

3.20 Recreation

This section describes the environmental setting for recreational resources, as well as potential environmental impacts and associated mitigation measures under the Proposed Project. Water quality, aquatic resources, and phytoplankton and periphyton¹⁶⁹ are discussed in this section only in terms of their relationship to recreation opportunities. For a detailed discussion of these resources, see Section 3.2 *Water Quality*, Section 3.3 *Aquatic Resources*, and Section 3.4 *Phytoplankton and Periphyton* of this EIR. Potential impacts to wild and scenic river segments are discussed in this section, as well as in Section 3.14 *Land Use and Planning*.

As part of the NOP scoping process, the State Water Board received several comments regarding potential recreation impacts due to Lower Klamath Project dam removal. Several commenters noted that reservoir recreational activities, including fishing, would be reduced due to dam removal, particularly at Copco No. 1 Reservoir. Many other comments anticipated an increase in river-related fishing and recreation following dam removal. Several commenters noted that Iron Gate Fish Hatchery is important for enhancing recreational fishing opportunities. Finally, one commenter questioned the future disposition of PacifiCorp properties within and adjacent to the former Lower Klamath Project reservoirs. Additional summary of the recreation comments received during the NOP public scoping process, as well as the individual comments themselves, are presented in Appendix A. Issues raised by the comments have been considered in the discussion below.

3.20.1 Area of Analysis

The Area of Analysis for recreation includes recreation areas and associated access along the Klamath River corridor from the California-Oregon border to the Klamath Estuary. Outside of the Area of Analysis for recreation, areas within and directly adjacent to the Klamath Basin, including those in Oregon, are also described to provide an overview of regional recreation opportunities and to provide a larger context for the recreational facilities that would be impacted under the Proposed Project. River reach designations are presented in Figures 2.2-2 and 2.2-3.

¹⁶⁹ *Phytoplankton* are defined as aquatic microscopic organisms, including algae, bacteria, protists, and other single-celled plants, that obtain energy through photosynthesis and float in the water column of still or slowly flowing waters like lakes or reservoirs. *Periphyton* are defined as aquatic organisms including algae and bacteria that live attached to underwater surfaces such as rocks on a riverbed. See Section 3.4 *Phytoplankton and Periphyton* for additional definitions related to algae.

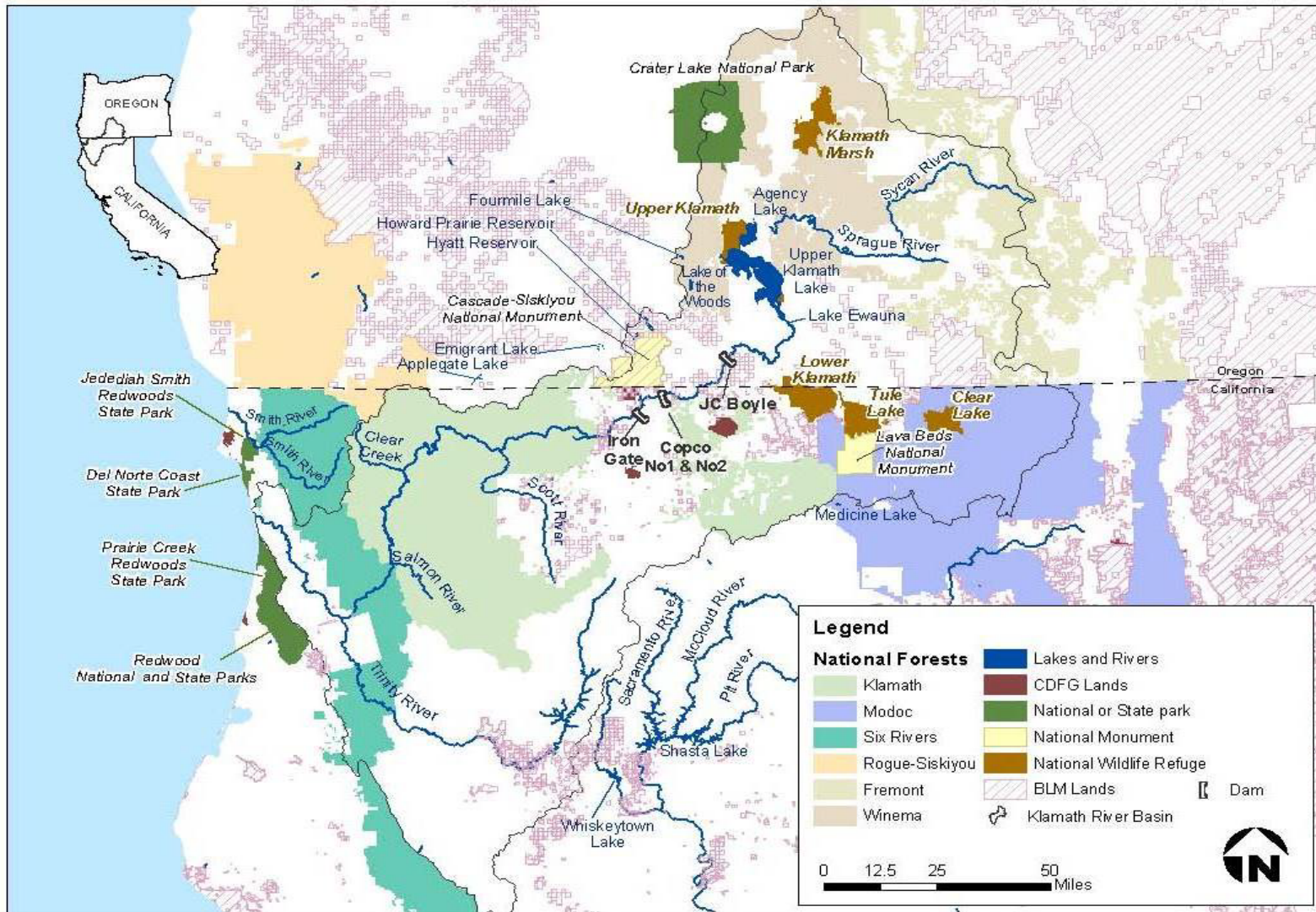


Figure 3.20-1. Area of Analysis for Klamath River Corridor and Regional Recreation Opportunities.

3.20.2 Environmental Setting

3.20.2.1 Regional Recreation

The recreational setting within the Klamath Basin is characterized by an expansive rural landscape that offers a myriad of outdoor recreational opportunities. Rivers, streams, and lakes are common throughout the mountainous landscape of the Klamath Basin, and grasslands exist in the high plateau areas of the region. Within the Klamath Basin, there are four national forests (Klamath, Fremont-Winema, Six Rivers, and Modoc), one joint national and state park (Redwood), one national park (Crater Lake), two national monuments (Lava Beds and Cascade - Siskiyou), and five National Wildlife Refuges (NWRs) (Klamath Marsh, Tule Lake, Clear Lake, Upper Klamath, and Lower Klamath), where the latter make up the Klamath Basin NWR System (Figure 3.20-1). These areas provide sightseeing, camping, hiking, fishing, boating, hunting, wildlife viewing, snow sports, off-highway vehicle uses, and other recreational opportunities. There are 297 miles of wild and scenic (under Section 2(a)ii of the Wild and Scenic Rivers Act [WSRA]) rivers in the Klamath Basin, which include segments of the Klamath, Scott, and Salmon rivers and Wooley Creek. There are also extensive public and private recreational opportunities along the Klamath River and within its reservoirs. Federal and state agencies, including the USDA Forest Service, BLM (including the Northern California District, and the Lakeview and Medford districts in Oregon), USFWS, the National Park Service (NPS), and CDFW, are responsible for managing associated lands located in Klamath and Jackson counties in Oregon, and Siskiyou County in California. Table 3.20-1 provides a summary of the opportunities offered on public lands within and adjacent to the Klamath Basin.

Table 3.20-1. Public Lands Offering Recreational Opportunities in the Area of Analysis for Recreation.

Name	Size	No. of Campgrounds	Recreational Activities Available											
			Sightseeing	Hiking	Picnic Areas	Fishing	Boating	OHV	Wildlife Viewing	Rock Climbing	Mountain Biking	Snow Play	Other	
Klamath National Forest	1.7 million acres	34	X	X	X	X	X	X	X	X	X	X	X	hunting, equestrian use, spelunking,
Fremont-Winema National Forest	2.3 million acres	40	X	X	X	X	X	X	X	X	X	X	X	hunting, equestrian use, backpacking, snowmobiling, leisure driving
Six Rivers National Forest	1 million acres	17	X	X	X	X	X	X	X	X		X		hunting, backpacking
Lava Beds National Monument	46,500 acres	1	X	X	X				X					spelunking
Crater Lake National Park	183,000 acres	2	X	X	X	X				X		X		swimming, snowshoeing, snow camping
Klamath Marsh NWR	40,600 acres	0	X			X	X		X					waterfowl hunting, photography

Name	Size	No. of Campgrounds	Recreational Activities Available											
			Sightseeing	Hiking	Picnic Areas	Fishing	Boating	OHV	Wildlife Viewing	Rock Climbing	Mountain Biking	Snow Play	Other	
Lower Klamath NWR	50,100 acres	0	X							X				waterfowl and pheasant hunting, photography, automobile touring
Upper Klamath NWR	23,100 acres	0	X		X	X	X			X				waterfowl hunting, photography
Redwood National and State Parks	132,000 (71,700 federal, 60,300 state) acres	4	X	X	X	X	X			X		X		Backpacking, tidepooling, bicycling, equestrian trails, scenic drives
BLM - Cascade-Siskiyou National Monument	170,400 total, (113,000 BLM) acres	4	X	X		X	X	X		X		X	X	snowmobiling, equestrian use, hunting
BLM - Klamath Falls Resource Area	215,000 acres	8	X	X	X	X	X	X		X		X	X	Hang-gliding, rafting, swimming, snowmobiling

Sources: BLM 1995, 2018; NPS 2018a,b,c; USBR 2012b; USDA Forest Service 2018a,b,c; USFWS 2018a,b.

Key:

OHV: off-highway vehicle

NWR: National Wildlife Refuge

BLM: Bureau of Land Management

River-based Regional Recreation

A number of rivers cross the region, including four rivers designated as wild and scenic under the WSRA (Sprague, Sycan, Smith, and Trinity rivers). Portions of the Klamath River and its tributaries (further described below in Section 3.20.2.4 *Wild and Scenic River Conditions*), are designated as wild and scenic or have been deemed suitable and eligible for listing. Designated tributaries of the Klamath River include the Salmon River, Scott River, and Wooley Creek. These rivers provide a variety of recreational opportunities, including sightseeing, fishing, and whitewater boating. Figure 3.20-1 shows the location of these rivers relative to the Klamath River. Table 3.20-2 provides a summary of the rivers, the fish species caught, and the typical types of fishing methods (e.g., boat, bank, fly). Table 3.20-3 summarizes the whitewater boating opportunities in the region. These three tables show that there are a number of recreational opportunities outside of the Proposed Project area but within the region. The Oregon Wild and Scenic Rivers, in particular, have outstanding recreational and/or scenic values along the length of the designated segments. The California Wild and Scenic Rivers are classified as wild, scenic, and recreational along the length of the designated segments (NPS 2017).

Table 3.20-2. Rivers Providing Recreational Fishing Opportunities in the Region.

River	Fish Species Caught¹	Common Types of Fishing
McCloud River	Native trout	Fly fishing, bank fishing
Pit River	Native trout; brown trout; smallmouth bass; rough fish	Fly fishing, bank fishing
Rogue River	Chinook salmon, steelhead	Drift boat, powerboat, fly fishing
Salmon River	Chinook salmon, steelhead, resident trout	Fly fishing, bank fishing
Scott River	Chinook salmon, steelhead, resident trout	Fly fishing, bank fishing
Smith River	Chinook salmon, steelhead	Drift boat, powerboat, fly fishing, bank fishing
Trinity River	Chinook salmon, steelhead, sturgeon, American shad, lamprey	Drift boat, powerboat, fly fishing, bank fishing
Upper Sacramento	Chinook salmon, native and stocked trout, American shad	Fly fishing, bank fishing
Klamath River	Redband trout, salmon	Fly fishing, bank fishing, drift boat

Source: FERC 2007

¹ Information is based on species caught within the 2003–2004 time period.

Table 3.20-3. Rivers with Whitewater Boating Opportunities in the Region.

River	Generalized Use Levels	Boating Class Type ¹	Miles of Boatable Whitewater	Factors Affecting Use Levels
Clear Creek	Low	III–V	7	Difficult access
Klamath River (upstream of CA/OR State line)	Moderate	III–IV+	31	Remote, not suited for beginner or intermediate boaters, unless accompanied by a commercial outfitter
Klamath River (downstream from Iron Gate Dam)	Moderate	II–V	122	Most skill levels, easy access, 186 miles support multi-day floats, shoreline camping, scenery, many outfitters, commercial use
North Umpqua River	Moderate	II–IV	32	Easy access, most skill levels, scenery, boatable year-round, shoreline suitable for camping
McCloud River	Moderate	II–IV	35	Proximity to I-5, most skill levels, low flows in summer
Pit River	Low	IV–V	34	Fragmented/short runs with long stretches of flat water between, remote location
Rogue River	High	II–V	100+	Easy access, most skill levels, scenery, boatable year-round, shoreline suitable for camping, many commercial outfitters
Salmon River	Moderate	II–V	44	Requires advanced/expert boating skills, commercial use
Scott River	Low	III–V	20	Recommended for expert boaters only
Smith River	Low	II–V	100+	Requires advanced/expert boating skills, low summer flows
Upper Sacramento River	Low	III–V	36	Proximity to I-5, average solitude
Trinity River	Moderate	II–V	100+	Most skill levels, easy access, commercial use

Source: FERC 2007

¹ As rated by the American Whitewater International Scale of Difficulty (American Whitewater 2017).

Reservoir- and Lake-based Regional Recreation

Numerous opportunities for reservoir and lake-based recreation are available in the vicinity of the Proposed Project. Table 3.20-4 provides a summary of some of the comparable lakes and reservoirs in the region, including facilities and use levels. Within Klamath County and Jackson County in Oregon and Siskiyou County in California, there are more than 85 boatable lakes, containing approximately 40 boat ramps (Boat Escape 2017). The region also has more than 180 high-elevation and wilderness lakes in Siskiyou County (FERC 2007). In addition to boat ramps, these lakes provide nearly 2,300 developed campsites within a two-hour drive from the Lower Klamath Project reservoirs. Some reservoirs in the region are also stocked with trout or warm water fish such as perch or bass. Angling occurs at the many lakes and reservoirs in the region and many are known for having excellent fisheries.

Table 3.20-4. Comparison of Lower Klamath Project Reservoirs with Lakes and Reservoirs in the Region.

Lake or Reservoir	Distance from Nearest Subject Reservoir (road miles)	Surface Water (acres)	Number of Developed Campsites	Number of Developed/Improved Boat Launches	Number of Developed Picnic Areas	Generalized Use Levels
Lower Klamath Project Reservoirs						
J.C. Boyle	N/A	420	16	2	4	Low
Copco No. 1	N/A	1,000	0	2	2	Low
Copco No. 2	N/A	40	0	0	0	Low
Iron Gate	N/A	944	37	3	6	Moderate
Other Lakes and Reservoirs in the Region						
Hyatt Reservoir	15	1,250	172	2	1	Moderate
Emigrant Lake	16	806	110	2	2	Moderate
Howard Prairie Reservoir	17	2,000	303	4	1	Moderate
Upper Klamath Lake	20	85,120	269	6	1	Moderate
Lake of the Woods	21	1,113	190	3	1	High
Fourmile Lake	26	740	25	1	0	Low
Agency Lake	28	5,500	43	3	0	Low
Applegate Reservoir	36	988	66	3	1	Low
Medicine Lake	46	408	72	1	1	Low
Gerber Reservoir	62	3,830	50	2	1	Moderate
Trinity Lake Unit	73	16,535	500	7	2	Moderate
Whiskeytown Lake	87	3,200	139	3	1	Moderate
Shasta Lake	87	29,500	320	7	7	High
Lost Creek Lake	78	3,430	202	1	2	N/A
Willow Lake	31	927	66	7	8	N/A
Willow Valley Reservoir	69	200	1	1	1	N/A
Lake Siskiyou	46	160	1			N/A
Juanita Reservoir	14	55	23	2		N/A
McCloud Reservoir	58	520	6	1	1	N/A

Source: PacifiCorp 2004; Jackson County Parks 2017; USDA Forest Service 2017

Key:

mi: miles

N/A: not available

A small number of developed recreation facilities exist in the Upper Klamath Basin. The following paragraphs provide brief descriptions of each facility and the recreational opportunities available, to provide further context for the regional recreational setting.

Agency Lake is connected to the northern arm of Upper Klamath Lake. Although Agency Lake has no marina, there are two public boat launches and it has a fishery that features trophy redband trout. Other popular recreational activities at the lake are sightseeing, including wildlife viewing of waterfowl (and waterfowl hunting), otter, mink, deer, and bald eagles (Southern Oregon Directory and Guide 2017). The BLM's Wood River Wetland Management Area is on Agency Lake. As shown in Table 3.20-4, a number of campgrounds surround the lake.

Upper Klamath Lake is the largest freshwater body of water in Oregon. In the northern portion of the lake, Pelican Bay is known for its population of redband trout and is an extremely popular destination for fly-fishing. The bay is also a popular location for canoeing and kayaking, as well as sightseeing and wildlife viewing. Other popular activities in Upper Klamath Lake include sailing and waterfowl hunting. As shown in Table 3.20-4, there are numerous campgrounds and boat launches surrounding the lake.

