3.12 Historical Resources and Tribal Cultural Resources

This section focuses on the potential for impacts to historical and tribal cultural resources due to the Proposed Project. For the purposes of this section of the EIR:

Tribal Cultural Resources: Tribal Cultural Resources (TCRs) are defined consistent with Public Resources Code section 21074(1)(a) which includes sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either included or determined to be eligible for inclusion in the California Register of Historical Resources, or included in a local register or historical resources, or as determined by the lead agency under the criteria for listing (PRC 210749(1)(a)).

Historical Resources: Historical Resources are defined consistent with Public Resources Code section 21084.1 which includes a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources, or as determined by the lead agency (PRC 21084.1).

Many comments were received during the NOP public scoping process relating to historical and/or tribal cultural resources (Appendix A). Several commenters expressed a profound personal and tribal connection to the Klamath River, its water quality, and its fishery from a traditional, subsistence, ceremonial, and spiritual viewpoint, and expressed that dam removal would provide an opportunity for river restoration, including the return of a traditional fishery. Other commenters expressed concern regarding low flows and poor water quality that would ensue following dam removal and could preclude certain tribal ceremonies. Several commenters expressed concern regarding dam removal and the potential for impacts to specific known cultural resources associated with ancient Shasta tribal occupation of the landscape and that there may be unknown archaeological resources that could be adversely affected by dam removal. A summary of the historical and/or tribal cultural resources comments received during the NOP public scoping process, as well as the individual comments themselves, are presented in Appendix A.

Assembly Bill 52 (AB52) (Gatto 2014) amended Section 5097.94 of the Public Resources Code to require consideration of tribal cultural resources in CEQA review, and to require certain consultation requirements with California Native American Tribes. AB 52's requirements went into effect on July 1, 2015.

A tribal cultural resource is defined as a site, feature, cultural landscape, sacred place or object with cultural value to a California Native American tribe that is listed or determined to be eligible for listing in the California Register of Historical Resources or under certain local registers, or that the lead agency determines to be significant under the criterial for listing. (Public Resources Code, Section 21074, subdivision (a).).

The Yurok Tribe, the Shasta Indian Nation and the Shasta Nation requested consultation under AB 52, and met with the State Water Board and the KRRC in a series of confidential consultation meetings within the timeframe of February 2017 through October 2018. The consultations with the Yurok Tribe and the Shasta Indian Nation resulted in identification of potentially-impacted resources, articulation of potential impacts, and development of, and agreement on, specific mitigation measures (see Section 3.12.5.1 *Potential Impacts to Tribal Cultural Resources*, TCR-1 through TCR-8).

KRRC has formally committed to implementing the measures as part of concluding AB 52 consultation, and has initiated consultation for development of a Tribal Cultural Resources Management Plan to meet the requirements described in TCR-1 through TCR-4, as well as the requirements of National Historic Preservation Act, Section 106. The TCRMP will be submitted to FERC for implementation.

Consultation with the Shasta Nation has informed the analysis in this EIR, but concluded after the Shasta Nation and the State Water Board acknowledged that it would not be possible to reach agreement on mitigation measures, despite a good faith effort to do so.

In order to support Project development, the KRRC undertook efforts to identify and evaluate historical and tribal cultural resources in the vicinity of the Proposed Project, and these efforts have provided information contributing to the Historical and Tribal Cultural Resources environmental setting, potential impacts and mitigation measures. KRRC has also prepared a Draft Cultural Resources Plan (Appendix B: *Definite Plan – Appendix L*), which provides a framework for understanding the cultural resources studies that KRRC has completed, those that are currently ongoing, and others that KRRC anticipates completing in order to comply with regulatory requirements. The KRRC proposes that the Final Cultural Resources Plan would be available prior to implementation of the Proposed Project.

3.12.1 Area of Analysis

The Area of Analysis for historical and tribal cultural resources is shown in Figure 3.12-1. Within the Area of Analysis, there are four subareas relevant to the analysis of potential historical and tribal cultural resource impacts, as follows:

- *Subarea 1* (Figure 3.12-2)
  - KRRC's Limits of Work for the Proposed Project, which includes the horizontal boundary conforming to the high-water line around the Lower Klamath Project reservoirs, the construction footprint needed for dam and other structure removal, ingress and egress routes, staging and stockpiling areas, disposal areas, and transmissions lines to be removed; and,
  - The inclusive area of known cultural sites that lie partially within and partially outside of the Limits of Work.
- *Subarea 2* (Figure 3.12-3)
  - Post-dam removal altered Federal Emergency Management Agency (FEMA) 100-year floodplain along the 18-river mile stretch of the Middle Klamath River downstream of Iron Gate Dam (RM 193.1) to the confluence with Humbug Creek (RM 174).
- *Subarea 3* (Figure 3.12-4)
  - 0.5-mile buffer on either side of the Hydroelectric Reach, Middle Klamath River, and Lower Klamath River encompassing the existing conditions and post-dam removal altered FEMA 100-year floodplain, which, with the exception of the Middle Klamath River reach described in *Subarea 2*, have the same extent.
- *Subarea 4* (Figure 3.12-5)
  - Parcel B lands immediately surrounding the Lower Klamath Project, which would be transferred from PacifiCorp to the KRRC prior to dam removal and

then transferred to the respective states (i.e., California, Oregon), as applicable, or to a designated third-party transferee, following dam removal. The lands would thereafter be managed for public interest purposes (KHSA Section 7.6.4.A).

To allow for individual impact analyses specific to geographic location (e.g., reservoir footprint, riverside location) and Proposed Project activity timing (e.g., pre-dam removal, reservoir drawdown, restoration activities), the subareas include overlap. The subarea overlap has no bearing on the analysis of any impact, since the subareas are considered independently by impact.

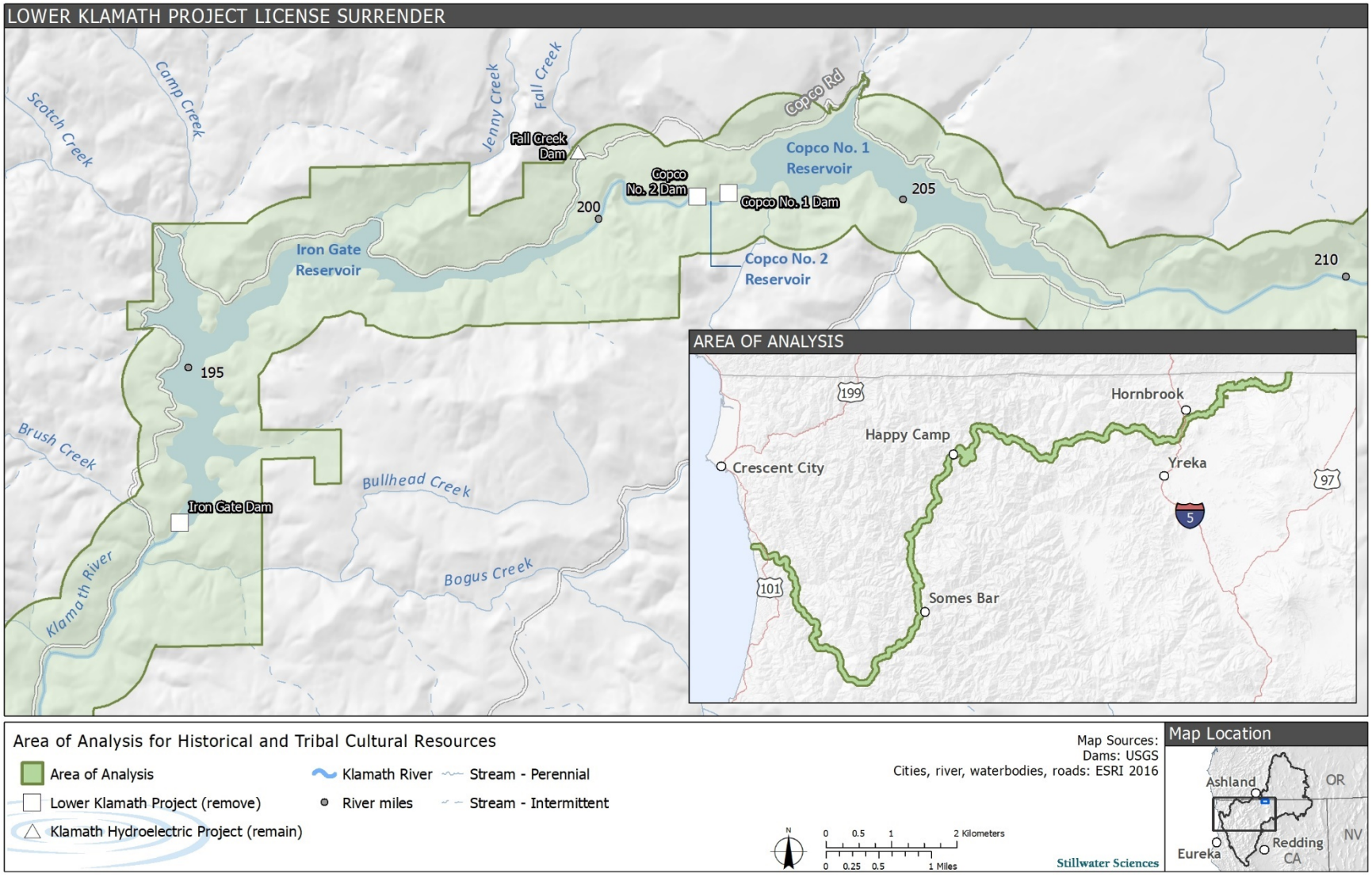

Figure 3.12-1. Area of Analysis for Historical and Tribal Cultural Resources.

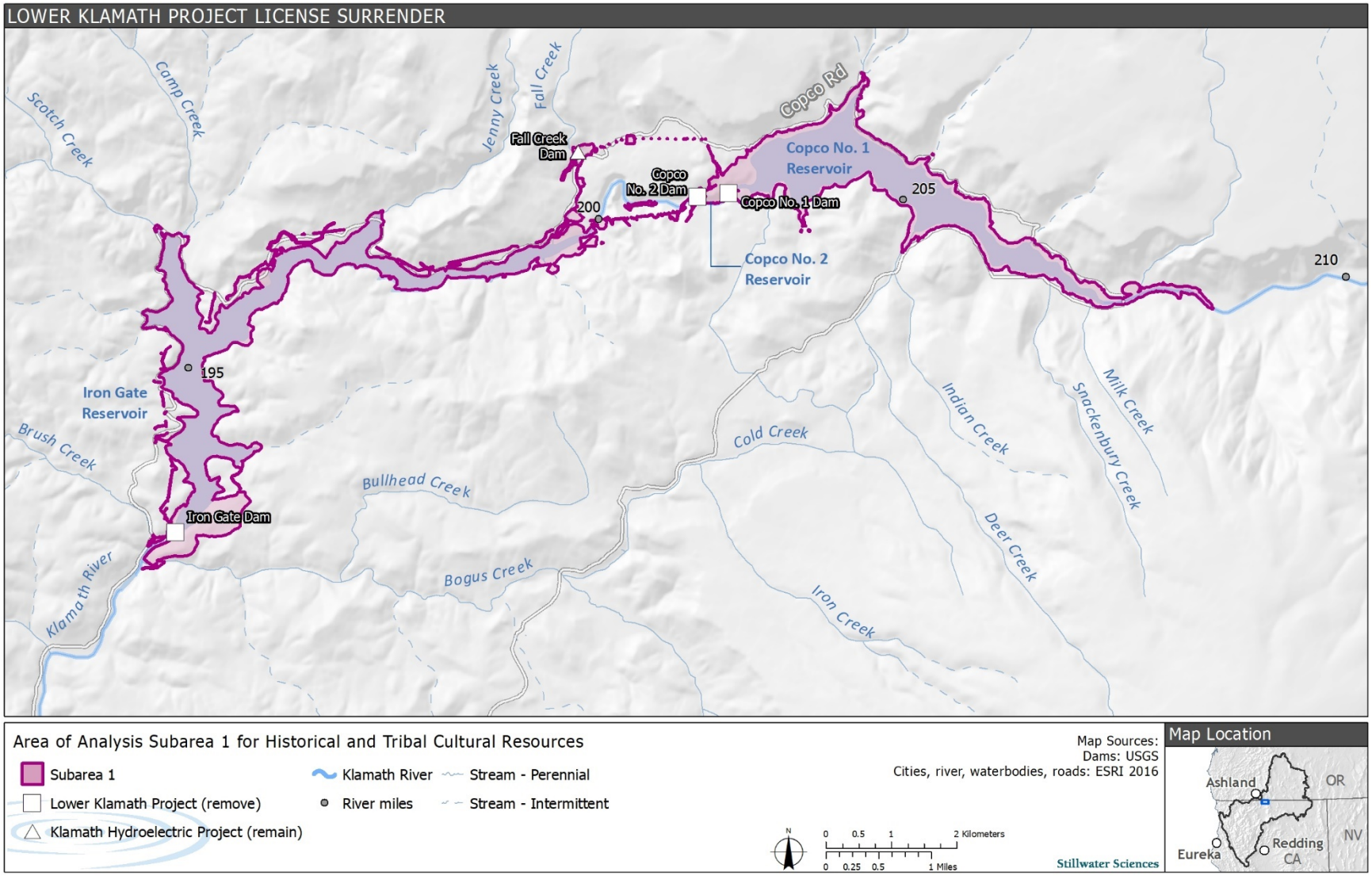

Figure 3.12-2. Area of Analysis *Subarea 1* for Historical and Tribal Cultural Resources.

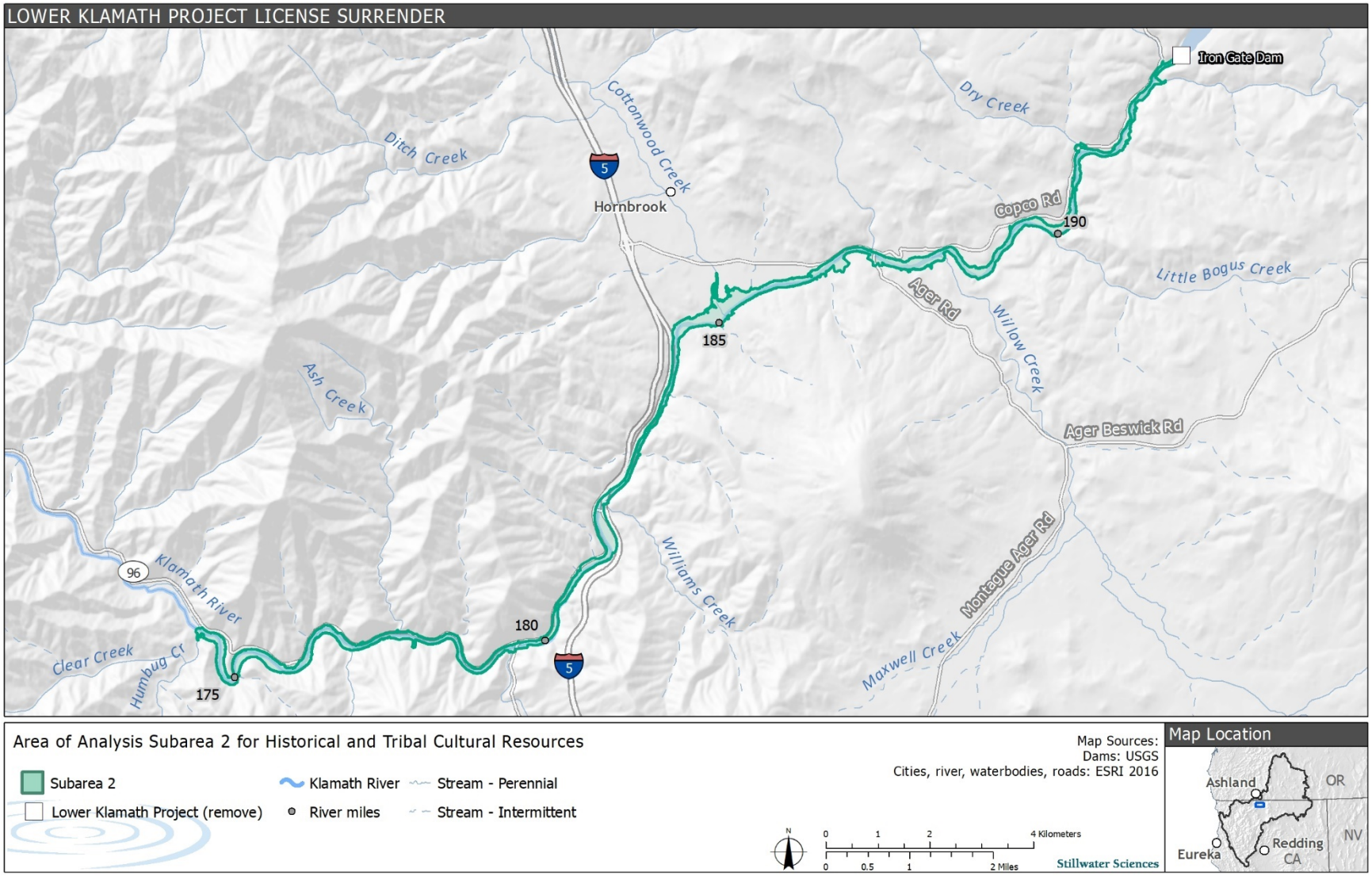

Figure 3.12-3. Area of Analysis *Subarea 2* for Historical and Tribal Cultural Resources.

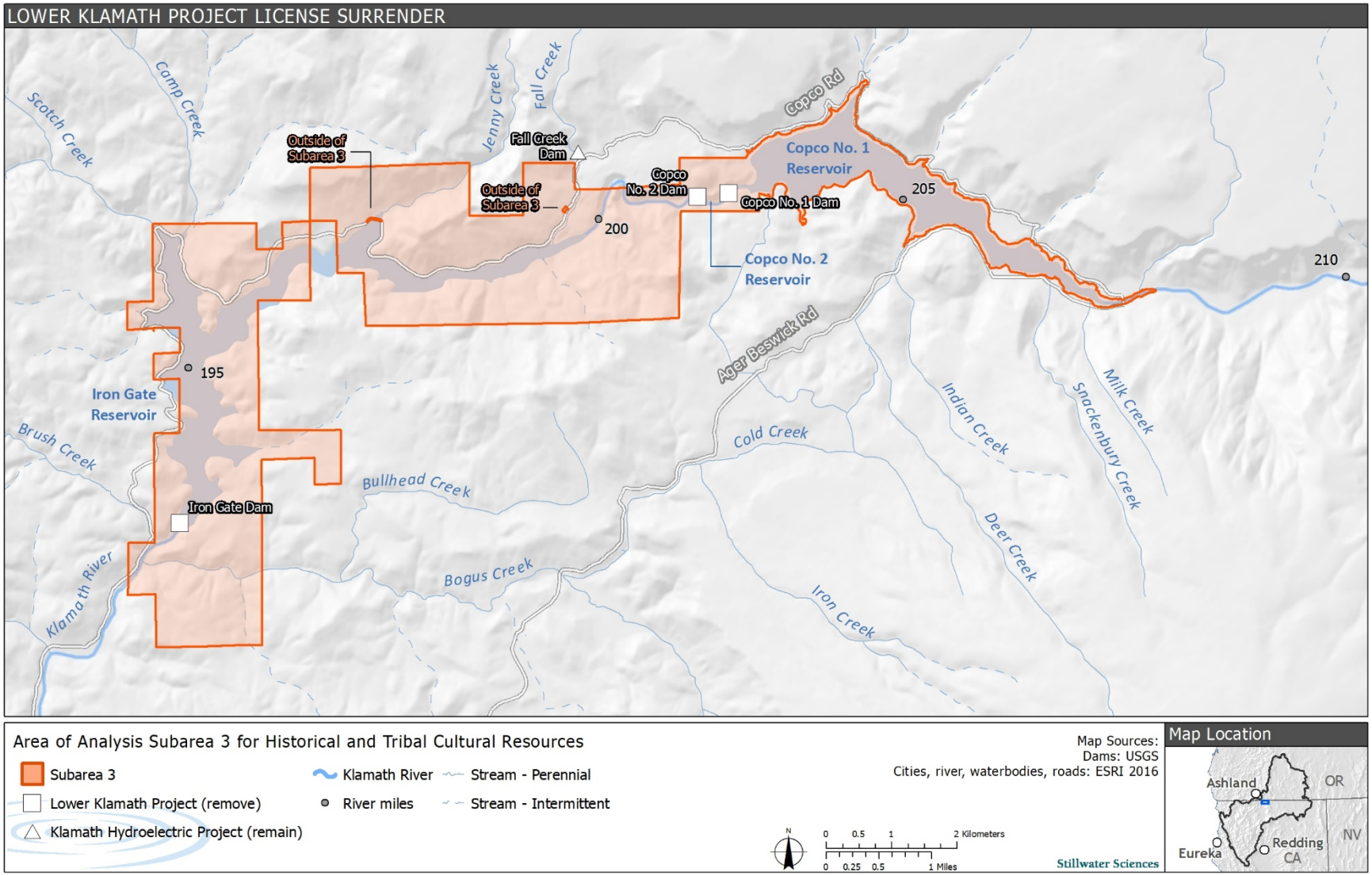

Figure 3.12-4. Area of Analysis *Subarea 3* for Historical and Tribal Cultural Resources.

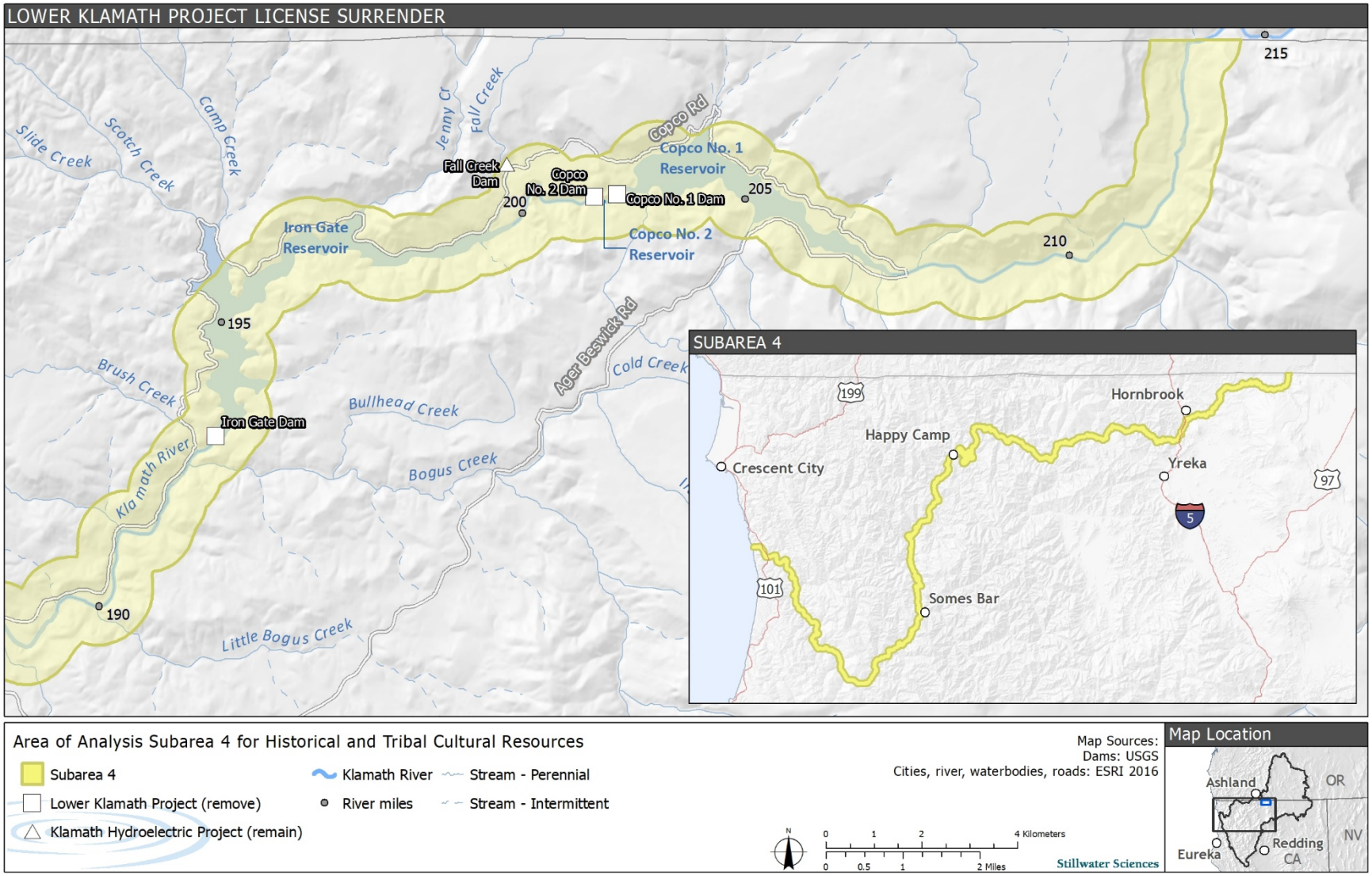

Figure 3.12-5. Area of Analysis *Subarea 4* for Historical and Tribal Cultural Resources.

3.12.2 Environmental Setting

The Klamath River flows through several cultural regions in California's Northwest Coast, the Great Basin, and portions of the Columbia Plateau. These unique cultural regions have been used and occupied by Native American peoples for centuries.

3.12.2.1 Tribal Cultural Chronology and Ethnography (including Historic and Pre-Historic Periods)

The tribal cultural resources analysis focuses on Shasta, Klamath, Karuk, Modoc, Hupa[177], and Yurok peoples that occupy the territory along and adjacent to the Klamath River in the vicinity of the Proposed Project. These tribes have a long history of occupation along the Klamath River as evidenced by the numerous archaeological and ethnographical resources that are present. Traditional beliefs indicate that these groups have occupied the area for time immemorial.

Over the millennia, native peoples occupied the area along the Klamath River in the vicinity of the Proposed Project, especially the corridor along the Klamath River. Ancient stream terraces—composed of gravel and sand and covered in meadows of grass with mixed oak groves—provided ideal conditions for food supply. Additionally, the area of the Upper and Middle Klamath River provided naturally occurring salt deposits, geothermal hot springs, basalt rock caves, and food such as anadromous and resident fish, seeds, roots, birds, and mammals.

Archaeological investigations have confirmed over 10,000 years of human presence in the Middle and Upper Klamath Basins, which extend beyond the extent of the Klamath River (Balter 2008, Ames et. al 1998, and Aikens and Jenkins 1994). Mammal remains document their use as a food source for native people approximately 7,500 years before the present (BP) (Ames et al., 1998). The presence of milling slabs, mortars, and mullers on the landscape dating back to approximately 6,000 BP, provides evidence for use of bulbs and seeds for subsistence (Mack 1983 and 1991). Use of fish, as a food source, began about 2,600 years BP (Beckham 2006, Daniels 2006, Deur 2011).

Section 3.12 *Tribal Trust* of the 2012 KHSA EIS/EIR is included as Appendix V of this EIR, and includes significant additional context regarding the histories of Native Americans in the basin and the longstanding relationships with various resources. Because this information was developed under auspices of the USBR's trust responsibilities towards federally-recognized Native American tribes, it includes only federally-recognized tribes. Additionally, the subsections of Section 3.12 *Tribal Trust* that address the various potential impacts of the alternatives that were being evaluated in the 2012 KHSA EIS/EIR are not directly applicable to the Proposed Project because they involve similar, but not exactly the same, actions.

Columbia Plateau and Great Basin Culture Areas

The Upper Klamath Basin and Klamath Lakes area exhibits a blend of cultural traits from the Columbia Plateau and Great Basin culture areas. The chronology of the area may be organized into the Paleoarchaic (14,000 to 7,000 BP), Early Archaic (7,000 to 4,500 BP), Middle Archaic (4,500 to 2,500 BP), and Late Archaic/Late Prehistoric (2,500 to 200 BP) periods (Ames et al. 1998; Balter 2008; Aikens and Jenkins 1994; Mack 1983, 1991).

