauling, steamers also carried passengers. However, steamboat passenger service was eventually replaced by rail and automobile transit in the first two decades of the twentieth century. Steamboats continued in operation through the early 1900s (Clark and Miller, 1999; Drew, 1974).

Transportation also played a key role in the development of local industry, and chief among transportation developments in the Klamath basin was the coming of the railroad. Throughout the West, communities hoped that prosperity would follow the arrival of the railroad. In most cases it did, though not always to those in the railroad's path. In 1855, the Abbot and Williamson survey party passed through the Lost River area (Dicken and Dicken, ca. 1985). However, railroads did not arrive in southern Oregon and northern California until 1887, when the Oregon & California Railroad (O&CRR) was constructed through Siskiyou County, California, and Jackson County, Oregon, en route from Sacramento to Portland. That same year, the Southern Pacific Railroad (SPRR) Company acquired the O&CRR (Hills et al. 1996).

The story of transportation and logging in the Klamath basin and the project corridor are closely intertwined. To support logging operations on the north rim of the canyon, the Pokegama Sugar Pine Railroad was established connecting the Pokegama flats with an impressive chute that delivered logs to the river, where they were then floated to the mill at Klamath City (Klamathon). Some debate exists as to whether or not this rail was narrow or standard gauge. In any event, the first rail cars were pulled by horses. The line connected the head of the log chute and the Snow logging camp by December 1893.

The following year a steam locomotive, nicknamed "Old Blue," was hauled up to the rail line and placed in service. While the Pokegama Sugar Pine network proved effective at delivering logs to the river, it remained disconnected from the region's broader railroad system (Gavin, ca. 2001; Lewis, 1987). According to Bob Lewis (1987) "it was a railroad from nowhere to nowhere." Moreover, getting logs down the river to mills proved a major challenge because of fluctuating water levels and rapids. This all changed in the following decade, but in the meantime, Pokegama Sugar Pine Railroad extended its line to Horn's Camp, a new camp north of Snow in 1896. Two years later, the line was extended again to Pokegama, north of Horn's Camp (Gavin, ca. 2001).

The beginning of the twentieth century saw the construction of the Klamath Lake Railroad, which connected the SPRR line in Thrall, California (near Klamathon), and the logging camp of

Pokegama. Construction of the line attracted Greeks, Turks, Italians, Hungarians, Chinese, and some Mexican workers, many of whom settled in the area. The line, traversing the northern edge of the Klamath River, was completed to "New" Pokegama in 1903, a new camp southeast of "Old" Pokegama. Builders hoped to eventually extend the line on to Klamath Falls. In the meantime, mule teams and stage coaches transported freight and passengers from Pokegama to Klamath Falls—a 6-hour trip by stage or more than 2 days by freight wagon. In 1905, Weyerhaeuser gained control of the railroad, along with other timber interests in the area.

With increased rail service came the demise of the Keno to Pokegama stage lines, which saw its last service in 1909 (Bartoy, 1995; Gavin, ca. 2001; Klamath County Historical Society, 1984; Hills et al. 1996; Lewis, 1987). However, not until 1909 was the Klamath basin connected by rail to the outside world, via the Southern Pacific Railroad (Hopkins, 1977). Kevin Bartoy succinctly describes transportation developments in the Upper Klamath River Canyon, developments that recapitulate similar themes found throughout the West:

Developing from Indian trail networks, Euroamericans began to clear pack trails and stage roads. Stage and freight lines provided an economic stimulus for settlement along these new roads. Eventually, communities and social networks arose along the stage routes. With the development of the railroad, however, new economically viable centers arose along the rail lines. In many cases, these new centers overshadowed those of the stage period. Eventually, the loss of economic vitality led to the decline and abandonment of the stage line route. Although the population declined along the old routes, the roads remained important. (Bartoy 1995)

Agriculture and Ranching

The earliest Euroamerican settlers largely engaged in ranching. In 1852, prefiguring settlement of the canyon terraces and agricultural development of the Klamath basin, Wallace Baldwin traveled the "emigrant road" from the Rogue River to the Keno area with 50 horses. Although he stayed only about 9 months, he set the stage for the region's future ranching economy (Snyder, 1988). Four years later, Judge Fredrick Adams introduced cattle to the Klamath basin, wintering 2,000 head near Keno in 1856.

A November 11, 1863, journal entry of William H. Brewer reinforces the predominate land use of the era in the Shasta Valley, south of the project corridor: "We descended into Shasta Valley, a plain of lava, generally barren and desolate, but in places with a thick soil where there are ranches" (Brewer, 1966). Unsuccessful miners often turned to ranching and agriculture (City of Klamath Falls, 1986). Only after the 1870s, and the completion of Topsy Road, did settlement significantly increase throughout the current project corridor (Bartoy, 1995).

Ranching, as opposed to farming, became the main focus of early white settlement in the Klamath basin. But successful ranching and agriculture needed two key ingredients: forage for cattle and soil for crops. And both forage and suitable soil depended on access to land and adequate water.

The 1850 Donation Land Law provided one means to obtain water. According to the statute, "every white man and Indian half-breed who was a citizen of the United States and a resident of the territory [Oregon] by December 1, 1850" was eligible for a half-section, or 320 acres. This included married women (City of Klamath Falls, 1986). The ability to appropriate land was expanded by the Homestead Act of 1862, which promised 160 acres of public land to those heads of families, 21 years of age and older, who were, or who intended to become, citizens of the United States. The Homestead Act made available only surveyed agricultural lands and required claimants to live on their land within 6 months of paying their \$10 filing fee. Thereafter, settlers were required to inhabit their claim for at least 7 months of every year and to improve their claim through construction and cultivation. The remaining 5 months of each year could be spent off site, and often were, as occupants returned to towns to take advantage of work, school, and social opportunities (Gates, 1968).

Arid western lands, void of timber and uncultivable without irrigation, could also be claimed under the Desert Land Act, passed in 1877. The 1877 act allowed claims of 640 "reasonably compact" acres, at a cost of \$0.25 per acre at the time of filing. An additional \$1 per acre was due 3 years later at the time of final proof, when, ostensibly, the land had been reclaimed through irrigation. Revisions to the act in 1891 attempted to thwart "lands being held for grazing without settlement" by requiring that detailed plans for irrigation systems be submitted and that \$1 per acre be spent on construction of irrigation works and on leveling the land in each of the first 3 years. Despite these protective provisions, few Desert Land Act claims were ever patented, in part because of the "well-nigh impossib[ility]" of irrigating such large tracts (Gates, 1968). This circumstance underlies the Herculean reclamation efforts by the United States government in the Upper Klamath basin in the early twentieth century.

In years of generous rainfall, ranchers cut and grazed native riparian grasses in and around the project corridor. However, unless potential ranching and farming lands had access to water they could neither support livestock nor grow crops. In 1867 George Nurse and Edgar Overton established the town of Linkville, on the banks of the Link River between Upper Klamath Lake and Lake Ewauna. Some of the first land reclamation in the basin occurred shortly thereafter. The Langell family moved into the area in 1868 and rechanneled part of the Lost River, reclaiming 4,000 acres for agriculture. Area residents constructed additional ditches throughout the 1870s, and in 1882 the Linkville Water Ditch Company was formed, creating a canal that irrigated Linkville (now known as Klamath Falls) lots with Link River water. In subsequent years, the ditch was expanded.

In 1888, the Klamath Falls Irrigation Company acquired the Linkville ditch and transformed it into the large Ankeny-Henley Canal. Within a decade, Klamath-area farmers were raising barley and potatoes, and by 1904 Obed Short was able to harvest up to 350 bushels of potatoes off eighty acres. Times were good (Blake et al. 2000; Langston, 2003; Markle, 2002; Stene, 1994).

As noted earlier, the Klamath River Canyon and its fertile terraces also attracted ranchers and small-scale farming, particularly following completion of Topsy Road. In some cases these outfits supplied meat and produce to area logging outfits and railroad workers. Both the Spannaus ranch, near Beswick, and Louis Hessig's Double Heart Ranch, east of present-day Copco Lake, purveyed supplies to the Pokegama Logging Camp and railroad crews. Earndst Spannaus even provided the Pokegama camp with tallow to lubricate its log chute. In addition,

other trappings of civilization sprung up in the canyon to supply the needs and desires of local settlers, such as schools and saloons. One-room schools included Topsy, Oak Grove, Cleaveland, and Bogus (Bartoy, 1995; Dow, 1963; Hessig, 1978; Harder, 1995). Still, difficult times intervened. Ranchers in the area were not immune from the so-called "hard winter" of 1889-1890, in which they saw several feet of snow descend upon the area in early November, killing many cattle. This was followed by a rapid spring melt-off that caused severe flooding of the Klamath River (Hessig, 1978; Klamath County Historical Society, 1984).

Treaties with Local Indigenous Peoples

Like most of the West, the story of American Indians in the Upper Klamath River Canyon following European contact is complex. Some early settlers in the region married Shasta Indians, blurring what might otherwise appear to be a polarization of white versus Indian (Bartoy, 1995; Carpelan, 2000). While federal laws provided Euroamericans with homesteads, complementary federal actions deprived indigenous peoples of land in the Upper Klamath River Canyon and Klamath basin. In 1851 a treaty was made with California Shasta, but it was not ratified. Following their involvement in the Rogue War and their inclusion in treaties with Rogue River Valley Indians in the mid-1850s, Oregon Shasta were removed to the Grand Ronde and Siletz reservations (Ruby and Brown, 1992; Silver, 1978). With their culture collapsing, some Shasta adopted the Ghost Dance religion in the 1870s. Ghost Dance ceremonial sites, used by Shasta who did not relocate to reservations in Oregon, have been documented in the Klamath River Canyon (Terry and Goebel, 1996).

An 1864 treaty between the United States government and a number of other Indian tribes reserved for the tribes 1.18 million acres northeast of Klamath Lake, in exchange for 23 million acres ceded to the United States. Among the tribes affected were the Modocs and Klamaths. However, an earlier, "unauthorized" treaty had been signed with the Modocs, reserving land for them near Tule Lake close to their traditional hunting grounds. In 1872 a group of Modoc warriors led by Kintpuash (Captain Jack) returned to the Tule Lake area. What followed came to be known as the Modoc War—a conflict between the band of Modocs and the United States Cavalry that ultimately cost the U.S. government \$500,000 and the lives of 400 U.S. troops and 13 Modoc. In 1873, chief negotiator General Edward Canby and two others were killed in an ambush. Captain Jack eventually surrendered in April 1873. Four months later, Jack and three Modoc warriors were executed at Fort Klamath (Blake et al. 2000; Klamath Tribes 2003). Difficult times for the tribes were only beginning.

Following the General Allotment (Dawes) Act of 1887, which gave the President of the United States the authority to allot parcels of land on reservations to individual tribal members, Klamath Indians lost control of 250,000 additional acres (Blake et al. 2000). Nevertheless, the tribes sought to capitalize on emerging economic opportunities within the region. In 1889 20 tribal freighters supplied goods to outlying areas. To support construction of the Klamath Tribal Agency, the Agency sponsored the construction of a sawmill in 1870. While at first the mill merely supplied lumber needs on the reservation, within 3 years it was selling lumber to Fort Klamath and private parties. By 1896, off-reservation lumber sales topped 250 million board feet of lumber (Klamath Tribes, 2003). Other Indians either found work on area ranches or worked their own allotments acquired under the Dawes Act (Phillips, 1997).

Early Logging

Agricultural and mining interests precipitated the first white settlement along the Klamath River, but within a few decades the timber industry became a major force in the local economy. The earliest known milling activity in Klamath County was at a sawmill constructed in 1863 by the United States Army near Fort Klamath. In 1869 the first privately owned sawmill was established in the Keno area (Dicken and Dicken, ca. 1985). Sustained logging began in the mid-to late 1880s. The first operations tended to be small, family-run businesses often operated by ranching families seeking to supplement their income.

One early operation in the canyon was located near the Kerwin Ranch, spanning both sides of the river. In 1888, the Klamath River Lumber & Improvement Company5 (incorporated in 1881 by timber company interests) established Klamath City—later renamed Pokegama and eventually Klamathon—near the California border, not far from the Southern Pacific Railroad near Thrall. Starting in 1890, the Improvement Company began work on a sawmill. While Klamath City (Klamathon) was briefly named Pokegama, it should not be confused with the Pokegama logging camps referred to in the discussion that follows (Gavin, ca. 2001; Hills et al. 1996; Klamath County Historical Society, 1984; Bartoy, 1995; Lewis, 1987).

In the early 1890s, larger-scale logging companies such as Pokegama Sugar Pine Lumber Company and Klamath River Lumber and Improvement Company were established on the north rim of the canyon. Logging operations used both horse-drawn "high wheels" and a narrow gauge rail line to haul logs from the Pokegama Plateau (Flats) to the canyon rim where they were then delivered to the river via a 2,650-foot-long wooden chute. Once Klamathon was reduced to charcoal by fire in 1902—consuming the mill, 8 million board feet of lumber, and two box factories—lumber companies built mills near their logging operations. Prominent logging camps and mill sites included Snow, Horns Camp, Pokegama, Potter's Mill, and New Pokegama.

Weyerhaeuser moved into the Pacific Northwest region in 1900, attracted by the abundance of natural resources, the arrival of transcontinental railroads, and the federal government's forest releases. In 1905 Weyerhaeuser acquired the Klamath Lake Railroad and purchased the timber interests of several companies, including the Pokegama Sugar Pine Lumber Company, and Pelton, Reed & Ward. Not until 1920, however, did Weyerhaeuser establish a major presence in Klamath Falls.

Towns and settlements emerged around the logging companies, which provided loggers and businessmen with multiple services, including schools, stores, and post offices. Area ranchers and farmers oftentimes supplied meat and produce to nearby logging camps. By the turn of the century, logging was also becoming a significant economic component of Siskiyou County, at the southern end of what is now the project corridor. Between 1873 and 1900, 13 sawmills operated in Klamath County (Bartoy, 1995; Hessig, 1978; Harder, 2003; Hills et al. 1996; Lewis, 1987; Siskiyou County Sesquicentennial Committee, 2003).

⁵ Other sources (e.g., Lewis, 1987) refer to this group as the Klamath River Land and Improvement Company.

Commercial Recreation

Though not as prominent as other economic interests in the basin, recreation did play a role in the early settlement era in the form of Klamath Hot Springs (near Shovel Creek), which were originally used by Indians and then trappers. A.M. Johnson homesteaded the land containing the hot springs in 1860. It was sold to Richard Beswick circa 1870, a stage station was constructed, and between 1870 and 1887 Beswick operated a small hotel at the site. In 1887 Beswick sold the land to the Edson brothers, who realized the economic potential of the property when they constructed a larger Klamath Hot Springs Hotel, a 75-room resort and spa that offered patrons a bath house, barber shop, fish-cleaning facility, stage barn, ice house, hydroelectric plant, swimming pool, and landscaped gardens. Guests of the area represented a veritable "Who's Who" of national celebrities, including Herbert Hoover, Zane Gray, Amelia Earhart, and others. The area was a popular local and regional destination until 1915, when a fire destroyed the hotel and services. The facility was never rebuilt. The California-Oregon Power Company (Copco) purchased the property in 1924 (Bartoy, 1995; Hessig, 1978; Jones, 1971).

Upstream, in the Klamath basin, steamboat owners expanded their operations beyond freight and ferry services, offering recreation to area residents. Among those vessels used for sightseers were the *Alma*, which hosted Sunday excursions beginning in 1901, and the 125-foot long *Winema*, which ran both regular passenger service and excursion runs between 1905 and 1916 (Clark and Miller, 1999).

E6.1.7.3 The Age of Reclamation, 1905-1949

The first half of the twentieth century brought rapid social and economic change to the Klamath basin. The population of Klamath Falls increased nineteen-fold between 1900 and 1930, from 852 to 16,047. County wide, population increased eight-fold during this same time frame, from 3,970 at the turn of the century to 32,407 in 1930 (Dicken and Dicken, ca. 1985). The federal government and private interests initiated major irrigation and hydroelectric projects, railroads connected the basin to the rest of the country, and the timber industry experienced both depression and expansion.

The Klamath Project

In 1902 the U.S. Congress passed the Reclamation Act, or Newlands Act, creating the Bureau of Reclamation. The act provided the opportunity for a new round of homesteading and set the stage for major social, economic, and environmental developments in the Klamath basin (Blake et al. 2000; Markle, 2002). Though geographically on the margins of the current project corridor, the regional economic and social effects of the act were significant and linger to the present.

Western commentator William Kittredge writes: "My grandfather started grazing cattle on the [Klamath] marsh in 1911, leasing land from members of the Klamath tribes, to whom this land, as part of the Klamath Reservation, belonged. He began buying up allotments from tribespeople in 1916, and selling off timber from the fringes of the meadows to pay for the land." Eventually, he drained much of his land and converted it to hay fields (Blake et al. 2000). This pattern of development characterized the lives of many residents in the Klamath basin. Since 1860, sheep and cattle had fed on the region's grasslands, but decades of overgrazing dramatically shifted the

flora from native perennials to non-native annual grasses. The resulting degradation of grazing lands, combined with the influx of new settlers, increased the demand for arable lands and led to the initiation of the Klamath Project in 1905 (Robbins, 1997).

Through the Swamp Act of 1860, the states of Oregon and California acquired title to Lower Klamath Lake. This area, along with Oregon's claim to Klamath River water, were ceded to the federal government in 1904 and 1905 as part of the effort to "reclaim" the basin for agriculture (Langston, 2003). In 1903, a Reclamation Service engineer estimated that upwards of 200,000 acres might be arable in the Klamath basin. In future years canals were extended and a number of dams built in association with the project: Clear Lake, 1909-1910; Lost River Diversion dam, 1912; and Gerber dam, 1924-1925. An enormous amount of labor was necessary for the work, much of it furnished by the hands of immigrants, including Austrians, Montenegrins, and Serbians. Eventually, the Project encompassed seven dams, hundreds of miles of canals and lateral ditches, and 45 pumping plants. Today, the southern end of the basin contains only about 36,000 acres of marshlands out of 185,000 acres that existed prior to the project (Blake et al. 2000).

In 1908 President Theodore Roosevelt created the 80,000-acre Lower Klamath Lake National Wildlife Refuge. At least partially, this act can be attributed to heightened public awareness of the importance of conservation in light of commercial hunting's (particularly the "plume trade's") ravaging of bird populations, including grebes, terns, and gulls. Photographs and writings of individuals such as William Finley and Herman Bohlman showcased the fecundity of the Lower Klamath Lake area for wildlife and also showed the magnitude of the professional hunting take. All of this coincided with the beginnings of the Progressive Era conservation movement in America. There is irony, however, found in near-simultaneous passage of acts that on the one hand provided for the siphoning off of water for irrigation-which decreased bird habitat—while on the other hand setting aside land for wildlife within the reclamation district. According to Finley "we move to conserve or develop one resource while at the same time, we are destroying another" (Blake et al. 2000). The Reclamation Service interpreted its mandate to protect the wetlands for wildlife habitat as meaning that only lands perennially under water would be part of the refuge (Langston, 2003). In 1915, the refuge was reduced in size by approximately 27,000 acres to increase the amount of land available for agriculture. Only a 365acre pothole of water remained on the Lower Klamath where once sprawled thousands of acres of wetlands. Not until 1928 were Tule Lake and Upper Klamath Lake National Wildlife Refuges created. On May 25, 1941, a tunnel was completed linking the Tule Lake basin with the Lower Klamath basin to deliver water back to what had become a "dry wasteland" (Blake et al. 2000; Markle, 2002).