The Link River segment of the Klamath River, an approximately 1-mile stretch downstream from Link River Dam (Figure 2.4-3), has only one developed recreational facility, the Link River Nature Trail. This 1.4-mile trail is for pedestrian use only and follows a gated access road on the west side of the Link River Bypass Reach. The Link River Nature Trail is popular for sightseeing, hiking, walking, jogging, trout fishing, and bird watching (FERC 2007).

The Keno Impoundment/Lake Ewauna (Figure 2.4-3) provides various recreational opportunities, including fishing, picnicking, boating, camping, sightseeing, and wildlife viewing. In the fall, waterfowl hunting is a popular activity at Keno Impoundment/Lake Ewauna. Although most of the land adjacent to the reservoir is privately owned, Lake Ewauna has several public access areas, including the City of Klamath Falls Veterans' Memorial Park/Boat Launch, Miller Island Boat Launch, the Klamath Wildlife Viewing Area, and the Keno Recreation Area and Campground (PacifiCorp 2004). Table 3.20-5 provides a summary of the facilities and estimated annual visitation and capacity as assessed by PacifiCorp as part of relicensing studies for the Klamath Hydroelectric Project (PacifiCorp 2004).

Table 3.20-5. Keno Impoundment/Lake Ewauna Developed Recreation Facilities.

Site Name	Facilities	2001/2002 Est. Annual Use (User Days ^{1,2})	Est. Facility Use vs. Capacity
Klamath Falls Veterans' Memorial Park/Boat Launch (OR)	Boat launch, day-use area	42,500	Exceeding capacity
Miller Island Boat Launch and Klamath Wildlife Viewing Area (OR)	Boat launch, wildlife viewing trail, and a portable toilet	7,300	Approaching capacity
Keno Recreation Area and Campground (OR)	Campsites (26), day-use area, restrooms, boat launch and boarding dock	6,000	Below capacity

Source: PacifiCorp 2004, FERC 2007

Notes:

¹ User days are defined as one visitor to a recreation area for any reason in a 24-hour period.

² Data for PacifiCorp Klamath Hydroelectric Project Facility use was collected by PacifiCorp in 2001 and 2002. No more recently collected data exists or is available.

The Klamath Falls Veterans' Memorial Park provides a boathouse and boat launch ramp on the northern shoreline of Keno Impoundment/Lake Ewauna and is managed by the City of Klamath Falls, Department of Parks and Recreation. Along the northwestern end of the lake, the Klamath Wingwatchers Lake Ewauna Nature Trail provides opportunities for bird watching and hiking. This 1.8-mile trail connects Veterans' Memorial Park to the Link River trail, along the Link River to the north. Another trail is currently under construction on the northeastern side of the lake (Klamath Birding Trails 2017).

The Miller Island Boat Launch is on the east shore of Keno Impoundment/Lake Ewauna, approximately six miles south of Klamath Falls, and is managed by the Oregon Department of Fish and Wildlife. The facility is accessed by Miller Island Road, which runs three miles through the Klamath Wildlife Area and Miller Unit, and provides an entrance station area, parking area, wildlife viewing trail, and a portable toilet. The Keno Recreation Area and Campground on the southwestern shore of the Keno Impoundment/Lake Ewauna provides a campground, day-use area, and boat launch. The campground has 26 developed campsites, restrooms, and a recreational vehicle (RV) dump station. Recreational opportunities in this area include camping, fishing, picnicking, sightseeing, and boating. The Keno Recreation Area consists of upper and lower use areas, with the upper area adjacent to the campground and the lower area adjacent to the boat launch (FERC 2007).

3.20.2.2 Klamath River-based Recreation

Upper Klamath River and the Hydroelectric Reach

Klamath river-based recreational facilities are only considered upstream to Keno Dam (i.e., inclusive of the Upper Klamath River). Upstream of Keno Dam, due to the flat topography, the influence/slackwater of Keno Reservoir extends almost to Upper Klamath Lake (FERC 2007).

Whitewater Boating Opportunities

In Oregon, the Upper Klamath River provides approximately five miles of river suitable for Class III whitewater boating, including a flatwater paddle upstream of J.C. Boyle Reservoir, however, not much boating use is reported for this reach. The reach is rated Class III difficulty and flows acceptable for whitewater boating opportunities range from 1,000 to 4,000 cfs. The J.C. Boyle Bypass Reach includes about five miles of the Klamath River downstream from J.C. Boyle Dam and upstream of the J.C. Boyle Powerhouse. This reach provides Class III to IV+ rapids, and acceptable whitewater boating flows range from 1,300 cfs to 1,800 cfs; however, this reach is typically dewatered with only 100 to 300 cfs base flow. Therefore, the majority of the year there is almost no boating use on this stretch of the river (FERC 2007).

The Spring Island boater access is adjacent to (downstream from) the J.C. Boyle Powerhouse and is managed by BLM. This site provides car-top whitewater boat launching and shoreline fishing access. The Klamath River Campground, managed by BLM, is about three miles downstream from the J.C. Boyle Powerhouse. The campground has three developed campsites and the shoreline which can be used for fishing and boater access.

Table 3.20-6 provides a summary of acceptable flow ranges for whitewater boating and other flow-dependent recreational activities in the Klamath River (from the Upper Klamath River to the ocean).

Table 3.20-6. Acceptable Flow Ranges for Various River-Based Activities for Reaches of the Klamath River.

River Reach (Length of Reach)	Activity	Low Value (cfs) ¹	High Value (cfs) ¹
Upper Klamath River (5.0 miles)	Whitewater Boating – Standard	1,000	4,000
	Play Boating	1,100	1,800
	Fishing	200	1,500
J.C. Boyle Bypass Reach (4.3 miles)	Whitewater Boating – Standard	1,300	1,800
	Fishing	200	1,000
Hell's Corner Reach (16.4 miles)	Whitewater Boating/Kayaking ²	1,000	3,500
	Whitewater Boating/Commercial Rafting ²	1,300	3,500
	Fishing ³	200	1,500
Copco No. 2 Bypass Reach (1.3 miles)	Whitewater Boating	600	1,500
	Fishing	50	600
Iron Gate to Scott River (47 miles)	Whitewater Boating/Fishing	800	4,000
Scott River to Salmon River (76 miles)	Boating	800	7,000
	Fishing	800	4,000

River Reach (Length of Reach)	Activity	Low Value (cfs) ¹	High Value (cfs) ¹
Salmon River to Trinity River (23.1 miles)	Whitewater Boating/Fishing	800	10,000
Trinity River to Ocean (43.4 miles)	Whitewater Boating/Fishing	1,800	18,000

Source: Appendix R of USBR 2012b

Notes:

- ¹ Values were determined by the Secretarial Determination Recreation Sub-team (2010) from relicensing documents (PacifiCorp 2004; FERC 2007) and consultation with USDA Forest Service and BLM representatives.
- ² Flows are within the desirable range during the daily peak hydroelectric operations period (between 10:00 AM and 2:00 PM).
- ³ Flows are within the desirable range for at least 4 hours during the daily non-peak hydroelectric operations period (either between 5:00 AM and 11:00 AM or between 3:00 PM and 9:00 PM).

Key:

cfs: cubic feet per second

Within California, whitewater boating opportunities are provided on the Hell's Corner Reach of the Klamath River Hydroelectric Reach, and the Copco No. 2 Bypass Reach. The Hell's Corner Reach from J.C. Boyle Reservoir to Copco No. 1 Reservoir extends about 16.4 river miles. Several public fishing and boat access areas exist along this reach, as summarized in Table 3.20-7. A 2002 recreation survey indicated that whitewater boating is the most common activity among respondents between J.C. Boyle Dam and Copco No. 1 Reservoir (PacifiCorp 2004).

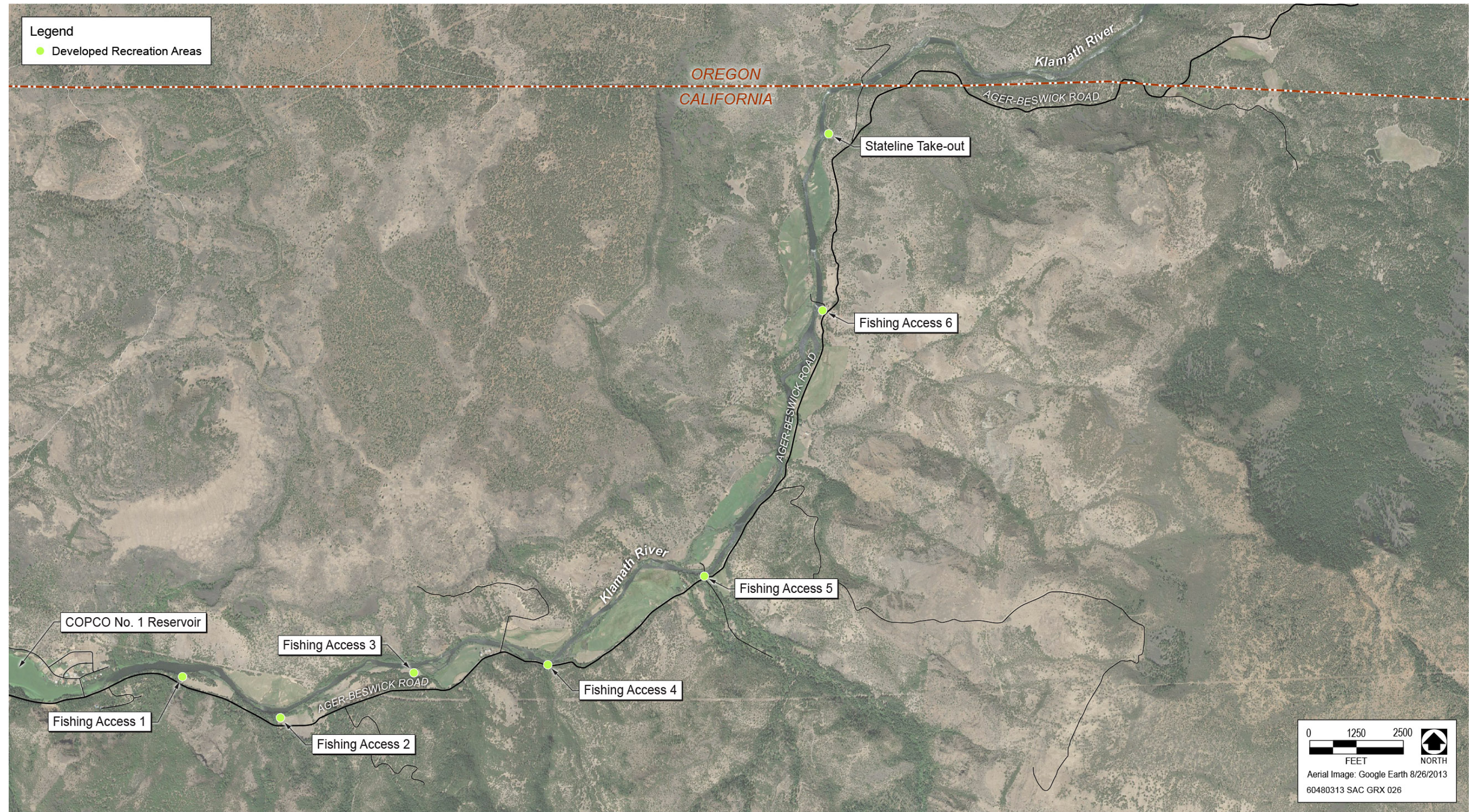


Figure 3.20-2a. California Stateline to Copco No. 1 Reservoir Recreation Area. Data source: PacifiCorp 2004. Map from AECOM (unpublished).

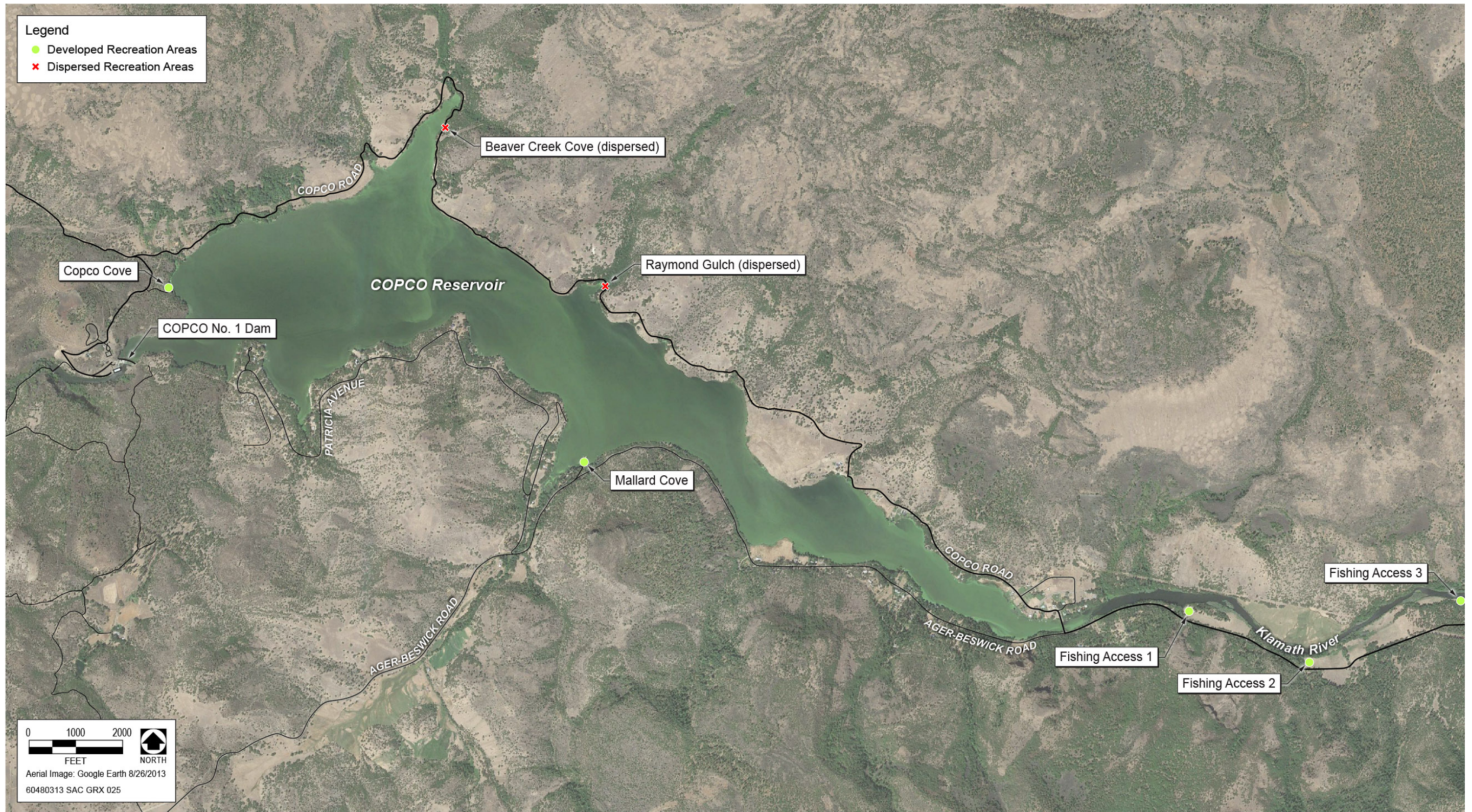


Figure 3.20-2b. Copco No. 1 Reservoir Recreation Area. Data source: Reclamation 2011. Map from AECOM (unpublished).

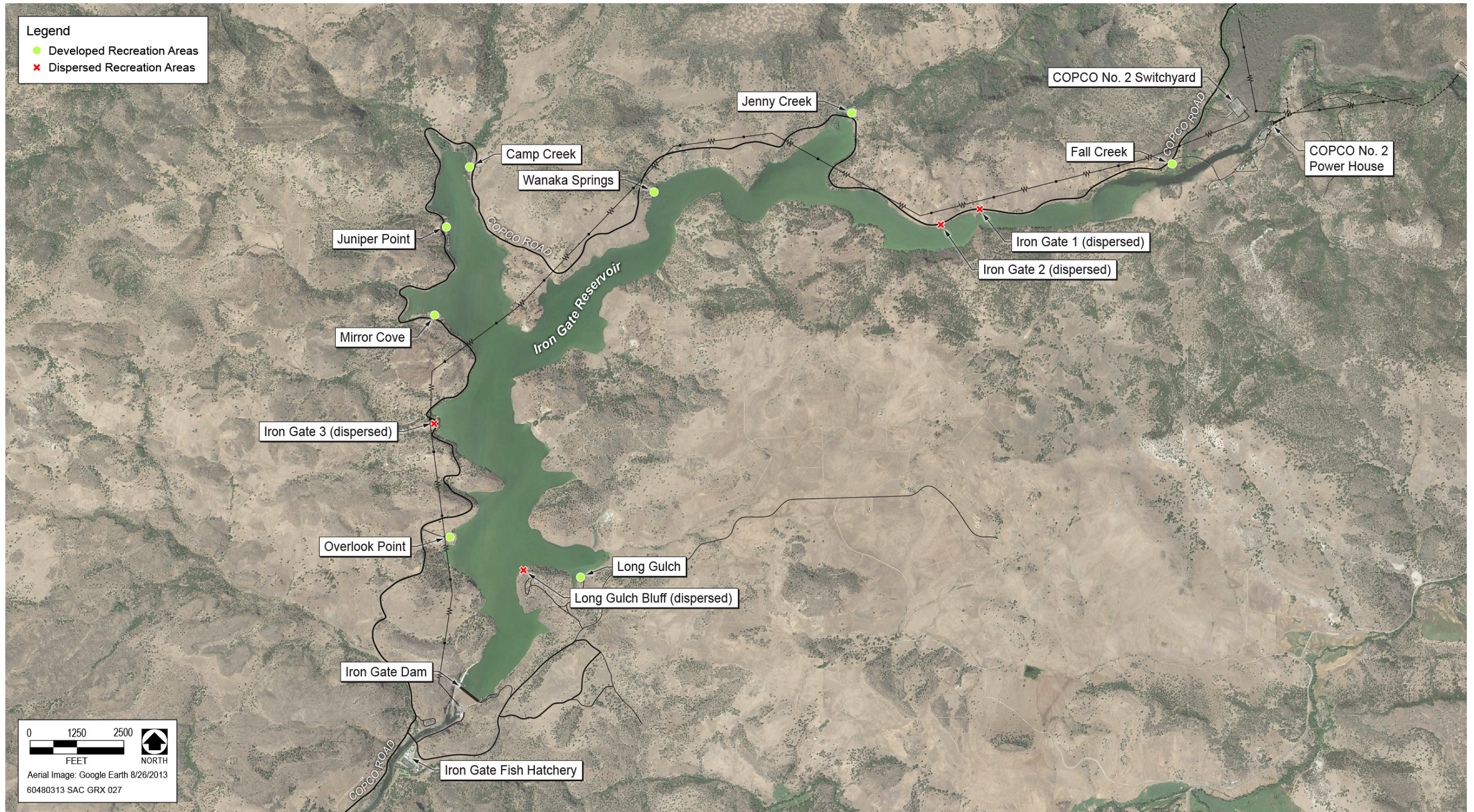


Figure 3.20-2c. Iron Gate Recreation Area. Data source: PacifiCorp 2004. Map from AECOM (unpublished).