Paleoarchaic (14,000 to 7,000 BP)
During the Paleoarchaic period, the Klamath Basin was occupied by hunter-gatherers that tended to focus on hunting large game animals, but also supplemented their diet with fish, birds, and plant resources. These groups were seasonally mobile and generally small in size (Ames et al. 1998). Two of the oldest sites in the region are Paisley Cave, which is dated at 14,200 BP (Balter 2008) and Fort Rock Cave, which is dated between 13,200 and 10,200 BP (Aikens and Jenkins 1994). The oldest site in the upper Klamath River area is the Klamath Shoal midden site, 35KL21, which yielded a date of 7,700 BP.

Early Archaic (7,000 to 4,500 BP)
Most of the archaeological evidence for early human occupation in the Klamath River Canyon dates to the beginning of the Early Archaic period (Mack 1983 and 1991). Semi-subterranean house pits first appear in the Plateau region during this period suggesting that some people were adopting a less mobile lifestyle. Typical artifacts associated with the Early Archaic include large stemmed, lanceolate, or leaf-shaped projectile points, knives, gravers, scrapers, and some cobble and ground stone tools (e.g., abraders or grinding slabs, mortars, mullers, and stone bowls).

Middle Archaic (4,500 to 2,500 BP)
The Middle Archaic period is characterized by an increase in the exploitation of riverine and marsh environments and food resources such as salmon and various plant roots/tubers. There was also an increase in the use of milling stones and pestles at sites during this period. Typical Middle Archaic artifacts include broad-necked, corner-notched, and side-notched projectile points, many types of ground stone tools, bone and antler tools (e.g., chisels and wedges), and specialized fishing gear (e.g., bone harpoon barbs and net sinkers).

Late Archaic/Late Prehistoric (2,500 to 200 BP)
Several major cultural changes occurred during the Late Period, including: the widespread appearance of pit houses; a shift to a heavy reliance on fishing; the use of storage pits for salmon; camas exploitation; the development of seasonal land use patterns (i.e., use of “winter villages”); the appearance of the bow as evidenced by the presence of small corner- and side-notched projectile points at sites; and the appearance of Olivella shell beads. Extensive trade networks became important across the region by as early as 1,500 years ago, as suggested by tools made from obsidian sources 110 to 120 miles away and the presence of beads made from marine shells.

Ethnography
Klamath Tribes: The Klamath Tribes include the Klamath, Modoc, and Yahooskin Band of Snake Indians. Prior to their placement on a shared reservation, these groups utilized overlapping resource areas in the Upper Klamath Basin. The Klamath and Modoc people occupy the entire Upper Klamath Basin and adjacent interior drainages to the east, living in close association with the marsh and riverine resources of this area (Spier 1930 and Barrett 1910). The Klamath and Modoc tribes were occupying the Upper Klamath Basin prior to Euro-American contact, and also participated in salmon fishing and social gatherings along the Klamath River at least as far downstream as Seiad Valley (Deur 2011). The Yahooskin principally occupy lands east of the Klamath Basin, but did participate in resource harvests, including fish harvests, with Klamath and Modoc on the Sprague River and other Klamath River tributaries (Deur 2011).

Deur (2011) also presents a summary of the ethnography of The Klamath Tribes and their relationship to the Klamath River. Klamath ancestral territory stretches from the southern boundary of the Deschutes River watershed in the north to Shovel Creek drainage in the south (Stern 1998). These encompass the Sprague River and Sycan Rivers, Sycan Marsh, Klamath Lake, and Klamath Marsh (Spier 1930, Berreman 1937). Modoc territory extends from Mount Shasta in the south to an area near the current Oregon-California state line in the north and from the eastern slope of the Cascade Range near Mount Shasta to the area around Goose Lake in the east (Ray 1963). This area encompassed Lower Klamath Lake and Tule Lake.

Klamath and Modoc were both organized in villages that collectively owned productive fishing or other resource (e.g., seed or other plants) gathering areas. Influential heads of households, supported by extended families, assumed leadership roles in the villages (Stern 1998). Villages included various types of structures including semi-subterranean winter lodges for families and extended families. The Klamath and Modoc rebuilt their winter lodges in the fall. Spier (1930) identified five geographic subdivisions of winter villages:

- Klamath Marsh-Williamson River group 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 on Agency Lake and the northern arm of Klamath Lake (one village and one hamlet).
- Lower Williamson River group close to the mouth of Williamson River (about seven villages).
- Pelican Bay group that includes the 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: along Klamath Lake south of Modoc Point (about 14 villages).

The permanent winter villages were never fully abandoned during the year. Each group of villages maintained one or more places for cremation of the dead. The ashes of cremated individuals were covered with soil and rocks. Individuals dying away from home might be interred under piles of rocks or cremated and returned to the cremation ground. Particular sweat houses, said to have been built by the legendary *Kemu'kumps*, and a hot spring were used to cleanse mourners.

Fish is the primary resource for the Klamath and Modoc; consequently, settlements clustered near rivers and streams. Runs of fish began in the early spring and lasted into the fall (Spier 1930). Men, with some assistance from women, fished throughout the year from the banks of rivers or streams or from canoes using long-handled dip nets, spears, harpoons, and hook-and-line. During parts of the year, fish drives were also used to harvest fish. Members of the tribe would drive fish toward individuals dragging triangular nets on A-frames or purse nets through the water either on foot or from a canoe. Gill nets drawn between canoes and traps were also used to acquire fish. In addition, stone barriers were constructed on some streams to restrict fish passage and facilitate fishing.

Klamath and Modoc typically left their winter villages in early spring to begin a seasonal round of harvest activities. Spring activities began with harvesting fish from the run of large suckers that took place in Upper Klamath Lake in March. Fish were dried on the branches of pine saplings and sometimes pounded into a meal and bagged for storage. 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. By late spring, women dug camas bulbs in wet meadows, baking them in earth ovens and sun-drying them for storage while men hunted waterfowl and other animals.

Summer was the season when women harvested wocas, the nutritious seeds of the yellow pond lily, at Klamath Marsh, Sycan Marsh, Tule Lake, Lower Klamath Lake, and other water bodies. Wocas were an important food resource and shaman conducted a ceremony at the beginning of the harvest. The seeds were processed for soup and flour. Women also collected cattail roots for drying and grinding into meal. During the summer months men hunted waterfowl and a variety of small mammals.

In fall, Klamath and Modoc gathered chokecherries, serviceberries, Klamath plums, pine nuts, blackberries, and gooseberries. Klamath and Modoc eventually moved into the high country of the western Cascades to harvest huckleberries. Women dried the berries before fires, while men hunted deer and elk and trapped furbearing mammals. 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. Whitefish were also harvested in the fall primarily by the use of dip-nets.

Klamath and Modoc sought power by visiting places where they believed that sacred beings resided and sought to gain their power through ritualized activities. Klamath and Modoc parents sent boys and girls on a power quest when they reached puberty. Fathers and mourning kinsmen sometimes sought power at the birth of a child or death of a wife or child (Stern 1998). Seekers of power often sought specific competence such as luck in hunting or fishing, war, love-making, gambling, foot-racing, 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 hills. Power might come in the form of a dream or a visit by a spirit, which would be followed by the seeker waking with blood in his mouth or nose and a personalized spirit song in his ears.

Shamans, mourners, and gamblers also sought power by swimming in deep river eddies. During the day, the seeker sweated and fasted, waiting in the brush until nightfall. At that time the power seeker went to the river and dove to the bottom in search of a spirit. The seeker did not appear to be frightened even if he saw something moving under the water. Similar to other power-seeking events, it is reported that sometimes a seeker surfaced from the bottom of the river unconscious, with blood flowing from his mouth and/or nose (Spier 1930).

Shamans performed important ceremonies in midwinter gatherings, first-fruit rites for wocas gathering, and other occasions. They also cured illnesses and provided spiritual and practical support during warfare. Novice shamans received their initiation as a group at midwinter ceremonies. Helpers worked with shamans over a 5-day period during the ceremonies to call spirits, interpret spirit messages, and lead the audience in singing sacred songs.

Euro American expansion into Klamath and Modoc territory had a dramatic effect on their traditional cultural practices. Regardless, 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. However, in 1954 Congress terminated the reservation and its trust relationship with The Klamath Tribes. The Klamath Tribes retained some rights to resources, but a majority of the tribal members withdrew from the tribe and received a portion of the tribal holdings. The trust account created for the rest of the members was later liquidated. In addition, in 1974 the Federal Government condemned thousands of forest acres that had been part of the Klamath Reservation so that the forest land could be added to the Winema National Forest (Klamath Tribes 2003).

The Klamath Tribes accomplished restoration of Federal recognition in 1986 and began to rebuild their tribal government, economy, and community. Currently, the tribal Culture and Heritage Department is working to protect, preserve, and enhance traditional cultural values (Klamath Tribes 2003). The Klamath Tribes are also pursuing a variety of economic enterprises through their Economic Self-Sufficiency Plan. (Please refer to 2012 KHSA EIS/EIR Section 3.12 *Tribal Trust* in Appendix V of this EIR for additional information on traditional and current lifeways and the history of Federal recognition.)

Northern Interior California Culture Area

Previous archaeological investigations in the vicinity of the Proposed Project were conducted in response to hydroelectric developments and highway construction projects beginning in the 1940s. These early archaeological investigations contain limited general information on the cultural chronology of lands in the vicinity of the Proposed Project. However, the investigations of Basgall and Hildebrandt (1989) and Cleland (1997a,b) in the northern Sacramento River Canyon do offer information on cultural chronology of lands in the Sacramento River Canyon which can provide additional insights to cultural chronology of lands in the Proposed Project area because it is likely that the subsistence and settlement patterns identify for the Sacramento River Canyon are similar to the patterns along the Klamath River and within the vicinity of the Proposed Project.

Basgall and Hildebrandt (1989) propose a three-phase cultural chronology for the northern Sacramento River Canyon, which is thought to be similar to the prehistory of the Klamath Basin. These are the Pollard Flat Phase (2,700–5,300 BP), the Vollmers Phase (1,700–4,500 BP), and the Mosquito Creek Phase (1,900 BP to contact). The Pollard Flat Phase appears to represent a forager population that occupied residential base camps for extended periods of time, and is characterized by relatively large projectile points, ground stone tools, anvils, mauls, and net weights. The Vollmers Phase represents populations that were more mobile than those of the previous phase, while still maintaining residential camps, and are characterized by medium size projectile points, ground stone tools, anvils, mauls, and net weights. The Mosquito Creek Phase populations consisted of small groups that practiced a pattern of seasonal migration, and have ben archaeologically characterized by small projectile points, ground stone tools, and the absence of hand stones, milling stones, hammer stones, anvils, mauls, and net weights.

Cleland's (1997a,b) chronology for the Lake Britton area is divided into six periods spanning 7,000 years. The six periods include: Paleo-Indian (prior to 7,500 BP; Early Archaic-A (5,000–7,500 BP); Early Archaic-B (3,900–5,000 BP); Middle Archaic-A

(3,000–3,900 BP); Middle Archaic-B (2,000–3,000 BP); Late Archaic (1,000–2,000 BP); and Emergent (150–1,000 BP).

The Paleo-Indian Period is poorly represented at the Area of Analysis and only sporadic use of the area may have been occurring during this time. Early Archaic Period sites along the Pit River and Klamath River, however may be associated with an intensification of use of the area. Sites associated with this period are usually on mid-slope terraces and tend to be situated some distance from rivers. This period reflects increased occupation of the area and freshwater mussel shell midden deposits appear at sites suggesting the exploitation of riverine resources.

The Middle Archaic Period is highlighted by a continued increase in the intensity of use of the area and a diversification of the overall settlement pattern. Occupation of the higher terraces above the river continues, but habitation sites also occur closer to the river. The diversified settlement pattern of the Middle Archaic-A Period continues during the Middle Archaic-B Period, but there is increased occupation of sites near the river. The Late Archaic-A Period is characterized by an increase of more riverine sites. This pattern continues into the Emergent-A Period during which occupation of riverine sites intensifies.

Ethnography

Shasta People

The Shasta People are currently represented by various Native American entities including the Shasta Nation, Shasta Indian Nation, and the Etna Band of Indians otherwise known as the Ruffey Rancheria. During separate consultations between the State Water Board and the Shasta Indian Nation and Shasta Nation, tribal representatives provided various historic accounts related to locations, individuals, and significant events permanent to the specific tribe's history and culture. These accounts, and specific tribal histories are included in confidential appendixes of this EIR (Confidential Appendix P and Q). Below is the traditional information provided for the Shasta people based on literary research.

Silver (1978) summarizes ethnographic information regarding Shasta collected by Dixon (1907), Voegelin (1942), and Holt (1946). These sources generally agree that traditional Shasta territory extended north to a point about 20 miles north of Ashland, Oregon, and from Clear Creek on the Klamath River east to Mt. Hebron (Silver 1978, Jester 2016) (Figure 3.12-6). Shasta are members of the Hokan language family (Silver 1978).

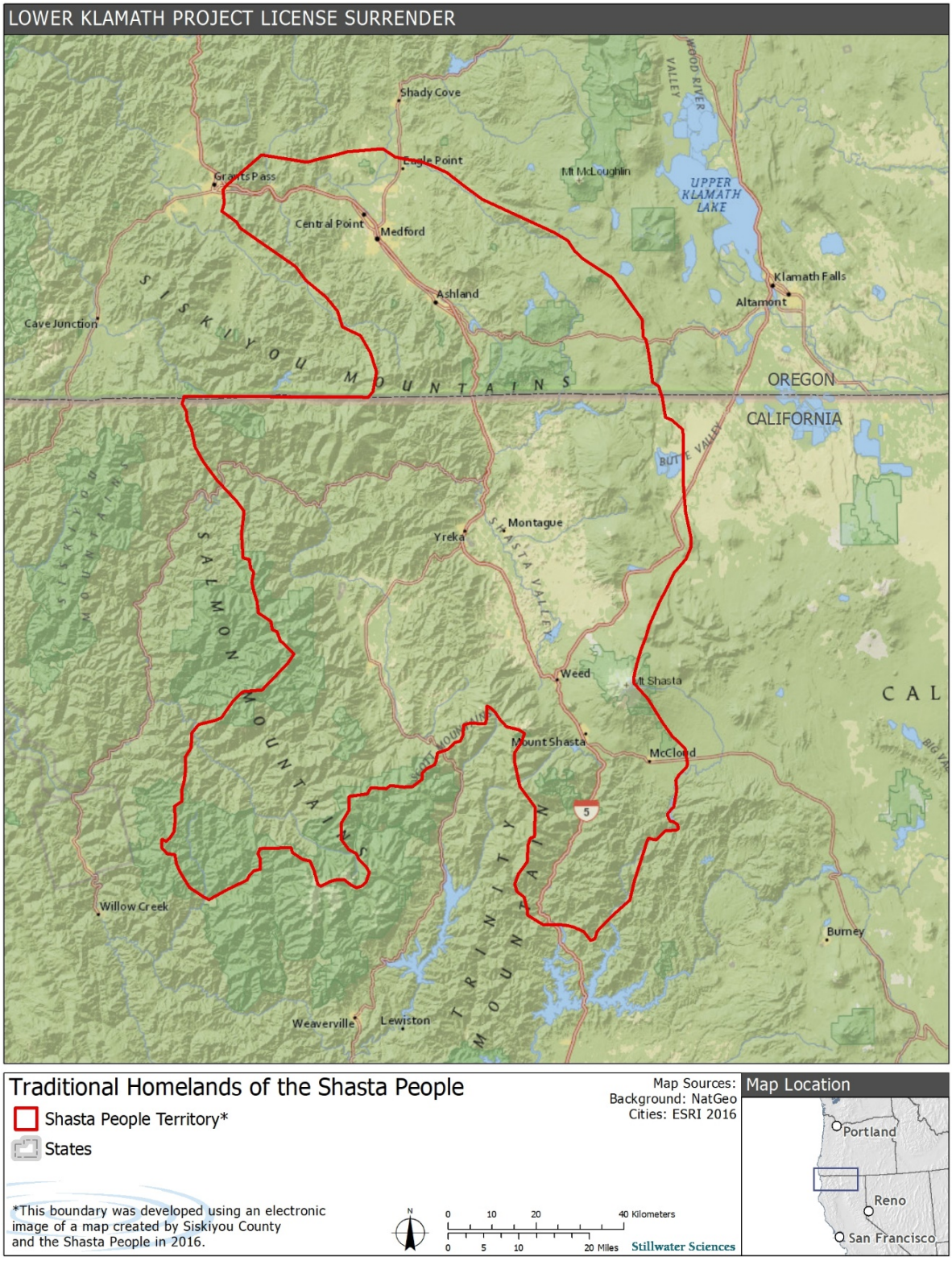

Figure 3.12-6. Traditional Homelands of the Shasta People. Map based on GIS interpretation of traditional Shasta People Homeland map provided by Shasta Nation and Siskiyou County.

There are several groups of Shasta that exhibit different cultural traits. Information presented here focuses on the Klamath River Shasta, called the Wiruhikwaiiruka or Kammatwa (Daniels 2006). Shasta were organized into autonomous tribelets consisting of extended family groups that occupied a group of villages. The family was the basic social unit of the Shasta, with the village being the political and economic unit. Each village had a chief/headman to provide leadership and organize important social, political, and economic events (Silver 1978). Shamans conducted a variety of ceremonies in villages, and the Shasta people considered Mount Shasta to be sacred ground that was used for healing, blessing, and ceremonies. Mount Shasta is a significant part of Shasta traditions and ceremonialism.

Shasta along the Klamath River tended to build their winter villages near the river. Villages had recognized territories with areas for each family, including fishing places with fish weirs along the Klamath. 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. Typical villages consisted of brush shelters, bark houses, sweathouses, assembly houses, and winter houses (Silver 1978). The major structures of a Shasta village included the dwelling house (umma), a big house (okwa-umma), the sweat house (wukwu), and the menstrual hut (wapsahumma) (Shasta Indian Nation 2018).

During the spring and summer, Shasta established temporary hunting and gathering camps in the foothills and mountains to make use of seasonally available resources in those ecological zones. Shasta relied on a subsistence pattern emphasizing gathering, hunting, and fishing, and use of a variety of plant and animal resources as they became seasonally available. For example, resources used by the Shasta included deer, brown bear, rabbit, and a variety of small mammals, fish, birds, insects, acorns, buckeye, pine nuts, manzanita berries, and a variety of other plants. Acorns were a staple of the Shasta diet. Regardless of the variety of resources available to the Shasta, the primary components of their diet were deer, Chinook salmon, and acorns (Dixon 1907, Silver 1978).

Individual hunters and communal hunting parties hunted deer using bows and arrows, snares, dogs, and drives (e.g., driving deer over cliffs). Waterfowl and quail were taken using nets, snares, and traps (Moratto 1984). Spring and fall salmon runs were important fishing times for the Shasta. Fishing techniques included a combination of techniques including nets, weirs, spears, and fish drives (Shasta Indian Nation 2018). In the spring, Klamath River Shasta waited to catch salmon until a member of another Shasta Group called the Kammatwa caught the first fish and performed a ritual. Klamath River Shasta could then catch and process the fish for storage but could not eat them until the Karuk performed the White Deerskin Dance ceremony. Salmon and trout were sun dried and stored in baskets for winter consumption (Silver 1978). Women and children also dove for mussels in the Klamath River during the spring.

Shasta traded pine nuts, obsidian blades, and juniper beads with their neighbors for obsidian from the Achumawi; pine nut necklaces from the Wintu; canoes from Karuk and Yurok; acorns, baskets, dentalia shells, haliotis shells, and other shells from the Karuk, Hupa[177], and Yurok; and beads from Wintu (Silver 1978). Shasta also acted as a middleman for the Achumawi, who acquired dentalia shells from groups in the Columbia River area. In addition, Shasta occasionally attended Karuk, Hupa, and Yurok dances.

Euro American settlement into Shasta lands accelerated as a result of the Gold Rush. Conflicts between Indian Tribes and Euro Americans resulted in the Rogue River Indian Wars of 1850–1857 that pushed Shasta from their traditional fishing, hunting, and village sites. A treaty in 1851 established a reservation in Scott Valley for Shasta, but conflict between Euro Americans and Shasta persisted. Consequently, in the 1870s Shasta welcomed cultural revivalist movements such as the Ghost Dance. From the 1870s through the 1940s most Shasta in the vicinity of the Proposed Project lived at the Frain Ranch or Bogus Tom Smith's Rancheria (Daniels 2006) and continued to practice their traditional subsistence activities. Currently, Shasta are represented in the Shasta Nation, Shasta Indian Nation, and the Etna Band of Indians otherwise known as the Ruffey Rancheria. Along with working on federal recognition, through the Ruffey Rancheria Restoration Act (HR 3535, La Malfa 2017), the Shasta people continue to preserve, protect, and maintain traditional cultural practices, including sites associated with those practices.

Northwest California Culture Area

King et al. (2016) identified six patterns or modes of adaptation (i.e., Post, Borax Lake, Berkeley, Mendocino, Tuluwat, and Augustine Patterns) for northwest California and the North Coast Ranges and assigned them to six time periods: Paleo-Indian (10,000–6,000 B.C.); Lower, Middle, and Upper Archaic (6,000 B.C.–A.D. 500); and Upper and Lower Emergent (A.D. 500–1800) periods. The patterns applicable to northwest California are the Post, Borax Lake, Mendocino, and Tuluwat (formerly Gunther).

The Post Pattern (12,000–8,000 BP) represents the earliest occupation of the area and is characterized by fluted, concave-base projectile points and crescents. Regardless, archaeological sites with well-defined assemblage of typical Post Pattern artifacts are not well represented in northwest California.

The Borax Lake Pattern (8,000–2,500 BP) represents a generalized hunting and gathering subsistence pattern. It is characterized by heavy, wide-stemmed points with indented bases, serrated bifaces, ovoid tools, hand stones, and milling slabs (King et al. 2016). The Borax Lake Pattern is identified at sites across a wide variety of environments in Humboldt and Trinity counties along Pilot Ridge and South Fork Mountain and along a river terrace adjacent to the Trinity River. One archaeological site has a house floor and post holes dated over 7,000 BP (Fitzgerald and Hildebrandt 2001).

The Mendocino Pattern (5,000–1,500 BP) appears to represent a hunting and gathering subsistence pattern that is well adapted to local environments and typically exploits seasonally available resources across different ecological zones. It is characterized by side-notched, corner-notched, and concave base dart points, hand stones, milling slabs, and in some cases small numbers of cobble mortar and pestles. The Mendocino Pattern is not clearly defined in northwestern California, but it has been identified at sites on Point St. George, and along the Smith River, in Humboldt Bay, and in the northern mountains of Humboldt County (King et al. 2016).

The Tuluwat Pattern (beginning about 1,500 years BP) appears to be associated with the exploitation of marine and riverine resources. It is characterized by barbed projectile points, concave based points used for composite harpoons, spears, hooks ground and polished stone artifacts, flanged pestles, notched net sinkers, and steatite bowls.

Sites representing this settlement pattern are associated with exploitation of marine mammals and fish and include locations in Del Norte and Humboldt Counties (King et al. 2016). The pattern appears to represent the earliest evidence of subsistence patterns associated with the exploitation of marine mammals and fish that is typical of the Yurok, Hupa, and Karuk that currently inhabit northwest California and the Klamath Basin.

Ethnography

Karuk: Bright (1978) summarizes ethnographic information regarding Karuk primarily from information presented by Gifford (1939a,b; 1940) and Kroeber and Barrett (1910). Karuk occupy territory west of the Shasta, which stretches along the Middle Klamath River near the western boundary of Siskiyou County from Seiad to Bluff Creek just west of Orleans (Bright 1978). The Karuk Tribe has been federally recognized since 1979 and occupies territory along the Middle Klamath River. Karuk are members of the Hokan language family (Bright 1978). Karuk share similar cultural traits with the Yurok and Hupa and regularly interact with each other.

Karuk were organized in villages with a relatively loose political structure. The acquisition of wealth is an important part of Karuk culture, and wealthy men assumed leadership roles because of their prestige. Villages varied in size and consisted of rectangular cedar plank houses and sweat houses. Karuk focused on the use of fish and aquatic resources, but other terrestrial resources were also important supplements to their diet. Karuk also harvested acorns and hunted in upland areas around the Klamath River for deer, elk, birds, and fur bearing mammals. The hides of mammals were used for a variety of clothing and bird feathers and pelts were used for ceremonial regalia.

Plentiful fish resources facilitated the occupation of numerous villages along the Klamath and Salmon Rivers (i.e., Salter [2003] reports that 100 villages existed along the two rivers). The villages were in advantageous locations on bends of the Klamath River and bluffs above it, such as near the mouths of Camp Creek (Tishawnik), the Salmon River (Mashuashav), and Clear Creek (Inam).

Archaeologically, Karuk tools reflect their emphasis on the acquisition of fish and other aquatic resources and include harpoons, nets, and hooks. Facilities constructed to harvest fish include weirs, dams, and fishing platforms. Karuk also constructed canoes from hollowed out logs for fishing and transportation along the Klamath River and its tributaries. Transportation along the river and streams was essential to Karuk ceremonial activity. Indeed, Karuk traditions state that the Klamath River was created to facilitate their interaction with Yurok and Hupa and with salmon.

The political and social organization and material cultural of the Karuk are important topics, but their religious and ceremonial practices highlight their relationship to the Klamath River and its associated resources. Of particular importance are world renewal ceremonies and ceremonies for bountiful harvests of fish and other resources (Bright 1978). World renewal ceremonies include the White Deerskin and Jump ceremonies at which the earth and the creator are honored for providing food and facilitating the prosperity of the tribes. These ceremonies were and continue to be conducted at sites along the Klamath River such as Panamnik (Drucker 1936, Verwayen and Hillman 2010). Ceremonies to insure harvests of fish include the First Fish, First Salmon, and Fish Dam ceremonies. Other ceremonies related to world renewal and curing are the

Boat Dance and the Brush Dance. Karuk, Hupa, and Yurok regularly attend each other's ceremonies and the ceremonies are conducted for the benefit of all the groups.

The White Deerskin and Jump ceremonies honor the earth and the creator for providing food resources and maintaining the tribes. The White Deerskin ceremony is held from late August into September, depending on the river and its waters. The Jump ceremony is conducted after the conclusion of the White Deerskin ceremony and is also held for the "good" of the world. Both the White Deerskin and the Jump ceremonies depend on a healthy Klamath River system for fish, basket materials, and bathing. The First Fish ceremony is conducted in spring and the Fish Dam ceremony is conducted to in mid-summer to celebrate the harvesting of fish and to pray for continuing prosperity and access to subsistence resources, primarily fish resources. The Boat ceremony forms part of the White Deerskin ceremony, celebrating the flows and health of the rivers. The Brush Dance is held to cure the sick, particularly children.

Euro American settlement in the Area of Analysis for historical and tribal cultural resources accelerated as a result of the California Gold Rush. Conflicts between Indian Tribes and Euro Americans were commonplace across Karuk territory. Consequently, Karuk welcomed cultural revivalist movements in the 1870s such as the Ghost Dance, but traditional cultural practices and numbers of Karuk continued to decline. Regardless, the Karuk persisted and contemporary Karuk continue to practice their traditional activities and are actively engaged in programs related to improving the health of the Klamath River and its fishery.

Quartz Valley Indian Community

The Quartz Valley Community is a federally recognized tribe mainly representing people of Karuk and Shasta ancestry, with 174 acres of reservation lands in the Scott Valley, near Fort Jones, California. Their cultural history is similar to that described for the Karuk, as most members are of Karuk ancestry (Appendix V – 2012 KHSA EIS/EIR *Section 3.12 Tribal Trust*). The Quartz Valley Indian Community's reservation lands are located near the community of Fort Jones. The Quartz Valley Indian Community initially filed their constitution and bylaws with the Office of Indian Affairs in 1939 (DOI 1939).