Reclamation-Era Homesteading and Agriculture

The first reclamation homestead allotment in the vicinity took place in 1917 and involved land in the Tule Lake area, southeast of the project area. Thirty-five units were available, at 80 acres each. In 1922 there was a second allotment of 174 units, this time geared toward World War I veterans. Many complained about the fees for this allotment, which over 20 years would cost a homesteader \$7,200 for an 80-acre farm. Other allotments were offered in future years, with the final one occurring in 1949. Farming in the basin was not without its false starts. In the Malin area, about 20 miles southeast of Klamath Falls near the California line, farmers tried growing

melons, sugar beets, celery, carrots, and strawberries, with little success. Finally, by 1923, local farmers found success with crops such as alfalfa, flax, barley, clover, and potatoes. In small towns such as Merrill and Malin, telltale signs of organized civic life began creeping in, in the form of meat markets, newspapers, barbershops, pharmacies, and even candy stores (Blake et al. 2000). The era of reclamation homesteading came to a close in the years following World War II. William Kittredge describes the scene of a post-World War II homestead allotment for Tule Lake:

By 1946 it had been ten years since a homestead allotment. The Bureau of Reclamation delayed proceedings so World War II veterans would have a chance to file. On December 18, a drawing was held in the Klamath Falls armory. The ceremonies played on the radio all up and down the West coast. There were eighty-six winners. Their names were picked from a pickle jar filled with 1,305 gelatin capsules, each containing a slip of paper with a number. The Klamath Union High School band played as the capsules were picked from the jar one by one, broken open with a wooden mallet, the numbers read, a list consulted. Winners cried and laughed. Some got drunk, others prayed. Speeches were given. (Blake et al. 2000)

A January 20, 1947, cover of *Life* shows one of the winners—the Dale Sprout family. Over 2,000 veterans vied for only 86 sites at Tule Lake, ranging in size from 61 to 141 acres. The article reports that to be eligible, one had to be "a World War II veteran with two years of farm experience, 'habits of honesty, temperance, thrift, and industry' and \$2,000 of his own money to build a house and develop the property" (Farm Lottery, 1947).

On February 15, 1949, the last homestead drawing was held in Tulelake. While there was a fair amount of controversy over releasing additional refuge lands to homesteading, it was not just homesteaded lands that affected environmental and economic conditions in the basin. In the Tule Lake National Wildlife Refuge alone, 22,000 acres were leased to farmers. Some suspect this may have been the result of local pressure, but it may have been just as much the result of the philosophical stance afoot in much of the American West—to be fully useful (even on a wildlife refuge), land should be farmed or otherwise used for economic purposes (Blake et al. 2000).

The number of farms in the basin remained fairly constant during the first half of the century, increasing by a little over 8 percent, from 1,197 in 1930 to 1,295 in 1950. Nevertheless, production figures vary considerably during this period. Wheat production in Klamath County increased markedly, from 2,400 acres to 21,700 acres, and barley and potato production also showed significant gains (Dicken and Dicken, ca. 1985).

"Railroadless" No More

Until 1909, the Klamath basin was known as the "railroadless central area of [Oregon] state" and the "largest region in the nation without a railroad" (Robbins, 1997). The Pokegama plateau had been conquered by rails for almost a decade, but it was not until 1909 that the Southern Pacific Railroad Company constructed a spur line from Weed, California, to Klamath Falls, connecting the heart of the region's emerging timber industry to national markets. Weyerhaeuser had planned on extending its newly acquired Pokegama line (purchased in 1905) to Klamath Falls

but dropped these plans upon learning of the Southern Pacific's Weed to Klamath Falls extension. With the coming of the Southern Pacific, local agricultural commodities also gained a relatively inexpensive and efficient means of transport out of the basin (Hopkins, 1977). According to Robbins (1997), Portland boosters were less than thrilled with these developments, having sought to embrace Klamath Falls as part of their hinterland. They hoped that a rail link up the Deschutes River and on to Klamath Falls would reclaim their dream. Regardless, the Klamath basin was no longer "railroadless," and this proved to be vital to the success of the region's burgeoning timber industry. The fates of the Klamath Lake Railroad, the timber industry, and Siskiyou Electric Power & Light Company converged in the Upper Klamath River country early in the twentieth century. Following the foundering of the lumber industry (and the demise of the Klamath Lake Railroad in 1912) on the canyon's north rim, the Siskiyou Electric Power & Light Company reused portions of abandoned rail lines to construct a new spur line to its Copco dam construction site. This line was used between 1921 and 1934, eventually being disassembled in 1942 (Bartoy, 1995; Nilsson and Greenway, 1985). The Weyerhaeuser Timber Company eventually constructed a railroad line between Klamath Falls and Pokegama Flats in 1937, more than 30 years after the Klamath Lake Railroad reached New Pokegama from the west (Gavin, ca. 2001).

As some modes of transportation gained importance, others were either abandoned or relegated to a much less significant role. Stage and wagon use proved increasingly impractical in the wake of automobile and rail transit. Likewise, the first decades of the twentieth century saw major road improvements, such as the completion of U.S. Highway 97 and new bridges across the Link River. While water transport boomed in the early 1900s, it too suffered the same fate as the stage and wagon (Dicken and Dicken, ca. 1985). Also, during the 1940s a Naval Air Station was constructed south of Klamath Falls. In time, this became the Klamath Falls municipal airport and Kingsley Air Force Base (Hopkins, 1977).

Growth of the Timber Industry

As mentioned earlier, by 1905 the Weyerhaeuser group had established a presence in the Klamath Canyon area. Shortly thereafter, the Algoma Lumber Company, owned by a California fruit packer, began acquiring lands in Siskiyou County and built a mill at New Pokegama. Much of New Pokegama burned in 1908. By 1911, Algoma had logged most of its lands. It closed its mill in 1912 and relocated to Rattlesnake Point on Upper Klamath Lake. Potter's Mill closed in 1906, only 3 years after it was built (Follansbee et al. 1988; Gavin, ca. 2001; Klamath County Historical Society, 1984; Lewis, 1987).

While the early 1900s saw an overall decline in the timber industry, operations began to recover by about 1910, following the completion of Southern Pacific's Weed spur. By 1920, Klamath County boasted at least 30 sawmills producing more than 117 million board feet of lumber per year. At the start of World War I, Weyerhaeuser had acquired approximately 255,000 acres of forest lands in the basin—an investment of \$4,422,500. In the mid-1920s, Weyerhaeuser built a major mill in Klamath Falls—its only pine mill—and remained a major economic force in the basin for decades to come. Milling operations that had been located along the north rim of the canyon were relocated to Klamath Falls, and area residents who remained either turned entirely to cattle ranching or eventually sold their land to the Siskiyou Electric Power & Light Company. Rapid growth in lumbering continued between 1920 and 1929, with 39 saw mills producing 350

million board-feet per year and eight box factories producing 200 million board-feet per year. This period also saw the multiplication of spur railroads to support logging operations and the increasing use of mechanized equipment. But the Depression caused operations to abruptly halt by 1930. Numerous small mills closed, and across the nation nearly 50 percent shut down either temporarily or permanently. Surviving mills had to diversify their clientele and markets—usually outside the region—to survive. The number of millworkers in Klamath County declined nearly 43 percent, from 4,406 in 1928 to 1,908 in 1932. By 1932, timber production plummeted to only 191 million board-feet per year (55 percent of the pre-Depression volume), and about half of all timber-related jobs were lost. The industry recovered by World War II, which resulted in multiple government contracts to local timber companies. With a depleted workforce, women were employed in local sawmills and box factories. Following World War II, the Weyerhaeuser Timber Company expanded and became the prominent company in the region (Bartoy, 1995; City of Klamath Falls, 1986; Hidy et al. 1963; Hills et al. 1996; Snyder, 1988).

Hydroelectric Generation

A critical development in the history of the region was hydroelectric power generation, which is extensively treated elsewhere (see Kramer, 2003a, presented in Appendix E6-D). Nevertheless, it is impossible to fully understand the story of settlement and development in the basin without noting the reasons for and the effects of hydroelectric facilities. The earliest hydroelectric generation in the region occurred in 1891 in Yreka, California. Four years later, in 1895, the Klamath Falls Light & Water Company built a power plant along the banks of the Link River and soon thereafter began power generation for the town of Klamath Falls.

The first decade of the twentieth century saw a number of mergers and reorganizations of power companies in the area. Out of this period of corporate flux emerged the California-Oregon Power Company, or Copco. Klamath Falls-area residents were divided over Copco's proposal to dam and generate power on the Klamath River. Farmers feared the depletion of precious irrigation water while other businesses saw Copco as another payroll source for the local economy. Nevertheless, with the increasing power needs of both irrigation and lumber mills, not to mention a huge influx of military personnel stationed at Medford and Klamath Falls, it was only a matter of time before additional generation facilities were built. Historian William Robbins (1997) points out that "in all of the debate over legal rights to water, however, there were no discussions about potential dangers to fish migrations or to the remaining waterfowl nesting areas in the basin. The legal struggle over control of the river was argued and metered out in water units for a variety of industrial uses."

While Copco's pre- and post-World War II generation facilities played a key role in supporting the economy of southern Oregon and northern California, their effects linger today in terms of fisheries debates in the Klamath basin over the effects of both irrigation and dams on resident and anadromous fish (Kramer, 2003a; Robbins, 1997). Whereas in earlier decades local ranches provided logistical support for loggers and railroad workers, during the 1930s some residents provided lunches for Copco construction workers (Spannaus, 1995). Nevertheless, for longtime residents of the canyon, the most apparent effect of Copco's projects came in the form of ranch and farmland inundated by waters from the newly formed reservoirs (Bartoy, 1995; Harder, 2003).
E6.1.7.4 Contemporary Period, 1950–Present

Klamath Tribe

The Klamath Termination Act of 1957 (Public Law 587) proved a defining moment for the Klamath Tribe and the social and economic fabric of the entire Klamath basin. The act "terminated" federal government administration and recognition of the tribe. Subsequently, the U.S. Forest Service and the U.S. Fish and Wildlife Service purchased 70 percent of what had been tribal lands. Prior to termination, the tribe was one of the largest owners of Ponderosa pine in the West. The social effects of termination were widespread and deeply felt among the Klamaths. Termination changed the fabric of Indian social life, with the changes manifested in alarming statistics: 40 percent of deaths were alcohol-related, 52 percent of deaths were of people under the age of 40, and 70 percent of high school students dropped out before graduation (Blake et al. 2000; Klamath Tribes, 2003; Stern 1998).

In 1974, the Klamath tribe won a major court victory related to reserved rights. A U.S. District Court ruling in *Kimball v. Callahan* stated that those "who were Klamath Indians by ancestry and who elected to withdraw from the tribe pursuant to the Klamath Termination Act and have their interest in tribal property converted to money and paid to them, nevertheless retained treaty rights to hunt, trap, and fish free of state regulations on former Indian land that was sold to pay for their shares in tribal property, including land taken by the United States for national forests and privately owned land on which hunting, trapping, or fishing was permitted." A 1984 court ruling went even further by ensuring the tribe adequate water to protect hunting and fishing rights (Blake et al. 2000).

Economic Development

Following "termination," Laurence Shaw, with the Modoc Lumber Company, spearheaded lobbying efforts to create the Winema National Forest out of what had been the Klamath Indian Reservation, to prevent out-of-state timber interests from obtaining any of these lands. The Klamath Falls economy was bolstered by these efforts. Though the Modoc Lumber Company and Weyerhaeuser mill were at the heart of the Klamath basin economy for much of the twentieth century, both operations closed (or were sold) in recent decades in the context of decreased economic hegemony of the timber industry (Blake et al. 2000).

Other notable changes have occurred in the basin during the contemporary period. Roads were gradually improved so that what at one time might have been a kidney-jarring ride between outlying areas and larger communities—such as Klamath Falls—is now a trip over smooth pavement. In contrast to signs of economic expansion and diversification, many small towns are even smaller today than they once were. The population of Tulelake, for instance, has shrunk by one third since the 1940s. Today Klamath Falls serves as a regional hub of commerce, with national and global markets. Klamath Falls' diversified economy ranges from algae harvesting on Klamath Lake to door and window manufacturers (Blake et al. 2000).

Conservation Challenges

The tension between the use of refuge lands for wildlife and farming played out in legislation proposed by California Senator Thomas Kuchel in 1964. The Kuchel Act articulates seemingly contradictory goals when it states that Klamath basin refuge lands "shall be administered by the Secretary of the Interior for the major purpose of waterfowl management, but with full consideration to optimum agricultural use that is consistent herewith." Moreover, the act officially ended homesteading on Klamath Project lands. In 1977, management of refuge lease lands and associated irrigation water was transferred to the Bureau of Reclamation. The tension between agriculture and wildlife conservation remains to this day (Blake et al. 2000; Markle, 2002).

The late 1960s and early 1970s were halcyon years for environmental legislation. The passage of the National Environmental Policy Act in 1969 and the Endangered Species Act in 1973 brought a new level of environmental awareness to the Klamath basin. In the mid-1980s, large fish kills occurred in the Klamath River as a result of low water oxygen levels. Following a 1988 request from the Klamath tribes, the U.S. Fish and Wildlife Service listed the shortnose (*qapdo*) and Lost River (*c'wam*) suckers as endangered, and the Klamath Reclamation Project was identified as a potential source of species degradation.

A number of drought years during the 1990s exacerbated the problem of balancing the water needs of fish with those of irrigators in the basin (Blake et al. 2000). In the late 1990s, coho salmon were listed as a threatened species while scientists studied the link between the Project and declining runs of fish. The drought of 2001 elevated the situation in the Klamath basin to a near-crisis level, causing a rift between local farmers and environmental advocates. In April of that year, based on requirements of the Endangered Species Act, the Klamath Project "water allocation decision" stated that Klamath basin farmers would not be eligible to receive water from the Upper Klamath Lake (Markle, 2002). Subsequent biological studies questioned the validity of this decision, prolonging the debate to the present.

E6.2 SITES LISTED OR DETERMINED ELIGIBLE FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES

E6.2.1 Archaeological Resources

Detailed information will be provided to appropriate parties listing archaeological resources (sites) determined or recommended to be NRHP eligible. This section and a table will be provided in the Cultural Resources Final Technical Report, which is a confidential document. A summary table of archaeological sites and their recommended NRHP eligibility is provided below (see Table E6.2-1).

E6.2.1.1 NRHP Eligibility Considerations

For federally involved undertakings (projects), cultural resource significance is evaluated in terms of eligibility for listing in the National Register of Historic Places. Specific NRHP significance criteria are applied to evaluate cultural resources and are defined in 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- (a) are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) are associated with the lives of persons significant in our past; or
- (c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) have yielded or may be likely to yield information important in prehistory or history.

Significant impacts can occur when prehistoric or historic archaeological sites, structures, or objects listed in or eligible for listing in the NRHP are subjected to the following effects:

Physical destruction of or damage to all or part of the property

- Alteration of a property
- Removal of the property from its historic location
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features
- Neglect of a property that causes its deterioration
- Transfer, lease, or sale of the property

If cultural resources are evaluated and determined to be significant following the procedures described above and Project impacts on the resources cannot be avoided (or eliminated), it may be necessary to conduct additional historical or archaeological documentation. This will be discussed later in this section of Exhibit E.

Using the guidelines and standards established by the Secretary of the Interior, this Project's historical and/or archaeological resources are evaluated using an understanding of the regional setting and criteria established in the project work plan and pertinent research questions that identify the significant patterns each observed resource is likely to represent. Comparing the prehistoric and historic contexts with the integrity characteristics and data requirements for each specific property type leads to NRHP eligibility recommendations.

PacifiCorp agrees with the NRHP eligibility recommendations made by its consultants and will be submitting the NRHP eligibility recommendations to FERC and the SHPOs for their concurrence.

For prehistoric archaeological sites—and for some historic-period archaeological sites—NRHP eligibility usually depends upon a site's integrity and ability to yield important information (Criterion D). Significance becomes the guiding principle for determining which sites to preserve or study in greater detail because not all cultural resources can be preserved (Nicholas, 1994). The preservation of the original relationship between artifacts and features is crucial to site integrity. Substantial alteration of a site as a result of erosion, excavation, or the transportation of site materials to other locations results in the loss of integrity and significance. While the determination of the significance of a prehistoric site often falls under Criterion D of 36 CFR 60.4, any of the four criteria can potentially be appropriate.

Historic-period resources are primarily evaluated through extended literature searches and archival studies to determine significance. The integrity of historic sites and traditional cultural properties is evaluated similar to prehistoric sites, although Criteria A, B, and C frequently are used. For TCPs or historical sites, documentation or oral history may exist to tie a location directly to an important person or event in national, state, or local history. Sites that hold cultural heritage significance to American Indian tribes are considered in the confidential FTR (PacifiCorp, 2004). Additional consultation and TCP/SCR (sensitive cultural resource) studies reveal the importance of these later site types.

Certain historic properties can immediately be evaluated as NRHP-eligible based on surface examination. Such obvious NRHP-eligible sites include the following:

- Village sites with pit house depressions.
- Sites with human burials present (cemeteries or village sites with burials present). In most circumstances, isolated burials would not be NRHP eligible but would be considered to be SCRs.
- Sites with a broad array of artifact types and lithic debitage.
- Sites with stratigraphically intact subsurface deposits.
- Surface artifact and/or debitage scatters that also have structural or other features present (e.g., house pits, rock alignments, cairns, rock art, cache pits, cooking features, etc.).
- Standing buildings or structures of exemplary design or construction.

Prehistoric Archaeological Sites Relative to NRHP Eligibility

The archaeological inventory work and site integrity data confirmed the nature of previously recorded isolated artifacts and clusters of prehistoric archaeological remains and revealed evidence of previously undocumented and/or unknown sites. Some of these sites meet the scientific criterion (Criterion D, having the capability to provide information important in prehistory or history) for NRHP eligibility. This section includes a summary of the prehistoric

archaeological sites, or the prehistoric component of multicomponent sites, as necessary. Table E6.2-1 presents the recommended NRHP eligibility for each site and the rationale for eligibility relative to addressing known contexts. The historic-period themes and recommendations for historic-period sites and sites with both prehistoric and historic components are presented in Section E6.2.2.

Prehistoric resources are evaluated primarily through Criterion D. In only a few cases can literature searches, archival studies, and oral history testimony augment the archaeological information and assist in determining significance under the other NRHP criteria. The NRHP eligibility of prehistoric-period sites is evaluated based on each of four NRHP eligibility criteria and the qualities of site integrity, and the criteria considerations outlined in 36 CFR 60.4.

In general, resources that consist of ephemeral remains, such as lithic scatters (with or without ground stone or minor site features) generally do not provide information important in prehistory (that is, information that is not redundant and/or is better represented at many other sites in the immediate region). However, these resources are often incompletely understood if recorded based on surface evidence alone. Therefore, in most cases, the prehistoric sites with limited evident data are recommended as potentially eligible in Table E6.2-1, pending additional field research. Additional research would, in most cases, clarify the role that negative impacts have had on the sum of the site deposits. Without additional research it is often difficult, if not impossible, to understand these resources as products of their time or as illustrations of unique, representative, or pivotal aspects of tribal heritage. If resources with poor remaining integrity (based on the sum of surface and subsurface evidence) have been significantly affected by natural or historic human events, they could then be evaluated relative to NRHP eligibility criteria.

