

COVER SHEET

FEDERAL ENERGY REGULATORY COMMISSION

DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE KLAMATH HYDROELECTRIC PROJECT

Docket No. P-2082-027

Section 3
Environmental Consequences
Pages 3-369 to 3-509
DEIS

1 **3.3.5.1.4 Essential Fish Habitat**

2 The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act
3 (MSA) require the identification of essential fish habitat (EFH) for federally managed fishery species and
4 the implementation of measures to conserve and enhance this habitat. The MSA, as amended, defines
5 EFH as those waters and substrate necessary for fish use in spawning, breeding, feeding, or growth to
6 maturity. The MSA requires federal agencies to consult with NMFS regarding activities that may
7 adversely affect EFH. The implementing regulations for MSA allow for the integration of NEPA or ESA
8 Section 7 reviews with the analysis of proposed project effects on EFH.

9 Chinook, coho, and Puget Sound pink salmon are the only Pacific coast salmonid fish actively
10 managed under the MSA. Freshwater EFH for coho and Chinook salmon includes all those streams,
11 lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in
12 Washington, Oregon, Idaho, and California. In amendment 14 to the Pacific Coast Salmon Plan, the
13 Pacific Fishery Management Council identified dams that should be considered to represent the upstream
14 extent of EFH, including Iron Gate dam on the Klamath River, Dwinnell dam on the Shasta River, and
15 Trinity dam on the Trinity River.

16 There are four major components of EFH for these species including: (1) spawning and
17 incubation; (2) juvenile rearing; (3) juvenile migration corridors; and (4) adult migration corridors and
18 holding habitat. Chinook and coho EFH includes the mainstem Klamath River upstream to Iron Gate
19 dam and all of its major tributaries including the Shasta River upstream to Dwinnell dam, the Scott River,
20 the Salmon River, the Trinity River upstream to Trinity dam, and the South Fork Trinity River.

21 **3.3.5.1.5 Slender Orcutt Grass**

22 FWS listed slender Orcutt grass (*Orcuttia tenuis*) as a threatened species on March 26, 1997
23 (FWS, 1997). Slender Orcutt grass is an annual grass which shares some unique characteristics with other
24 grasses in its genus such as stems filled with pith, rather than hollow stems like most grasses. These
25 grasses also grow underwater for 3 months or more and have evolved specific adaptations for both aquatic
26 and terrestrial growth such as producing two or three different types of leaves during their life cycle,
27 whereas most grasses have a single leaf type throughout their life span. Slender Orcutt grass is endemic
28 to vernal pools and occurs primarily on substrates of volcanic origin within a vernal pool ecosystem in
29 northern California (FWS, 2004b). In 2003, FWS designated critical habitat for slender Orcutt grass and
30 several other vernal pool species in its *Final Designation of Critical Habitat for Four Vernal Pool*
31 *Crustaceans and Eleven Vernal Pool Plants in California and Southern Oregon* (68 FR 46,683 – 46,867).
32 The Klamath Hydroelectric Project is not located within any of the designated critical habitat units for this
33 species and FWS did not identify any critical habitat near the Klamath Hydroelectric Project.

34 An occurrence of slender Orcutt grass has been reported in Siskiyou County, California, and
35 PacifiCorp suspected that slender Orcutt grass could potentially occur anywhere in the project vicinity
36 from Keno Canyon to the Iron Gate development. However, no slender Orcutt grass was observed during
37 PacifiCorp’s field surveys, nor were any vernal pools documented within the area influenced by project
38 operations. Also, the Klamath Hydroelectric Project does not occur in any of the vernal pool regions
39 identified in the FWS recovery plan that includes this species, and no critical habitat for this species
40 occurs in the project vicinity. For these reasons, we do not discuss this species further in this document.

41 **3.3.5.1.6 Applegate’s Milk-vetch**

42 FWS listed Applegate’s milk-vetch (*Astragalus applegatei*) as an endangered species on June 28,
43 1993. Applegate’s milk-vetch is a perennial legume that was believed to be extinct until its rediscovery in
44 1983. The species is endemic to the Lower Klamath Basin and is restricted to flat-lying, seasonally moist,
45 strongly alkaline soils. Applegate’s milk-vetch has previously been found in only three sites, all situated
46 at about elevation 4,100 feet in Klamath County, Oregon. These three sites are Ewauna Flat, near Keno

1 reservoir at the southern edge of the city of Klamath Falls, where the largest population is located, the
2 Klamath Wildlife Area, about 6 miles southwest of Klamath Falls, near the town of Midland, and, within
3 the vicinity of Wordon, Oregon, approximately 3 miles north of the California border. The floodplains
4 where Applegate's milk-vetch is found are noticeably moist in the winter and spring, which may partially
5 be caused by the clay hardpans underlying the known sites for Applegate's milk-vetch. Hardpans impede
6 water percolation, providing seasonal soil moisture saturation and retention. Applegate's milk-vetch has
7 likely adapted to, and may require, this hydrologic regime since the excessive soil moisture may exclude
8 plants requiring dry conditions, creating a niche for this species (FWS, 1998b).

9 The Nature Conservancy purchased nearly 7 acres of land that encompasses much of the Ewauna
10 Flat population of Applegate's milk-vetch (FWS, 1998b). Fencing has been placed around this milk-
11 vetch population, and the current ownership should protect it from encroaching development.

12 During field surveys, PacifiCorp discovered a new occurrence of Applegate's milk-vetch along
13 Keno reservoir. PacifiCorp observed 50 to 60 Applegate's milk-vetch plants within 45 to 100 feet of
14 Keno reservoir along approximately 250 feet of the reservoir shoreline. PacifiCorp estimated that the
15 height or elevation of the site above the reservoir water surface was less than 2 feet. PacifiCorp reported
16 that this site was dominated by gray rabbitbrush and saltgrass.

17 **3.3.5.1.7 Gentner's Fritillaria**

18 FWS listed Gentner's fritillaria (*Fritillaria gentneri*) as an endangered species on December 10,
19 1999. Gentner's fritillaria is a perennial member of the lily family (Liliaceae) and has showy, deep red to
20 maroon flowers from April until July. Gentner's fritillaria occurs primarily in the rural foothills of the
21 Rogue and Illinois River valleys in Jackson and Josephine counties, Oregon at elevations ranging from
22 approximately 1,004 to 5,064 feet. A small population is also located in northern California, close to the
23 Oregon border. The species is often found in grassland and chaparral habitats within, or on the edge of,
24 dry, open woodlands (FWS, 2003).

25 PacifiCorp determined that Gentner's fritillaria could potentially occur anywhere in the project
26 vicinity from the J.C. Boyle reservoir to the Fall Creek development, since this area is located in recovery
27 unit 4 designated in FWS recovery plan for this species. No Gentner's fritillaria were observed during the
28 field surveys.

29 **3.3.5.1.8 California Red-legged Frog**

30 FWS listed the California red-legged frog (*Rana aurora draytoni*) as a threatened species on June
31 24, 1996. Cal Fish & Game lists this species as a Species of Special Concern, which includes species not
32 listed under the California Endangered Species Act, but believed by Cal Fish & Game to either be
33 declining at a rate that could result in listing, or historically occurring in low numbers and having current
34 known threats to their persistence. On March 13, 2001, FWS formally designated critical habitat for this
35 species. None of the Klamath Hydroelectric Project was included in any of the critical habitat units.
36 However, on June 8, 2001, a lawsuit challenging the designation was filed in the U.S. District Court for
37 the District of Columbia, and on November 6, 2002, the court entered a consent decree remanding the
38 designation to FWS and vacating most of the 2001 designation. On April 13, 2004, FWS proposed
39 designating critical habitat for the CRLF identical to the configuration of the previously published final
40 designation of critical habitat and accepted comments on this proposal until July 14, 2004. On November
41 3, 2005, FWS revised the critical habitat boundaries to better reflect lands containing essential features for
42 the California red-legged frog, and proposed designating approximately 737,912 acres of critical habitat
43 in 23 California counties. FWS accepted comments on this proposal until February 1, 2006. Siskiyou
44 County is not one of the counties containing the proposed critical habitat. FWS did not designate any
45 critical habitat in Oregon.

1 The California red-legged frog is the largest native frog in the western United States and is
2 typically associated with deep, still, or slow moving water and dense, shrubby or emergent vegetation
3 (FWS, 2002b). The Klamath Hydroelectric Project is not located within or near the current or historic
4 range of the California red-legged frog. PacifiCorp did not observe any California red-legged frogs
5 during the field surveys. The Klamath Hydroelectric Project is not located in or near any of the recovery
6 units designated by FWS in its recovery plan for this species and no critical habitat for this species occurs
7 in the project vicinity. For these reasons, we do not discuss this species further in this document.

8 **3.3.5.1.9 Bald Eagle**

9 FWS listed the bald eagle (*Haliaeetus leucocephalus*) as an endangered species on March 11,
10 1967, and then reclassified it to threatened status on July 12, 1995. On July 6, 1999, FWS proposed
11 removing the bald eagle from the list of threatened and endangered species due to the success of recovery
12 efforts throughout the United States (64 FR 36,453-36,464). The largest known wintering population of
13 bald eagles in the contiguous United States occurs in the Klamath basin. In some years, up to 117 bald
14 eagle pairs nest and 1,100 individuals winter in the Klamath basin. A large communal roost is located
15 south of Klamath Falls, Oregon, in the Bear Valley National Wildlife Refuge west of Worden, California.
16 The refuge is approximately 6 miles south of Keno reservoir.

17 The Klamath Hydroelectric Project is located in the Klamath Basin and California/Oregon Coast
18 management zones identified in the Bald Eagle Recovery Plan for the Pacific Region (FWS, 1986).
19 Overall recovery goals for the bald eagle in the Pacific Region were met in 1990 and have been reached
20 or exceeded in every year since. Goals for nest productivity and wintering population stability in the
21 region also have been met or exceeded. Although the recovery goal of 800 breeding pairs in the region
22 has not yet been reached, the number of breeding pairs has increased dramatically. In 2000, the Klamath
23 Basin Management Zone had 117 occupied breeding sites, which greatly exceeded its habitat
24 management goal of 80. In the California/Oregon Coast Management Zone the habitat management goal
25 is 52 bald eagle territories and 28 breeding pairs. The nesting season for bald eagles in Oregon generally
26 runs from February through mid-August.

27 Both nesting resident and migrant bald eagles occur in the vicinity of the Klamath Hydroelectric
28 Project. In 2002, the Oregon Cooperative Fish and Wildlife Research Unit conducted aerial surveys,
29 searched for new nests, and checked 19 previously known nesting territories in the project vicinity, nine
30 of which were not near any project water bodies. In 2003, the Oregon Cooperative Fish and Wildlife
31 Research Unit conducted bald eagle aerial surveys to determine the status of the same 19 nests inspected
32 in 2002. In 2003, during aerial bald eagle surveys a new, inactive nest located approximately 540 feet
33 southeast of Copco dam was discovered. These surveys documented 10 nests, including the newly
34 discovered Copco dam nest, within about 7 miles of the project (table 3-83). Other than the inactive
35 Copco dam nest, only the Moore Park East, Topsy, and Jenny Creek nests are within 1 mile of any project
36 facility. The Pony Express nest is approximately 7 miles from a facility, but is immediately adjacent to
37 the J.C. Boyle peaking reach. All nests were located in large ponderosa pine trees.

1 Table 3-83. Bald eagle territories and nesting status through 2003 in the general vicinity of the Klamath River Hydroelectric
 2 Project. (Source: PacifiCorp, 2004a, as modified by staff)

Nesting Territory Name	Ownership	Nearest Project Facility	Distance to the Nearest Project Facility in feet	First Year Known	Confirmed Young Fledged 1998-2003	Young Fledged in 2002	Young Fledged in 2003
Moore Park East (Oregon)	City of Klamath Falls	West Side canal	4,300	1992	5	2	2
Moore Park/Wocus Pass (Oregon)	City of Klamath Falls/Private	Link River dam	7,600	1978	7	0	2
Klamath River/Chase Mtn. (Oregon)	Bureau of Land Management	J.C. Boyle dam	9,300	1979	6	0	0
Topsy (Oregon)	Bureau of Land Management	J.C. Boyle dam	3,900	1998	5	0	0
Klamath River Canyon (Oregon)	Private	J.C. Boyle powerhouse	18,800	1979	4	0	0
Pony Express (Oregon)	Bureau of Land Management	J.C. Boyle powerhouse	37,300	2001	3	3	0
Lucky Springs (California)	Forest Service	Copco dam	27,200	1983	4	Unknown	Inactive ^a
Copco Dam (California)	Private	Copco dam	540	2003	NA	NA	Inactive
Jenny Creek (California)	Bureau of Land Management	Fall Creek canal	3,200	1985	Unknown	2	0
Black Mountain (California)	Federal	Iron Gate dam	30,800	2002	2	1	1

3 ^a Inactive indicates that no eagles were observed at a nest or within a breeding territory (0 = No young fledged within an “active” breeding territory).

1 In 2002, eight young fledged from the eight occupied territories. This equates to a production
2 rate of 1.0 fledglings/occupied territory, which is equal to the recovery goal of 1.0 young/occupied
3 territory. In 2003, eight nests were occupied and three were found to fledge young.

4 The combination of waterfowl, small mammals, and fish in the vicinity of the Klamath
5 Hydroelectric Project provide abundant forage for resident bald eagles, and at times, wintering bald eagles
6 that congregate in the Klamath basin. The J.C. Boyle, Copco, and Iron Gate reservoirs, along with the
7 Klamath River downstream of Iron Gate dam provide large populations of warm water fish species that
8 are known to be species used by bald eagles in the western United States.

9 Prey remains collected from under the four successful bald eagle nests near the project that were
10 visited in 2002 indicated a varied diet. Waterfowl and gull remains dominated the collected prey items
11 under the Moore Park nest site. This likely indicates that this pair forages on Upper Klamath Lake, which
12 is in direct view from the nest tree. Perch-like fish remains were the only remains found under the Jenny
13 Creek nest site. This nest is located in a remote canyon about 1 mile from Iron Gate reservoir and not
14 much farther from Copco reservoir. These two project reservoirs likely provide foraging habitat for this
15 pair. Prey remains collected at the Black Mountain and Pony Express nest sites were composed entirely
16 of small mammals, tentatively identified as ground squirrels. This varied diet is consistent with other
17 studies that showed bald eagles to be opportunistic feeders. In a 1989 study of the Grizzly Butte bald
18 eagle territory that occurs in the J.C. Boyle peaking reach, prey brought to the nest included 68 percent
19 fish and 32 percent mammals, which is consistent with the varied and opportunistic diet of bald eagles.

20 Within the project vicinity, the fish that are available as prey for eagles vary by reach. Fish found
21 in project reaches and reservoirs are described in tables 3-38 through 3-46 in section 3.3.3.1, *Aquatic*
22 *Resources*. Fish likely to represent potential bald eagle prey include suckers, chubs, rainbow trout,
23 yellow perch, largemouth bass, and sunfish.

24 The river reach downstream of Iron Gate dam supports many species of cool water or cold water
25 species that are known to be used by bald eagles, such as chubs, suckers, trout, and salmon. Anadromous
26 salmonids historically and currently using the lower Klamath basin downstream of Iron Gate dam include
27 summer and winter-run steelhead, spring fall Chinook salmon, and coho salmon. One or more of the
28 anadromous fish species/life stages is present in the river downstream of Iron Gate dam during all months
29 of the year (see table 3-36) and annual estimates of adult steelhead and salmon returns to the Klamath
30 River Basin are described in section 3.3.3.1, *Aquatic Resources*. After spawning, most salmon die, and
31 their carcasses represent an important food source for bald eagles.

32 Data from other river systems (e.g., the Pit River in California) indicate that bald eagles make use
33 of shallow pool tail-outs and runs to forage for fish such as suckers and chubs. It is in these types of
34 habitats that eagles can prey on fish because of increased water clarity and less water turbulence. Aquatic
35 habitat mapping indicates that even during high flows, the J.C. Boyle bypassed and peaking reaches
36 provide 56 to 80 percent pool, glide, and run habitat. From a coarse habitat structure perspective, there
37 should be ample foraging habitat in these river reaches. As discussed in section 3.3.2.1.2, *Water Quality*,
38 water clarity sampling results (turbidity) in the vicinity of the Klamath Hydroelectric project show a
39 seasonal and longitudinal pattern. Generally, water clarity in the Klamath River is reduced during the
40 spring run-off period and is greater in the lower project reaches during the summer and fall months. The
41 Copco No. 2 bypassed reach is too heavily forested to provide foraging habitat for eagles.

42 Targeted avian field surveys conducted by PacifiCorp in 2002 and 2003 resulted in 37 bald eagle
43 detections. The largest number of bald eagle detections was 11, recorded along the J.C. Boyle reservoir.
44 Eight detections at Copco reservoir accounted for the second highest number of bald eagle records. Bald
45 eagles were also observed perched or flying over J.C. Boyle and Keno reservoirs. There were no obvious
46 concentrations of foraging eagles along project reservoirs or river reaches. However, during February
47 2003, two adult bald eagles and three subadults were perched along the southern shoreline of Copco
48 reservoir a short distance from Mallard Cove, where they were seen diving on waterfowl. Occasionally,

1 bald eagles were observed perched in oak trees or on power poles near the northwest shore of Copco
2 reservoir. At J.C. Boyle reservoir, bald eagles were documented perching near the shoreline along most
3 of its length.

4 Bald eagles were also detected by PacifiCorp during goshawk protocol surveys, reservoir surveys,
5 rapid ornithological inventories, and during other project-related field studies. Five bald eagle detections
6 were recorded during northern goshawk protocol surveys with four along the J.C. Boyle reservoir and one
7 in the J.C. Boyle bypassed reach. Eight bald eagles were recorded during reservoir surveys with four near
8 Copco reservoir, one near J.C. Boyle reservoir, and three near Keno reservoir. Bald eagles also were
9 detected during censuses associated with a rapid ornithological inventory conducted in the J.C. Boyle
10 peaking reach. In addition, numerous bald eagle detections were recorded incidental to other field studies
11 in other areas of the project.

12 No eagle collisions or electrocutions have been reported on project transmission lines since the
13 introduction of PacifiCorp's Raptor Electrocution Reduction Program in the late 1980s.

14 **3.3.5.1.10 Northern Spotted Owl**

15 FWS listed the northern spotted owl (*Strix occidentalis caurina*) as a threatened species on June
16 26, 1990. Northern spotted owls are one of the largest North American owls, averaging 18 inches tall
17 with a wingspan about 48 inches wide. This species is typically found in old growth forests of northern
18 California and the Pacific Northwest of the United States and in southern parts of British Columbia,
19 Canada. Suitable spotted owl habitat includes old-growth forest areas with multi-layered canopies of
20 trees that are high and open enough for the owls to fly between and underneath them. Spotted owls prefer
21 areas with large trees with broken tops, deformed limbs, and large cavities that are capable of supporting
22 their nesting materials (Defenders of Wildlife, 2005).

23 In southern Oregon, spotted owls are known to successfully breed in late-successional mixed
24 coniferous forest and several breeding pairs are known to occur in the project vicinity. FWS designated
25 critical habitat for this species on January 15, 1992, and approximately 35,700 acres of designated critical
26 habitat is located north of the Klamath Hydroelectric Project boundary in the Jenny Creek watershed.
27 FWS focused on nesting and roosting habitat as the most important elements of spotted owl habitat when
28 designating critical habitat (57 FR 1,796 -1,836). There are approximately 11,300 acres of potentially
29 suitable spotted owl habitat in the project vicinity, including all forested communities (with the exception
30 of oak woodland and oak-juniper woodland) with at least 40 percent canopy cover and trees greater than 6
31 inches in diameter. Suitable habitat for the spotted owl occurs within the project boundary at the western
32 end of Keno development, at J.C. Boyle development, along both sides of Shovel Creek, on the south side
33 of Copco reservoir, and at Fall Creek development.

34 PacifiCorp conducted northern spotted owl protocol surveys during the 2002 and 2003 field
35 seasons in habitat meeting the protocol criteria within 1.2 or 1.3 miles of project facilities and recreation
36 sites that are adjacent to the project reservoirs. In 2002, PacifiCorp recorded five northern spotted owl
37 detections, representing three individuals. PacifiCorp detected one male along the J.C. Boyle peaking
38 reach in June, and one pair along the J.C. Boyle peaking reach in the same general area on 2 days in July.
39 None of the detections were within 5 miles of any project facilities. No incidental spotted owl detections
40 were noted during other field study types in 2002.

41 In 2003, PacifiCorp again recorded five northern spotted owl detections and presumed that they
42 represented four or five owls. PacifiCorp detected a mixed gender pair of owls southwest of the Beswick
43 Ranch along the J.C. Boyle peaking reach and a lone female owl located about 0.5 mile from the pair
44 described above. This bird may have been the female from the mated pair, although the location of the
45 detection indicated that this may be a separate isolated individual female owl. PacifiCorp also detected
46 two female spotted owls located less than 1 mile southeast of J.C. Boyle reservoir. These two detections
47 were recorded on consecutive evenings and may actually represent a single female spotted owl.

1 The location of the mixed gender pair of owls detected by PacifiCorp is consistent with that of a
2 historic pair of owls monitored by the Forest Service. The National Council for Air and Stream
3 Improvement also monitors a breeding pair of owls in the upper J.C. Boyle peaking reach. Northern
4 spotted owls have large home ranges and use large tracts of land containing a substantial amount of older
5 forest to meet their biological needs. FWS has determined that northern spotted owls in the Klamath
6 province have home ranges of about 1,000 acres in size (57 FR 1,796 – 1,838). The owl detections made
7 during PacifiCorp field surveys were within the home ranges of the Negro Creek and Lucky Springs pairs
8 that have been monitored by the National Council for Air and Stream Improvement or the Forest Service.
9 Radio telemetry data from this monitoring indicates that these spotted owl pairs have home ranges that do
10 not extend within 0.5 mile of the Klamath River.

11 **3.3.5.1.11 Western Snowy Plover**

12 FWS listed the western snowy plover (*Charadrius alexandrinus nivosus*) as a threatened species
13 on March 5, 1993 (FWS, 2001b). The Oregon Fish and Wildlife Commission lists this species as
14 threatened; the Oregon Natural Heritage Information Center includes it on its List 2, which includes
15 species that are threatened with extirpation or presumed to be extirpated from the state of Oregon; and Cal
16 Fish & Game lists this species as a Second Priority Species of Special Concern, which includes species
17 that are definitely jeopardized and declining, but extinction or extirpation appears less imminent than
18 species with a higher priority. The western snowy plover is a shorebird that typically nests in sandy
19 substrate along the Pacific Coast from southern Washington to southern Baja California, Mexico.
20 However, a small inland population, consisting of less than 1,000 birds in Oregon, is known to nest along
21 the margin of alkaline lakes in southern Klamath County, Oregon, and the species is a rare fall migrant at
22 the Klamath Wildlife Area. PacifiCorp did not locate any western snowy plovers during field surveys and
23 no suitable breeding habitat was observed in the project area. For these reasons, we do not discuss this
24 species further in this document.