Yurok

Pilling (1978) summarizes ethnographic information regarding Yurok collected by Waterman (1920), Waterman and Kroeber (1934), and others. Sloan (2003, 2011) also presents a summary of the ethnography of the Yurok and the relationship to the tribe to the Klamath River. Yurok are members of the Algonquian language family. Yurok ancestral territory extends along the Pacific coast of California from Crescent City in the north to Trinidad in the south and along the Klamath River from the coast to a point near the confluence of the Klamath and Trinity Rivers and the town of Weitchpec (Pilling 1978). The Yurok Tribe's reservation currently consists of a strip of land beginning at the Pacific Ocean and extending a mile along each side of the Klamath River approximately 45 miles.

The Yurok life, language, ceremonies, society, and economy are linked with the Klamath River. There are Yurok stories that reinforce the Yurok belief that the River was created in a distinct way in order to provide Yurok people with the best of worlds (Sloan 2003, 2011). Yurok refer to the river as HeL kik a wroi or "watercourse coming from way back in the mountains." Contemporary Yurok often refer to the Klamath River as the "Yurok Highway" emphasizing its comparison to a blood vessel that provides the main flow of

sustenance. Karuk, Yurok, and Hupa share similar cultural traits and traditional stories state that the Klamath River was created to facilitate their interaction with each other and with salmon.

The Yurok had permanent settlements with substantial architectural features including houses, smokehouses, and storage facilities (Kroeber and Barrett 1910, Pilling 1978). Pilling (1978) cites 44 villages, 97 fishing spots, 82 significant cultural places (e.g., places used for ceremonies, gathering, and hunting), and 41 places of cultural significance along the Klamath River in Yurok territory.

The Yurok represent a socially complex hunter-gatherer population in California (Fredrickson 1984, Kroeber 1925) that used marine and salmon resources. Organizing labor to capture the short-duration salmon runs, preserving fish by smoking, then packing and storing the fish suggests a high degree of sociopolitical differentiation. There is also evidence of a maritime expression to Yurok culture involving marine mammal hunting more than 10 miles offshore. The most telling argument for an open-ocean maritime adaptation comes from the presence of the large amount of northern fur seal fauna in the Stone Lagoon midden. Jones and Hildebrandt (1995) argued that pinnipeds were extirpated early on shore by Native Americans, who then developed watercraft to hunt offshore.

The material culture of the Yurok people includes, to this day, dugout redwood canoes, split-plank houses, storage boxes, sweathouse pillows and stools, many fishing devices, baskets and leather, shell, straw and feather garments and ceremonial regalia.

Transportation along the rivers and streams is essential to Yurok ceremonial activity. One of the most important aspects of Yurok technology was the river- and ocean-going canoe or yoch, which were carved from selected redwood trees (Sloan 2003, 2011). There are historic accounts of expeditions traveling up to 180 miles along the coast (Sloan 2003, 2011). A typical river canoe measured 16 to 20 feet in length and 3 to 4 feet in width. River canoes were customarily paddled and/or pushed with a long pole. Yurok technology and facilities do not only serve utilitarian functions, but also include ceremonial aspects of Yurok culture. For example, facilities, such as fishing weirs, were created specifically to signify the time of sacred ceremonies (e.g., the White Deerskin and Jump ceremonies).

Fishing places along the Klamath River are owned by individuals, families, or groups of individuals. Fishing places can be borrowed, leased, inherited, or bought and sold (Sloan 2003, 2011). Some ownership rights at fishing places depended on species of fish caught at the site, while others depended on the water level (i.e., individuals owned the right to fish at a place if the river was below or above a certain level). Yurok still recognize this traditional form of resource management and use of the river. Families and individuals continue to use and own rights to fishing places on the Klamath River.

Like the Karuk, the religious and ceremonial practices highlight the Yurok relationship to the Klamath River and its associated resources. Of particular importance were the Jump, White Deerskin, Boat, and Brush ceremonies. The Jump and White Deerskin ceremonies were held in late fall to give thanks for food resources abundance collected during the year and to insure a continued abundance of food resources for the next year (Sloan 2003, 2011). Affluent individuals and religious leaders conduct most ceremonies,

and wealthy individuals were expected to feed salmon to everyone attending the ceremonies.

The Boat Ceremony is part of the White Deerskin Ceremony. In this ceremony, several boats filled with participants travel down the Klamath River. The participants thank the river for continuing to flow and provide resources. The Brush Ceremony unfolds over a four-day period and highlights the importance of Klamath River resources to Yurok. For example, baskets made of plant materials collected at the water's edge are used to hold food and ceremonial medicine; acorns are cooked in the baskets using cooking stones gathered at specific river bars; ceremonial regalia is made from various plant and animals that live along the river; ceremonial bathing is performed; and participants listen to the sounds made by the Klamath River (King 2004).

The social and ceremonial significance of the Klamath River is evident in and reinforced by Yurok traditions. For example, there are at least 77 Yurok stories that make direct reference to the Klamath River (Sloan 2003, 2011). These Yurok stories reinforce the belief that the Klamath River was created to provide Yurok with a very good place to live.

Spanish explorers and vessels traveling from the Philippines may have interacted with Yurok along the coast in the late 1700s. Other explorers such as Peter Skene Odgen and Jedediah Smith certainly encountered Yurok along the Klamath River in the early 1800s. Regardless, Euro American settlement and use of Yurok territory did not begin until after the discovery of gold in California in early 1850. With strikes along the Klamath and Trinity rivers, gold prospectors inundated the region affecting Yurok traditional culture (Pilling 1978).

In 1851 a "Treaty of Peace and Friendship" was signed between the United States Government and the Klamath River Indians, but the United States Congress did not ratify this treaty. Subsequently, on November 16, 1855, the Klamath River Reserve, also known as the Klamath Indian Reservation, was established by Executive Order. The Order designated the reservation lands from the mouth of the Klamath River, one mile on each side extending approximately 20 miles upriver to Tectah Creek (Sloan 2003, 2011).

Escalating conflict between Yurok and Euro Americans during the 1860s and 1870s over encroachment onto the Klamath Indian Reservation resulted in the gradual displacement of Lower Klamath Indians further upriver (Sloan 2003, 2011). Euro Americans on the reserve resisted attempts to remove them, including eviction in 1879 by the United States Army (Sloan 2003, 2011). After decades of struggle to regain their traditional homelands, the Yurok Tribe was re-organized and was granted its own reservation in 1988. As a result of the 1988 Hoopa-Yurok Settlement Act (PL-100-580), the Yurok Indian Reservation was established.

The ancestral lands of the Yurok Tribe extend unbroken along the Pacific Ocean coast (including usual and customary off-shore fishing areas) from Damnation Creek, its northern boundary, to the southern boundary of the Little River drainage basin, and unbroken along the Klamath River, including both sides to the associated tributary watershed boundaries from the mouth upstream to the Bluff Creek drainage basin. The Yurok Tribe considers cultural resources sites along and associated with the Klamath River to be part of a larger ethnographic riverscape (King 2004, Yurok Tribe 2012). Sites include fishing areas; a fish dam (weir) site; many different types of resource

gathering sites, complex trail systems that connect villages, camps, the river, ceremonial sites, gathering areas, and other Tribes; and 47 villages with graves/cemeteries.

The Yurok Tribe is the largest tribe in California, with over 4,500 enrolled tribal members and over 200 tribal government employees. The Yurok Tribe is actively pursuing economic development and management of fisheries, forestry, and cultural programs, both on the reservation and Yurok ancestral lands.

Resighini Rancheria: The Resighini Rancheria is located on the southern banks of the Klamath River Estuary, surrounded by the Yurok Reservation. The tribe is composed of Yurok ancestry and has a very similar cultural history to that of greater Yurok culture. Land known as the Resighini Rancheria was designated by Secretarial Order and was officially declared a reservation in 1939. In 1975, a group of Yurok Indians stood together and formally created a non-traditional form of government with a constitution and bylaws which was approved and ratified by the last Indian Commissioner Bruce Thompson from the Department of Interior of the United States. However, the disastrous flooding of 1964 (see also Figure 3.6-14) led to the temporary evacuation of Resighini Rancheria.

Today, the tribal government consists of a General Council with an elected Tribal Council to operate our governmental and private tribal affairs as well as represent the tribal needs of our small membership. The Tribal Council consists of five tribal members who are elected annually by staggered two-year terms of Chairman, Vice Chairman, Secretary, Treasurer and Councilperson. Their general membership serves on boards, committees, commission and corporations to assist the Tribal Council.

Hoopa Valley Tribe: Wallace (1978) summarizes ethnographic information regarding Hupa primarily collected by Goddard (1903). Hupa are members of the Athabascan language family and they call themselves Natinixwe. Hupa ancestral territory is centered in Hoopa Valley and the area surrounding the Trinity River near its confluence with the Klamath River. Hupa, Karuk, and Yurok share similar cultural traits and regularly interact with each other.

Hupa were organized in villages with a relatively loose political structure. Villages typically consisted of family groups (Wallace 1978). Villages varied in size and consisted of rectangular cedar plank houses. For substances, traditional Hupa people primarily used fish and aquatic resources, but also utilized terrestrial resources such as mammals, birds, reptiles insects, and other fauna (Wallace 1978). Hupa also harvest acorns and hunted in upland areas around the Trinity and Klamath River for deer, elk, birds, and fur-bearing mammals. The hides of mammals were used for a variety of clothing and bird feathers and pelts are used for ceremonial regalia.

Hupa tools reflect their emphasis on the acquisition of fish and other aquatic resources and include harpoons, nets, and hooks. Facilities constructed to harvest fish include weirs and dams. The Hupa used canoes for fishing and transportation along the Trinity and Klamath rivers but obtained their canoes from the Yurok. Transportation along the river and streams was essential to Hupa ceremonial activity.

Like the Karuk and the Yurok, the Hupa's religious and ceremonial practices highlight their relationship to a river, the Trinity River, and its associated resources. Of particular importance are world renewal ceremonies and ceremonies for bountiful harvests of fish

and other resources (Wallace 1978). World renewal ceremonies include the White Deerskin and Jump ceremonies at which the earth and the creator are honored for providing food and facilitating the prosperity of the tribes. Ceremonies to ensure harvests of fish and acorns include the First Salmon ceremony and Acorn Feast (Wallace 1978). Hupa, Karuk, and Yurok regularly attend each other's ceremonies and the ceremonies are conducted for the benefit of all the groups.

Euro American settlement of the as a result of the Gold Rush, ultimately resulting in the establishment of the original Hoopa Valley Reservation in 1864. President Harrison expanded the Hoopa Valley Indian Reservation in 1891 to include the Klamath River Reserve that extended one mile on either side of the Klamath River from the Pacific Ocean for 22 miles upstream, as well as the lands one mile on either side of the river between the two reservations (Salter 2003). The 1988 Hoopa-Yurok Settlement Act (PL-100-580) divided the reservation again, separating it into the Hoopa Valley Reservation and the Yurok Indian Reservation (Salter 2003).

The culture of Karuk, Hupa, and Yurok is closely tied to the Klamath and Trinity Rivers. These tribes subsist wholly or in large part on the resources acquired from the river, most of their sacred sites are located along it, and their cultural traditions are related to it (Bright 1978, Pilling 1978, Wallace 1978). Contemporary Hupa practice their traditional activities and are actively engaged in programs related to improving the health of the Trinity River and its fishery.

3.12.2.2 Historic Period

Euro American exploration of the Klamath region began in the early 19th century. Jedediah Strong Smith and Peter Skene Ogden explored current Siskiyou and Klamath County in 1826 and 1827 for beaver as part of fur trade, and in 1829 a party of Hudson Bay Company trappers and explorers, led by Alexander Roderick McLeod, also passed through the area (Klamath Hydroelectric Project 2004). The fur trade ended in the mid-1840s. Largely, the area remained sparsely occupied by Euro Americans until the mid-1800s, when mining and logging attracted settlers to the area.

The discovery of gold at Sutter's Mill in Coloma in 1848 was the catalyst that caused a dramatic alteration of both Native American and Euro American cultural patterns in California. A flood of immigrants entered the California and the Klamath region once news of the discovery of gold spread. Initially, the Euro American population grew slowly, but soon exploded as the presence of large deposits of gold were confirmed. The non-Native American population of California quickly swelled from an estimated 4,000 Euro Americans in 1848 to 500,000 in 1850 (Bancroft 1888). The discovery of gold and the large influx of primarily Euro American immigrants had a positive effect on the growth and economic development of California as a state, but a negative effect on Native American cultures. The discovery of gold in California marked the beginning of a relatively rapid decline of both Native American populations and culture. The influx of primarily European Americans displaced Native Americans from their traditional territory, discouraged the use of traditional languages and the practice of religious ceremonies, and Euro American economic pursuits (e.g., gold mining, logging, ranching, and farming) limited the practice of traditional subsistence activities.

Gold was discovered by Abraham Thompson and his party just north of the present-day location of the City of Yreka in 1851 (Hoover et al. 2002). Known as "Thompson's Dry

Diggins", the population quickly exploded to 2,000 miners, and the town of Shasta Plains was established (Hoover et al. 2002). The town primarily included tents and brush shanties, but also included a saloon built out of shakes and canvas by Sam Lockhart. The first permanent house in the town was built by D.H. Lowry and his wife.

Euro American settlement in the Klamath River watershed continued to grow through the 1850s due to the completion of roads such as the Southern Emigrant Road, also known as the Applegate Trail, in 1846 (Klamath Hydroelectric Project 2004). These roads brought prospectors to the region and helped to establish communities such as Henley (Cottonwood), Gottville, Happy Camp, and Somes Bar. Fertile soil and plentiful water sources provided opportunities for homesteading and the private development of agriculture and ranching, particularly in the area around current Upper Klamath Lake, but also extending downriver, occupying the rich alluvial terraces along the river through the canyon. The expansion of Euro Americans in southeastern Oregon resulted in execution of treaties with the various Klamath River tribes and the relocation of these groups in the area (Klamath Hydroelectric Project 2004). Shasta women married into ranching families at this time and are recognized as being instrumental in the tribes' long-term survival today.

Logging began in the Klamath Basin in the 1860s and sustained logging enterprises appeared in the 1880s (Klamath Hydroelectric Project 2004). Early companies were generally small, family-run operations managed by ranching families trying to supplement their income. In 1867, President Ulysses S. Grant signed legislation to create a land-grant subsidy for the construction of the Oregon and California Railroad (Klamath Hydroelectric Project 2004). The grant allowed the Oregon and California Railroad Company to select off-numbered sections from the public domain for the construction of the railroad. In 1887, the Oregon and California Railroad Company claimed "lieu" lands on the Pokegama Plateau as compensation for other lands that had already been claimed by homesteaders or military and wagon road companies. Title to these lieu lands were immediately (and illegally) transferred to the Pokegama Sugar Pine Lumber Company. To move the logs from the Pokegama Plateau, the Pokegama Sugar Pine Lumber Company built a log chute on the rim of the Klamath River Canyon and the first railroad in Klamath County (Gavin 2003). During this period, 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 Klamath River Canyon.

The end of the nineteenth and beginning of the twentieth centuries witnessed an ongoing and growing immigration into the area, which was facilitated by the construction of the railroad through the region. The railroad provided a reliable means of transportation in the area and stimulated regional cultural and economic development. In addition to improving transportation, a railroad grade constructed at the northern end of Lower Klamath Lake functioned as a dike that facilitated drainage of wetlands for agriculture and control of the flow of water from the Klamath River.

The Oregon and California Railroad constructed in 1877 was the first railway through the region (Klamath Hydroelectric Project 2004). It extended from Siskiyou County, California, to Jackson County, Oregon, and facilitated travel and the transport of goods between Sacramento and Portland. Subsequently, the Southern Pacific Railroad Company acquired the Oregon and California Railroad, and by 1909 agricultural and lumber products of the Klamath Basin could be distributed to a nationwide market.

The first hydroelectric development in the Klamath Basin was established in 1891 in the Shasta River Canyon below Yreka Creek to provide electricity to the City of Yreka (Klamath Hydroelectric Project 2004). 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 (Klamath Hydroelectric Project 2004). The first decade of the 20th century brought a number of mergers and reorganizations of power companies in the specific project reach of Klamath River canyon currently under study. The California-Oregon Power Company (COPCO) was one of the companies that emerged from this period of reorganization (Klamath Hydroelectric Project 2004). The USBR's Klamath Irrigation Project, authorized in 1905, was developed by the DOI to supply farmers with irrigation water and farmland in the Klamath Basin. Link River Dam is the principal source of water for Reclamation's Klamath Project and the irrigation system and serviced areas are situated upriver of the Proposed Project.

COPCO proposed to develop hydroelectric power facilities along the Klamath River. Residents in the Klamath Falls area were divided over COPCO's proposal to dam and generate power on the river. Farmers feared the depletion of precious irrigation water while other businesses saw COPCO operations as an addition to the local economy. Regardless, with the increasing power needs of both irrigation and lumber mills and a huge influx of military personnel stationed at Medford and Klamath Falls, it was only a matter of time before additional power generation facilities were needed in the area. Envisioned in 1911, the Klamath Hydroelectric Project (Klamath Hydroelectric Project) was built in phases through 1962 (Kramer 2003a,b). Klamath Hydroelectric Project facilities were constructed by COPCO beginning with Copco No. 1 Dam (1918), followed by Copco No. 2 Dam (1925), and reconstruction of the old East Side facility in 1924. After World War II, regional population growth prompted a new round of hydroelectric power expansion highlighted by COPCO's Big Bend project (J.C. Boyle Dam and powerhouse) in 1958 and the construction of the Iron Gate facilities in 1962. While the Iron Gate facilities were still under construction, COPCO merged with Pacific Power & Light, currently PacifiCorp. PacifiCorp currently owns and operates the Klamath Hydroelectric Project.

The development of the Klamath Hydroelectric Project 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 20th century. The Klamath Hydroelectric Project dams and associated facilities are recommended as eligible for inclusion on the National Register of Historic Places (NRHP) as the Klamath Hydroelectric Historic District (KHHD) under Criterion A for its association with the industrial and economic development of southern Oregon and northern California from 1903–1962 (Kramer 2003a,b; Cardno Entrix 2012). Economic development continues in the region, but it is now driven by tourism and recreation rather than gold mining, agriculture, or logging.

3.12.2.3 Known Tribal and Historical Resources in the Vicinity of the Proposed Project

Summary of California Historical Resources Information System Record Searches

In 2017, the KRRC conducted an updated records search at the California Historical Resources Information System's Northeast center at Chico, State University, for a study area that includes the length of the Klamath River from the Oregon-California state line, 40 miles downstream to Humbug Creek. The section of river below Iron Gate Dam (the most downstream Lower Klamath Project dam) was included in the records search since this 18-mile long area lies within the altered FEMA 100-year floodplain following dam removal, where cultural resources have the potential to be affected. The records search area included a 0.5-mile wide buffer, extending on either side of the shorelines of Copco No. 1 Reservoir and Iron Gate Reservoir, and from the center point of the Klamath River in all other areas.

The KRRC's 2017 record search compliments the cultural resource record searches previously performed as part of the Klamath Hydroelectric Project Relicensing (FERC 2007) and 2012 KHSA EIS/EIR studies (PacifiCorp [2004] and Cardno Entrix [2012]).

The records search included gathering archaeological site forms, survey and excavation reports, maps, and other records. Survey and site locations were hand plotted onto USGS topographic maps at the Northeast Information Center. Research of historic registers included the California Historic Landmarks, National Register of Historic Places (NRHP), California Register of Historical Resources, California Points of Historical Interest, California Inventory of Historic Resources, and the California State Historic Resources Inventory. In April 2017, the KRRC visited the Klamath National Forest office and the Siskiyou County Museum, both in Yreka, California to collect additional historic information. Klamath National Forest Heritage Program Manager Jeanne Goetz conducted a search of records for Forest Service lands within or near the KRRC records search area and provided appropriate archaeological site record forms (Appendix B: *Definite Plan – Appendix L*).

The KRRC also conducted a background literature search to identify known cultural resources and also to determine the types of cultural resources likely to occur within the area of the Proposed Project. In addition, online newspaper archives were searched, including the National Digital Newspaper Program archives provided by the Library of Congress and National Endowment for the Humanities (www.chroniclingamerica.loc.gov); Genealogy Bank newspaper archives provided by NewsBank, Inc. (www.geneaologybank.com); the California Digital Newspaper Collection repository provided by University of California, Riverside (www.cdnc.ucr.edu); and newspaper archives provided by www.Ancestry.com.

In May 2017, the KRRC obtained cultural sources data from PacifiCorp, including GIS shapefiles with previous survey and resource locations, as well as, a copy of the final cultural resources technical report prepared for Klamath Hydroelectric Project relicensing (PacifiCorp 2004). In addition, the KRRC contacted Dr. Joanne Mack, Professor Emeritus at Notre Dame University, a primary researcher in the Upper Klamath Basin, to discuss the Proposed Project and to learn of her on-going research in the area that might not be reflected in published or unpublished literature. The KRRC also consulted with Dr. Brian Daniels, Director of Research and Programs for the Penn Cultural Heritage Center at the University of Pennsylvania Museum, regarding ethnographic

information, archival documents, and oral histories pertaining to tribal cultural resources within the California records search area.

The KRRC contacted the Native American Heritage Commission in June 2017, to secure a review of the Sacred Lands file for a 0.5-mile wide area on either side of the Klamath River corridor, extending from the California-Oregon state line downstream to the Pacific Ocean. In a June 14, 2017 letter, the Native American Heritage Commission stated that there was a positive result, with the recommendation to contact the Karuk Tribe, Yurok Tribe, and Shasta Nation. The Native American Heritage Commission also provided a consultation list of 29 tribes with traditional lands or cultural places located within the boundaries of Del Norte, Humboldt, and Siskiyou counties.

The KRRC records search and literature review (Appendix B: *Definite Plan – Appendix L*) identified that 58 previous cultural resources investigations have been conducted within the records search study area, with five studies (Kramer 2003a,b; Cardno Entrix 2012; Durio 2003; PacifiCorp 2004) completed specifically for the Proposed Project (Appendix B: *Definite Plan – Appendix L*). Several of these studies are archaeological, ethnographic, or historical overviews, while others describe the findings of specific archaeological excavations.

The majority of the past surveys involve pedestrian field survey and cultural resources monitoring. Overall, an estimated 8,189 acres of federal, state, and/or private land have been previously surveyed within the records search area and except for some proposed disposal sites, encompasses the current boundaries of the Proposed Project.

The KRRC California record searches identified 206 previously recorded cultural resources, consisting of 120 archaeological sites,1 ethnographic property, 9 built environment resources, 68 isolated finds, and 8 resources of an undetermined resources type (Appendix B: *Definite Plan – Appendix L*). By type, these resources include 114 prehistoric, 59 historic-period, 23 multiple-component (prehistoric and historic period), 1 ethnographic property, and 9 resources whose temporal association is unknown.

Archaeological Sites

The known archaeological sites on file at the Northeast Information Center represent roughly 60 percent of the previously recorded resources along the Klamath River from the Oregon-California state line to Humbug Creek. The sites consist of 49 prehistoric, 48 historic-period, and 23 multiple-component (both historic and pre-historic at the same location) sites. Identified prehistoric period sites include villages; campsites; lithic scatters; lithic scatters with associated cultural features; toolstone quarries; a possible ceremonial site with multiple features; and a human burial site.

The historic-period archaeological sites consist of late-nineteenth or early-twentieth century properties associated with the development of agriculture, including settlements or features such as homesteads; logging; mining; commercial; public works (hydroelectric); and transportation. Agricultural-related sites include settlements (homesteads), irrigation ditches, rock features, and artifact scatters.

Logging-related sites focus on elements of the former Klamathon townsite, including the town and lumber mill and the associated Pokegama log chute and ditch flume. Mining related sites, located in the Klamath River area below Hornbrook, include two quartz mines and four placer mines with ditches and/or tailings. The Beswick Hotel, ranch, and

Klamath Hot Springs area represents the single commercial property. An extensive refuse scatter associated with the Copco No. 1 Village is the sole public works site. Finally, transportation-related sites consist of an abandoned segment of the Klamath Lake Railroad, a collapsed trestle and segment of railroad grade, a segment of Topsy Road, a road leading to Horseshoe Ranch, and a segment of the California-Oregon Stage Road.

The multiple component sites include both prehistoric and historic-period components. Prehistoric components associated with these sites include housepit villages, a housepit village with a documented historic-period cemetery, lithic scatters, a toolstone quarry, and a rockshelter. Historic-period components comprise mining camps and/or tailings features, agricultural related resources such as historic ranches and artifact scatters, and a possible commercial property associated with a former saloon.

Table 3.12-1. Non-confidential Historic–period Cultural Resources within the Area of Analysis.[1]

Primary No.	State Trinomial	Resource Type	Site Type	General Vicinity	NRHP Eligibility
P-47-000522	CA-SIS-522	Site	Empire Quartz Mine	below IGR	7
P-47-000536	CA-SIS-536H, CA-SIS-1315H	Site	Klamathon Townsite and Lumber Mill	below IGR	7
P-47-001671	CA-SIS-1671H	Site	Klamath Lake Railroad Grade	on hillslope	7
P-47-002129	CA-SIS-2129H	Site	Grieve-Miller-DeSoza Ditch	on hill slope	3
P-47-002239	CA-SIS-2239H	Site	COPCO II Ranch Features	on hill slope	4S2
P-47-002266	CA-SIS-2266H	Built Environment	Copco II Powerhouse	Copco Dam	3S
P-47-002267	CA-SIS-2267H	Built Environment	COPCO I Powerhouse and Dam	Copco dam	3S
P-47-002268	CA-SIS-2268H	Built Environment	Fall Creek Powerhouse	Fall Creek	3S
P-47-002823	CA-SIS-2823H	Built Environment	COPCO II Wooden Stave Penstock	In between Copco and IGR	3S
P-47-002824	CA-SIS-2824H	Site	COPCO Guest House	Copco dam	3S
P-47-003917	CA-SIS-3917H	Site	Refuse Scatter	Copco Dam	7
P-47-003922	CA-SIS-3922H	Site	COPCO Village Dump	Copco Dam	7
P-47-003934	CA-SIS-3934H	Site	Historical Cairns	edge of IGR	7
P-47-003937	CA-SIS-3937H	Site	Rock Wall	below IGR	7
P-47-003940	CA-SIS-3940H	Site	Franklin Homestead	edge of IGR	7
P-47-003942	CA-SIS-3942H	Site	Rock wall	edge of IGR	7
P-47-003943	CA-SIS-3943H	Site	Rock Wall	on hill slope	7
P-47-003945	CA-SIS-3945H	Site	Historical Cairns	edge of IGR	7
P-47-004212	N/A	Built Environment	Bridge	below IGR	7

Primary No.	State Trinomial	Resource Type	Site Type	General Vicinity	NRHP Eligibility
P-47-004427	N/A	Site	Habitation with Artifact Scatter and Features	below IGR	7
N/A	N/A	District	Klamath River Hydroelectric Project District	Lower Klamath Project facilities and associated structures	7

[1] Table 3.12-1 was developed based on Table 3.5-3 3 Previously Recorded Archaeological Sites and Built Environment Resources in the KRRC's September 30 CEQA Technical Submittal. Table 3.5-3 is included as Appendix W of this EIR, and is available online at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/lower_klamath_ferc14803/table3.5_3.pdf

* National Register of Historic Places (NRHP) Eligibility from Cardno ENTRIX (2012) and/or NEIC site records:
- 3: Appears eligible for listing in the National Register of Historic Places;
- 3S: Appears eligible for separate listing;
- 4S2: May become eligible for separate listing in the National Register of Historic Places when more historical or architectural research is performed on the property;
- 7: Not evaluated.
- 8. Eligibility determinations were not made for all historic-period cultural resources listed in this table, but all historic-period cultural resources listed in this table are considered during impact analysis evaluation.

The site recorded solely as an ethnographic property consists of a natural rock landform in the Iron Gate area that features prominently in the cultural history of Shasta tribes. A group of eight sites, termed the Pollock Sites, represents undetermined site components.