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CB-04	Lithic Scatter, Rock Rings, Vision Quest	Looting, Erosion and Recreation Development	PE	A, D	May meet NRHP eligibility criteria for a TCP and for capability to provide information important in prehistory. Further testing and other information required.
CB-05	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Recreation, Road and Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-04	Habitation/Village Site; Lithic Scatter, Food Processing, Pit Features	Road, Utilities and Recreation Development, Looting, Erosion	E	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
CB-24	Lithic Scatter, Food Processing	Looting, Erosion, Utilities, Road, and Rec- reational Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

Table E6.2-1. NRHP recommendations and j	ustification for	prehistoric	sites and	site components.
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Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
35KL1059	Village and Burial Site; Lithic Scatter, Food Processing	Looting, Erosion, Road, Rural and Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing and/or information are required.
35KL1121	Burial Site; Lithic Scatter	Looting, Erosion, Road, Rural and Utilities Development, Data Recovery	E	D	Appears to meet NRHP eligibility criteria as an important burial site dating from the Late Archaic/ Late Prehistoric.
35KL1458	Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-11	Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-12	Lithic Scatter, Food Processing	Looting, Erosion, Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-09	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-10	Lithic Scatter, Food Processing	Looting, Erosion, Road Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-11	Village and Burial Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities and Rural Development	Е	D	Appears to meet NRHP eligibility criteria as an important habitation and burial site dating from the Late Archaic/Late Prehistoric.
FH-08	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-09	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development, Dumping	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-10	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-11	Lithic Scatter	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-21	Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CB-25	Lithic Scatter	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-12	Lithic Scatter	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-08	Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-13	Lithic Scatter	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-24	Habitation/Village Site; Lithic Scatter, Food Processing, Pit Feature	Looting, Erosion, Rural and Recreation Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-14	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-15	Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities Development	Е	D	Appears to meet NRHP eligibility criteria as an important habitation site.
FH-16	Village and Burial Site; Lithic Scatter, Food Processing	Looting, Erosion, Utilities and Rural Development	E	D	Appears to meet NRHP eligibility criteria as an important habitation and burial site dating from the Middle/Late Archaic.
FH-17	Lithic Scatter, Food Processing	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-18	Lithic Scatter	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-22	Lithic Scatter, Food Processing	Looting, Erosion, Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-21	Lithic Scatter	Looting, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-19	Lithic Scatter	Looting, Erosion, Utilities and Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

Table E6.2-1. NRHP recommendations and	justification for	prehistoric	sites and	site components.
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Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
JC03-20	Lithic Scatter	Looting, Erosion, Rural and Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-18	Lithic Scatter	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-17	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Recreation, Residential and Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-13	Lithic Scatter	Looting, Erosion, Rural and Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-26	Lithic Scatter	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-14	Habitation/Village Site; Lithic Scatter, Food Processing	Looting, Erosion, Rural and Recreation Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-16	Lithic Scatter	Looting, Recreation Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
AS-01	Lithic Scatter, Cremation(s)	Looting, Recreation, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important as a special use (cremation) site. Further information required.
JC03-15	Lithic Scatter	Looting, Erosion, Rural and Road Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL1348	Lithic Scatter, Food Processing	Looting, Erosion, Road and Rural Development, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-01	Habitation/Village Site; Lithic Scatter, Milling Stations	Road and Recreation Development, Logging	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL1901	Pictographs	Vandalism, Weathering	Е	C, D	Appear to meet NRHP eligibility criteria as a rare example of rock art pictographs in the Klamath River Canyon.
CB-01	Lithic Scatter	Looting	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
JS-03	Lithic Scatter	Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-03	Lithic Scatter, Food Processing	Looting and Recreation Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-02	Habitation/Village Site; Lithic Scatter, Milling Station, Petroglyph	Recreation Utilities and Road Development, Erosion	E	D	Appears to meet NRHP eligibility criteria as an important habitation site.
JS-07	Habitation/Village Site; Lithic Scatter, Milling Station	Recreation, Utilities and Road Development, Erosion, Looting, Live- stock Activities, Logging	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JS-05	Habitation/Village Site; Lithic Scatter,	Recreation Utilities and Road Development, Erosion, Looting, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL1942	Habitation Site?; Lithic Scatter, Food Processing, Pos- sible Pit Features	Road and Recreation Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-20	Habitation/Village Site; Lithic Scatter, Food Processing, Petroglyph	Siltation/Erosion, Looting, Utilities Development	Е	D	Appears to meet NRHP eligibility criteria as an important habitation site.
JC03-09	Lithic Scatter, Food Processing	Looting, Erosion, Recreation Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-10	Lithic Scatter, Food Processing	Looting, Erosion, Utilities and Recreation Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL1943	Habitation Site; Lithic Scatter, Food Processing, Pit Features	Road and Recreation Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required (U of O test results pending).
35KL1941	Lithic Scatter, Food Processing	Road and Recreation Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required (U of O test results pending).

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Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
35KL14	Rock shelter; Burial, Lithic Scatter	Erosion, Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as an important Late Archaic/Late Prehistoric period burial and rock shelter site.
35KL13	Rock shelter; Pit Feature, Lithic Scatter, Food Processing	Erosion, Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as an important Late Archaic/Late Prehistoric period habitation and rock shelter site.
35KL15	Habitation Site; Lithic Scatter, Milling Stations, Possible Pit Feature	Road and Recreation Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
RM-01	Lithic Scatter	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-06	Lithic Scatter	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL577	Pit Features, Cairn Features; Origin Site	Erosion	PE	А	May meet NRHP eligibility criteria for a TCP. Further information required.
35KL558	Pit Feature; Lithic Scatter	Erosion, Data Recovery	PE	А	May meet NRHP eligibility criteria for a TCP. Further information required.
35KL634	Lithic Scatter, Food Processing	Road and Recreation Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL576	Ceremonial/Village Site; Lithic Scatter, Food Processing, Pit Features	Road and Recreation and Rural Development, Looting, Erosion, Data Recovery	E	A, D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site (Criterion D). May also meet NRHP eligibility Criterion A as a TCP (further information required).
35KL22	Village and Burial Site; Lithic Scatter, Food Processing, Pit Features	Looting, Erosion, Data Recovery	Ε	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
35KL550	Habitation Site; Lithic Scatter, Pit Features	Recreation and Road Development, Looting, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL1083	Lithic Scatter, Food Processing	Road and Recreation and Rural Development, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

Table E6.2-1. NRHP recommendations and	justification for	prehistoric	sites and	site components.
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Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
35KL17/ 35KL554	Village Site; Lithic Scatter, Food Processing, Pit Features; Possible Petroglyphs	Road and Recreation and Rural Development, Looting, Erosion, Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as part of the larger <i>Laik'elmi</i> Prehistoric District.
35KL20	Village Site; Lithic Scatter, Food Processing, Pit Features; Possible Petroglyphs	Road and Recreation and Rural Development, Looting, Erosion, Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as part of the larger <i>Laik'elmi</i> Prehistoric District.
35KL21/786	Village and Burial Site; Lithic Scatter, Food Processing, Pit Features	Road and Recreation and Rural and Utilities Development, Looting, Erosion, Data Recovery	E	D	Appears to meet NRHP eligibility criteria as part of the larger <i>Laik'elmi</i> Prehistoric District.
35KL567	Burial Site; Rock Cairn Features, Lithic Scatter	Road and Recreation and Rural Development, Looting, Erosion, Data Recovery	E	C, D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Prehistoric District (Criterion D). Burial cairns may embody the distinctive characteristics of a type and be NRHP eligible (Criterion C).
35KL18	Village and Burial Site; Lithic Scatter, Food Processing, Pit Features; Petroglyphs	Road and Recreation Development, Looting, Erosion, Data Recovery	E	D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Prehistoric District.
35KL578	Habitation/Village Site; Lithic Scatter, Food Processing	Road, Recreation and Rural Development, Looting, Erosion, Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Prehistoric District.
35KL19	Habitation/Village Site; Lithic Scatter, Food Processing, Petroglyphs	Road and Recreation and Rural Development, Looting, Erosion, Data Recovery	E	D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Prehistoric District.
35KL23/566	Ceremonial/Village Site; Lithic Scatter, Food Processing, Pit Features	Road and Recreation and Rural Development, Looting, Erosion, Data Recovery	E	A, D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Prehistoric District (Criterion D). May also meet NRHP eligibility (Criterion A) as a TCP (further information required).
35KL784	Lithic Scatter, Food Processing	Recreation and Utilities Development, Erosion, Testing	NE		Determined not NRHP eligible.

Table E6.2-1. NRHP recommendations and	justification for	prehistoric	sites and	site components.
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Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
JC-01	Lithic Scatter	Erosion, Logging	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL24	Rock shelter; Lithic Scatter	Recreation Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL630	Possible Quarry	Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL629	Habitation/Village and Burial Site; Lithic Scatter, Food Processing, Pit Features	Recreation Development, Looting, Erosion	E	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
35KL633	Village Site; Lithic Scatter, Food Processing, Pit Features	Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
35KL791	Habitation Site; Lithic Scatter, Food Processing, Rock Rings, Pit Features	Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL785	Rock Ring	Grazing	N/A		OUTSIDE OF FIC. NO NRHP RECOMMENDATIONS.
35KL16	Village Site; Lithic Scatter, Food Processing, Pit Features	Road and Recreation Development, Looting, Erosion, Data Recovery	E	A, D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site (Criterion D). May also meet NRHP eligibility Criterion A as a TCP (further information required).
35KL632	Lithic Scatter, Possible Pit Houses	Road, Recreation and Rural Development, Looting, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
35KL635	Lithic Scatter, Food Processing	Road and Rural Development, Erosion, Data Recovery	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-1721	Village Site; Lithic Scatter, Food Processing, Pit Features	Road and Recreation Development, Erosion, Data Recovery	E	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CA-SIS-2646	Habitation Site; Lithic Scatter, Food Processing, Possible Pit Features	Road, Recreation and Rural Development, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2263	SIS-2263 Lithic Scatter, Food Recreation and Road Development, Erosion, Livestock Activities, Features Research Collection		PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS- 2402/H	Temporary Habitation Site; Lithic Scatter	Erosion, Livestock Activity	PE	C, D	May meet NRHP eligibility criteria for capability to provide information important in prehistory (Criterion D), or may represent contact period features that embody distinctive characteristics of a type and be NRHP eligible (Criterion C). Further testing required.
CA-SIS-2401	Lithic Scatter, Food Processing	Recreation and Road Development, Erosion, Livestock Activities, Research Collection	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2570	Habitation Site; Lithic Scatter, Food Processing, Pit Features	Rural Development, Erosion, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2569	Habitation/Village Site; Lithic Scatter, Food Processing, Milling Feature, Petroglyphs	Recreation and Road and Rural Development, Erosion, Livestock Activities, Research Collection	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2241	Habitation Site; Lithic Scatter, Food Processing, Pit Feature	Rural Development, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS- 2400/H	Village Site; Lithic Scatter, Food Processing, Pit Features, Boulder Feature, Petroglyphs	Looting, Road, Residential and Rural Development, Research Collection	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.

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Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CA-SIS-2568	Burial Site; Lithic Scatter, Rock Cairn Features, Petroglyphs	Rural Development, Livestock Activities	PE	C, D	May meet NRHP eligibility criteria for capability to provide information important in prehistory (Criterion D). Further testing is required. Burial cairns features may embody distinctive characteristics of a type and be NRHP eligible (Criterion C).
CA-SIS-1839	Habitation/Village Site; Lithic Scatter, Food Processing	ion/Village thic Scatter, rocessing Development, Utilities Recreation Development		D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2578 (Locus 2)	Lithic Scatter, Food Processing; Ceremonial Site	Road and Recreation Development, Looting, Erosion	PE	A	May meet NRHP eligibility criteria for a TCP. Further information required.
CA-SIS-16/H	Rock shelter; Lithic Scatter, Food Processing	Looting, Data Recovery, Erosion, Livestock Activity	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation and rock shelter site.
CA-SIS-2577	Habitation/Village Site?; Lithic Scatter, Possible Pit Features	Rural Development, Looting, Erosion, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2576	Habitation/Village Site; Lithic Scatter, Food Processing, Pit Features	Rural and Recreation Development, Looting, Erosion, Livestock Activities	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
CA-SIS-2574	Lithic Scatter, Food Processing	Road and Recreation Development, Erosion, Research Collection, Looting	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2573	Burial Site?; Lithic Scatter, Rock Cairn Features	Road and Recreation Development, Erosion, Research Collection, Looting	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
RM-20	Lithic Scatter	Recreation, Rural and Road Development, Erosion, Looting, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2827	Lithic Scatter, Food Processing	Rural and Road Development, Erosion, Research Collection	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CA-SIS-2572	Habitation/Village Site?; Lithic Scatter, Possible Pit Features	Erosion, Livestock Activity	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-1840	Habitation/Village Site; Lithic Scatter, Food Processing, Pit Features	Recreation Develop- ment, Erosion, Livestock Activities, Research Collection, Looting	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2579	Lithic Scatter, Rock Cairn Feature	Road Development, Erosion, Research Collection, Faunal Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-15	Lithic Scatter, Food Processing, Petroglyphs	Utilities Development, Looting, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-16	Lithic Scatter	Utilities Development, Looting, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-17	Lithic Scatter, Food Processing	Rural, Recreation and Utilities Development, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-06	Lithic Scatter	Erosion, Looting, Utilities, Rural, and Recreational Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-06	Habitation/Village Site; Lithic Scatter, Food Processing	Erosion, Looting, Utilities, Road, and Recreational Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-07	Lithic Scatter	Recreation and Road Development, Erosion, Looting	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
JC03-08	Habitation/Village Site; Lithic Scatter, Food Processing, Pit Feature	Recreation, Rural, Utility and Road Development, Erosion, Looting, Livestock Activities	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
FH-07	Habitation/Village Site; Lithic Scatter, Food Processing, Pit Features	Erosion, Utility Development	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.

Table E6.2-1. NRHP recommendations and justification for prehistoric sites and site components.	

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CB-29	Lithic Scatter	Looting, Residential and Road Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
RM-21	Habitation Site; Lithic Scatter, Food Processing, Pit Features	Rural Development, Looting, Livestock Activities	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-08	Lithic Scatter	Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CB-28	Lithic Scatter, Food Processing	Rural, Road, and Utilities Development, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-2403	Village Site; Lithic Scatter, Food Processing, Pit Features	Looting, Road, Utility Development, Erosion, Livestock Activities, Data Recovery	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
JC03-01	Village Site; Lithic Scatter, Food Processing, Pit Features	Erosion, Looting, Utilities, Road, and Rural Development	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.
CB-10	Village Site; Lithic Scatter, Food Processing, Milling Stations, Petroglyphs	Road, Recreational, Utilities Development, Looting, Erosion	Ε	C, D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site (Criterion D), and also to meet NRHP eligibility (Criterion C) for embodying the distinctive characteristics of a petroglyph (cupule boulder) feature type.
FH-01	Lithic Scatter	Looting, Erosion, Utilities Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-03	Lithic Scatter	Erosion, Rural Development	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-02	Lithic Scatter	Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
CA-SIS-326	Village Site; Lithic Scatter, Food Processing, Pit Features	Utilities Development	Е	D	Appears to meet NRHP eligibility criteria as an important prehistoric habitation site.

Site No.	Assumed Site Function (Prehistoric Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CB-12	Lithic Scatter, Food Processing	Rural and Utilities Development, Looting, Erosion	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.
FH-04	Rock shelter; Lithic Scatter	Erosion, Looting	PE	D	May meet NRHP eligibility criteria for capability to provide information important in prehistory. Further testing required.

NE = Not eligible.

PE = Potentially eligible.

E = Eligible.

Other resources recommended as "potentially eligible" have the potential to provide valuable information on prehistoric events or individuals within the Klamath River Basin, pending the results of additional oral history research as well as surface or subsurface testing. For example, several properties may be significantly associated with traditional cultural values or as sites where prehistoric American Indians gathered annually for seasonally available resources and for social interaction. These sites (CB-04, 35KL577, 35KL558, 35KL576, 35KL23/566, and CA-SIS-2578, among others) may be evaluated as NRHP eligible under Criterion A. In these instances, the sites may possess significance and integrity, but the current level of oral history research and surface-only archaeological inventory is insufficient to provide an accurate determination.

Other examples of potentially eligible resources (in this case, under Criterion C) include sites that may embody the distinctive characteristics of a type and period of construction that represent a significant and distinguishable entity whose components lack individual distinction (National Register of Historic Places, 1991). This could include prehistoric burial cairn sites (such as 35KL567 or CA-SIS-2568), unusual examples of prehistoric rock art (35KL1901 and CB-10) and the potential contact-period features at Site CA-SIS-2402 (Crush Circles), if the features present can be associated with a particular time period or a specific type.

Resources evaluated as meeting NRHP eligibility criteria include several of the village sites that represent important properties associated with prehistoric settlement, subsistence, and other behavior for a specific period of time. These include the following:

 In Oregon: JS-04, 35KL1121, JS-11, FH-15, FH-16, CB-20, CB-02, 35KL13, 35KL14, 35KL22, 35KL576, 35KL629, 35KL16, 35KL633, and the sites in the Frain Ranch/ *Laik'elmi* region, (35KL17/35KL554, 35KL20, 35KL21/786, 35KL567, 35KL18, 35KL578, 35KL19, and 35KL23/35KL566) • In California: CA-SIS-1721, CA-SIS-2400/H, CA-SIS-16/H, CA-SIS-2576, JC03-08, FH-07, CB-10, JC03-01, and CA-SIS-363

Of these sites, 35KL1121, JS-11, FH-16, 35KL14, 35KL22, 35KL18, 35KL21/786, and 35KL629 have had human remains recorded in site forms and reports. In addition, Site AS-01 has potential human cremation remains and Site 35KL1059 has reported human burials present.

Additional prehistoric properties are located outside of the Project APE and outside of the FIC. For example, these include 35KL785 and the village component at Site CA-SIS-2578 (Locus 1). Both site areas were revisited during the 2002/2003 field season but are located outside of the FIC. No recommendations regarding these resources were made in Table E6.2-1.

It is important to note that Joanne Mack (2003) has recently proposed that the Freedom Site (CA-SIS-1721), Lion's Village (CA-SIS-2646), and related isolated finds be considered a prehistoric NRHP district. Five additional areas of multiple sites, which are probably related and are located in a congruent stretch of the river, may each potentially be associated into a distinct NRHP district. These sites include the following:

- The various sites in the vicinity of Link River, including the house pit village JS-04 and Site CB-05, but probably including additional sites near Upper Klamath Lake.
- The complex of non-house pit sites near Teeter's Landing (FH-14, FH-16, FH-15, and FH-16).
- Sites near J.C. Boyle Reservoir (35KL1942, CB-2, CB-3, CB-20, JS-7, JS-5, JC03-9, and JC03-10).
- Sites 35KL554/35KL17, 35KL20, 35KL21/35KL786 on the west bank (collectively representing the fishing station complex called Laik'elmi [Spier 1930]) and 35KL567, 35KL18, 35KL 578, 35KL19, 35KL23/35KL566 on the east bank in the Upper Klamath River Canyon. Note that a similar portion of the canyon at this point will be mentioned as a historic-period potential district in the following section.
- The three large villages (CA-SIS-2403, JC03-01, and CB-10) near Copco reservoir.

The Historic Properties Management Plan (HPMP; see Section E6.6.1 and Appendix E-6F) includes measures to protect the NRHP-eligible, or potentially eligible, prehistoric sites.