25 **3.3.5.1.12 Canada Lynx**

26 FWS listed the Canada lynx (*Lynx canadensis*) as a threatened species on March 24, 2000 and the
27 Oregon Natural Heritage Information Center includes it on its List 2. Lynx are solitary, boreal forest
28 felines with a northern range extending south along the west coast to southern Oregon. They have large
29 feet adapted to walking on snow, long legs, tufts on the ears, and black-tipped tails. Lynx are highly
30 adapted for hunting snowshoe hare, their primary prey, in the snows of the boreal forest. In the United
31 States, lynx inhabit conifer and conifer-hardwood habitats that support their primary prey, snowshoe
32 hares. In North America, the distribution of lynx is nearly the same as that of snowshoe hares; lynx
33 survivorship, productivity, and population dynamics are closely related to snowshoe hare density in all
34 parts of its range (FWS, 2005). Canada lynx occurrence records in Oregon are uncommon, and the last
35 confirmed specimen was observed in Corvallis in 1974. In its recovery plan, FWS considers the entire
36 state of Oregon to be a “peripheral area” for lynx habitat and occurrence because there is no evidence of
37 long-term presence or reproduction that might indicate colonization or sustained use of the area by lynx
38 and there have been large gaps in time with no lynx sighting records (FWS, 2005).

39 According to FWS recovery outline for this species, quality and quantity of habitat to support
40 adequate snowshoe hare or lynx populations in this peripheral area are questionable. Habitat may occur
41 in small patches and is not well-connected to larger patches of high quality habitat. PacifiCorp did not
42 observe any Canada lynx during field surveys, nor did it observe any snowshoe hares, the primary prey
43 for lynx. Even though lynx are reported to have large home ranges, and to be highly mobile, it is unlikely
44 that this species would occur in the project vicinity. For these reasons, we do not discuss this species
45 further in this document.

3.3.5.1.13 Gray Wolf

FWS listed the gray wolf (*Canis lupus*) as an endangered species on March 9, 1978 and then reclassified the western distinct population segment, which includes wolves in Oregon and California, to threatened status on April 1, 2003. It is listed as endangered by the Oregon Fish and Wildlife Commission and is on List 2 at the Oregon Natural Heritage Information Center. Key habitat components for wolves are an abundance of natural prey and minimal conflict with human interests and uses (FWS, 1987). Gray wolves typically range in northern areas of tundra and untouched wilderness but wolves have recently been documented in the far northeastern corner of Oregon. PacifiCorp did not locate any gray wolves during field surveys, little suitable habitat exists in the project vicinity, and the Klamath Hydroelectric Project is not included in any of the recovery areas identified in the recovery plan for this species. For these reasons, we do not discuss this species further in this document.

3.3.5.2 Environmental Effects

3.3.5.2.1 General Recommendations

Oregon Fish & Wildlife recommends that if, at any time, unanticipated circumstances or emergency situations arise in which federal or state ESA-listed fish or wildlife are being killed, harmed, or endangered by any project facilities or as a result of project operation, PacifiCorp would immediately take appropriate action to prevent further loss in a manner that does not pose a risk to human life, limb, or property. PacifiCorp would, within 6 hours of any such event, notify appropriate resource agencies and implement restoration actions, as needed. Within 10 days of the event, PacifiCorp would inform the Commission of the nature of the event and restorative measures taken.

Our Analysis

It is reasonable to expect that in response to any type of environmental monitoring, if the need for corrective actions or opportunities for environmental enhancements becomes apparent, recommendations based on the monitoring results would be specified in any monitoring report submitted to the Commission for approval. We consider it most appropriate to include measures that would protect fish and wildlife from identifiable sources of harm as specific conditions of a new license. However, in some instances, unanticipated project-related effects may result in unexpected mortality or injury to fish and wildlife. We conclude that establishing notification procedures to alert the management agencies of project-related fish or wildlife problems and to develop appropriate measures to minimize adverse effects, as Oregon Fish & Wildlife recommends, is both reasonable and appropriate.

3.3.5.2.2 Coho Salmon

NMFS (2002) has identified important coho habitat in the Shasta, Scott, Salmon, and Trinity rivers; in 6 creeks between Iron Gate dam and Seiad Valley; 13 creeks between Seiad Valley and Orleans; and 27 creeks between Orleans and the mouth of the Klamath River. Designated critical habitat within the Klamath basin includes all rivers within accessible reaches including estuarine areas and tributaries, excluding areas on tribal lands and habitat upstream of existing impassable barriers including Iron Gate dam. NMFS identified five essential habitat types for the SONCC coho ESU: (1) juvenile summer and winter rearing areas; (2) juvenile migration corridors; (3) areas for growth and development to adulthood; (4) adult migration corridors; and (5) spawning areas. Measures proposed by PacifiCorp and prescribed or recommended by other stakeholders have the potential to affect coho salmon and their critical habitat downstream of Iron Gate dam by affecting sediment transport, water quality, fish disease, instream flows, and fish passage. We evaluate the potential benefits of these measures in *Geology and Soils* (section 3.3.1), *Water Quality* (section 3.3.2.2.2), *Instream Flows* (section 3.3.3.2.1), *Fish Passage* (section 3.3.3.2.2), *Disease Management* (section 3.3.3.2.3), *Dam Removal or Decommissioning* (section 3.3.3.2.4), *Anadromous Fish Restoration* (section 3.3.3.2.5), and *Iron Gate Hatchery Management*

1 (section 3.3.3.2.6). In this section, we summarize the potential effects of these measures on coho salmon
2 and their critical habitat.

3 *Our Analysis*

4 **Effects on Critical Habitat**

5 Juvenile summer and winter rearing areas and areas for growth and development to adulthood.

6 Available information indicates that coho salmon in the Klamath basin primarily use tributary habitats for
7 spawning and rearing to the smolt stage. Most coho emigrate from tributaries as age 1+ smolts during
8 March and April, and they migrate through the lower river from May through July.⁹¹ Although some
9 coho salmon fry emigrate from tributaries into the mainstem of the Klamath River, NAS (2003) reports
10 that juvenile coho salmon are uncommon in the mainstem in early summer and become progressively less
11 common as the season progresses. It reports that juvenile coho salmon are virtually absent from the
12 mainstem, including pools at tributary mouths, by late summer. We conclude that this substantial
13 reduction in abundance indicates that few of the fish that emigrate to the mainstem as fry survive to the
14 smolt life stage.

15 Several of the measures proposed by PacifiCorp, recommended by stakeholders, or developed by
16 staff have limited potential to improve rearing habitat for coho salmon in the mainstem Klamath River.
17 These include the development of a temperature management plan, measures to increase downstream
18 dissolved oxygen levels, and to manage the incidence of fish disease. Although there is little information
19 on the effects of fish diseases on coho salmon in the Klamath basin, controlling the incidence of fish
20 disease on the more abundant fall Chinook salmon should limit the potential for transmission of these
21 diseases to coho salmon during their migration through the mainstem Klamath River. We conclude,
22 however, that summer temperatures and competition with juvenile fall Chinook and steelhead would
23 continue to limit the survival of coho salmon that migrate into the mainstem Klamath River as fry.

24 Measures recommended by Siskiyou County to enhance stream flows and reduce water
25 temperatures in the Shasta River would provide a substantial benefit to coho salmon that spawn and rear
26 in that basin, and would help to reduce water temperatures in the mainstem Klamath River. However, the
27 Klamath Hydroelectric Project does not directly affect habitat conditions in the Shasta River.
28 Nevertheless, we include measures to reduce water temperatures in tributaries such as the Shasta River
29 among the measures that could be considered as part of a disease monitoring and management plan
30 designed to improve conditions in the Klamath River migratory corridor (discussed in section 3.3.3.2.3,
31 *Disease Management*).

32 Juvenile and adult migration corridors. Adult coho salmon ascend the Klamath River from
33 October through December and migrate through the mainstem river to access and spawn in tributary
34 habitats. As described above, most juvenile coho salmon migrate from tributaries and pass through the
35 mainstem Klamath River between mid-March and early July. Water temperatures during the adult
36 migration period are generally near optimal, but water temperatures often reach stressful to severely
37 stressful levels during the last few weeks of the juvenile migration (see table 3-70).

38 Effects of proposed and recommended measures on the juvenile migration corridor would be
39 essentially the same as those that we describe previously for effects on rearing habitat. Measures that we
40 discuss as potential components of a disease management plan to control outbreaks of disease, reduce
41 water temperatures, and increase river flows during the juvenile outmigration period would be likely to

⁹¹Timing of coho juvenile movement based on bar graph showing timing of coho juvenile collections during screw trap sampling conducted in the mainstem Klamath River, Shasta River, and Bogus Creek presented by Tom Shaw, FWS, at the Lower Klamath Basin Science Conference on June 8, 2004.

1 provide substantial benefits to coho salmon during the juvenile outmigration period. Although few if any
2 measures would affect conditions during the adult migration period, existing conditions appear to be
3 favorable for coho salmon during that particular period.

4 Spawning areas. Most coho salmon spawning takes place in tributaries, but coho salmon have
5 been observed spawning in side channels, tributary mouths, and shoreline margins of the mainstem
6 Klamath River between Beaver Creek (RM 161) and Independence Creek (RM 94) (T. Shaw, M.
7 Magnusen, A. Olsen, personal communication, as cited by Trihey & Associates, 1996). Gravel
8 augmentation downstream of Iron Gate dam as proposed by PacifiCorp has the potential to increase the
9 amount of spawning habitat that is available to coho salmon in the mainstem Klamath River. However,
10 because high summer water temperatures appear to limit the survival of coho salmon that attempt to rear
11 in the mainstem Klamath River, any increase in spawning habitat is unlikely to provide an increase in
12 coho salmon production or population sizes.

13 **Effects of Fish Passage and Dam Removal**

14 Although no critical habitat has been designated upstream of Iron Gate dam, potential habitat
15 exists within the project area in several of the tributaries to the project reservoirs, and possibly in Shovel
16 Creek, which enters the J.C. Boyle peaking reach. PacifiCorp (2006a) states that Spencer Creek, which
17 flows into J.C. Boyle reservoir, contains abundant spawning habitat and excellent rearing conditions for
18 coho salmon, providing more than three times the amount of rearing habitat, based on low-flow rearing
19 area, than the combined area available in the tributaries between J.C. Boyle and Iron Gate dams (Jenny,
20 Fall, and Shovel creeks). In its Recovery Strategy for California Coho Salmon, Cal Fish & Game (2004b)
21 recommends that a plan, including a feasibility analysis, be developed to provide passage for coho salmon
22 over and above Iron Gate and Copco dams to restore access to historic habitat. NAS (2003) recommends
23 that the benefits to coho salmon from elimination of Dwinnell dam and Iron Gate dam should be
24 evaluated on grounds that these structures block substantial amounts of coho habitat and, in the case of
25 Dwinnell Dam, also degrade downstream habitat.

26 In sections 3.3.3.2.4, *Dam Removal or Decommissioning*, and 3.3.3.2.5, *Anadromous Fish*
27 *Restoration*, we evaluate the potential benefits of dam removal and various approaches to restoring
28 anadromous fish passage to habitat within and above the project area. Provision of passage into the reach
29 between Iron Gate and Copco No. 2 dams would provide access to several small tributaries including Fall
30 and Jenny creeks, provision of passage over Copco No. 1 dam would provide access to potential habitat in
31 Long Pine and Shovel creeks, and provision of passage over J.C. Boyle dam would provide access to
32 Spencer Creek.

33 Implementing the NMFS/Interior fishway prescription would provide volitional upstream and
34 downstream passage at all project dams, and provide access to the tributary habitats identified above. We
35 have serious reservations, however, about the survival rates of outmigrating smolts passing through
36 Copco and Iron Gate reservoirs due to potential losses from fish predation and the cumulative stress from
37 passing through multiple screening facilities, especially when stressful water quality conditions exist
38 during the later part of the outmigration season. We are convinced that implementing a trap and truck
39 approach to provide downstream passage from Spencer Creek past the project dams would have a much
40 greater chance of success than providing volitional passage at each project dam. Whatever approach to
41 anadromous fish restoration is considered for implementation, it would be prudent for initial efforts to
42 focus on providing passage for the more abundant fall Chinook salmon, with introduction of coho being
43 considered only after successful passage strategies have been developed and implemented.

44 Removal of Iron Gate and Copco No. 1 dams would substantially reduce the risk of fish predation
45 on outmigrating smolts. It would also reduce the number of screening facilities that outmigrating smolts
46 would have to negotiate as well as exposure to adverse water quality conditions during the downstream
47 migration period. Because the reservoirs created by the J.C. Boyle and Copco No. 2 dams do not have as

1 large a population of predatory fish and because they have less effect on water quality conditions (due to
2 the smaller volume of the reservoirs), removal of these dams would provide minimal additional benefit if
3 effective fish passage was provided at these dams. We make our final conclusions regarding coho salmon
4 in section 5.6.4, *Endangered Species Act*.

5 **3.3.5.2.3 Lost River and Shortnose Suckers**

6 Lost River and shortnose suckers are known to occur in Upper Klamath Lake and its tributaries;
7 the Lost River; Tule Lake; Clear Lake; and Gerber, J.C. Boyle, Copco, and Iron Gate reservoirs. These
8 species reside primarily in lake habitats and spawn in tributary streams or at springs and shoreline areas
9 within Upper Klamath Lake. Upper Klamath Lake currently supports the largest remaining population of
10 both species.

11 PacifiCorp proposes to decommission the East Side and West Side facilities to eliminate the
12 entrainment of listed suckers at these developments. FWS recommends that PacifiCorp develop an
13 adaptive management plan for federally listed suckers, in consultation with FWS and Oregon Fish &
14 Wildlife, to evaluate the need for a ladder built to sucker criteria at Keno dam. During the months of
15 February through May, or as otherwise directed by FWS, the anadromous fish trap at that location (part of
16 the fishway prescription for Keno development) would be operated to gather data on the possible need for
17 such a ladder for suckers. Data collected would include information on species, size, sex, and estimated
18 numbers. Regular visual examination also would be conducted to evaluate use of the ladder.

19 FWS recommends that PacifiCorp develop and implement a plan to monitor resident fish
20 populations every 3 years to include monitoring the distribution, population structure, and abundance of
21 resident fish populations, including federally listed suckers (using protocols of Markle et al. [2000] and
22 Simon et al. [1995], for larvae, juvenile, and adult suckers) in all project reservoirs and reaches below
23 Keno dam.

24 *Our Analysis*

25 Prior to the construction of the Klamath Hydroelectric Project, the Klamath River downstream of
26 Lake Ewauna (now part of Keno reservoir) did not include any lake or reservoir habitat suitable for
27 supporting the rearing life stages of these species. Based on their limited swimming ability compared to
28 salmonid species, it is unlikely that any suckers that moved downstream past the high gradient rapids in
29 the Keno and J.C. Boyle peaking reaches would be able to return upstream to suitable rearing habitat, and
30 they were probably lost from the reproducing population. The project reservoirs, especially the J.C.
31 Boyle, Copco, and Iron Gate reservoirs, provide suitable rearing habitat that did not exist before project
32 construction. Based on the size distribution of the federally listed sucker species that were sampled by
33 Desjardins and Markle (2000), it appears that recruitment to these reservoirs occurs almost entirely
34 through downstream migration of juvenile and adult suckers from Upper Klamath Lake and possibly from
35 J.C. Boyle reservoir. Desjardins and Markle (2000) concluded that the lack of recruitment to Copco and
36 Iron Gate reservoirs was likely due to predation by abundant populations of non-native fish species.

37 Decommissioning the East Side and West Side facilities, as proposed by PacifiCorp, would
38 eliminate sucker mortality due to entrainment through turbines at these developments, and would increase
39 the recruitment of shortnose and Lost River suckers to the downstream reservoirs. The populations of
40 juvenile and adult suckers in these reservoirs have the potential to play a role in conservation of the
41 species, especially in the event of a catastrophic fish kill in Upper Klamath Lake, as adult fish residing in
42 the project reservoirs could serve as a source of broodstock in a restoration effort.

43 We see very little potential benefit in evaluating the need for a ladder built to sucker criteria at
44 Keno dam, as FWS recommends. Review of the gradient profile of the Klamath River (see figure 3-1)
45 indicates that the stream gradient in the Keno reach is comparable to the gradient in the Hells Corner
46 section of the peaking reach, which we conclude is likely to preclude the upstream emigration of sucker

1 species. Furthermore, any suckers that were to ascend a ladder at Keno dam would be subject to lethal
2 DO conditions if they remained in the reservoir during the summer months. We conclude that
3 construction of a fish ladder designed to meet sucker criteria at Keno dam would provide little, if any,
4 conservation benefit to the population of shortnose or Lost River suckers.

5 Also, we see little reason to expect that sucker populations in project reservoirs would be affected
6 by any proposed measures or changes in project operation, except if downstream recruitment from Upper
7 Klamath Lake were reduced through the installation of a smolt collection or screening facility.
8 Accordingly, we conclude that monitoring reservoir populations every 10 years, rather than every 3 years
9 as FWS recommends, would be sufficient to assist with tracking population trends of the federally listed
10 sucker species. We make our final conclusions regarding Lost River and shortnose suckers in section
11 5.6.4, *Endangered Species Act*.

12 **3.3.5.2.4 Bull Trout**

13 PacifiCorp does not propose any measures that are designed to benefit bull trout, nor has any
14 agency proposed any specific measures to benefit bull trout. However, implementation of the
15 NMFS/Interior fishway prescription, PacifiCorp's alternative prescription, or restoration of passage of
16 anadromous fish to Upper Klamath Lake via dam removal all have the potential to affect bull trout
17 populations upstream of Upper Klamath Lake.

18 *Our Analysis*

19 All designated bull trout critical habitat in the Klamath basin occurs in the upper basin upstream
20 of Upper Klamath Lake. None of this habitat is affected by the existence or operation of the Klamath
21 Hydroelectric Project, and no bull trout have been reported to occur downstream of Upper Klamath Lake.

22 Implementation of the NMFS/Interior fishway prescription, PacifiCorp's alternative prescription,
23 or removal of all project dams as recommended by some stakeholders could restore the passage of
24 anadromous fish to Upper Klamath Lake. This has the potential to benefit bull trout populations by
25 increasing opportunities for bull trout by providing access to eggs, fry, and juvenile anadromous fish,
26 upon which bull trout are known to feed. It also has the potential to adversely affect bull trout by
27 introducing or increasing the prevalence of disease pathogens. However, most populations of bull trout in
28 the basin occur in isolated portions of headwater streams that would not likely be accessible to
29 anadromous fish in the foreseeable future. The only exception to this would be Agency Lake, which is
30 directly connected to Upper Klamath Lake and includes tributaries such as the Wood River that may
31 currently be suitable for the reintroduction of anadromous fish. We make our final conclusions regarding
32 bull trout in section 5.6.4, *Endangered Species Act*.

33 **3.3.5.2.5 Applegate's Milk-vetch**

34 The federally endangered Applegate's milk-vetch was discovered during relicensing surveys
35 within 45 to 100 feet of Keno reservoir. This site is approximately 2 feet above the surface water
36 elevation and, as such, could potentially be affected by reservoir water level fluctuations.

37 PacifiCorp proposes to remove Keno development from the project boundary. Therefore, the
38 proposed threatened, endangered, and sensitive plant protection measures contained in its vegetation
39 resource management plan (see section 3.3.4.2, *Terrestrial Resources*) would not apply to this population.

40 *Our Analysis*

41 Keno reservoir maintains a relatively stable surface water elevation, as seen in figure 3-7 in
42 section 3.3.2.11, *Water Quantity*, with a +/- 0.1-foot fluctuation. The period of record shown in figure 3-
43 7 (1990 through 2004) included several high flow events as measured at the USGS gage downstream of

1 Keno dam, yet the water level of Keno reservoir never increased more than about 6 inches. Any such
2 increases in water level in response to flood conditions would generally not be within the control of Keno
3 dam. As such, the population of Applegate's milk-vetch located about 2 feet above the surface water
4 elevation would not be affected by project operations of Keno dam. Occasional 2-foot maintenance
5 drawdowns occur, which could result in altered hydrology for the plant population; however, these
6 drawdowns generally occur outside of the growing season and are very short in duration. Therefore,
7 project operations of Keno dam would have negligible effects on the Applegate's milk-vetch.

8 Most of the land occupied by the Ewauna Flats population of Applegate's milk-vetch, adjacent to
9 the Keno reservoir, is owned by the Nature Conservancy, and this organization is taking appropriate
10 stewardship measures to ensure the protection of this population. Although no ground-disturbing
11 activities are currently proposed within the existing project boundary around Keno reservoir, if the
12 reservoir remains within the project boundary, extending PacifiCorp's proposed plant protection measures
13 to the Keno reservoir would protect this population from future project-related, ground-disturbing
14 activities. If Keno development should remain part of the project, no planned operation or maintenance
15 actions would have the potential to affect the known Applegate's milk-vetch populations.

16 Applegate's milk-vetch is adapted to and may require seasonally moist floodplains (FWS, 1998).
17 We do not have sufficient information to determine if seasonal moistness of the habitat adjacent to Keno
18 reservoir is derived from retention of precipitation on hardpan or whether there may be some hydrological
19 connection with Keno reservoir. If the latter, removal of Keno dam could adversely affect Applegate's
20 milk-vetch by altering the hydrology in the floodplain adjacent to the existing Keno reservoir. We make
21 our final conclusions regarding Applegate's milk-vetch in section 5.6.4, *Endangered Species Act*.

22 **3.3.5.2.6 Gentner's Fritillaria**

23 Although the federally endangered Gentner's fritillaria was not located within the project
24 boundary during relicensing surveys, it could potentially occur anywhere in the project vicinity from the
25 J.C. Boyle reservoir to Fall Creek development, since this area is located in recovery unit 4, as designated
26 in its FWS recovery plan.