Information provided in Table 6-8 in Appendix B: *Definite Plan – Appendix* L regarding the National Register of Historic Places eligibility of the archaeological sites is based on recommendations provided by Cardno Entrix (2012), or by eligibility information noted on site records that were not part of the Cardno Entrix study. Overall, one site is listed in the National Register of Historic Places as a contributor to a district, one site is individually eligible, three sites are contributors to a district, determined eligible, 29 sites appear eligible for listing, 2 sites might become eligible for listing when more historical research is performed; 4 sites have been found ineligible, and the remaining 80 sites have not been evaluated for National Register of Historic Places eligibility.

During State Water Board AB 52 consultation with the Shasta Indian Nation and Shasta Nation it was agreed that tribal cultural resources reflected in PacifiCorp (2004) and Daniels (2006), qualify as tribal cultural resources. Additionally, the Shasta Indian Nation provided updated tribal cultural resources information which is included in Confidential Appendix Q. A process to determine tribal cultural resource eligibility for previously unknown tribal cultural resources or refining understanding of existing tribal cultural resources following Proposed Project activities is discussed in Potential Impact 3.12-1.

Historical Built Environment Resources

The KRRC records search (Appendix B: *Definite Plan – Appendix L, Table 6-3*) identified nine historic-period built environment resources associated with the historic themes of commerce, settlement, transportation, and public works, as described below. The single commerce-themed resource includes a former service station converted to residence

(Klamath Kamp). Two settlement-related sites have been recorded, consisting of a post-1930s duplex residence with associated structures and the Frank Wood cabin, a late 1890s to 1950s era homesite. Transportation-related sites consist of a one-lane, wooden and steel beam truss bridge over the Klamath River (Ash Creek Bridge) west of Interstate 5, and the concrete State Route 263, T-beam bridge over the Klamath River at the confluence of Shasta River. Public works sites include four recorded elements of the Klamath Hydroelectric Project, including Copco No.1 Hydroelectric Powerhouse and Dam; Copco No. 2 Hydroelectric Powerhouse; Fall Creek Hydroelectric Powerhouse; and the Copco No. 2 Wooden Stave Penstock.

Besides these nine built environment resources, standing historic-period structures have been identified at several archaeological sites, including a ranch house and bunkhouse at the Beswick Hotel site (CA-SIS-513-H) and a shed at Copco II Ranch (CA-SIS-2239-H). The historic Spannaus Barn was noted at prehistoric/ethnographic site CA-SIS-2574, but was not recorded as an element of the site.

National Register of Historic Places eligibility information for these nine sites indicates that the two Klamath River bridges have been determined eligible for listing in the National Register of Historic Places. The four hydroelectric related sites were noted by Cardno Entrix (2012) as appearing eligible for separate listing, but these sites have also been documented as contributing elements to the Klamath Hydroelectric historic district (Kramer 2003b) which has yet to be concurred upon by the California and Oregon State Historic Preservation Officers. Also recommended as National Register of Historic Places eligible is the Frank Wood cabin. The final two resources, composed of a residence and a former service station, have been found ineligible for the National Register of Historic Places.

Isolated Finds

The KRRC records search (Appendix B: *Definite Plan – Appendix L, Table 6-3*) identified 68 individual resources not directly associated with sites (i.e., isolated finds or individual low-density concentrations of artifacts or features that do not appear to be associated with a larger site but could indicate Native American use of the area), including 65 prehistoric resources, 2 historic-period resources, and 1 isolated feature of unknown age. Prehistoric isolates include a rock cairn, bedrock milling feature, possible cupule boulders, an incised cobble, ground/battered stone and flaked stone artifacts. Forty-one isolate locations were found to contain flakestone manufacturing debris (debitage) ranging from 1 flake to as many as 13 flakes in a single location. Debitage includes obsidian, chert, and basalt. Eleven isolates contain both tools and debitage.

The historic-period isolates consist of one rusted horseshoe and the remains of a wagon. The isolate of unknown age is described as a rocky depression measuring 8.2 feet in diameter.

Potential Archaeological Districts

As part of the Klamath Hydroelectric Project relicensing study (FERC 2007), five areas containing multiple prehistoric sites were identified along the same section of the Klamath River which was considered as a potential National Register of Historic Places District (PacifiCorp 2004, FERC 2007). This potential district includes four groups of multiple sites in Oregon located at the head of Link River and the mouth of Upper Klamath Lake, Teeter's Landing, Spencer Creek/mouth of upper Klamath River Canyon, and near Frain Ranch. In California, a cluster of three villages near the headwaters to

Iron Gate Reservoir, comprised the fifth potential district group. The National Register of Historic Places eligibility of this district has not been finalized.

A historic-period archaeological district was also considered for the Frain Ranch, in Oregon (PacifiCorp 2004). Due to their association with early homesteading and the beginning of ranching and agriculture within the upper Klamath River, four Frain Ranch area sites were envisioned for this district. The National Register of Historic Places eligibility of this district has not been finalized at this time.

Potential Klamath River Hydroelectric Project District

The Klamath River Hydroelectric Project District comprises seven hydroelectric generation facilities and their related resources located along the Klamath River and its tributaries in Klamath County, Oregon and Siskiyou County, California. Beginning at the Link River Dam, in Klamath Falls, Oregon, the Project boundary continues southwest along the Klamath River to include the Keno Dam Complex and the J.C. Boyle Complex in Oregon. Within California, the Klamath Hydroelectric Project boundary includes the Fall Creek, Copco No. 1 and Copco No. 2 complexes, and terminating at Iron Gate Dam. The Klamath Hydroelectric Project facilities were constructed between 1903 and 1958 by the California Oregon Power Company (COPCO) and its predecessors and are now owned and operated by PacifiCorp under FERC License Nos. 2082 (Kramer 2003a,b) and 14803.

The proposed Klamath River Hydroelectric Project District includes the hydroelectric facilities and various diversion dams; support structures; linear elements such as flumes, canals, and tunnels; and other related buildings and structures. A historic context statement (Kramer 2003a) and Determination of Eligibility (Kramer 2003b) developed for the Klamath Hydroelectric Project notes its eligibility to the National Register of Historic Places as a District under Criterion A for its association with the industrial and economic development of southern Oregon and northern California (Kramer 2003b). The California and Oregon State Historic Preservation Officers have not concurred with this eligibility recommendation. Table 6-11 of Appendix B: *Definite Plan – Appendix L*, identifies key features of the three hydroelectric complexes located in California that are part of the Proposed Project in reference to the National Register of Historic Places eligibility recommendations.

Upper Klamath River Stateline Archaeological District

The newly designated Upper Klamath River Stateline Archaeological District (BLM 2016) is located along the Klamath River, in California, less than 0.5-miles from the Oregon-California state line. The district encompasses three pre-contact village sites that contribute to the district's significance and one lithic scatter that does not contribute. Archaeological research indicates site use in the district extended from circa 1,000 years ago or earlier to possibly as late as the 1840s (BLM 2016). The district was determined eligible for the National Register of Historic Places at the local level of significance under Criterion D in the areas of Prehistoric Archaeology, Native American Ethnic Heritage, Commerce, Economics, Religion, and Politics/Government. The California State Historic Preservation Officer and the Keeper of the National Register of Historic Places have concurred with the district's eligibility, and it would therefore qualify as an Historical Resource for the purposes of CEQA.

Ethnographic Information and Tribal Cultural Resources

The ethnographic information presented here for the California portion of the Lower Klamath Project identified tribal cultural resources, and other culturally sensitive areas along the Klamath River in the Proposed Project area are based on ethnographic inventory reports prepared by the Klamath Tribes (Deur 2004), Shasta Nation (Daniels 2003, 2006), Karuk Tribe (Salter 2003), and Yurok Tribe (Sloan 2003) for the FERC Relicensing study, the 2012 KHSA EIS/EIR, and during AB 52 consultation meetings between the State Water Board the Shasta Indian Nation and the Shasta Nation (Confidential Appendices P and Q).

The Klamath Tribes identified several culturally important locations in the Klamath Basin, and noted that tribal fisheries were impacted as a result of impediment of anadromous fish passage due to Klamath River dams (Deur 2004). The Klamath Tribes also identified places along the Klamath River between J.C. Boyle Dam (Oregon) and the Scott River (California) that have tribal cultural value (Theodoratus et al. 1990).

The Shasta Nation reports (Daniels 2003, 2006) present a list of village sites recorded in ethnographic literature, a list of locations that the Shasta consider traditional cultural properties, and another inventory of 11 locations, drawn from the first two listings, that are eligible for the National Register of Historic Places.

The Karuk (Salter 2003) and Yurok (Sloan 2003) ethnographic reports draw upon oral interviews, other writings, ethnographical literature, and a review of natural and cultural resources within the Klamath River to discuss each tribe's traditional and historical relationships with the river, and its resources, to subsistence, spiritual culture, and identity. These tribes recognized the entire Klamath River as part of an important cultural (ethnographic) riverscape.

Klamath Cultural Riverscape

The Klamath River Inter-Tribal Fish and Water Commission incorporated information from existing ethnographic studies, in addition to information provided by the Hoopa Valley Tribe, into a report that focused on the Klamath River (King 2004). The entire length of the river was then identified as a type of cultural or ethnographic landscape, termed the Klamath Riverscape, due to the relationship between The Klamath Tribes, Shasta, Karuk, Hoopa, and Yurok tribes and the river and its resources (Gates 2003, King 2004). The characteristics that contribute to the riverscape's cultural character include natural and cultural elements such as the river itself; its anadromous and resident fisheries; its biological diversity; and its cultural sites, sacred places, uses, and perceptions of value by the tribes (King 2004). Gates (2003) and King (2004) recommend the Klamath Riverscape as eligible for the National Register of Historic Places based on its association with broad patterns of tribal environmental stewardship, spiritual life, and relationships between humans and the non-human world. The ethnographic reports for the riverscape and its eligibility determination have not been submitted to the Oregon and California State Historic Preservation Officers for national or state register for concurrence (USBR and CDFG 2012). This EIR recognizes the Klamath Cultural Riverscape as a Tribal Cultural Resource under Public Resources Code, section 21074.

The Klamath Riverscape's contributing elements include the resources described in the 2012 KHSA EIS/EIR's discussion of tribal trust resources and resources traditionally

used by tribes (see Appendix V – 2012 KHSA EIS/EIR *Section 3.12 Tribal Trust*). It is clear from formal consultation under AB 52 with the Yurok Tribe that the health of the Klamath River as a whole, as well as the fishery in particular, are of critical importance to the Tribe's well-being and identity, forming a core for cultural, spiritual, and economic life, and that the Klamath River as a whole constitutes a vital Tribal Cultural Resource. Formal and informal consultation, and comments from tribal representatives from the Karuk Tribe, Hoopa Valley Tribe, and the Klamath Tribe, also underscore the high degree to which the Klamath River's water quality and fisheries are important cultural resources.

Historical Landscape Analysis

As part of the Project Area records search, a historical landscape analysis was conducted to identify locations where post 1850s era settlement and resource developments occurred within the records search area (AECOM 2018). The sources for this study included the review of the General Land Office records, including California plat maps (1856, 1876, 1880, and 1881) and surveyor's notes; a variety of published and manuscript resources (Beckham 2006, Boyle 1976, Kramer 2003a, PacifiCorp 2004, USDI 1989); and USGS maps available at http://historicalmaps.arcgis.com/usgs. Other map searches included the David Rumsey collection, Northwestern California map collection at Humboldt State University, Library of Congress digital collections, and Online Archive of California. Historical landscape information was digitized into a GIS format and a table prepared with site-specific information annotated by Township/Range/Section (Appendix B: *Definite Plan – Appendix L,* Table 6-12). In summary, this research indicated roads, railroads, bridges, logging features, ditches, fence lines, buildings, homesteads, ranches, sites associated with military encampments, and several townsites.

KRRC is currently completing the review of the J.C. Boyle Collection (MI 165306) housed at the Southern Oregon Historical Society in Medford, Oregon. This archive contains photo albums, newspaper clippings, maps, manuscripts, financial records, and Copco annual reports belonging to Copco Engineer J.C. Boyle, and pertaining predominately to construction of Copco No. 1 Dam and Reservoir. This archive is a valuable source of information concerning the pre-inundation historical landscape of the Copco No. 1 area and provides important information regarding cultural and historical resources that may be encountered during reservoir drawdown. In addition, archival and historical landscape research is currently underway at local County repositories and historical societies to provide information regarding cultural and historical resources that may be anticipated during reservoir drawdown at J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate reservoirs.

3.12.3 Significance Criteria

Criteria for determining significance of impacts on historical and tribal cultural resources are based upon consultation, referenced texts, the Appendix G of the CEQA Guidelines (California Code of Regulations title 14, section 15000 et seq.), and professional judgment.

Impacts to historical and tribal cultural resources are significant if they include the following:

- Physical demolition, destruction, relocation, or other alteration of the historical or tribal cultural resource or its immediate surroundings such that the significance of the historical or tribal cultural resource would be materially impaired.
- Exposure or substantial movement of human remains or associated funerary items[143].
- Exposure of, substantial movement of or increased access to other historic tribal cultural resources leading to increased access and looting[144] of tribal cultural resources above levels occurring under existing conditions.
- Elimination or substantial restriction[145] of access of tribal members to their respective tribal cultural resources above levels occurring under existing conditions.

Tribal cultural resources are defined in Public Resources Code Section 21074 as either a site, feature, place or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to the affected tribe, and that is:

1. Listed or eligible for listing in the national or California Register of Historical Resources, or in a local register of historical resources, or
2. A resource that the lead agency determines is a tribal cultural resource, as further described below.

A lead agency has discretion in identifying unlisted resources as tribal cultural resources, but such a determination requires substantial evidence under the criteria used to determine listings in the historical register and considering the significance of the resource to a California Native American tribe (Public Resource Code, Sections 5024.1, 21074). California Native American tribes traditionally and culturally affiliated with the geographic area of a project may have expertise concerning their tribal cultural resources (Public Resource Code, Section 21080.3.1).

3.12.4 Impact Analysis Approach

The historical and tribal cultural resources impact analysis is based on a review of existing information, such as the results of the California Historical Resources Information System confidential record searches, KRRCs identification efforts (Appendix B: *Definite Plan – Appendix L*) and the AB 52 process with Native American tribes and representatives. Additionally, information received during public scoping was also used to identify potentially important cultural resources (Appendix A).

Known tribal cultural resources within the Proposed Project Area of Analysis include archaeological sites and districts, ethnographic villages, historic period Shasta communities, cemeteries, and cultural landscapes associated with the historical uses of the environments surrounding Iron Gate and Copco No. 1 reservoirs.

[143] Substantial movement is defined as movement that would displace tribal cultural resources completely or predominantly outside of existing cultural context in a manner that would impair its cultural significance.
[144] Refers to the illicit collection of artifacts or other tribal cultural resources.
[145] Substantial restriction is defined as loss of access during ceremonial windows or periods of hunting and gathering or other traditional activities associated with a particular tribal cultural resource.

Parts of AB 52 (Gatto 2014) amended Public Resources Code to require consultation with California Native American tribes, when requested, and consideration of tribal cultural resources in the CEQA environmental review process. Following the public scoping meetings, the State Water Board conducted a series of confidential consultation meetings with the Shasta Indian Nation, Yurok Tribe, and Shasta Nation. During consultation, the State Water Board sought information regarding the identification of areas with religious or cultural importance to these tribes, potential impacts of the Proposed Project on such resources, and mitigation measures to avoid, minimize or mitigate adverse effects to identified resources. Information discussed as part of AB52 consultation is incorporated into the impact analyses for historical and tribal cultural resources, as appropriate. AB 52 consultation resulted in development of, and agreement on, mitigation measures with the Shasta Indian Nation and the Yurok Tribe. Consultation with the Shasta Nation informed development of mitigation measures, but the AB 52 process concluded without agreed-upon mitigation measures.

The impact analysis approach for historical and tribal cultural resources also considered existing studies related to reservoir inundation and drawdown with respect to resources located within the Iron Gate and Copco No. 1 reservoir footprints, as described below.

3.12.4.1 Studies on Effects of Reservoir Inundation on Cultural Resources

Lenihan et al. (1981), conducted an interagency, interdisciplinary study on the effects of freshwater reservoirs on cultural resources in order to address conservation management of inundated resources. A hierarchical scheme composed of three levels of cultural resources was assessed for inundation effects: artifacts and artifact assemblages; archaeological site or loci; and regional environmental data base, settlement and resource utilization patterns. The use of the hierarchical scheme was intended to include cultural values beyond discrete sites or artifacts that include spatial, temporal, and organizational relationships between the entities within an environmental and cultural context.

This approach is particularly applicable to landscape level resources such as traditional cultural properties and ethnographic landscapes, even though these property type names came into use after the Lenihan et al. (1981) study. When a river with a long history of cultural use is dammed and water is impounded, the cultural landscape is adversely affected through direct impacts to the archaeological or historical sites themselves and to the relationships of these properties to their environment and to each other on local and broader scales. Besides the changes to the environmental setting, processes of inundation that could affect cultural resources are sediment transport and deposition, erosion processes of wave action along shorelines, and saturation and slumping of submerged strata (Lenihan et al. 1981). Note that slumping, or short-term hillslope instabilities, as may occur during reservoir drawdown are discussed in Section 3.11 *Soils, Geology, and Mineral Resources*, Potential Impact 3.11-3, as well as below for tribal cultural resources (Potential Impact 3.12-2) and historical resources (Potential Impact 3.12-13). Erosion of sediment stored within the Lower Klamath Project reservoirs during reservoir drawdown and the potential for downstream sedimentation due to the released sediment is discussed in Section 3.11 *Soils, Geology, and Mineral Resources*, Potential Impact 3.11-5.

Four factors regarding the extent of impacts to archaeological sites by these processes include the characteristics of the reservoirs themselves (size and operation-fill rate and drawdown frequency); location of sites within the impoundment; geological foundation of a site; and characteristics of the site itself (Lenihan et al. 1981). Erosion processes are most damaging along the edges of the reservoirs in wave action zones that vary vertically with reservoir operations. In general, cultural resource sites located within the wave action zone are most heavily affected, while inundated sites beyond the shore are less affected by erosion and may be capped with sediment. A multitude of other factors, such as, slope, vegetation coverage, substrate, soil and water chemistry, also influences the extent of the impacts to a cultural resource site from inundation. Surface artifact displacement from water movement results in an overrepresentation of heavier weight artifacts (such as, groundstone) and an underrepresentation of lighter weight artifacts (such as, lithic flakes). Damage from vandalism, both intentional and unintentional, increases to sites exposed through erosion and reservoir fluctuations. All of these impacts limit the ability to reconstruct human behavior through artefactual, paleoenvironmental, and site analyses; through direct dating techniques and relative dating of vertical and horizontal placement; and through contextual relationships.

Surveys for previously inundated ancestral Puebloan archaeological sites being exposed due to lowering lake levels as a result of drought at Lake Mead, the reservoir behind Hoover Dam, in Southern Nevada resulted in situations where inundation preserved the sites (Haynes 2008). Sites in shoreline locations were eroded as water regressed, resulting in extensive damage to architectural remains and in the removal of the surface artifact assemblages. In lower energy situations, inundation resulted in capping of the sites with sediment that enhanced preservation. Both architectural and non-architectural features and surface artifacts remained. In other situations, effects of inundation and drawdown resulted in differential artifact removal and secondary re-deposition. Factors contributing to impacts from inundation and later exposure include: energy levels of the reservoir at the site location; terrains upon which the sites sit; weight of artifacts; and artifact collecting once sites were exposed. The results of these surveys on lands exposed from natural drawdown at Lake Mead, a man-made reservoir, are directly applicable to the proposed drawdown of the reservoirs along the Klamath River.

3.12.5 Potential Impacts and Mitigation

3.12.5.1 Potential Impacts to Tribal Cultural Resources

For the purposes of the mitigation measures TCR-1 through TCR-7, the following definitions apply:

Affected Tribes: Tribes on the Native American Heritage Commission list that (1) have expressed interest in participating in further development of the Tribal Cultural Resources (TCRs) measures for the Lower Klamath Project (Project) within 60 days of the Klamath River Renewal Corporation's (KRRC) January 8, 2018, notice and (2) are traditionally and culturally affiliated with the Area of Potential Effect or otherwise affected by the Project. As of August 13, 2018, the following Native American tribes have expressed interest in participating in further development of such mitigation measures: Cher-Ae heights Indian Community of the Trinidad Rancheria, Karuk Tribe, Klamath Tribes, Modoc Tribe of Oklahoma, Quartz Valley Indian Reservation, Shasta Indian Nation, Shasta Nation, and the Yurok Tribe.

Consultation: Consultation with Affected Tribes in a manner consistent with applicable law. KRRC intends to implement these requirements consistent with California Environmental Protection Agency's "Policy on Consultation with California Native American Tribes," CIT-15-01 (August 20, 2015).

Project Implementation: Project implementation is defined as pre-construction activities, reservoir drawdown, dam removal, restoration activities, and other ground-disturbing activities that comprise the Project, as stated in the Definite Plan.

Potential Impact 3.12-1 Pre-dam-removal activities that involve disturbance of the landscape, including construction or improvement of associated roads, bridges, water supply lines, staging areas, disposal sites, hatchery modifications, recreation site removal and/or development, and culvert construction and improvements could result in potential exposure of or damage to known Tribal Cultural Resources through ground-disturbing construction and disposal activity and increased access to sensitive areas.

Pre-dam removal activities involving ground disturbance, construction or improvement of associated roads, bridges, water supply lines, staging areas, disposal sites, hatchery modifications, recreation site removal and/or development, and culvert construction and/or improvements would occur within the Area of Analysis *Subarea 1* (Figure 3.12-2).

Tribal cultural resources are known to be present within Area of Analysis *Subarea 1* (Figure 3.12-2). Cultural resource sites identified at the edges of Copco No. 1 Reservoir include prehistoric archaeological sites with habitation debris and several contributing elements of the ethnographic landscape (Cardno Entrix 2012, Daniels 2006, Heizer and Hester 1970, PacifiCorp 2004). In addition, ethnographic village sites have been identified within Copco No. 1 Reservoir (Heizer and Hester 1970, Daniels 2006). Native American burials and traditional use areas (for ceremonies) within the Copco No. 1 Reservoir footprint have also been identified through ethnographic research and consultations with the Shasta people. At least one ethnographic village site has been identified within Iron Gate Reservoir by PacifiCorp (2004) and Daniels (2006). Specific TCR locations known to the Shasta people, which include TCRs as reflected in PacifiCorp (2004) and Daniels (2006), and as updated by Confidential Appendix Q, Attachment 4, are cataloged in Confidential Appendices P and Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places (NRHP) in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis.

Due to the nature of ground-disturbing activities and a general increase in the level of activity (e.g., construction, surveys) within the Area of Analysis *Subarea 1*, pre-dam removal activities that would involve ground disturbance have the potential to result in the following significant impacts to known TCRs identified in Confidential Appendices P and Q, as well as unknown TCRs:

- Physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the TCR would be materially impaired; and/or
- Exposure or substantial movement of TCRs leading to increased access and looting above levels occurring under existing conditions.

Note that TCR sites located within the reservoir fluctuation zones (Confidential Appendices P and Q) may be periodically at risk of looting during low water periods under existing conditions and may have suffered significant degradation in the existing condition.

Implementation of mitigation measures TCR-1 (TCRMP), TCR-2 (LVPP), TCR-3 (IDP), TCR-4 (Endowment)[146] would reduce these impacts considerably, and, for many resources is expected to avoid impacts completely, through the design and implementation of construction plans to completely avoid impacts, or on-the-ground modifications to Proposed Project implementation to avoid impacts. For impacts for which it is not feasible to completely avoid impacts, these impacts may be reduced to a less-than-significant level. The measures (listed fully, below) include among other requirements, field worker training, limits to worker and public access, tribal monitors, surveys, and identification of protocols and best practices upon discovery or disturbance of TCRs during implementation of the Proposed Project. With timely discovery and appropriate steps to address exposure or damage, many TCRs can maintain their current level of cultural significance. Additionally, providing a means for the long-term protection or enhancement of affected TCRs can mitigate for some impacts.

However, the impact of exposing, disturbing or otherwise damaging tribal human remains, or associated funerary items, is itself profound. While the mitigation measures are expected to considerably reduce impacts, they cannot reasonably be expected to eliminate such exposure or disturbance, particularly where, as here, the number of potentially affected burials is high. While treating remains and associated funerary objects with the appropriate respect and procedures can reduce and avoid compounding the harm from the initial damage, it cannot do so fully. Additionally, in light of the high density of TCRs within the Limits of Work, and the nature of the construction involved, significant risk remains that other TCRs may sustain damage that results in a material impairment of the resource's significance. In light of the particular harm of exposing human remains even where they are treated appropriately after exposure, and the likelihood of significantly impairing other types of TCRs in light of the type of construction actions and the density of resources, the impact would remain significant and unavoidable.

Mitigation Measure TCR-1 – Develop and Implement a Tribal Cultural Resources Management Plan.
The KRRC shall develop a Historic Properties Management Plan (HPMP). The HPMP shall include measures to avoid, minimize, or mitigate the Project's adverse impacts to TCRs. The HPMP shall include a Tribal Cultural Resources Management Program (TCRMP), which will state such measures.

KRRC shall develop the TCRMP in consultation with Affected Tribes. The KRRC shall finalize the HPMP during FERC's hearing on the license surrender application for the Project. The KRRC shall propose the HPMP for FERC's approval as a term of the license surrender order.

[146] Mitigation Measures TCR-6, TCR-7, and TCR-8 could also further reduce the potential impact. However, at this point it is not clear whether the measures are feasible (see Potential Impact 3.12-9.) Therefore, this EIR does not rely on implementation of these measures, in reaching its significance determinations.

In developing the TCRMP, KRRC shall engage in good faith consultation with the Affected Tribes that are traditionally and culturally affiliated with a specific portion of the APE or with potentially affected TCRs. Where a particular tribe has identified a specific TCR, the primary consultation about that TCR shall be with the affected tribe. All such consultation shall be subject to the schedule for HPMP development. If consensus cannot be reached during TCRMP development, KRRC shall record the disputed issues, positions on the disputed issues, and KRRC's proposed resolution, in the HPMP that is submitted to FERC.

The TCRMP shall include the following elements consistent with applicable law:

1. The TCRMP shall include an inventory of known and potential TCRs that could be affected by the Project. Appendix B: *Definite Plan – Appendix L* includes a preliminary inventory of such resources. KRRC will continue to develop the inventory through the consultation process for the license surrender application under authority of the National Historic Preservation Act (NHPA) Section 106.

   Based on AB 52 consultation, KRRC acknowledges that the Shasta Indian Nation and Shasta Nation are primarily concerned with TCRs associated with Iron Gate, Copco No. 1, and Copco No. 2 reservoirs, and tributary sub-watersheds such as Fall Creek, Bogus Creek, and Deer Creek. The TCRMP shall include TCRs known to the Shasta Indian Nation, which include TCRs as reflected in PacifiCorp (2004) and Daniels (2006) and as updated by Attachment 4 of the Confidential Appendix Q. The TCRMP shall include TCRs known to the Shasta Nation, which include the TCRs identified in the Confidential Appendix P. The TCRMP shall include TCRs known to other Affected Tribes.
2. The TCRMP shall include provisions to protect the confidentiality of known TCRs. The TCRMP shall also include provisions to share information collected by the KRRC with: Affected Tribes that are traditionally and culturally affiliated with the known TCR(s); regulatory agencies that have authority over protecting such resources, as necessary; or as necessary with the permission of such tribes in order to implement appropriate protective or enhancement measures. These provisions will be consistent with California Public Resources Code Section 21082.3(c).
3. The TCRMP shall assure that the Project will avoid, minimize, or mitigate adverse impacts to TCRs, consistent with California Public Resources Code section 21084.3(a). In developing the plan, the KRRC will consider measures listed in California Public Resources Code section 21084.3(b) that, if feasible, may be appropriate to avoid, minimize, or mitigate adverse impacts:
   (1) "Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
   (2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
      (A) Protecting the cultural character and integrity of the resource.
      (B) Protecting the traditional use of the resource.
      (C) Protecting the confidentiality of the resource.