E6.2.2 Historical Resources

The previous section presented the prehistoric themes and recommendations for sites with both prehistoric and historic components. This section summarizes the historic components of multicomponent sites and sites with only historic-period artifacts and features, with respect to their eligibility for inclusion on the NRHP. This section includes Table E6.2-2, which lists historical resources (sites) that appear to meet NRHP eligibility criteria.

Historic resources are evaluated primarily through extended literature searches and archival studies to determine significance. The NRHP eligibility of historic-period sites, including

archaeological sites of this era and aboveground or built environment sites, are evaluated using the four NRHP eligibility criteria, the qualities of historic integrity, and the criteria considerations outlined in 36 CFR 60.4. A summary of the historic-period archaeological sites is presented in Table E6.2-2. Additionally, six historic-period sites (JS-12, 35KL578H, OSI-432, CA-SIS-2400-H, CA-SIS-513H, and CA-SIS-2577H) retain at least one standing structure or building that may contribute to their recommended NRHP eligibility.

NRHP eligibility is summarized in Table E6.2-2. In general, resources that consist of ephemeral remains, such as isolated trash scatters, remnant rock walls, and portions of irrigation ditches, have been evaluated as not meeting NRHP eligibility criteria. These resources lack context and this lack of context makes it difficult, if not impossible, to understand these resources as products of their time or as illustrations of unique, representative, or pivotal aspects of heritage. Likewise, resources that appear to have been significantly affected by human or natural events, resulting in a loss of historic integrity, have been evaluated as not meeting NRHP eligibility criteria.

Other resources evaluated as "potentially eligible" have the potential to provide valuable information on homesteading and logging within the Klamath River basin, pending the results of additional research and surface or subsurface testing. Resources evaluated as potentially NRHP eligible may possess significance and integrity, but the current level of archival research and surface-only archaeological inventory is insufficient to provide an accurate eligibility determination.

Other examples of potentially eligible resources include several sites that appear to have been associated with the construction of the Copco No. 1 dam (Sites CB-29, CB-27, CA-SIS-2824H, and FH-21). These sites may contain information that could provide insights into the organization and activities associated with construction of the dam, and they may offer particular insight into the construction workers and their experiences. Although the Copco powerhouse has been documented in the State Historic Preservation Office (SHPO) records, it is not included in Table E6.2-2; rather, it is discussed separately in Section E6.2.3. Each of the hydroelectric-associated aboveground buildings and structures is discussed later. In addition, the Project's HPMP will include measures for protecting the NRHP-eligible, or potentially eligible, historical sites.

Resources evaluated as meeting NRHP eligibility criteria include the Frain Ranch, an important property associated with an early homesteader and the origins of ranching and agriculture within the Upper Klamath River Canyon. The Frain Ranch property appears to be best understood as a historic district encompassing standing structures, archaeological resources, and landscape elements, such as irrigation ditches and fields. Potential Historic District elements of the Frain Ranch include the main ranch area (35KL578H) and elements of Sites 35KL567, 35KL1083, and JC03-29. Similarly, the Beswick Hotel property (CA-SIS-513) contains a variety of resources with important associations to early tourism, dating from the 1860s.

Several additional historic properties are located outside of the Project APE and outside of the FIC. One example is the historic Spencer Cemetery (recorded as Site JS-06), which is located near the J.C. Boyle reservoir drawdown area but outside of the FIC. No recommendation was made for this resource, yet it should be included in future BLM Klamath Falls Resource Area

records and management planning and be protected from unauthorized artifact collection or vandalism.

Site No.	Assumed Site Theme (for Historic Component)	Assumed Site Function (Historic Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
JS-05H	Agriculture	Rural homestead, trash scatter	Road development, Camping	NE		Does not appear to meet NRHP eligibility criteria.
35KL1458	Agriculture	Ditch	Erosion, rural and road development	NE		Does not appear to meet NRHP eligibility criteria.
FH-15	Transportation	Location of ferry landing/ferry crossing	Erosion, looting	NE		Does not appear to meet NRHP eligibility criteria.
JS-12	Agriculture	Rural homestead	Looting, recreation use, erosion, weathering	NE		Does not appear to meet NRHP eligibility criteria.
35KL2228	Public Utilities	Location of former dam	Recreational use, rural development, dredging, erosion dismantling	NE		Does not appear to meet NRHP eligibility criteria.
35KL1461	Logging	Logging railroad grade	Recreational use, utility and road development, erosion	NE		Does not appear to meet NRHP eligibility criteria.
35KL2229	Public Utilities	Location of former powerhouse	Recreational use, road development, erosion, weathering	NE		Does not appear to meet NRHP eligibility criteria.
35KL1901	Transportation	Historical graffiti	Recreational use, erosion, weathering	NE		Does not appear to meet NRHP eligibility criteria.
JS-06	Cemetery	Euroamerican cemetery	Weathering			OUTSIDE OF FIC. NO NRHP RECOMMENDATIONS.
RM-03	Trash scatter	Trash dump	Logging, weathering	NE		Does not appear to meet NRHP eligibility criteria.
LA-01	Logging	Possible portable mill location and trash dump	Looting, weathering, road development	PE	A, D	May meet NRHP eligibility criteria for associations with logging industry and for ability to convey information pertaining to early 20th century logging. Further testing required.
35KL1419	N/A	Recent feature— not a historic site	Destroyed, Recreational development	N/A	N/A	This is not a historic-period site, but a circa 1970s - 1980s construct. Destroyed by recent development at BLM Turtle Camp campground. Should be removed from SHPO and BLM records.

Site No.	Assumed Site Theme (for Historic Component)	Assumed Site Function (Historic Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
35KL1083	Agriculture	Ditch	Road development, erosion	Е	A, B, C and D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Historic District.
JC03-29	Agriculture	Developed spring, ditch	Recreational use and road development, erosion	Е	A, B, C and D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Historic District.
35KL567	Agriculture	Ditches	Recreational use and road development, erosion	Е	A, B, C and D	Appears to meet NRHP eligibility criteria as part of the larger Frain Ranch Historic District.
35KL578H	Agriculture	Rural homestead, ditch, orchard	Looting, recreational use, road development, data recovery, erosion	Е	A, B, C and D	Appears to meet NRHP eligibility criteria as a historic district associated with an early settler and for its associations with early ranching, agriculture, and irrigation.
JC03-30	Transportation	Road grade	Grading, realignment, erosion, weathering	NE		Does not appear to meet NRHP eligibility criteria. While this segment of the road appears to retain its original alignment it has lost its integrity as a result of modern improvements.
OSI-431	Transportation	Rock blind	(none)	NE		Does not appear to meet NRHP eligibility criteria.
OSI-432	Education	Rural school, outbuilding, trash scatter	Vandalism, looting, weathering, road development	Е	A, C and D	Appears to meet NRHP eligibility criteria for associations with local education and community development.
35KL635	Agriculture	Rural homestead, trash scatter	Erosion, road and rural development, livestock herding and grazing	NE		Does not appear to meet NRHP eligibility criteria.
CA-SIS- 2402-H	Agriculture	Foundation, depressions, trash scatter (contact- period use?)	Erosion, livestock herding and grazing	PE	A and D	May meet NRHP eligibility criteria for associations with early homesteading in the region. Further testing required.
CA-SIS- 2571H	Cemetery	American Indian cemetery	Erosion, livestock herding and grazing	PE	A, C and D	May meet NRHP eligibility criteria for associations with Shasta Indian soldiers who fought in the Civil War, and as a rare example of burial cairns. Further research required, but no subsurface testing should occur.
CB-07	Agriculture	Rural homestead rock walls, trash scatter, orchard	Road development, weathering, erosion, livestock herding and grazing	PE	A and D	May meet NRHP eligibility criteria for associations with early homesteading in the region. Further testing required.

Table E6.2-2. NRHP recommendations and justification	tion for historic-period sites and site components.
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Site No.	Assumed Site Theme (for Historic Component)	Assumed Site Function (Historic Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
CA-SIS- 2400-H	Agriculture	Rural homestead	Weathering, livestock herding and grazing	NE		Does not appear to meet NRHP eligibility criteria. Resource has lost integrity due to poor condition.
CA-SIS- 1839-H	Commercial	Saloon and Shop	Looting, erosion, rural, recreational, utilities and road development	NE		Does not appear to meet NRHP eligibility criteria. Resource has lost integrity due to poor condition.
CA-SIS- 513	Commercial	Rural commercial enterprise, recreational development	Weathering, rural and road develop- ment, livestock herding and grazing, irrigation	Ε	A, C and D	Appears to meet NRHP eligibility criteria for associations with early tourism.
CA-SIS- 16-H	Agriculture	Rural homestead, ranching	Weathering, loot- ing, data recovery, dismantling, livestock herding	NE		Does not appear to meet NRHP eligibility criteria.
CA-SIS- 498H	Logging	Log Chute	Dismantling, erosion, rural development	NE		While potentially significant under NRHP Criteria A, the resource no longer retains integrity.
CA-SIS- 2577H	Commercial and Agriculture	Rural commercial enterprise, homestead, ranching, ditch	Weathering, rural development, livestock herding and grazing	PE	A and D	May meet NRHP eligibility criteria for associations with early homesteading and commercial enterprise in the region. Further testing required.
CA-SIS- 2575H	Agriculture	Rock wall	Erosion, logging, road development, livestock grazing	NE		Does not appear to meet NRHP eligibility criteria.
JC-02	Agriculture	Irrigation ditch	Erosion, weathering, recreational use	NE		Does not appear to meet NRHP eligibility criteria.
CB-19	Trash scatter	Trash dump	Weathering, livestock grazing	NE		Does not appear to meet NRHP eligibility criteria.
CB-29	Agriculture	Rural homestead, trash scatter	Weathering, livestock herding and grazing, looting	PE	A and D	May meet NRHP eligibility criteria for associations with early 20th century dam construction. Further testing required.
CB-27	Public Utilities	Trash scatter	Weathering, livestock herding and grazing, looting	PE	A and D	May meet NRHP eligibility criteria for associations with early 20th century dam construction. Further testing required.
CA-SIS- 2824H	Public Utilities	Foundation remains of guest house, trash scatter	Looting, weathering, road and recreation development	PE	A and D	May meet NRHP eligibility criteria for associations with early 20th century dam construction. Further testing required.

Site No.	Assumed Site Theme (for Historic Component)	Assumed Site Function (Historic Component)	Site Impacts	Recommended NRHP eligibility	Applicable NRHP Criterion	Eligibility Justification
FH-21	Public Utilities	Trash dump	Looting, weathering, road and recreation development	PE	A and D	May meet NRHP eligibility criteria for associations with early 20th century dam construction. Further testing required.
JC03-26	Agriculture	Rock wall	Erosion, road and utility development	NE		Does not appear to meet NRHP eligibility criteria.
CB-18	Public Utilities	Rail grade and trestle	Erosion, weathering, dismantling	NE		Does not appear to meet NRHP eligibility criteria.
JC03-25	Trash scatter	Bread oven feature, trash dump	Road and utility development, ero- sion, recreation use, livestock grazing	NE		Does not appear to meet NRHP eligibility criteria.
JC03-02	Agriculture	Rock wall	Erosion, weathering	NE		Does not appear to meet NRHP eligibility criteria.
JC03-03	Agriculture	Rock wall	Erosion, road development	NE		Does not appear to meet NRHP eligibility criteria.
JC03-04	Agriculture	Rock wall	Erosion, road development	NE		Does not appear to meet NRHP eligibility criteria.
CB-11	Agriculture	Field clearing cairns	Looting, erosion	NE		Does not appear to meet NRHP eligibility criteria.
JC03-05	Agriculture	Field clearing cairns	Erosion, livestock grazing	NE		Does not appear to meet NRHP eligibility criteria.
CB-13	Agriculture	Field clearing cairns, rock wall	Erosion, livestock grazing	NE		Does not appear to meet NRHP eligibility criteria.
FH-05	Agriculture	Rural homestead, stock dam, trash scatter	Looting, erosion, livestock herding and grazing	NE		Does not appear to meet NRHP eligibility criteria.
FH-04	Trash scatter	Possible short- term camp in rock shelter	Looting, erosion	NE		Does not appear to meet NRHP eligibility criteria.
CB-14	Agriculture	Rock wall	Erosion	NE		Does not appear to meet NRHP eligibility criteria.

NE = Not eligible.

PE = Potentially eligible.

E = Eligible.

E6.2.3 Historic Hydroelectric Resources

The Klamath Hydroelectric Project consists of seven hydroelectric generation facilities, with their associated diversion dams, support structures, transmission lines, flumes, tunnels, and other

related resources located along the Klamath River in Klamath County, Oregon, and Siskiyou County, California. Hydroelectric development within the Klamath River region began in 1891 with pioneer developments in Yreka, California, followed shortly by those in Klamath Falls, Oregon. The oldest extant facility is the Fall Creek Power Plant, developed in 1902-1903 by the Siskiyou Electric Power Company.

Envisioned in 1911, the Klamath Hydroelectric Project incorporated these earlier elements into a single "system," designed and built in phases over the following five decades. The Project continues to function as a single system, using the same water flow at each of its locations, with upstream facilities serving regulatory functions for facilities located further downstream. The Project resources were constructed by the California Oregon Power Company and its various pioneer predecessors between 1902 and 1962 and are now owned and operated by PacifiCorp. George Kramer (2003a; see Appendix E-6D) provides a more detailed discussion of the hydroelectric resources involved.

Located along a waterway that crosses the Oregon-California border and serving a sparsely settled multicounty region, the resources of the Klamath Hydroelectric Project are strongly associated with the early development of electricity in the southern Oregon and northern California region. They played a significant role in the area's economic development, both as part of a regionally significant, locally owned and operated private utility and through the role that increased electrical capacity played in the expansion of the timber, agriculture, and recreation industries during the first six decades of the twentieth century.

The Klamath Hydroelectric Project is considered regionally significant under Criterion A for listing in the NRHP. Specific Project elements—most notably Fall Creek powerhouse and Copco No. 1—also may be significant under Criterion C for their early construction, design, and engineering features, which exemplify the design of pioneer-era hydroelectric generation facilities. As a single system, a Multiple Property Submission is recommended as the appropriate format for documentation.

E6.2.3.1 Period of Significance: 1903-1958

Although the development of hydroelectric generation facilities in the Klamath River area began in 1895, the earliest standing resources within the Project area are those at Fall Creek (see Project Complex Area 6, below), started in 1902 and completed in 1903. As a result, 1903 serves as the beginning of the period of significance for the evaluation of the historic resources.

The closing date of a period of significance for "activities begun historically that continue to have an importance" is generally subject to the so-called "50-year rule" of the National Register of Historic Places process (National Park Service, 1990). Based on the 2006 FERC license renewal for the Klamath Hydroelectric Project, the period of significance would typically end in 1956, including all the main generation resources built prior to World War II and defining both the J.C. Boyle and Iron Gate developments, dated from 1958 and 1962, respectively, as nonhistoric. There is precedence in FERC-license situations, which by nature continue the federal undertaking as defined by 36 CFR 800 over a long period of time subsequent to the actual date of relicensing, to extend the 50-year requirement to include properties that will achieve that status within the license period. The Boyle development, first envisioned as early as

1911 and completed in 1958 (48 years old in 2006), is considered appropriately included, reflecting the important post-war development of the Klamath Hydroelectric Project. Iron Gate dam, although planned as a component of the initial development of the Klamath River in 1911, was not completed until 1962. Iron Gate has been previously determined not eligible for listing in the National Register of Historic Places by the State of California (Kramer 2003b; see Attachment 1 in Appendix E-6E).

E6.2.3.2 Physical Description

The Klamath Hydroelectric Project consists of a series of seven hydroelectric generation facilities; various diversion dams, support structures, and linear elements such as flumes, canals and tunnels; and other related resources located on the Klamath River and its tributaries in southern Klamath County, Oregon, and northern Siskiyou County, California. The Fall Creek powerhouse is located on Fall Creek, a tributary of the Klamath in Siskiyou County, just north of Copco No. 2.

Resources within the Klamath Hydroelectric Project are documented in geophysical order between the Link River and Iron Gate dams, following the flow of water from Project beginning to end. The linear nature of the Project and the concentration of resources in specific groups or "nodes" of activity define the basic identification structure with seven individual Project complexes: (1) Link River [Klamath Falls], (2) Keno, (3) J.C. Boyle, (4) Copco No. 1, (5) Copco No. 2, (6) Fall Creek, and (7) Iron Gate.

Within a linear resource system that both reuses water within the Klamath River channel proper and is augmented by various water conveyance systems that divert flow from point to point or from complex to complex, certain Project resources such as flumes or pipelines connect Project components rather than existing entirely within a single Project component. Such connections, which are entirely typical within an interconnected system such as the Klamath Hydroelectric Project, are documented here at their starting point for convenience.

Within the seven Project complex areas, individual resources are identified numerically in order, following the flow of water through the system. For example, the Link River dam, the northeastern-most resource in the Link River Complex, is documented as Resource 1.1 while the communications building, located just downstream from the dam, is documented as Resource 1.2 and so forth. Subcomponents or other multiple resources categorized within a single heading are identified as such (i.e., 1.3.1, 1.3.2, etc.).⁶

The following itemized catalog of major built resources within the Klamath Hydroelectric Project briefly documents the various components of the Project and summarizes their construction and development. This brief material is supplemented by the more detailed individualized inventory forms (see Attachments 2 and 3 in Appendix E-6E). Like any industrial system developed over more than a century of use, the Klamath Hydroelectric Project contains dozens, if not hundreds, of seemingly discrete but essentially interconnected elements, and a

⁶ Separate components generally occur with the water conveyance systems while some support resources (warehouses, residences) include multiple structures of similar design and development history. Some nonstandard numbering occurs in an effort to maintain identification consistency between the Determination of Eligibility and the previously prepared inventory forms in the attachments to Appendix E-6E.

comprehensive catalog of each of these elements is beyond the scope of the investigation conducted for Exhibit E. Therefore, this section of Exhibit E documents and provides data for the evaluation of the major Project components that form the essential operational and characterdefining elements of the Klamath Hydroelectric Project today. Individual resources are categorized using standard National Register evaluation terminology (historic contributing, historic noncontributing, and nonhistoric noncontributing) in the item header. More detailed information on individual Project elements, including site photographs, are included within the inventory forms in the attachments to Appendix E-6E.

Project Complex Area 1: Link River Complex (Klamath Falls, Oregon)

The Link River Complex begins at the Link River dam, which is owned by the Bureau of Reclamation but operated by PacifiCorp, and continues downstream to include the locations of the original H.V. Gates and Moore Brothers developments that first generated commercial electricity in Klamath County during the late 19th century. Link River dam is not included in the Klamath Hydroelectric Project boundary but is described here for context.

<u>Resource 1.1: Link River Dam</u> Built: 1920-21 Evaluation: **Historic Contributing**

The Link River dam is a 435-foot-long concrete gravity structure with an average height of 16 feet. Though not part of the FERC license, the dam provides water control for both hydroelectric operations and irrigation and includes several connected elements: a 40-foot-wide gated West Side canal intake structure, a 40-foot-wide gated concrete weir spillway, a 260-foot-wide ungated spillway, and the 48-foot-wide East Side intake structure. Fish passage facilities were upgraded in July 2003.

Resource 1.2: Link River Communication Building Built: ca. 1993 Evaluation: Nonhistoric, Noncontributing

This small concrete block structure contains equipment that connects the Link River dam with the Project control facilities at Merwin dam.