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Table 3.20-7. Hell's Corner Reach Developed Recreation Facilities.

Site Name	Facilities	2001/2002 Est. Annual Use (Recreation days)	Est. Facility Use vs. Capacity
Spring Island Boater Access	Launch area, shoreline fishing access, restrooms	5,200	Below capacity
Klamath River Campground	Campsites (3), shoreline fishing and boating access, restrooms	1,000	Below capacity
Stateline Take-out	Boat put- in/take-out, shoreline fishing access, restrooms	2,700	Approaching capacity
Fishing Access Sites 1-6	Shoreline fishing access, parking	3,600	Below capacity

Source: PacifiCorp 2004, FERC 2007

The State line take-out access area of the Hell's Corner Reach, at the Oregon/California State line, includes upper and lower areas and is co-managed by BLM and PacifiCorp. The facility provides shoreline fishing and boat launching access. The fishing access sites provide access to the Klamath River in six locations between the State line take-out access area and Copco No. 1 Reservoir.

BLM manages whitewater boating use in the Hell's Corner Reach, a 16.4-mile reach from below J.C. Boyle Reservoir to the Fishing Access Site 1 take-out (see Figure 3.20-2a). This reach provides Class III to IV+ rapids during daily peaking flows from the PacifiCorp hydropower operations (between 10:00 AM and 2:00 PM), and acceptable whitewater boating flows range from 1,300 cfs to 3,500 cfs for commercial rafting and heavier loaded boats. Acceptable minimum flows for kayaking and private boaters are 1,000 cfs. Outside of the daily peaking flows, flow rates within this reach do not meet the acceptable range to create or enhance whitewater boating opportunities.

The average estimated annual whitewater boating use from 1994 through 2009 on this reach was 4,414 recreation days, peaking in the mid-1990s at around 6,000 recreation days per year. Whitewater boating use occurs typically during April through October, with about 80 percent of the commercial rafting use occurring during July through September. Commercial boating use accounted for about 93 percent of the whitewater boating use on this reach (DOI 2011).

Commercial boating use is allowed by permit only. There is a set commercial capacity of 10 outfitters or 200 clients per day on this reach. There is no limit for private boating capacity, although BLM has established 250 persons per day as the overall whitewater boating carrying capacity of the reach. Factors that constrain the carrying capacity of the reach are vehicle congestion at the take-out locations near Copco No. 1 Reservoir and the limited size and number of areas that are available to scout rapids (FERC 2007).

The Copco No. 2 Bypass Reach is approximately 1.3 miles long, extending from Copco No. 2 Dam to the Copco No. 2 Powerhouse and whitewater boating opportunities are limited due to lack of flow. However, the reach could provide Class IV whitewater opportunities at acceptable flows ranging from 600 to 1,400 cfs (Appendix S).

Fishing Opportunities

In Oregon, fishing is allowed from September 30 until June 16 on the Klamath River downstream from Link River Dam. The highest use in this area occurs from late winter through spring; this area is mainly used by Klamath Falls residents. At lower flow times, anglers use the river at a few sites where there is access for bank fishing through thick riparian vegetation. Catch records indicate that although angler success is consistently low, there is a greater percentage of larger fish caught in the upstream reach than between J.C. Boyle Dam and the state line. Table 3.20-6 summarizes flows acceptable for fishing opportunities in the various reaches of the Klamath River.

PacifiCorp conducted a visitor use survey in 2002 to obtain information on existing visitor demand, needs, and recreational activities within the area between J.C. Boyle Reservoir and Iron Gate Dam. The results of the survey indicated that 33 percent of visitors to the area participate in bank fishing, both along the river and reservoirs. Survey respondents also indicated that fishing for trout on river reaches in this area is considered very good, and one of the two most popular reaches for fishing opportunities includes the J.C. Boyle Bypass Reach downstream from J.C. Boyle Dam. Opportunities for trout fishing also exist downstream of J.C. Boyle Powerhouse (Hell's Corner Reach). This reach (between J.C. Boyle Powerhouse and the state line) is popular with anglers, and catch records indicate good angler success, although fish size is typically smaller than fish caught below Keno Dam and rarely exceeds 16 inches (FERC 2007).

Recreational opportunities downstream from Hell's Corner Reach, between the California/Oregon state border and Iron Gate Dam, are quite popular for angling. In 1974, a 6-mile reach of the Klamath River, from the California/Oregon state line to Copco No. 1 Reservoir (not including tributaries), was designated as Wild Trout Waters by the State of California and is managed under the Wild Trout Program (CDFG 2010) (see also Section 3.3 *Aquatic Resources*). Demand for recreational angling is high in this area. However, the Klamath River between the Copco No. 1 and Iron Gate developments has limited public access and no documented fishing activity.

In California, the Lower Klamath Project dams impound three waterbodies on the Klamath River: Copco No. 1, Copco No. 2, and Iron Gate reservoirs. Since Copco No. 2 is small with a surface area of only about 40 acres and contains no recreational facilities, the discussion focuses on Iron Gate and Copco No. 1 reservoirs. In addition to these reservoirs, there is a stretch of un-impounded river between the California-Oregon state line, and Copco No. 1 Reservoir. There is also a small (approximately 1.5-mile) stretch of river in between Copco No. 2 Dam and Iron Gate Reservoir. Figures 3.20-2(a), (b), and (c) show the locations of these waterbodies, and Section 3.20.2.3 *Lower Klamath Project Reservoir-based Recreation* describes recreational opportunities at each of these areas.

Middle and Lower Klamath River

The USDA Forest Service (Klamath and Six Rivers National Forests) manages the majority of the Klamath River corridor from downstream from Iron Gate Dam to the confluence with the Trinity River. Other areas downstream from Iron Gate Dam are also managed by the NPS, BLM, tribes, and private landowners. Table 3.20-8 summarizes the river-based recreational opportunities available on the Klamath River downstream of Iron Gate Dam.

Table 3.20-8. River-Based Recreation Opportunities in the Middle Klamath River, Between Iron Gate Dam and the Confluence with the Trinity River.

Reach	Length (miles)	Current Recreation Opportunities
Iron Gate Dam to Shasta River	13	Sightseeing, fishing (especially from boats), tubing and swimming, whitewater boating (rare), waterplay
Shasta River to Scott River	34	Sightseeing, fishing, canoeing, whitewater boating, locational playboating, waterplay
Scott River to Indian Creek	36	Sightseeing, fishing, canoeing, whitewater boating, waterplay
Indian Creek to Salmon River	40	Sightseeing, fishing, whitewater boating, canoeing, hiking, waterplay
Salmon River to Trinity River	40	Sightseeing, fishing, waterplay

Source: PacifiCorp 2004

There are two privately developed recreation facilities located along the Middle Klamath River a few miles downstream of Iron Gate Dam. The R Ranch Klamath River Campground is located a few miles east of Cottonwood and I-5 and 2.5 miles downstream from Iron Gate Dam along 1.7 miles of the Middle Klamath River. This campground contains 156 campsites with a large lodge/recreation center and provides opportunities to fish, hunt, and view natural scenery and wildlife. And the Klamath Ranch Resort Blue Heron RV Park is located along the Klamath River 1.5 miles downstream of Iron Gate Dam. This campground features 26 campsites, several accessory structures, a fly-fishing school casting pond, historic restaurant, and boat launch.

There are several other private land areas near the I-5 corridor, in Seiad Valley, at Happy Camp, and near the mouth of the Salmon River at Somes Bar. In general, these areas have several homes and associated, sparsely populated, rural development. These areas have considerable opportunities to camp, swim, picnic, or relax along this portion of the Klamath River. There are also some opportunities for sightseeing, hiking, walking, or biking along the river. In addition, there are some popular short hikes from the river up the tributaries, such as Ukonom and Clear Creek. Land-based recreation points along the river are generally near developed access points for boaters and anglers and a few developed USDA Forest Service and private campgrounds (PacifiCorp 2004).

In addition, there are two National Forest Scenic byways located along this segment of the river and within the Klamath and Six Rivers National Forests. The "State of Jefferson" National Forest Scenic Byway is located primarily on California State Highway 96 (State Highway 96) between Shasta River to Happy Camp, and the "Bigfoot" National Forest Scenic Byway is located on Highway 96 from Happy Camp to California State Highway 299 (State Highway 299). There is also an "All America Road," the Volcanic Legacy Scenic Byway, which goes from Lassen National Park in California and through the project area via Highways 97, 140, and 62 on its way to Crater Lake National Park in Oregon. These byways provide excellent views for sightseers within the Klamath and Six Rivers National Forests and access to numerous other recreational activities (America's Scenic Byways 2017).

Downstream of the Trinity River confluence, the Lower Klamath River flows through the Yurok, Hoopa, and Resighini Indian Reservations and Redwood National Park, as well as through public lands managed by the BLM and privately-owned lands. A number of private RV and tent campgrounds are along the river in Redwood National Park, and just outside of the park in the City of Klamath. These campgrounds provide opportunities for bank fishing, camping, and picnicking. Other recreation opportunities in the area are associated with Redwood National and State Parks, which includes Jedediah Smith, Del Norte Coast, and Prairie Creek Redwood state parks and Redwood National Park, which offer hiking, hunting, wildlife viewing, and other recreational opportunities. (See Table 3.20-1 for a summary of the facilities associated with these parks.)

Public Health Issues

As discussed in Section 3.2.2.7 *Chlorophyll-a and Algal Toxins*, concentrations of chlorophyll-*a* and *Microcystis aeruginosa* have exceeded World Health Organization guidelines for protection from adverse effects in recent years, in both Copco No. 1 and Iron Gate reservoirs, as well as reaches of the Klamath River downstream from Iron Gate Dam. In 2005, 2008, 2009, 2010, 2012, 2013, 2014, 2016, and 2017, the North Coast Regional Board, Karuk Tribe, Yurok Tribe, USEPA, and other local, state, and federal agencies issued warnings to residents and recreational users of the reservoirs and river to use caution near these algal blooms due to possible health effects of exposure to *Microcystis aeruginosa* and its microcystin toxin (Kann and Corum 2006, Kann and Corum 2009, North Coast Regional Board 2009, 2010, 2012a, 2013, 2014, 2016, 2017a). Effects range from mild, non-life-threatening skin conditions to permanent organ impairment and death, depending upon exposure time and intensity (FERC 2007). As identified in comments received during the scoping period for the 2012 KHSA EIS/EIR, as well as in PacifiCorp's recreation survey in 2002, these water quality issues and public health warnings have resulted in reduced recreational activity in affected river segments in recent years.

Whitewater Boating Opportunities

Extensive whitewater boating opportunities exist downstream from Iron Gate Dam. Depending on the river segment and level of flow, there are opportunities for play, standard, and big water boating on Class II and III waters (American Whitewater 1998). These runs are boatable in rafts, kayaks, inflatable kayaks, and open canoes. Table 3.20-6 summarizes the acceptable flow ranges for all reaches within the area of effect, including downstream from Iron Gate Dam.

Although not as challenging as the Hell's Corner Reach upstream, there are a few rapids that are sometimes rated Class IV, including Hamburg and Upper Savage on the Otter's Playpen run, Rattlesnake on the day-use run below Happy Camp, and Dragon's Tooth between Ferry Point and Coon Creek Access. There is also a well-known kayak playboating wave known as the "School House Wave" between Skehan Bar and Gottville. This wave is typically available during low to moderate summer flows and is popular with local kayakers from the Mount Shasta, Klamath Falls, and Ashland areas (PacifiCorp 2004). There is also a Class V-VI rapid at Ishi Pishi Falls (Somes Bar) that boaters are strongly advised to portage around due to its cultural significance to local tribes (American Whitewater 2017).

The primary whitewater boating season is in summer (June through August), when water temperatures are warm; however, the Klamath River can be boated in most months of the year (PacifiCorp 2004). There is less whitewater rafting downstream from the Trinity

River confluence after the river turns northwest into strong prevailing winds. There are fewer developed river access points along this reach than in the reaches upstream. This reach is located within the boundaries of the Yurok Tribe Indian Reservation. Data collected by the USDA Forest Service and BLM indicate that substantially more whitewater boating occurs on the Klamath River downstream of Iron Gate Dam than in the Klamath River upstream to J.C. Boyle Dam. From 1994 through 2009, the average annual number of user days was 14,392 per year. However, whitewater boating in this portion of the Klamath River has decreased somewhat in recent years. Total user days from 2000 through 2003 ranged from 13,976 to 15,349 per year, whereas from 2005 through 2009, total user days ranged from 11,751 to 15,279 per year (DOI 2011).

Fishing Opportunities

The Klamath River downstream from Iron Gate Dam has high quality angling opportunities extending nearly 200 miles to the Pacific Ocean and is open to fishing year-round. This reach, designated a wild and scenic river (see Section 3.20.2.4 *Wild and Scenic River Conditions* below), attracts and supports several fishing outfitter services that focus on salmon, steelhead, and trout fisheries. A review of outfitters conducted as part of the Secretarial Determination process identified over 50 outfitters providing sport fishing, boat fishing, and/or fly-fishing trips on the Klamath River. Twenty-seven river access sites within the Klamath National Forest provide access for fishing in this section of the river. Use at the sites varies; however, most are rated as light usage (Klamath National Forest 2017). Tables 3.20-9 and 3.20-10 provide recent use data for Chinook salmon and steelhead fishing on the Klamath River. As shown in Table 3.20-9, angler success for Chinook salmon varied annually, but was generally greater in the first half of the decade than in the latter half. The USDA Forest Service reported that the decline in fish production in the past few decades triggered a similar decline in the guide and resort industry, as well as sport fisheries (FERC 2007).

Table 3.20-9. Estimated Number of Recreational Salmon Angler Days¹ and Chinook Salmon Harvest on the Klamath River (excluding the Trinity River), 2001-2015.

Year	# Angler Days	Chinook Salmon Harvest (# Fish)		
		Adults	Grilse (Jacks)	Total
2001	28,251	9,621	1,365	10,986
2002	24,993	9,769	651	10,420
2003	23,259	7,322	589	7,911
2004	24,751	3,463	2,293	5,756
2005	17,789	1,029	912	1,941
2006	12,141	57	5,202	5,259
2007	19,597	4,975	257	5,232
2008	15,249	1,560	4,039	5,599
2009	20,755	4,820	2,033	6,853
2010	16,219	2,610	1,570	4,180
2011	Not available	3,019	8,738	11,757
2012	Not available	11,837	3,802	15,639
2013	Not available	18,628	2,212	20,840
2014	Not available	4,464	3,190	7,654
2015	Not available	7,798	1,580	9,315

Year	# Angler Days	Chinook Salmon Harvest (# Fish)		
		Adults	Grilse (Jacks)	Total
01–05Avg	23,809	6,241	1,162	7,403
06–10Avg	16,792	2,804	2,620	5,425
11–15Avg	NA	9,149	3,904	13,053

Source: CDFW 2016; NMFS 2011

Notes:

¹ Angler days are defined by USBR as the time spent fishing by one person for any part of a day.

Table 3.20-10. Estimated Number of Recreational Steelhead Angler Days on the Klamath River (excluding the Trinity River), 2003-2008.

Year	# Angler Days
2003	19,183
2004	14,345
2005	13,216
2006	19,371
2007	15,622
2008	21,192
03-08Avg	17,155

Source: NMFS 2011

Downstream from the Trinity River confluence, angling in the Klamath River is dependent on the annual status of the fall-run Chinook salmon run, so the number of businesses that offer angling guide services varies from year to year with the Chinook salmon population size. The main run of Klamath River Chinook salmon peaks in late fall and is normally over by mid-January each year; the steelhead season generally starts in November and runs through March (see also Section 3.3 *Aquatic Resources*).

Anglers fish from boats and the bank. Most of the boat fishing occurs from drift boats or rafts. Fishing regulations allow anglers to keep up to five trout per day and most of the fishing activity occurs in summer and fall. Quotas and limits on salmon and steelhead have varied over the years, and regulations may depend on whether the fish are wild or from a hatchery. Most anglers catch and release steelhead (PacifiCorp 2004).

3.20.2.3 Lower Klamath Project Reservoir-based Recreation

As there are no reservoirs located on the Klamath River downstream of Iron Gate Dam, the following discussion of reservoir-based recreation focuses on the Lower Klamath Project reservoirs located in the Hydroelectric Reach from J.C. Boyle Reservoir to Iron Gate Dam.