27 PacifiCorp, as part of its vegetation resources management plan described in section 3.3.4.2,
28 *Terrestrial Resources*, proposes to protect, monitor, and adapt management as necessary at known
29 threatened, endangered, and sensitive plant sites, as well as any new locations identified within the project
30 boundary. In addition, it proposes to coordinate with the transmission and delivery group to provide
31 avoidance training, procedures, and scheduling to avoid or protect threatened, endangered, and sensitive
32 plant sites in or near rights-of-ways. As part of its proposed wildlife resources management plan,
33 PacifiCorp also proposes to conduct on-the-ground surveys for threatened, endangered, and sensitive
34 plant and wildlife species. Based upon the results of these surveys, a site-specific protection plan would
35 be developed in consultation with the resource agencies.

36 The Bureau of Land Management specifies that PacifiCorp develop a vegetation resources
37 management plan within 1 year of license issuance that includes provisions for managing threatened,
38 endangered, and sensitive plants on Bureau of Land Management-administered lands affected by the
39 project. The plan would include surveys, protection, remediation of effects, and review of rare plant
40 records (see section 3.3.4.2, *Terrestrial Resources*). Oregon Fish & Wildlife's recommendation described
41 previously for Applegate's milk-vetch also would apply to Gentner's fritillaria.

42 *Our Analysis*

43 Because Gentner's fritillaria is not currently known to exist within the project boundary, there are
44 no known project effects on this species. PacifiCorp's proposed threatened, endangered, and sensitive
45 plant protection and monitoring measures would ensure that if any populations are discovered within the
46 project boundary, they would be monitored and protected from potential adverse effects. Because

1 PacifiCorp conducted rare plant surveys during relicensing efforts and proposes to conduct surveys prior
2 to ground-disturbing activities, we conclude that the Bureau of Land Management’s specification to
3 conduct additional rare plant surveys on all Bureau land affected by the project is unnecessary for the
4 protection of Gentner’s fritillaria.

5 Because Gentner’s fritillaria is not known to exist in the project boundary, dam removal would
6 not affect this species. We make our final conclusions regarding Gentner’s fritillaria in section 5.6.4,
7 *Endangered Species Act*.

8 **3.3.5.2.7 Bald Eagle**

9 There are 10 known federally threatened bald eagle nest sites within approximately 7 miles of the
10 project. Of these, only three active and one inactive nest sites are within 1 mile of any project facility,
11 with none within the project boundary. An additional nest site, the Pony Express nest, is approximately 7
12 miles from a facility, but is immediately adjacent to the J.C. Boyle peaking reach. Although nesting
13 territories in the project vicinity are meeting the recovery goal of 1.0 young/occupied territory, project
14 operations and associated activities could potentially affect the bald eagle. Specifically, bald eagles could
15 potentially be affected by collisions with project transmission lines, disturbance from project recreation,
16 and the effect of project operations on prey availability.

17 As part of its proposed wildlife habitat management plan, PacifiCorp proposes to fund annual
18 aerial bald eagle surveys to document new nests and productivity of territories, and to protect bald eagle
19 habitat within the project boundary. The annual data would be used as a monitoring tool in assessing the
20 need for additional environmental measures, such as protection of any newly discovered nest sites within
21 the project boundary. In coordination with its proposed vegetation resource management plan, discussed
22 in section 3.3.4.2, *Terrestrial Resources*, PacifiCorp would preserve existing trees and human-made
23 structures within the project boundary that could be used as perch or roost sites. Additionally, as
24 described in section 3.3.4.2, *Terrestrial Resources*, PacifiCorp proposes to monitor powerlines within the
25 project boundary and, whenever feasible, retrofit poles on lines where birds have died to improve avian
26 protection. PacifiCorp also proposes to conduct on-the-ground surveys for threatened, endangered, and
27 sensitive plant and wildlife species in areas where ground-disturbing activities are proposed.

28 The Bureau of Land Management specifies that PacifiCorp develop and implement, within 2
29 years of license issuance, a wildlife habitat management plan for Bureau-administered lands affected by
30 project operations and maintenance. As part of this plan, the Bureau specifies that it include (1) survey
31 protocols for long-term survey and monitoring of threatened, endangered, and sensitive species and their
32 habitat for Bureau-administered lands within the project boundary to assess effects and develop necessary
33 mitigation to supplement the previous surveys completed by PacifiCorp; (2) the identification of
34 restoration, protection, and/or enhancement measures; and, (3) seasonal restrictions for active nest sites on
35 Bureau-lands for bald eagles and other raptors affected by project operations.

36 FWS recommends that PacifiCorp, within 2 years of license issuance, in consultation with FWS
37 and appropriate state and federal land management agencies, develop and implement a bald eagle
38 management plan for the project area. The plan would provide for monitoring and protection of bald
39 eagle nest sites, roost sites, and regular foraging areas from human disturbance. The plan would be based
40 on FWS’s Draft Bald Eagle Management Guidelines (FWS, 2006b) or on the successor to those
41 guidelines and would incorporate local knowledge as available. The plan would also include measures
42 for evaluation of changes in prey base relationships and incorporate measures that would protect bald
43 eagles from powerline collisions and electrocution. FWS and Oregon Fish & Wildlife both make
44 recommendations regarding avian protection from potential transmission line interactions and associated
45 monitoring. These measures are discussed in greater detail in section 3.3.4.2, *Terrestrial Resources*.

1 *Our Analysis*

2 Bald eagles are found throughout the project boundary with bald eagle use documented by
3 PacifiCorp on each of the reservoirs, the J.C. Boyle peaking reach, and downstream of Iron Gate dam
4 during both nesting and wintering seasons. Human disturbance to bald eagles can adversely affect their
5 ability to successfully fledge young. Although there are no bald eagle nest sites within the project
6 boundary, project-related human disturbance, particularly from recreation, could deter bald eagles from
7 foraging, if such disturbance is not managed with eagles in mind. Depending upon the tolerance of the
8 eagles to human presence, bald eagles may not use areas that are actively being used by humans during
9 peak feeding times (mid-morning and afternoon). Recreational activities, including boating and camping,
10 are anticipated to increase under a new license, as discussed in section 3.3.6, *Recreation Resources*,
11 particularly at project reservoirs during April through September. Specifically, flatwater boating, angling,
12 and camping occur at the project reservoirs from May through September, and commercial rafting occurs
13 in the peaking reach from April through October. This overlaps with the bald eagle nesting period of
14 February through mid-August. If increased recreation occurs in active bald eagle foraging areas, bald
15 eagles may be disturbed by humans and have to expend additional energy during foraging attempts to
16 locate a place they are willing to inhabit. PacifiCorp proposes monitoring and protection measures that
17 would document any new nests, preserve roosting and perching trees, and monitor productivity of known
18 nests to determine if any further environmental protection measures are needed. These proposals, when
19 implemented as part of a bald eagle management plan, such as the one recommended by FWS, would
20 ensure that increased recreation is not adversely affecting eagles. If productivity is found to be adversely
21 affected by project-related activities, then PacifiCorp's proposed measures and FWS's recommended
22 management plan would provide a mechanism to implement further protective measures, including
23 recreation closures during nesting season.

24 During nesting season, bald eagles are sensitive to disturbance such as human activity or loud
25 noises too close to their nests. Bald eagle productivity can be adversely affected because of added energy
26 expenditure or even nest abandonment if disturbance is too great. As part of FWS's recommended bald
27 eagle management plan and the Bureau of Land Management's specified wildlife habitat management
28 plan, existing nesting territories would be protected from project management activities, such as major
29 maintenance and vegetation management, during sensitive nesting periods, by closing sensitive areas
30 around nest sites during nesting season. Prohibiting potentially disturbing activities around bald eagle
31 nests would limit or stop bald eagles from leaving their nests in response to human activities.
32 Furthermore, implementing PacifiCorp's proposed and the Bureau of Land Management's specified
33 measures to conduct surveys for threatened, endangered, and sensitive species before ground-disturbing
34 activities would ensure that no new bald eagle nest locations would be disturbed.

35 As discussed in section 3.3.4.2, *Terrestrial Resources*, PacifiCorp has previously retrofitted most
36 project transmission lines to raptor-safe standards; however, Line 15 still has a few poles that do not meet
37 current safety standards. Line 15 is located south of the Copco No. 2 bypass and has both transmission
38 and distribution lines on the same poles with separation between phases not always more than 60 inches
39 (the suggested minimum distance). Only one nest location, which is inactive, located about 540 feet
40 southeast of Copco No. 1 dam is in the vicinity of Line 15. Although no avian electrocutions have been
41 identified at Line 15, it is located on a north-facing hillside, so it could possibly be a hazard to raptors.
42 According to APLIC (1994), waterfowl and large wading birds are the species most likely to collide with
43 transmission lines because of their lack of maneuverability in flight; therefore, bald eagles are expected to
44 have a low risk of collision. There have been no reported electrocutions or avian collision deaths along
45 the project transmission lines since PacifiCorp personnel began tracking them in the late 1980s.

46 The *Avian Protection Plan Guidelines* (APLIC, 2005), used in conjunction with *Suggested*
47 *Practices for Raptor Safety on Power Lines: The State of the Art in 1996* (APLIC, 1996) and *Mitigating*
48 *Bird Collisions with Power Lines: The State of the Art in 1994* (APLIC, 1994), are considered industry
49 standards for raptor protection from transmission lines. As such, following standards specified in these

1 documents when designing any new poles or retrofitting any existing pole that is involved in avian
2 mortality, as proposed by PacifiCorp and recommended by FWS and Oregon Fish & Wildlife, would
3 minimize the potential for future bald eagle mortality and injury due to collision or electrocution.
4 Developing and implementing an avian collision and electrocution hazard avoidance plan, as
5 recommended by FWS, in consultation with FWS, Oregon Fish & Wildlife, the Bureau of Land
6 Management, and the Forest Service would ensure that appropriate site-specific practices would be put
7 into place for the project's transmission lines, further reducing potential adverse effects on bald eagles.
8 We expect that during the consultation process, FWS and Oregon Fish & Wildlife would ensure that the
9 appropriate provisions of the existing Avian Protection Plan for the Klamath Basin (PacifiCorp and FWS,
10 2005, as cited in a letter from Interior dated March 27, 2006) would be incorporated into the plan. In
11 addition, such consultation with FWS and Oregon Fish & Wildlife could ensure that provisions for
12 monitoring and reporting avian mortality, as appear to be specified in the 1988 Memorandum of
13 Understanding between PacifiCorp, FWS, and Oregon Fish & Wildlife, would be appropriately
14 addressed. However, because the 1988 Memorandum of Understanding has not been filed as part of this
15 proceeding, we cannot evaluate it further. Bald eagle protection measures, as specified by the Bureau of
16 Land Management and recommended by FWS, would provide mechanisms to limit periodic vegetation
17 control in transmission line rights-of-way that occur within proximity to bald eagle nests to outside of
18 nesting season.

19 The proposed project could potentially be beneficial to the bald eagle by enhancing its prey base.
20 Currently, bald eagles in the project area have a varied diet that includes waterfowl, mammals, and fish.
21 As described in section 3.3.3.2, *Aquatic Resources*, several measures could result in increased salmonid
22 populations. PacifiCorp's alternative fishway prescription, which would entail trapping adult salmon at
23 Iron Gate dam and hauling them to appropriate spawning sites could result in more juvenile salmon
24 outmigrating through portions of the project area, and enhancements to the project flow regime proposed
25 by PacifiCorp and recommended by others would likely result in an increase in the resident redband trout
26 population. Furthermore, fishway prescriptions, if implemented, could result in adult salmon occurring
27 throughout the project area. However, as discussed in detail in the following section, activities associated
28 with fishway construction could result in disturbance of nearby bald eagle populations, especially during
29 the breeding and nesting season. Fishway construction would be especially prolonged at the two Copco
30 developments and at Iron Gate development.

31 Removal of all the project dams would result in a change from lacustrine to riverine conditions
32 throughout the project area. As bald eagles frequently forage in lakes and reservoirs, this would eliminate
33 a large amount of bald eagle habitat. Because the areas in proximity to the Fall Creek and Copco No. 2
34 developments are too heavily forested to provide foraging opportunities for eagles, dam removal would
35 be unlikely to adversely affect bald eagles at those locations. There are no known bald eagle nests in the
36 vicinity of Keno dam, and because much of Keno reservoir is relatively narrow and therefore not ideal
37 foraging habitat, dam removal would be unlikely to affect bald eagles at this location. There are two
38 known eagle nests in the vicinity of the J.C. Boyle reservoir and one known nest territory in the vicinity
39 of Iron Gate dam. It is likely that dam removal at these locations would alter and potentially diminish
40 bald eagle foraging habitat because the broad expanses of open water (preferred foraging habitat)
41 associated with these two reservoirs would be eliminated. Dam removal, if it should occur, would be
42 considered under a separate proceeding (either a license amendment proceeding or, if all project dams
43 should be removed, a project license surrender proceeding), and as such, separate section 7 consultation
44 pursuant to the ESA would need to take place before dam removal could occur. We make our final
45 conclusions regarding bald eagles in section 5.6.4, *Endangered Species Act*.

46 **3.3.5.2.8 Northern Spotted Owl**

47 Suitable habitat for the federally threatened northern spotted owl occurs within the project
48 boundary at the western end of Keno development, at the J.C. Boyle development, along both sides of

1 Shovel Creek, on the south side of Copco reservoir, and at the Fall Creek development. Surveys
2 conducted by PacifiCorp detected the presence of northern spotted owls near the J.C. Boyle peaking
3 reach, but not within 5 miles of any project facilities. If project-related recreation or new recreational
4 facility development occurred near northern spotted owl nests, it could potentially affect spotted owls.

5 Although PacifiCorp and the resource agencies did not propose, recommend, or specify any
6 measures specifically for the northern spotted owl, PacifiCorp proposes to conduct surveys for threatened,
7 endangered, and sensitive species prior to any ground-disturbing activities. As previously discussed,
8 PacifiCorp also proposes and FWS and Oregon Fish & Wildlife recommend avian protection measures
9 regarding transmission line interactions, and the Bureau of Land Management specifies that threatened,
10 endangered, and sensitive species surveys and monitoring be conducted and seasonal restrictions of
11 management activities take place on or adjacent to Bureau lands when sensitive avian species could be
12 disturbed. Interior, in its March 27, 2006, letter to the Commission stated that: “Ordinary project
13 operations are not expected to affect this species (northern spotted owl). Activities related to potential
14 construction of fish passage facilities will be subject to section 7 consultation under ESA; the necessity of
15 protection measures will be evaluated at that time. No further measures are proposed herein.”

16 *Our Analysis*

17 Although northern spotted owls are known to exist near the project at the J.C. Boyle peaking
18 reach, they are not known to nest within proximity to project facilities. As such, proposed project
19 operations or project-related activities are not expected to affect the owls. No new recreational facility
20 developments are proposed for areas near northern spotted owl nests, and PacifiCorp’s proposal to
21 conduct surveys for threatened, endangered, and sensitive species prior to any ground-disturbing activities
22 would ensure that no new owl nests would be disturbed. PacifiCorp does not propose new fish passage
23 facilities, although relatively minor improvements to existing facilities at J.C. Boyle are proposed.

24 NMFS and Interior prescribe fishways at all project dams. Construction activities could disturb
25 northern spotted owls. Given the presence of suitable habitat near Keno dam, if this habitat should be
26 occupied when fishways are constructed, the associated disturbance could adversely affect spotted owls if
27 it occurs during the breeding and nesting season. Prescribed fishways at this location include
28 modifications to the existing ladder (with the potential for constructing a new ladder designed for suckers)
29 including a trap and haul facility and spillway modifications. It may be feasible to schedule this activity
30 during periods that would not disturb northern spotted owls, if they occupy nearby habitat. Fishway
31 construction at Copco No. 1 dam could also adversely affect northern spotted owls, if they should occupy
32 nearby suitable habitat near Copco reservoir. Copco No. 1 dam is 126-feet-high, and construction of a
33 fish ladder at this site, scheduled to be completed within 6 years of license issuance, would be a major
34 undertaking. Retrofitting the dam with screens and a bypassed system that would extend to the base of
35 Copco No.2 dam, also scheduled to be completed within 6 years of license issuance, also would require a
36 major construction effort. Spillway modifications, to be completed within 8 years of license issuance,
37 could entail a major construction effort, depending on the modifications that may be needed.

38 Consequently, there could be at least 3 or 4 years of continuous construction activity and
39 associated construction vehicle traffic on access roads, which would likely disturb northern spotted owls,
40 if they should colonize the nearby suitable habitat. Such extended construction activity would likely
41 preclude colonization of the nearby suitable owl habitat until after completion of construction.
42 Construction of the prescribed fishways at Copco No. 2 dam would occur during the same time frame,
43 and although construction would not be as extensive and undertaking as at Copco No. 1 dam because the
44 dam is only 33-feet-high, potential disturbance of northern spotted owls or owl habitat would occur
45 during on-site construction activities and construction traffic, which would use many of the same roads
46 needed to access Copco No. 1 dam. Fishway construction at Iron Gate dam would entail a similar major
47 construction effort, but the absence of nearby suitable northern spotted owl habitat would likely result in
48 no effect on owls at this location. Fishway construction at J.C. Boyle dam would entail a moderate level

1 of construction activity, but there is no known nearby suitable northern spotted owl habitat, so there
2 would be no identifiable effects on northern spotted owl or its habitat at this site. Fishway construction at
3 the Fall Creek and Spring diversion dams would entail a relatively minor construction effort that would be
4 unlikely to influence northern spotted owl or its habitat.

5 Construction activities associated with dam removal have the potential to disturb northern spotted
6 owls, depending on the specific dam removed. The potential for disturbance of northern spotted owl or
7 its habitat would be similar to that described for fishway construction, with the greatest potential for long-
8 term disturbance occurring with the removal of Copco No. 1 dam. Similar levels of construction activity
9 would be necessary for removal of Keno and Copco No. 2 dams, which are 25- and 33-foot-high,
10 respectively. Because all three of these dams are near suitable northern spotted owl habitat, removal of
11 each has the potential to affect this species. Removal of J.C. Boyle, Iron Gate, and the two Fall Creek
12 diversion dams would be unlikely to influence northern spotted owls. Dam removal would entail a
13 separate proceeding, as mentioned in the previous section, and section 7 consultation would need to occur
14 as part of that proceeding, reflecting the specific dams that would be slated for removal. We make our
15 final conclusions regarding the northern spotted owl in section 5.6.4, *Endangered Species Act*.

16 **3.3.5.3 Cumulative Effects**

17 **3.3.5.3.1 Coho Salmon**

18 The settlement and development of the Klamath River Basin has caused substantial adverse
19 cumulative effects on the habitat and population size of coho salmon. Dams for impounding water for
20 mining and farming operations were first built in the 1850s, and water uses associated with mining
21 activities caused substantial increases in turbidity, siltation, and altering stream morphology. Starting
22 around 1912, construction and operation of facilities associated with Reclamation's Klamath Irrigation
23 Project resulted in extensive draining of wetlands, increased agricultural diversions, increased nutrient
24 loading, and reduced dissolved oxygen levels. In the 1920s, the water resources in the Shasta and Scott
25 rivers were developed to support irrigated agriculture, and the construction of Dwinnell dam blocked
26 access for coho salmon to the southern headwaters. Agricultural diversions in these tributaries and in the
27 tributaries to Upper Klamath Lake have reduced flows, increased water temperatures, and increased
28 nutrient inputs. Diversion of up to 80 percent of the flow from the Trinity basin to support agriculture in
29 the Sacramento River Basin started in 1964 with the completion of Trinity and Lewiston dams.

30 Timber harvest practices and grazing have also contributed to erosion, damage to riparian habitat,
31 and increased water temperatures. Overfishing also contributed to the decline of coho salmon in the
32 basin, although NMFS (2002) indicates that fishing mortality has been reduced substantially since the
33 retention of naturally produced coho south of Cape Falcon, Oregon, was prohibited in 1994. Competition
34 with Chinook and coho salmon produced at Iron Gate and the Trinity River hatcheries has also adversely
35 affected wild runs of coho salmon. NMFS (2002) reports that approximately 95 percent of the coho run
36 in the Trinity River above Willow Creek and about 65 percent of the coho run in the Klamath River above
37 Weitchipek consist of hatchery fish. Prior to the construction of Iron Gate dam in 1964, peaking
38 operations at the Copco developments adversely affected anadromous fish by causing large daily
39 fluctuations in flow, which likely resulted in extensive fish stranding.

40 The Klamath Hydroelectric Project contributes to adverse cumulative effects on coho salmon by
41 blocking access to tributary habitats upstream of Iron Gate dam. The project contributes to the
42 cumulative effects associated with nutrient inputs from upstream, non-project sources by providing
43 seasonal increases in nutrients and contributing to diurnal fluctuations in dissolved oxygen levels and pH
44 downstream of Iron Gate dam associated with plankton blooms in the project reservoirs. Several project
45 effects act in a cumulative manner to contribute to disease losses downstream of Iron Gate dam, including
46 an increase in the density of salmon spawning below the dam, increased habitat for disease pathogens and
47 their alternate hosts due to seasonally increased nutrient inputs and armoring of the stream bed, which

1 provides a stable substrate for the growth of attached algae, and increased disease susceptibility caused by
2 stressful water quality conditions. Although little information is available on the effects of these diseases
3 on coho salmon, the high incidence of disease on Chinook salmon increases the potential for infection of
4 coho salmon.

5 Although implementing the NMFS/Interior fishway prescription would provide access to
6 upstream tributary habitats, we have serious reservations about the survival rates of outmigrating smolts
7 passing through Copco and Iron Gate reservoirs due to potential losses from fish predation and the
8 cumulative stress from passing through multiple screening facilities, especially when stressful water
9 quality conditions exist during the later part of the outmigration season. Because it would not involve
10 passage past multiple dams and reservoirs, we conclude that implementing a trap and haul program to
11 above J.C. Boyle dam would be a more effective method to restore anadromous fish, including coho
12 salmon, to Spencer Creek, which contains the majority of potential coho habitat upstream of Iron Gate
13 dam. The same goal could also be accomplished by removing Iron Gate and Copco No. 1 dams and
14 providing effective fish passage at Copco No.2 and J.C. Boyle dams, which would also serve to reduce
15 adverse effects on water quality downstream of Iron Gate dam.

16 **3.3.5.3.2 Shortnose and Lost River Suckers**

17 Habitat conditions for the two federally listed sucker species have been degraded over the past
18 150 years by agriculture, grazing, forestry, and to a smaller degree, urbanization (FWS, 2002a). Nearly
19 all streams and rivers in the Klamath basin have been degraded, some seriously, by the loss of riparian
20 vegetation, geomorphic changes, introduction of return flows from agricultural drainage ditches and water
21 pumped from drained wetlands, stream channelization, dams, and flow reductions from agricultural and
22 hydroelectric diversions. Most water bodies in the basin fail to meet state water quality criteria. Wetland
23 losses have been especially harmful for sucker populations, since wetlands provide habitat for larval and
24 juvenile suckers and have important water quality functions. Along the perimeter of Upper Klamath
25 Lake, about 40,000 acres of wetlands have been diked and drained for agriculture, and extensive amounts
26 of wetland have been drained elsewhere in the basin. Lower Klamath and Tule lakes no longer support
27 suckers or have been reduced to a few hundred acres of suitable habitat.