(3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places in a manner consistent with the KHSA.

(4) Protecting the resource."

4. The TCRMP shall require a training program for KRRC's field personnel associated with the Project. The training program will be designed to train KRRC field personnel to work collaboratively with tribal monitors and will focus on field procedures (across the range of field personnel) as necessary for appropriate and respectful treatment of TCRs; and will be intensive and systematic, in light of the scale, complexity, and schedule of the Project undertakings.
5. The TCRMP shall identify TCR areas that will have limited or no public access during Project implementation. During that period, the KRRC shall: install adequate signage to clearly mark areas with limited or no public access areas; install fencing where necessary and feasible to reduce access; and provide appropriate training to field personnel. Upon the recommendation of a tribe that has identified the TCR area, the KRRC may consider, and the TCRMP may include, other equally effective measures to reduce public access in lieu of (or in addition to) those identified immediately above.
6. The TCRMP shall include site-specific mitigation measures for potentially affected TCRs. The TCRMP shall provide for ongoing consultation or site-specific mitigation refinement with the relevant Affected Tribe(s) with a traditional and cultural affiliation to an impacted TCRs, as appropriate and feasible consistent with the schedule for Project implementation.
7. The TCRMP shall identify any areas where the KRRC, before Project implementation, shall conduct any additional cultural resource surveys, consistent with California Public Resources Code section 21074.
8. The TCRMP shall provide that the KRRC, following reservoir drawdown and dam removal, shall undertake intensive surveys of TCRs, archaeological, and other historical resources within the area of analysis, using joint teams of archaeologists and tribal monitors. The TCRMP shall specify the methods for such surveys. It shall also specify the process by which Affected Tribes will nominate, and KRRC will select and compensate tribal monitors. During this process, an Affected Tribe that is traditionally and culturally affiliated with the area may nominate tribal monitor(s) for KRRC's consideration; and KRRC shall make the selection after consultation with Affected Tribes. KRRC shall select and pay tribal monitor(s) for the purpose of Project implementation. In the event that KRRC does not select a tribe's recommended monitor, an Affected Tribe that is traditionally and culturally affiliated with the area may request participation of its recommended tribal monitor in these surveys at its own cost. KRRC's field personnel, in consultation with tribal monitors, shall record these surveys in a manner consistent with applicable law. KRRC shall provide recorded survey data pertaining to a known TCR to the Affected Tribes that are traditionally and culturally affiliated with that TCR.
9. The TCRMP shall state a range of appropriate measures, and a protocol to select from such range, to address the disturbance or exposure of known TCRs during Project implementation. The KRRC shall implement measures necessary to ensure the protection of disturbed or exposed TCRs.
10. The TCRMP shall provide that the KRRC will identify and avoid TCRs during the siting and construction of new recreational sites, to the extent feasible. The

KRRC shall address potential conflicts consistent with California Public Resources Code section 21084.3(a) and (b).

11. The TCRMP shall provide for restoration actions associated with any ground disturbances such as grading and manual or machine excavation, so as to protect TCRs. The KRRC shall consider limiting or completely avoiding mechanical weed control activities (e.g., mowing, hand-weeding) or herbicide use to protect TCRs in areas identified by Affected Tribes, as necessary. In revegetation efforts, the KRRC shall incorporate specific plant species that are important to Affected Tribes with a traditional and cultural affiliation to the area at issue, to the extent that doing so is feasible and complies with the requirements of the federal and state approvals of the Project. The KRRC shall provide training regarding these actions to its field personnel.
12. The TCRMP shall incorporate the results of the KRRC's Bathymetric Survey, and specifically, the refined understanding of sediment thickness in Iron Gate and Copco No. 1 reservoirs, to inform monitoring efforts for potential exposure of TCRs during and following reservoir drawdown. Information from this review shall inform the Inadvertent Discovery Program (described below), which will be part of the TCRMP.
13. The KRRC shall consult with Affected Tribes in the planning process for the redesign and relocation of the water supply line for the City of Yreka to identify, avoid if feasible, or mitigate effects to TCRs during the siting and construction of the water supply line. The KRRC shall address potential conflicts consistent with California Public Resources Code section 21084.3 (a) and (b).
14. Consistent with KHSA Section 7.6.6, the TCRMP shall include recommended measures to identify, avoid, minimize, or mitigate effects to TCRs during modifications of Iron Gate Hatchery, consistent with California Public Resources Code section 21084.3 (a) and (b).
15. Consistent with KHSA Section 7.6.6, the TCRMP shall also include recommended measures to identify, avoid, minimize, or mitigate adverse impacts to TCRs during rehabilitation and expansion of Fall Creek Hatchery, consistent with California Public Resources Code section 21084.3 (a) and (b).
16. The TCRMP shall include a dispute resolution process in the event that, during Project implementation, Affected Tribes dispute which measures to apply to avoid, minimize, or mitigate the Project's adverse impacts to a specific TCR with which the Affected Tribes are traditionally and culturally affiliated. The process shall include neutral mediation to be undertaken consistent with the schedule for Project implementation. In consultation with Affected Tribes, the KRRC shall engage a standing mediator who is available to resolve disputes about which measures to apply.

Mitigation Measure TCR-2 – Develop and Implement a Looting and Vandalism Prevention Program.

In consultation with Affected Tribes and jurisdictional law enforcement, the KRRC shall develop and implement a Looting and Vandalism Prevention Program (LVPP), specifically to deter looting and vandalism to TCRs associated with the Project. The LVPP, which may be part of the TCRMP, shall include the following elements consistent with applicable law:

1. The LVPP shall include appropriate measures to deter looting and vandalism during Project Implementation. The KRRC shall implement these measures for a

minimum of 3 years following completion of dam removal, or until KRRC has transferred applicable Parcel B lands to the States or third parties under the terms of the KHSA Section 7.6.4.

2. The LVPP shall specify the frequency of monitoring efforts of known TCR areas and other areas subsequently identified by the KRRC or tribal monitors during Project implementation. Monitoring frequency shall not be less than quarterly, with allowances for additional targeted monitoring that is triggered by natural or opportunistic events, such as a large magnitude flood event. The LVPP shall provide that monitoring need and frequency will vary depending on the level of risk associated with various activities during Project implementation.
3. The LVPP shall include a training program on looting and vandalism prevention and site documentation, for the benefit of KRRC's field personnel as well as tribal monitors.
4. The LVPP shall include protocols for communications and reporting to law enforcement and other relevant state and federal agencies, consistent with applicable law.
5. The LVPP shall include appropriate measures to restrict public access to specific Project areas where known TCRs, or those identified through inadvertent discovery, are located. KRRC shall implement these measures until it has transferred the Parcel B lands to the states or third parties under KHSA Section 7.6.4. Specific measures to be considered shall include: fencing; posting of signs; strategic plantings; strategic routing of access roads, boating access points and trails; specific recommendations for land use or land transfer in the KHSA Section 7.6.4 process or other means determined necessary and feasible to protect TCRs from opportunistic looting and public access (authorized and unauthorized).
6. The LVPP shall include appropriate measures to prevent or restrict public access to reservoir areas during reservoir drawdown and dam removal.
7. The LVPP shall include appropriate measures to prevent or restrict public access to newly exposed reservoir areas following reservoir drawdown. Such measures shall limit use of off-road vehicle paths and informal roads and tracks, and unauthorized use of developed and dispersed recreation sites. KRRC shall implement these measures until it transfers Parcel B lands to the states or third parties pursuant to KHSA Section 7.6.4, subject to an assignment of continuing responsibilities by the transferee.

Mitigation Measure TCR-3 – Develop and Implement Inadvertent Discovery Plan (IDP).

In consultation with Affected Tribes, the KRRC shall develop and implement an Inadvertent Discovery Program (IDP), which shall be a part of the TCRMP. The IDP shall establish protocols for the discovery of unanticipated or previously unknown TCRs, including human burials or human remains discovered during Project implementation. The IDP shall provide for compliance with applicable law regarding cultural resources and human remains; state work site protocols to be followed in the event of an inadvertent discovery; and identify appropriate point of contacts associated with the protocols. The IDP shall include protocols for work in areas known to have a high chance of inadvertent discoveries, including the Iron Gate, Copco No. 1, Copco No. 2 reservoir areas, as well as the altered FEMA 100-year floodplain area between Iron Gate Dam and Humbug Creek following dam decommissioning.

The IDP shall include the following specific elements:

1. The IDP shall acknowledge that there may be unknown TCRs in association with TCRs known to the Shasta Indian Nation, which include TCRs as reflected in PacifiCorp (2004) and Daniels (2006) and as updated by Confidential Attachment 4 of the Confidential Appendix Q.
2. The IDP shall state protocols that KRRC shall implement for sites that are addressed under California Public Resources Code 5097.993 and/or for sites found to contain TCRs, human burials, or human remains during and after drawdown activities. These protocols shall identify appropriate agency and tribal contacts for such situations. In the case of human remains in California, the KRRC shall also notify the county coroner and follow the procedures stated in California Health and Safety Code section 7050.5(b) to the extent feasible. Upon discovery, the KRRC's environmental monitor shall notify the KRRC's qualified archaeologist of the discovery, and the KRRC's qualified archaeologist shall complete a letter report to assess and document the discovery. The KRRC shall circulate the letter report to Affected Tribes, the Native American Heritage Commission for inadvertent discoveries on private and state lands in California, and other appropriate land management agencies, within 72 hours of the discovery.
3. The IDP shall state protocols that KRRC will implement for reservoir drawdown or restoration activities following an inadvertent discovery. Such protocols shall be consistent with the Definite Plan and shall take into account potential downstream environmental impacts; cultural resource impacts in the Iron Gate, Copco No. 1, Copco No. 2 reservoir areas; mitigation and stabilization for tribal and cultural resources found in the APE outside of the reservoirs; and mitigation in the altered FEMA 100-year floodplain area between Iron Gate Dam and Humbug Creek following dam decommissioning. The IDP shall identify the measures that the KRRC will follow to protect TCRs following an inadvertent discovery.
4. The IDP shall provide for tribal monitors to participate in monitoring during Project implementation. The tribal monitors shall be present as feasible and appropriate pursuant to the schedule for different phases of Project implementation, to address unknown TCRs that are exposed. Pursuant to item (6), the monitoring schedule for tribal monitors shall consider that monitoring frequency and duration may differ by geographic area or Project phase or activity.
5. The IDP shall provide for the development and implementation of a training program regarding the inadvertent discovery of cultural resources and human remains during Project activities. All of KRRC's field personnel and tribal monitors shall be instructed on site discovery, avoidance, and protection measures, including information on the statutes protecting cultural resources.
6. The IDP shall establish the frequency of specific monitoring efforts during Project implementation in identified areas where the discovery of unidentified TCRs may be likely given currently available information and other known archaeologically or culturally sensitive areas that may be identified by the tribal monitors. Monitoring locations will be specified during the development of the Inadvertent Discovery Program in the HPMP. Monitoring frequency during Project activities that cause ground disturbance shall not be less than quarterly, with allowances for additional targeted monitoring that is triggered by natural or opportunistic events during the reservoir drawdown or a subsequent large magnitude flood event. Such monitoring efforts shall be led by KRRC's archaeologists in consultation with tribal

monitors and shall include the field reconnaissance of newly exposed sediments for surface features, to include, but not be limited to intensive, pedestrian survey for areas with relatively low slopes (<30 percent) and that are sufficiently dried to permit for safe access for pedestrian survey and to permit safe access for survey vehicles. In areas where intensive, pedestrian survey is not possible, KRRC in consultation with tribal monitors may use low-elevation aerial survey methods (e.g., unmanned aerial vehicles) or barge surveys to accomplish monitoring.

7. The IDP shall include a timeline, in consultation with Affected Tribes, for completing treatment measures and assessing California Register significance for discovered cultural resources and human burials or remains.
8. The IDP shall include dispute resolution procedures in the event that Affected Tribes disagree on which measures to apply to protect TCRs following inadvertent discovery. When the inadvertent discovery occurs on private or state lands in California, the procedures set forth in California Public Resources Code section 5097.98 will be followed where feasible, including mediation pursuant to California Public Resources Code section 5097.94. To the extent that inadvertent discoveries occur on federal or tribal lands, appropriate procedures under tribal or federal law will apply.

Mitigation Measure TCR-4 – Endowment for Post-Project Implementation.
The TCRMP shall include a provision for the KRRC to provide funding for an endowment or other appropriate organization (e.g., a non-profit mutual benefit organization) to protect and enhance TCRs that are exposed due to the Project implementation on state and private lands in California, on a long-term basis following license surrender. This endowment shall include funding for monitoring, including supplementing or enhancing law enforcement resources, and shall also be available to cover measures that will be implemented following license surrender, including measures related to looting and vandalism protections. The endowment shall be governed in a manner that is representative of Affected Tribes that are traditionally and culturally affiliated with the TCRs impacted by Project Implementation. The KRRC shall consult with Affected Tribes, with the assistance of the standing mediator during development of the TCRMP, to develop the specifications for funding and governance.

Significance
Significant and unavoidable with mitigation

Potential Impact 3.12-2 Drawdown of Iron Gate, Copco No. 1, and Copco No. 2 reservoirs could result in shifting, erosion, and exposure of known or unknown, previously submerged Tribal Cultural Resources.
The Proposed Project would draw down Iron Gate, Copco No.1, Copco No. 2 and J.C. Boyle reservoirs at a rate between 2 and 5 feet per day (i.e., 1 to 2.5 inches per hour). Drawdown of Copco No. 1 would begin November 1 of dam removal year 1 at a maximum rate of 2 feet per day, and drawdown of all reservoirs would occur at a maximum rate of 5 feet per day beginning January 1 of dam removal year 2 and continue until March 15 of the same year. The analysis for Potential Impact 3.12-2 focuses on the California Lower Klamath Project reservoirs, including Copco No.1, Copco No. 2, and Iron Gate, which are contained within Area of Analysis *Subarea 1* (Figure 3.12-2).

Since the Lower Klamath Project reservoirs were constructed, fine sediments composed primarily of organic material (including dead algae), but also including some silts and clays, have accumulated along the reservoir bottoms. The distribution of sediment deposits varies within each reservoir (Figure 2.7-8 and 2.7-9). Because the accumulated sediments are primarily fine material, they would be easily eroded and flushed out of the reservoirs into the Klamath River during reservoir drawdown. The degree of sediment erosion would vary, with the majority of the erosion focused in the historical river channel that is currently submerged in Copco No. 1 and Iron Gate reservoirs (see Figures 2.7-5 and 2.7-6).

Following drawdown, 40 to 60 percent of the existing sediment deposits would remain in place in each of the former reservoir beds, primarily on terraces located above the historical river channel. The sediments that remain in the reservoir footprints would consolidate (dry out and decrease in thickness) (USBR 2012a), making them less subject to erosion. Further, during the drawdown period, aerial seeding of pioneer mixes would occur as the reservoir water level drops before the exposed reservoir sediments dry and form a surface crust. Pioneer seed mixes would contain a variety of riparian and upland common native species, and possibly a small amount of sterile non-native species to enhance initial erosion protection. Aerial seeding during reservoir drawdown would not result in any further disturbance of soil on the exposed reservoir terraces and the establishment of vegetation on the terraces would potentially reduce erosion of fine sediments. Recent laboratory tests of reservoir sediments showed vegetated sediments produced less erodible fine particles and aggregates during cycles of wetting and drying than unvegetated sediments (Appendix B: *Definite Plan – Appendix H*).

Although not currently anticipated by KRRC, the Proposed Project may also include hydroseeding from a barge on exposed reservoir terraces as the water recedes during reservoir drawdown. Hydroseeding from a barge would be accomplished by placing a ground rig on one barge with another boat used to ferry materials from shore. A moveable pier or other engineered method of accessing the supply boat as the water level recedes would also be needed. If it occurs, barge hydroseeding would occur in the higher elevation portion of the reservoir shoreline, until the reservoir levels become too low to operate (i.e., March of dam removal year 2).

The Proposed Project also includes barge-mounted pressure spraying during reservoir drawdown that would target six locations in Copco No. 1 Reservoir and three locations in Iron Gate Reservoir within which to maximize erosion of sediment deposits and subsequently excavate to the historical floodplain elevation to create wetlands, floodplain areas and off-channel habitat features (see Appendix B: *Definite Plan – Appendix H Figures 5-4 and 5-7*).

Tribal cultural resources are known to be present within Area of Analysis *Subarea 1* (Figure 3.12-2). Cultural resource sites identified at the edges of Copco No. 1 Reservoir include prehistoric archaeological sites with habitation debris and several contributing elements of the ethnographic landscape (Cardno Entrix 2012, Daniels 2006, Heizer and Hester 1970, PacifiCorp 2004). In addition, ethnographic village sites have been identified within Copco No. 1 Reservoir (Heizer and Hester 1970, Daniels 2006). Native American burials and traditional use areas (for ceremonies) within the Copco No. 1 Reservoir footprint have also been identified through ethnographic research and consultations with the Shasta Nation and Shasta Indian Nation. At least one ethnographic village site has been identified within Iron Gate Reservoir by PacifiCorp

(2004) and Daniels (2006). Specific TCR locations known to the Shasta people, which include TCRs as reflected in PacifiCorp (2004) and Daniels (2006), and as updated by Confidential Appendix Q, Attachment 4, are cataloged in Confidential Appendices P and Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis.

It is unknown whether adverse effects have already occurred to known or unknown, previously submerged TCR sites due to saturation within reservoir sediments and overlying water currents. However, impacts to these sites would likely result from shifting and exposure of reservoir sediment deposits during and after drawdown. Some TCR sites within the reservoir footprints may remain covered in sediment, or capped, resulting in some degree of preservation and protection.

Tribal cultural resource sites located in areas of steep or perched slopes, such as those along the steeper edges in the reservoir fluctuation zones[147], may experience shifting and slumping as a result of the underlying strata not being able to support the weight of overlying saturated soils. This is of particular concern for diatomaceous deposits located along the rim and below the Copco No. 1 Reservoir water level (see also Section 3.11.2.2 *Geomorphology* and Potential Impact 3.11-3). While the Proposed Project maximum drawdown rates (i.e., between 2 and 5 feet per day) are intended to minimize the potential for shifting and slumping of sediment deposits during reservoir drawdown, some sediment movement could still occur and could displace tribal cultural resources located in areas of steep or perched slopes that have relatively less thick sediment deposits. Note that some of the tribal cultural sites located within the reservoir fluctuation zones may be experiencing macro-scale wave-induced erosion impacts as part of existing conditions. Existing damage to exposed tribal cultural resources at some of these sites may be evident as wave cut terraces (beachlines) and other areas of accelerated erosion or scouring, as well as pedestaled and redeposited artifacts within the reservoir fluctuation zones. Given the proposed drawdown rates (2 to 5 feet per day), the reservoir shoreline would move below the normal fluctuation zone for each reservoir within 1 to 3 days of beginning drawdown. As this is a relatively short time frame compared to the continuous wave action that happens in this zone under existing conditions, reservoir drawdown alone is not expected to result in additional erosion-induced destruction or material alteration of the known tribal cultural resource sites in a way that would undermine their current or historical tribal significance relative to existing conditions. If it occurs, barge hydroseeding within the reservoir fluctuation zone would not result in additional wave-induced shoreline erosion outside of the range of existing conditions because barges tend to generate low wave heights due to their wide, flat bottoms and low operating speeds. Further, any concentrated additional wave-induced erosion from barge hydroseeding would be limited to a shorter duration (i.e., over several hours within a single day) than that of wind-action on the slowly downward-moving reservoir surface. Therefore, barge hydroseeding would be unlikely to exacerbate erosion impacts beyond that of reservoir drawdown itself, which would be within the range of existing conditions.

[147] For Copco No. 1 Reservoir, the normal maximum and minimum reservoir operating levels are between 2,607.5 and 2,601.0 feet mean sea level (MSL), respectively, or a range of 6.5 feet for the reservoir fluctuation zone (PacifiCorp 2004b). For Iron Gate Reservoir, levels are between 2,330.0 and 2,324.0 feet MSL, respectively, or a range of 4 feet for the fluctuation zone (PacifiCorp 2004b).

Additional potential impacts to TCR sites within the reservoir footprints, including short-term erosion, surface/shallow subsurface disturbance (i.e., sediment slumping), artifact displacement, and precipitation-induced runoff disturbance are discussed in Potential Impact 3.12-7. Increased potential for looting of exposed TCRs at Iron Gate, Copco No. 1, and Copco No. 2 reservoirs during and following reservoir drawdown activities is discussed in Potential Impact 3.12-6.

Overall, the increased likelihood of impacts to known or as-yet unknown previously submerged TCRs due to drawdown of Iron Gate, Copco No. 1, and Copco No. 2 reservoirs would be a significant impact in light of the following:

- Increased potential for shifting, erosion, and/or exposure of TCRs that results in destruction or material alteration of the resources in a way that would undermine current or historical significance, in light of an existing condition in which the TCRs are under water.
- The large number of known TCRs, and the high potential for the presence of as-yet unknown TCRs, that are currently submerged by Copco No.1, Copco No. 2, and/or Iron Gate reservoirs.

Implementation of Mitigation Measures TCR-1 (TCRMP), TCR-2 (LVPP), TCR-3 (IDP), and TCR-4 (Endowment)[148] would reduce these impacts considerably, and, for many resources is expected to avoid impacts completely or to reduce the impact to less than significant. The measures (listed fully, below) include, among other requirements, timely surveys of exposed land, on-side tribal monitors, limits to public access, and identification of protocols and best practices upon discovery or disturbance of TCRs in project implementation. With timely discovery and appropriate steps to address exposure, shifting or erosion impacts, many TCRs can maintain their current level of cultural significance. Additionally, providing a means for the long-term protection or enhancement of affected TCRs can mitigate for certain impacts.

However, the impact of exposing or disturbing tribal human remains, or associated funerary items, is itself profound. While the mitigation measures are expected to considerably reduce impacts, they cannot reasonably be expected to eliminate such exposure or disturbance, particularly in light of evidence that the number of submerged burial sites is high. Thus, while drawdown is not generally anticipated to have large effects on material below the earth's surface at the time of reservoir inundation, where slumping is a risk and where so many sites are involved (including some sites that have been subject to wave action with an erosive effect) material risk remains that some burials may be affected. While treating remains and associated funerary objects with the appropriate respect and procedures can reduce and avoid compounding the harm from the initial exposure or movement, it cannot do so fully. In light of the particular harm of exposing human remains even where they are treated appropriately after exposure, the impacts would remain significant and unavoidable.

Significance

Significant and unavoidable with mitigation

[148] Mitigation Measures TCR-6, TCR-7 and TCR-8 could also further reduce the potential impact. However, at this point it is not clear whether the measures are feasible (see Potential Impact 3.12-8). Therefore, this EIR does not rely on implementation of these measures in reaching its significance determinations.

Potential Impact 3.12-3 Reservoir drawdown could result in short-term erosion or flood disturbance to tribal cultural resources located along the Klamath River.

Hydroelectric Reach

The Hydroelectric Reach from the California-Oregon state line to Copco No. 1 Reservoir includes prehistoric archaeological riverside sites with habitation debris, house pits and rock features and cemeteries; as well as ethnographic places and other features of the cultural landscape (PacifiCorp 2004, Daniels 2006). Historic period refuse scatters, an historical hotel ruin sites, historical ranching sites, and historic roads are also present (Cardno Entrix 2012). There are known TCR sites located within the Area of Analysis *Subarea 3* (Figure 3.12-4) along the Klamath River between J.C. Boyle Dam and Copco No.1 Reservoir (Confidential Appendices P and Q). Certain of these sites may be impacted by increased flows during drawdown of J.C. Boyle Reservoir in Oregon because they are situated along the river's edge. It is a profound concern of the Shasta Nation that particular TCR sites along this reach would be flooded, and possibly destroyed, during drawdown (see also Confidential Appendix P as well as Shasta Nation consultation letter [2/1/2017] and public scoping letter [2/1/2017]).

As the Copco No. 1, Copco No. 2, and Iron Gate dams and associated facilities are located below this section of the Klamath River, the TCRs in this area would only be affected by the drawdown of J.C. Boyle. J.C. Boyle Reservoir has a relatively small storage capacity (3,495 acre-feet) and is not operated by PacifiCorp as a flood control reservoir. PacifiCorp operates J.C. Boyle Reservoir to produce hydroelectric power. Under current operations, when the inflow to J.C. Boyle Reservoir is below approximately 2,800 cfs, water is typically stored at night and released for power generation during the day which coincides with peak energy demand. When the inflow to the reservoir is greater than approximately 2,800 cfs, water does not need to be stored to generate power since the maximum capacity of the two turbine units in the J.C. Boyle Powerhouse is 2,850 cfs and any additional inflow to the reservoir spills over the dam. Spillage over the dam and flow through the J.C. Boyle Bypass reach in excess of the typical 100 cfs bypass flows generally occurs during the months of January through May when the Klamath River inflow to J.C. Boyle Reservoir tends to be greater than 2,800 cfs (Appendix B: *Definite Plan*). All flows diverted for power generation are returned to the Klamath River downstream stream of the J.C. Boyle Powerhouse in the J.C. Boyle Peaking Reach. Flows in the Klamath River between J.C. Boyle Reservoir and the upstream end of Copco No. 1 Reservoir vary by season and year, ranging from a daily mean value of less than 1,000 cfs during summer low flow periods to as high as 10,800 cfs in the spring of 1972 (Figure 3.12-7).

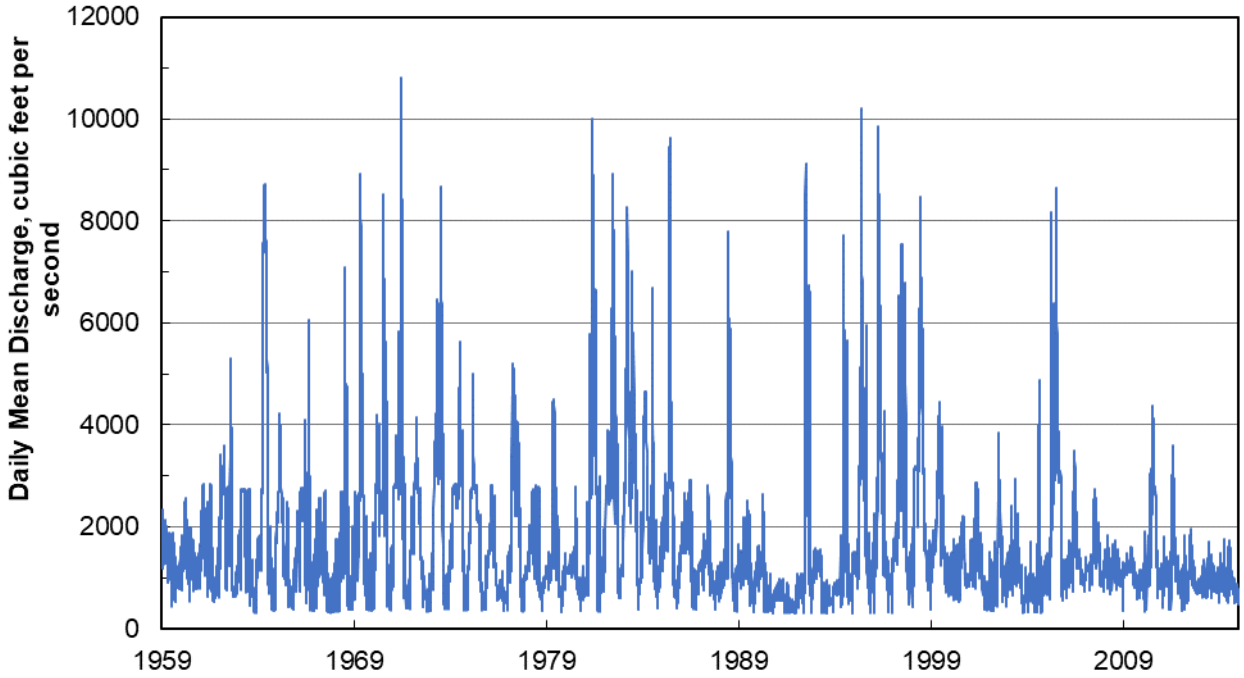

Figure 3.12-7. Discharge (flow) for Klamath River Downstream from J.C. Boyle Powerhouse, 1959–2015. Source: USGS 2016.