Hydroelectric Reach

J.C. Boyle Reservoir

J.C. Boyle Reservoir has a surface area of approximately 420 acres and is about 3.6 miles long. Developed public recreational facilities at the reservoir include Pioneer Park, Sportsman's Park, and Topsy Campground (Table 3.20-11). See Appendix B: *Definite Plan - Appendix C*, Figure 5.1-1, Sheets 2-3, for locations of these recreational facilities.

Table 3.20-11. J.C. Boyle Reservoir Developed Recreation Facilities.

Site Name	Ownership	Facilities	2001/2002 Est. Annual Use	Est. Facility Use vs. Capacity
Pioneer Park	PacifiCorp	Picnic areas, boat launches, interpretive signs, restrooms	16,700	Below capacity
Topsy Campground	BLM	Campsites (16), an RV dump, two day-use areas, a boat launch with boarding dock, an accessible fishing pier, restrooms	5,600	Below capacity
Sportsman's Park	Klamath County	Shooting ranges, dirt racetracks, archery courses, a model aircraft flying field, off-highway vehicle area, restrooms	12,600	Below capacity

Source: PacifiCorp 2004, FERC 2007

Pioneer Park is owned and operated by PacifiCorp and it lies off Oregon State Highway 66 (State Highway 66) east and west of Spencer Bridge. Pioneer Park is a day-use area that provides picnic areas, boat launches, interpretive signs, and two restroom facilities. It has an improved boat ramp on the east shore just off State Highway 66, and a picnic area and unimproved boat launch on the west shore. Popular activities at this location include sightseeing, boating, fishing, swimming, and picnicking (PacifiCorp 2004).

Topsy Campground is managed by BLM. The campground is south of State Highway 66 off Topsy Grade Road, a gravel road maintained on an as-needed basis by BLM, private owners, timber companies, and PacifiCorp. This site features a campground with 16 sites, an RV dump, two day-use areas, a boat launch with boarding dock, an accessible fishing pier, and two restroom facilities. The campground is available to the public and BLM charges fees for day-use and camping at this facility (PacifiCorp 2004).

Sportsman's Park, approximately 0.25-mile east of the reservoir, is a multi-use recreation area owned by Klamath County and leased long term to Klamath Sportsman's Park Association. The park does not provide developed reservoir access, but it does provide river access for fishing. The park contains shooting ranges, dirt racetracks, archery courses, and a model aircraft flying field. The park also has facilities for self-contained RVs and some tent camping. Annual membership passes and single-day passes for use of the park are available to the general public for a fee (PacifiCorp 2004, Sportsman's Park 2017).

In California, the Lower Klamath Project dams impound three waterbodies on the Klamath River: Copco No. 1, Copco No. 2, and Iron Gate reservoirs. In addition to these reservoirs, there is a stretch of un-impounded river between J.C. Boyle Reservoir and Copco No. 1 Reservoir. Figures 3.20-2(a), (b), and (c) show the locations of these reservoirs, and the following sections describe recreational opportunities at each of these areas.

Copco No. 1 Reservoir

Copco No. 1 Reservoir, with a surface area of approximately 1,000 acres and about 4.5 miles long, has two publicly available day-use facilities—Mallard Cove and Copco Cove—that are owned and operated by PacifiCorp. These facilities provide day-use access to the reservoir, and although they are not official campgrounds, camping occasionally occurs at both locations. Copco No. 1 Reservoir currently provides a recreational fishery for non-native fishes including largemouth bass, trout, catfish, crappie, sunfish, and especially yellow perch (Hamilton et al. 2011). Table 3.20-12 summarizes the existing facilities and estimated use during 2001/2002 at both of these areas.

Table 3.20-12. Copco No. 1 Reservoir Developed Recreation Facilities.

Site Name	Facilities	2001/2002 User Days ^{1,2}	Est. Facility Use vs. Capacity
Mallard Cove	Picnic area, restrooms, boat launch with boarding dock	7,600	Below capacity
Copco Cove	Picnic area, restrooms, boat launch with boarding dock	1,250	Below capacity

Source: PacifiCorp 2004, FERC 2007

Notes:

- ¹ User days are defined as one visitor to a recreation area for any reason in a 24-hour period. Estimated use was during the 2001/2002 study period (PacifiCorp 2004).
- ² Although annual user data from 2001/2002 represent the most comprehensive information available, these data were collected prior to data characterizing seasonal blue-green algae blooms in Iron Gate Reservoir became available (see also Section 3.4.2.3 *Hydroelectric Reach*) and prior to the freshwater CyanoHABs Program that began posting of public health advisories for California reservoirs that exceed algal toxin thresholds.

Mallard Cove, on the south shore of Copco Reservoir, is accessed off Ager-Beswick Road and includes day-use facilities, two restrooms, and a boat launch with boarding dock. Copco Cove, on the western shoreline of Copco Reservoir, off of Copco Road, has a small picnic area, two restrooms, and a boat launch with boarding dock (PacifiCorp 2004).

Additionally, homes on Copco Lake provide private recreational access, including docks for fishing, boating, swimming and birdwatching.

Copco No. 2 Reservoir

Copco No. 2 Reservoir is relatively small (with a surface area of approximately 40 acres and about 0.3-mile long) and has a narrow configuration with steep and difficult shoreline access. Copco No. 2 Reservoir has no recreational facilities and no public access (FERC 2007).

Iron Gate Reservoir

Iron Gate Reservoir has a surface area of approximately 944 acres and is 6.8 miles long. The reservoir has the highest concentration of recreation sites of all the developments associated with the PacifiCorp facilities. The developed facilities at Iron Gate Reservoir are owned and managed by PacifiCorp and include a trail (Fall Creek Trail), five combination day-use and campground areas (Jenny Creek, Camp Creek, Juniper Point, Mirror Cove, and Long Gulch), three day-use areas (Fall Creek, Overlook Point, and

Wanaka Springs), and a fish hatchery and associated day-use area (Iron Gate). Recreational opportunities include sightseeing, swimming, fishing, boating, and day and overnight use. Iron Gate Reservoir currently provides a recreational fishery for non-native fishes including largemouth bass, trout, catfish, crappie, sunfish, and especially yellow perch (Hamilton et al. 2011). Summer and weekend use is high at the reservoir due to the popularity of bass tournaments, waterskiing, and camping. Table 3.20-13 summarizes the developed recreation facilities at the reservoir and PacifiCorp's estimated annual recreation visitation and capacity during the 2001/2002 study period.

The Fall Creek Day-Use Area is at the upper end of the reservoir and includes a picnic area, boat launch access, and restroom facilities. This small day-use area is adjacent to the CDFW Fall Creek Fish Hatchery and provides access to Fall Creek Trail. Fall Creek Trail is a short (0.1-mile) trail located adjacent to the Fall Creek Fish Hatchery where visitors can hike up to Fall Creek Falls.

Wanaka Springs Day-Use Area provides picnic areas, a fishing dock, restroom facilities, and some informal camping occurs in the area.

Table 3.20-13. Iron Gate Reservoir Developed Recreation Facilities.

Site Name	Facilities	2001/2002 Est. Annual Use (User days) ¹	Est. Facility Use vs. Capacity
Fall Creek Day-Use Area and Fall Creek Trail	Picnic area, boat launch access, restrooms, hiking trail	4,150	Below capacity
Overlook Point	Restrooms	1,900	Below capacity
Wanaka Springs Day-Use Area	Fishing dock, restrooms	4,150	Exceeding capacity
Jenny Creek Day-Use Area and Campground	Campsites (6), restrooms	3,700	Approaching capacity
Camp Creek Day-Use Area and Campground	Campsites (13), boat launch, boarding and fishing docks, swimming area, a RV dump station, sports field, interpretive display restrooms	15,250	Exceeding capacity
Juniper Point Day-Use Area and Campground	Campsites (9), a fishing dock, restrooms	4,700	Exceeding capacity
Mirror Cove Day-Use Area and Campground	Campsites (10), a boat launch, restroom	11,140	Exceeding capacity
Long Gulch Day-Use Area and Campground	Picnic sites, boat launch, restrooms	5,200	Below capacity
Iron Gate Fish Hatchery	Picnic area, picnic shelter, visitor center/interpretive kiosk, restrooms, trail to river	2,200	Below capacity

Sources: PacifiCorp 2004, FERC 2007

¹ Although annual user data from 2001/2002 represent the most comprehensive information available, these data were collected prior to data characterizing seasonal blue-green algae blooms in Iron Gate Reservoir became available (see also Section 3.4.2.3 *Hydroelectric Reach*) and prior to the freshwater CyanoHABs Program that began posting of public health advisories for California reservoirs that exceed algal toxin thresholds.

Overlook Point is on the west side of the reservoir, approximately 0.75-mile upstream of Iron Gate Dam. The facility has picnic sites on moderately steep topography, providing a good view of the reservoir and surrounding landscape.

Jenny Creek Day-Use Area and Campground includes six day-use/campsites and a restroom facility. Jenny Creek is on the north side of the reservoir and provides a creekside setting for picnicking and bank fishing.

Camp Creek Day-Use Area and Campground is along a narrow reach on the north side of Iron Gate Reservoir. The surrounding hilly, semi-arid landscape and the reservoir provide pleasant views. Camp Creek Campground has several campsites designed primarily for RV campers, with a large overflow RV/tent camping area. The facility also has picnic sites, a sports field, and boat docks/fishing piers.

Juniper Point Day-Use Area and Campground has several picnic areas (occasionally used as campsites), a fishing dock, and restroom facilities.

Mirror Cove is a day-use area and campground centrally located on the west side of the reservoir. The area offers several picnic sites (occasionally used as campsites), a boat launch, and restroom facilities. This particular location is popular for group camping and is used extensively by local water-ski clubs. This boat launch is the nearest access to a competitive water-ski course placed in the western area of the reservoir.

Long Gulch Day-Use Area and Campground is on the east side of the reservoir directly across from Overlook Point. Facilities at this location include picnic sites, restroom facilities, and a boat launch. Land along an adjacent ridge is occasionally used for dispersed camping and day-use (PacifiCorp 2004).

Immediately downstream of Iron Gate Dam, the Iron Gate Fish Hatchery is operated by CDFW and includes a public day-use area adjacent to the hatchery and an undeveloped boat launch across the river from the hatchery. The day-use area includes a picnic area, a picnic shelter, visitor center/interpretive kiosk, restroom facilities, a trail to the river, and seasonal interpretive tours. Fishing is prohibited in this area as well as within 3,500 feet downstream from the dam.

Visitor Use and Perception

PacifiCorp conducted a visitor survey in 2004 to assess recreational use and visitor perceptions of recreational facilities, including the Lower Klamath Project reservoirs. The majority of visitors surveyed (approximately 60 percent of total) were from Klamath County and Jackson County, Oregon. The remaining visitors were from California (approximately 40 percent of total), approximately half of which came from Siskiyou County (approximately 20 percent of total). When asked to indicate all activities participated in while visiting the Lower Klamath Project reservoirs, more than half of the visitors' surveys included resting/relaxing as one of the activities. When surveyed on their perception of crowding at the reservoirs, the mean score of respondents was 3.2 (on a 9-point scale from 1—not crowded to 9—extremely crowded), indicating that visitors did not feel overly crowded while participating in recreation activities. Further, approximately 39 percent of respondents had changed their visits to the Lower Klamath Project reservoirs from other lakes in the area to avoid crowding. When surveyed regarding management options of the reservoirs, survey respondents indicated

opposition to the collection of user fees at either day-use sites or facility campgrounds (PacifiCorp 2004).

In response to the survey question “Has water quality ever affected your visit to the Klamath River area?” approximately two-thirds of recreational users of the Lower Klamath Project reservoirs had negative perceptions of water quality, commenting on its color, turbidity, and odor. The source of visitor concerns was primarily the brown, foamy water in free-flowing reaches and regular, extensive phytoplankton [algae] blooms that occur throughout the reservoirs. Visitors reported that the phytoplankton [algae] produces bad odors, fouls fishing lines, and reduces the area available for fishing, swimming, and wading (FERC 2007).

3.20.2.4 Wild and Scenic River Conditions

Two segments of the mainstem Klamath River are designated wild and scenic rivers, one in Oregon and one in California (Figure 3.20-3). The reach in Oregon, between the J.C. Boyle Powerhouse and the Oregon-California state line was designated a wild and scenic river in 1994. As this section is not in California, it is not analyzed in this EIR.

In California, the entire river beginning 3,600 feet downstream of Iron Gate Dam to the Klamath Estuary (i.e., Middle and Lower Klamath River) is designated a wild and scenic river segment by both the State of California and the federal government. Wild and scenic river segment boundaries include variable-width linear corridors which typically include not more than 320 acres per linear mile (averaging up to approximately 0.5 mile in width along the river corridor). However, some protections for designated outstanding remarkable values can extend beyond the boundaries.

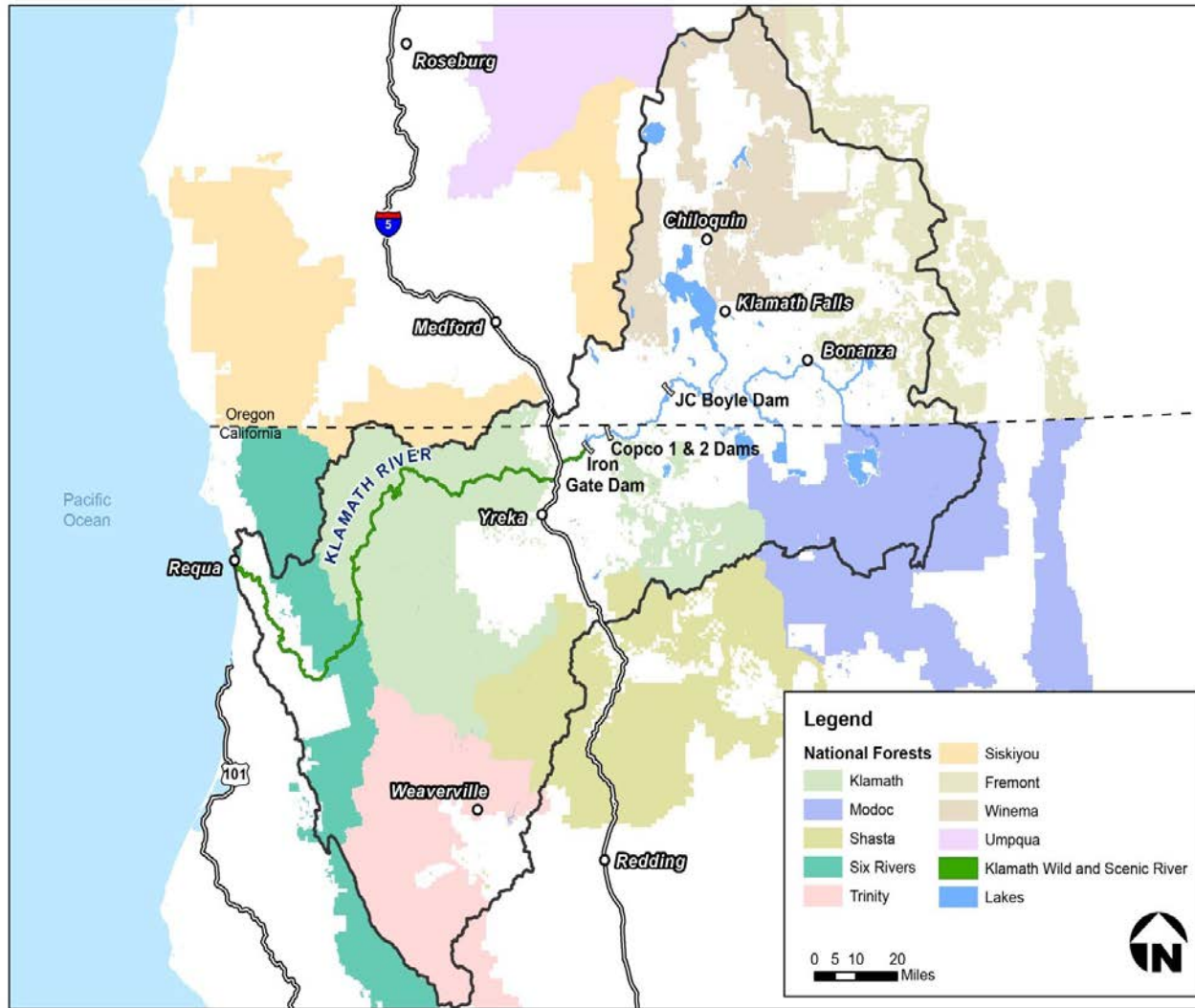


Figure 3.20-3. Klamath Wild and Scenic River Corridor.

California Klamath River Wild and Scenic River Segment

The segment of the Klamath River in California, as well as portions of three tributaries (Salmon and Scott rivers and Wooley Creek), were added to the National Wild and Scenic River System in 1981 through Section 2(a)(ii) of the WSRA. The wild and scenic river portion of the mainstem Klamath River in California is classified as recreational with portions of the tributaries classified as scenic and wild. At the time of listing, the anadromous fishery, including salmon and steelhead, was considered to have the outstandingly remarkable value for the entire 286 miles of the designated segment, which includes the tributaries. For the purposes of evaluating the potential impacts of the Proposed Project on the wild and scenic qualities of this river segment, the following subsections summarize the conditions of the river at the time of the wild and scenic river designation, as well as changes to the condition of the river since the time of the designation that have affected its wild and scenic character.