28 The Klamath Hydroelectric Project causes mortality to suckers that are entrained through turbines
29 at the mainstem developments downstream from Keno dam. Upstream migration of suckers is blocked by
30 Iron Gate and the Copco dams, which do not have fish ladders, and the ladders at J.C. Boyle and Keno
31 dam do not meet criteria for sucker passage. However, prior to the construction of the Klamath
32 Hydroelectric Project, the Klamath River downstream of Lake Ewauna did not include any lake or
33 reservoir habitat suitable to support rearing of these species. Based on their limited swimming ability
34 compared to salmonid species, it is unlikely that any suckers that moved downstream past the high
35 gradient rapids in the Keno and J.C. Boyle peaking reaches would be able to return upstream to suitable
36 rearing habitat, and they were probably lost from the spawning population. Accordingly, we conclude
37 that it is unlikely that the Klamath Hydroelectric Project has contributed to adverse cumulative effects on
38 the shortnose and Lost River suckers.

39 **3.3.5.4 Unavoidable Adverse Effects**

40 If the project is relicensed without removal of Iron Gate or Copco No. 1 dams, the project would
41 likely continue to adversely affect water quality conditions downstream of Iron Gate dam, which has the
42 potential to adversely affect juvenile coho salmon during their outmigration from tributaries to the lower
43 Klamath River. Although some entrainment mortality of shortnose and Lost River suckers would
44 continue, this would have no effect on sucker populations upstream of Link River dam.

45 This project would not result in unavoidable adverse effects on terrestrial threatened and
46 endangered species.

1 **3.3.6 Recreational Resources**

2 **3.3.6.1 Affected Environment**

3 Recreational resources associated with the project extend along the California-Oregon border
4 from Klamath Falls to Iron Gate reservoir and include both developed recreational facilities and dispersed
5 recreational opportunities. In the following section, we first describe the regional recreational setting and
6 then the recreational resources associated with the project, including a discussion of latent demand for
7 recreational facilities at the project and visitor survey results.

8 **3.3.6.1.1 Regional Recreational Setting**

9 Rivers, streams, and lakes are common throughout the mountainous landscape, and there are also
10 grasslands in the high plateau areas of the region. Major routes of access in the region include Interstate
11 Highway 5 (I-5), and state highways 66, 97, and 140. There are also numerous paved and unpaved public
12 roads that provide access throughout the region. Most recreational opportunities in the region require
13 several hours drive from the project as well as from Yreka, Ashland, and Klamath Falls, which are the
14 three major population centers in the region (see figure 1-1). Although there are also a few small
15 communities scattered throughout, in general, the region can be characterized as rural.

16 *Public Land*

17 Although most of the land within the region is privately owned and managed for agricultural uses
18 and timber production, the Bureau of Land Management, Forest Service, National Park Service (NPS),
19 and FWS manage public lands within the region for many uses including recreation. The Bureau
20 manages public lands primarily in the portions of the region in Oregon. The public lands managed by the
21 Forest Service are within the Klamath and Fremont-Winema national forests.

22 The Klamath National Forest (KNF) in north-central California consists of about 1.7 million
23 acres, and the 300 miles of rivers within the forest include 152 miles of river that are designated national
24 Wild and Scenic Rivers. KNF lands and resources offer opportunities for angling, wildlife viewing,
25 hunting, whitewater and flatwater boating, golf, hiking, mountain biking, equestrian use, skiing, off-
26 highway vehicle (OHV) and snowmobile use, mountain climbing, and spelunking. There are 28
27 developed campgrounds within the KNF, and dispersed day and overnight use occurs in various locations
28 throughout the forest.

29 The Fremont-Winema National Forest in south-central Oregon on the eastern slopes of the
30 Cascade Mountain range consists of 2.3 million acres. The lowest elevations of the forest adjoin Upper
31 Klamath Lake where there are marshes, lakes, forested slopes, and wide basins. There are 22 developed
32 campgrounds and 9 day-use areas across the forest; most campgrounds and some day-use facilities require
33 visitors to pay a fee. Recreational opportunities are similar to those provided on the KNF and also
34 include downhill ski areas and hangliding sites.

35 The NPS manages two areas within the region. Lava Beds National Monument, about 25 miles
36 southeast of Klamath Falls, provides visitor education opportunities for this landscape dominated by
37 striking volcanic features through cave tours, interpretive walks, and campfire programs. Developed
38 recreational facilities include trails, and sites are provided for day and overnight use. Crater Lake
39 National Park, about 25 miles north of Klamath Falls, provides similar recreational opportunities and
40 facilities focused on Crater Lake. Entrance and overnight-use fees are required for both areas.

41 Located in an area with abundant wetlands, there are also state and federal lands specifically
42 managed for wildlife habitat in the region. FWS manages five wildlife refuges in the region that provide
43 wildlife viewing and hunting opportunities. Visitors can enjoy watching wildlife on canoe, pedestrian,

1 and auto trails and participate in environmental education programs at these refuges. There are also two
2 state-managed wildlife areas in the region that provide hunting and wildlife viewing opportunities.

3 *Wild and Scenic Rivers*

4 Portions of the Klamath River between its headwaters in Oregon and the Pacific Ocean are
5 designated as national Wild and Scenic River. As part of the designation process, segments of the river
6 are nominated and classified based on outstandingly remarkable values (ORV) which reflect the
7 characteristics contributing to its importance. The 11-mile segment of the Klamath River from the J.C.
8 Boyle powerhouse to the California-Oregon border was designated by Congress in 1994 as ‘scenic’ with
9 ORVs for quality whitewater boating, diverse wildlife, prehistoric sites, quality rainbow trout fishery,
10 habitat for endangered species, historic places, scenery, and evidence of Native American traditional uses.
11 In particular, the almost continuous series of 46 rapids with chaotic hydraulics creates a high quality
12 whitewater boating resource, and the rainbow trout fishery creates high quality angling opportunities.

13 The lower portion of the Klamath River beginning at 3,600 feet downstream of Iron Gate dam to
14 the Pacific Ocean (about 189 miles) was also designated as a national Wild and Scenic River by Congress
15 in 1981. There are 286 miles (including portions of the Salmon and Scott rivers and Wooley Creek) of
16 which 12 miles are classified as “wild,” 24 miles as “scenic,” and 250 miles as “recreational.” The ORV
17 for this river is anadromous fisheries (steelhead and salmon). The importance of anadromous fisheries
18 extends into cultural, recreational, and socioeconomic resources. The Forest Service notes that the river
19 itself is an important recreational corridor through the forests, and the flow and clarity of the water affect
20 the recreational experience. River communities within the forest boundary depend on resources that the
21 river has historically provided, most notably fisheries resources and boatable flows. A decline in fish
22 production in the past few decades has triggered a decline in the guide and resort industry, the Native
23 American fishery (commercial, subsistence, and ceremonial) and the ocean commercial and sport fishery
24 (Forest Service, 2004). This river segment is located downstream of all project features.

25 *Regional Recreational Opportunities and Demand*

26 The expansive region offers settings for a wide spectrum of recreational activities on reservoirs
27 and lakes. There are 10 reservoirs and lakes similar to the size of the project reservoirs and three much
28 larger than the project reservoirs. All reservoirs and lakes in the region, except for Copco No. 2, have
29 boat ramps and provide opportunities for boating (high- and low-speed), fishing (shoreline and boat), and
30 day use; there are also some that do not allow motorized boating. Common recreational activities at these
31 waterbodies include swimming and beach activities that have reportedly high and moderate demand in
32 California and Oregon (CDPR, 1998; Oregon Parks & Rec, 2003). As PacifiCorp’s review of available
33 information pertaining to existing and future regional recreational demand noted (PacifiCorp, 2004c), the
34 supply of boat launches in the region is currently meeting demand; however, as activity participation and
35 population trends continue to rise, demand may eventually exceed the existing supply.

36 Angling occurs at the many lakes and reservoirs in the region that have excellent trout fisheries;
37 some reservoirs in the region are stocked with trout. Table 3-84 lists rivers in the region providing
38 opportunities to catch Chinook and coho salmon and steelhead, and trout (see figure 1-1). The Klamath
39 River supports a genetically unique population of rainbow trout able to survive the naturally high
40 temperatures and acidity of the river. With an abundant trout population, the Klamath River is considered
41 to be one of the finest fisheries in Oregon. There is a high demand for fishing in California and moderate
42 demand in Oregon (CDPR, 1998; Oregon Parks & Rec, 2003). Residents of local communities do a
43 majority of the fishing on rivers within this region. Visitors travel to the region to fish especially from the
44 San Francisco Bay Area and Portland; some pay for fishing guides or charter services to enhance their
45 experience.

1 Table 3-84. Regional rivers with angling opportunities. (Source: PacifiCorp, 2004c, modified
2 by staff)

River	Fish Species ^a Caught	Common Types of Fishing
Lower Klamath River	Chinook salmon; coho salmon; steelhead; native trout	Drift boat, powerboat
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, coho 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, coho 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 River	Chinook salmon, native and stocked trout, American shad	Fly fishing, bank fishing

3 ^a The term 'native trout' refers to rainbow trout populations and 'resident trout' may include populations of
4 brown and brook trout as well as rainbow trout.

5 The regional study area includes at least 10 rivers that provide a variety of whitewater boating
6 opportunities requiring different skill levels. The Rogue River has the highest existing level of use,
7 whereas the other rivers have more moderate levels of use. Several of the rivers have commercial
8 whitewater outfitters, including the Rogue, Upper Sacramento, and Klamath rivers. The Klamath and
9 Rogue rivers are the only two rivers in the region that provide year-round flows adequate for whitewater
10 boating. In general, factors contributing to higher levels of whitewater use are (1) rivers that are close to
11 urban centers, (2) have year-round flows that are suitable for boating, and (3) where commercial outfitters
12 offer trips. Conversely, rivers with (1) difficult access, (2) require advanced or expert boating skills, and
13 (3) experience low flows tend to have relatively lower levels of use. Table 3-85 lists regional rivers with
14 whitewater boating opportunities.

15 Table 3-85. Rivers with whitewater boating opportunities in the region. (Source: PacifiCorp,
16 2004c, modified by staff)

River	State	Comparative Level of Use	Boating Class Type ^a	Miles of Boatable Whitewater	Factors Affecting Use Levels
Clear Creek	CA	Low	IV+	7	Difficult access
Upper Klamath River ^b	CA	Low	III-V ^c	31	Remote, not suited for beginner or intermediate boaters
Lower Klamath River ^d	CA	Moderate	II-V	122	Most skill levels
McCloud (tributary of the Sacramento)	CA	Moderate	II-IV	35	Proximity to I-5, most skill levels, low flows in summer

River	State	Comparative Level of Use	Boating Class Type ^a	Miles of Boatable Whitewater	Factors Affecting Use Levels
Pit River (tributary of the Sacramento)	CA	Low	IV-V	34	Fragmented/short runs with long stretches of flatwater between, remote location
Rogue River	OR	High	III-V	100+	Easy access, most skill levels, scenery, boatable year round, shoreline suitable for camping, many commercial outfitters
Salmon River (tributary of the Klamath)	CA	Moderate	III-V	44	Requires advanced/expert boating skills
Scott River (tributary of the Klamath)	CA	Low	III-V	20	Recommended for expert boaters only
Smith River	OR, CA	Low	III-V	100+	Very remote, Requires advanced/expert boating skills, low summer flows
Upper Sacramento River	CA	Low	III-V	36	Proximity to I-5, difficult access, average solitude
Trinity River (tributary of the Klamath)	CA	Moderate	III-V	100+	Most skill levels, easy access,

1 Note: I-5 – Interstate Highway 5

2 ^a American Whitewater International Scale of Difficulty (AW, 1998).

3 ^b Upstream of Iron Gate reservoir.

4 ^c Mostly class III-IV with 2 class V rapids.

5 ^d Downstream of Iron Gate dam.

6 Because much of the region is relatively remote, visitors often plan to stay for more than 1 day
7 during their recreational excursions; both tent and recreational vehicle (RV) camping are popular. Within
8 the region many campgrounds provide a wide spectrum of visitor conveniences (e.g., showers, RV
9 hookups) near lakes and reservoirs. In general, the season of use extends from May to September with
10 peak use occurring on holidays and weekends, and the highest occupancy occurring at facilities located
11 near I-5. The California and Oregon Statewide Comprehensive Outdoor Recreation Plans (SCORPs)
12 report high and low existing demand, respectively, for developed camping experiences. As PacifiCorp's
13 review of available information pertaining to existing and future regional recreational demand noted
14 (PacifiCorp, 2004c), the supply of developed campgrounds in the region is currently meeting demand,
15 although as activity participation and population continue to increase, demand may eventually exceed the
16 existing supply. Although recreational data for both California and Oregon indicate that visitors currently
17 prefer primitive camping settings, interviews conducted during the development of SCORPs indicate that
18 RV camping opportunities may have a greater demand with the aging of the population. For visitors who
19 prefer to camp in a dispersed manner there is abundant opportunity at lakes and reservoirs within the

1 region. Whereas the existing demand for primitive camping in California is high, it is low in Oregon
2 (CDPR, 1998; Oregon Parks & Rec, 2003). The demand for dispersed camping opportunities would
3 likely increase in the future.

4 Other developed recreational facilities including trails, interpretive displays/centers, and day-use
5 facilities also enhance visitors' experiences within the region. These regional facilities are available
6 mostly on public lands. The existing demand for trail hiking and picnicking is high in California and
7 moderate in Oregon. Of particular note, the existing demand for nature study/wildlife viewing is high in
8 both California and Oregon. The supply of hiking trails, interpretive displays/centers, and day-use
9 facilities in the region is currently meeting demand. As PacifiCorp's review of available information
10 pertaining to existing and future regional recreational demand noted (PacifiCorp, 2004c), however, as
11 activity participation and population continue to trend upwards, demand may eventually exceed the
12 existing supply.

13 Activities with increasing participation levels in California and Oregon over the last 20 years
14 include bicycling (paved surfaces), nature study/wildlife viewing, and OHV use. The levels of
15 participation in mountain biking (unpaved surfaces), dispersed camping, kayaking/canoeing/rafting, and
16 fishing (freshwater) have not changed much there over the last 20 years. Participation levels have not
17 decreased for any of the recreational activities in the region. Interviews conducted during the
18 development of the SCORPs indicated that there would likely be increased numbers of people
19 participating in powerboating/personal watercraft use, sightseeing, wildlife viewing, RV camping
20 resting/relaxing, hiking, and waterskiing. Based on the existing supply of facilities and current use levels
21 in the region and the projected recreational demand in California and Oregon, additional boat launches,
22 campgrounds (RV and tent), hiking trails, day-use facilities, and interpretation facilities would be needed
23 according to the SCORPs.

24 **3.3.6.1.2 Project Recreational Resources**

25 We identify and describe project-related recreational developments in the following section.
26 Nearby non-project recreational developments are also included to provide a complete description of the
27 available developed recreational facilities; some provide direct public access to the project waters. This
28 section also includes a description of the recreational facilities at the East and West Side and Keno
29 developments even though they are proposed to be removed from the project. Each development includes
30 the reservoir and the downstream river segment located between the dam and upstream of the next
31 development. For example, the recreational resources for the J.C. Boyle development include the J.C.
32 Boyle reservoir and the Klamath River between J.C. Boyle dam and Copco reservoir.

33 Figures 3-82 through 3-85 show the project recreation facilities. In general, the project provides
34 most types of developed recreational facilities such as boat launches, reservoir access, campgrounds, and
35 day-use areas. Facilities that provide opportunities for persons with disabilities, group use, trail use,
36 swimming, and interpretation and education are notably absent or are in short supply.

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DRAFT ENVIRONMENTAL IMPACT STATEMENT
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1 *East Side and West Side Development*

2 Link River dam defines the upstream boundary of the existing project. There is only one project
3 recreational facility, Link River Nature Trail, at this location. Most, but not all of this trail is included in
4 the existing project boundary. The 1.4-mile trail is designated for pedestrian use only and follows a gated
5 project access road on the west side of the Link River bypassed reach. Since this area is located in the
6 community of Klamath Falls, it is popular among local residents for outdoor activities such as hiking,
7 walking, jogging, and bird watching. The estimated annual use is 25,300 recreation days,⁹² and peak
8 occupancy and visitor survey data indicate existing use is below the facility capacity.⁹³ Although the Link
9 River Nature Trail offers relatively distant views and no close access to the river, spur trails allow visitors
10 to get to the water, particularly at the two ends of the trail. There is a bird-watching blind and four fishing
11 platforms (one is ADA-accessible⁹⁴) on Upper Klamath Lake. Although the main trail surface is in good
12 condition, there are maintenance needs at the parking area, fishing platforms, trail entrance, shoreline
13 access trails, and the bird-watching blind; the signage is hard to read and out of date.⁹⁵

14 The Klamath River downstream of Link River dam provides about 1 mile of river suitable for
15 whitewater boating and other river-based activities. Of the total estimated 25,283 recreation days at this
16 location, hiking accounted for 26 percent of the visitor use and bank fishing and picnicking each
17 accounted for 4 percent of visitor use.⁹⁶ Whitewater boating use was not detected in PacifiCorp's study
18 observations; however, there are anecdotal accounts of boating use occurring in the reach. There is one
19 short class III/IV rapid and one class II/III ledge drop. At the latter, a play wave forms at high flows
20 which kayakers use. Acceptable playboating begins around 700 cfs and optimal playboating flows are
21 from 2,000 to 3,000 cfs. At base flows, the water level is too low for boating; however, at this flow, there
22 may be opportunities for tubing and bank fishing. Anglers appear to use the river at a few sites where
23 there is access through thick riparian vegetation. Fishing is allowed year round, and the highest use
24 occurs from late winter through spring. The area is mainly used by local residents from Klamath Falls.
25 The river's proximity to this community allows local residents to take advantage of the suitable
26 conditions for these activities. Table 3-86 summarizes acceptable and optimal flow ranges for whitewater
27 boating and other flow-dependent recreational activities that occur in the Link River bypassed reach. For
28 simplicity, acceptable and optimal flow ranges for the other Klamath River reaches are also included in
29 this table and this information is referenced later in the text presented for each development.

⁹²A recreation day is defined as one visitor to a recreation area for any reason in a 24-hour period.

⁹³PacifiCorp defines capacity levels as follows: below capacity: <40 percent peak season occupancy and <60 percent peak season weekend occupancy; approaching capacity: 40 to 59 percent peak season occupancy and 60 to 79 percent peak weekend season occupancy; at capacity: 60 percent peak season occupancy and 80 percent peak weekend season occupancy; and exceeding capacity: >60 percent peak season occupancy and >80 percent peak weekend season occupancy.

⁹⁴This refers to a facility that meets the criteria under the Americans with Disabilities Act.

⁹⁵Based on site visit by staff in August 2005.

⁹⁶The highest reported use was resting and relaxing (26 percent); however, this categorization does not provide information about the visitors' specific activity. Total estimated visitor use at the project is 191,131 RDs.

1 Table 3-86. Acceptable and optimal flow ranges for various river-based activities for reaches
 2 of the Klamath River. (Source: PacifiCorp, 2004c, as modified by staff)

Reach/Opportunity	Acceptable Range		Optimal Range	
	Low	High	Low	High
Link River Bypassed Reach				
Angling	100	1,500	200 ^a	1,000 ^a
Locational playboating	<i>1,000^b</i>	<i>3,000^b</i>	<i>2,000^b</i>	<i>3,000^b</i>
Keno Reach				
Angling	200	1,500	300	900
Locational playboating	1,100	1,800	1,300	1,600
Standard whitewater boating	<i>1,000^b</i>	<i>4,000^b</i>	<i>1,200^b</i>	<i>3,000^b</i>
J.C. Boyle Bypassed Reach^d				
Angling	200	1,000	300	400
Technical kayaking	800	1,300	900	1,200
Technical rafting	1,000	1,500	1,200	1,500
Standard whitewater boating	1,300	1,800	1,300	1,700
Big-water rafting	1,600	2,300	1,800	2,300
Big-water kayaking	1,700	3,000	2,000	3,000
Hell's Corner Reach				
Angling	200	1,500	300	500
Technical kayaking	400	1,500	900	1,400
Technical rafting	700	1,400	900	1,400
Low-flow commercial rafting	1,000	1,300	1,000	1,300
Standard whitewater boating	1,400	3,000	1,800	2,800
Standard commercial rafting	1,300	2,000	1,500	2,000
Big-water boating	1,700	3,700	2,300	3,100
Copco No. 2 Bypassed Reach				
General recreation	10	1,500	50	300
Angling	50	600	50	300
Technical kayaking	200	600	300	600
Standard whitewater boating	600	1,500	800	1,200
Big-water whitewater boating	1,200	Undetermined	1,500	Undetermined
Downstream of Iron Gate Dam^e				
Angling	800	2,500	1,000	1,500
Technical whitewater boating	600	1,500	800	1,500
Standard whitewater boating	800	4,000	1,500	2,000
Big-water boating	2,500	<i>30,000^b</i>	5,000	<i>20,000^b</i>

3 Notes: cfs – cubic feet per second

4 ^a We note that PacifiCorp's license application presents an optimal range of flows that is not within the
 5 acceptable range of flows.

6 ^b Figures shown in italics based on less precise data.

7 ^c Unspecified ranges because of high degree of uncertainty.

8 ^d For the J.C. Boyle bypassed reach, acceptable and optimal range flows were measured as releases from J.C.
 9 Boyle dam (does not include any accretion flows).

10 ^e These data are only for the segment from Iron Gate dam to the Salmon River confluence.

1 *Keno Development*

2 State highways parallel and cross Keno reservoir providing opportunities for bird watching and
3 wildlife viewing. In the fall, waterfowl hunting is a popular activity at Keno reservoir. Existing peak use
4 boating density is only 2 percent of the theoretical maximum density.

5 According to a 1968 contract between PacifiCorp and Reclamation for the operation of Keno
6 reservoir, the reservoir must be maintained between elevations 4,085.0 and 4,086.5 feet. The contract
7 was developed in compliance with Article 55 of the current license. However, at the request of irrigators
8 with pumps located on the Keno reservoir, PacifiCorp maintains Keno reservoir at 4,085.4 +/- 0.1 foot
9 from October 1 through May 15 and at 4,085.5 +/-0.1 foot from May 16 through September 30 such that
10 reservoir levels are suited for their irrigation pumps. There are no terms or conditions in the current
11 license that require PacifiCorp to accommodate the irrigator’s requests.