The proposed drawdown of the Lower Klamath Project reservoirs is designed to minimize potential flood risks, including carefully drawing down the reservoirs using controlled flow releases and the increased storage availability in J.C. Boyle, Copco No. 1, and Iron Gate reservoirs once drawdown has begun to accommodate for potential winter flow events. Drawdown of J.C. Boyle Reservoir would occur from January 1 to March 15 of dam removal year 2. During drawdown, release flows at J.C. Boyle Dam would range from 1,000 to 3,000 cfs for short durations (1−2 days) (Appendix B: *Definite Plan*). As shown in Figure 3.12-7, flows of this magnitude are typical for the Klamath River upstream of Copco No. 1 Reservoir and downstream from J.C. Boyle Powerhouse and are well below maximum flows (close to 11,000 cfs). Accordingly, the average increase in Klamath River flow due to drawdown of J.C. Boyle Reservoir is expected to be small, from less than 1 percent up to 8 percent during the months of January and February of dam removal year 2 (Appendix B: *Definite Plan*). Thus, the Proposed Project would not result in drawdown flows that are out of the normal range of flows experienced under existing conditions. Since drawdown releases from J.C. Boyle Dam would not cause flooding of the river between the dam and Copco No. 1 Reservoir, the Shasta TCR sites located along this reach of the Klamath River would not be subject to short-term erosion and/or flood disturbance related to the removal of J.C. Boyle Dam.

Many of the Shasta TCR sites located along the river in this reach are located within the current FEMA 100-year floodplain. Because J.C. Boyle Reservoir is not a flood control reservoir, the FEMA 100-year floodplain extent in the Klamath River between J.C. Boyle Dam and Copco No. 1 Reservoir would not change with dam removal (see Appendix K). Thus, there would be no long-term change in the flooding potential for Shasta TCR sites due to removal of J.C. Boyle Dam. Overall, there would be no significant impact of the

Proposed Project on Shasta TCR sites located between J.C. Boyle Dam and Copco No. 1 Reservoir.

Middle Klamath River
Known TCRs within the Area of Analysis *Subarea 2* (Figure 3.12-3) include resources identified in PacifiCorp (2004) and Daniels (2006), as updated by Confidential Appendix Q, Attachment 4, and are cataloged in Confidential Appendices P and Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis.

Under the Proposed Project, drawdown of the four reservoirs would occur simultaneously beginning in January of dam removal year 2 (Copco No. 1 Reservoir would also experience early drawdown starting November of dam removal year 1 at a lower rate) (see also Section 2.7.2 *Reservoir Drawdown*). Drawdown of Copco No. 2 may occur later, at the start of May of dam removal year 2. The reservoir releases would be controlled and would vary by reservoir depending on the type of dam, discharge capacity, water year type, and the volume of water and sediment within the reservoir (Appendix B: *Definite Plan*). The proposed drawdown of the Lower Klamath Project reservoirs is designed to minimize potential flood risks, including drawing down the reservoirs using controlled flow releases and the increased storage availability in J.C. Boyle, Copco No. 1, and Iron Gate reservoirs once drawdown has begun to accommodate for winter flow events. If a flood event occurred during drawdown, the flood flows would be retained using the newly available storage capacity in each reservoir and drawdown would continue after flood risks have ended. Current conditions do not allow the Lower Klamath Project reservoirs to assist in flood prevention in this manner as the reservoirs' current operations occur within a narrow reservoir storage rage and do not provide adequate space for storage of winter flows. The Proposed Project drawdown rates are consistent with the historical discharge rates from the reservoirs, where flow rates downstream of the dams would not increase substantially above median historical rates, if at all. Discharges from Copco No. 1 and Iron Gate reservoirs would be similar to, or less than, seasonal 10-year flood flows from the reservoirs (see also Potential Impact 3.6-1).

Thus, drawdown releases from the Lower Klamath Project dams would not cause flooding of the Middle and Lower Klamath River, riverside TCR sites located in Area of Analysis *Subarea 2* (Figure 3.12-3), downstream of Iron Gate Dam either along the reach from Iron Gate Dam (RM 193) to Humbug Creek (RM 174) or further downstream. Therefore, these resources would not be subject to increased short-term erosion or flood disturbance as a result of reservoir drawdown that could destroy or materially alter TCRs in a way that would undermine current or historical cultural significance.

However, hydrologic and hydraulic modeling of floodplain inundation shows that removal of the Lower Klamath Project dams could result in minor alterations to the FEMA 100-year floodplain inundation area downstream of Iron Gate Dam, along the 18-river mile stretch of the Middle Klamath River between RM 193 and 174 (i.e., from Iron Gate Dam to Humbug Creek) (USBR 2012c). Changes in the extent of the floodplain inundation area could increase the risk of flood damage to TCRs that are not currently located within the FEMA 100-year floodplain but would be following dam removal, where flood damage could involve physical destruction or relocation of TCRs such that the significance of the TCR would be materially impaired. This would be a significant impact

in the short term and long term. Implementation of TCR-1, TCR-2, and TCR-3 would reduce impacts, although for the reasons described in Potential Impact 3.12-1, the impacts would remain significant and unavoidable.

Lower Klamath River and Klamath River Estuary
Because drawdown is not expected to increase flood risk and because dam removal is not expected to alter the floodplain downstream of Humbug Creek, no increased erosion or flooding-related risk of damage to cultural resources is expected over the current conditions in these areas in either the short term or the long term.

There is the potential for the morphology of the Klamath River Estuary to change in light of sediment releases from the drawdown of the reservoirs (see Potential Impact 3.2-3). These changes to the estuary have a low-risk potential to affect estuary-based Yurok Tribe TCRs; however, there is some risk of potential impacts that would not occur absent implementation of the Proposed Project. The Yurok Tribe has adopted ordinances and policies to address impacts to cultural resources on the Yurok Reservation, which includes the Klamath River Estuary. In the unlikely event that such Proposed Project-related impacts would occur to resources in the area of the Klamath River Estuary, implementation of Mitigation Measure TCR-5 would reduce the potential impacts to less than significant.

Mitigation Measure TCR-5 – Implementation on Yurok Reservation.
Mitigation Measures TCR-1, TCR-2, and TCR-3 do not apply on the Yurok Reservation. The Yurok Tribe's Cultural Resource Ordinance and Inadvertent Discovery Policy shall apply to such TCRs on the Yurok Reservation.

Significance
No significant impact in the short term or long term for the Hydroelectric Reach between J.C. Boyle Dam and Copco No. 1 Reservoir

Significant and unavoidable with mitigation in the short term and long term for the Middle Klamath River from Iron Gate Dam to Humbug Creek

No significant impact in the short term or long term for Middle Klamath River downstream of Humbug Creek and Lower Klamath River excluding the Yurok Reservation (approximately RM 0 to RM 45)

No significant impact with mitigation on the Yurok Reservation (approximately RM 0 to RM 45) along Lower Klamath River and Klamath River Estuary

Potential Impact 3.12-4 Project activities associated with removal of Iron Gate, Copco No. 1, and Copco No. 2 dams could result in physical disturbance to known or unknown tribal cultural resources from blasting or other removal techniques.
Blasting and other dam removal techniques could cause significant adverse impacts to known or unknown TCRs located in the immediate vicinity[149] of Iron Gate, Copco No.1 and Copco No. 2 dams. While minor ground vibration and sounds from blasting and other dam removal techniques may extend throughout the 0.25-mile distance from each

[149] For the purposes of this analysis, "immediate vicinity" is defined as within 0.25 miles of Copco No. 1, Copco No. 2, and Iron Gate dams.

of the dams, the vibration and sounds would not result in significant impacts to TCRs because they would not result in physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the TCR would be materially impaired.

However, direct physical disturbance associated with blasting and other removal techniques could significantly impact those TCR sites that directly overlap with the blasting locations. The KRRC proposes complete removal of dam facilities, including, in some instances, excavation of concrete below the existing streambed level, in order to prevent future development of fish barriers as the river morphology changes. Removal of the concrete dam structures would require blasting and drilling which could destroy, relocate, or alter those TCRs sites that directly overlap with the blasting locations or their immediate surroundings such that the significance of these TCRs would be materially impaired.

There is at least one TCR that was present before dam construction that would be potentially impacted. It is unknown the extent to which the resource survives currently as it is no longer accessible. To the extent the site still exists, removal of the dam has a high likelihood of significantly degrading the site. There is also the potential for as-yet unknown sites to be impacted within the blasting zone, or by other techniques associated with the removal of these features, in light of the density of sites in the Hydroelectric Reach.

Implementation of mitigation measures TCR-1 (TCRMP), TCR-2 (LVPP), TCR-3 (IDP), and TCR-4 (Endowment)[150] would reduce impacts to TCRs associated with dam removal activities, but impacts would remain significant and unavoidable.

Significance
Significant and unavoidable with mitigation

Potential Impact 3.12-5 Ground disturbance associated with reservoir restoration, recreation site removal and/or development, and disposal site restoration could physically disturb known Tribal Cultural Resources. Additionally, ongoing road and recreation site maintenance has the potential to disturb known Tribal Cultural Resources.
The proposed Reservoir Area Management Plan includes restoration activities that would occur both within the reservoir footprint and in upland areas (i.e., disposal, staging, and hydropower infrastructure demolition areas, access roads, former recreational areas) within the Area of Analysis *Subarea 1* (Figure 3.12-2). Known TCR locations include those reflected in PacifiCorp (2004) and Daniels (2006), and as updated by Confidential Appendix Q, Attachment 4, which are cataloged in Confidential Appendices P and Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis.

[150] Mitigation Measures TCR-6, TCR-7 and TCR-8 could also further reduce the potential impact. However, at this point it is not clear whether the measures are feasible (see Potential Impact 3.12-9). Therefore, this EIR does not rely on implementation of these measures, in reaching its significance determinations.

After reservoir drawdown, the following ground-disturbing activities would be implemented in the former reservoir areas to stabilize remaining sediments over time and to restore riparian, floodplain, and wetland habitats:

- Active seeding[151] via ground equipment to revegetate reservoir areas with native grasses, sedges, rushes and forbes immediately after reservoir drawdown and planting of acorns, shrub seedlings, and pole cuttings as early as feasible;
- Manual removal/treatment of invasive exotic vegetation, which may include manual weed extraction, solarization (covering round areas with black visqueen), tilling, and use of herbicides;
- Planting of woody riparian trees and shrubs along the river banks in the former reservoir areas; and
- Installation of floodplain and off-channel habitat features such as large wood, roughening of the floodplain to enhance establishment of vegetation, and rectifying any non-natural fish passage barriers in mainstems and tributaries.

Within the reservoir footprint portions of the Area of Analysis *Subarea 1*, numerous TCR sites have been identified, including prehistoric archaeological sites with habitation debris, village sites, house pits and rock features and burial sites; as well as ethnographic places and other features of the cultural landscape (Confidential Appendices P and Q). Additionally, there may be many as-yet unknown TCRs located within the footprints of Copco No. 1, Copco No. 2, and Iron Gate reservoirs. Artifacts within the reservoir footprint may be materially impaired through physical demolition, destruction, relocation, or alteration by construction equipment (e.g., tilling) or hand tools (e.g., shovels for planting trees) during the aforementioned reservoir restoration activities. The proposed Reservoir Area Management Plan also includes long-term monitoring of vegetation growth, invasive exotic vegetation, and fish passage to ensure objectives are accomplished; however, these activities are not expected to be ground-disturbing.

Within the upland portions of the Area of Analysis *Subarea 1* (i.e., outside of the Copco No. 1 and Iron Gate reservoir footprints, including the fluctuation zone), known TCRs include those reflected in PacifiCorp (2004) and Daniels (2006), and as updated by Confidential Appendix Q, Attachment 4, and are cataloged in Confidential Appendices P and Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis. Proposed upland restoration activities include active management of invasive exotic vegetation species, which may include ground-disturbing activities such as manual weed extraction, solarization (covering of ground areas with black visqueen), tilling, and planting (Appendix B: *Definite Plan − Appendix H*) (see also Section 2.7.5 *Restoration of Upland Areas Outside of the Reservoir Footprint*). These activities may result in material impairment of TCRs located

[151] The Reservoir Area Management Plan includes aerial pioneer seeding using helicopters during the winter/early spring during and following reservoir drawdown (Appendix B: *Definite Plan – Appendix H*). Aerial seeding is not a ground-disturbing activity. Fall overseeding, which is potentially ground-disturbing, would be completed with a ground-based broadcast seeder over the mowed or rolled vegetation remaining from the pioneer seeding (Appendix B: *Definite Plan – Appendix H*). Hydroseeding via barge during reservoir drawdown is potentially a ground-disturbing activity, although this activity is not currently anticipated by KRRC. Potential impacts due to barge hydroseeding are discussed in Impact 2.

within upland portions of the Area of Analysis *Subarea 1* from physical demolition, destruction, relocation, or alteration by construction equipment (e.g., tilling) or hand tools (e.g., shovels for planting trees). Non-ground-disturbing, proposed upland restoration activities include the possible use of herbicides for controlling invasive exotic vegetation; collecting seeds for local nurseries to grow trees and shrubs; and implementing a short-term Storm Water Pollution Prevention Plan (SWPPP)/Erosion Control Plan.

Ground-disturbing activities associated with ongoing road and recreation site maintenance within the Area of Analysis *Subarea 1* (Figure 3.12-2) include grading and excavating, which may also result in material impairment due to physical demolition, destruction, relocation, or alteration of TCRs located in both upland and reservoir footprint locations.

In summary, several known and potentially many as-yet unknown TCRs could be significantly adversely impacted due to the aforementioned ground-disturbing activities associated with revegetation and restoration of riparian, floodplain, and wetland habitat within former reservoir areas and upland areas, as well as ongoing road maintenance and potential recreation site construction and maintenance, if any.

Implementation of Mitigation Measures TCR-1 (TCRMP), TCR-2 (LVPP), TCR-3 (IDP), and TCR-4 (Endowment)[152] would reduce these impacts considerably, and, for most resources is expected to avoid impacts completely, through designing restoration plans to completely avoid impacts, or by on-the-ground changes to implementation to avoid impacts. Using hand tools to restores sensitive areas will reduce the risk and severity of potential damage as compared to use of heavy equipment. For impacts that it is not feasible to completely avoid, the impacts may be reduced to a less than significant level. The measures include, among other requirements, field worker training, limits to worker and public access, tribal monitors, surveys, and identification of protocols and best practices upon discovery or disturbance of TCRs in project implementation. With timely discovery and appropriate steps to address exposure or damage, many TCRs can maintain their current level of cultural significance. Additionally, providing a means for the long-term protection or enhancement of affected TCRs can mitigate for some impacts.

However, the impact of exposing or disturbing tribal human remains, or associated funerary items, is itself profound. The mitigation measures are expected to considerably reduce - but cannot be reasonably be expected to completely avoid - such exposure or disturbance, particularly in light of the density of villages in the reservoir bed areas. While treating remains and associated funerary objects with the appropriate respect and procedures can reduce and avoid compounding the harm from the initial damage, it cannot do so fully.

Additionally, in light of the high density of TCRs in the restoration areas, and because some of the contemplated restoration involves significant earth-moving with heavy equipment, such as potentially regrading areas and enhancing wetlands, significant risk remains that other TCRs may sustain damage that results in a martial impairment of the

[152] Mitigation Measures TCR-6, TCR-7 and TCR-8 could also further reduce the potential impact. However, at this point it is not clear whether the measures are feasible (see Potential Impact 3.12-9). Therefore, this EIR does not rely on implementation of these measures, in reaching its significance determinations.

resource's significance. In light of the particular harm of exposing human remains even where they are treated appropriately after exposure, and the likelihood of significantly impairing other resources in light of the type of construction actions and the density of resources, the impact would remain significant and unavoidable.

Significance
Significant and unavoidable with mitigation

Potential Impact 3.12-6 During and following reservoir drawdown activities at Iron Gate, Copco No. 1, and Copco No. 2 reservoirs there is an increased potential for looting of Tribal Cultural Resources (short-term and long-term).
During and immediately following reservoir drawdown[153], TCRs located within the footprints of Copco No. 1, Copco No. 2, and Iron Gate reservoirs would no longer be partially or completely covered by reservoir waters and thus would be more accessible and at greater risk for looting. For these known TCR sites, plus as-yet unknown sites, some tribal representatives assert that the reservoirs offer the best protection against looting because the reservoir waters currently prevent looter access.

Known TCRs within the Area of Analysis *Subarea 1* (Figure 3.12.2) include resources identified in PacifiCorp (2004a) and Daniels (2006), as updated by Confidential Appendix Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis. Within the footprints of Copco No. 1, Copco No. 2, and Iron Gate reservoirs, which is the focus of this Potential Impact 3.12-5 analysis, numerous TCR sites have been identified. Additionally, there may be many as-yet unknown TCRs located within the footprints of the California reservoirs. Note that many of the known TCR sites are located within the reservoir fluctuation zones and several of these are associated with relatively shallow sediment deposits (approximately 0.2 to 2 feet deep). Tribal cultural resource sites located within the reservoir fluctuation zones may be periodically at risk of looting during low water periods under existing conditions.

Within the reservoir footprints, Proposed Project restoration activities would occur during and immediately following reservoir drawdown (i.e., dam removal years 1 and 2) as well as post-dam removal year 1, including active seeding to revegetate reservoir areas with native grasses, sedges, rushes and forbes, and planting of acorns, shrub seedlings, and pole cuttings, all of which would stabilize sediments remaining in the reservoir footprints (see also Potential Impact 3.12-4). Revegetation activities would reduce erosion of fine sediments (Appendix B: *Definite Plan – Appendix H*) and would physically cover the remaining sediment deposits with a variety of vegetation, thus decreasing the potential for exposure and looting of TCRs located within the reservoir footprints. However, in general, sensitive areas located within the reservoir footprints would be subject to exposure and increased access since they would no longer be partially or completely covered by reservoir waters. This could increase the potential for looting of TCRs above levels occurring under existing conditions. The potential severity of this impact is underscored by significant anecdotal evidence of an extensive looting problem in the

[153] Consideration of exposure or substantial movement of tribal cultural resources during pre-dam removal ground-disturbing activities that could lead to increased access and looting above levels occurring under existing conditions is discussed in Potential Impact P-1.

area, and by statements made by tribal members regarding the deep impact of past and ongoing looting, particularly in light of a history of repeated dispossession in the area.

Implementation of Mitigation Measure TCR-2 (LVPP) and TCR-4 would significantly reduce the impacts of looting in the short term and long term. However, illegal looting remains a pervasive problem in the vicinity, as related through extensive anecdotal evidence by tribal members and archaeologists with experience in the area. Therefore, although it is likely that the LVPP would be effective in protecting most resources through the intensive monitoring and broad range of tools to address the concern, it would be unlikely to be completely effective. The impact of looting of certain resources is profound, and could result in material impairment of a resources' significant or result in the exposure or disturbance of human remains. Therefore, the increased risk of looting remains significant and unavoidable.

Significance
Significant and unavoidable with mitigation in the short term and long term

Potential Impact 3.12-7 Short-term erosion caused by high-intensity and/or duration precipitation events could cause exposure of or disturbance to known or unknown tribal cultural resources within the reservoir footprints immediately following reservoir drawdown and prior to vegetation establishment/full stabilization of sediment deposits.
Immediately following reservoir drawdown[154], high-intensity and/or long-duration precipitation events could occur that would result in surface erosion of remaining reservoir sediment deposits and cause exposure of or disturbance to TCRs located within the reservoir footprints. Known TCRs to be within the Area of Analysis *Subarea 1* include resources identified in PacifiCorp (2004a) and Daniels (2006), as updated by Confidential Appendix Q. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis. Within the footprints of Copco No. 1, Copco No. 2, and Iron Gate reservoirs, which is the focus of this analysis for Potential Impact 3.12-7, numerous TCR sites have been identified (Confidential Appendices P and Q). Additionally, there may be many as-yet unknown TCRs located within the footprints of Copco No. 1, Copco No. 2, and Iron Gate reservoirs.

Since the Lower Klamath Project reservoirs were constructed, fine sediments composed primarily of organic material (including dead algae), but also including some silts and clays, have accumulated along the reservoir bottoms (see Section 2.7.3 *Reservoir Sediment Deposits and Erosion During Drawdown*). The distribution of sediment deposits varies within each reservoir (Figure 2.7-8 and 2.7-9). Because the accumulated sediments are primarily fine material, a percentage of them would be easily eroded and flushed out of the reservoirs into the downstream Klamath River during reservoir drawdown, with the majority of the erosion focused in the original river channel (Figures 2.7-5 and 2.7-6). However, following drawdown, 40−60 percent of the sediment deposits accumulated behind the dams would remain in place in each of the former reservoir beds, primarily on terraces located above the original river channel. The sediments that remain in the reservoir footprints would consolidate (dry out and

[154] Consideration of potential shifting-, erosion-, and exposure-related impacts to tribal cultural resources during reservoir drawdown is discussed in Potential Impact 3.12-2.

decrease in thickness) (USBR 2012a), making them less subject to erosion. Further, during the drawdown period, seeding (by helicopter and potentially barge) of pioneer mixes would occur as the reservoir water level drops and before the exposed reservoir sediments dry and form a surface crust. The seeded native grasses are expected to become well established within weeks after application (January to March of dam removal year 2), which would reduce erosion of the remaining reservoir sediment deposits during cycles of wetting (i.e., from precipitation events) and drying (Appendix B: *Definite Plan – Appendix H*). During the first summer and fall following reservoir drawdown (dam removal year 2), additional seeding application would occur including grasses and ground cover, with monitoring and targeted revegetation for areas that do not meet vegetation cover goals (Appendix B: *Definite Plan – Appendix H*).

During the period of weeks when seeded native grasses have not yet become well established within the reservoir footprints, high intensity and/or long-duration precipitation events could increase erosion of remaining reservoir deposits through sediment cracking and gully erosion, and destroy or materially impair TCRs in a way that would undermine current or historical cultural significance, including through substantial movement of human remains. This could increase disturbance impacts to TCRs that were already affected during drawdown (see Potential Impact 3.12-4), or impact additional TCRs that were not affected by erosion during drawdown. The risk of this occurring would be higher for TCRs located in areas where post-reservoir sediment deposition was relatively thin (i.e., areas where sediment deposits are less than 2 feet deep) and would be limited to TCRs that were located above ground prior to reservoir inundation[155].

However, since 40−60 percent of the reservoir sediment deposits are predicted to remain in place following drawdown, many TCRs that were located above ground at the time of reservoir inundation are expected to remain substantially covered, even those located within reservoir sediment deposits that are less than 2 feet deep (see Confidential Appendices P and Q). For those sites located within deeper reservoir sediment deposits, the overlying sediment layer would offer protection from surface cracking and gully erosion that may result from high intensity and/or duration precipitation events and these deeper sites would not be likely to be destroyed or materially impaired in a way that would undermine current or historical cultural significance.

The risk of continued erosion and subsequent exposure of or disturbance to TCRs located in the reservoir footprints, particularly for those associated with relatively shallow (e.g., less than 2 feet deep) sediment deposits (see Confidential Appendices P and Q), would decrease within weeks to months following reservoir drawdown as revegetation stabilizes the remaining sediments. Monitoring and targeted revegetation activities included in the proposed Reservoir Area Management Plan (Appendix B: *Definite Plan – Appendix H*) would reduce the risk of impacts to TCRs located in areas of large crack or gully formation. As the system returns to riverine conditions within the reservoir

[155] For tribal cultural resources that were located below ground prior to inundation, the Proposed Project is not expected to result in exposure or disturbance impacts because sediment erosion would be limited to the fine materials accumulated since the reservoirs were constructed (see Potential Impact 3.12-2). These tribal cultural resources would remain buried, their significance to the Shasta Nation would not be materially impaired, and there is no anticipated impact.

footprints, with revegetated terraces along the river and sides of the former reservoirs, long-term erosion and sediment transport rates would return to natural rates for this portion of the watershed (USBR 2012c).

Implementation of Mitigation Measures TCR-1 (TCRMP), TCR-2 (LVPP), and TCR-3 (IDP)[156] would reduce these impacts, overall they would remain significant and unavoidable for the reasons described for the erosion related to reservoir drawdown (Potential Impact 3.12-2).

Significance
Significant and unavoidable with mitigation in the short term

Potential Impact 3.12-8 Long-term (post-removal) impacts to Tribal Cultural Resources as a result of dam removal from increased looting opportunities and from surface and subsurface erosion of Tribal Cultural Resources.
Following drawdown of Iron Gate, Copco No.1, and Copco No. 2 reservoirs, 40−60 percent of the reservoir sediment deposits would remain in place, primarily on areas at higher elevation than the active river channel within the reservoir footprints (see also Potential Impacts 3.12-4 and 3.12-8). During tribal consultations, some tribal representatives expressed strong concerns that long-term erosion of remaining sediment deposits within the Lower Klamath Project reservoirs would disturb or destroy TCRs that are located there (see also Confidential Appendix P). In addition, the Proposed Project includes transfer of PacifiCorp lands immediately surrounding the Lower Klamath Project ("Parcel B lands") from PacifiCorp to the KRRC prior to dam removal, where Parcel B lands contain all of the Copco No. 1 Reservoir footprint and the majority of the Iron Gate Reservoir footprint (Figure 3.12-5). The Proposed Project then provides that the KRRC would transfer Parcel B lands to the respective states (i.e., California, Oregon), as applicable, or to a designated third-party transferee, following dam removal. The lands would thereafter be managed for public interest purposes (KHSA Section 7.6.4.A).

The potential for increased looting opportunities and surface erosion to result in long-term impacts to known or unknown TCRs due to the Proposed Project is discussed below for resources located within the reservoir footprints and within Parcel B lands.

Tribal Cultural Resource Sites Within the Reservoir Footprints Prior to Land Transfer
Tribal cultural resources known to the Shasta Nation to be within the Area of Analysis *Subarea 1* include resources identified in PacifiCorp (2004a) and Daniels (2006), as updated by Confidential Appendix Q, Attachment 4. Resources identified as villages, cairns or burial sites, or sites eligible for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis. Within the footprints of Copco No. 1, Copco No. 2, and Iron Gate reservoirs, numerous TCR sites have been identified including village and cairn sites (Confidential Appendices P and Q). Additionally, there may be many as-yet unknown TCRs located within the footprints of Copco No. 1, Copco No. 2 and Iron Gate reservoirs.

[156] Mitigation Measures TCR-6, TCR-7 and TCR-8 could also further reduce the potential impact. However, at this point it is not clear whether the measures are feasible (see Potential Impact 3.12-8). Therefore, this EIR does not rely on implementation of these measures, in reaching its significance determinations.

As described in Potential Impacts 3.12-2 and 3.12-6, following reservoir drawdown, the remaining sediment deposits would consolidate through air drying and would decrease in thickness (USBR 2012a). Revegetation efforts under the Proposed Project would support re-establishment of native species on newly exposed reservoir sediments, including grasses and woody riparian species, where the latter would be planted at densities of several hundred plants per acre. It is expected that former wetland areas within the reservoir footprints would revert to wetland vegetation without long-term active revegetation inputs (Appendix B: *Definite Plan – Appendix H*).