Resource 1.3: East Side Water Conveyance Features Built: 1924 Evaluation: **Historic Contributing**

Water is conveyed along the east side of the Link River via a series of connected elements cataloged under this main heading. Beginning at the East Side intake of the dam, water enters the East Side forebay (1.3.1), a 670-foot-long mortar and stone flume. An abandoned fish bypass (1.3.2) runs parallel to this wall. Exiting the forebay, water enters a 12-foot-diameter wooden penstock line (1.3.3) and continues for 1,729 feet before joining a 1970-1980 steel replacement penstock (1.3.4) that is 1,361 feet long, continuing to the powerhouse. A concrete and riveted steel surge tank (1.3.5) is located atop the penstock line.

Resource 1.4: East Side Powerhouse No. 3 Built: 1924 Evaluation: **Historic Contributing**

In 1917, Charles and Rufus Moore built a second powerhouse at the site of H.V. Gates' original 1895 development in Klamath County; this second powerhouse stood until construction of the present structure. East Side powerhouse No. 3 is a substantial poured concrete volume with industrial-type steel sash windows and a pyramidal roof. The first remotely controlled unit in the Klamath Project (it was first controlled from the West Side powerhouse, just across the river), the East Side powerhouse No. 3 remains largely as constructed.

<u>Resource 1.5: West Side Water Conveyance Features</u> Built: 1908, 1921, 1973 Evaluation: **Historic Contributing**

Beginning from the six cast iron slide gates on the west end of the Link River dam, the West Side water system consists of a 1-mile-long (5,575-foot) flume (1.5.1) with both concrete lined and unlined sections. This flume runs from the dam to the concrete penstock intake structure (1.5.2). Near this structure is a concrete overflow spillway (1.5.3) built in 1921 and rebuilt in 1973. The penstock itself is a 7-foot-diameter steel pipe (1.5.4) approximately 140 feet in length that continues to the West Side powerhouse.

Resource 1.6: West Side Powerhouse Built: 1908, ca. 1920s Evaluation: **Historic Contributing**

The West Side powerhouse consists of two adjoining volumes: a concrete main structure similar in plan to the East Side powerhouse constructed in the 1920s and a rear, wood-framed building that is probably a portion of the original 1908 powerhouse built on this site.

Resource 1.7: Operator's Residence/Sheds Built: ca. 1940s Evaluation: Nonhistoric, Noncontributing

Located downriver from the powerhouse, the operator's residence (1.7) is either a circa 1950s ranch-style single-story dwelling or a massive remodel of an earlier, circa 1920s structure that was located in this same general area. The house has been serially remodeled with window replacements, applied siding, metal roofing, and other changes that negatively affect its integrity. Two wood-framed outbuildings, a small shed (1.7.2) believed to have originally been a chicken coop, and a garage/barn (1.7.3) are located to the rear of the house. Both of these outbuildings appear to predate the house in construction but, as essentially minor structures, are considered noncontributing.

Project Complex Area 2: Keno Dam Complex (vicinity of Keno, Oregon)

This area was initially developed for hydroelectric development in association with a timber mill in the early 20th century and by 1911 was operated by the Keno Power Company, a competitor purchased and absorbed into Copco in 1920. The original facilities were replaced in 1931 by the first Keno regulating dam, which itself was replaced by PacifiCorp after the end of the period of

significance. Although the facilities generated power at one time, the 1966 reconstruction did not include generation facilities.

<u>Resource 2.1: Keno Dam</u> Built: 1966 Evaluation: Nonhistoric, Noncontributing

The Keno dam, including the fish ladder, was built in 1966. The structure is a 723-foot-long concrete gravity dam with six gates and a maximum height of 25 feet. The Keno dam is used to control reservoir levels at Keno reservoir/Lake Ewauna and river flows downstream but has no generation facilities itself. A multiple switchback fish ladder and related features are located at this site.

<u>Resource 2.2: Keno Communications Building</u> Built: ca. 1966 Evaluation: Nonhistoric, Noncontributing

The Keno communications building is a small, single-story concrete block structure with little exterior detail. Like the similar structure at Link River, this building houses equipment that connects the Project with the Merwin dam control center.

Project Complex Area 3: J.C. Boyle Complex (Klamath County, Oregon)

Originally developed and known as Big Bend, the J.C. Boyle dam and powerhouse complex was rededicated to honor the pioneer hydroelectric engineer responsible for the design of virtually all of the Klamath Hydroelectric Project.

Resource 3.1: J.C. Boyle Diversion Dam Built: 1956-58 Evaluation: **Historic Contributing**

The Boyle diversion dam includes several sections (earth-fill, concrete gravity, intake and spillway) that combine to form an overall crest length of 714.3 feet with a height of 68 feet. The concrete spillway portion contains three gates and forms the J.C. Boyle reservoir. Fish screens, a fish ladder, and related features are also present.

Resource 3.2: Boyle Communications Building Built: ca. 1995 Evaluation: Nonhistoric, Noncontributing

This is a modern structure with vinyl and metal walls and metal roof materials, located adjacent to the dam and serving the same connection function as similar structures at Link River and Keno.

<u>Resource 3.3: Boyle Fire Protection Building</u> Built: ca. 1995 Evaluation: Nonhistoric, Noncontributing

This is a small, modern structure built of rough-faced concrete block with a shallow shed roof.

Resource 3.4: Boyle "Red Barn" Built: ca. 1958 (modified ca. 1978) Evaluation: Historic, Noncontributing

Originally built as a barn during the initial construction and operation period at Boyle, this single-story wood frame building has been extensively modified with applied siding and roofing, window replacements, and similar modifications. It no longer effectively relates its original development or design.

<u>Resource 3.5: Boyle Maintenance Shop</u> Built: 1991 Evaluation: Nonhistoric, Noncontributing

This large, modern, metal structure was built in 1991 and is used as a maintenance shop.

<u>Resource 3.6: Boyle Residences</u> Built: ca. 1985 Evaluation: Nonhistoric, Noncontributing

These two residences (3.6.1 and 3.6.2) were constructed circa 1985.

Resource 3.7: Boyle Water Conveyance System Built: 1958 Evaluation: **Historic Contributing**

Beginning at the dam, the water conveyance system at Boyle begins with a 14-foot-diameter steel pipe (3.7.1) that runs for 616 feet before passing through a flume headgate (3.7.2) installed in 2002-2003. From here water enters an 11,484-foot-long open canal/flume system (3.7.3) composed of both one- and two-wall concrete construction (the one-wall system uses rock on the opposite face). A concrete headgate structure (3.7.4) is located at the flume terminus, where water enters the forebay with two spill gates (3.7.5). A small spillway house is of newer but undated construction (3.7.6). A 16-foot-diameter tunnel (3.7.7) runs for 1,662 feet to the surge tank (3.7.8). The surge tank, 30 feet in diameter and 56 feet tall, leads to the two massive penstocks (3.7.9), 10.5 feet and 9 feet in diameter, respectively, that drop 925 feet down the slope to the powerhouse.

Resource 3.8: J.C. Boyle Powerhouse Built: 1958 Evaluation: **Historic Contributing**

Located 5 river miles downstream of the dam, the J.C. Boyle powerhouse has two outdoor generation units sited below an open steel gantry crane system. Substructure elements of the powerhouse, housing the turbines, are of concrete. The Project went online as the Big Bend powerhouse in October 1958 and was rededicated in honor of John Christie Boyle on June 25, 1962. A bronze plaque commemorating that event and documenting Boyle's role in the development of the Klamath system is located near the powerhouse site. An outdoor substation (3.8.1) is located near the powerhouse site.

Resource 3.9: Boyle Residential Sites Built: 1950 (razed 1995) Evaluation: Historic, Noncontributing

Located downstream from the substation and powerhouse, the Boyle complex was initially developed with five operator and related worker houses on the site. Historic images show these to have been modest single-story "ranch"-type houses typical of those at other Project facilities during the post-WWII era. Following the automation of the Boyle powerhouse these structures were unneeded and as a result were razed in 1995. Perimeter foundations, concrete walkways and other similar remnants remain on the site but do not retain sufficient integrity to relate the historic period.

<u>Resource 3.10: Boyle Warehouse</u> Built: 1957 Evaluation: **Historic Contributing**

This Armco prefabricated metal-clad gable-roofed structure was constructed in 1957 as an element of the original development at Big Bend. It is of wood-frame construction with a concrete slab foundation.

<u>Project Complex Area 4: Copco No. 1 Complex (Siskiyou County, California)</u> The first of the Project resources located in California, approximately 35 miles downstream of the Oregon border, Copco No. 1 was also the first project developed on the river following the formation of the California-Oregon Power Company, which formally joined several smaller, local providers into a broader regional operation. Copco No. 1 went into service in 1918 after a lengthy and challenging construction process and was expanded just 4 years later, in 1922, to its present capacity. A large construction camp/workers' village was historically located on the flat area above (north) of the river.

Resource 4.1: Copco No. 1 Dam Built: 1912-18, 1922 Evaluation: **Historic Contributing**

Copco No. 1 was initially known and referred to as the "Ward's Canyon" dam or project, and its construction was initiated by the Siskiyou Electric Light and Power Company in 1910. Environmental and financial obstacles related to the construction of Copco No. 1 ultimately led to the reorganization of power companies in the entire region. This resulted in the creation of the California-Oregon Power Company and brought the well-financed McKee interests of San Francisco to the region. The McKees, along with several other San Francisco-based investors, played an important role in the area through connection with both Copco and, later, Pacific Power and Light. Copco No. 1 dam (4.1) is a concrete gravity arch structure of "stepped" construction on the downstream face. It was initially completed in 1918 and then enlarged in 1922. The dam is 126 feet high with an overall crest length of 415 feet, including the spillway section. Two gatehouses (4.1.2 and 4.1.3) are incorporated into the design at the north abutment, both with poured concrete walls and copper-clad hipped roofs. The crest of the dam is the location of a single-track railroad first used during the construction period and later modified for use as a part of the gate hoist system (4.1.4). This element was repaired and updated in 1981.

Resource 4.2: Copco No. 1 Water Conveyance System Built: 1912-18, 1922 Evaluation: **Historic Contributing**

Two steel penstocks that lead from the Copco dam to the powerhouse. One, a double penstock (4.2.1), runs from Gatehouse No. 1 and is 172 feet long on the east leg and 194 feet long on the west, with a diameter that begins at 10 feet and reduces to 8 feet before entering the powerhouse. The second, single penstock (4.2.2), which was added in 1922 as part of the expansion, is 228 feet long. The second penstock is 14 feet in diameter at the gatehouse, reducing to 8 feet at the powerhouse.

Resource 4.3: Copco No. 1 Powerhouse Built: 1918 Evaluation: **Historic Contributing**

The Copco No. 1 powerhouse is a concrete and steel gable-roofed building located just downstream from the dam, nestled against the rock wall of Wards Canyon. The powerhouse has a gable roof with a central "monitor" or clerestory and a small projecting shed extension to the river side. Large industrial-type steel sash windows provide interior light. As shown in historic photos, the southwest elevation was initially partially open, with large windows, and has been resided and somewhat modified. Overall, however, the building retains substantial integrity to its original design.

Resource 4.4: Copco Guest House [Remains] Built: ca. 1917 Evaluation: **Historic Contributing**

The guest house, sometimes referred to as the John Boyle house, was built as the manager's dwelling during the initial construction period of Copco No. 1 and figures prominently in period accounts and historic photographs documenting the project. John Boyle, along with his family, occupied the house during construction. The facility was additionally used by visiting company officials and other dignitaries. Built on a foundation of natural stone and sited to offer a commanding view of the river channel and the Copco No. 1 Development, the superstructure of the Copco guest house was of wood with a full wrap-around porch or veranda. Although the wood portions of the building were removed, probably in the 1980s or later, the stone foundation and chimney retain sufficient integrity to relate the historic period.

Resource 4.5: Copco No. 1 House 1

Built: ca. 1922

Evaluation: Historic Contributing

One of two residential buildings surviving from the original worker's housing village at Copco No. 1, this structure is a small single-story wood frame bungalow. Vinyl siding has been applied over the original horizontal wood siding, and doors and windows have been replaced with aluminum units. Although somewhat modified, the siting and general character remain sufficient to relate to the original development period and association with the expansion of Copco No. 1 in 1922. A small garage of similar construction is located to the rear of the house and is assumed to also date from 1922.

Resource 4.6: Copco No. 1 House 2 Built: ca. 1922 Evaluation: **Historic Contributing**

Identified as 21600 Copco Road, this structure is of similar design to House 1 but retains slightly higher integrity, including original 1/1 wood sash windows, a wood entry door, and other features. This structure too retains a matching garage.

Resource 4.7: Garage/Warehouse Built: ca. 1922 Evaluation: **Historic Contributing**

Although of unknown use, this single-story wood frame building is believed to date from the 1922 expansion of Copco No. 1, or perhaps earlier. The exterior is of 8-inch-wide lapped siding, and the wood and glass doors appear original, with the singular exception of an aluminum slider on the rear elevation. The building is constructed over a wood post and pier foundation that is open, taking advantage of a small slope, to create a "service area" below the heavy-timbered wooden floor that may have provided access for under-carriage auto or truck repair.

Project Complex Area 5: Copco No. 2 Complex (Siskiyou County, California)

Designed to operated in complete synchronization with Copco No. 1 and lacking active water storage of its own, the Copco No. 2 system was in many ways the first of the facilities to use the pattern of repeated water use on the Klamath and North Umpqua rivers pioneered by John Boyle. The facility went into commercial operation in 1925, just 3 years after the expansion of Copco No. 1. Today Copco No. 2 and the adjacent "Copco Village" serve as the primary support and operations center of the Klamath Hydroelectric Project.

Resource 5.1: Copco No. 2 Dam Built: 1925

Evaluation: Historic Contributing

Located approximately 1/4 mile downstream from Copco No. 1, the Copco No. 2 dam is a concrete gravity structure and includes a 145-foot-long gated spillway. The dam is 33 feet tall with a 278-foot-long crest.

Resource 5.2: Copco No. 2 Water Conveyance System Built: 1925 Evaluation: **Historic Contributing**

The water conveyance system below the Copco No. 2 dam is controlled by a rebuilt headgate (5.2.1.) that controls flows into a 53-foot-long tunnel intake (5.2.2.). A concrete lined tunnel 2,440 feet in length (5.2.3) connects to a 1,313-foot-long wood stave pipeline (5.2.4), a 1,110-foot-long concrete lined tunnel (5.2.5), and then, finally, two steel penstocks (5.2.6) that lead to the powerhouse. The concrete lined tunnels and wood stave pipeline are 16 feet in diameter while the penstocks, which are 16 feet at the start, constrict to half that dimension (8 feet) at the powerhouse.

Resource 5.3: Copco No. 2 Timber Cribbing Built: 1924 Evaluation: **Historic Contributing**

This log cribbing is built into the hillside just above the Copco No. 2 dam site and apparently was a component of the original development and construction period, although the initial function is somewhat unclear. Like the coffer dam below, this feature may have been related to the crusher plant or simply constructed as an abutment of some sort to solidify a weak portion of the canyon wall. Looming above the dam and clearly visible, the timber cribbing remains an unusual and rare element of the mechanics of hydroelectric construction in the second decade of the 20^{th} century.

Resource 5.4: Copco No. 2 Coffer Dam Built: 1924 Evaluation: **Historic Contributing**

The remains of this timber wing or coffer dam are located in the Klamath River channel between Copco No. 1 and Copco No. 2. Apparently the dam provided a diversion function during the initial construction of Copco No. 2 in 1924-1925 and was abandoned in place once the project was completed. It is possible, though not conclusive, that this feature was developed to power the "crusher plant" used to mill gravel during the construction, as shown in several historic photographs. Today the wood elements of the dam extend from the south bank of the river and are generally protected and submerged, becoming visible during periods of low water flows. The coffer dam provides a clear indication of the construction challenges encountered by Copco during this early period in the Klamath Hydroelectric Project's development history and remains a rare and somewhat unusual remnant of the original construction period of the Project.

Resource 5.5: Copco No. 2 Powerhouse

Built: 1925

Evaluation: Historic Contributing

The Copco No. 2 powerhouse is a large gabled building of poured concrete walls with engaged columns and other details typical of industrial architecture of the period. Original steel-sash multilight window systems illuminate the interior, and engaged surface decoration includes string course bands and a detailed parapet. The Copco No. 2 powerhouse has been somewhat modestly altered over its near 80 years of use, but in general it retains very high integrity. Immediately south of the powerhouse is an early-appearing mortared and coursed-stone retaining wall (5.5.1) that dates from the period of significance and was expanded in 1996.

Resource 5.6: Copco Control Center/Office Built: ca. 1980 Evaluation: Nonhistoric, Noncontributing

Located west of the powerhouse, the Copco No. 2 control center is a single-story metal-clad building that houses Project offices, meeting rooms, and similar functions, as well as system operations. Not specifically dated, this structure was probably built in the mid-1980s.

Resource 5.7: Copco No. 2 Maintenance Building Built: 1991 Evaluation: Nonhistoric, Noncontributing

This large metal garage/shop building is located west of the control center and was constructed in 1991.

<u>Resource 5.7.1:⁷ Copco No. 2 Substation</u> Built: unknown (ca. 1970s) Evaluation: Nonhistoric, Noncontributing

A large outdoor substation is located west of the control center, behind a chain link enclosure. Presumed to be a replacement or substantial augmentation/alteration of an earlier feature, this structure was probably built circa 1970 or later, after the end of the period of significance.

Resource 5.8: Copco No. 2 Oil and Gas Storage House Built: ca. 1925 Evaluation: **Historic Contributing**

This small wood-frame, corrugated-metal clad building is located northeast of the maintenance building. It has a log or timber foundation and appears to date from the original development period.

Resource 5.9: Copco No. 2 Cookhouse/Bunkhouse Built: ca. 1925 Evaluation: **Historic Contributing**

This two-story wood frame building likely dates from the original construction camp use on this site and was converted into a permanent feature in the workers' housing/support village after Copco No. 2 went into operation. Although somewhat modified from its original design as documented in historic photographs, the cookhouse/bunkhouse retains sufficient integrity to relate its original development.

Resource 5.10: Copco No. 2 Modern Bunkhouse Built: ca. 1960 Evaluation: Nonhistoric, Noncontributing

This low-pitched, gable-roofed, single-story wood building has a projecting central gable over the entry. Of mixed siding and window types, it is not specifically dated, but apparently it was built in the mid-1960s as a bunkhouse.

⁷ This number is added here not to reflect connection with the maintenance shed but to maintain consistency with the number scheme of the inventory sheets in the attachments to Appendix E-6E.

<u>Resource 5.11: Garage/Accessory Building</u> Built: Unknown, ca. 1960 Evaluation: Nonhistoric, Noncontributing

This single-story, wood-frame building is not directly associated with any specific residential resource and appears to provide extra storage, accessed via twin roll-up garage doors. Of seemingly modern construction, it was likely built in the 1960s.

Resource 5.12: Copco No. 2 Ranch Houses Built: ca. 1965 Evaluation: Nonhistoric, Noncontributing

There are three ranch-style residential structures (5.12.1, 5.12.2, and 5.12.3) at Copco No. 2 Village that provided worker housing at the facility but are now predominately unoccupied or used only sporadically. Single-story, shallow-pitched, gable-roofed dwellings, most have fixed, sliding, or louver-type aluminum windows and other details that indicate construction during the mid-1960s.