12 Most of the land adjacent to the reservoir is privately owned with three points of public access,
13 Miller Island boat launch and the Klamath Wildlife Viewing Area, which are both managed by Oregon
14 Fish & Wildlife and outside the existing project boundary, except for land along the shoreline, and the
15 Keno Recreation Area, which was developed as part of the existing project, is managed by PacifiCorp,
16 and is entirely within the existing project boundary. The access road through the Keno Recreation Area
17 provides public access to the boat launch, Keno dam, and the Klamath River downstream of Keno dam.

18 Activities at the Keno Recreation Area include camping, fishing, horseshoes, sunbathing,
19 resting/relaxing, and boating. The site has a campground, day-use area, and boat launch. PacifiCorp
20 reports that the interior gravel road and parking areas at the day-use areas and boat launch, as well as the
21 shoreline fishing access areas, are in need of maintenance. The historical display, RV dump station,
22 drinking fountains (particularly the fountain at the historical display that is currently broken), and boat
23 ramp are in need of repair. Over time, recurrent foot traffic between site components has established
24 many user-created trails throughout the footprint of the Keno Recreation Area. The estimated annual use
25 is 6,050 recreation days, and peak occupancy and visitor survey data indicate the existing use is below the
26 facility capacity. Table 3-87 provides a summary of the project and non-project recreational facilities at
27 Keno development.

28 Table 3-87. Recreational facilities at Keno development. (Source: PacifiCorp, 2004c, as
29 modified by staff)

Facility	Capacity ^a	Facility Components/Comments
Keno Recreation Area- Campground	26 sites	Fee, tables, fire rings, 3 restrooms (1 ADA-accessible), RV dump station, potable water, showers
Keno Recreation Area Day-use Areas	19 picnic tables, 50 parking spaces (in 2 separate areas)	No fee, 2 fire grills, boat launch (12 parking spaces) with boarding dock, playground, historical display ^b
Miller Island Boat Launch		Boat launch (25 parking spaces), restrooms, narrow one- lane access road
Klamath Wildlife Viewing Area		Trail for wildlife viewing, interpretive/education display

30 Notes: ADA – Americans with Disabilities Act
31 RV – recreational vehicle

32 ^a Overnight capacity is presented in terms of the number of sites. Day-use capacity is presented in terms of the
33 number of picnic tables.

34 ^b There is a historical marker displaying a rack and pinion mechanism used at the old dam site.

1 The Klamath River downstream of Keno dam provides approximately 5 miles of river suitable for
2 whitewater boating. The reach is rated class III⁹⁷ difficulty, and suitable flows are approximately 1,000 to
3 4,000 cfs with optimum flows between 1,200 and 3,000 cfs. There is not much reported boating use on
4 this reach, which may relate to access, short run length, and sharp volcanic riverbed rock that is hard on
5 boaters and their equipment.

6 This reach is identified as one of the two most popular angling reaches of the Klamath River
7 between Link River and Iron Gate dams. Catch records indicate that although angler success is
8 consistently low, there are a greater percentage of larger fish caught in this reach than between J.C. Boyle
9 dam and Stateline access. See table 3-86 earlier in this section for a summary of acceptable and optimal
10 flow ranges for whitewater boating and other flow-dependent recreational activities that occur in the
11 Klamath River below Keno dam.

12 PacifiCorp did not identify any areas in this development receiving recurrent dispersed
13 recreational use that could potentially cause resource concerns.

14 *J.C. Boyle Development*

15 J.C. Boyle reservoir has 420 surface acres and lies almost entirely on land owned by PacifiCorp.
16 The upstream extent of the project boundary is located at the upstream end of this impoundment. This
17 development is easily accessed by Highway 66, which crosses the reservoir near its midpoint. The
18 topography is gentle-sloping in a forested setting. Visitors to this reservoir enjoy swimming, fishing,
19 boating, day and overnight use, target shooting, and OHV use. Existing peak use boating density is only
20 37 percent of the theoretical maximum density. The normal maximum and minimum elevations of the
21 J.C. Boyle reservoir are 3,793 and 3,788 feet, a range of 5 feet. Under typical peaking operations, the
22 reservoir fluctuates about 3.5 feet, while average daily fluctuations are approximately 1 to 2 feet.

23 There are two existing points of public access to the reservoir. Pioneer Park (east and west sides),
24 is a project recreational facility located on PacifiCorp land, managed by PacifiCorp, and within the
25 existing project boundary. Pioneer Park is a day-use facility with two separate areas located on opposite
26 ends of the Highway 66 Bridge that crosses the reservoir. Visitors enjoy picnicking, swimming, and
27 boating at this facility, which has day-use sites, dirt-surfaced and concrete tie boat launches, and
28 interpretive signs. The estimated annual use is 16,700 recreation days, and peak occupancy and visitor
29 survey data indicate the existing use is below the facility capacity. PacifiCorp states that the dirt- and
30 gravel-surfaced roads and parking areas and boat launch are rough and in need of maintenance.
31 PacifiCorp reports that there are plans to realign Highway 66 where it crosses the reservoir. The existing
32 bridge is not high enough above the water to allow boats to cross underneath; the new bridge would likely
33 be constructed to allow boats to pass to use both ends of the reservoir. Road realignment may eliminate
34 the east side portion of Pioneer Park. The second facility, Topsy Campground, is located on Bureau of
35 Land Management-managed lands and was constructed and is operated and maintained by the Bureau,
36 even though it is within the existing project boundary. Although Topsy Campground provides public
37 access to the reservoir, PacifiCorp does not consider this to be a project recreational facility.

38 Within 0.25 mile of the reservoir, the Sportsman's Park, managed by Klamath County under a
39 lease from PacifiCorp, provides camping sites and designated areas for activities such as OHV use and
40 target shooting. Although this facility is located on land owned by PacifiCorp, it is not within the existing
41 project boundary, and there is currently no access to the reservoir from this facility. Peak occupancy and
42 visitor survey data indicate the existing use at these recreational facilities near the reservoir is
43 approaching facility capacities. Table 3-88 provides a summary of the recreational facilities at J.C. Boyle
44 reservoir.

⁹⁷Class III, intermediate, class IV, advanced, and class V, expert, rapids as rated by American Whitewater using the International Scale of River Difficulty (AW, 1998).

1 Table 3-88. Recreational facilities at J.C. Boyle reservoir. (Source: PacifiCorp, 2004c, as
 2 modified by staff)

Facility	Capacity ^a	Facility Components/Comments
Pioneer Park Day-use Area	17 picnic tables (in two separate areas)	Fire grills, 2 restrooms (1 ADA-accessible), boat launch at each development ^b , interpretive signs ^c
Topsy Campground	16 sites	Bureau of Land Management-managed facility, fee, boat launch with boarding dock, 2 day-use sites, 4 restrooms (none ADA-accessible), RV dump station, accessible fishing pier
Sportsman's Park	16 picnic tables	Operated under lease from PacifiCorp, shooting range, OHV area, archery range, model aircraft flying field, day (primarily) and overnight (limited) use, group use, 4 restrooms (none ADA-accessible)

3 Notes: ADA – Americans with Disabilities Act

4 Bureau of Land Management – U.S. Department of the Interior, Bureau of Land Management

5 RV – recreational vehicle

6 OHV – off-highway vehicle

7 ^a Overnight capacity is presented in terms of the number of sites. Day use capacity is presented in terms of the
 8 number of picnic tables.

9 ^b Pioneer Park (East) has a boat ramp with two lanes (concrete ties) and an area for hand launching small
 10 watercraft. Pioneer Park (West) has a dirt surfaced boat launch.

11 ^c Interpretive signs for the Applegate Trail.

12 The gentle sloping land on the north and west side of J.C. Boyle reservoir enables vehicular
 13 access to the shoreline. Although the area is posted to prohibit overnight use, such use exists. PacifiCorp
 14 identified 17 dispersed use sites along the reservoir shoreline and immediately below the dam along the
 15 river. These sites have documented resource effects related to recreational use including erosion, trash
 16 accumulation, sanitation problems, and vegetation removal.

17 Vehicular access into the Klamath River Canyon, which includes both the bypassed and peaking
 18 reaches, is possible from both sides of the river. The north side has better roads and is where most
 19 recreation users enter the canyon. The fishing, camping, and day-use opportunities and boating access
 20 below the J.C. Boyle powerhouse on the north side of the river are all reached by a dirt- and gravel-
 21 surfaced access road that connects to Highway 66; as the road proceeds downstream from the J.C. Boyle
 22 powerhouse, it is best suited for high clearance vehicles. Access on the south side of the river is by a
 23 more difficult route—the Topsy Grade. Most of this road is located upslope from the river, and access to
 24 the river does not generally exist except near Frain Ranch and downstream from Stateline where there are
 25 access roads to the river that connect to the Topsy Grade and the Ager-Beswick Road. Without
 26 exception, roads on the south side of the river are rough and best suited for high-clearance or four-wheel
 27 drive vehicles.

28 The Klamath River downstream of J.C. Boyle dam and upstream of the J.C. Boyle powerhouse
 29 (J.C. Boyle bypassed reach) provides about 5 miles of river suitable for whitewater boating and other
 30 river-based activities. Although this reach offers class III-IV+ rapids, suitable boating conditions occur
 31 infrequently and only when the upstream storage (Upper Klamath Lake, Keno, and J.C. Boyle reservoirs)
 32 capacity is full and the J.C. Boyle powerhouse capacity is exceeded. The J.C. Boyle canal parallels this
 33 reach, and there are instances where material sidecast from the canal has fallen into the river channel.
 34 Based on our observations during the site visit, the sidecast material that has reached the bypassed reach
 35 channel could form an obstacle for whitewater boaters. There is road access to the reach near the dam

1 and powerhouse, and an upslope road parallels the river between these points. Although the road is
 2 generally between one- and two-tenths of a mile from the river channel, the slope between the road and
 3 the river is extremely steep. Signage at the powerhouse discourages parking and shoreline use in the
 4 vicinity of the powerhouse.

5 There are also opportunities for trout fishing and general riverside recreation at the few benches
 6 and clearings in the riparian zone along the bypassed reach. This reach and the Keno reach are the two
 7 most popular angling reaches of the Klamath River between Link River and Iron Gate dams. Catch
 8 records indicate good angler success, although fish size has typically been smaller than fish caught in the
 9 Keno reach and rarely exceeds 16 inches. See table 3-86 for a summary of acceptable and optimal flow
 10 ranges for whitewater boating and other flow-dependent activities in the J.C. Boyle bypassed reach.

11 The recreational opportunities in the J.C. Boyle peaking reach focus on the Klamath River which
 12 is a nationally designated Wild and Scenic River. The Bureau of Land Management manages the
 13 recreational activities in the river corridor north of the Stateline access, primarily whitewater boating,
 14 angling, and camping. Elements of the landscape that contribute to high recreational value of this river
 15 segment include (1) almost continuous class IV and V rapids for whitewater boating; (2) an undeveloped
 16 setting where human development is not apparent; (3) abundant wildlife that provides wildlife viewing
 17 and hunting opportunities; (4) one of the finest fisheries with a unique population of rainbow trout; (5)
 18 high quality scenery in the form of tall vertical cliffs, diverse vegetation, and flowing river; and (6)
 19 historic and pre-historic cultural resources that add complexity to the recreational value of the river.

20 In terms of whitewater boating opportunities, the most important reach of the Klamath River is
 21 located below the J.C. Boyle powerhouse. The Bureau of Land Management manages whitewater
 22 boating use in this 17-mile reach, known as the Hell’s Corner run.⁹⁸ Commercial boating use is allowed
 23 by permit only,⁹⁹ and there is a set commercial capacity of 10 outfitters or 200 clients per day on the
 24 reach; private boating use does not have a set limit. The Bureau of Land Management established 250
 25 persons per day as the overall whitewater boating carrying capacity for the reach. Factors constraining
 26 the carrying capacity are vehicle congestion at the take-out locations near Copco reservoir and the limited
 27 size and number of areas that can be used to scout rapids (FERC, 1990). Commercial boating use
 28 accounts for approximately 90 percent of the existing use; most are single-day trips and there are some
 29 overnight trips. Table 3-89 lists the estimated annual boating use for this reach for 1994 to 2001. These
 30 data show that whitewater boating use peaked in the mid-1990s at around 6,000 recreation days per year,
 31 and recently has fluctuated between about 4,000 and 5,000 recreation days per year.

32 Table 3-89. Estimated annual whitewater boating use between J.C. Boyle powerhouse and
 33 Copco reservoir (1994—2001). (Source: PacifiCorp, 2004c)

Year	Recreation Days
1994	5,206
1995	6,365
1996	6,207
1997	5,826
1998	4,395
1999	4,897
2000	5,369
2001	3,699
Average	5,250

⁹⁸The run is named after a specific section of the bypassed reach known as Hell’s Corner.

⁹⁹The Bureau of Land Management has issued permits to more than 20 outfitters to operate whitewater boating trips on this reach.

1 Whitewater boating use includes both rafting and kayaking. Rafting use, in particular, depends
2 upon operation of the J.C. Boyle powerhouse and generally occurs only when at least one generator is
3 operating. When one generator is operating at optimum efficiency (typical summer conditions), the flow
4 in the peaking reach is usually about 1,500 cfs, including about 350 cfs accretion flow from the bypassed
5 reach. When two generators are running (typical winter and spring, sometimes summer and fall
6 conditions), the flow increases to about 2,700 cfs, including accretion flow. These flow levels are not
7 continuous and flows of this magnitude create hydraulic conditions suitable only for the most experienced
8 boaters. Very few commercial rafting trips occur when both generators are operating because of safety
9 concerns. Whitewater boating typically occurs from April through October, and about 80 percent of the
10 whitewater rafting use occurs during July, August, and September.

11 PacifiCorp investigated suitable and optimal whitewater boating opportunities on this reach
12 (PacifiCorp, 2004c). Based on the magnitude of flows, there are two types of boating opportunities
13 available which PacifiCorp labels, 'standard' and 'big water' reflecting the degree of difficulty and
14 challenge provided by the hydraulic forces. The reach is boatable at about 320 cfs (base flows) using
15 hard shell and inflatable kayaks. Standard whitewater boating opportunities begin at about 1,000 cfs and
16 continue to about 2,000 to 2,500 cfs, offering mostly class IV rapids. The optimal range of flows for
17 standard boating is from 1,000 to 2,000 cfs. Big water whitewater boating opportunities exist at flows
18 exceeding 2,000 cfs, offering mostly class V rapids. The optimal range of flows for big water boating is
19 from 2,300 to 3,000 cfs.

20 Scoping comments and information provided by a commercial outfitter (letter from N. Hague,
21 Noah's River Adventures, to M.R. Salas, Secretary, FERC, dated April 26, 2004) indicate flows at or
22 above 1,500 cfs are preferred and that the reach is not suitable for boating below this level because of
23 safety considerations. At flows less than 1,400 cfs, rocks are not sufficiently covered which increases the
24 potential for boats to hit or bump them causing accidental swims, and this increases the potential for
25 injuries. Commercial outfitters also state that flows over 3,000 cfs are not suitable for commercial
26 boating because of safety concerns. In addition, the Bureau of Land Management considers 1,500 cfs the
27 minimum raftable flow for this reach.

28 The timing and duration of the releases are also critical for commercial operators so they can
29 offer their clients reasonable trip itineraries. Four hours of release beginning at 10 a.m. provides
30 commercial operators with sufficient flow and time to complete quality trips for their clients.

31 In addition to whitewater boating, other forms of flow-dependent recreational activities occur in
32 the J.C. Boyle peaking reach. Based on field observations PacifiCorp reports that angling use between
33 J.C. Boyle powerhouse and the California-Oregon stateline appears low and may be related to difficult
34 access to the river. See table 3-86 earlier in this section for a summary of acceptable and optimal flow
35 ranges for whitewater boating and other flow-dependent recreational activities that occur in the J.C. Boyle
36 peaking reach.

37 Between J.C. Boyle dam and the Stateline take-out, there are recreational facilities constructed
38 and managed by the Bureau of Land Management on public land at the Spring Island boater access and
39 Klamath River Campground. The Spring Island boater access is the put-in location for commercial and
40 private whitewater boaters. This facility has a launch area, restrooms, changing room, tables, and
41 informational signage. The estimated annual use is 5,250 recreation days, and peak occupancy and visitor
42 survey data indicate the existing use is below the facility capacity. This facility is not included within the
43 existing project boundary.

44 The Klamath River Campground has three campsites with few amenities; there is a vault
45 restroom, and the facility has maintenance needs. The estimated annual use is 1,000 recreation days, and
46 peak occupancy and visitor survey data indicate the existing use is below but approaching the facility
47 capacity. This facility is not included within the existing project boundary. Visitors to this facility are
48 camping here to access the river.

As the Klamath River continues flowing south into California, the landform transitions from a steep-walled river canyon with challenging access to a broad river valley with a developed floodplain and a landscape more forgiving to access. Whereas the river canyon sections of the river in Oregon are mainly public lands managed by the Bureau of Land Management, PacifiCorp owns nearly all of the land within the river corridor between the California-Oregon border and Copco reservoir (some land between Copco Road bridge and fishing access number 1 is privately owned). PacifiCorp leases most of its land for cattle grazing.

Angling use is high in the California portion of the peaking reach of the river, and this is also the take-out location for most whitewater boaters. Consequently, PacifiCorp has created seven points of public access to the river to manage recreational use in a manner compatible with the lease interests. There are six developed public access points (Fishing Access Sites 1-6) developed and managed by PacifiCorp along the 4.5-mile-long section of the Klamath River; only one site is within the existing project boundary (Fishing Access 1). The seventh site, Stateline take-out, is managed by both PacifiCorp and the Bureau of Land Management, but is also not within the existing project boundary. The seven access points have portable restrooms (except for one vault restroom on Bureau-managed lands at Stateline), dirt-surfaced parking areas, signage, and pedestrian access to the river. There are instances of maintenance needs associated with road and parking area surfaces, signage, and gates. With the exception of the vault restroom at the Stateline access, there are no ADA-accessible restrooms. There are also no ADA-accessible routes to the river. Estimated annual use at Stateline and Fishing Access Sites 1 to 6 is 3,000 and 3,630 recreation days, respectively. Peak occupancy and visitor survey data show existing use at Stateline is approaching capacity; use at the fishing access sites is below capacity.

Table 3-90 provides a summary of the recreational facilities along the J.C. Boyle bypassed and peaking reaches. PacifiCorp determined that the Spring Island boater access and Fishing Access Sites 1 to 6 are below their capacity and the Klamath River Campground and the Stateline Take-out are approaching their capacity, based on biophysical (e.g., soil erosion), social (e.g., visitor perceptions of crowding), and site capacity (e.g., occupancy data) factors.

Table 3-90. Recreational facilities on the Klamath River between J.C. Boyle dam and Copco reservoir. (Source: PacifiCorp, 2004c, modified by staff)

Facility	Capacity ^a	Facility Components/Comments
Spring Island Boater Access	1 picnic table	Launch area, shoreline fishing access, ADA-accessible vault restroom and changing room, 12 parking spaces, paved loop road, day-use only
Klamath River Campground	3 campsites	Vault restroom (not ADA-accessible)
Stateline Take-out	River access only	Site located on both Bureau of Land Management-managed and PacifiCorp-owned lands. Lower area ^b : day use only, boat put-in/take-out, shoreline fishing access, 2 portable restrooms (one ADA-accessible), parking area. Upper area ^c : day use only (although unmanaged overnight use occurs), vault restrooms (ADA-accessible), parking area
Fishing Access Sites 1 to 6	6 sites	Portable restrooms (not ADA-accessible), parking areas, and signage at each site, pedestrian access routes to river

Notes: Bureau of Land Management – U. S. Department of the Interior, Bureau of Land Management

^a Overnight capacity is presented in terms of the number of sites. Day use capacity is presented in terms of the number of picnic tables.

^b Lower portion is managed by both PacifiCorp and the Bureau of Land Management.

^c Upper portion is managed by the Bureau of Land Management.

1 PacifiCorp identified four dispersed use sites in this reach between J.C. Boyle powerhouse and
2 Stateline and documented resource effects at these areas related to recreational use. The area of greatest
3 concern is at Frain Ranch where there are many user-created roads with compacted soil and routes located
4 too close to the river. PacifiCorp owns this land; however, it is not included within the existing project
5 boundary. Commercial and private boaters use this site for both day and overnight boat trips. Campers,
6 anglers, and hunters who access the site by vehicle also use Frain Ranch.

7 *Copco Development*

8 This development includes two reservoirs, Copco reservoir and Copco No. 2 reservoir, and the
9 Klamath River to where it enters Iron Gate reservoir. As the project features descend in elevation, the
10 vegetation transitions from mixed conifer to oak woodland in the vicinity of this development. Similarly,
11 temperatures at this elevation of the project are warmer during the summer months as compared to the
12 upstream developments. Access to Copco reservoir and Copco No. 2 reservoir is from the west by way of
13 either of two paved two-lane county roads (Copco Road and Ager-Beswick Road) that connect to I-5;
14 travel time from I-5 is approximately 1 hour. Copco reservoir is almost entirely located on privately
15 owned land, and Copco No. 2 is located entirely on land owned by PacifiCorp. Because of steep
16 topography, small size (40 acres), narrow configuration, and difficult access, Copco No. 2 reservoir has
17 little suitability for recreational use. Project access roads have locked gates, and there is no public access
18 to Copco No. 2. In contrast, Copco reservoir has high recreational suitability, and there is a small
19 residential community at this reservoir. Public roads run along almost the entire length of the shoreline.

20 Visitors to Copco reservoir enjoy fishing, boating, and day and overnight use. The Copco Lake
21 Community Advisory Committee provides anecdotal reports that there are large quantities of bass,
22 catfish, and trout in Copco reservoir which support recreational angling opportunities, including fishing
23 tournaments, on a regular basis (letter from B. Davis, Chairman, Copco Lake Community Advisory
24 Community Advisory Committee, Montague, CA, to M. Salas, FERC, Washington, DC, dated July 18,
25 2004). Existing peak use boating density is only 12 percent of the theoretical maximum density. Copco
26 reservoir can fluctuate up to 5.0 feet, from 2,602.5 to 2,607.5 feet, but the average daily fluctuation is
27 approximately 0.5 foot.