Scenic Character

Scenery within the wild and scenic river segment of the Klamath River in California is dominated by natural settings. This segment's characteristic river flows, water appearance, anadromous fish, and riparian vegetation within a forested river canyon are the primary scenic aspects. Since 1981, flow regimes have varied moderately in response to water resource competition within the Klamath Basin. During summer months, these variations have typically been caused by water diversions (Van de Water et al. 2006). Copco No. 1 and Iron Gate reservoirs serve as the major sources of large seasonal phytoplankton blooms with the first documented toxic bloom in 2004 (see also Section 2.6 *Project Background* and Section 3.4.2.3 *Hydroelectric Reach*), which when transported into downstream reaches of the Middle and Klamath River reduce water clarity, cause discoloration, and result in surface scums that impair the historic scenic character of the river downstream from Iron Gate Dam. Extensive seasonal periphyton mats that colonize bottom surfaces in the Middle and Lower Klamath River, (see also Section 3.4.2.4 *Middle and Lower Klamath River*) can also result in water coloration, cloudiness, and limitations on depth of view. The level of reduced water clarity, discoloration, limitations on depth of view, and resulting scenic quality effects is dependent on viewer location. Views from on-river, in-river, or riverside viewpoints are most likely to display substantial changes to scenic quality indicators, while these changes are less likely to be noticed as viewed from nearby river canyon roadways and communities.

Similarly, seasonal and project-induced changes in flow and resulting scenic quality changes are more likely to be observed by on-water, in-water, and riverside viewpoints than nearby river canyon roadways and community viewpoints. The scenic quality of the river changes with different flow levels; more banks and mid-channel rocks are visible during low flows. The lowest monthly mean flows on the Klamath River occur in the summer (July and August), which also tends to coincide with the highest visitorship rates. Monthly mean flows below Iron Gate Dam (USGS Gage #11516530) in July and August have generally ranged from around 700 cfs to 1,100 cfs, with a few exceptions in drought years and wet years (USGS 2017). With the exception of 17 months between 1991 and 2004, flows have not dropped below 700 cfs since the dam was built; since 2004, flows have not dropped below 800 cfs (Van de Water et al. 2006 and USGS 2017).

Recreation

Before and since the wild and scenic designation, the flows released from Iron Gate Dam have greatly influenced the downstream Klamath River summer recreation season's whitewater boatability, challenge levels, safety hazards, potential for equipment damage, and the opportunity to access and experience the river's full range of rapids and channels. Exceptionally low summer time flow releases are especially adverse to wild and scenic river boating activities on the Klamath River. Table 3.20-14 compares flows at the time of the 1981 designation to flow conditions required for whitewater boating and recreational fishing (see Table 3.20-6 for optimal flow ranges) (Van de Water et al. 2006).

Table 3.20-14. Comparison of 1981 Flows to the Acceptable Range for Whitewater Boating and Fishing.

Month	Flows (cfs)	Whitewater Boating	Fishing
January	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
February	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
March	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
April	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
May	1,000	In acceptable boating flow range/optimal playboating range	In optimal range
June	710	Does not meet minimum boatable flow or playboating opportunities	Does not meet minimum fishing flow
July	710	Does not meet minimum boatable flow or playboating opportunities	Does not meet minimum fishing flow
August	1,000	In acceptable boating flow range/optimal playboating range	In optimal range
September	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
October	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
November	1,300	In acceptable boating flow range/optimal playboating range	In optimal range
December	1,300	In acceptable boating flow range/optimal playboating range	In optimal range

Source: Van de Water et al. 2006

Key:

cfs: cubic feet per second

Although precise estimates of available recreation days in 1981 are not available, commercial recreational whitewater boating activity on the Klamath River within the Klamath National Forest, increased by approximately 34 percent between 1981 and 2005 (Van de Water et al. 2006). However, commercial activity on the Lower Klamath River has decreased somewhat since 2005 from a recorded 10,695 user days to 8,230 user days in 2009. Private recreational whitewater boating activity has followed a similar pattern, with the greatest number of user days between 1995 and 2005 (ranging from

4,193 to 5,230) and decreasing since 2005 to a low of 3,525 user days in 2009 (DOI 2011).

Water Quality

Water quality influences recreational use and it is one of the criteria considered in a Wild and Scenic River designation. Water quality issues have existed since the time of wild and scenic river designation and there is evidence indicating that these issues may have increased since that time (Kann and Corum 2009, Asarian and Kann 2011, Asarian and Kann 2013). Data collected in the past five years provides further evidence water quality issues continue to persist (Watercourse Engineering, Inc. 2012, 2013, 2014, 2015, 2016). Water quality issues in the Klamath River, including phytoplankton blooms and microcystin toxin from blue-green algae [cyanobacteria], affect river recreation users (also see discussions in Section 3.20.2.2 *Klamath River-based Recreation*, and Section 3.20.2.3 *Lower Klamath Project Reservoir-based Recreation*). Monitoring of blue-green algae [cyanobacteria] species that produce algal toxins conducted by the Karuk Tribe between 2005 and 2007 at 16 nearshore stations in the Klamath River downstream of Iron Gate Dam indicate that nearly 60 percent of samples taken between June and September exceeded the moderate risk level as defined by the World Health Organization (Kann and Corum 2009). Sampling conducted in 2007 shows that microcystin toxin is found as far downstream as the Yurok Reservation, near the river mouth (Kann 2006). In recent years, high levels of microcystin concentrations have continued to be measured during summer months in Copco No. 1 and Iron Gate reservoirs with the microcystin concentrations exceeding the state recommended threshold in recreational waters in most years since 2008 (North Coast Regional Board 2009, 2010, 2012a, 2013, 2014, 2016, 2017a). Microcystin concentrations in the reservoirs and much of the Klamath River exceeded the “Danger Tier II” threshold in August/September 2017 (North Coast Regional Board 2017). In addition, the entire length of the Klamath River’s wild and scenic river section in California currently does not meet North Coast Regional Board water quality objectives for temperature during certain times of the year (North Coast Regional Board 2017b; Watercourse Engineering, Inc. 2012, 2013, 2014, 2015, 2016; Asarian and Kann 2013). Water temperature in the Klamath Basin varies seasonally, with mean monthly temperatures in the river immediately downstream from Iron Gate Dam peaking at approximately 20 to 22.5°C (68 to 72.5°F) in July and August (Asarian and Kann 2013). Daily mean and daily maximum water temperatures during summer typically increase with distance downstream from Iron Gate Dam due to meteorological controls until between Seiad Valley and Orleans, then, as the Klamath River approaches the coast, the daily mean and daily maximum water temperatures decrease with distance downstream due to the influence of cooler coastal air temperatures as well as incoming flow from cooler tributaries such as the Salmon and Trinity rivers (Basdekas and Deas 2007, Asarian and Kann 2013). A detailed description of existing water quality is provided in Section 3.2.2 *Environmental Setting* and Appendix C.

Fisheries

The Klamath River was designated a wild and scenic river from 3,600 feet downstream of Iron Gate Dam to the mouth because of its free-flowing condition and its outstandingly remarkable anadromous fisheries, including that of salmon and steelhead trout. Even at the time of designation, decreasing salmonid trends in the Klamath River system were identified as being affected by various factors, including dam construction and operations related to hydropower generation in the Klamath River (Snyder 1931; DOI 1980; see also Section 3.3.2.1 *Aquatic Species*). Such factors have resulted in

increased summer water temperatures, changed the natural flow regime, decreased dissolved oxygen levels in portions of the river, and blocked access to more than 350 miles of anadromous salmonid spawning, incubation, and rearing habitat.

Fisheries and the associated fisheries wild and scenic river conditions in the Klamath River are also affected by the coarse sediment deficit resulting from sediment trapping in the Lower Klamath Project developments, which has resulted in coarsening of the channel bed and a reduction in the size and frequency of mobile coarse sediment deposits in a limited downstream channel extent. Because tributaries downstream of Cottonwood Creek supply most of the coarse sediment to the mainstem Klamath River under both unimpaired and current conditions, the effects of reservoir sediment trapping are limited to the reach between J.C. Boyle Reservoir and approximately the Scott River. As discussed for fisheries resources in Section 3.3.2.3 *Habitat Attributes Expected to be Affected by the Proposed Project*, reduced coarse sediment delivery to this reach has reduced the amount and quality of spawning gravel deposits and disrupted the geomorphic processes that create and maintain aquatic habitats (Buer 1981, PacifiCorp 2004). Although the reach downstream of Iron Gate Dam was historically a prime spawning area, by 1981 the reach produced few salmon and the riffles within the reach contained cobbles too large for salmon to move. Prior to the construction of Iron Gate Dam and the 1981 wild and scenic river designation, the reach between Iron Gate Dam and Shasta River was scoured by daily peak flows from Copco No. 1 and Copco No. 2 operations (Van de Water et al. 2006).

Given the findings of the 2006 study, it appears that much of the riverbed coarsening had occurred prior to the wild and scenic river designation (Van de Water et al. 2006). However, impacts from dams progress over time so continued sediment depletion (by the retention of sediment behind the dams) is expected to continue to worsen spawning habitat below Iron Gate Dam (Ligon et al. 1995, Kondolf 1997, Grant et al. 2003).

River flows also affect fisheries' population and abundance. Table 3.20-14 shows the monthly flows at the time of the Klamath River's wild and scenic river designation. Flows are a key component of cumulative effects from water management on the aquatic environment. The flow regime downstream from Iron Gate Dam affects aquatic resources through instream flow influences on physical habitat (depth, velocity, substrate, and cover) and on water quality that may affect the prevalence of disease pathogens (Bartholow et al. 2005). See Section 3.1.6 *Summary of Available Hydrology Information for the Proposed Project* for a discussion of the Klamath River flows under the Proposed Project.

Estimates of abundance for anadromous fisheries in California at the time of the wild and scenic river designation are not available for all species. Table 3.20-15 provides estimates of abundance at the time of designation, or as near as possible to the time of designation for those species for which data is available. As discussed in Section 3.3.2.1 *Aquatic Species*, the abundance of anadromous fisheries has decreased since the time of the wild and scenic river designation. Specific units of coho salmon in the Klamath River were listed as threatened under the ESA in 1997. Similarly, green sturgeon was listed by NMFS as a Species of Concern in 2005 and designated as threatened under the ESA in 2010. The resident (i.e., non-anadromous) Lost River and shortnose suckers endemic to the Upper Klamath Basin of southern Oregon and northern California were designated as endangered in 1988 after the wild and scenic river designation.

Table 3.20-15. Estimated Abundance of Fish Species at the 1981 Wild and Scenic River Designation.

Species	Estimated Abundance
Fall Chinook salmon	Natural spawners – 4,000 (1981)
	Iron Gate hatchery spawners – 21,595 (1981)
Coho salmon	3,400 (1984)
Summer Steelhead	110,000 (average 1977–1991)
Winter Steelhead	20,000 (average 1977–1991)

Source: Van de Water et al. 2006

Wildlife

Wildlife populations have not been systematically surveyed on the Klamath River. Baseline data were not collected in 1981; therefore, population numbers or trends are not available for most species in specific areas like the wild and scenic river corridor.

Riparian vegetation provides habitat for feeding, breeding, and sheltering for willow flycatchers, western pond turtles (a species of special concern in California), and various other wildlife species along the Klamath River. There is no reference condition for the riparian vegetation in 1981 (Van de Water et al. 2006). The Proposed Project area and the area within the Klamath River corridor includes a large number and diversity of wildlife species. Surveys conducted by PacifiCorp in 2002 and 2003 identified five amphibian species, numerous bird species, including 19 species of birds of prey, and numerous mammal species, including black-tailed jackrabbit, mule deer, and California ground squirrels. See Section 3.5 *Terrestrial Resources* for further discussion of wildlife populations within the Klamath River corridor.

Eligible and Suitable Wild and Scenic River Section on the Klamath River

In 1990, BLM found the 5.3-mile section of the Klamath River from the California-Oregon state line to the slack water of Copco No.1 Reservoir to be eligible and suitable for wild and scenic river designation under Section 5(d)(1) of the WSRA. The river segment is free-flowing and possesses outstandingly remarkable scenic, recreational, fish, and wildlife values. This river segment is not a designated wild and scenic river and is not protected under the WSRA and its Section 7(a) requirements. The BLM is required, within its authorities, to protect this suitable river segment's free-flowing character, water quality, and outstandingly remarkable river values. This segment of the Klamath River is also listed on the Nationwide Rivers Inventory (NPS 2009). If a river is listed in the Nationwide Rivers Inventory, the federal agency involved with the action must consult with the land managing agency in an attempt to avoid or mitigate adverse effects of any proposed water resources projects. This consultation is required pursuant to a directive from the Council on Environmental Quality.

3.20.3 Significance Criteria

Criteria for determining significance on recreational opportunities are based on Appendix G of the CEQA Guidelines (California Code of Regulations title 14, section 15000 et seq.) and professional judgement. As the Appendix G checklist questions for recreational impacts are limited, two additional criteria were added for this EIR as there is potential for impacts on a variety of users and uses under the Proposed Project.

Impacts from the Proposed Project would be considered significant if any of the following criteria are met:

- Changes to or loss of rare or unique recreational facilities affecting a large area or substantial number of people.
- Significant increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.
- Construction of new or expansion of existing recreational facilities which might have an adverse physical effect on the environment.
- Affect identified resource values in a wild and scenic river segment (i.e., scenic, recreational, fish, and wildlife) such that the long-term wild and scenic river designation or eligibility for listing would be compromised.

3.20.4 Impact Analysis Approach

The impact analysis for recreational resources considers the potential implications of the Proposed Project on changes to river- and reservoir-based recreation opportunities, activities, and settings within the Area of Analysis. Short-term and long-term effects on access, flow-dependent recreational activities, recreational fishing, and other recreational activities associated with the existing Klamath River corridor and reservoir recreational facilities within the Area of Analysis are described. The relocation of the City of Yreka's water supply pipeline is not expected to result in any impacts to recreational resources; therefore, it is not addressed in this section of the EIR.

3.20.4.1 Recreational Setting, Facilities, and Access

Likely changes to recreational use and access were assessed qualitatively, including changes from reservoir-based recreational opportunities to more river-based opportunities in the areas where the Lower Klamath Project dams, recreational facilities, and/or PacifiCorp facilities would be removed. The short-term effects analysis includes a discussion of potential areas where recreational access would be restricted during construction activities. The assessment of long-term effects considers potential changes in the recreational setting and experience, changes in water quality and reservoir area revegetation for Klamath River-based recreational opportunities, as well as potential impacts on regional recreational facilities due to increased use.

3.20.4.2 Whitewater Boating Opportunities

Optimal and acceptable flows for whitewater boating opportunities along reaches of the Klamath River were assessed as a part of the technical review completed for the Proposed Project. The range of acceptable flows resulted from the Final Technical Report, Klamath Hydroelectric Project (PacifiCorp 2004). Flow values that fall within these ranges are considered acceptable flow levels for the various activities (see Table 3.20-6).

Hydrologic modeling was used to assess changes in the availability of acceptable flows under the various alternatives. The modeling results for each water year type were subjected to a statistical analysis (paired T-tests) to determine whether the difference in number of days meeting the acceptable range of flows following dam removal (both on an annual and monthly basis) would be statistically significant. A qualitative approach

was used to assess the effects of the identified alternatives on whitewater boating access and existing whitewater boating opportunities.

3.20.4.3 Recreational Fishing Opportunities

The results of the hydrologic modeling were used to: determine whether changes in flow would affect recreational fishing opportunities (i.e., the number of days with optimal flows for recreational fishing); qualitatively assess potential changes in fisheries populations and abundance; and determine effects of changes from reservoir-based fishing opportunities to river-based opportunities.

3.20.4.4 Other Recreational Opportunities

The analysis also includes an assessment of other recreational activities, such as sightseeing, swimming/wading/tubing, fish and wildlife viewing, and camping that occur within the river corridor and a qualitative discussion of the effects of the various alternatives on these activities. The discussion here covers both anticipated short-term effects, such as construction-related effects, and long-term effects, such as changes in reservoir-based swimming opportunities.

3.20.4.5 Wild and Scenic Rivers

Evaluation criteria for each of the four protected resources specified in the WSRA Section 7 (a) (i.e., scenic, recreational, fish, and wildlife) have been developed to assess the effects of the Proposed Project as compared with conditions at the date of the Klamath River's designation into the National Wild and Scenic Rivers System (see Section 3.20.2.4 *Wild and Scenic River Conditions*). The type (positive or negative) and duration (short term or long term) of the effects are described, and the magnitude of these effects is analyzed. The effects are characterized as unchanged, beneficial, or adverse (or similar conclusion), by value (i.e., scenic, recreational, fisheries, and/or wildlife), for that resource.

Scenery was evaluated using the following criteria:

- Water flow character (river flows and accompanying river width, depth, and channel inundation or exposure)
- Water appearance (clarity, turbidity, depth of view, color, prominence of phytoplankton and periphyton)
- Fish and wildlife viewing
- Riparian vegetation
- Natural appearing landscape character (the visual effects of facilities and structures as viewed from within the designated wild and scenic river corridor)

Recreation was evaluated using the following criteria:

- Whitewater boating
- Recreational fishing
- Other recreational activities (water play, swimming, camping)
- Recreational setting (water quality related aesthetic odors, tastes, contacts, and public health and safety aspects)

Fishery was evaluated using the following criteria:

- Stream flow regime
- Water temperature
- Water quality (physical, biological, and chemical)
- Aquatic habitat (geomorphic condition, sediment transport regime, and substrate quality)
- Fish species population conditions, specifically:
 - Anadromous salmonid fish species
 - Resident fish species
 - Species traditionally used and culturally important to Native Americans

Wildlife was evaluated using the following criterion:

- Changes in habitat for affected species

3.20.5 Potential Impacts and Mitigation

Potential Impact 3.20-1 Effects on existing recreational facilities and opportunities due to access restrictions, noise, dust, and/or sediment release resulting from construction activities.