Resource 5.13: Copco No. 2 Bungalows/Garages Built: ca.1925 Evaluation: **Historic Contributing**

Facing the main access road into Copco No. 2 are a group of three small bungalow-style dwellings (5.13.1, 5.13.2, and 5.13.3) built during the original development period. Of wood frame, one-and-one half story construction with small projecting porch coverings, these buildings are each of similar design and have matching gable-roof garages to the rear. While modified, some with window replacements, they retain sufficient integrity and effectively relate their appearance to the period of significance.

Resource 5.14: Copco No. 2 Modular Residences Built: ca. 1985 Evaluation: Nonhistoric, Noncontributing

There are three modern prefabricated or manufactured dwellings (5.14.1, 5.14.2, and 5.14.3) at Copco No. 2, all dated circa 1985 when they were built for operator housing.

Resource 5.15: Copco No. 2 Schoolhouse Built: 1965 Evaluation: Nonhistoric, Noncontributing

Now used as a community center/training facility, this single-story building was completed in 1965 and replaced the original Copco No. 2 school that stood near the Fall Creek powerhouse.

Project Complex Area 6: Fall Creek Complex (Siskiyou County, California)

The Fall Creek complex, including the powerhouse and dam, was initially developed by the Churchill interests of Yreka, California, and operated by the Siskiyou Electric Power and Light Company, the pioneer power provider in the Yreka/Siskiyou County area prior to the formation of the original California-Oregon Power Company in 1911. Fall Creek, still in use more than a

century after its development, is the oldest unit of the PacifiCorp system and is among the oldest continuously operated hydroelectric facilities in the western United States.

<u>Resource 6.1: Fall Creek Dam</u> Built: 1902-3, as modified Evaluation: **Historic Contributing**

An earth fill structure with an open-weir concrete spillway and flashboards, the Fall Creek dam has a crest of 95 feet. Built in 1902-1903 as part of the initial development of the Project, the dam was reconstructed in 1970 and improved to its current condition in 1988.

<u>Resource 6.2: Fall Creek Water Conveyance System</u> Built: 1902-3, as modified Evaluation: **Historic Contributing**

Beginning at an 18-foot-long waterway intake located at the dam (6.2.1), the conveyance system continues through a cast-iron slide gate to a 9-foot-wide by 3-foot-deep earthen canal that runs for 4,560 feet (6.2.2). A concrete intake structure (6.2.3) connects to a 2,834-foot-long steel penstock (6.2.4) that ranges in diameter from 3.5 feet to 2.5 feet. A penstock valve structure (6.2.5) located just north of the transformer building is used to regulate the flow to the powerhouse.

Resource 6.3: Fall Creek Powerhouse Built: 1902-3, as modified Evaluation: **Historic Contributing**

This structure was completed in 1903 and originally operated with a single unit, augmented with a second unit in 1906-1907. A third and final unit was installed in the spring of 1910. All three of these pioneer generation units remain in operation. The Fall Creek powerhouse, a steel-framed structure clad with corrugated metal, remains essentially unchanged from its original design and appearance.

<u>Resource 6.4: Fall Creek Transformer/Office Building</u> Built: 1902-3, as modified Evaluation: **Historic Contributing**

Similar in design to the powerhouse, this structure dates from the original development period. It is of wood-frame construction, clad in corrugated metal. The building originally housed interior transformers; however, these features were removed and replaced by the outdoor units now located in front of the building, a change that represents the single greatest modification to generation system at Fall Creek. Today the transformer/office building houses portions of the water filtration system.

Resource 6.5: Fall Creek Residence/Garage Built: ca. 1960 Evaluation: Nonhistoric, Noncontributing

During the early years of the 20th century there was an active community associated with the Fall Creek project, including a school, boardinghouse, and at least five operators' cottages, none of
which survive. This nonhistoric, ranch-style, single-story dwelling and its associated garage are located east of the powerhouse and are similar to structures built at Copco No. 2 in the 1960s.

Resource 6.6: Fall Creek School Site Built: 1923 (razed) Evaluation: Historic, Noncontributing

The former site of the Fall Creek school is defined by a concrete slab foundation (6.6.1) and a small accessory structure or garage (6.6.2). This building is a single-story wood frame structure with a metal roof and asbestos siding. Nearby, a concrete wall (6.6.3) and small concrete dam-like structure (6.6.4) located in Fall Creek also are assumed to have been associated with the schoolhouse, but neither demonstrates any significant association or retains sufficient integrity to relate to the original development.

Resource 6.7: Fall Creek Fish Hatchery Built: 1919 Evaluation: **Historic Contributing**

Located opposite the powerhouse site, the Fall Creek fish hatchery and rearing ponds were built in 1919 and represent an early effort at fish management in association with hydroelectric development. Operated until 1948, the hatchery was essentially abandoned and remained unused until it was restored and reopened in 1979. The hatchery is now operated by the California Department of Fish and Game.

Project Complex Area 7: Iron Gate Complex (Siskiyou County, California)

Completed in 1962 as the final element—both geographically and temporally—of the Klamath Hydroelectric Project on the Klamath River, the Iron Gate complex includes the dam, the powerhouse, and the related fish hatchery facilities operated by the California Department of Fish and Game. In association with 2001-2002 work on the dam regulated by Section 106, the Iron Gate dam was determined not eligible for listing on the National Register (see Attachment 1 of Appendix E-6E).

<u>Resource 7.1: Iron Gate Dam</u> Built: 1962 Evaluation: Nonhistoric, Noncontributing

Iron Gate dam is an earth embankment dam with a rock-fill face and compact clay core. It is 173 feet high with a crest length of 740 feet. A 730-foot-long ungated concrete spillway (7.1.1) is located at the north abutment and is a modification to the original design. A concrete-lined diversion tunnel (7.1.2) remains from the construction period to the north of the spillway and is no longer functional.

Resource 7.2: Iron Gate Water Conveyance System Built: 1962 Evaluation: Nonhistoric, Noncontributing

The water system at Iron Gate begins with a 27-foot-long water way that includes trash racks and the intake gate (7.2.1) and continues to a 182-foot-long, 12-foot-diameter concrete-encased

pipeline (7.2.2) and then to a steel penstock that is 499 feet long and 12 feet in diameter (7.2.3) that connects to the powerhouse.

<u>Resource 7.3: Iron Gate Powerhouse</u> Built: 1962 Evaluation: Nonhistoric, Noncontributing

An outdoor-type powerhouse with a single unit, the Iron Gate powerhouse is a concretereinforced construction located at the south bank of the river near the base of the dam.

<u>Resource 7.4: Iron Gate Communication Building</u> Built: unknown, ca. 1980 Evaluation: Nonhistoric, Noncontributing

This is a small, metal-clad, gabled building located directly east of the powerhouse

<u>Resource 7.5: Iron Gate Restroom Building</u> Built: unknown, ca. 1980 Evaluation: Nonhistoric, Noncontributing

Located at the west end of the site, this is a single-story, metal clad, gable-roofed building. Both this structure and the similar communications building, described above, appear to post-date the completion of Iron Gate dam.

Resource 7.6: Iron Gate Dam Fisheries Facilities Built: 1962 Evaluation: Nonhistoric, Noncontributing

Related to the hatchery complex documented below, these facilities consist of six holding tanks located at the base of the dam (7.6.1), as well as a spawning building (7.6.2), a fish ladder (7.6.3) and an aerator (7.6.4). All of these facilities are components of the fish migration system that functions in lieu of a typical fish passage facility at the Iron Gate project.

Resource 7.7: Iron Gate Fish Hatchery Complex Built: 1962 Evaluation: Nonhistoric, Noncontributing

This complex, operated by the California Department of Fish and Game, was constructed in 1962 in connection with the original development of Iron Gate. It includes several buildings: the hatchery (7.7.1), a warehouse (7.7.2), an office (7.7.3), four workers' houses (7.7.4 through 7.7.7), the fish rearing ponds (7.7.8), and a fish ladder (7.7.9), all located within the main complex area. A visitors center, a small kiosk-style building (7.7.10), is located near the entrance to the site.

Summary

Located at seven "nodes" of activity related to the generation of hydroelectricity along the Klamath River, the Klamath Hydroelectric Project as documented above contains a total of 110 resources. Of these, 60—or about 55 percent—were built between 1902 and 1958, the defined

period of significance, and retain sufficient integrity to relate their association with the Project. Fifty resources (46 percent of the total) were constructed after 1958 or have been so altered that they are no longer considered historic. Twenty-three of these nonhistoric resources are located at the Iron Gate dam complex, which was added to the Project in 1962; as such, these resources are categorically not eligible. Eliminating Iron Gate, 60 of the 87 resources identified on the Klamath Hydroelectric Project between Link River and Copco No. 2, or nearly 70 percent of the total, were constructed during the period of significance and retain integrity with the associations that make them significant under Criterion A for eligibility to the National Register of Historic Places. Table E6.2-3 summarizes the Project resources, date of construction, and NRHP evaluation.

ID Number	Description	Date	NRHP Evaluation				
Link River Comp	Link River Complex						
1.1	Dam	1920-21	Historic Contributing				
1.2	Communication building	ca. 1993	Noncontributing				
1.3	East Side water conveyance features	1924					
1.3.1	East Side forebay		Historic Contributing				
1.3.2	Mortar and stone flume		Historic Contributing				
1.3.3	Wooden penstock line		Historic Contributing				
1.3.4	Steel penstock line		Historic Contributing				
1.3.5	Surge tank		Historic Contributing				
1.4	East Side powerhouse No. 3	1924	Historic Contributing				
1.5	West Side water conveyance features	1908,1921, 1973					
1.5.1	Flume	1908,1921, 1973	Historic Contributing				
1.5.2	Penstock intake	1908,1921, 1973	Historic Contributing				
1.5.3	Overflow spillway	1908,1921, 1973	Historic Contributing				
1.5.4	Steel pipeline	1908,1921, 1973	Historic Contributing				
1.6	Powerhouse, turbine, generator	1908, ca.1920s	Historic Contributing				
1.7	Operator's house	ca. 1940	Noncontributing				
1.7.1	Small shed	ca. 1920s	Noncontributing				
1.7.2	Garage/barn	ca. 1920s	Noncontributing				
Keno Dam Comp	lex						
2.1	Dam	1966	Noncontributing				
2.2	Communications building	ca. 1966	Noncontributing				
J.C. Boyle Diversi	on Dam Complex						
3.1	Dam	1956-58	Historic Contributing				
3.2	Communications building	ca. 1995	Noncontributing				
3.3	Fire protection building	ca. 1995	Noncontributing				
3.4	Red barn	ca. 1958, altered 1978	Noncontributing				
3.5	Maintenance shop	1991	Noncontributing				

Table E6.2-3. Historic project structures, date of construction, and NRHP evaluation.

ID Number	Description	Date	NRHP Evaluation
3.6	Residences	ca. 1985	
3.6.1	Residence 1	ca. 1985	Noncontributing
3.6.2	Residence 2	ca. 1985	Noncontributing
3.7	Water conveyance features	1958	
3.7.1	Steel pipe	1958	Historic Contributing
3.7.2	Flume headgate	2002	Noncontributing
3.7.3	Open flume/concrete	1958	Historic Contributing
3.7.4	Headgate structure	1958	Historic Contributing
3.7.5	Forebay/spillgates	1958	Historic Contributing
3.7.6	Spillway house	ca. 1958	Historic Contributing
3.7.7	Tunnel	1958	Historic Contributing
3.7.8	Surge tank	1958	Historic Contributing
3.7.9	Penstocks	1958	Historic Contributing
3.8	Powerhouse	1958	Historic Contributing
3.8.1	Substation	1958	Historic Contributing
3.9	Residential site	ca. 1950/1995	Noncontributing
3.10	Armco warehouse	1957	Historic Contributing
Copco No. 1 Com	plex		
4.1	Dam	1912-1918, 1921-1922	
4.1.1	Dam	1912-1918, 1921- 1922	Historic Contributing
4.1.2	Gatehouse 1	1918	Historic Contributing
4.1.3	Gatehouse 2	1922	Historic Contributing
4.1.4	Gate hoist system/rails	1918	Historic Contributing
4.2	Penstocks	1912-1918, 1921-1922	
4.2.1	Double penstock	1912-1918	Historic Contributing
4.2.2	Single penstock	1921-1922	Historic Contributing
4.3	Powerhouse	1918	Historic Contributing
4.4	Copco guest house (remains)	1917, 1980s	Historic Contributing
4.5	House/Garage 1	ca.1922	Historic Contributing
4.6	House/Garage 2 (21600 Copco Rd)	ca.1922	Historic Contributing
4.7	Garage/warehouse	ca.1922	Historic Contributing
Copco No. 2 Com	plex		
5.1	Dam	1925	Historic Contributing
5.1.1	Mortared stone wall	1925	Historic Contributing
5.2	Water conveyance features	1925	

Table E6.2-3. Historic project structures, date of construction, and NRHP evaluation.

ID Number	Description	Date	NRHP Evaluation
5.2.1	Headgate	1925 (rebuilt)	Historic Contributing
5.2.2	Tunnel intake	1925	Historic Contributing
5.2.3	Concrete-lined tunnel	1925	Historic Contributing
5.2.4	Wood stave pipeline	1925	Historic Contributing
5.2.5	Concrete tunnel	1925	Historic Contributing
5.2.6	Steel penstocks	1925	Historic Contributing
5.3	Timber cribbing	1925	Historic Contributing
5.4	Coffer dam	1925	Historic Contributing
5.5	Powerhouse	1925, 1996	Historic Contributing
5.6	Control center/office	ca. 1980	Noncontributing
5.7	Maintenance building	1991	Noncontributing
5.8	Oil and gas shed		Historic Contributing
5.9	Cookhouse/bunkhouse	ca. 1925	Historic Contributing
5.10	Modern Bunkhouse	ca. 1960	Noncontributing
5.11	Garage/accessory building	ca. 1960	Noncontributing
5.12	Ranch housing	ca. 1965	
5.12.1	Ranch House 1	ca. 1965	Noncontributing
5.12.2	Ranch House 2	ca. 1965	Noncontributing
5.12.3	Ranch House 3	ca. 1965	Noncontributing
5.13	Bungalow housing	ca. 1925	
5.13.1	Bungalow/Garage 1	ca. 1925	Historic Contributing
5.13.2	Bungalow/Garage 2	ca. 1925	Historic Contributing
5.13.3	Bungalow/Garage 3	ca. 1925	Historic Contributing
5.14	Modular residences	1985	
5.14.1	Modular 1	1985	Noncontributing
5.14.2	Modular 2	1985	Noncontributing
5.14.3	Modular 3	1985	Noncontributing
5.15	Schoolhouse/community center	1965	Noncontributing
Fall Creek Compl	ex		
6.1	Dam	1902-1903, 1970, 1988	Historic Contributing
6.2	Water conveyance system	1902-03	
6.2.1	Intake	1902	Historic Contributing
6.2.2	Earthen canal	1902	Historic Contributing
6.2.3	Intake	1902	Historic Contributing
6.2.4	Penstock	1902	Historic Contributing
6.2.5	Penstock operator valve	1902	Historic Contributing

Table E6.2-3. Historic project structures, date of construction, and NRHP evaluation.

ID Number	Description	Date	NRHP Evaluation
6.3	Powerhouse	1902-03, 1906, 1910	Historic Contributing
6.4	Transformer house/office	1903	Historic Contributing
6.5	Residence/garage	ca.1960	Noncontributing
6.6	School site	1923 (razed)	Noncontributing
6.7	Fish hatchery	1919	Historic Contributing
Iron Gate Dam C	omplex		
7.1	Dam	1960-62	Noncontributing
7.1.1	Spillway	ca. 1980	Noncontributing
7.1.2	Diversion tunnel	1960-62	Noncontributing
7.2	Water conveyance system	1960-62	
7.2.1	Water way/trash racks	1960-1962	Noncontributing
7.2.2	Pipeline	1960-62	Noncontributing
7.2.3	Penstock	1960-1962	Noncontributing
7.3	Powerhouse	1960-62	Noncontributing
7.4	Communication building	ca. 1980	Noncontributing
7.5	Restroom building	ca. 1980	Noncontributing
7.6	Dam fisheries facilities		
7.6.1	Holding tanks	1962	Noncontributing
7.6.2	Spawning building	1962	Noncontributing
7.6.3	Fish ladder	1962	Noncontributing
7.6.4	Aerator	1962	Noncontributing
7.7	Fish hatchery	1965, ca. 1994	
7.7.1	Hatchery building	1962	Noncontributing
7.7.2	Warehouse	1962	Noncontributing
7.7.3	Office	1962	Noncontributing
7.7.4	Workers Housing 1	1962	Noncontributing
7.7.5	Workers Housing 2	1962	Noncontributing
7.7.6	Workers Housing 3	1962	Noncontributing
7.7.7	Workers Housing 4	1962	Noncontributing
7.7.8	Fish rearing ponds	1962	Noncontributing
7.7.9	Fish ladder	1962	Noncontributing
7.7.10	Visitors center	1962	Noncontributing

Table E6.2-3. Historic project structures, date of construction, and NRHP evaluation.

Note: **Bold face** indicates resources that are considered historic contributing. *Italic face* indicates resources that are considered noncontributing.

E6.2.4 Ethnographic Resources

The Klamath Tribes' draft study identifies potentially NRHP-eligible traditional cultural properties within the Project's designated area of potential effect. The draft study for the Shasta tribes lists a number of ethnographic sites but has not yet identified potentially NRHP-eligible TCPs. For all of the tribes, a number of river-associated fish and plants constitute sensitive cultural resources. Similarly, all of the tribes agree that the Klamath River, along with its natural resources and cultural places, forms an ethnographic riverscape that holds extreme importance.

The Klamath Tribes' draft report identifies 10 potentially NRHP-eligible TCPs and discusses Project impacts in terms of how Project facilities have historically impeded anadromous fish passage to numerous traditional fishing stations, inhibiting the use of those sites for salmon fishing (Deur, 2003) and other traditional cultural activities and reducing site integrity. Other impacts include the physical and visual presence of Project facilities at the Link River TCP and the potential for flood events to exacerbate archaeological site erosion at the Big Bend TCP, a place where expansion of Project infrastructure along the canyon rim also could affect the cultural value. The reduction of natural seasonal fluctuations of water levels has affected the production of culturally important plants such as wocas and tules. Detailed site locations for the Klamath Tribes TCPs are provided in Appendix 4A of the Cultural Resources FTR (PacifiCorp, 2004).

An identification of potentially NRHP-eligible TCPs for the Shasta tribes is needed to identify potential Project impacts and PM&E measures. A final ethnographic study for the Shasta will be completed and submitted to FERC in the summer of 2004.

All of the tribes support the recognition of an ethnographic riverscape for the Klamath River. The river, its associated natural resources, cultural sites, and traditional cultural uses are important to maintaining the tribes' cultures. As stated by Sloan (2003), "the River is the bond that unifies Yurok culture. It is also the bond that unites Yurok with their upriver neighbors in a common life way that has persisted through time."

An NRHP determination of eligibility or nomination of a Klamath River ethnographic riverscape needs additional analysis to determine the form of a submission, boundaries, contributing elements, character-defining features, integrity, and NRHP criteria.

E6.3 CULTURAL RESOURCES MANAGEMENT FRAMEWORK

E6.3.1 Agencies and Tribes with Cultural Resources Management Responsibilities

Agency and tribal cultural resources management responsibilities are defined by several statutes. The most important statutory basis for relicensing that outlines agency and tribal responsibilities is the National Historic Preservation Act (NHPA). NHPA was enacted and amended to require the federal government to accelerate its historic preservation programs and to encourage such efforts on state, local, and private levels. Compliance with the NHPA may be coupled with the FERC's National Environmental Policy Act (NEPA) compliance process where a federal action, such as licensing, may affect a historical or cultural resource. In licensing, the FERC is bound by the provisions of the NHPA, which requires it to take into account the effect of the action on any

district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP. In such a case, the FERC must give the Advisory Council on Historic Preservation a reasonable opportunity to comment on a license issuance involving a historic resource.