28 There are two points of public access to this reservoir at day-use areas with picnic sites,
29 restrooms, and boat launches; unmanaged overnight use also occurs at these day-use sites. Mallard Cove
30 is a day-use area located on the south shoreline near the mid-point of the reservoir on a parcel of Bureau
31 of Land Management-managed public land and PacifiCorp-owned land. The facility encompasses the
32 entire area between Ager-Beswick Road and the reservoir shoreline; residential development surrounds
33 this site. Only the land along the reservoir shoreline is within the existing project boundary. The
34 estimated annual use is 7,600 recreation days, and peak occupancy and visitor survey data indicate the
35 existing use is below the facility capacity.

36 Copco Cove is a small day-use area located on the north shoreline approximately 0.5 mile north
37 of the dam on PacifiCorp land and within the existing project boundary. The estimated annual use is
38 1,250 recreation days, and peak occupancy and visitor survey data indicate the existing use is below the
39 facility capacity. Table 3-91 provides a summary of the recreational facilities at the Copco development.
40 The access roads, parking areas, tables, and grills at both of these day-use areas are in need of
41 maintenance. PacifiCorp determined that these facilities are below capacity based on biophysical (e.g.,
42 soil erosion), social (e.g., visitor perception of crowding), and site capacity (e.g., occupancy data) factors.

1 Table 3-91. Recreational facilities at Copco development. (Source: PacifiCorp, 2004c, as
 2 modified by staff)

Facility ^a	Capacity	Facility Components/Comments
Mallard Cove Day-use Area	10 picnic tables/12 fire grills	2 restrooms (none ADA-accessible), boat launch, boarding dock
Copco Cove Day-use Area	2 picnic tables and fire grills	2 restrooms (none ADA-accessible), boat launch, boarding dock

3 ^a Both located at Copco reservoir.

4 PacifiCorp identified two dispersed use sites with excessive bare ground potentially related to
 5 both recreational use and cattle grazing. The sites are on the north shoreline in the vicinity of Beaver
 6 Creek Cove and Raymond Gulch.

7 The Klamath River downstream of Copco No. 2 dam extends 1.5 miles to the backwater of Iron
 8 Gate reservoir. The only access to this river reach is by a steep gravel road that leads to Copco No. 1 and
 9 No. 2 dams that is closed to public vehicular access. This reach may offer undocumented boating and
 10 fishing opportunities. PacifiCorp determined that the reach provides low-quality class IV whitewater
 11 boating opportunities. Suitable range of flows for kayaking and rafting are 500 to 1,500 cfs with an
 12 optimal range of 800 to 1,200 cfs. See table 3-86 earlier in this section for a summary of acceptable and
 13 optimal flow ranges for whitewater boating and other flow-dependent recreational activities that occur in
 14 the Klamath River downstream of Copco No. 2 dam.

15 *Fall Creek Development*

16 Fall Creek development is the only development in the project that does not include a reservoir.
 17 Instead, the recreational resources associated with this development focus on the attributes of Fall Creek
 18 in the vicinity of the Fall Creek powerhouse. There is a small day-use area adjacent to a Cal Fish &
 19 Game fish hatchery where visitors can park along Copco Road to picnic or hike up to Fall Creek Falls on
 20 a 0.2 mile trail. The facility was developed and is managed by Cal Fish & Game and is not within the
 21 existing project boundary. The site was closed during the relicensing study period but PacifiCorp
 22 estimates that the annual use at this site is low and below capacity. This site has no obvious signage or
 23 restrooms, and the trail is poorly maintained. Table 3-92 provides a summary of the recreational facilities
 24 at Fall Creek development. PacifiCorp determined that these facilities are below capacity based on
 25 biophysical (e.g., soil erosion), social (e.g., visitor perceptions of crowding), and site capacity (e.g.,
 26 occupancy data) factors.

27 Table 3-92. Recreational facilities at Fall Creek development. (Source: PacifiCorp, 2004c, as
 28 modified by staff)

Facility	Capacity	Facility Components/Comments
Fall Creek Day-use Area	2 picnic tables	No restrooms, parking area on Copco Road
Fall Creek Trail	0.1-mile trail	Non-motorized trail, terminates with views of Fall Creek Falls

29 *Iron Gate Development*

30 Recreational resources for this development include the area around Iron Gate reservoir and
 31 downstream of the dam on the Klamath River to the Iron Gate Hatchery. Most of the developed

1 recreational capacity of the entire project is located at Iron Gate reservoir. There are campgrounds, day-
 2 use areas, boat launches, and a scenic overlook. Access to the reservoir is from the west on Copco Road,
 3 a paved, two-lane county road that connects to I-5. Visitors to this reservoir enjoy swimming, fishing,
 4 boating, and day and overnight use. Among all of the project reservoirs, Iron Gate reservoir is the most
 5 popular for waterskiing and powerboating. Existing peak use boating density is the highest of all of the
 6 project reservoirs at 47 percent of the theoretical maximum density. The Iron Gate reservoir is
 7 maintained between 2,328.0 and 2,324.0 feet, a range of 4 feet. The reservoir is operated on a daily basis
 8 over a limited range of approximately 1.5 feet.

9 The seven developed recreational facilities at the reservoir are interspersed along the north and
 10 west shorelines and are all located, at least partially, within the existing project boundary (portions of the
 11 Camp Creek, Juniper Point, and Mirror Cove recreational areas are not within the existing project
 12 boundary). All of the seven recreational developments provide access to Iron Gate reservoir. PacifiCorp
 13 constructed and operates and maintains these facilities. In general, there are maintenance needs and
 14 accessibility deficiencies at all of these facilities related to roads, parking areas, signage, restrooms, boat
 15 launches, and fishing/boarding docks (PacifiCorp, 2004c).

16 The Iron Gate Fish Hatchery is also located downstream of Iron Gate dam which Cal Fish &
 17 Game operates and PacifiCorp partially funds. At this location, there is a day-use area adjacent to the
 18 hatchery with tables, an interpretive kiosk, restrooms, parking area, and an ADA-accessible trail to the
 19 river/fish return area. There is public access to the river with a graveled road to the shoreline for
 20 launching small boats located on the northwest side of the river (accessed from Copco Road). Both
 21 facilities are located within the existing project boundary. PacifiCorp reports that the boat launch and
 22 gravel access road to the launch are in need of repair. Table 3-93 provides a summary of the recreational
 23 facilities at Iron Gate development.

24 Table 3-93. Recreational facilities at Iron Gate development. (Source: PacifiCorp, 2004c, as
 25 modified by staff)

Facility	Capacity ^a	Facility Components/Comments
Fall Creek Day-use Area	3 tables	Unmanaged overnight use occurs, 1 vault restroom (closed) and 1 portable restroom (not ADA-accessible), hand-launch boating access
Jenny Creek Day-use Area and Campground	6 sites	Co-located within same footprint so sites are used for both day and overnight use, restroom (not ADA-accessible)
Wanaka Springs Day-use Area	6 overnight sites/6 tables	Unmanaged overnight use occurs, fishing dock, 2 vault restrooms and 1 portable restroom
Camp Creek Day-use and Campground	13 overnight/ 6 tables	Development is in 3 separate areas, boat launch (1 vehicle-launch/1 hand-launch), boarding and fishing docks, RV dump station, restrooms, potable water, sports field, interpretive display ^b
Juniper Point Day-use and Campground	9 sites	Co-located within same footprint so sites are used for both day and overnight use, restroom (not ADA-accessible), fishing dock, steep access road
Mirror Cove Day-use and Campground	10 sites	Co-located within same footprint so sites are used for both day and overnight use, boat launch, 2 vault restrooms and 1 portable restroom, site often occupied by groups

Facility	Capacity ^a	Facility Components/Comments
Long Gulch Day-use and Campground	2 tables	Co-located within same footprint so sites are used for both day and overnight use, boat launch, 2 vault restrooms (closed) and 1 portable restroom, access road maintained by PacifiCorp and homeowners group
Overlook Point Day use area	3 tables	2 vault restrooms (closed) and 1 portable restroom
Iron Gate Fish Hatchery Day-use Area	6 tables	Picnic shelter, visitor center/interpretive kiosk, restroom, ADA-accessible trail to river, seasonal interpretive tours of hatchery for schools, river/ boating access on northwest side of river (small watercraft)

1 Notes: RV – recreational vehicle

2 ^a Overnight capacity is presented in terms of the number of sites. Day-use capacity is presented in terms of the
3 number of picnic tables.

4 ^b Wilkes Expedition historical marker.

5 Table 3-94 provides an assessment of each developed site relative to its existing capacity.
6 PacifiCorp based this comprehensive assessment on biophysical (e.g., soil erosion), social (e.g., visitor
7 perceptions of crowding), and site capacity (e.g., occupancy data) factors.

8 Table 3-94. Annual estimated use and capacity assessment at recreational facilities at the Iron
9 Gate development. (Source: PacifiCorp, 2004c)

Facility	Estimated Annual Use (Recreation Days)	Overall capacity assessment
Fall Creek	3,500	Approaching capacity
Jenny Creek	3,700	Approaching capacity
Wanaka Springs	4,150	Exceeding capacity
Camp Creek	15,260	Exceeding capacity
Juniper Point	4,720	At capacity
Mirror Cove	11,140	Exceeding capacity
Overlook Point	1,900	Approaching capacity
Long Gulch	5,225	Below to approaching capacity
Iron Gate Fish Hatchery Day Use Area	2,200	Below capacity

10 PacifiCorp identified four dispersed-use sites along the Iron Gate shoreline and documented
11 resource effects potentially related to both recreational use and cattle grazing. These sites appear to be

1 primarily used by anglers for shoreline access; however, the dispersed site near Long Gulch appears to
2 receive widespread¹⁰⁰ recurrent overnight use.

3 The Klamath River downstream of Iron Gate dam has high quality angling opportunities
4 extending nearly 200 miles to the Pacific Ocean. The main Klamath River from 3,500 feet downstream
5 of Iron Gate dam is open to fishing year round. This reach attracts and supports several fishing outfitter
6 services that focus on salmon, steelhead, and trout fisheries. An internet search located a website that
7 contains a guide services directory; the listing identifies at least five businesses that offer angling guide
8 services on the Klamath River (The Fish Sniffer, 2006). However, as discussed in section 3.3.3.1.5,
9 *Salmon and Steelhead Harvest and Harvest Management*, angling in the Lower Klamath River is
10 dependent on the annual status of the fall-run Chinook salmon run, so the number of businesses that offer
11 angling guide services changes from year to year. The main run of Klamath River Chinook salmon peaks
12 in late fall and is normally over by mid-January each year; the steelhead season normally starts in
13 November.

14 Extensive whitewater boating opportunities exist on the 123-mile segment of the Klamath River
15 from downstream of Iron Gate dam to the confluence with the Salmon River. Depending on the river
16 segment and level of flow, there are opportunities for play, standard, and big water boating on mostly
17 class II and III waters. For most reaches, standard boating opportunities range from about 750 to 1,500
18 cfs, and the optimal flow is about 1,500 to 2,000 cfs. Flows of 3,000 to 5,000 cfs provide powerful
19 hydraulics creating big water boating opportunities. Locational play boating (at School House Wave¹⁰¹)
20 can be reliably available for long periods during the summer and attracts considerable use. This wave is
21 boatable at flows between 900 and 1,400 cfs; optimal between 1,000 and 1,300 cfs; and it washes out at
22 flows over 1,400 cfs. See table 3-86 earlier in this section for a summary of acceptable and optimal flow
23 ranges for whitewater boating and other flow-dependent recreational activities that occur in the Klamath
24 River downstream of Iron Gate dam to its confluence with the Salmon River.

25 *Latent Demand at the Project*

26 Latent demand is unmet demand whereby visitors do not have sufficient opportunity to
27 participate in a specific activity because there are no facilities or conditions to allow the activity.
28 PacifiCorp identified five activities, listed below, that likely have some existing latent demand at the
29 project and the accompanying reason(s).

- 30 • Non-motorized bicycling—few bike paths, routes, or trails
- 31 • Interpretation—few interpretive facilities (other than signboards) such as amphitheaters and
32 campgrounds
- 33 • Waterskiing—few courses (clubs only)
- 34 • ADA-accessible activities—few accessible facilities
- 35 • Group use—no formal group-use facilities available

36 *Visitor Survey Results*

37 PacifiCorp's recreation relicensing study included surveying visitors across the footprint of the
38 project. The Final Technical Report, Recreation Resources (PacifiCorp, 2004c) contains a complete
39 discussion and summary of all visitor survey responses. In the following section, we discuss the

¹⁰⁰PacifiCorp identified at least five fire rings in its recreation relicensing study.

¹⁰¹About 8 miles west of Interstate 5 near Gottville.

1 responses to a subset of the visitor survey questions that are relevant to existing recreational resources and
2 desired changes.

3 Indicators of demand for facilities, services, and opportunities are reflected in the responses to the
4 visitor surveys conducted by PacifiCorp. Only about 14 percent of the survey respondents indicated there
5 were activities they would like to participate in but currently cannot. Nearly half of the comments
6 received related to facility needs rather than need for opportunities or services. The most frequent facility
7 needs identified were restrooms, showers, and boat rentals. The most frequent activity-based responses
8 identified the desire to participate in motorized water sports (e.g., waterskiing and wake boarding),
9 hiking, and swimming. Other respondents identified the need for RV hookups, swimming areas,
10 motorized and non-motorized trails, and skeet shooting. Positive responses (satisfaction with facilities)
11 were distributed among all of the developments; however, Iron Gate had a somewhat higher frequency of
12 affirmative responses.

13 Visitor survey responses indicate that, in general, the existing recreational facilities are sufficient
14 to meet visitor needs, and visitors perceive that the recreational facilities are adequately maintained. Only
15 10 percent of the visitors surveyed indicated maintenance concerns such as unclean restrooms; litter
16 accumulation; needed site upgrades; and the need for road, trail, and boat launch maintenance. The
17 highest frequency of dissatisfaction with facility maintenance (29 of the total 59 negative responses) was
18 at Iron Gate reservoir.

19 Overall, visitors appear satisfied with the water levels in the reservoir and river. The areas with
20 the lowest acceptability were in the J.C. Boyle bypassed and peaking reaches, which reflects the
21 sensitivity of whitewater boating to the amount of flow in the Klamath River. PacifiCorp states that
22 drought conditions existed during the survey period, which may have caused more visitors to be
23 dissatisfied with water levels.

24 Water quality concerns were identified in the visitor survey by asking visitors if the water quality
25 had ever affected their visit to the Klamath River area. Affirmative responses ranged from 32 percent at
26 Iron Gate and Link River/Lake Ewauna/Keno reservoirs to 61 percent at the J.C. Boyle bypassed and
27 peaking reaches.

28 These results indicate that whitewater boaters may be more affected by water quality than
29 reservoir users. The source of concern appears to be regular and extensive algae blooms that occur
30 throughout the reservoirs and flowing river extending from Upper Klamath Lake to the Klamath River
31 downstream of Iron Gate dam. Visitors report that algae produces unsavory odors, fouls fishing lines, and
32 reduces the areas available for fishing, swimming, and wading; brown foam also accumulates in river
33 eddies. In 2005, some of the highest recorded levels of toxic algae appeared in blooms on the Klamath
34 River. In response, the North Coast Regional Water Board (memorandum from K.B. Kaley, Staff
35 Toxicologist Applied Risk Assessment Unit to M. St. John, North Coast Regional Water Quality Control
36 Board, Santa Rosa, CA, dated September 1, 2005), the Karuk Tribe, and the U.S. Environmental
37 Protection Agency (EPA) joined other local, state, and federal agencies in warning residents and
38 recreational users of the river to use caution when near such algal blooms. Possible health effects of
39 exposure to *Microcystis aeruginosa* and its microcystin toxin range from mild, non-life threatening skin
40 conditions to permanent organ impairment and death, depending upon exposure time and intensity.
41 Additional discussion of algal blooms is provided in section 3.3.2.1, *Water Resources*.

42 **3.3.6.2 Environmental Effects**

43 We present the analysis of PacifiCorp's proposed measures, stakeholder terms and conditions,
44 and recommendations in the following three sections: (1) Recreation Resource Management; (2) River
45 Recreation; and (3) Development Decommissioning and Dam Removal. PacifiCorp's proposed

1 recreational measures are outlined in the draft Recreation Resources Management Plan¹⁰² (RRMP) filed
2 by letter to the Commission dated September 29, 2004 (PacifiCorp, 2004j).

3 **3.3.6.2.1 Recreation Resource Management**

4 *Framework for Recreation Resource Management*

5 In its introduction to the draft RRMP, PacifiCorp proposes to file a final RRMP within 1 year of
6 license issuance.

7 The Bureau of Land Management specifies that PacifiCorp should, within 1 year of license
8 issuance, develop a RRMP in consultation with the Bureau, and provide copies of the final RRMP filed
9 with the Commission and evidence of consultation to the Bureau of Land Management. The Bureau of
10 Land Management would reserve the right to require changes to the RRMP by filing modifications to the
11 RRMP within 30 days of receiving the final RRMP documentation. Upon Commission approval, the
12 licensee would implement the plan, including any changes required by the Bureau of Land Management.

13 Oregon Fish & Wildlife and Oregon Parks & Rec both recommend that within 4 months of
14 license issuance, PacifiCorp should form a recreation stakeholder group to assist with the completion of
15 the RRMP. The group would be comprised of representatives from state (including Oregon Fish &
16 Wildlife and Oregon Parks & Rec) and federal agencies, counties, tribes, and other interested parties.
17 Within 1 year of license issuance, PacifiCorp would complete the RRMP.

18 *Our Analysis*

19 PacifiCorp's proposed time frame for finalizing the RRMP is consistent with the agencies' and
20 seems reasonable, given the existence of a draft RRMP that addresses many of the recreational issues
21 associated with relicensing this project. However, PacifiCorp does not state that the plan would be
22 finalized in consultation with others, as the Bureau of Land Management specifies and Oregon Fish &
23 Wildlife and Parks & Rec recommend. We expect consultation would be needed since the configuration
24 of the to-be-licensed project cannot be determined prior to license issuance, and the final RRMP would
25 need to reflect as-licensed conditions. Considering the draft plan was developed in consultation with a
26 broad group of recreation stakeholders, the Recreation Work Group, it seems reasonable to continue
27 consulting with appropriate stakeholders during the finalization of the RRMP. Although the Commission
28 cannot require that any entity other than PacifiCorp participate in a recreation stakeholder group,
29 consultation with appropriate stakeholders during plan finalization would ensure that relevant input is
30 considered and incorporated into the final plan. By inviting those agencies identified by PacifiCorp in
31 section 3.1 of the draft RRMP to participate in RRMP finalization, agencies that would serve an advisory
32 role during plan implementation could begin to form a working relationship with PacifiCorp.

33 PacifiCorp does not specify that Oregon Fish & Wildlife would serve in an advisory role during
34 implementation of the final RRMP, although Cal Fish & Game would serve in such a capacity. Inviting
35 Oregon Fish & Wildlife to participate in both RRMP plan finalization and implementation would enable
36 Oregon's fish and wildlife resources to be considered on an equal footing with California natural
37 resources. We also consider it appropriate to invite relevant tribal representatives to participate in plan
38 finalization. Recreational activities can have adverse affects on cultural resources and sites of importance
39 to the tribes. Such cultural resources have confidential aspects that cannot readily be divulged to the
40 general public and tribal participation in plan finalization would enable consideration of measures to
41 protect these sensitive resources in the final RRMP.

¹⁰²PacifiCorp filed a draft RRMP in February 2004 and revised it in September 2004. All references to the draft RRMP are to the September 2004 version of the draft plan.

1 *Recreational Facility Development*

2 PacifiCorp’s draft RRMP proposes site-specific recreational development that it would design,
3 permit, and construct at the project. The proposed facilities would be designed and constructed to comply
4 with ADA, applicable health and safety codes and regulations, and provide design continuity and visitor
5 experiences consistent with the recreational setting where the facility would be located. The proposed
6 facilities would also be designed to minimize facility and site deterioration and O&M costs and protect
7 natural and cultural resources.

8 The following text is organized by project development beginning at the uppermost elevation of
9 the project and proceeding downstream. We analyze PacifiCorp’s proposed developments identified in
10 the draft RRMP and we analyze the terms, conditions and recommendations of stakeholders as they
11 pertain to each of the project developments.

12 East and West Side Developments. The only recreational facility associated with East and West
13 Side developments is the Link River Trail. This trail is primarily on land owned by PacifiCorp and the
14 trail is maintained by PacifiCorp. PacifiCorp proposes to define future ownership, management
15 responsibilities, and transfer rights of the Link River Trail and corridor lands within a future
16 decommissioning plan for East Side and West Side developments.

17 Interior recommends PacifiCorp improve the Link River Trail by resurfacing the trail, managing
18 vegetation in the trail corridor, and incorporating river access off the trail. In addition, Interior
19 recommends PacifiCorp develop a trail that connects Veteran’s Memorial Park with the Link River Trail.

20 *Our Analysis*

21 The Link River Trail is a project recreational facility that provides public access to project lands
22 and waters. It would be appropriate for it to remain part of the project unless East Side and West Side
23 developments are decommissioned. Since PacifiCorp proposes to decommission both developments,
24 including the disposition of the trail as an item to be addressed in a decommissioning plan would ensure
25 the trail would either be operated and maintained in a safe and suitable manner or it would be removed
26 and the land restored. If the Commission should decide that one or both developments should be
27 decommissioned, a decommissioning plan would provide for relatively short-term measures that would
28 ensure an orderly transition as Commission jurisdiction over the developments is relinquished. Long term
29 recreational enhancement measures, such as resurfacing Link River Trail, or constructing a new trail,
30 would only be appropriate for the Commission to consider if one or both developments were not
31 decommissioned. If the Commission should make such a determination, consideration of such
32 enhancement measures could be addressed in the final RRMP.

33 Keno Development. The only project-related recreational facility at Keno development is the
34 Keno Recreation Area, which is located on land owned by PacifiCorp and lands of the United States
35 managed by the Bureau of Land Management. PacifiCorp currently operates and maintains this facility.
36 PacifiCorp proposes to define future ownership, management responsibilities, and transfer rights of the
37 Keno Recreation Area within a future Commission jurisdictional proceeding. PacifiCorp states that Keno
38 dam currently serves no project purposes and therefore should be removed from the project.

39 *Our Analysis*

40 The Keno Recreation Area is currently a project recreational facility that provides public access
41 to project lands and waters. Accordingly, it would be appropriate for this facility to remain part of the
42 project unless Keno development was removed from the project. As with East and West Side
43 developments, if the Commission should determine that Keno development serves no project purposes or
44 should be decommissioned for any other reason, the disposition of the Keno Recreation Area could be
45 addressed in the decommissioning process. If the Commission determines that Keno development serves

1 project purposes, continued operation and maintenance of this recreational site by PacifiCorp would be
 2 appropriate, and provisions for doing so could be included in a final RRMP.