Construction activities associated with dam removal would result in temporary loss of access to recreational facilities at the Lower Klamath Project reservoirs and associated reservoir-based recreational opportunities. Access could remain restricted for an additional period following completion of dam removal as restoration activities are conducted on the former reservoir area and existing recreational areas are modified to accommodate the new river channel. However, as described above in Section 3.20.2.1 *Regional Recreation*, a number of reservoirs, lakes, and rivers are present within and adjacent to the Klamath Basin and provide similar opportunities for recreational activity. Therefore, temporary impacts on recreational access in the vicinity of Iron Gate and Copco No. 1 reservoirs would be less than significant.

As described in Potential Impact 3.9-1 and Potential Impact 3.23-1, the use of heavy vehicles and equipment during dam removal activities, and to a much lesser degree during restoration, would result in increases in dust and ambient noise in the vicinity of the Proposed Project. These activities will primarily occur over a period of approximately one and a half years; however, in any one location, there will generally be less than six months of nuisance generating activities (see Table 2.7-1). These increases could indirectly result in a decrease in the quality of recreational experiences at nearby facilities that would not have restricted access during construction (e.g., river access, trails, and private parks not directly affected by construction and reservoir drawdown). Specific effects related to dust and noise during construction are discussed in detail in Potential Impact 3.9-1 and Potential Impact 3.23-1, respectively.

With regard to recreational activities, increases in ambient noise and air pollutants could impede visitors' ability to rest and relax, and disrupt bird and wildlife viewing opportunities. These effects would last for the duration of demolition activity and during initial restoration activities. However, as shown in Figures 3.20-2(a-c), the majority of recreation facilities and access points at the Lower Klamath Project reservoirs and along

the Hydroelectric Reach are located a fair distance away from the Lower Klamath Project dams and would continue to provide opportunities for recreation until drawdown is completed. Because noise and dust impacts decrease with increasing distance from the source, impacts at these recreational facilities will be minimal. Further, as described in Section 3.20.2.1 *Regional Recreation*, numerous other recreational facilities are available outside the area of affect, but within the vicinity of the Iron Gate and Copco No. 1 reservoirs that provide similar recreational opportunities (Table 3.20-4). Therefore, these temporary noise and dust impacts would be less than significant.

As discussed in Potential Impact 3.2-3, drawdown of the reservoirs would result in short-term increases in turbidity (also expressed as suspended sediment concentration) downstream from the Lower Klamath Project reservoirs. Elevated turbidity would be most pronounced immediately downstream from Iron Gate Dam to Bogus Creek and it would become less noticeable farther downstream due to dilution from tributary flows entering the Klamath River. Modeling of suspended sediment concentrations during drawdown indicates suspended sediment concentrations would decrease to 60 to 70 percent of the initial value by Seiad Valley (RM 132.7) and to 40 percent of the initial value downstream of Orleans (approximately RM 59). Turbidity in the Klamath River is anticipated to flush through the system relatively quickly, but elevated turbidity is conservatively anticipated to occur for six to ten months following drawdown based on modeling of suspended sediment concentrations (USBR 2012a). Sediment jetting would occur during drawdown maximize erosion of accumulated sediments during this period and potentially reduce turbidity after drawdown concludes, and immediate revegetation will occur to further minimize the potential for prolonged increases in turbidity. Turbidity in the Klamath River is expected to resume natural background levels by the end of post-dam removal year 1 regardless of the water year type based on modeling of suspended sediment concentrations (USBR 2012a) (see Potential Impact 3.2-3 for more details).

The increase in turbidity would reduce visibility for boaters, swimmers, and fishermen during the sediment flushing period and could result in reduced public participation for these activities (e.g., swimmers might be less likely to enter the river, and fishermen might be less successful due to the reduced water clarity). Increased turbidity would also affect swimmer safety considerations if swimmers are unable to see the river bottom or navigate around obstacles, such as large boulders or logs beneath the water surface. However, impacts would be temporary; following completion of reservoir drawdown activities, water quality and clarity would be expected to improve as sediments are flushed downstream and into the Pacific Ocean. Due to naturally high levels of turbidity in the river during winter flows, increased turbidity from the Proposed Project would not be noticeable for most of the drawdown period. In addition, turbidity impacts primarily would occur for a period of approximately six to ten months, with turbidity decreasing with distance downstream of Iron Gate Dam due to dilution from tributary flows entering the Klamath River. Turbidity would likely be only slightly above or similar to natural background turbidity in the Klamath River downstream of Seiad Valley (RM 132.7) by mid-May following drawdown based on a comparison of model SSCs during drawdown and natural background SSCs, except during dry water year types when turbidity may remain above natural background turbidity until after September (USBR 2012a). While opportunities for fishing and swimming in the vicinity of the Klamath River, including the area where Copco No. 1 and Iron Gate reservoirs are located, would be reduced during the drawdown period when these recreational activities would typically be low, opportunities for fishing and swimming in the Klamath

River downstream of Seiad Valley (RM 132.7) during the deconstruction period would be similar or slightly reduced compared to existing conditions since turbidity would only be slightly above or to similar to natural background turbidity levels during most water year types. Additionally, opportunities for fishing and swimming would remain available in tributaries of the Klamath River during both drawdown and deconstruction. As such, the Proposed Project would not result in changes to or loss of rare or unique recreational facilities affecting a large area or substantial number of people; therefore the impacts are less than significant.

Sediment release could also decrease the quality of water-contact-based recreational opportunities if sediment released downstream resulted in longer-term deposition in pools, eddies, slack water, and beaches and decreased the availability of these areas for recreational activity. As discussed in Potential Impact 3.11-5, modeling was conducted to determine the potential for such deposition following dam removal activities. The results of the modeling indicate that following dam removal activities, short-term deposition of fine and coarse sediment would occur primarily between Iron Gate Dam and Cottonwood Creek and average river bed elevation would change (i.e., increase or decrease) by up to 1 foot (see Figure 3.11-15). The Proposed Project was developed to allow reservoir drawdown to occur during winter months when precipitation, river flows, and turbidity are naturally highest. Suspended sediment concentrations would be highest during the period of greatest reservoir drawdown (January through mid-March of dam removal year two), as erodible material behind the dams is mobilized downstream (see also Potential Impacts 3.2-3 and 3.11-6). During normal to dry water years, suspended sediment concentrations would begin to decline in late March and would continue declining through early summer. If it is a wet year, it may take longer to drain the reservoirs and the high concentrations may extend until June. Suspended sediment concentrations would return to near background conditions for all water year types within the first year following removal (see also Potential Impact 3.2-3). Therefore, it is unlikely that sediment release would decrease the availability of pools, eddies, or beaches for recreational activity, even temporarily, and impacts on the quality of water contact-based recreational opportunities would not be significant.

Overall, the impacts of construction and restoration activities are limited in temporal and geographic scope and so would not result in changes to or loss of rare or unique recreational facilities affecting a large area or substantial number of people. Nor would they result in a significant temporary increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. Tables 3.20-2, 3.20-3, and 3.20-4 show that there are numerous alternative recreational facilities and access outside the area of affect, but within the vicinity. Most of these facilities experience low to moderate use levels and they can accommodate additional users. Recreational users who are temporarily displaced would be able to use these other areas, but they are unlikely to overload the other areas because those areas have sufficient capacity to accept them. Therefore, impacts will be less than significant.

Significance

No significant impact

Potential Impact 3.20-2 Long-term changes to or loss of reservoir-based recreation activities and facilities due to removal of Iron Gate and Copco No. 1 reservoirs.

The removal of Iron Gate and Copco No. 1 reservoirs under the Proposed Project would eliminate existing opportunities for reservoir-based recreation activities, such as power boating, waterskiing, lake swimming, and flat-water boat angling. Copco No. 2 Reservoir is very small and has no recreational facilities or access. As discussed in Section 3.20.2.3 *Lower Klamath Project Reservoir-based Recreation*, Iron Gate and Copco No. 1 reservoirs are popular recreational areas for sightseeing, fishing, camping, swimming, boating, and wildlife viewing, and they attract visitors primarily from the surrounding communities in Klamath and Jackson counties, Oregon and Siskiyou County, California. As indicated in the responses to visitor use surveys conducted by PacifiCorp (2004), the reservoirs are popular recreation areas in part because they are uncrowded relative to other lakes in the area and do not require user fees. Some activities associated with reservoir recreation could still be possible in the restored river channel (e.g., swimming and wading). However, due to increased flows, certain reservoir-based recreation such as swimming opportunities and flat-water boating may be limited in the restored river channel during certain times of year and in wet water years.

Thus, under the Proposed Project there would be a long-term loss of local reservoir-based recreational activities at Iron Gate and Copco No. 1 reservoirs, but there would be no change from existing conditions in reservoir-based recreational activities at Copco No. 2 since it has no recreational facilities or access.

However, a number of other lakes and reservoirs are in the vicinity of the Lower Klamath Project reservoirs and provide similar opportunities for recreation in an uncrowded setting (Table 3.20-4). Specifically, Fourmile Lake, Agency Lake, Applegate Reservoir, and Medicine Lake, located from 26 to 46 miles away from the Lower Klamath Project reservoirs, each have generally low-use levels as well as similar or greater surface area, a greater number of developed campsites, and a similar number of improved boat launches compared with Iron Gate and Copco No.1 reservoirs (PacifiCorp 2004). As described in Section 3.20.2.1 *Regional Recreation* (in particular, see Table 3.20-4), there are more than 85 boatable lakes in Klamath and Jackson Counties in Oregon and Siskiyou County in California that are within 100 miles of the Lower Klamath Project reservoirs and provide similar facilities and activities. The Lower Klamath Project reservoirs only account for less than 1.5 percent of the surface area of the regional lakes, 2.2 percent of the developed campsites and 1.1 percent of the boat launches. The percent of picnic areas was not calculated, because Table 3.20-4 only includes day-use only picnic areas and does not include day-use areas that are also associated with overnight facilities. In addition, there are a multitude of other recreational facilities in the region; Table 3.20-1 lists public lands, but there are private facilities as well. Also, approximately two-thirds of recreational visitors to the Lower Klamath Project reservoirs had negative perceptions of water quality, stating concerns of bad odors and phytoplankton (e.g., blue-green algae) blooms, which restrict areas available for fishing, swimming, and wading (PacifiCorp 2004). Therefore, the loss of Iron Gate and Copco No.1 reservoirs under the Proposed Project would not result in a long-term loss in regional lake-based recreational activities that would affect a large area or a substantial number of people.

With respect to local recreational facilities and access points, the Proposed Project would completely remove most of the existing recreational sites at Iron Gate, Copco No. 1, and J.C. Boyle reservoirs, which primarily provide fishing, boating, and day-use

access to the three reservoirs. Several existing recreational sites also provide camping facilities for overnight use. Decommissioning of these facilities would include removal of structures, concrete and pavement, regrading and revegetation of associated parking areas, access roads, and other improvements (Appendix B: *Definite Plan – Appendix Q*). Facilities at Fall Creek and Jenny Creek Day-Use Areas at Iron Gate Reservoir, Topsy Campground at J.C. Boyle Reservoir, and the Iron Gate Fish Hatchery Day-Use Area downstream of Iron Gate Reservoir, would remain, where possible, and be upgraded or enhanced (Appendix B: *Definite Plan – Appendix Q*). In addition, most existing river access facilities would be retained and upgraded.

The Proposed Project includes a Recreation Plan (see Appendix B: *Definite Plan – Appendix Q* for the Draft Recreation Plan) that would be used to identify new recreation opportunities that offset the proposed removal of reservoir recreation sites as well as the reduction in whitewater boating days resulting from the Proposed Project (see Potential Impact 3.20-5 for a discussion of whitewater boating). KRRRC has started an ongoing stakeholder outreach process seeking input from potentially impacted recreation users, operators, managers and administrators, including tribes, state and federal agencies, county agencies and chambers of commerce, local residents, recreation businesses, and public interest groups. The stakeholder outreach process would continue through the development of the Final Recreation Plan, which is scheduled for completion by KRRRC in June 2019. The Draft Recreation Plan includes potential recreation opportunities identified in the USBR (2012) Detailed Plan as well as those identified through recent stakeholder outreach efforts. The Draft Recreation Plan also outlines preliminary criteria for screening opportunities, including whether each recreation opportunity would: “*directly address the recreation impacts generated by the KHSA;*” and “*directly address or offset changes in the localized reservoir recreation or Hells Corner boating near where the impacts are occurring.*” In addition, the Proposed Project includes the transfer of approximately 8,000 acres of real property (Parcel B lands; see also Section 2.7.10 *Land Disposition and Transfer*) located in Klamath County, Oregon, and Siskiyou County, California, to the respective states (or a designated third party) for public interest purposes, including river-based recreation, open space, active wetland and riverine restoration, and public education.

The Proposed Project would result in the loss of the locally popular fishery for non-native fishes including largemouth bass, trout, catfish, crappie, sunfish, and yellow perch (Hamilton et al. 2011). Fishing is popular in Copco No. 1 and Iron Gate reservoirs, especially for yellow perch, with one fishing guide (Shaffer 2005) considering the reservoirs the best yellow perch fishery in California. Without the Lower Klamath Project dams, fishing for non-native warm water species would be lost at the Lower Klamath Project reservoirs. While the yellow perch fishery in the reservoirs is considered by Shaffer (2005) to be the best in California, it does not constitute a unique recreational resource since there are other yellow perch fishing opportunities near the Copco No. 1 and Iron Gate reservoirs in northern California and southern Oregon, including Emigrant Lake (Ashland Daily Tidings 2009). Additionally, fishing tournaments like the largemouth bass tournaments (e.g., Rogue Valley Bassmasters) in Iron Gate Reservoir would no longer occur under the Proposed Project (Hamilton et al. 2011). However, yellow perch fishing and bass tournaments occur in dozens of lakes in northern California and southern Oregon, including some of those listed in Table 3.20-4, because these non-native fish occur over large areas of the Western United States. Thus, Copco No. 1 and Iron Gate reservoirs do not constitute a unique recreational resource with respect to perch, largemouth bass, and other warm water fishing. Steelhead, trout, and salmon

fisheries would be enhanced by the Proposed Project, since Lower Klamath Project reservoir habitat would be replaced by riverine habitat that supports these cold water species. Lastly, the loss of warm-water fishing in Iron Gate and Copco No. 1 reservoirs does not represent the loss of a recreational resource that would affect a large number of people. Therefore, fishing-related impacts from the Proposed Project would be less than significant.

Given that a number of other lakes and reservoirs in the vicinity of the Lower Klamath Project provide similar opportunities for reservoir-based recreation in an uncrowded setting, KRRRC's proposal to retain and enhance most existing river access facilities within the Area of Analysis for recreation, and Parcel B land transfer under the Proposed Project that would potentially allow for additional future river-based recreation opportunities, the Proposed Project would be highly unlikely to result in a loss of rare or unique recreational facilities affecting a large area or substantial number of people. In addition, the KRRRC has prepared a Draft Recreation Plan (Appendix B: *Definite Plan – Appendix Q*) that includes stakeholder outreach, identification of potentially new or modified recreational facilities as well as evaluation and screening criteria, which will further reduce any potential impacts.

Significance

No significant impact

Potential Impact 3.20-3 Significant increase in the use of regional recreational facilities due to loss of Iron Gate and Copco No. 1 reservoirs, such that substantial physical deterioration or acceleration of deterioration of the regional facilities would occur.

The Proposed Project would result in the loss of reservoir-based recreational facilities at Iron Gate and Copco No. 1 reservoirs, but this impact is not significant for the reasons discussed in Potential Impact 3.20-2. While the Proposed Project also includes the creation of additional recreational facilities and opportunities, the types of river-based recreational opportunities available following dam removal activities, including camping in a river setting as opposed to camping in a lake/reservoir setting, may not appeal to the same recreational users who currently visit and recreate at Iron Gate and Copco No. 1 reservoirs. In other words, while new recreation opportunities would exist along the restored river corridor, there could be a change in user type.

A number of other lakes and reservoirs are in the vicinity of the Lower Klamath Project reservoirs and provide similar opportunities for recreation in an uncrowded setting for people specifically seeking lake or reservoir-based recreation (Table 3.20-4). Specifically, Fourmile Lake, Agency Lake, Applegate Reservoir, and Medicine Lake, are located from 26 to 46 miles away from Iron Gate and Copco No.1 reservoirs, and each exhibits generally low use-levels as well as similar or greater surface area, number of developed campsites, and number of improved boat launches. Within Klamath County and Jackson County, Oregon, and Siskiyou County, California, there are more than 85 boatable lakes, containing nearly 40 boat ramps (Boat Escape 2017). There are also more than 180 high-elevation and wilderness lakes in Siskiyou County (FERC 2007). In addition to boat ramps, these lakes provide nearly 2,300 developed campsites within less than a two-hour drive from Iron Gate and Copco No. 1 reservoirs (Table 3.20-4). The Lower Klamath Project reservoirs only account for less than 1.5 percent of the surface area of the regional lakes, 2.2 percent of the developed campsites and 1.1 percent of the boat launches. In addition, there are a multitude of other recreational

facilities in the region; Table 3.20-1 lists public lands, but there are private facilities as well. Given the number and proximity of these regional lakes, as well as other lakes and reservoirs summarized in Table 3.20-1, the loss of Iron Gate and Copco No. 1 reservoirs under the Proposed Project would not be a significant impact because it would not result in a substantial increase in the use of regional lake and reservoir recreational facilities such that deterioration of those facilities would occur or be accelerated.

Significance

No significant impact

Potential Impact 3.20-4 Effects on the environment due to construction of new or expansion of existing recreational facilities.