While a portion of the fine sediments that have deposited since the dams were constructed would erode rapidly during reservoir drawdown (see Potential Impacts 3.12-4 and 3.12-8), erosion rates would decrease over weeks to months, as the remaining sediment deposits are stabilized by drying and by active and passive revegetation. As the system returns to riverine conditions within the reservoir footprints, long-term erosion and sediment transport rates would also return to natural rates for this portion of the watershed (USBR 2012c). Previous wave action within the reservoir fluctuation zone would cease as the reservoir shoreline would no longer exist, with a long-term benefit over current conditions to the known and as-yet unknown TCR sites located within the reservoir fluctuation zone (Confidential Appendices P and Q).

Thus, in the long term, drying, consolidation, and stabilization (due to re-vegetation) of the remaining sediment deposits would substantially limit the potential for erosion to result in exposure or substantial movement of TCRs buried within the deposits, or those that were located below the ground surface prior to construction and inundation of Copco No.1, Copco No. 2, and/or Iron Gate dams, such that increased access and looting above levels occurring under existing conditions would be unlikely. Instead, long-term drying, consolidation, and stabilization of the sediment deposits remaining in the reservoir footprints have the potential to preserve and protect known or as-yet unknown TCRs within or beneath the deposits. The potential for long-term erosion-related impacts on TCRs within the reservoir footprints is therefore different from and significantly less than the potential for erosion-related impacts to these resources in the periods during and immediately following reservoir drawdown (Potential Impact 3.12-4). However, despite the protection offered from the remaining sediment deposits, the vulnerability of existing TCRs to long-term exposure due to natural rates of erosion and sediment transport for the watershed would still increase as compared to existing conditions where the reservoir waters offer almost complete protection from access and looting (with the exception of resources located within the reservoir fluctuation zone). The potential impact of this increased potential is underscored by significant anecdotal evidence of an extensive looting problem in the area, and by tribal members' testimony regarding the deep impact of past and ongoing looting, particularly in light of a history of repeated dispossession in the area.

Implementation of Mitigation Measure TCR-1 (TRMP), TCR-2 (LVPP), and TCR-3 (IDP), would reduce long-term impacts to TCRs from increased looting opportunities and surface and subsurface erosion, however, these impacts would remain significant.

Tribal Cultural Resource Sites Within Parcel B Lands After Transfer

Known TCRs within the Area of Analysis *Subarea 4* (Figure 3.12-5) include resources identified in PacifiCorp (2004a) and Daniels (2006), as updated by Confidential Appendix Q, Attachment 4. Resources identified as villages, cairns or burial sites, or sites eligible

for the National Register of Historic Places in a subsequent compilation by Cardno ENTRIX (2012) were also considered as part of this analysis. Numerous TCR sites have been identified completely inside or partially inside Parcel B lands (Confidential Appendices P and Q).

It is unknown what public use the lands in Parcel B would ultimately serve. The California Natural Resources Agency (CNRA) and California Department of Fish and Wildlife (CDFW) have begun speaking with interested stakeholders on various recreation, water quality, tribal, resource protection, conservation, and economic uses of the land, including with tribal governments and Siskiyou County representatives. While the lands would be managed for public interest, this could include a range of uses, including open space, active wetland and riverine restoration, river-based recreation, grazing, and potentially other uses. Certain future land uses (e.g., open space) would presumably result in less potential for impacts to TCRs.

However, certain land uses, if undertaken in areas with TCRs, would have the potential to increase public access to TCRs beyond the level of simply removing the reservoirs, and it could therefore result in additional impacts due to construction, looting, illegal excavation, vandalism, and other destruction or damage within the Area of *Subarea 4* (Figure 3.12-5). Existing and potentially new recreation facilities along the river corridor may also direct the public to favorable landforms (e.g., flat topography, close to tributary confluences and other water sources) that coincide with locations chosen by tribal ancestors for habitation and other cultural uses. Increased access to TCRs due to land transfer has the potential to lead to looting above levels occurring under existing conditions or to land uses that result in material alteration of TCRs in a way that would undermine their current or historical tribal significance.

Further, future Parcel B land transfer could result in uses of lands currently not submerged that eliminate or substantially restrict access of tribal members to TCRs during ceremonial windows or periods of hunting and gathering or other traditional activities associated with a TCR. It is unclear what public use of Parcel B lands could result in such an increased barrier over the existing private ownership by PacifiCorp. For currently submerged lands, there is currently no access such that future land use decisions for the reservoir footprint portions of Parcel B would likely result in access-related benefits as compared with existing conditions.

In 2017, the Kikaceki Land Conservancy was formed, which includes representation of Shasta people with ancestry in the area affected by the Proposed Project. In the ongoing consultation process under NHPA section 106, KRRC will address whether this existing land conservancy, or other entities which represent Affected Tribes, could continue to implement measures for TCR protection and enhancement after the KRRC has completed Project implementation. The express mention of the Kikaceki Land Conservancy in this EIR in no way excludes the claims of any other traditionally and culturally affiliated tribes, or harms any other tribes' rights.

The process for determining future land use under the KHSA Section 7.6.4 has the potential to offer TCRs appropriate protection through a variety of land use strategies: that process remains unaltered by this EIR. Implementation of TCR-6 (Land Transfer), TCR-7 (Land Easement and Transfer Stipulations), and TCR-8 (Off-site Land Transfer) have the potential to reduce the impact of future land use decisions to less than significant. These measures are in alignment with the general proposed measures for

consideration to mitigate impacts to TCRs described in Public Resources Code section 21084.3, subdivision (b)(3).

However, the ultimate feasibility of these measures is uncertain. The process for determining future land uses under KHSA Section 7.6.4 has not advanced to the point at which competing uses, financial limitations, parcel access requirements, or other constraints have become clear. Additionally, because the KRRC has a set amount of funding with which to implement the Proposed Project, its ability to undertake purchase of lands outside Parcel B as a mitigation measure is also uncertain, and thus the feasibility of Mitigation Measure TCR-8 (Off-site Land Transfer) is also uncertain. Because the ultimate feasibility of these measures is uncertain, and the State Water Board lacks the authority to impose them through its Clean Water Act section 401 certification, this EIR does not rely on implementation of these measures, although it is disclosing them because it is likely that the protections would be viable for at least some portion of the identified lands, and because they represent a potentially feasible path to protect TCRs.

Mitigation Measure TCR-6 – Land Transfer.
The State Water Board has determined, and KRRC has acknowledged, that transfer of some Parcel B lands to an entity representative of Affected Tribes which are traditionally and culturally affiliated with TCRs on such lands, could foster tribal cultural and conservation practices and promote tribal identity; and further, that such transfer could be an appropriate measure to address past disturbance of TCRs caused during construction of Iron Gate Dam, Copco No. 1 Dam, and Copco No. 2 Dam, and to mitigate the impacts to TCRs caused by Project implementation.

Pursuant to KHSA Section 7.6.4, the California Natural Resources Agency (CNRA) and CDFW have begun the process to determine the disposition of Project-related (or "Parcel B") lands, totaling approximately 8,000 acres, for public interest purposes. In California, that process is anticipated to involve the following steps: (1) inspections and preliminary due diligence regarding the condition of the Parcel B lands; (2) consultation with KHSA parties and other stakeholders regarding disposition; (3) for each parcel, a proposal by CNRA and CDFW regarding proposed transferee and other terms; (4) actual transfer of Parcel B lands from PacifiCorp to KRRC, upon KRRC's notice that it has secured all necessary permits for dam removal; and (5) subsequent transfer from KRRC to California or the third-party transferee, by parcel.

Based on AB 52 consultation, the State Water Board has identified the following potential mitigation measure, which is dependent on the outcome of the process required by KHSA Section 7.6.4. The Shasta Indian Nation has proposed the transfer of selected Parcel B lands (as identified in Confidential Appendix Q they have identified as possessing the most significant tribal cultural value to the Shasta Indian Nation and also having central importance to other Shasta peoples. The Shasta Indian Nation has proposed transfer to an entity, such as the Kikaceki Land Conservancy, that includes representation of the several bands of Shasta peoples. While it is too early in the process to determine the feasibility of such transfer, this measure is included for analysis in the Environmental Impact Report. In the process required by KHSA Section 7.6.4, the KRRC shall support consideration of transfers of selected lands to an entity representative of Affected Tribes that are traditionally and culturally affiliated with the TCRs on such lands, in circumstances where the lands have resources of critical tribal

importance and such transfer would be a cost-effective approach to protect such resources.

Mitigation Measure TCR-7 – Proposal for Land Easement and Transfer Stipulations.
The CNRA and CDFW have begun initial discussions in a stakeholder process for determining land disposition as described in KHSA Section 7.6.4, including discussions with Shasta people.

1. For TCRs and such sites that are protected under Public Resources Code 5097.993, land easement and transfer stipulations could ensure that protection measures described in the TCRMP encumber the title for all subsequent owners for other lands not returned to the Shasta people. Any such land easement or transfer stipulations shall be consistent with KHSA Section 7.6.4 and other applicable terms.
2. There is also the potential to coincide public wildlife conservation management areas with lands that contain tribal cultural values to restrict public access where feasible and promote protection of cultural sites.
3. These mechanisms can also provide the opportunity for Shasta people to access TCRs through creation of tribal conservation easements.

Mitigation Measure TCR-8 – Off-site Land Transfer.
At any time prior to completing the TCRMP, the KRRC may identify parcels of land not subject to the process under KHSA Section 7.6.4, that may be appropriate for transfer to an entity representative of Affected Tribes (such as the Kikaceki Land Conservancy), as off-site mitigation for Project-related impacts to TCRs. Any such transfer involving the KRRC is subject to funding availability consistent with the terms (including funding authorities) of the KHSA.

Significance
Significant and unavoidable prior to land transfer

No significant impact with mitigation after land transfer

Potential Impact 3.12-9 Klamath Cultural Riverscape Contributing Aspect – Combined effects on the Klamath River fishery of dam removal, changes in hatchery production, and increased habitat for salmonids.
Many California Native American tribes located in the Klamath River Basin historically relied on fish (such as salmon, steelhead, and Pacific lamprey) for food, currently use fish in their diet, including some members at a subsistence level of reliance, and have and continue to consider fish to be an important part of their culture (Section 3.12.2 *[Historical Resources and Tribal Cultural Resources] Environmental Setting* and Appendix V – 2012 KHSA EIS/EIR *Section 3.12 Tribal Trust*). Under existing conditions, these fish may include adult Chinook and coho salmon returns to Iron Gate Hatchery. CDFW operates Iron Gate Hatchery with an annual production goal (CDFW 2014) (see also Section 3.3.2.3 *Habitat Attributes Expected to be Affected by the Proposed Project – Fish Hatcheries*) of 75,000 coho salmon smolts, and six million fall-run Chinook salmon yearlings and smolts.

The ability to meet the above production goals varies annually based on adult returns and hatchery performance. Coho salmon production has averaged 75,000 yearlings

(achieving production goals) and 866 adult returns on an annual basis (CDFW 2014). Coho returns to Iron Gate Hatchery have significantly and steadily declined from a high of 2,466 adults in the 2001/2002 return year to a low of 38 adults in the 2015/2016 return year (CDFW 2016). From 2005 through 2018 actual fall-run Chinook salmon yearling production has averaged 955,931 (exceeding production goals), and actual smolt production has averaged 4,276,728 (around a million fewer smolts than the goal on average) (K. Pomeroy, CDFW, pers. comm., 2018). The fall-run Chinook salmon hatchery spawner return goal is 8,000 fish. Total Chinook salmon returns to Iron Gate Hatchery between 1978 and 2016 ranged from 2,558 to 72,474 and averaged 16,206 fish (CDFW 2017). From 2000 to 2016, adult winter steelhead returns to Iron Gate Hatchery averaged 242 and peaked at 631 in 2001 (CDFW 2016). Returns have been declining, and in 2016 no adult steelhead returned to the hatchery (CDFW 2016). The low adult returns of steelhead have resulted in no production of steelhead yearlings from Iron Gate Hatchery since 2012.

It appears that progeny from Iron Gate Hatchery releases have contributed appreciably to in-river tribal harvest since the late 1960s (PacifiCorp 2004a). PacifiCorp (2004a) estimates that based on smolt-to-adult survival studies conducted on Iron Gate fall Chinook salmon, the Iron Gate Hatchery production contributes about 50,000 fish annually to the Chinook and coho salmon fisheries (including commercial, tribal and recreational fisheries), in addition to escapement back to the hatchery.

The Proposed Project includes the continued operation of Iron Gate Hatchery and the reopening of Fall Creek Hatchery. The Iron Gate and Fall Creek hatcheries would be operated for eight years following dam removal (Section 2.7.6 *Hatchery Operations* and Section 3.3.5.6 *Fish Hatcheries*). The total production goals for both hatcheries would be reduced from the current production at Iron Gate Hatchery, whereby fall-run Chinook salmon smolts (both age 0 and age 1 yearling smolts) would be reduced by about 43 percent relative to current (2005 through 2018) releases, coho yearling production would remain the same, and steelhead production would continue to be zero.

Operation of the hatcheries at a combined reduced capacity following dam removal would be likely to reduce average annual hatchery Chinook salmon returns (by around 7,120 fewer fish) compared with existing conditions (Potential Impact 3.3-7) between post-dam removal years 3 and 10 (Table 3.3-11). There would be no change to the coho salmon population through dam removal year 9 relative to existing conditions as a result of shifting all coho production to Fall Creek Hatchery (Potential Impact 3.3-9) and there would be no change to steelhead production relative to existing conditions since steelhead have not been released since 2012.

No reduction in hatchery adult returns would be evident until post-dam removal year 3 (Section 3.3.5.6 *Fish Hatcheries*), by which time the first adult returns from the progeny of naturally spawning Chinook salmon in newly accessible habitat upstream of the prior location of Iron Gate Dam would occur (Potential Impact 3.3-7). Between post-dam removal years 3 and 10, both hatchery returns and returns from newly accessible habitat would occur, offsetting reductions due to lower hatchery capacity in the early years of the Proposed Project, as total adult returns of Chinook salmon, and the associated tribal fishery resource, increase towards overall higher levels.

The elimination of hatchery production after eight years following dam removal under the Proposed Project would eliminate the congregation of returning hatchery adults to the

reach downstream of the prior location of Iron Gate Dam. Combined with the removal of the dams, which would increase the likelihood that adults would disperse further upstream, these factors would be likely to reduce the incidence of fish disease and parasites in the Klamath River (see Section 3.3.5.5 *Fish Disease and Parasites*). Further, since hatchery juveniles would no longer be released after post-dam removal year 7, fish disease would be less likely to affect outmigrating smolts. Higher smolt survival would result in an increase in adult returns available for in-river tribal harvest (PacifiCorp 2004a). Overall, it is anticipated that the Proposed Project would help to reduce the incidence of fish disease and parasites in the Klamath River and thus would be beneficial.

As described in Section 3.3.5.9, Potential Impact 3.3-7, quantitative modeling of fall-run Chinook salmon populations predict that the Proposed Project would increase Chinook salmon abundance. Median escapements to the Klamath Basin are predicted to be higher (median increase greater than 30,000) with the Proposed Project than under existing conditions. The potential for tribal harvest is therefore also predicted to be greater with the Proposed Project due to increased numbers of Chinook salmon adults (affecting the number of fish available annually), and the decrease in the probability of low escapement leading to fishery closures (affecting the number of years in which fishing will be available for more than ceremonial purposes).

While a reduction (around 7,120 fish on average) in total fall-run Chinook salmon returns for up to four years under the Proposed Project would constitute a potential short-term alteration in Chinook salmon as a tribal fishery resource, it is within the existing degree of annual variability in hatchery-origin Chinook salmon returns (2,558 to 72,474 for the period 1980 to 2001 [CDFW 2016b]) and natural Chinook salmon returns (6,957 to 91,757 for the period 1980 to 2001 [CDFW 2016a]). The Proposed Project would be unlikely to represent a material impairment of the Klamath Riverscape as a resource or a substantial restriction of tribal access to the fishery relative to existing conditions, even in the short term. This assessment is bolstered by the lack of reduction in hatchery-origin coho adult returns that would occur under the Proposed Project and the lack of change in hatchery operations from the existing condition for steelhead and spring-run Chinook (neither of which the hatchery produces) under the Proposed Project.

In addition, survival of natural and hatchery smolts is predicted to increase by post-dam removal year 1 from reduced incidence of disease (see Section 3.3.5.5 *Fish Disease and Parasites*) and increased natural production from newly accessible habitat is predicted to increase salmon abundance by post-dam removal year 3 (see Section 3.3.5.6 *Fish Hatcheries*). Thus, reduced hatchery production goals for eight years following dam removal would be a less than significant impact in the short term. In the long term, the loss of hatchery production would be more than replaced by increased natural production (Potential Impact 3.3-7), and the cessation of hatchery operations would be beneficial to the Klamath River fishery TCR by helping to reduce the incidence of fish disease and parasites.

As described in Section 3.3.5.9, the Proposed Project would not have a significant short-term impact and would have a long-term beneficial effect on spring-run Chinook salmon (Potential Impact 3.3-8), coho salmon (Potential Impact 3.3-9), steelhead (Potential Impact 3.3-10), Pacific lamprey (Potential Impact 3.3-11), and redband trout (Potential Impact 3.3-14). The tribal fishery resource is anticipated to benefit from the Proposed

Project in the long term as a result of population improvements for these tribal trust species.

As described in Section 3.3.5.9, the Proposed Project would not have a significant short- or long-term impact on green sturgeon (Potential Impact 3.3-12), Lost River and shortnose suckers (Potential Impact 3.3-13), eulachon (Potential Impact 3.3-15), longfin smelt (Potential Impact 3.3-16), and freshwater mussel species *M. falcata* and *G. angulate* (Potential Impact 3.3-16). Freshwater mussel *Anodonta spp*. would experience a significant and unavoidable impact under the Proposed Project (Potential Impact 3.3-16).

As discussed under Section 3.12.2.3 *Known Tribal and Historical Resources in the Vicinity of the Proposed Project [Klamath Cultural Riverscape]*, the influence of the Proposed Project on the riverscape as a whole, and overall ecosystem health, are more important than the individual potential impacts on specific species. Based on the assessment that there would be a short-term, less-than-significant effect on most tribally significant species (with the exception of *Anodonta ssp.*) under the Proposed Project; the relatively short duration of a predicted measurable decline in fall-run Chinook adult returns from reduced hatchery operations that falls within the existing variation of hatchery returns; the lack of predicted impact from the closure of the hatchery after eight years as compared to the existing conditions (i.e., baseline); the predicted increases in fish production and health from dam removal; and the long-term benefits on much of the key tribal trust species (e.g., Chinook salmon, coho salmon, steelhead, and Pacific lamprey) resulting from improved river ecosystem function and increased habitat access, the riverscape is anticipated to benefit under the Proposed Project.

Significance

No significant impact in the short term

Beneficial in the long term

Potential Impact 3.12-10 Klamath Cultural Riverscape Contributing Aspect: Ability of tribes to use the Middle and Lower Klamath River for ceremonial and other purposes due to alterations in riverine water quality and the extent of nuisance and/or noxious blue-green algae blooms.

California Native American tribes, such as Karuk, Yurok, Resighini Rancheria, Hoopa Valley, and Klamath, currently consume considerable amounts of fish and may ingest or contact water during fishing, bathing, collection and washing of basket and plant materials, and during tribal ceremonies such as the Boat Dance (DOI 2011) (see also Section 3.12.2.1 *Tribal Cultural Chronology and Ethnography (including Historic and Pre-Historic Periods – Northwest California Culture Area*). Under current conditions, seasonal blooms of nuisance blue-green algae regularly occur in Lower Klamath Project reservoirs and are released from Iron Gate and Copco No. 1 reservoirs into the Middle and Lower Klamath River. This can result in elevated concentrations of algal toxins in the water commonly exceeds public health advisory postings for water contact and inhibit the use of the Middle and Lower Klamath River for tribal purposes. Released blue-green algae can also clog fishing nets as well as result in elevated concentrations of algal toxins in the water, further interfering with tribal use of the river (see Section 3.2.2.7 *Chlorophyll-a and Algal Toxins*).

Based on available data, measured concentrations of the algal toxin microcystin in fish tissue have varied in the Middle and Lower Klamath River, but instances of microcystin bioaccumulation have been reported at levels that exceed public health guidelines (in addition to the water column exceedances mentioned above) (see Section 3.3.2.3 *Habitat Attributes Expected to be Affected by the Proposed Project – Algal Toxins*). Because of health risks associated with direct ingestion of fish tissue and water, as well secondary health risks due to dermal exposure to water containing elevated levels of algal toxins, tribes have had to adopt precautionary steps to avoid ingestion and water contact (DOI 2011).

Despite the slightly increased total nutrient concentrations anticipated under the Proposed Project in the Hydroelectric Reach (see Potential Impact 3.2-8), elimination of the reservoir environment that currently supports growth conditions for toxin-producing nuisance blue-green algal species such as *Microcystis aeruginosa* would result in decreases in high seasonal concentrations of chlorophyll-*a* (greater than 10 ug/L) and periodically high levels of algal toxins (greater than 8 ug/L microcystin) generated by suspended blue-green algae in the Hydroelectric Reach, the Middle and Lower Klamath River as well as the Klamath River Estuary (see Potential Impact 3.2-12). The anticipated reductions in blue-green algae concentrations under the Proposed Project would support Cultural Use of Klamath River waters without risk of adverse health effects, which would improve tribal members' access to the river above levels occurring under existing conditions. This would be a beneficial effect. Since drawdown of the reservoirs would begin in winter and would be largely complete by March/April (i.e., the beginning of the algal growth season) of dam removal year 2, reductions in chlorophyll-*a* and algal toxins would be a short-term benefit as well as a long-term benefit since the reduction would begin during dam removal year 2 and it would continue beyond post-dam removal year 1 (Potential Impact 3.2-12).

Significance
Beneficial in the short term and long term

3.12.5.2 Potential Impacts to Built Environment and Historic-period archaeological Resources

Potential Impact 3.12-11 Facilities removal would result in significant impacts to Copco No. 1 Dam, Copco No. 2 Dam, and Iron Gate Dam, their associated hydroelectric facilities, and the Klamath River Hydroelectric Project District as a whole.
The Proposed Project would include removal of large-scale contributing elements of the Klamath River Hydroelectric Project District, an historical resource recommended eligible for listing to the California Register of Historical Resources for the role in early development of electricity and economy of the southern Oregon and northern California regions (Cardno Entrix 2012; Kramer 2003a,b).

Under the Proposed Project, J.C. Boyle Dam, Copco No. 1 Dam, Copco No. 2 Dam, and Iron Gate Dam, and many of the associated hydroelectric facilities would be removed. (see Section 2 *Proposed Project*) Proposed Project activities would directly impact the historical significance of the dam structures and hydroelectric facilities and other associated properties. Removal of the three California dams (the major contributors of significance), would preclude the ability for the district to remain eligible for listing with

the California Register of Historical Resources. Thus, facilities removal would be a significant impact on the resource.

As the core of the Proposed Project is removal of the Lower Klamath Project dams and associated facilities, historical restoration and "adaptive re-use" is simply not feasible as mitigation for these facilities. Dams and other hydroelectric facilities are not able to be relocated, making this form of mitigation not feasible. Maintaining some structures in place is considered in Section 4.3 *Partial Removal Alternative*.

Documentation measures that meet the National Park Services Secretary of the Interior standards for documentation of historical architectural and engineering properties are the only feasible form of mitigation because avoidance and minimization measures would not be possible.

The Proposed Project includes a Cultural Resources Plan (Appendix B: *Definite Plan – Appendix L*) that considers potential impacts to historic built environment resources, including the Klamath River Hydroelectric Project District. The Cultural Resources Plan proposes updating the Request for Determination of Eligibility for listing on the NRHP to include Iron Gate Dam (which has reached 50 years of age since the Request was first filed. Additionally, the Cultural Resources Plan sets forth a process for addressing potential impacts through avoidance and preservation in place as a first priority, then minimization, then resource-specific approaches where avoidance and minimization are not feasible. Where documentation is used, the Cultural Resources Plan recommends adopting protocols consistent with the Secretary of the Interior's Standards for Archaeological Documentation, Historical Documentation, and Architectural and Engineering Documentation; the ACHP Section 106 Archaeology Guidance; and other guidance from the appropriate SHPOs and/or THPOs, as applicable.

However, elements of the Cultural Resources Plan are not final. The Cultural Resources Plan would be further developed by KRRC working through the FERC process to comply with Section 106 of the National Historic Preservation Act of 1966, as codified in 36 CFR Part 800. As stated in the Cultural Resources Plan, mitigation measures and other protective measures would be developed and implemented to protect historic built environment resources.

Overseeing development and implementation of the Cultural Resources Plan does not fall within the scope of the State Water Board's water quality certification authority. While the KRRC has initiated a process through the Cultural Resources Working Group and FERC to develop a Historic Properties Management Plan and a Programmatic Agreement that will be finalized and implemented, at this time the Historic Properties Management Plan and the Programmatic Agreement are not finalized and the State Water Board cannot require their implementation. While the State Water Board anticipates that implementation of the Historic Properties Management Plan and the Programmatic Agreement would reduce impacts to the historical built environment, the core of the Proposed Project is removal the hydroelectric facilities and much of the context for these historic resources, such that historical restoration, "adaptive re-use," or relocation of the structures and buildings is not feasible. Even with documentation, the impact to the resource and its context would be significant and the historic resource would be materially impaired. Thus, while the inclusion of documentation measures in conformance with the Secretary of the Interior's guidance would lessen the impact to the resource, the impact to the Klamath Hydroelectric Historical District under the Proposed

Project would be significant and unavoidable even with inclusion of the KRRC's proposed mitigation measure.

Significance
Significant and unavoidable

Potential Impact 3.12-12 Pre-dam-removal activities that involve disturbance of the landscape, including construction or improvement of associated roads, bridges, water supply lines, staging areas, disposal sites, hatchery modifications, recreation site removal and/or development, and culvert construction and improvements could result in potential exposure of or damage to historic-period archaeological resources (identified in Table 3.12-1) through ground-disturbing construction and disposal activity and increased access to sensitive areas.
Historic-period cultural resources are known to be present within Area of Analysis *Subarea 1* (Figure 3.12-2) and are identified in Table 3.12-1. Pre-dam removal activities involving ground disturbance, construction or improvement of associated roads, bridges, water supply lines, staging areas, disposal sites, hatchery modifications, recreation site removal and/or development, and culvert construction and/or improvements would occur within the Area of Analysis *Subarea 1* (Figure 3.12-2).

Due to the nature of ground-disturbing activities and a general increase in the level of activity (e.g., construction, surveys) within the Area of Analysis *Subarea 1*, pre-dam removal activities that would involve ground disturbance have the potential to result in the following impacts to historic-period cultural resources through physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings; and/or exposure or substantial movement of the resources leading to increased illicit looting resulting in a significant impact.

To reduce impacts to historic-period cultural resources associated with pre-dam removal activities, the KRRC is developing a Historic Properties Management Plan to identify historic properties and include measures to implement before and during drawdown and dam removal activities to protect significant historic, cultural, and tribal resources during Proposed Project implementation. The Historic Properties Management Plan will be submitted to FERC for approval before the commencement of any ground disturbing activities (including reservoir drawdown).

Additionally, the KRRC has committed to implement a Looting and Vandalism Prevention Program (LVPP) to reduce looting and vandalism to TCRs and historic-period cultural resources (Mitigation Measure TCR-2), and an Inadvertent Discovery Plan (IDP) that would include actions to implement in the event an inadvertent discovery (e.g., human remains) (Mitigation Measure TCR-3), both of which would provide for compliance with applicable laws regarding cultural resources and human burials.

Implementation of the Historic Properties Management Plan, Mitigation Measure TCR-2 (LVPP), and Mitigation Measure TCR-3 (IDP) would reduce these impacts considerably, and, for many resources is expected to avoid impacts completely through the design and implementation of construction plans or on-the-ground modifications to Proposed Project implementation. For impacts for which it is not feasible to completely avoid, these impacts may be reduced to a less than significant level with implementation of the Historic Properties Management Plan, Mitigation Measure TCR-2 (LVPP), and Mitigation Measure TCR-3 (IDP).