3 J.C. Boyle Development. PacifiCorp proposes improvements at existing project recreational
 4 facilities, and constructing new recreational developments listed in table 3-95. PacifiCorp’s proposals for
 5 owning, operating and maintaining the recreational facilities and managing dispersed recreational use are
 6 also shown in the table.

7 Table 3-95. PacifiCorp’s proposed recreational improvements at J.C. Boyle development.
 8 (Source: PacifiCorp, 2004j, as modified by staff)

Facility (Existing or New)	Recreational Improvements	Ownership, Operation and Maintenance
Pioneer Crossing Recreation Area ^a	Install: (1) improved and expanded day use facilities including sunbathing and picnic areas; (2) new boat launch and parking area; and (3) accessible double vault restroom. Renovate existing parking area (regravel and provide traffic control barriers).	Explore potential management agreement with the Bureau of Land Management to operate this facility, if both parties agree, PacifiCorp to provide annual O&M.
<i>J.C. Boyle Reservoir Loop Trail</i>	<i>Provide two trailheads and a non-motorized loop trail connecting Pioneer Park, Topsy Campground, and Boyle Bluffs (a 5 mile loop).</i>	Provide annual trail O&M. Contingent on assessing cultural resources and acquiring easements from other landowners
<i>Upper J.C. Boyle Reservoir Boating Access</i>	<i>Provide gravel road access, parking for 10-12 vehicles, and a single accessible vault restroom; modify the shoreline to accommodate small watercraft access.</i>	Access to this site is on an existing road through Sportsman’s Park Provide annual O&M
<i>Boyle Bluffs Day-Use Area and Campground</i>	<i>Construct 10 picnic sites and rehabilitate disturbed areas; construct a gravel access road and parking area with traffic control barriers. Future developmentb may include: construct 20 family campsites (10 of 20 RV) that could also function as a group campground; install accessible double-vault restroom, and hand pump water well with distribution system.</i>	Provide annual O&M. Contingent on acquisition of land for the facility.
<i>J.C. Boyle bypassed reach access</i>	<i>Construct two fishing access trails, trailheads, signs, single vault restroom, and pullouts below J.C. Boyle dam and near J.C. Boyle powerhouse^e.</i> <i>Construct boater put-in site below Boyle dam; provide sign; and graded gravel access road and parking area.</i> <i>Construct accessible fishing access platform near the J.C. Boyle powerhouse.</i> Construct day-use area near ‘old foundations area’ with graveled parking area and turnaround; install accessible double-vault restroom. Construct trail between J.C. Boyle powerhouse and Spring Island Boater Access ^d .	PacifiCorp to develop joint management agreement with the Bureau of Land Management. PacifiCorp to provide annual O&M. U.S. to own and Bureau of Land Management to administer day-use facility and trail and provide O&M.

Facility (Existing or New)	Recreational Improvements	Ownership, Operation and Maintenance
Stateline Take-out	Harden site (but do not expand footprint) to allow continued access and protect area resources; install traffic control barriers; relocate portable restrooms and provide changing rooms; PacifiCorp to correct the irrigation ditch seepage problem.	PacifiCorp and the Bureau of Land Management continue sharing O&M. PacifiCorp-owned lands to be included in the project boundary.
Fishing Access Nos. 1-6	Site 1: regravels access road and parking area; install interpretive sign and accessible double-vault rest room that may also be used as a changing room; construct an accessible fishing platform and short trail. Install traffic control barriers, particularly at Sites 1, 5, and 6. Provide formalized and hardened fishing access trails at Sites 2, 3, 4, and 5. Site 6: Manage as permit-only take-out and limit the number of whitewater boating take-out permits to five outfitters, when needed, harden to protect resources, and install accessible single-vault restroom.	PacifiCorp to continue providing O&M
Dispersed site management	Boyle reservoir area: (1) Install traffic control barriers to restrict use in sensitive areas; (2) close, relocate, rehabilitate, and/or harden dispersed sites in sensitive areas, and (3) prioritize treatments in the Spencer Creek area. J.C. Boyle bypass and peaking reaches: Provide periodic site cleanup, enforce use policies on company-owned project lands, minimize fire hazards, as appropriate, and protect sensitive resources.	Coordinate dispersed use policies and actions with other land managers

1 Note: Italicized text indicates new recreational sites or additions to existing recreational sites.

2 ^a Replaces Pioneer Park that is vacated due to Highway 66 Bridge realignment.

3 ^b Estimated at 10 years from license issuance.

4 ^c Proposed for PacifiCorp and/or the Bureau of Land Management to develop.

5 The Bureau of Land Management specifies that the RRMP (1) include descriptions of and
6 identify responsibility for O&M for the existing and proposed recreational sites and trails on Bureau-
7 managed lands affected by the project, including Topsy Campground, Spring Island boater access,
8 Klamath River Campground, dispersed day-use sites, and Stateline take-out; and (2) provide funding for
9 additional development and O&M at the J.C. Boyle bypassed reach boating and fishing access sites,
10 associated access trails, and scouting trails at major rapids.

11 Interior recommends that PacifiCorp provide the following recreational improvements at the J.C.
12 Boyle development: (1) a trail between J.C. Boyle and Copco reservoirs; (2) scouting trails at Caldera
13 and Hell's Corner rapids; (3) a trail connecting Topsy Recreation site, Sportsman's Park, and Pioneer
14 Park; (4) work with the Bureau of Land Management to design trails that provide universal access to
15 fishing, wildlife viewing, and dispersed camping at appropriate sites; (5) trail access (to design standards
16 for semi-primitive gradients) to access fishing sites and provide river access along the J.C. Boyle
17 bypassed reach; (6) improve the hiking trail upstream of the parking area at the J.C. Boyle powerhouse to

1 enhance fishing and boating access; (7) develop several parking sites connected by a trail system along
2 the powerhouse road; (8) a trail to connect with Klamath River Canyon dispersed sites; (9) replace a
3 bridge across the Klamath River in the upper Frain Ranch at the location of the old bridge to provide
4 pedestrian and administrative vehicle access; (10) design and locate the bridge and trails along the east
5 side of the Klamath River that connect dispersed camping and fishing sites; and (11) a trail to connect the
6 proposed upper J.C. Boyle boat access with an existing trail that provides access to the Keno reach.

7 In addition to the recreation proposals in the license application, Oregon Parks & Rec
8 recommends that the RRMP include funding support to the Bureau of Land Management to: (1) provide
9 O&M funding for and develop a potable water system at Topsy Campground; (2) provide O&M funding
10 for and provide law enforcement at Frain Ranch; and (3) improve and maintain the whitewater-scouting
11 trail at Caldera Rapid. Oregon Parks & Rec also recommends PacifiCorp construct a non-motorized trail
12 between the J.C. Boyle powerhouse and Copco reservoir to connect dispersed camping, fishing, river
13 access, and scouting sites.

14 *Our Analysis*

15 PacifiCorp's proposed recreational measures at the J.C. Boyle development would increase public
16 access to project lands and waters, enhance recreational facilities, and provide additional recreational
17 opportunities at this project development. All but two (discussed below) of the proposed measures for
18 this development would be implemented during the first 10 years after license issuance.

19 Pioneer Park provides the most obvious point of access to the reservoir because it is located on
20 Highway 66, a major thoroughfare. The footprint of this site overlaps with Oregon Department of
21 Transportation's bridge replacement project and the resultant changes would likely eliminate at least
22 some of the facility components. Therefore, PacifiCorp would need to coordinate with Oregon
23 Department of Transportation in order to provide public access to the reservoir. Although PacifiCorp
24 currently maintains a small day use area on the east side of the bridge, the only proposed new or
25 refurbished facilities are on the west side of the bridge. PacifiCorp estimates that the existing Pioneer
26 Park use is below capacity and that any loss in capacity because of facility reconfiguration could result in
27 use of this site meeting its capacity shortly after issuances of a new license. We consider it appropriate to
28 evaluate providing recreational access on both sides of the new bridge location since the topography is
29 gentle and Highway 66 provides easy access to the project. This would provide abundant area for visitors
30 on both sides of the bridge and would minimize the potential for user-created routes of access to the
31 shoreline. We recognize that with the new bridge configuration, much of the existing parking area on the
32 east side of the bridge would be lost. However, there may be sufficient room for a small pull-off area,
33 and the existing picnic table and signage could be retained. This east side site offers much broader views
34 of the expansive wetlands associated with J.C. Boyle reservoir than the west side site and would be ideal
35 for wildlife viewing.

36 Additional development at the upper end of J.C. Boyle reservoir would provide recreational
37 cartop boat access to the reservoir where such access does not currently exist, thereby opening more of
38 the project lands and waters to recreational use. Besides creating new recreational access to the reservoir,
39 this site could serve to absorb additional public day use if and when Pioneer Park reaches its capacity
40 (which is likely during the term of a new license based on expected population increases). Although the
41 site would be located on land owned by PacifiCorp, the access road to this site would go through
42 Sportsman's Park and the property of an adjacent private landowner. PacifiCorp would need to acquire
43 an easement across private lands to provide public access to this potential site. Since this development
44 would be a project recreational facility, it would be appropriate to include both the access road and the
45 facility within the project boundary.

46 The proposed J.C. Boyle Bluffs campground and day use area would provide another point of
47 public access to the reservoir and provide a family campground that could also accommodate group use.

1 This facility would provide about 10 additional overnight sites at the project and would meet a need for
2 group use recreational facilities at the project that is documented in PacifiCorp’s study results. As
3 proposed, it would be constructed within the first 10 years following license issuance; however, the
4 restroom and water system would not be installed until 20 years after license issuance. It is not clear to us
5 why PacifiCorp would delay installing these important components and we consider it appropriate to
6 install them as part of the site development within the first 10 years of the license.

7 PacifiCorp does not propose to include the Topsy Campground within the project boundary citing
8 that the Bureau of Land Management constructed the site and is responsible for its O&M. Topsy
9 Campground is located within the existing project boundary and provides a point of public access to the
10 reservoir with a boat ramp, day use facilities, and a fishing pier. Agency ownership and O&M of the
11 facility do not provide sufficient rationale for us to support removing Topsy Campground from the project
12 boundary. The Bureau of Land Management requested permission from the Federal Power Commission
13 in 1962 to develop Topsy Campground. In response to this request, the Federal Power Commission noted
14 that it wished “...to encourage all further recreational developments at the project which are practicable”
15 (letter from J. Gutride, Secretary, Federal Power Commission, to State Director, Bureau of Land
16 Management, Portland, Oregon, dated March 1, 1963). However, the Federal Power Commission
17 requested that the Bureau of Land Management consult with the licensee regarding development of this
18 facility and the completed facility was included in the project boundary. There is no evidence that
19 management conditions have changed at this site since the Commission originally determined that this
20 site served project purposes and should be included in the project boundary. Topsy Campground
21 currently provides public access to project lands and waters, including a boat ramp and shoreline day use
22 facilities. The Bureau of Land Management seeks funding assistance for its management of this site but
23 does not request that PacifiCorp manage it. The agency states the two water wells at the site have failed
24 and there is a need to provide a reliable potable water supply. The Bureau of Land Management’s desire
25 to continue managing this site could be accommodated by including the site in PacifiCorp’s proposed
26 Operations and Maintenance Program whereby PacifiCorp proposes to develop memoranda of agreement
27 with other entities to share recreation site administration. Including the site in the project license and
28 establishing site management responsibilities with the Bureau of Land Management would ensure the site
29 would continue to provide safe and adequate access to the reservoir. Topsy Campground is the only site
30 on J.C. Boyle reservoir that currently provides non-dispersed campsites. Limited overnight camping is
31 available at Sportsman’s Park, but use is primarily for people participating in activities at the park
32 (shooting, archery, OHV use, and model airplane facilities) not people using project lands and waters.
33 Oregon Park & Rec’s recommendation to provide a potable water system could be addressed through a
34 memorandum of agreement that would define PacifiCorp’s and the Bureau of Land Management’s
35 respective responsibilities.

36 Formal non-motorized trails do not currently exist in the vicinity of the reservoir. As proposed,
37 the new loop trail would provide 5 miles of non-motorized trails for project visitors. This development
38 would provide a new recreational opportunity, increase public access to the reservoir, and respond to the
39 existing latent demand for trails that PacifiCorp identified in their recreation studies. As proposed, much
40 of the trail would be within the proposed project boundary¹⁰³ and may require PacifiCorp to obtain
41 easements across one or more private parcels. If this trail were constructed as a license requirement, it
42 would be necessary to review the trail location and make any necessary revisions to ensure the entire trail
43 was included within the project boundary. This measure would be consistent with Interior’s
44 recommendation to construct a trail connecting the Topsy Recreation site (we assume Interior means
45 Topsy Campground), Sportsman’s Park, and Pioneer Park. However, Sportsman’s Park is currently not a
46 project-related recreational facility, and there is no evidence that it serves project purposes because the
47 park is enclosed by a fence that excludes the public from gaining access to J.C. Boyle reservoir.

¹⁰³The proposed boundary excludes Topsy Campground and the trail passes through this site.

1 PacifiCorp’s proposed trail alignment would pass close to Sportsman’s Park at the Highway 66 Bridge,
2 but we would have no basis to recommend that the trail provide pedestrian access to a non-project
3 recreational facility.

4 PacifiCorp’s proposed recreational enhancements at the J.C. Boyle bypassed reach would
5 formalize existing user-created access routes and parking areas, as well as create new trails and fishing
6 access. Formalizing the existing points of access would minimize the number of user-created routes
7 leading to the river and prevent resource damage such as soil compaction and vegetation damage caused
8 by indiscriminate parking along the roads. The proposed fishing platform near the J.C. Boyle
9 powerhouse would enhance accessibility for persons with disabilities at the project. The two access trails
10 to the bypassed reach would provide river access where formalized access does not currently exist. The
11 proposed trails and day use area (i.e., parking area and restroom) would accommodate recreation at the
12 bypassed reach, which is within the existing and proposed project boundary.

13 PacifiCorp’s proposed trail between the J.C. Boyle powerhouse and the Spring Island boater
14 access would not provide project-related access (the peaking reach is not included in the existing or
15 proposed project boundary). We question the need for such a short¹⁰⁴ trail and cannot determine a
16 demonstrated project-related need for this trail (e.g., no identified recreation-related effects or visitor
17 demand). We also note that parking would be provided at both ends of this proposed trail so there does
18 not appear to be a need for a route of travel between the two sites. If this site were constructed as a
19 license requirement, PacifiCorp should enter into an agreement as part of the Operation and Maintenance
20 Program to identify their responsibilities prior to initiating this development.

21 PacifiCorp’s proposal to manage dispersed recreational use at this development would continue to
22 provide dispersed day and overnight use while minimizing the documented effects on natural resources
23 such as wildland fire, vegetation damage, bare and compacted soil, and pollution. PacifiCorp’s proposed
24 measures to close, harden, and/or monitor certain sites near sensitive resources, and provide site closure
25 enforcement are consistent with the Bureau of Land Management’s preliminary 4(e) condition.

26 In the peaking reach there would be continued public access to project waters and lands within
27 the project boundary and enhancements would be provided at the Stateline take-out and the six fishing
28 access sites. PacifiCorp’s study results and comments filed in Interior’s March 27, 2006, letter to the
29 Commission document maintenance needs for roads, restrooms, signage, and gates. Our observations
30 during our site visit to the project area confirm that these sites are in need of maintenance. This need for
31 maintenance, combined with considerable high levels of recreational use, support the need to reconstruct
32 these sites to provide safe and adequate project recreational facilities. PacifiCorp’s proposed redesign,
33 reconstruction and O&M of these sites would meet this need and address existing effects to sensitive
34 resources. Proposed new facilities would provide amenities such as a changing room¹⁰⁵ and improved
35 restrooms to whitewater boaters who use the peaking reach. PacifiCorp’s proposal to make capital
36 improvements and provide O&M is consistent with agency conditions and recommendations.

37 We agree that if a PacifiCorp irrigation canal is leaking onto Bureau of Land Management-
38 managed land, as the conceptual design for the proposed Stateline take-out recreational enhancements
39 indicates, it should be repaired. However, there is no indication that this irrigation canal or the affected
40 Bureau of Land Management-managed land serve any existing or proposed project purpose.
41 Consequently, it would be inappropriate to include repair of this irrigation canal as a condition of any
42 license that may be issued for this project.

¹⁰⁴Staff estimates the length of the trail would be about 0.25 mile.

¹⁰⁵We note the specific wording in the draft RRMP describes this structure as ‘above-ground’
changing room. Staff assumes this is a building with a foundation, walls and roof and we do not
understand the significance of the term ‘above-ground’.

1 We do not find several of the agency conditions and recommendations to have a project nexus.
 2 The Spring Island boater access, Klamath River Campground, Frain Ranch, dispersed sites, and
 3 whitewater scouting trails along the peaking reach do not provide access to project lands or waters or
 4 accommodate project recreation, nor are these sites located within the project boundary. Public access for
 5 kayakers and small rafts would be accommodated by PacifiCorp’s proposed angler and boater access sites
 6 at the upper and lower ends of the bypassed reach. Most commercial rafters would still likely use the
 7 Spring Island boater access. Several of the trails recommended by Interior, Oregon Fish & Wildlife, and
 8 Oregon Parks & Rec are included in PacifiCorp’s proposal as previously indicated; however, the
 9 recommended trail from the proposed Upper J.C. Boyle boating access to an existing trail along the Keno
 10 reach would primarily access non-project waters. Similarly, the agency-recommended trail between the
 11 J.C. Boyle powerhouse and Copco reservoir in the project license would not provide access to project
 12 waters. We conclude that the proposed 5-mile loop trail around the reservoir would meet the need for
 13 additional trails at this development.

14 Copco Development. PacifiCorp proposes improvements at existing recreational facilities and
 15 constructing new recreational developments as listed in table 3-96. PacifiCorp’s proposals for owning,
 16 operating, and maintaining the recreational facilities and managing dispersed recreational use are also
 17 indicated in the table.

18 Table 3-96. PacifiCorp’s proposed recreational improvements at Copco development.
 19 (Source: PacifiCorp, 2004j, as modified by staff)

Facility	Recreational Improvements	Ownership, Operation and Maintenance
Mallard Cove	Redesign and reconstruct site to include: 10 family campsites, two accessible double-vault restrooms and; a separate day use area at the point (north of existing parking area) with five picnic sites, shade trees, and/or shelters and an accessible fishing access pier adjacent to the boat launch.	PacifiCorp to provide O&M for this site.
Copco Cove	Redesign and reconstruct boat ramp access and parking area and gravel the parking area; repair (regrade) and replace three picnic sites; install an accessible single-vault restroom.	Close this site to overnight use and enforce closure. PacifiCorp to provide O&M for this site.
Copco Reservoir Shoreline	Prohibit all overnight camping at dispersed use areas.	PacifiCorp to provide O&M and enforcement.

20 *Our Analysis*

21 There are only two small parcels of land that are not privately owned at this reservoir shoreline
 22 and these are the only two points of public access to the reservoir. These sites have a nexus to project
 23 purposes because they provide boating and fishing access to the reservoir. As previously discussed in the
 24 affected environment section, use of both sites is currently below capacity not because of low demand but
 25 because of visitor perception that both sites do not offer optimal recreational opportunities. PacifiCorp’s
 26 studies documented a need to separate the existing overlapping day and overnight use occurring at these
 27 small sites and install new infrastructure to address health and safety concerns with the aging site
 28 components. Mallard Cove, located on the southern shoreline with paved road access, is a gentle sloping
 29 site where it would be possible to create distinct and separate facilities for day and overnight use.
 30 Developing such facilities, as PacifiCorp proposes, would ensure overnight users would not displace day

1 users at the limited shoreline available for public access. We also note that the gentle slopes would be
 2 compatible with providing accessible facilities such as the proposed fishing pier.

3 Copco Cove is a small site with steep slopes so it may not have sufficient area to develop separate
 4 day and overnight areas. PacifiCorp’s studies document soil erosion and a need for improvements to the
 5 parking area, access road, and restroom. Access to this area is by way of about 5 miles of native-surfaced
 6 road, which appears to limit the number of visitors who use this site. Consequently, PacifiCorp’s
 7 proposal to convert this site seems appropriate so that overnight users would not displace the few day use
 8 visitors who come to this area. Developing a designated area for camping at Mallard Cove would
 9 accommodate overnight users who could be displaced by the changed conditions at Copco Cove.
 10 Eliminating overnight use at Copco Cove may also reduce some of the documented harmful effects, such
 11 as vegetation removal that is likely related to campfire use.

12 PacifiCorp’s proposed measures for developed recreational facilities at the Copco development
 13 would enhance these facilities. The existing deteriorated conditions (documented in PacifiCorp’s study
 14 results and viewed by staff) and visitor displacement occurring at both of these sites supports the need for
 15 redesign and reconstruction within the first 10-year period after license issuance. We note that the
 16 existing project boundary includes the Copco Cove site but not Mallard Cove site. If these facilities were
 17 included in the project license, it would be appropriate to include both of them within the project
 18 boundary, as proposed by PacifiCorp.

19 PacifiCorp only identified two dispersed use areas along the Copco reservoir shoreline. It
 20 documents moderate ecological effects in the form of bare and compacted soil that it speculates is more
 21 related to grazing practices than recreational use. Regardless of the source of the damage, it would be
 22 appropriate to include measures, as PacifiCorp proposes, to correct practices occurring within the project
 23 boundary that could contribute sediment to the project reservoir from erosion. The number of displaced
 24 visitors affected by instituting site closures would be negligible since there are only two sites.

25 Fall Creek Development. PacifiCorp proposes improvements at existing project recreational
 26 facilities and constructing new recreational developments listed in table 3-97. PacifiCorp’s proposals for
 27 owning, operating and maintaining the recreational facilities and managing dispersed recreational use are
 28 also indicated in the table.

29 Table 3-97. PacifiCorp’s proposed recreational improvements at Fall Creek development.
 30 (Source: PacifiCorp, 2004j, as modified by staff)

Facility (Existing or New)	Recreational Improvements	Ownership, Operation and Maintenance
Fall Creek Trail	<i>Harden the trail to the falls and extend to create a loop trail</i> ; construct a graveled trailhead and install a sign along Copco Road outside gate and hatchery area or near the existing parking area; install fencing to restrict public access near hatchery and hydro facilities ^a	Cal Fish & Game and PacifiCorp to share O&M. PacifiCorp to operate the site if Cal Fish & Game vacates the site.