As described previously, the Proposed Project involves the development and implementation of a plan to construct new recreational facilities and river access points along the restored river channel between the California-Oregon border and Iron Gate Dam following dam removal activities. Replacement of recreation facilities would not necessarily be “like for like”, but rather would be designed to accommodate similar levels, if different types of use. This would require the creation of new gravel roads and other improvements for vehicle and visitor access to and use of the new river-based recreation sites, which could result in construction-related impacts to the environment, including potential impacts to water quality and historical and/or tribal cultural resources.

While new recreation facilities are part of the Proposed Project, the final location, size, and design of the facilities are still under development and will be the subject of subsequent approvals. It is thus too soon to conduct a meaningful environmental analysis of the replacement facilities. However, construction and operation of new recreational facilities would undergo any environmental review necessary for the subsequent approvals, and any impacts of the construction and operation of the facilities would be mitigated, if feasible, to levels that comply with all applicable laws, regulations, and environmental standards. Because this component of the Proposed Project would not be approved until a later date, for the purposes of this EIR the impacts of this component are not significant.

Significance

No significant impact

Potential Impact 3.20-5 Changes to or loss of river conditions that support whitewater boating.

Dam removal activities would not affect whitewater boating access locations, as access areas are at established places along the Klamath River channel, outside of the Lower Klamath Project reservoirs and would not be affected by dam removal activities. As discussed in the impact analysis above and in Potential Impact 3.11-6, drawdown of the reservoirs would not result in substantial changes to the floodplain or river channel. Thus, no impacts to land-based recreational facilities would be expected. Therefore, there would be no adverse impacts on whitewater boating access downstream of Iron Gate Dam. However, in the reaches between the existing dams, particularly in the Hell’s Corner Reach, whitewater boating access would likely be temporarily affected due to dam removal activities and sedimentation, as discussed previously. However, these short-term impacts on whitewater boating access locations would be less than significant.

The average number of days providing acceptable river flows in specific reaches each month was modeled for specific recreational activities as part of the 2012 KHSA EIS/EIR under the KBRA Flows (see Appendix S). However, flow requirements in the Klamath River have changed since the modeling for the 2012 KHSA EIS/EIR was performed, with 2013 BiOp Flows replacing the KBRA Flows as detailed in Section 3.1.6 *Summary of Available Hydrology Information for the Proposed Project* and Appendix S.

Differences in the monthly flow ranges between the 2013 BiOp Flows and the KBRA Flows result in changes to the previously-modeled number of days with acceptable flows for whitewater boating during certain months. The greatest differences would occur during summer and fall in the Klamath River reaches between Keno and Iron Gate dams due to variations in the amount of time flows would be within the acceptable range for whitewater boating between the 2013 BiOp Flows and the KBRA Flows. Whitewater boating requires a minimum flow of 1,000 cfs to 1,300 cfs in the Keno, J.C. Boyle Bypass, and Hell's Corner reaches of the Klamath River. In July through September, KBRA Flows would exceed 1,000 cfs during wet water years, with KBRA Flows exceeding 1,300 cfs during wet water years in July. However, the 2013 BiOp Flows would remain below 1,000 cfs during all water year types between July through September, so the number of days whitewater boating could occur between July and September in the Keno, J.C. Boyle Bypass, and Hell's Corner reaches of the Klamath River would be zero under the 2013 BiOp Flows. Conversely, in October the average number of days of whitewater boating would increase under the 2013 BiOp Flows relative to the KBRA Flows since the 2013 BiOp Flows exceed 1,000 cfs in 30 percent of years, but the KBRA Flows are always below 1,000 cfs. Overall, the average number of days supporting whitewater boating for all water year types between Keno and Iron Gate dams would decrease under the 2013 BiOp Flows compared to under the KBRA Flows, since decreases in July through September are expected to be greater than an increase in October (see Appendix S for more detail). Downstream of Iron Gate Dam, the differences between the 2013 BiOp Flows and the KBRA Flows would not significantly alter the previously modeled average number of days whitewater boating could occur because the flow variations would occur within the range of acceptable flows for whitewater boating. Thus, the average annual number of days estimated by the previous modeling downstream of Iron Gate Dam is generally representative of trends and conditions under the 2013 BiOp Flows (see Appendix S for more detail).

Model results under the KBRA Flows indicate that the changes in the availability of flows within the acceptable flow ranges for whitewater boating and fishing opportunities would be negligible for the reaches downstream from Iron Gate Dam. As previously discussed, whitewater boating opportunities under the Proposed Project with 2013 BiOp Flows would be similar to model results under the KBRA Flows downstream of Iron Gate Dam. Dam removal activities would likely improve access and create new opportunities in the reservoir reaches, which would benefit whitewater boating opportunities in this area. Given negligible changes in flows and improvements in access, impacts in reaches downstream from Iron Gate Dam would not be significant.

The reaches of the Klamath River that are currently inundated by the existing Copco No. 1 and Iron Gate reservoirs would be converted to free-flowing riverine reaches over the long term, and depending on the river channel and access, could provide additional opportunities for whitewater boating in these reaches. However, river flows following dam removal activities were not modeled for areas currently inundated by reservoirs. While it could be expected there would be additional opportunities for whitewater boating

in these reaches, no records exist of the condition or suitability of the presently inundated areas for whitewater boating activities. With details of the condition of these areas lacking, it is too speculative to determine the quality and quantity of whitewater boating opportunities that could be realized due to dam removal activities in areas currently inundated by reservoirs. Accordingly, this analysis does not rely on the creation of whitewater boating opportunities in these reaches.

In contrast, for the Copco No. 2 Bypass Reach, model results indicate there would be a substantial increase in whitewater boating opportunities during the July through September time period. Comparison of the monthly range of KBRA Flows utilized in the modeling with the 2013 BiOp Flows indicates that the whitewater boating opportunities during the July through September time period would still increase under 2013 BiOp Flows, but the magnitude of the increase may be more than modeled under the KBRA Flows for the 2012 KHSA EIS/EIR. The flows would be more likely to be within the range of acceptable flows for whitewater boating in the Copco No. 2 Bypass Reach (i.e., 600 cfs to 1,500 cfs) under 2013 BiOp Flows than the modeled KBRA Flows, especially during July (see Appendix S for more detail). The increase in the number of days with acceptable flows for whitewater boating would be a long-term beneficial effect on whitewater boating in the Copco No. 2 Bypass Reach.

In the J.C. Boyle Bypass Reach, modeling done in 2012 under the KBRA Flows show an increase in the average annual number of days with acceptable flows for whitewater boating during the July through September time period after implementation of the Proposed Project. Under the Proposed Project with 2013 BiOp Flows there would be no increase in the whitewater boating opportunities in the J.C. Boyle Bypass Reach. Similar to baseline conditions, Klamath River flow between July and September would remain below the minimum flow necessary for whitewater boating in this reach (i.e., 1,000 cfs) under the 2013 BiOp Flows, so the average annual number of days with acceptable flows for whitewater boating under the Proposed Project would be similar to the model results for the No Project scenario (see Appendix S for more detail). With the Proposed Project operating under the 2013 BiOp flow regime, there would be no impact on whitewater boating in the J.C. Boyle Bypass Reach.

The Hell's Corner Reach is located partially in California and partially in Oregon. This stretch of river would be impacted by removal of the J.C. Boyle Dam, which is part of the Proposed Project and is located in Oregon. Since potential impacts to flows in the Hell's Corner Reach were brought up as an issue during the Lower Klamath Project scoping process, and because the impacts would also occur in California, a discussion and analysis is included in this EIR. Currently, the Hell's Corner Reach is the only Class IV+ rapids in the region with late summer flows. Whitewater rafters can boat on the Hell's Corner Reach from April through October due to hydroelectric peaking power and flows historically generated by J.C. Boyle Powerhouse to meet high power demand periods. This typically occurs for four hours, between 10 a.m. and 2 p.m. each day. It also happens approximately 15 to 20 days per month in July, August and September. Additionally, flow peaking occurs on a predictable schedule, which is highly favorable for commercial boating operations. The vast majority of rafting is performed by permitted commercial outfitters, due to the technical difficulty of the run and lack of access to scouting points. There are 10 outfitters, which take up to 200 clients down the river per day, primarily between July and September, and BLM has set an overall carrying capacity of 250 people per day on this stretch of river (DOI 2011).

In the Hell's Corner Reach, there would be loss of acceptable flows for whitewater boating opportunities with the Proposed Project as compared to existing conditions. The minimum flow necessary for whitewater boating in this reach is estimated to be between 1,000 cfs and 1,300 cfs. Klamath River flow in the high demand months of July to September are expected to remain below 1,000 cfs under the 2013 BiOp Flows based on an evaluation of flow exceedance curves at Keno Dam. Flow accretion from groundwater springs may cause some increase in the flow between Keno Dam and the Hell's Corner Reach, but the flow exceedance curve at Keno Dam is still expected to be representative of flow conditions within the Hell's Corner Reach under the Proposed Project with 2013 BiOp Flows. Flow in the Hell's Corner Reach would be below the minimum flow necessary for whitewater boating between July and September, eliminating opportunities for whitewater boating during this time under the Proposed Project. For the month of October, some whitewater boating opportunities would exist during wetter years, with the Proposed Project operating under but there would be a significant reduction compared to existing (see Appendix S for more detail).

There are a number of alternative rafting opportunities in the region that are available all summer, including the Klamath River downstream of Iron Gate Dam, Trinity River and Rogue River. However, due to the lower late summer flows, the higher-class rapids are not available, typically from July until the fall rains start. From spring through early summer, there are ample whitewater rafting opportunities for all skill levels in the region (see Table 3.20-3). However, whitewater boating opportunities within the Hell's Corner Reach would be eliminated during July through September and significantly reduced in October.

The Proposed Project would result in the loss of a unique opportunity in the region to raft Class IV+ rapids for three months during the late summer and early fall. This would affect up to 250 people per day during that time, as well as 10 commercial outfitters. However, the resource is not lost completely due to the following: (1) alternative Class IV+ whitewater boating opportunities during other times of the year; and (2) ample alternative nearby rafting opportunities in the late summer, albeit with lower class ratings. However, the impact to whitewater boating opportunities in the Hell's Corner Reach (within the upper portion of the Hydroelectric Reach) would be significant and unavoidable.

Significance

No significant impact in the Middle and Lower Klamath River

Significant and unavoidable in the Hell's Corner Reach (within the upper portion of the Hydroelectric Reach)

Potential Impact 3.20-6 Changes to or loss of other river-based recreation including fishing.

No significant impacts to river-based recreational facilities upstream of the Hydroelectric Reach would occur as a result of the Proposed Project, because any changes to flow and water quality would occur within and downstream of this reach. However, as discussed in Potential Impact 3.3-7 through 3.3-11 in Section 3.3.5.9 *Aquatic Resource Impacts*, removal of the dams would help eliminate barriers to volitional fish passage in the Klamath River upstream of the Lower Klamath Project, which would beneficially affect recreational fishing at these upstream locations.

In general, river-based recreational facilities downstream of the Hydroelectric Reach would not be physically affected by dam removal activities, since there would be little change to the 100-year floodplain extent under the Proposed Project (see also Potential Impacts 3.6-3 and 3.20-1). However, along the Middle Klamath River from Iron Gate Dam (RM 193.1) to the confluence with Humbug Creek (RM 174.0), the 100-year floodplain extent would change slightly due to dam removal and this would potentially impact existing recreational facilities. At the Blue Heron RV Park, the Fish Hook Restaurant (see Site “FS-2” in Appendix B: *Definite Plan – Appendix C, Figure 7.7-1 Sheet 1*) is within the 100-year floodplain extent under current conditions and would remain within the (altered) 100-year floodplain extent following dam removals. The R Ranch office at the Klamath Campground (see Site “FS-3” in Appendix B: *Definite Plan – Appendix C, Figure 7.7-1 Sheet 2*) is also within the 100-year floodplain extent under current conditions and would remain within the (altered) 100-year floodplain extent following dam removals. Thus, there would be no change or loss to these facilities under the Proposed Project. The Blue Heron RV Park office structure (see Site “FS-1” in Appendix B: *Definite Plan – Appendix C, Figure 7.7-1 Sheet 1*) is not within the 100-year floodplain extent under current conditions and would be within the (altered) 100-year floodplain extent following dam removals. While there would be an increased potential for flooding at this office structure, this would not represent a change or loss of a rare or unique recreational facility affecting a large area or substantial number of people and therefore impacts to recreation would be less than significant. In addition, the Proposed Project includes implementation of the Downstream Flood Control Project Component, as described in Section 2.7.8.4 *Downstream Flood Control* and in Appendix B: *Definite Plan*. Thus, under the Proposed Project, KRRC would move or elevate legally-established structures, where feasible, to reduce the risks of exposing people and/or structures to damage, loss, injury, or death involving flooding, which would further reduce the potential for flooding impacts to this structure.

Downstream of Humbug Creek (RM 174.0), there would be no significant effect on flood elevations (Potential Impact 3.6-3) and therefore there would be no impacts to river-based recreational facilities, including to the Klamath National Forest Tree of Heave Campground near the confluence of Humbug Creek (Figure 7.7-1 in Appendix B: *Definite Plan – Appendix C*).

Over the long term, removal of the Lower Klamath Project dams is also expected to result in water quality improvements within the Hydroelectric Reach and in the Middle and Lower Klamath River downstream of Iron Gate Dam (see Potential Impacts 3.2-1, 3.2-11, 3.2-12, and 3.2-13), which could improve visitor perceptions and attract a greater number of visitors to existing recreational facilities.

Dam removal activities are expected to result in long-term improvements in water quality, notably by decreased prevalence of microcystin toxin during summer phytoplankton blooms in the Lower Klamath Project reservoirs and in the Middle and Lower Klamath River. As discussed in Section 3.2.2.7 *Chlorophyll-a and Algal Toxins* and Section 3.20.2.4 *Wild and Scenic River Conditions*, microcystin toxin has been associated with public health risks for recreational bathing waters. Health warnings issued in 2005, 2008, 2009, 2010, 2012, 2013, 2014, 2016, and 2017 by the USEPA, the North Coast Regional Board, and other agencies warned recreation visitors to use caution due to the potential health effects of contact with waters containing elevated microcystin concentrations. In addition, 91 percent of recreational survey respondents indicated that water quality detracted from their experience at least a little within the

Hell's Corner Reach (PacifiCorp 2004). These adverse effects related to water quality negatively influenced the quality of the recreational experience for visitors and also resulted in safety risks to the recreational visitors. As existing conditions for water-contact-based recreational activities are considered adverse due to water quality, improved water quality conditions would result in long-term beneficial effects.

As discussed in Section 3.3.5.9 *Aquatic Resource Impacts*, dam removal activities are anticipated to result in increased abundance of recreational fish species from increased access to suitable habitat, and improved habitat conditions. The increased fisheries populations and abundance would beneficially affect recreational fishing opportunities. More specifically, the increased abundance and extent would allow for enhanced fishing opportunities and could decrease the number of closures of entire fishing seasons over the long term. These effects on recreation-based fisheries would be long-term and beneficial.

The Proposed Project would improve river access and create new fishing opportunities in the Hydroelectric Reach through implementation of the Recreation Facilities Plan (see Potential Impact 3.20-2), which would benefit fishing opportunities in this area. Given negligible changes in flows and improvements in access, impacts in reaches downstream from Iron Gate Dam would be less than significant. There would be a slight reduction in length of time available for fishing in the Copco No. 2 Bypass Reach, which would primarily occur during May due to the availability of acceptable flows (Table 3.20-5). In the Hell's Corner Reach, there would be a reduction in the availability of acceptable flows during April; however, the impacts would be minor overall and outweighed by other beneficial effects (Figure 3.20-4).

Significance

No significant impact for the Middle Klamath River between Iron Gate Dam (RM 193.1) and Humbug Creek (RM 174.3)

Beneficial for the Hydroelectric Reach, the Middle Klamath River downstream of Humbug Creek (RM 174.3), and the Lower Klamath River

Potential Impact 3.20-7 Effects on Wild and Scenic River resources, designations, or eligibility for listing.

The following section provides an assessment of the effects of the Proposed Project on each of the four resources specified in the Wild and Scenic River Act Section 7(a) (i.e., scenery, recreation, fish, and wildlife river values). The evaluation criteria presented in Section 3.20.4.5 *Impact Analysis Approach* were used to assess the effects of the Proposed Project as compared with conditions present at the time of wild and scenic river designation or eligibility listing, as well as changes to the condition of the river since the time of the designation or eligibility listing that have affected its wild and scenic character.

Potential impacts to scenery on designated California Klamath Wild and Scenic River segment.

As previously discussed in Section 3.20.2.4 [*Recreation*] *Environmental Setting – Wild and Scenic River Conditions*, the historic scenic character of reaches downstream from Iron Gate Dam has been impacted by reduced water clarity and discoloration resulting from large seasonal phytoplankton blooms in the Lower Klamath Project reservoirs that are subsequently transported into the Middle and Lower Klamath River. The Proposed

Project would eliminate the major sources of seasonal phytoplankton blooms to the Klamath River downstream of Iron Gate Dam (see also Section 3.4.2.3 [*Phytoplankton and Periphyton*] *Hydroelectric Reach*, Section 3.4.2.4 [*Phytoplankton and Periphyton*] *Middle and Lower Klamath River*, and Potential Impact 3.4-2), enhancing water appearance in the wild and scenic river segment of the Klamath River in California by eliminating or substantially reducing seasonal algal surface scums in the Middle and Lower Klamath River and increasing water clarity during summer low-flow periods.