Overseeing development and implementation of the Historic Properties Management Plan does not fall within the scope of the State Water Board's water quality certification authority. While the KRRC has initiated a process through the Cultural Resources Working Group and FERC to develop the Historic Properties Management Plan and a Programmatic Agreement that will be finalized and implemented, at this time the Historic Properties Management Plan and the Programmatic Agreement are not finalized and the State Water Board cannot require their implementation. While the State Water Board anticipates that implementation of the Historic Properties Management Plan and the Programmatic Agreement, including any modifications developed through the FERC process that provide the same or better level of protection for historic-period cultural resources, would reduce impacts to less than significant, because the State Water Board cannot ensure implementation of the Historic Properties Management Plan and the Programmatic Agreement, it is analyzing the impact in this Draft EIR as significant and unavoidable.

Significance

Significant and unavoidable impact with mitigation

Potential Impact 3.12-13 Drawdown of Iron Gate, Copco No. 1, and Copco No. 2 reservoirs could shift, erode, or exposure historic-period archaeological resources resulting in increased potential for damage and looting.

The Proposed Project would draw down Iron Gate, Copco No.1, Copco No. 2 and J.C. Boyle reservoirs at a rate between 2 and 5 feet per day (i.e., 1 to 2.5 inches per hour). Drawdown of Copco No. 1 would begin November 1 of dam removal year 1 at a maximum rate of 2 feet per day, and drawdown of all reservoirs would occur at a maximum rate of 5 feet per day beginning January 1 of dam removal year 2 and continue until March 15 of the same year. The analysis for this potential impact focuses on the California Lower Klamath Project reservoirs, including Copco No. 1, Copco No. 2, and Iron Gate, which are contained within Area of Analysis *Subarea 1* (Figure 3.12-2).

Since construction of Lower Klamath Project reservoirs, fine sediments composed primarily of organic material (including dead algae), but also including some silts and clays, have accumulated on the reservoir bottoms covering the original topography and potentially historic-period cultural resources that were present prior to reservoir construction. The distribution of sediment deposits associated with sediment deposition following reservoir construction varies within each reservoir (Figures 2.7-8 and 2.7-9). Because the accumulated sediments are primarily fine material, they will be easily eroded and flushed out of the reservoirs into the Klamath River during reservoir drawdown. The degree of sediment erosion will vary, with the majority of the erosion focused in the former river channel that is currently submerged in Copco No. 1, Copco No. 2, and Iron Gate reservoirs (see Figures 2.7-5 and 2.7-6). The Proposed Project also includes barge-mounted pressure spraying during reservoir drawdown that would target six locations in Copco No. 1 Reservoir and three locations in Iron Gate Reservoir within which to maximize erosion of sediment deposits and subsequently excavate to the historical floodplain elevation to create wetlands, floodplain areas and off-channel habitat features (see Appendix B: *Definite Plan – Appendix H Figures 5-4 and 5-7*).

Following drawdown, approximately 40 to 60 percent of the sediment deposited since construction of Lower Klamath Project reservoirs would remain in the former reservoir footprints, primarily on terraces located above the historical river channel. The

sediments that remain in the reservoir footprints would consolidate (dry out and decrease in thickness) (USBR 2012a), likely making them less subject to erosion. Further, during reservoir drawdown, aerial seeding of pioneer seed mixes would occur following the receding reservoir waters. Aerial seeding during reservoir drawdown would not result in any further disturbance of soil on the exposed reservoir terraces and the establishment of vegetation on the terraces would potentially reduce erosion of fine sediments. Recent laboratory tests of reservoir sediments showed vegetated sediments produced less erodible fine particles and aggregates during cycles of wetting and drying than unvegetated sediments (Appendix B: *Definite Plan – Appendix H*).

Although not currently anticipated by KRRC, the Proposed Project may also include hydroseeding from a barge on exposed reservoir terraces as the water recedes during reservoir drawdown. Hydroseeding from a barge would be accomplished by placing a ground rig on one barge with another boat used to ferry materials from shore. A moveable pier or other engineered method of accessing the supply boat as the water level recedes would also be needed. If it occurs, barge hydroseeding would occur in the higher elevation portion of the reservoir shoreline, until the reservoir levels become too low to operate (i.e., March of dam removal year 2). If barge hydroseeding occurred, additional disturbances of reservoir sediments would occur as wave action from the barge would increase disturbance of sediment adjacent to the receding reservoir's shoreline, potential increasing the chance for slope instability and exposure of historic-period archaeological resources.

Historic-period cultural resources associated with late-nineteenth and early-twentieth century settlement, agriculture, logging, mining, hydroelectric, and transportation facilities are known to be present within the proposed Limits of Work (Area of Analysis *Subarea 1)* (Figure 3.12-2). Known historic-period archaeological sites along the margin of Copco Reservoir include ruins of buildings (P-47-002824) and refuse dumps (P-47-003917 and P-47-003922). Other known but unrecorded historic period sites at Copco Reservoir included early homesteads[157], such as the lands of Ward, Keeton, Reimundo, and Pecard (Daniels 2017), and Spannaus, Lennox and Kempler. Additionally, there are references to railroads, irrigation ditches, buildings, camps, roads, trails, bridges, and agricultural fields in the historic record that are not attributed to a specific location but could be encountered during Copco Reservoir drawdown (see Appendix B: *Definite Plan – Appendix L, Table 6-12*)

Known historic-period cultural resources along the shoreline of Iron Gate Reservoir include a homestead site (P-47-003940), several stacked rock wall segments (P-47-003943, P-47-003942, and P-47-003937), and a location with dozens of historical rock cairns believed to be the result of field clearing (P-47-003945) (Cardno ENTRIX 2012, PacifiCorp 2004). Additionally, there are references to homesteads of Griever, Madero, and Spearing, rock walls, irrigation ditches, bridges, road trails, railroads, former gauge stations that could be encountered during Iron Reservoir drawdown.

Specific historic-period cultural resources located at the sites identified above include features, such as buildings, foundations, cellars, wood posts, rock stacks, refuse deposits, wells, privies, and orchards. Associated artifacts may include whole of fragmented glass or ceramic containers, table ware, lighting, or electrical artifacts. Metal

[157] Some historic-period resources may also be considered Tribal Cultural Resources and are included in Potential Impacts 3.12-1 through 3.12-10.

artifacts may include fencing, wire, containers, fasteners, tools, and roofing. Other structural and personal artifacts may include brick or mortar, wood, rubber, some plastics, and textiles. These archaeological materials can be discovered in concentrations, such as in a refuse dump, or as isolated artifacts.

The condition of historic-period cultural resources inundated under the reservoirs is unknown, however it is anticipated that deposits of artifacts, features and sites are present and could be impacted from shifting and erosion of reservoir sediment deposits during and after drawdown. Some historic-period cultural resources within the reservoir footprints may remain covered in sediment, or capped, resulting in some degree of preservation and disturbance minimization.

Due to the nature of ground-disturbing activities during drawdown within the Area of Analysis *Subarea 1* that have the potential to result in physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings; and/or exposure or substantial movement of the resources leading to increased illicit looting, the impact of drawdown to historic-period cultural resources would result in a significant impact. However, as discussed in Potential Impact 3.12-2, the KRRC is developing a Historic Properties Management Plan, LVPP, and IDP to identify historic properties and include measures to implement before and during drawdown and dam removal activities to protect historic, cultural, and tribal resources. Implementation of the Historic Properties Management Plan, Mitigation Measure TCR-2 (LVPP), and Mitigation Measure TCR-3 (IDP) would reduce significant drawdown impacts considerably, and, for many resources is expected to avoid impacts completely through the design and implementation of construction plans or on-the-ground modifications to Proposed Project implementation. For impacts that it is not feasible to completely avoid, the impacts may be reduced to a less than significant level with implementation of the Historic Properties Management Plan, Mitigation Measure TCR-2 (LVPP), and Mitigation Measure TCR-3 (IDP).

Overseeing development and implementation of the Historic Properties Management Plan does not fall within the scope of the State Water Board's water quality certification authority. While the KRRC has initiated a process through the Cultural Resources Working Group and FERC to develop the Historic Properties Management Plan and a Programmatic Agreement that will be finalized and implemented, at this time the Historic Properties Management Plan and the Programmatic Agreement are not finalized and the State Water Board cannot require their implementation. While the State Water Board anticipates that implementation of the Historic Properties Management Plan and the Programmatic Agreement, including any modifications developed through the FERC process that provide the same or better level of protection for historic-period cultural resources, would reduce impacts to less than significant, because the State Water Board cannot ensure implementation of the Historic Properties Management Plan and the Programmatic Agreement, it is analyzing the impact in this Draft EIR as significant and unavoidable.

Significance

Significant and unavoidable with mitigation

Potential Impact 3.12-14 Reservoir drawdown could result in short-term erosion or flood disturbance to historic-period cultural resources located along the Klamath River.

As discussed in Potential Impact 3.12-3, the proposed drawdown of the Lower Klamath Project reservoirs is designed to minimize potential flood risks, including carefully drawing down the reservoirs using controlled flow releases and the increased storage availability in J.C. Boyle, Copco No. 1, and Iron Gate reservoirs once drawdown has begun to accommodate for potential winter flow events and drawdown would not result in flows that are out of the normal range of flows experienced under existing conditions.

Hydrologic and hydraulic modeling of floodplain inundation shows that removal of the Lower Klamath Project dams could result in minor alterations to the FEMA 100-year floodplain inundation area downstream of Iron Gate Dam, along the 18-river mile stretch of the Middle Klamath River between RM 193 and 174 (i.e., from Iron Gate Dam to Humbug Creek) (USBR 2012c). Changes in the extent of the floodplain inundation area could affect potential historic-period cultural resources currently located within the FEMA 100-year floodplain (P-47-00522 [Empire Quartz Mine], P-47-00536 [Klamathon Townsite and Limber Mill], P-47-003937 [Rock Wall], P-47-004212 [Bridge], and P-47-004427 [artifact scatters]) which could result in a significant impact to historic-period cultural resources.

As discussed in Potential Impact 3.12-11, the KRRC is developing a Historic Properties Management Plan and an IDP to identify historic properties and include measures to implement before and during drawdown and dam removal activities to protect historic, cultural, and tribal resources. Implementation of the Historic Properties Management Plan and Mitigation Measure TCR-3 (IDP) may reduce impacts to resources identified in the 18-river mile stretch below Iron Gate Dam but given their proximity to Iron Gate Dam and their future inclusion in the altered 100-year floodplain following completion of the Proposed Project, impacts would remain significant and unavoidable.

As implementation of the Proposed Project is not anticipated to result in any other changes to the FEMA 100-year floodplain, or result in drawdown flows above historically recorded flows, potential impacts to historic-period cultural resources along other portions of the Klamath River would result in no significant impact.

Significance

Significant and unavoidable with mitigation for Middle Klamath River from Iron Gate Dam (RM 193) to Humbug Creek (RM 174)

No significant impact for Hydroelectric Reach excluding Iron Gate Dam, Middle Klamath River downstream of Humbug Creek, Lower Klamath River, Klamath River Estuary

Potential Impact 3.12-15 Project activities associated with removal of Iron Gate, Copco No. 1, and Copco No. 2 dams could result in physical disturbance to historic-period cultural resources from blasting or other removal techniques.

As described in Potential Impact 3.12-4, blasting and other dam removal techniques could cause significant adverse impacts to historic-period cultural resources located in the immediate vicinity[158] of Iron Gate, Copco No.1 and Copco No. 2 dams. The direct

[158] For the purposes of this analysis, "immediate vicinity" is defined as within 0.25 miles of Copco No. 1, Copco No. 2, and Iron Gate dams.

physical disturbance associated with blasting and other removal techniques could significantly impact historic-period archaeological resources that directly overlap with the blasting locations.

Though no data has identified historic-period cultural resources in the immediate vicinity of Iron Gate, Copco No. 1, and Copco No. 2 dams, but given the use of lands surrounding Proposed Project dams prior to construction of the Lower Klamath Project, this potential impact analysis assumes that historic-period archeological resources may be present in the immediate vicinity. For historic-period cultural resources that may be present in the immediate vicinity, impacts to these resources associated with dam removal would be significant and unavoidable.

As discussed in Potential Impact 3.12-11, the KRRC is developing a Historic Properties Management Plan and an IDP to identify historic properties and include measures to implement before and during drawdown and dam removal activities to protect historic, cultural, and tribal resources. Implementation of the Historic Properties Management Plan and Mitigation Measure TCR-3 (IDP) may reduce impacts to resources in the immediate vicinity of Iron Gate, Copco No. 1, and Copco No. 2 dams, but given construction activities and their potential for impacts to potential historic-period cultural resources, impacts would remain significant and unavoidable.

Significance
Significant and unavoidable with mitigation

Potential Impact 3.12-16 Ground disturbance associated with reservoir restoration, recreation site removal and/or development, and disposal site restoration could physically disturb historic-period cultural resources. Additionally, ongoing road and recreation site maintenance may have the potential to disturb known historic-period cultural resources.

As discussed in Potential Impact 3.12-5, the Proposed Project includes a Reservoir Area Management Plan that includes restoration activities that would occur both within the reservoir footprint and in upland areas (i.e., disposal, staging, and hydropower infrastructure demolition areas, access roads, former recreational areas) within the Area of Analysis *Subarea 1* (Figure 3.12-2). Historic-period archaeological resources are located within the footprints of Lower Klamath Project reservoirs.

Ground-disturbing activities associated with ongoing road, restoration, and recreation site maintenance within the Area of Analysis *Subarea 1* (Figure 3.12-2) include grading and excavating, which may result in material impairment due to physical demolition, destruction, relocation, or alteration of historic-period cultural resources located in both upland and reservoir footprint locations resulting in a significant impact.

However, as discussed in Potential Impact 3.12-11, the KRRC is developing a Historic Properties Management Plan, LVPP, and IDP to identify historic properties and include measures to implement before and during drawdown and dam removal activities to protect historic, cultural, and tribal resources. Implementation of the Historic Properties Management Plan, Mitigation Measure TCR-2 (LVPP), and Mitigation Measure TCR-3 (IDP) would reduce significant post-dam removal restoration impacts considerably, and, for many resources is expected to avoid impacts completely, through the design and implementation of construction plans or on-the-ground modifications to Proposed Project

implementation. For impacts that it is not feasible to completely avoid, the impacts may be reduced to a less than significant level with implementation of the Historic Properties Management Plan, Mitigation Measure TCR-2 (LVPP), and Mitigation Measure TCR-3 (IDP).

Overseeing development and implementation of the Historic Properties Management Plan does not fall within the scope of the State Water Board's water quality certification authority. While the KRRC has initiated a process through the Cultural Resources Working Group and FERC to develop the Historic Properties Management Plan and a Programmatic Agreement that will be finalized and implemented, at this time the Historic Properties Management Plan and the Programmatic Agreement are not finalized and the State Water Board cannot require their implementation. While the State Water Board anticipates that implementation of the Historic Properties Management Plan and the Programmatic Agreement, including any modifications developed through the FERC process that provide the same or better level of protection for historic-period cultural resources, would reduce impacts to less than significant, because the State Water Board cannot ensure implementation of the Historic Properties Management Plan and the Programmatic Agreement, it is analyzing the impact in this Draft EIR as significant and unavoidable.

Significance
Significant and unavoidable impact with mitigation

3.12.6 References

AECOM Technical Services, CDM Smith and River Design Group. 2017. Klamath River Renewal Project: California Environmental Quality Act (CEQA) and California and Oregon 401 Water Quality Certifications Technical Support Document. Submitted to: California State Water Resource Control Board and Oregon Department of Environmental Quality. Submitted by: Klamath River Renewal Corporation.

AECOM Technical Services. 2018. Klamath River Renewal Project: Definite Plan for decommissioning Administrative Draft. Submitted to: California State Water Resource Control Board. Submitted by: Klamath River Renewal Corporation.

Aikens, C. M., and D. L. Jenkins, editors. 1994. Archaeological research in the Northern Great Basin: Fort Rock archaeology since Cressman. University of Oregon Anthropological Papers 50. Eugene, Oregon.

Ames, K. M., D. E. Dumond, J. R. Galm, and R. Minor. 1998. Prehistory of the Southern Plateau. Pages 103–119 in D. E. Walker, Jr., editor. Handbook of North American Indians, Volume 12: Plateau. Smithsonian Institution, Washington, D.C.

Balter, M. 2008. DNA from fossil feces breaks Clovis barrier. Science 320:37.

Bancroft, H. H. 1888. Annals of the California gold era.

Barrett, S. A. 1910. The material culture of the Klamath Lake and Modoc Indians of Northeastern California and Southern Oregon. University of California Publications in Archaeology and Ethnology 5: 239–292.

Basgall, M. E., and W.R. Hildebrandt. 1989. Prehistory of the Sacramento River Canyon, Shasta County, California. Center for Archaeological Research at Davis Publication Number 9. University of California, Davis, California.

Beckham, S. D. 2006. Historical landscape overview of the Upper Klamath River Canyon of Oregon and California, Cultural Resources Series No. 13, on file with the Klamath Falls Resource Area, Bureau of Land Management.

Berreman, J. V. 1937. Tribal distribution in Oregon. Memoirs of the American Anthropological Association No. 47. American Anthropological Association, Menasha, Wisconsin.

BLM (U.S. Bureau of Land Management). 2016. Bureau of Land Management. National Register of Historic Places Registration Form for the Upper Klamath River Stateline Archaeological District, Beswick Vicinity, Siskiyou County, California.

Boyle, J. C. 1976. 50 Years on the Klamath. Medford, Oregon.

Bright, W. 1978. Karok. Pages 180–189 *in* R. F. Heizer, editor. Handbook of North American Indians, Volume 8: California. Smithsonian Institution, Washington, D.C.

Cardno Entrix. 2012. Klamath secretarial determination cultural resources report. Prepared for the Bureau of Reclamation, Mid-Pacific Region, Sacramento, California.

Cleland, J. H. 1997a. Prehistory of the Middle Pit River, Northeastern, California. KEA Environmental, Inc., San Diego and Dames and Moore, Inc., Chico, California. Submitted to Pacific Gas and Electric Company, San Francisco, California.

Cleland, J. H. 1997b. Cultural Chronology. Pages 69–79 *in* J. H. Cleland, editor. Prehistory of the Middle Pit River, Northeastern, California. KEA Environmental, Inc., San Diego and Dames and Moore, Inc., Chico. Submitted to Pacific Gas and Electric Company, San Francisco, California.

Daniels, B. I. 2003. Draft Shasta Nation TCP Study. Report prepared for PacifiCorp, Portland, Oregon.

Daniels, B. I. 2006. Shasta Nation TCP study. Prepared for PacifiCorp, Portland, Oregon.

Deur, D. 2003. Traditional cultural properties and sensitive resource study, Klamath Tribes, Klamath Hydroelectric Project FERC Relicensing Documentation. Report prepared for The Klamath Tribes.

Deur, D. 2011. The Klamath tribes: An ethnographic assessment of cultural resource impacts. Report prepared for the Klamath Tribes.

Dixon, R. B. 1907. The Shasta. Bulletin of the American Museum of Natural History 17: 381–498.

DOI (Department of the Interior). 1939. Constitution and Bylaws of the Quartz Valley Indian Community California. Prepared by DOI, Office of Indian Affairs, Washington, D.C.

DOI. 2011. Current Effects of PacifiCorp Dams on Indian Trust Resources and Cultural Values. Prepared for DOI Cultural/Tribal Sub-team. Prepared by North State Resources, Inc., Sacramento, CA.

Drucker, P. 1936. A world renewal ceremony at Panamnik. Varia Anthropologica, University of California Publications in American Archaeology and Ethnology 35: 23–28.

FERC (Federal Energy Regulatory Commission). 2007. Final Environmental Impact Statement for hydropower license, Klamath hydroelectric project. FERC Project No. 2082-027, FERC/EIS-0201F. Office of Energy Projects, Division of Hydropower Licensing, Washington, D.C.

Fitzgerald R. T., and W. R. Hildebrandt, 2001. Will the true age of the Borax Lake Pattern please stand up? The archaeology of CA-HUM-573, an Early Holocene site on the south end of Pilot Ridge, Humboldt County California. Society of California Archaeology Proceedings 2001.

Fredrickson, D. A. 1973. Early cultures of the North Coast Ranges, California. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Gates, T. 2003. Ethnographic riverscape: regulatory analysis. Draft report prepared for PacifiCorp Hydroelectric Inc., by Yurok Tribe Heritage Preservation Office under contract #P13342 in conjunction with FERC Project No. 2082.

Gatto, M. 2014. Assembly Bill No. 52 (2013- 2014 Reg. Sess.) (as of Feb. 17, 2015). http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB52

Gavin, S. 2003. A tale of four Pokegamas or Klamath county's first railroad. Document on file at the US Department of the Interior, Bureau of Land Management, Klamath Falls Resource Area office, Klamath Falls, Oregon

Gifford, E. W. 1939a. Karok Field Notes. Bancroft Library, University of California, Berkeley; CU 23.1 item 174.

Gifford, E. W. 1939b. Karok field notes. Bancroft Library, University of California, Berkeley.

Gifford, E. W. 1940. Karok field notes. Bancroft Library, University of California, Berkeley; CU 23.1 item 175.

Goddard, P. E. 1903. Life and culture of the Hupa. University of California Publications in Archaeology and Ethnology 1.

Haynes, G.M. 2008. A Class III Archaeological Inventory at Pueblo Grande de Nevada, A Virgin Anasazi Community along the Lower Muddy River in Southeastern Nevada.

Draft document in possession of the National Park Service, Lake Mead National Recreation Area, Boulder City, Nevada.

Heizer, R. R., and T. R. Hester. 1970. Shasta villages and territory. University of California Archaeological Research Facility Contributions 9: 119–158.

Hildebrandt, W. R., and T. L. Jones. 1992 Evolution of marine mammal hunting: a view from the California and Oregon coasts. Journal of Anthropological Archaeology 11: 360–401.

Holt, C. 1946. Shasta ethnography. University of California Anthropological Records 3.

Hoover, M., H. Rensch, E. Rensch, and W. Abeloe. 2002. Historic spots in California. Fifth Edition. Stanford University Press, Stanford, California.

Jester, D. 2016. Siskiyou supes adopt Shasta tribal homeland map. Siskiyou Daily News, Yreka, California. 9 September, http://www.siskiyoudaily.com/article/20160915/NEWS/160919839.

King, T. F. 2004. First salmon: the Klamath cultural riverscape and the Klamath River hydroelectric project. Report prepared for the Klamath River Intertribal Fish and Water Commission.

King J. H., W. R. Hildebrandt, and S. A. Waechter 2016. A class 1 cultural resources overview and existing information inventory for the Northwest California integrated resource management plan, Bureau of Land management Redding and Arcata Field Offices.

Klamath Hydroelectric Project. 2004. Exhibit E cultural resources, FERC License Application.

Klamath Tribes. 2003. Klamath Tribes History. Prepared by Klamath Tribes, Chiloquin, Oregon.

Kramer, G. 2003a. Historic context statement: Klamath Hydroelectric Project, FERC No. 2082. Prepared for PacifiCorp in Portland, Oregon. June 2003.

Kramer, G. 2003b. Request for determination of eligibility: Klamath Hydroelectric Project, FERC No. 2082. Prepared for PacifiCorp in Portland, Oregon. October 2003.

Kroeber, A. L., and S. A. Barrett. 1960 Fishing among the Indians of Northwestern California. In: University of California Publications, Anthropological Records 21.

Kroeber, A. L. 1925 Handbook of Indians of California. Bureau of American Ethnology Bulletin 78. Smithsonian Institution, Washington, D.C.

La Malfa, D. 2017. H.R.3535 - Ruffey Rancheria Restoration Act of 2017. https://www.congress.gov/bill/115th-congress/house-bill/3535/text

Lenihan, D. J., T. L. Carrell, S. Fosberg, L. Murphy, S. L. Rayl, and J. A. Ware. 1981. The Final Report of the National Reservoir Inundation Study, Volume 1. U.S.

Department of the Interior, National Park Service, Southwest Cultural Resources Center, Santa Fe, New Mexico.

Mack, J. M. 1983. Archaeological investigations in the salt cave locality: subsistence uniformity and cultural diversity on the Klamath River, Oregon. University of Oregon Anthropological Papers 29.

Mack, J. M. 1991. Klamath River canyon prehistory. *In* R. Haned, editor. Klamath Canyon Prehistory and Ethnology. USDI BLM, Oregon State Office, Cultural Resource Series No. 8. Portland, Oregon.

Moratto, M. J. 1984. California archaeology. Academic Press, New York, New York.

OPR (Office of Planning and Research). 2017. Tribal Cultural Resources (AB 52). http://www.opr.ca.gov/ceqa/updates/ab-52.

PacifiCorp 2004. Cultural Resources Final Technical Report and Associated Confidential Appendices. Klamath Hydroelectric Project FERC No. 2082. PacifiCorp, Portland, Oregon.

Pilling, A. R. 1978. Yurok. Pages 137–154 *in* R. F. Heizer, edtiro. Handbook of North American Indians, Volume 8: California. General editor, W.C. Sturtevant. Smithsonian Institution, Washington, D.C.

Ray, V. F. 1963. Primitive pragmatists: the Modoc Indians of Northern California. University of Seattle, Washington.

Salter, J. F. 2003. A context statement concerning the effect of the Klamath hydroelectric project on traditional resource uses and cultural patterns of the Karuk people within the Klamath River corridor. Report prepared for PacifiCorp, Portland, Oregon.

Shasta Indian Nation. 2018. Our story. Website. http://www.shastaindiannation.org/our_story.html [Accessed December 2018]. Prepared by Shasta Indian Nation, Macdoel, California.

Silver, S. 1978. Shasta. *In* W. C. Sturtevant, editor. Handbook of North American Indians Volume 8. Smithsonian Institution, Washington, D.C.

Sloan, K. 2003. Ethnographic riverscape: Klamath River Yurok Tribe ethnographic inventory. Report prepared for the Klamath Hydroelectric Project FERC 2082.

Sloan, K. 2011. Yurok and the Klamath River: Yurok historical context and data for assessing current conditions and the effects of the proposed Klamath restoration project on Yurok tribal trust assets and Yurok resources of cultural and religious significance. Prepared for the Department of the Interior, Bureau of Indian Affairs

Spier, L. 1930. Klamath ethnography. University of California Publications in American Archaeology and Ethnology Volume 30.

Stern, T. 1998. Klamath and Modoc. *In* D. E. Walker, Jr., editor. Handbook of North American Indians, Vol. 12: Plateau. Smithsonian Institution, Washington, D.C.

Theodoratus, D., M. M. Ashman, H. McCarthy, and D. L. Genetti. 1990. Klamath River canyon ethnology study. Prepared for the U.S. Bureau of Land Management, Lakeview Oregon.

USBR (U.S. Bureau of Reclamation). 2012. Bureau of Reclamation and California Department of Fish & Game. Klamath Facilities Removal Final EIS/EIR.

USDI 1989. U.S. Department of Interior, Bureau of Land Management, Klamath Falls Resource Area Office Draft Eligibility, and Sustainability Report for the Upper Klamath Wild and Scenic River Study.

Verwayen, D., and L. Hillman 2010. National Register of Historic Places Nomination for Panamnik High Country. Prepared for the Karuk Tribe.

Voegelin, E. 1942. Culture element distributions, XX: Northeast California. University of California Anthropological Records 7: 47–252.

Wallace, W. J. 1978. Hupa, Chilula, and Whilkut. Pages 164–179 *in* R.F. Heizer, editor. Handbook of North American Indians, Volume 8: California. Smithsonian Institution, Washington, D.C.

Waterman, T. T. 1920. Yurok geography. University of California Publications in American Archaeology and Ethnography 16: 177–314.

Waterman, T. T., and A. L. Kroeber. 1934. Yurok marriages. University of California Publications in American Archaeology and Ethnology 35: 1–14.

Yurok Tribe Cultural Resources Staff. 2012. Cultural resource overview report. Manuscript in possession of the Yurok Tribe. Klamath, California.

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