As is explained below, the main goal of NHPA-required consultations amongst agencies and tribes is to identify historic properties potentially affected by the undertaking, to assess its effects, and to seek ways to avoid, minimize, or mitigate any adverse effects on historic properties.

NHPA and its implementing regulations at 36 CFR 800 state that it is the statutory obligation of the federal agency to fulfill the requirements of Section 106 (of the NHPA) and to ensure that an agency official with jurisdiction over an undertaking takes legal and financial responsibility for Section 106 compliance. The agency official has approval authority for the undertaking and can commit the federal agency to take appropriate action for a specific undertaking as a result of Section 106 compliance. The agency official has the authority to commit the federal agency to any obligation it may assume in the implementation of a program alternative. The agency official may be a state, local, or tribal government official who has been delegated legal responsibility for compliance with Section 106 in accordance with federal law.

The following parties have consultative roles in the Section 106 process and thus have responsibilities in the FERC relicense process:

- State historic preservation officers. The SHPOs (Oregon and California) reflect the interests of the states and its citizens in the preservation of their cultural heritage. The SHPO advises and assists federal agencies in carrying out their Section 106 responsibilities and cooperates with such agencies, local governments, and organizations and individuals to ensure that historic properties are taken into consideration at all levels of planning and development. If an Indian tribe has assumed the functions of the SHPO in the Section 106 process for undertakings on tribal lands, the SHPO shall participate as a consulting party if the undertaking takes place on tribal lands but affects historic properties off tribal lands, if requested, or if the Indian tribe agrees to include the SHPO.
- Indian tribes. For a tribe that has assumed the responsibilities of the SHPO for Section 106 on al lands, the tribal historic preservation officer (THPO) is the official representative for the purposes of Section 106. The agency official shall consult with the THPO in lieu of the SHPO regarding undertakings occurring on or affecting historic properties on tribal lands. When an Indian tribe has not assumed the responsibilities of the SHPO for Section 106 on tribal lands, the agency official shall consult with a representative designated by such Indian tribe in addition to the SHPO regarding undertakings occurring on or affecting historic properties on its tribal lands. Such Indian tribes have the same rights of consultation and concurrence that the THPOs are given throughout Subpart B of this part, except that such consultations shall be in addition to and on the same basis as consultation with the SHPO.

E6.3.1.1 Discussion

The NHPA requires the agency official to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking. This

requirement applies regardless of the location of the historic property. Such an Indian tribe shall be a consulting party. Indian tribes that attach religious and cultural significance to historic properties in the Project area include the Klamath, Shasta, Yurok, Karuk, and Hoopa Indian tribes. These tribes are consulting, in part, with PacifiCorp, FERC, and federal agencies through monthly meetings of the Cultural Resources Work Group.

E6.3.2 Existing Cultural Resource Management Plans

The existing FERC license under which PacifiCorp operates its Klamath River hydroelectric facilities has no cultural resources management plan. Lands administered by the Bureau of Land Management that lie within PacifiCorp's FERC Project boundary are subject to management by BLM staff in accordance with applicable federal mandates and regulations, including, among others, the Federal Land Policy and Management Act (FLPMA).

For the new FERC license, PacifiCorp is preparing a Historic Properties Management Plan; HPMPs are now required by FERC in accordance with provisions of the NHPA and other authorities. A draft outline of the HPMP is provided in Section E6.7.4 of this Exhibit E.

E6.4 CONSULTATION WITH APPLICABLE AGENCIES, TRIBES, AND THE PUBLIC ON CULTURAL RESOURCES

CRWG meetings were held monthly during 2001-2003. Major issues discussed at these meetings included essential elements of the study plans and what entities would be involved in implementing the study plans. For more information, please see the *PacifiCorp Consultation Record for Relicensing the Klamath Hydroelectric Project* (Appendix E-1A).

E6.5 CULTURAL RESOURCES STUDIES

E6.5.1 Previously Conducted Studies

Table E6.5-1 summarizes the results of record searches conducted at the Oregon Office of Historic Preservation (in Salem) and at the Northeast Information Center of the California Historical Resources Information System (in Chico).

State	State Report #	Year of Report	Author	Title	Synopsis
OR	15083	1995	Jensen & Associates	Archaeological Inventory Survey: The Proposed Klamath Cogeneration Project Area, Approxi- mately 400 Acres, Including Blocks and Linear Corridors, Klamath Falls, Klamath County, Oregon. Prepared for Resource Management International, Inc. Report #15083 on file at the Oregon State Historic Preservation Office, Salem.	About 400 acres of linear survey for gas, transmission, and water lines and a cogeneration plant. Used 20-meter transects for survey corridor, but little is in APE (when crossing at Link River Mouth only). Of little use for current Project.
OR	4150	1982	Philipek, F.M., and W.E. Ray, Jr.	Miller Island Canal Project. Klamath Game Management Area, Oregon State Fish and Wildlife	Small area survey on Miller Island using 10- to 12-meter transects. No subsurface testing. Lacked background research.

Table E6.5-1. Results of the Oregon and California record searches.

State	State Report #	Year of Report	Author	Title	Synopsis
OR	4714	1982	Pettigrew, R.M.	Report on the Archaeological Survey of the Proposed Klamath Falls South Side Bypass, Klamath County, OR. Oregon State Museum of Anthropology, University of Oregon, Eugene. Submitted to Oregon Department of Transportation (ODOT), Salem, Oregon.	OR Route 66 survey adjacent to Lake Ewauna. Narrow (400 feet wide) survey only.
OR	16216	1997	Fleming, D.	A Cultural Resource Inventory of the Undeveloped Portion of the Klamath Falls Memorial Park Klamath County, Oregon. Prepared for the City of Klamath Falls, Oregon.	Survey of 33 acres on a parcel of undeveloped land just east of the Klamath Falls Memorial Park Cemetery. Used transect intervals of 5 meters.
OR	15720	1996	Hills, T.J., J.S. Chapman, and D.C. Wilson	Volume 2: Weyerhaeuser Camp 2 (OR-KL-46): The Archaeology and Socioeconomic History of a Depression-ERA Railroad Logging Camp in Southern Oregon. PGT Project Report # 19 Results of Treatment of Cultural Resources in Pacific Gas Transmission Company's Medford Extension Pipeline Project. Prepared for Pacific Gas Transmission Company. Archaeological Investigations Northwest, Inc. Report # 114, Portland, OR.	Detailed report on this historic logging camp, circa 1910 to 1940, with intensive use between 1929 and 1934. Located on north side of river between Keno dam and Oatman Lake. Good report; because of size of Project area, can be considered complete survey within the site boundary.
OR	165	1978a	Hopkins, J.W., III.	A Cultural Resources Survey of Proposed Drainage Improvements in Lower Klamath Lake, Klamath County, OR. Department of Sociology/Anthropology, Southern Oregon State College, Ashland, Oregon.	On opposite side of SPRR from the APE. Methods only minimally reported, and not to modern standards.
OR	15889	1996	Wilson, D.C., T.L. Ozbun, E.E. Forgeng, J.J. Wilt, and J.S. Chapman	Volume 1: Expanding the Archaeology of the Klamath Basin and Cascade Range of Southern Oregon PGT Project Report # 19. Results of Treatment of Cultural Resources in Pacific Gas Transmission Company's Medford Extension Pipeline Project. Prepared for Pacific Gas Trans- mission Company. Archaeological Investigations Northwest, Inc. Report # 114, Portland, OR.	Part 1 of lengthy report with considerable background work, research, and data. Passes near the river for several miles but crosses into APE at West Klamath. Near river from Keno Access Road to West Klamath.
OR	15889 (b)	1996	Wilson, D.C., T.I. Ozbun, E.E. Forgeng, J.J. Wilt, and J.S. Chapman	Volume 1: Expanding the Archaeology of the Klamath Basin and Cascade Range of Southern Oregon, Appendices A – S. PGT Project Report # 19. Results of Treatment of Cultural Resources In Pacific Gas Transmission Company's Medford Extension Pipeline Project. Prepared for Pacific Gas Transmission Company. Archaeological Investigations Northwest, Inc. Report # 114, Portland, OR.	Part 2 of lengthy report with considerable background work, research, and data. Passes near the river for several miles but crosses into APE at West Klamath. Near river from Keno Access Road to West Klamath.
OR	13891	1993a	Cannon, W.J.	Cultural Resource Survey, Klamath River Campground. Report #13891 on file at the Oregon State Historic Preservation Office, Salem.	Survey of about 40 acres at campground in canyon. Survey is at 30-meter transects and is probably adequate.
OR	13885	1993b	Cannon, W.J.	Cultural Resource Survey, Klamath River Put-In. Report #13885 on file at Oregon State Historic Preservation Office, Salem.	Approximately 2.5-acre survey at put-in below J.C. Boyle power plant.
OR	8196	1987	Connoly, T. J.	Archaeological Survey of the Green Springs Highway-Midland Junction Section, The Dalles- California Highway (US 97), Klamath County. Prepared for the Oregon State Highway Division, Salem, OR.	A linear survey of about 5 miles; crosses the Klamath River at US 97.

Table E6.5-1. Results of the Oregon and California record searches.

State	State Report #	Year of Report	Author	Title	Synopsis
OR	15847	1996	Draper, J.A.	Results of an Archaeological Survey of 890 Acres in the Klamath Resource Area, Klamath County, Oregon. Report #15847 on file at Oregon State Historic Preservation Office, Salem.	Recent report, outside APE but on east canyon rim near Topsy, Oregon. Fairly good coverage.
OR	16293	1997	Ferguson, D.E. and K.C. Reid	Archaeological Survey of Bureau of Land Management Properties in the Klamath Fall Resource Area, Klamath County, Oregon. Rainshadow Research Project Report No.38, USDI Bureau of Land Management, Lakeview District Office. In partial compliance with the terms of Solicitation No. 1422-H-010-RFQ, Klamath Falls, Oregon.	Basic report, minimal summary of previous work. Some areas near state line and in northern canyon along river, but most work is on rim west of Topsy and scattered well away from APE. Did not update previously recorded sites. 30-meter transects used.
СА	1428	1996	Oetting, A.C.	Archaeological Inventory and Evaluation of the Orwick BLM Land Exchange Parcels, Siskiyou County, California. Heritage Research Associates, Eugene, Oregon.	Various parcels surveyed around Iron Gate, and Copco and on Secret Springs Quad. Several near APE, few inside it. Survey good, but at 30-meter transects. Good lithic/ obsidian studies; bibliography is good.
CA	SI-L-211	1985	Nilsson, E., and G. Greenway.	Cultural Resource Survey of the Klamath River Bridge (20-39) Replacement Located Near Copco Lake, CA. Mountain Anthropological Research. Prepared for Siskiyou County Department of Public Works, Yreka, California.	Small area survey at bridge (upper end of Copco reservoir), 8- to 10-meter transects.
CA	SI-L-251	1988	Nilsson, E.	Cultural Resource Survey Report for the Realignment of Portions of the Ager-Beswick Road (8L02), Siskiyou County, CA. Mountain Anthropological Research. Prepared for Siskiyou County Department of Public Works, Yreka, California.	Up Deer Creek south of Copco reservoir, almost 1/2 mile from the APE.
CA	1240	1992	Hamusek, B.	5100 Forest Regulations Timber Harvest Plans (THP #2-92-263 SIS (6) and ARP #92-181.	Small area survey above lower Salt Caves area in CA. Small area surveys outside APE, but within 1/2 mile. Methods poorly reported, of little use.
OR	1044	1979a	Cole, D. L.	Archaeological Survey of the Pacific Power & Light Company's Proposed Malin to Medford 500KV Powerline Project through the Klamath Basin, Klamath County, Oregon. Submitted to Pacific Power and Light Company, Portland, OR.	175-foot corridor crosses Klamath River at Highway 97. Of little use and not to modern standards.
OR	10212	1987	McAlister, J.	Cultural Resource Management Inventory Report for the Proposed Klamath Ranger District Modular Office Addition Project. Report #10212 on file at the Oregon State Historic Preservation Office, Salem.	Very small area (0.5-acre) survey at USFS Klamath District Offices, in the city of Klamath Falls. Located a few hundred meters east of the Link River.
OR	??	1993	Oetting, A.C.	An Archaeological Survey Along Line 19, a Pacific Power & Light Company 115 kV Transmission Line Between the Klamath River, California and the Rogue River, Oregon. Heritage Research Associates, Eugene, Oregon.	Linear survey originating at the Copco 2 power station and heading northwest. Survey corridor of 100 feet (30 meters) and transect intervals of 15 to 20 meters used. Biblio and context sections are brief.
OR	16582	1998b	Stepp, D.	Cultural Resource Inventory of the Slim Chicken Project Area, Klamath County, Oregon. Report #16582 on file at Oregon State Historic Preservation Office, Salem.16582.	Outside canyon; on rim and in Chicken Hills. Nearest to APE at Big Bend, where it is just under 1/2 mile away. Most of Project area is several miles from the river. Survey of 1,910 acres at 30-meter transects; methods and report quality are suspect.

Table E6.5-1. Results of the Oregon and California record searches.

State	State Report #	Year of Report	Author	Title	Synopsis
OR	16284	1998a	Stepp, D.	Klamath Falls Resource Area Cultural Resource Inventory, 1997: Stepp Consulting Report No. 12. Submitted to the U.S. Department of Interior. Bureau of Land Management Lakeview District. Klamath Falls Resource Area Contract No. 1422H010-C97-3018, Klamath Falls, Oregon.	Survey of 2,080 acres at 30-meter intervals (sometimes 50 meters on steep slopes). Three of the four areas surveyed are 1/2 mile or more from the river. One area is near state line on north margin of river.
CA	SI-L-411	1995	Vaughan, T. and D. McGann.	Archaeological Survey Report for the Proposed Jenny Creek Bridge Replacement Project (Bridge 2C-061), Siskiyou County, CA. Coyote and Fox Enterprises. Prepared for North State Resources, Inc., Redding, California.	Only 4.5 acres at 2-meter intervals along access roads and adjacent to bridge only. Minimal area covered (not areal, only along roads) within APE.
OR	5768	1984b	Gehr, E.A.	Archaeological and Historical Survey: Salt Caves Hydroelectric Project. Report #5765 (Attachment B) on file at the Oregon State Historic Preservation Office, Salem.	For Salt Caves reservoir. Report on a few work areas and geotech boring locations. Not much detail as to actual areas surveyed, but map scales in report are plotted accurately. Transects reported as 10-meter interval.
OR	16494	1998	Ross, M.	Oak Woodlands. Report #16494 on file at Oregon State Historic Preservation Office, Salem.	Small area survey (20 acres) on canyon rim at Grizzly Butte, 30-meter transects. About 1/2 mile north of river. Not of much use.
OR	14168	1993	Eckard, D.L.	Griffith Site Prep. Report #14168 on file at Oregon State Historic Preservation Office, Salem.	Survey of about 45 acres at 30-meter intervals in proposed burn. On rim, about 1/2 mile north of APE.
OR	8367	1986	City of Klamath Falls	Draft Application for License Salt Caves Hydroelectric Project Second Stage Consultation. Volume 3: Exhibit E (Section 4.0), Klamath Falls, Oregon.	November 1986 draft. Few changes from July draft. States (pp. 4.105-106) that Gehr performed a "complete survey" to USFS standards, 10- to 20-meter transects, within the diversion pool area (between riverbank and 3,400-foot elevation) and in auxiliary areas (map is at very large scale).
BOTH	n/a	2002	Mack, J.M.	Table and maps of previously inventoried lands along the Klamath River – Draft. Special Report Prepared for PacifiCorp, Portland.	Specific maps and cross-referenced table for the areas inventoried by various projects under the direction of Dr. Mack. Draft indicates survey transects of 15 meters.

Table E6 5-1	Results of the	Oregon and	California	record search	es
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Last Updated: August 7, 2002.

E6.5.2 Studies Conducted for Relicensing

As summarized in Sections E6.1 and E6.2, PacifiCorp conducted several technical studies for relicensing. These included cultural resource background research; pedestrian field surveys within the FIC to inventory and record historic and archaeological resources; preparation of cultural resource context statements to facilitate evaluation of historic and archaeological resources for NRHP eligibility; ethnographic studies conducted to identify traditional cultural properties, sensitive cultural resources, and possible delineation of an NRHP-eligible ethnographic riverscape; a study of effects to cultural resources from processes related to geomorphology; and an evaluation of historic hydroelectric Project facilities. Detailed results of these technical studies and confidential cultural resource information are presented in the confidential Final Technical Report (PacifiCorp, 2004) submitted to FERC as part of the Application.

Before the technical studies were conducted, the CRWG reviewed and approved detailed work plans. With the exception of tribal ethnographic studies currently under way (see Section E6.5.3), all of the CRWG-approved studies were substantially completed by December 2003. Subsequent to completion of the 2003 pedestrian survey of the FIC, the APE was defined. With a few exceptions, all of the APE lies within the FIC. Areas of the APE not otherwise covered by survey of the FIC in 2002-2003 will be surveyed in the spring of 2004.

E6.5.3 Studies Currently Underway

The tribal ethnographic studies conducted under contract to PacifiCorp inventoried ethnographic sites, identified traditional cultural properties/sensitive cultural resources (TCPs/SCRs), and analyzed Project effects on them. These studies reviewed and researched background literature and tribal archives of published and unpublished studies, recorded oral histories, and maps. The studies also included oral history interviews of elders and site visits. The study reports discuss the data gathering methods that were used, the results of the work, and the source materials referred to. These tribal ethnographic reports are attached to the confidential FTR as Appendices 4A through 4D (PacifiCorp, 2004). Final tribal reports (which will be kept confidential) will be submitted to PacifiCorp no later than June 30, 2004.

The Klamath and Shasta tribal studies inventory ethnographic sites, identify TCPs/SCRs within and near the Project area, and discuss Project effects on them. The Karuk and Yurok tribal studies produced broad overview statements about traditional use patterns within the portions of their ancestral territories that lie within the Klamath River corridor, downriver from Iron Gate dam to the river's mouth. The studies address traditional and/or continuing use of the river corridor for hunting, fishing, food or medicinal plant gathering, settlement, ceremonial activities, and so on. An important outcome of the studies was that each tribe has described the impacts that they ascribe to the Project (and its continuing operation) on TCPs, traditional cultural practices, and/or traditional-to-current Indian culture. Effects ascribed to the Project by the tribes include, for example, how water management may be affecting their culture.

PacifiCorp investigated fishery resources, water quality, riparian vegetation, wildlife, erosion, and other aspects of the natural (and cultural) environment outside of the tribal ethnographic work scopes. Nevertheless, discussions of the cultural significance of these resources are appropriate within both the tribal study reports and Exhibit E.