As discussed in Potential Impact 3.2-3, drawdown of the reservoirs would result in short-term increases in turbidity (also expressed as suspended sediment concentration [SSCs]) downstream from the Lower Klamath Project reservoirs. Elevated turbidity would be most pronounced immediately downstream from Iron Gate Dam to Bogus Creek and it would become less noticeable farther downstream due to dilution from tributary flows entering the Klamath River. Modeling of SSCs during drawdown indicates SSCs would decrease to 60 to 70 percent of the initial value by Seiad Valley (RM 132.7) and to 40 percent of the initial value downstream of Orleans (approximately RM 59). Sediment jetting would occur during drawdown maximize erosion of accumulated sediments during this period and potentially reduce turbidity after drawdown concludes, and immediate revegetation would occur to further minimize the potential for prolonged increases in turbidity. Turbidity in the Klamath River is anticipated to flush through the system relatively quickly, but based on modeling of SSCs elevated turbidity is conservatively anticipated to occur for six to ten months following drawdown, with turbidity completely resuming natural background levels by the end of post-dam removal year 1 regardless of the water year type (USBR 2012a) (see Potential Impact 3.2-3 for more details). Although removal of the dams would result in increases in SSCs (Potential Impact 3.2-3) and decreased water clarity, the SSC increases would be short term and as such would not affect scenic value such that the long-term wild and scenic river designation or eligibility for listing would be compromised. In the long term, improved water appearance from on-river, in-river, and/or riverside viewpoints would improve the wild and scenic character of the Klamath River below the Lower Klamath Project.

With respect to periphyton colonization in the California Klamath wild and scenic river segment, although increased nutrient transport and recycling following dam removal could favor enhanced periphyton growth downstream from Iron Gate Dam, dam removal would also restore more frequent river sediment movement (Potential Impact 3.11-6) and increased flow variability during storm flow downstream of Iron Gate Dam, which could result in increased scouring of periphyton during late spring storm events (Potential Impact 3.4-5). The magnitude of the effect of bed turnover and scouring on periphyton would decrease with distance downstream, with increased scour occurring from Iron Gate Dam to approximately the Shasta River (RM 179.5), or the upper portion of the California Klamath River wild and scenic river segment. Information about water appearance at the time of California Klamath River wild and scenic river designation is sparse; however, it is likely that the existing trend of increasing periphyton blooms with their associated water coloration, cloudiness, and limitations on depth of view was already underway at the time of wild and scenic river designation (Van De Water et al. 2006). Although there would be negative water clarity impacts on scenic quality due to elevated SSCs during reservoir drawdown, the increases would be temporary and as such would not affect scenic value in a manner that would compromise the long-term wild and scenic river designation or eligibility for listing. Instead, the long-term effect of

the Proposed Project would improve the scenic value of the California Klamath River wild and scenic river segment.

As discussed in Section 3.3.5.9 *Aquatic Resource Impacts*, removal of the Lower Klamath Project dams is expected to increase the long-term abundance, productivity, population spatial structure, and genetic diversity of fall-run Chinook salmon (Potential Impact 3.3-7), spring-run Chinook salmon (Potential Impact 3.3-8), coho salmon (Potential Impact 3.3-9), steelhead (Potential Impact 3.3-10) and Pacific Lamprey (Potential Impact 3.3-11) in the Klamath River. The expected restoration of the anadromous fish populations would largely be the result of the increased access to anadromous fish habitat within the Upper Klamath Basin, along with water quality improvements downstream from the Lower Klamath Project. The increased population of fish species and increased water clarity would improve scenic fish viewing value. Increased fish viewing would be most prominent during fish migration, spawning, or holding periods, when the fish concentrate at particular reaches, pools, riffles, and falls. Fish and wildlife viewing impacts to scenic quality would be long-term and beneficial for the California Klamath River wild and scenic river segment.

Specific effects on river-dependent wildlife populations and scenic viewing opportunities are unknown. As discussed in Section 3.5.5.5 [*Terrestrial Resources*] *Potential Impacts and Mitigation – Wildlife Corridors and Habitat Connectivity*, riparian habitat in the Iron Gate Dam to Shasta River reach of the California Klamath River wild and scenic river segment would potentially be improved by dam removal activities because proportional increases in wildlife presence related to the increase in abundance of anadromous fish in the river and scenic wildlife viewing are expected. Therefore, effects on river-dependent wildlife populations and scenic viewing opportunities would be long-term and beneficial.

Removal of the Lower Klamath Project may result in an increase in riparian vegetation immediately downstream from Iron Gate Dam due to more regular transport of riverbed sediments (Potential Impact 3.11-5) and sediment deposition that has the potential to create new surfaces for riparian plants to colonize (Potential Impact 3.5-5). Improved riparian vegetation would increase the presence and scenic variety of the vegetation within the Klamath River wild and scenic river segment in California. This would likely increase overall scenic riparian vegetation aspects of scenic quality over conditions present at the California Klamath River wild and scenic river segment's 1981 date of designation, as updated by existing conditions, and result in long-term beneficial effects.

The California Klamath River wild and scenic river segment is downstream from the Lower Klamath Project; therefore, removal of the dams and associated facilities would not result in any changes to the overall landscape character in the designated segment of the river. However, as discussed above, water appearance in the wild and scenic river segment is expected to improve due to elimination or reduction of large seasonal phytoplankton blooms transported into the Middle and Lower Klamath River (Potential Impact 3.4-2), as is the quality of the riparian vegetation (Potential Impact 3.5-4). These improvements would result in a more natural landscape character for the California Klamath River wild and scenic river segment and result in a long-term positive scenic quality effect from both near river and distant viewpoints.

Potential impacts to recreation on designated California Klamath Wild and Scenic River segment.

During dam removal years 1 and 2, release of sediment deposits stored within the reservoir footprints could decrease the quality of and opportunity for water contact activities. However, initial reservoir drawdown would occur in the coldest high flow months of winter and early spring when recreation use of the Lower Klamath Project reservoirs is at its lowest. Further, the increases in SSCs (Potential Impact 3.2-3) and decreased water clarity during dam removal would be short term so these would not affect the scenic value in a manner that would compromise the long-term wild and scenic river designation or eligibility for listing. In the long term, dam removal activities would improve water quality and also improve water contact-based recreation activities. For the California Klamath River wild and scenic river segment, dam removal activities would not affect recreational activities access downstream from the dams, and dam removal activities would result in improved water quality downstream from the dams in the long term; thus, there would be long-term beneficial effects on recreational activities in these areas as compared to the 1981 conditions and existing conditions.

Whitewater boating opportunities relating to river flow following removal of the Lower Klamath Project would likely be similar to 1981 conditions and current conditions of the California Klamath River wild and scenic river segment. As discussed in Potential Impact 3.20-5, following removal of the dams, changes in the availability of flows within the acceptable flow ranges for whitewater boating and fishing opportunities would be negligible for the reaches downstream from Iron Gate Dam following dam removal. Whitewater boating opportunities under the Proposed Project with 2013 BiOp Flows would be similar to results previously modeled under the KBRA Flows downstream of Iron Gate Dam. Therefore, no adverse impacts to flow-related whitewater boating opportunities would occur for the California Klamath River wild and scenic river segment. Dam removal activities would also result in long-term improvements to water quality conditions over existing conditions and the 1981 conditions. With improved water quality, the whitewater boating recreation experience would also improve. Therefore, long-term water quality-related whitewater boating impacts would be beneficial for the California Klamath River wild and scenic river segment.

As discussed in Potential Impact 3.20-6, removal of the Lower Klamath Project would not result in substantial increases or decreases in the number of days with acceptable flows for recreational fishing. However, as described in Potential Impacts 3.3-7 through 3.3-11, the geographic extent of the Klamath River fish habitat would be substantially expanded compared to 1981 and existing conditions. Moreover, the long-term improvements to water quality conditions are expected to reduce fish disease and increase the likelihood of fish survival. Increased fish populations could result in expansion of fishing seasons or increases to quotas and bag limits. Thus, recreational fishing effects from implementing the Proposed Project would be long-term and beneficial for the California Klamath River wild and scenic river segment.

There could be short-term impacts to recreational fishing during Lower Klamath Project reservoir drawdown. While it is not possible to accurately predict short-term deposition patterns in the mainstem Klamath River channel at a fine spatial scale (e.g., individual pools or other slack-water areas that may serve as fishing holes), general sediment transport and depositional patterns observed in the Klamath River and other analogous river channels indicate that dam-released sediment that may temporarily deposit in pools and other slack water areas (e.g., eddies) and at tributary confluences in the reach from

Iron Gate Dam to Cottonwood Creek would be highly erodible during subsequent flow events, leading to a short residence time (i.e., likely one year or less except during dry years) (Potential Impact 3.11-5). Thus, the potential for clogged fishing holes or less accessible shorelines that are temporarily blocked by sediment deposits of limited extent would be short-term and as such would not affect recreational value in a manner that would compromise the long-term wild and scenic river designation or eligibility for listing.

Further, In the short term, new beaches and riparian areas may become established, increasing the variety of shoreline settings. Most of these effects would be temporary and many aspects of the wild and scenic river segment's recreation setting would be considerably improved in the long term once the Klamath River stabilizes. The improved water quality conditions following completion of drawdown activities would improve the recreational setting overall (i.e., with improved clarity during swimming and fishing and reduced malodors and tastes [Bartholow et al 2005]). With regard to public health, improved water quality, and in particular a reduction in the potential for seasonal exposure to high levels of algal toxins (greater than 8 µg/L microcystin) generated by nuisance blooms in the Lower Klamath Project reservoirs and transported into the Middle and Lower Klamath River (Potential Impact 3.2-12) would also reduce potential human health risks associated with water-contact-based activities. Therefore, effects on the recreational setting would be long term and beneficial for the California Klamath River wild and scenic river segment.

Potential impacts to fisheries on designated California Klamath Wild and Scenic River segment.

Changes in flow regimes can affect fishery resources. Section 3.6.2.1 [*Flood Hydrology Environmental Setting*] discusses historic flow rates and discharge statistics for each of the reservoirs. The proposed drawdown rates for the Lower Klamath Project reservoirs are consistent with the historic discharge rates from the reservoirs and would be adjusted depending on the water year; therefore, flow rates downstream from the dams are not anticipated to increase substantially above historic rates, if at all. As such, conditions during the reservoir drawdown period (i.e., dam removal years 1 and 2) are expected to remain largely unchanged as compared to stream flow regimes at the time of the 1981 wild and scenic river segment designation.

Following removal of the Lower Klamath Project, the Klamath River would return to a natural flow regime in the Middle Klamath River immediately downstream of Iron Gate Dam. Restoration of the natural flow regime and upstream sediment supply would improve water quality conditions, likely reducing the occurrence of myxozoan parasites (*Ceratomyxa shasta* and *Parvicapsula minibicornis*) that are known to negatively affect salmonids. Increased spawning gravel from upstream sources could enhance spawning habitat following dam removal. Restoring natural sediment mobility processes could also help scour periphyton (e.g., *Cladophera* spp.) (Potential Impact 3.4-5), and deposited sand and gravel would be a less favorable substrate for the periphyton because of greater particle mobility during high-flow events than the existing armored substrate. A reduction in periphyton would reduce the habitat for the fish pathogen's alternate host (Section 3.3.5.5 *Fish Disease and Parasites*). Further, as discussed above, removal of the reservoirs would eliminate habitat for populations of blue-green algae that produce toxins that can result in acute and chronic effects on fish, including increased mortality, reduced fecundity, reduced feeding, and habitat avoidance (see Section 3.3.5.7 *Algal Toxins*). Thus, stream flow regime effects would be long term and beneficial for the California Klamath River wild and scenic river segment.

Removal of the Lower Klamath Project would improve water quality conditions over existing conditions and the 1981 conditions. As described in 3.2.5.1 [*Water Quality*] *Water Temperature* and 3.3.5.4 [*Aquatic Resources*] *Water Temperature*, following dam removal, the seasonal temperature regime downstream from Iron Gate Dam would be more suitable for salmon. As part of its relicensing procedure, PacifiCorp modeled changes in water temperature that could result following removal of the Lower Klamath Project dams. The modeling results show that from Iron Gate Dam to Clear Creek, water temperatures in the spring and early summer would be as much as 5°C warmer, but they would be cooler in later summer and fall than under existing conditions. Water temperatures currently remain greater than 20°C in dry years with little variability in July and August. Although summer temperatures would likely be more variable following dam removal, the median temperatures would be substantially lower than current conditions. Summer and fall water temperatures would therefore be more conducive to salmon rearing, migrating, and spawning than the conditions that likely existed in 1981 (Van de Water et al. 2006). Water temperature effects of dam removal would therefore be long-term and beneficial for the California Klamath River wild and scenic river segment.

Information about habitat conditions at the time of wild and scenic river segment designation is sparse; however, it is likely that existing trends of river coarsening, increasing habitat for periphyton, and reduced recruitment and maintenance of riparian vegetation were already underway at the time of wild and scenic river segment designation due to PacifiCorp facilities and operations. The Proposed Project would reduce those trends in the long term, and restore natural sediment transport processes, which were no longer in place by 1981. Following the initial drawdown period and flushing of reservoir sediment downstream, aquatic habitat conditions would be expected to improve compared with conditions in 1981, as well as existing conditions, in the long term. Therefore, effects on aquatic habitat conditions would be long-term and beneficial for the California Klamath River wild and scenic river segment.

As discussed in as described in Potential Impacts 3.3-7 through 3.3-11, dam removal would result in beneficial long-term effects on anadromous salmonids. Dam removal would restore connectivity to hundreds of miles of potentially usable habitat in the Upper Klamath Basin and would create additional spawning and rearing habitat within the Hydroelectric Reach. While, sediment released during dam removal could be sufficient to cause substantial smothering of spawning gravels, pool infilling, gill abrasion, and changes to holding and migration patterns in the Klamath River reaches immediately downstream of Iron Gate Dam, these impacts would be temporary, as sediment is expected to be flushed through the river system relatively quickly, and would not affect survivability of fish species in a manner that would compromise the long-term wild and scenic river designation or eligibility for listing. Removal of the Lower Klamath Project would also eliminate fish barriers and expand fish access to upstream spawning areas.

As discussed in Section 3.3.5.8 *Aquatic Habitat*, removal of the Lower Klamath Project would improve conditions for native resident fish species, including culturally important fish species (e.g., Chinook salmon, coho salmon, steelhead, and lamprey), by restoring connectivity between the Lower and Upper Klamath River, and by returning a natural flow regime to the reaches where the reservoirs currently exist, thereby improving water quality. Dam removal would also likely result in diminished non-native fish habitat and populations, reducing competition for space and resources with native resident fish (see

Potential Impact 3.3-17). Therefore, effects on the conditions for native resident fish species, including species traditionally used and culturally important to Indian Tribes, would be beneficial and long term in the California Klamath River wild and scenic river segment.

Potential impacts to wildlife on designated California Klamath River Wild and Scenic River segment.

Riparian vegetation in the California Klamath River wild and scenic river segment downstream from the Iron Gate Dam would benefit from dam removal activities. In the long term, especially in the reach between the Iron Gate Dam and the Shasta River confluence (Potential Impact 3.5-4). Special status species that utilize riparian habitat, such as the willow flycatcher (Potential Impact 3.5-12) and Western pond turtle (Potential Impact 3.5-16) would benefit in the long term from successful riparian habitat recovery from Iron Gate Dam downstream to the Klamath River's confluence with the Shasta River.

In addition to improving riparian habitat, the Proposed Project would result in improvements in fish resources in the long term following dam removal, thus providing increased forage for wildlife species that depend upon fish as a food source. The area currently blocked by dams would provide additional available habitat for anadromous fish (see above discussion). Increased fish abundance would also create greater foraging opportunities for riparian and riverine species such as bald eagle, river otter, osprey and black bear (see also Potential Impact 3.5-24). Therefore, there would be a long-term, beneficial effect on habitat for special status species in the California Klamath River wild and scenic river segment. Because wildlife viewing is an important component of recreational opportunities within the Area of Analysis, impacts to recreation would also be long-term and beneficial.

Potential impacts to eligible and suitable California Wild and Scenic River section.

In addition to the designated wild and scenic river segment, the Klamath River reach from the California-Oregon state line to the upstream end of Copco No. 1 Reservoir was found to be "eligible and suitable" for wild and scenic river designation, though it has not yet been designated into either the National or the State Wild and Scenic River System. The potential outstandingly remarkable values include scenic, fish, wildlife, recreation (whitewater boating and fishing), and historic. This candidate wild and scenic river reach is included in the Area of Analysis for recreation.

Short-term negative impacts on water quality, scenic, recreation, fishery, and wildlife river values would be likely to occur due to high SSCs anticipated during drawdown of the upstream J.C. Boyle Reservoir (see Potential Impact 3.2-3). Short-term impacts would also occur as a result of restricted access and use of river-based recreation facilities and opportunities within the Limits of Work during dam removal years 1 and 2. However, these temporary impacts would not affect river values in a manner that would compromise the long-term wild and scenic river eligibility for listing. In the long term, dam removal under the Proposed Project would eliminate hydropower peaking and return this section of the Hydroelectric Reach to a more natural condition than under existing conditions. Overall, dam removal activities under the proposed Project that return this section of the Hydroelectric Reach to a more natural condition would result in long-term beneficial effects to this candidate wild and scenic river reach's free-flowing condition, water quality, scenic, wildlife, fishery, and recreation river values and the long-

term wild and scenic river designation or eligibility for listing would be not be compromised.

Significance

No significant impact in the short term for the designated California Klamath River wild and scenic river segment.

No significant impact in the short term for the eligible and suitable California Klamath River wild and scenic river section

Beneficial in the long term for the designated California Klamath River wild and scenic river segment.

Beneficial in the long term for the eligible and suitable California Klamath River wild and scenic river section

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