PacifiCorp has provided for an investigation of the feasibility of nominating the Klamath River corridor from Upper Klamath Lake to the mouth of the river at the Pacific Ocean as a traditional cultural riverscape (TCR). PacifiCorp contracted with the Yurok Tribal Heritage Preservation Officer, Dr. Thomas Gates, to prepare a regulatory analysis for a Klamath River TCR pertinent to the Project. This regulatory analysis identified the steps and criteria for conducting a TCR nomination. The CRWG reviewed the results of the tribal studies and suggested that PacifiCorp contract with the Klamath River Inter-Tribal Fish and Water Commission to arrange for the tribal reports and regulatory analysis to be integrated into a final "integration report" that will be completed by spring 2004 (see below). The regulatory analysis conducted by Dr. Gates (see Appendix E-6B) did the following:

• Defined traditional cultural landscape (TCL) and traditional cultural riverscape (TCR)

- Explained the concept of landscapes and riverscapes and the regulatory and advisory apparatus available to support the identification and National Register evaluation of landscapes and riverscapes
- Provided examples from other projects or other regions of the United States where TCLs or TCRs were identified, recorded, evaluated for NRHP eligibility, and subsequently managed
- Explained how a TCL or TCR could be established within the Klamath River corridor and the management implications for PacifiCorp

E6.5.3.1 Integration Report

PacifiCorp has contracted with the Klamath River Inter-Tribal Fish and Water Commission to produce an integration report that would be based on the results of the draft (or final) tribal ethnographic studies for the Klamath, Shasta, Karuk, and Yurok tribes, as well as the regulatory analysis produced by Dr. Gates. The commission has hired Dr. Thomas F. King to compile the integration report. The primary purpose of the integration report will be to discuss common themes among the Klamath Basin tribes and to provide a basinwide overview, evaluation, and assessment of broad tribal concerns about basinwide water management and its effects on historic properties. The report also will discuss how those effects relate to the regulatory framework of historic properties. An important outcome of the document would be each tribe's description of the impacts to traditional cultural practices and/or traditional-to-current Indian culture that they ascribe to the Project and its continuing operations. The integration report will provide recommendations for further study and the justification for conducting such studies. The riverscape would fall within the jurisdiction of several agencies and many private land holdings. Therefore, the report also would address future studies or actions that could be undertaken by PacifiCorp and/or the federal agencies and states with jurisdiction in the basin (USACE, USBR, BLM, USFS, FERC, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Department of Commerce, Oregon, and California) whose actions are potentially affecting historic properties.

E6.5.4 Proposed Studies

No other studies beyond those noted above have been proposed at this time.

E6.5.5 Outstanding Study Issues

The CRWG has been grappling with the issue of identifying what, if any, Project effects on historic properties are taking place downstream of Iron Gate dam. The results of tribal ethnographic studies (and the forthcoming integration report) should help the CRWG resolve this issue.

E6.6 PROPOSED CULTURAL PROTECTION, MITIGATION AND ENHANCEMENT MEASURES

A variety of measures are proposed by PacifiCorp to manage and protect the historic properties within the proposed Project boundary. These include monitoring and managing archaeological sites, maintaining the integrity of the historic hydroelectric facilities through preservation

techniques; following the measures set forth in the Historic Properties Management Plan (HPMP); ensuring that Project maintenance, operation, and improvement actions are sensitive to historic properties; and training staff in appropriate historic preservation and management techniques. PacifiCorp will continue to operate and manage the Klamath Hydroelectric Project in a manner that protects the area's significant historic properties, while not impeding safe and efficient energy production.

E6.6.1 Historic Properties Management Plan (HPMP)

Section 106 of the NHPA requires FERC to take into account the effect of its undertakings on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. For hydropower licensing actions, FERC typically completes Section 106 by entering into a Programmatic Agreement (PA) or Memorandum of Agreement (MOA) with the applicable SHPOs/THPOs and the ACHP. Appropriate tribes, the license applicant (PacifiCorp), and other consulting parties may sign the agreement as concurring parties. This agreement is then incorporated by reference into the project license when it is issued.

Because it is not always possible for FERC to determine all of the effects of various activities that may occur over the course of a license, the PA or MOA typically provides—and FERC typically requires as a license condition—that the licensee (PacifiCorp) develop and implement a Historic Properties Management Plan. Through an approved HPMP, FERC can require consideration and appropriate management of effects on historic properties throughout the term of the license. In so doing, FERC meets the requirements of Section 106 for its undertakings.

An HPMP is a planning document, implemented pursuant to a FERC license, for considering and managing effects on historic properties of activities associated with constructing, operating, and maintaining hydropower projects. It establishes a decision-making process for considering potential effects on historic properties and considers and manages the effects on historic properties of actions taken to implement the license over its entire term.

The proposed HPMP will do the following:

- Take into consideration the management actions prescribed in other plans required (or that will be required) by the new license such as recreation plans, wildlife management plans, or fisheries plans. In the case of this HPMP, PacifiCorp will consider the effects of FERC prescribed PM&Es on historic properties.
- Identify the nature and significance of historic properties that may be affected by project maintenance and operation and any proposed improvements to project facilities and public access.
- Identify goals for the preservation of historic properties, establish guidelines for routine maintenance and operation, and establish procedures for consulting with appropriate SHPOs, THPOs, Indian tribes, historic preservation experts, and the interested public concerning effects to historic properties or contributing elements of a historic district.

PacifiCorp's HPMP will provide direction and guidelines for the management of properties that are within the new Project boundary as proposed in Exhibit G of this license application and that are listed in or eligible for listing in the NRHP (e.g., historic properties). Historic properties may include project facilities (dams, powerhouses, etc.); other kinds of buildings and structures; prehistoric and historic archaeological sites; and properties of traditional religious and cultural significance to Indian tribes. Managing historic properties involves both the long-term preservation of historic values of historic properties and consideration of the effects of PacifiCorp's actions on historic properties. Hydroelectric projects such as the Klamath Hydroelectric Project may affect historic properties in a number of ways if they cause "alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register" [36 CFR 800.16(j)]. Modes of Project operation can result in adverse effects to archaeological sites located along Project waters, and the construction of recreational developments and provision of general public access can damage archaeological sites and other historic properties. Even routine maintenance such as window replacements can alter a character-defining feature of historic buildings.

PacifiCorp will implement the HPMP, pursuant to the license conditions. Therefore, the HPMP will identify the project staff position responsible for implementing the plan over the course of the license. FERC is responsible for enforcing compliance with the license and implementation of the HPMP.

A draft HPMP will be submitted shortly after the license application is submitted to FERC. This should facilitate SHPO/THPO consultation on the proposed measures and allow tribes and stakeholders (the CRWG) to review and comment. It is anticipated that the CRWG and the SHPO/THPO will participate in the further development of the draft HPMP in mid- to late 2004. FERC will likely develop an MOA or PA that requires PacifiCorp to finalize and implement the HPMP upon license issuance.

As stated above, a draft HPMP is currently under preparation by PacifiCorp and its consultants and will be submitted to FERC in the spring of 2004. Appendix E-6F contains an outline of the HPMP that has been approved by the CRWG, tables identifying archaeological sites and historic structures included in the HPMP with potential PM&E measures, and a general description of each proposed PM&E and cost estimates for implementation.

Proposed HPMP measures are described below.

E6.6.2 Maintain Historic Hydroelectric Facilities Integrity

PacifiCorp will maintain the integrity of the Project's NRHP-eligible historic hydroelectric properties while maintaining the flexibility needed to manage the Project as required by law and operating conditions. PacifiCorp practices good preservation techniques by maintaining the existing facility and equipment through painting, retooling, repairing existing equipment, and, whenever practical, using in-kind materials when replacement is needed. Although the Project's historic hydroelectric resources have been properly maintained over the years, the normal deterioration of materials may necessitate stabilization.

PacifiCorp will apply the Preservation Standards (The Secretary of the Interior's Standards for Historic Preservation Projects—Federal Register 48(190):Part IV) in a reasonable manner, taking into consideration economic and technical feasibility as well as requirements for overall management of the Project and its other resources. Application of the Preservation Standards assures retention of the character-defining features of the Project's historic properties, while permitting the flexibility required to upgrade facilities and equipment for efficient and economical operation. The standards will guide future actions by PacifiCorp as long as they own and operate the Project. They apply to both the interior and exterior of NRHP-eligible Project facilities, including powerhouses, dams and intakes, support buildings, and water conveyance systems.

The HPMP includes several measures to guide PacifiCorp staff in maintaining the Project's historic hydroelectric properties. These measures are adapted from the Secretary of the Interior's Standards for Historic Preservation Projects and are described below (Federal Register 48(190):Part IV):

- **Retain Appropriate Use**—A property shall be used for its historic purpose or placed in a new use that requires minimal change to the defining characteristics of the property, its site, and its environment.
- **Maintain Historic Character**—The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
- **Maintain Appropriate Era**—Each property shall be recognized as a product of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall be avoided.
- **Retain Historic Changes**—Most properties change over time; changes that have acquired historic significance in their own right shall be retained and preserved.
- **Retain Distinctive Features**—Distinctive features, finishes, and construction techniques, or examples of craftsmanship that characterize a property, shall be preserved.
- **Repair Historic Features**—Deteriorated historic features shall be repaired rather than replaced, if possible. Where the extent of deterioration requires replacement of distinctive features, the new feature shall match the old in design, color, texture, and other visible qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
- Use Appropriate Cleaning Methods—Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of buildings and structures, if appropriate, shall use the gentlest means possible.
- Alterations to Be Compatible—New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. New work shall be differentiated from the old and shall be compatible with the massing, size, and scale

of the historic architectural features to protect the historic integrity of the property and its environment.

- **Design Removable Alterations**—New additions and adjacent or related new construction shall be undertaken in a manner so that if removed in the future, the essential form and integrity of the historic property and its environment will remain unimpaired.
- Ensure that Routine Actions Are Historically-Sensitive—Although no new development in the Project vicinity is planned or proposed, the routine maintenance, operation, and improvement actions that will occur during the relicense period have the potential to affect historic properties. Since all possible actions that might occur during the relicense period (generally 30 to50years) cannot be known at this date, general categories, or types, of actions have been developed to provide a basis for determining the necessary management steps. These possible maintenance activities are described below by category.

Routine Maintenance and Repairs

This category includes routine procedures, such as cleaning, painting, caulking, and repair work that replaces damaged features with in-kind materials. Anticipated work includes the following:

- Replacement of wood flashboards or other wooden elements with in-kind materials.
- Maintenance or replacement of the concrete anchor blocks at penstocks with in-kind materials.
- Maintenance or replacement of surge tank and penstock components with in-kind materials.
- Replacement of glazing, repair, or replacement of Project components. Replacement is generally made in-kind, using materials similar to the original, by on-site maintenance crews.

Alterations to Buildings, Structures, and Sites

This category includes modifications of, or additions to, buildings, structures, or sites as a result of use, modernization, operational requirements, or technological advances. This category includes replacement of features with unlike materials. Potential work includes the following:

- Replacement of bypass canals
- Replacement of original turbines and other electrical equipment with modern equipment to maintain operational efficiency
- Alterations to powerhouse structures to maintain adequate clearances around equipment in response to changing regulations
- Replacement of existing roofing with other materials

Alteration from, or Alteration of, the Property's Surrounding Environment

This category includes changes and additions to (or subtraction from) the physical setting of the buildings. No such work is anticipated.

Introduction of Elements Out of Character with the Property or its Setting

This category includes changes to characteristic features of the larger area that have the potential to affect the setting of the property. Anticipated work includes replacement of the wood stave flowlines with new materials.

Neglect of a Property Resulting in Deterioration or Destruction

No demolition or neglect of NRHP-eligible buildings or structures is likely to occur.

Transfer or Sale of the Property without Preservation Conditions.

No transfer, sale or lease of buildings or structures is anticipated.

• Train Staff in Preservation Techniques—PacifiCorp personnel responsible for the maintenance of historic resources at the Project are faced with the task of maintaining a viable, efficient power generating facility while protecting its historic character. Accustomed to modernizing, improving, or replacing components of the Project, PacifiCorp will now consider whether desired changes may be accomplished with minimal effect on the historic character of the resource. To ensure compliance during ongoing maintenance and repair activities, PacifiCorp will undertake a two-phase training effort. The first phase is the development of the HPMP and its distribution to the Hydro Superintendent and appropriate operations staff.

Within 1 year of the FERC relicensing, PacifiCorp will initiate the second-phase training effort. This will include an education program for the benefit of the Hydro Superintendent and appropriate staff and will focus on the HPMP and how to apply its procedures. Topics will include technical information on the maintenance, repair, and preservation of historic materials, as well as information on procedures for coordinating with the SHPO. The purpose of the training is to familiarize appropriate personnel with the historic and cultural resources that may be affected by proposed actions and to understand the procedures for evaluating the effects of those actions. Further training will occur periodically at the discretion of the Hydro Superintendent.

Within 2 years of the FERC relicensing, PacifiCorp will prepare Historic Hydroelectric Resource Maintenance Guidelines. The guidelines shall focus on appropriate methods of protecting, cleaning, and repairing historic materials typical of the historic hydroelectric facilities under PacifiCorp's ownership. State-of-the-art solutions to maintenance problems will be presented and cyclical preventive maintenance will be discussed. The guidelines will address typical field problems and concerns.

E6.6.3 Protect Archaeological Resources

Significant archaeological resources potentially affected by the Project shall be protected and preserved. If such resources must be disturbed, mitigation measures will be implemented. Site protection PM&E measures may include, but are not limited to, the following:

- **Procedures for Unanticipated Discoveries:** The HPMP will include procedures that PacifiCorp will follow in the event of an unanticipated discovery of human remains and/or an archaeological resource within the boundaries of the new license. Procedures for unanticipated discovery will include notification of the appropriate tribes of the discovery; in the case of human remains being discovered, notification of the coroner's office; confirmation of the new discovery by PacifiCorp's archaeologist; and immediate protection of the discovered resource pending notification of FERC, the SHPO, and appropriate land-managing agencies (if the discovery is not on PacifiCorp-owned land). Subsequent management of the discovered resource will be carried out in accordance with the provisions of the HPMP and in consultation with the agency and stakeholders.
- **Monitoring**: Monitoring site conditions for changes from 2003 baseline conditions documented during the pedestrian survey conducted for the new FERC license.
- **Capping**: Capping sites with a protective layer of soil.
- Site Concealment: Concealing sites using planted vegetation to obscure the site surface or to inhibit access by propagating thorny, spiny or densely growing native species or native species that cause contact dermatitis (poison oak, poison sumac, stinging nettle, etc.).
- **Proactive Site Isolation:** Proactively isolating or quarantining sites using fencing, boulders, or other physical barriers to deter vehicle and pedestrian access to sites.
- **Passive Site Isolation:** Passively isolating sites by diverting vehicle and pedestrian access using hardening measures to discourage site access. Hardening measures that "channel" recreational uses into certain areas can help divert human activities away from sensitive sites. Misinformation signage ("Warning Poisonous Snakes") can also be used to divert entrance into sensitive areas.
- **Removing Incompatible Uses**: Removing incompatible uses to protect sites by eliminating activities that disturb sites. These measures could include, among others:
 - Eliminating livestock grazing and/or livestock movement across site areas
 - Relocating or potentially eliminating recreation sites or specific facilities to remove vehicular and pedestrian activity or other disturbances from sensitive sites
 - Relocating campgrounds, individual campsites, or groups of campsite to remove vehicular and pedestrian activity or other disturbances from sensitive sites
 - Relocating, removing, or obliterating roads and trails that cross or closely skirt the edge of sensitive sites

- Law Enforcement: Enforcing laws that prohibit looting and vandalism of archaeological resources. Active enforcement of Oregon and California state laws and federal laws can be achieved through several means:
 - Hiring a full-time monitor and training the monitor in Archaeological Resources Protection Act (ARPA) and other applicable state and federal law enforcement. (Courses are offered annually by the University of Nevada, Reno; the Confederated Tribes of the Umatilla Indian Reservation; the Colville Indian Reservation; and the HAMMER facility located at the Hanford Site. The HAMMER facility is operated by Battelle Pacific Northwest National Laboratory—Richland). Also, the Oregon and California county lawenforcement authorities could "deputize" the monitor (examples exist with the Columbia River Inter-Tribal Fish Commission) to make citizen's arrests, issue citations, and receive immediate formal law enforcement backup by uniformed officers that can arrest and/or cite looters.
 - Posting warning signs in critical areas outlining laws that prohibit collection and vandalism, state the penalties (misdemeanor, Class-C Felony, etc.), and state that the area is under daily surveillance and patrol (even if it isn't) by plain-clothes deputized monitors with arrest authority.
- Erosion Control: This would include placing riprap or other stabilization measures at eroding site locations and armoring site deposits against water or terrestrial erosive forces (road culverts that create erosive flows that wash away site deposits, heavily trampled areas, etc.).
- Archaeological Data Recovery. In cases where PacifiCorp cannot protect certain areas from current and future degradation, archaeological sites could be mitigated through archaeological data recovery operations. However, it should be noted that tribes are strongly opposed to archaeological data recovery as a PM&E measure.

E6.6.4 Protecting Traditional Cultural Properties

At this time, there are no known TCPs or SCRs within the proposed Project Boundary. In consultation with tribes, agencies, and FERC at upcoming meetings of the CRWG, if TCPs, SCRs or a potentially eligible ethnographic riverscape are identified within the proposed Project Boundary, appropriate PM&E measures will be developed.

E6.7 IMPACT OF CONTINUED PROJECT OPERATION ON CULTURAL RESOURCES

E6.7.1 Impacts on Historic Hydro Resources

The proposed action consists of continued operation of the current Klamath Hydroelectric Project facilities with the exception of the East Side and West Side developments (at Link River), which PacifiCorp is proposing to decommission, and Keno dam, which PacifiCorp considers to be FERC-nonjurisdictional. This use will result in continued maintenance and upkeep of Project facilities and may result in the replacement of Project components, as demanded by continued operation. As in the past, as a condition of permits and licenses issued, PacifiCorp will work with the Oregon and California SHPOs during engineering activities and

Project construction to comply with the National Historic Preservation Act and regulation in 36 CFR 800 and the Secretary of the Interior's Standards for Rehabilitation. Specific mitigation and management measures regarding the ongoing operation of the Project facilities are included in the HPMP.

The abandonment of the Project and commensurate termination of regular maintenance efforts would result in neglect, defined in 36 CFR 800.5(a)(2)(vi) as an adverse effect.

E6.7.2 Impacts on Archaeological Resources

The archaeological investigations for the Project included pedestrian survey of several hundred acres, and resulted in the identification of 165 archaeological sites and 158 isolates within the FIC (within the Proposed Project Boundary, there are 61 archaeological sites that are eligible or potentially eligible for the NRHP – see Appendix E-6F). Continued operation under the future license will continue to inundate formerly terrestrial archaeological sites beneath the waters of Project reservoirs. Continued public access to Project waters and recreation facilities could affect historic properties. However, specific mitigation and management measures designed to manage and minimize the effects of ongoing operation of the Project facilities are included in the HPMP.

E6.7.3 Impacts on Traditional Cultural Properties

The ethnographic investigations for the Project included background research, oral history, consultation with tribal elders, and limited field visits. At present, there are no known traditional cultural properties identified within the proposed Project boundary (although the integration report now in preparation may identify an NRHP-eligible ethnographic landscape within the Project boundary). Continued operation of the current Klamath Hydroelectric Project facilities, with the exception of the East and West side developments, will continue to block upstream passage of salmon, inundate original (pre-dam/pre-reservoir) landforms and habitat, and continue to affect tribal cultural resources in ways in which they are currently being affected. Specific mitigation and management measures regarding the ongoing operation of the Project facilities will be included in the HPMP as specific sites and impacts are identified by the tribes, and appropriate mitigation measures are discussed by the CRWG, and submitted to PacifiCorp and FERC for review and approval.

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