31 Note: Italicized text indicates new recreational sites or additions to existing recreational sites.

32 ^a Proposed as PacifiCorp and/or Cal Fish & Game to develop

1 *Our Analysis*

2 This recreational site has closed gates and restrooms and deteriorated parking areas, trail surfaces,
3 gates, and signs, based on our site visit observations. It appears the recreational amenities have been
4 abandoned and PacifiCorp proposes to redesign, expand, and reopen the site. PacifiCorp determined that
5 the existing use of the recreational facilities is below capacity, not because of lack of demand, but because
6 of visitor perception that this area does not offer optimal recreation opportunities. However, PacifiCorp
7 suggests sharing site development and O&M responsibilities with Cal Fish & Game. The proposed day
8 use area and trail would provide an appropriate degree of public access to project lands and waters. We
9 note that this is the only existing non-motorized trail opportunity available for visitors to the Iron Gate
10 reservoir area. We conclude the presence of structures related to the project and fish hatchery require
11 clearly defined areas where the public can safely recreate without interfering with hatchery operations.
12 Because PacifiCorp states it would take over the site if Cal Fish & Game vacates it, this development
13 should be included in the project license to ensure it would continue to provide safe public recreational
14 access adjacent to a project feature. PacifiCorp could explore sharing O&M responsibilities through its
15 proposed Operations and Maintenance Program. Although Cal Fish & Game is currently not operating
16 this hatchery facility, in the event it is reopened, Cal Fish & Game may elect to include public observation
17 areas where hatchery operations could be viewed. In this case, some shared operation and maintenance
18 responsibilities could be appropriate. However, given that this is the only recreational site at this project
19 development and PacifiCorp already owns the land on which the proposed trail and day use area would be
20 located (as well as the land on which the hatchery is located), we consider it appropriate for PacifiCorp to
21 ultimately be responsible for operation and maintenance of this site. The footprints of the proposed trail
22 and day use facilities are within the proposed project boundary; however, if the trail were constructed
23 under a new project license, its location should be verified and PacifiCorp should adjust the project
24 boundary, if necessary, to include all of the as-built trail and associated amenities.

25 Iron Gate Development. PacifiCorp proposes improvements at existing project recreational
26 facilities and constructing new recreational developments as listed in table 3-98. PacifiCorp's proposals
27 for owning, operating and maintaining the recreational facilities and managing dispersed recreational use
28 are also indicated in the table.

29 The Forest Service and Interior recommend PacifiCorp improve river access sites in the Middle
30 Klamath Reach between Iron Gate dam and Happy Camp during the peak recreational season, including
31 maintenance and improvements at three river access sites¹⁰⁶ (1) below Iron Gate dam; (2) near I-5; and
32 (3) at the Klamath River confluence with Indian Creek. Interior states that the project has created stable
33 and reliable flows which has led to increased whitewater boating and fishing use. Interior's rationale for
34 the recommendation is, "the need to protect and enhance this WSR designated river segment...and help
35 support achievement of the environmental justice goals for economically disadvantaged communities and
36 populations."

¹⁰⁶Interior recommends improvements at all three sites. Forest Service only recommends improvements at the Klamath River confluence with Indian Creek.

1 Table 3-98. PacifiCorp's proposed recreational improvements at Iron Gate development.
 2 (Source: PacifiCorp, 2004j, as modified by staff)

Facility (Existing or New)	Recreational Improvements	Ownership, Operation and Maintenance
Fall Creek (at confluence with Iron Gate reservoir)	Close and restore site to protect sensitive resources. Remove existing infrastructure except for the boat ramp. Allow use only for special events.	PacifiCorp to O&M this site.
Jenny Creek Day-use Area and Campground	Close and restore site to protect sensitive resources. Remove existing infrastructure and install accessible single vault restroom. Construct a graveled pullout area along Copco Road adjacent to existing site with a trail leading to the restroom.	PacifiCorp to O&M this site.
Wanaka Spring Day-use Area	Redesign and reconstruct a fee-only group reservation camp with 10 to 12 RV/tent campsites, including shade trees and/or shelters; install two accessible double-vault restroom buildings; regrade and regravels the access road and parking areas and provide traffic control barriers; provide a central group shelter; install a hand pump water well.	PacifiCorp to O&M this site.
Camp Creek Day-use and Campground	<i>Construct campground with about 40 family campsites on the upper bench area behind the existing restroom; install 4 accessible double-vault restrooms; convert existing shoreline camping area to a 12-site day use area; provide additional shade trees (including irrigation) and/or covered picnic tables in day use picnic areas; construct a formalized overflow parking area with traffic control barriers; construct gravel access roads to both the adjacent private properties and the new campground; provide accessible improvements at the hand boat launch area and convert this area to a day use site; repair or replace the existing dock and ramp; provide 5-10 mooring balls for temporary boat moorage near the boat launch; extend the water system to the new camping area; provide 5-10 boat moorage slips near the boat launch.</i>	PacifiCorp to O&M this site. When the improvements have been completed, PacifiCorp would implement a fee-only camping policy.
Juniper Point Day-use and Campground	Redesign the site for day use picnicking only (nine sites) ^a ; redesign and reconstruct the access road; replace the existing restroom with an accessible double-vault restroom on the reservoir side of Copco Road; plant shade trees and/or shelters at picnic sites.	PacifiCorp to O&M this site.
Mirror Cove Day-use Area and Campground	Redesign and convert the area not associated with the boat launch area to a reservation-only group campground (about 10 sites) ^b . Retain boat launch area and provide: two accessible double-vault restrooms on the reservoir side of Copco Road; five picnic sites next to the boat launch; 5-10 mooring balls for temporary boat moorage; accessible improvements to the boat launch and new boarding docks. Relocate the boat ramp to a deeper area adjacent to the existing ramp or dredge the existing ramp area and extend the ramp lane. Plant shade trees and/or shelters at all camping and day use sites and install a hand pump water well.	PacifiCorp to O&M this site.

Facility (Existing or New)	Recreational Improvements	Ownership, Operation and Maintenance
Long Gulch Day-use Area and Campground	<p>Redesign, reconstruct and convert to day-use only facility^a with five new day use sites with additional shade trees (including irrigation) and/or covered picnic shelters for each site; provide 5-10 mooring balls for temporary boat moorage; formalize existing graveled parking area, provide an overflow parking area and install traffic control barriers. Construct a trailhead for the Long Gulch to Iron Gate Hatchery trail (described later). Provide accessible improvements to the boat launch and new boarding docks; expand the boat ramp to two lanes when this capacity is needed.^c</p> <p><i>Construct a new 40-site fee campground adjacent to the existing boat launch^e. Provide: gravel-surfaced roads and centralized potable water; three accessible double-vault restrooms; a non-motorized trail between the campground and the boat launch with overlook areas; a shoreline day use area at a nearby cove with parking and accessible double-vault restroom.^d</i></p> <p><i>Construct a 1-mile, multiple-use, native-surfaced trail between Long Gulch and Iron Gate Hatchery on an old roadbed; Improve an existing 0.5-mile trail along Bogus Creek and provide signage.</i></p>	<p>PacifiCorp to O&M this site.</p> <p>PacifiCorp to O&M this site.</p>
Overlook Point Day-Use Area	<p>Close site to overnight use and vehicular access and redesign and reconstruct this area as a boat-in day use only site (three sites). Provide additional shade trees (including irrigation) and/or covered picnic tables at each of the three sites and; one accessible single-vault rest room in place of the existing restroom.</p>	<p>PacifiCorp to O&M this site.</p>
Iron Gate Hatchery	<p>Redesign the day use area and provide additional shade trees (including irrigation) and/or covered picnic tables at picnic sites; and a trailhead for the proposed Bogus Creek and Long Gulch to Iron Gate Hatchery trails, with signage. Harden the access road to the existing river boat launch adjacent to this site.</p>	<p>Cal Fish & Game would provide annual O&M</p>
Iron Gate Reservoir Shoreline	<p>Prohibit all overnight camping at dispersed use areas.</p>	<p>PacifiCorp to provide O&M and enforcement.</p>

- 1 Note: Italicized text indicates new recreational sites or additions to existing recreational sites.
- 2 ^a Gradually phase out overnight use of this site as the Camp Creek campground expansion is completed and
3 direct overnight visitors to the Camp Creek Recreation Area or the Long Gulch Bluff recreation area (when
4 completed).
- 5 ^b Non-group overnight visitors would be redirected to Camp Creek or Long Gulch Bluff recreation areas, when
6 completed.
- 7 ^c Estimated at 15 years from license issuance.
- 8 ^d Contingent on documented level of use at the Camp Creek Recreation Area based on monitoring results.
9 PacifiCorp estimates this would occur about 20 years from license issuance.

1 *Our Analysis*

2 The primary factors we considered in evaluating PacifiCorp’s proposed developments at Iron
3 Gate reservoir include (1) instances of recreational use is harming sensitive resources; (2) existing use
4 levels indicating additional day and overnight capacity is needed; (3) areas within a facility being used for
5 both day and overnight without separation of these uses; (4) facilities designed for only day use activities
6 receiving overnight use; and (5) in general, PacifiCorp’s studies, which our site visit observations
7 confirm, documenting that there are maintenance needs and accessibility deficiencies at all of these
8 facilities related to roads, parking areas, signage, restrooms, boat launches and fishing/boarding docks.
9 As indicated in table 3-93, use of the existing recreational facilities at Iron Gate reservoir is approaching,
10 at, or exceeding capacity. Recreational demand is likely to increase during the term of a new license.
11 Consequently, the need for increased recreational opportunities at this development is evident.

12 PacifiCorp appropriately proposes to close the Jenny Creek and Fall Creek areas to reduce
13 recreation-related effects on sensitive resources. Closing these sites would eliminate about nine of the 59
14 developed sites¹⁰⁷ at Iron Gate reservoir. This decrease would be more than compensated by PacifiCorp’s
15 proposed development which would create about 97 sites within the first 10-year phase of the license and
16 potentially add about 40 more sites in the second 10-year phase of the project license at Iron Gate
17 reservoir.

18 We consider the optimal arrangement for providing public access to project waters to consist of
19 designating shoreline areas for day use and locating campgrounds upslope and adjacent to these areas, as
20 PacifiCorp proposes. In addition, PacifiCorp’s proposal would (1) meet the need to increase the
21 developed capacity at the reservoir by planning for two additional 40-site campgrounds; (2) meet the need
22 for providing group use recreational facilities by redesigning and reconstructing the Wanaka Springs and
23 Mirror Cove areas; (3) meet the need to provide trails by constructing two trails; (4) provide accessible
24 recreational facilities by redesigning and reconstructing existing facilities including boat ramps; and (5)
25 provide for public health and safety needs by replacing deficient infrastructure (e.g., restrooms, access
26 roads). PacifiCorp appropriately places a priority on the existing sites and use patterns by proposing to
27 complete improvements at the existing developments within the first 10-years of license issuance.
28 PacifiCorp’s proposal to provide moorings for temporary boat moorage would minimize effects to
29 shoreline vegetation by providing visitors an alternative place to tie up their boats. An adaptive approach
30 for developing additional facilities at Long Gulch tied to recreational use triggers at existing facilities at
31 Iron Gate reservoir, as PacifiCorp proposes, seems to us to be particularly appropriate. If summer algal
32 blooms that have occurred during recent years continue to persist under a new license, the planned
33 increased recreational capacity may not be needed, as the public may seek alternative locations.

34 PacifiCorp only identified four dispersed use areas along the Iron Gate reservoir shoreline. It
35 documents moderate ecological effects in the form of bare and compacted soil that it speculates is more
36 related to grazing practices than recreational use. Regardless of the source of the damage, it would be
37 appropriate to include measures, as PacifiCorp proposes, to correct practices occurring within the project
38 boundary that could foster erosion and contribute sediment to the project reservoir. The number of
39 displaced visitors affected by instituting site closures would be negligible considering there are only four
40 areas. Additionally, PacifiCorp’s proposed improvements to the developed sites and additional capacity
41 would likely accommodate any visitors displaced by the closures. We consider the Iron Gate Hatchery
42 day use area to be a project-related recreational facility and as such it would be appropriate for O&M to
43 ultimately be PacifiCorp’s responsibility.

44 The Forest Service and Interior recommendations are not supported by a demonstrated project-
45 related effect, and the recommended sites at I-5 and the Indian Creek confluence with the Klamath river

¹⁰⁷We cannot provide analysis in terms of overnight and day use capacity because both types of use occur at most of the sites.

1 are about 8 and 50 miles downstream of the most downstream extent of the project boundary,
2 respectively. Consequently, these sites would not provide access to project lands and waters. We
3 recognize there may indeed be river recreational use occurring at these locations. However, we consider
4 this activity and any associated effects would occur irrespective of the project and we cannot find a nexus
5 between these sites and the project. PacifiCorp proposes to make improvements to river access near the
6 Iron Gate Fish Hatchery and this is consistent with Interior's recommendation and would provide public
7 access to project lands and waters.

8 *Recreation Management-Programmatic Elements*

9 The draft RRMP outlines eight programs that would be used to manage project recreational
10 resources. We discuss the Whitewater Boating and River-Based Fishing Program in section 3.3.6.2.2,
11 *River Recreation*. The Recreation Facility Development/Capital Improvement Program is discussed in
12 the preceding subsection, *Recreational Facility Development* and the Aesthetic/Visual Resource
13 Enhancement Program is discussed in section 3.3.7, *Land Use and Aesthetic Resources*. The reader is
14 referred to the draft RRMP for a detailed description of the remaining five programs which include (1)
15 Recreation Operations and Maintenance Program, (2) Recreation Monitoring Program, (3) Resource
16 Integration and Coordination Program, (4) Plan Review and Update Program, and (5) Interpretation and
17 Education Program. The following text discusses these five proposed programs with analysis of the
18 agency terms, conditions and recommendations included as they pertain to each of these programs.

19 Recreation Operations and Maintenance Program. Under this program PacifiCorp would define
20 its O&M responsibility for developed and dispersed recreational sites, establish maintenance standards,
21 propose cost-sharing arrangements with other entities (both capital and O&M) and provide funding
22 assistance for land- and/or water-based law enforcement.

23 PacifiCorp proposes to provide seasonal resource protection and visitor management control by
24 providing a PacifiCorp Park Ranger to patrol all project recreational sites and reservoir shorelines by
25 vehicle from May through October.¹⁰⁸ PacifiCorp also proposes to seek a contract with the Siskiyou
26 County Sheriff's Office or other appropriate entity, for land-based law enforcement patrols¹⁰⁹ of project
27 lands from Iron Gate Hatchery upstream to Stateline takeout from May through October.

28 The Bureau of Land Management specifies that the final RRMP include the estimated O&M
29 costs, identify the appropriate instrument for shared administration of Bureau of Land Management sites,
30 and include provisions for working with the Bureau to define standards for facility O&M, replacement,
31 modification, or upgrade. They also specify that the RRMP include provisions to bring facilities up to
32 Bureau of Land Management standards for accessibility, public health and cleanliness, safety, and
33 security and that PacifiCorp develop an off-highway vehicle management program.

34 Oregon Parks & Rec recommends that PacifiCorp provide funding for O&M and law
35 enforcement at Frain Ranch. Interior recommends that PacifiCorp (1) negotiate an agreement to fund the
36 Klamath County Sheriff's Department to retain a land-based deputy for 4 to 6 months to patrol Project
37 roads; (2) negotiate an agreement to fund the Klamath County sheriff's department to retain a part-time
38 water-based deputy to patrol J.C. Boyle and Keno reservoirs during periods of peak recreational use (mid-
39 May through October); (3) fund the operation of a 4-wheel drive vehicle to patrol the project area; (4)

¹⁰⁸PacifiCorp would coordinate its patrols with the Bureau of Land Management and Klamath County law enforcement patrols in J.C. Boyle reservoir and J.C. Boyle bypassed reach to maximize management presence and coverage, address changing visitor management needs, provide backup coverage when needed, and better enforce new dispersed site use restrictions.

¹⁰⁹Siskiyou County Sheriff's Office would continue to provide California Department of Boating and Waterways-funded marine patrols.

1 fund a communications firm to analyze the feasibility of establishing and improving an emergency/early
2 warning system; and (5) increase on-river patrols and management presence in the Middle Klamath Reach
3 between Iron Gate dam and Happy Camp during the peak recreational season. The Forest Service also
4 recommends PacifiCorp provide funding for increased on-river patrols.

5 *Our Analysis*

6 As proposed, the Operation and Maintenance program identifies PacifiCorp's ultimate
7 responsibility to operate and maintain project related recreational facilities and dispersed use sites. This
8 program also provides a means to explore sharing development and O&M costs with other entities that
9 have overlapping ownership or management responsibilities with project recreational facilities. Although
10 other entities have recommended PacifiCorp provide O&M funding for Frain Ranch, Klamath River
11 Campground, and Spring Island boater access, we do not find these areas have a project nexus (see
12 subsection, *Recreational Facility Development*). Frain Ranch and Spring Island provide access for
13 primarily commercial whitewater boating outfitters, and consideration could be given to establishing
14 arrangements for the outfitters to take responsibility for a portion of the O&M associated with these
15 facilities.

16 PacifiCorp provides an appendix to the draft RRMP that outlines maintenance standards for
17 project recreational facilities. These appear to provide sufficient guidance to result in safe and suitable
18 public recreational facilities. Since some of the project recreational facilities¹¹⁰ overlap with other agency
19 jurisdictions, it would be appropriate to develop and agree upon these standards in consultation with these
20 other agencies. If such consultation has already been completed, it would be appropriate to provide
21 documentation to this effect in the final RRMP.

22 PacifiCorp's draft RRMP outlines plans for designing, upgrading, constructing and providing
23 O&M for several developments. However, the draft plan does not appear to address the need to replace
24 the facilities during the term of the license. We expect that PacifiCorp's O&M responsibilities would
25 include replacement of facilities on an as-needed basis.

26 PacifiCorp proposes and several of the agencies recommend funding support for law enforcement
27 at the project. We consider PacifiCorp's property tax payments and fees paid for occupying federal lands
28 fulfill its obligation and we do not find any rationale that support the need to augment agency funding for
29 these services. The Commission would not object to PacifiCorp's proposal to explore agreements with
30 law enforcement agencies; however, it would not be an appropriate measure to include in the project
31 license for the reason stated.

32 PacifiCorp's proposal includes project area patrols which are consistent with the portion of
33 Interior's recommendation to provide 4-wheel drive patrol of the project area. The draft RRMP does not
34 include a component to address OHV use at the project. Considering the growing popularity of this
35 activity, we consider it to be appropriate to include a plan to manage this use as either a component of the
36 final RRMP or the proposed Road Management plan (see section 3.3.7.2, *Land Use and Aesthetic*
37 *Resources*). This would help ensure this activity would not harm sensitive resources at the project.

38 Interior's recommendation for PacifiCorp to conduct a feasibility analysis for the potential
39 establishment of an early warning system is designed to enable notification of public agencies and
40 commercial whitewater boating outfitters in the event of an emergency at the J.C. Boyle dam or
41 powerhouse. In its rationale statement, Interior points out that within the Klamath River Canyon, there is
42 limited telephone and radio reception, which could prevent notification of recreationists within the

¹¹⁰The Bureau of Land Management has an interest in Topsy Campground and Stateline take-out, Pioneer Park is adjacent to the right-of-way for Highway 66 and Cal Fish & Game has an interest in the facilities at Fall Creek and Iron Gate fish hatchery.

1 peaking reach and emergency responders of unexpected hydropower release changes, wildfires, law
2 enforcement emergencies, and medical emergencies.

3 At a project where whitewater boating use is dependent on scheduled releases, such as the J.C.
4 Boyle peaking reach, unanticipated interruption of scheduled flows and the resultant decrease in water
5 level could result in rafters being stranded at relatively remote locations (the distance between the Spring
6 Island put-in site and the State-line takeout site is 11 miles). If communication with support personnel or
7 emergency responders is not possible, public safety could be jeopardized. Consequently, assessing the
8 feasibility of enhancing communications along portions of the peaking reach where it is currently limited
9 can be viewed as having a nexus to project purposes. If it is demonstrated to be feasible to enhance
10 communications, we consider it inappropriate for PacifiCorp to be responsible for all implementation
11 costs. Notification of whitewater boaters of risks associated with wildfires and law enforcement
12 emergencies and the potential need for whitewater boating outfitters to notify emergency responders of
13 medical emergencies is not, in our view, a project-related need. Consequently, if enhanced
14 communications are shown to be feasible, implementation of a cooperative funding agreement with other
15 entities would be appropriate. Details of any such agreement could be included in the periodic updates of
16 the RRMP that PacifiCorp proposes.

17 Recreation Monitoring Program. Under this program PacifiCorp would identify monitoring
18 indicators and standards, and establish the locations and frequencies that would be used to collect various
19 types of monitoring data. PacifiCorp proposes, in general, to conduct visitor surveys every 12 years;
20 monitor recreational use effects annually; monitor dispersed site conditions and flatwater boating use
21 every 6 years; determine visitor use levels every 6 years; and determine whitewater boating use levels
22 every year.

23 The Bureau of Land Management specifies that the final RRMP include provisions for working
24 with the Bureau to define standards for monitoring. Further, the Bureau specifies the final RRMP include
25 provisions for monitoring visitor use on Bureau lands affected by the project at an interval no greater than
26 5 years and establish trigger points for adaptive management. They also specify that PacifiCorp develop
27 and provide a visitor-use report to the Bureau of Land Management and the Commission.

28 *Our Analysis*

29 Recreational needs at the project would likely change over the term of any license in response to
30 growing population, and changes in user preferences, technology, and use patterns. PacifiCorp has
31 proposed a satisfactory approach to providing data that would reveal these potential changes through the
32 term of the license. PacifiCorp's proposed monitoring scheme coincides with the Commission's Form 80
33 requirement to report on recreational use at the project every 6 years and we recognize there are cost
34 benefits to synchronizing these two efforts. The Bureau of Land Management has not provided rationale
35 explaining why the 6-year reporting frequency does not meet the agency's needs or identified a specific
36 existing or potential condition that would create the need to monitor more frequently. We do not find a
37 material difference between the two monitoring frequencies, and there would be cost efficiencies gained
38 by synchronizing PacifiCorp's monitoring effort with the Form 80 reporting schedule. Providing the
39 visitor use report to the Bureau of Land Management, as the agency specifies, could be accommodated by
40 including this provision in the final RRMP.

41 Resource Integration and Coordination and Plan Review and Update Programs. PacifiCorp
42 would convene annual meetings with other recreation providers, agencies, and other stakeholders in the
43 project area. The following entities would be invited to participate: The Bureau of Land Management,
44 Forest Service, Oregon Park & Rec, National Park Service, Klamath County, Siskiyou County, Oregon
45 Fish & Wildlife, Cal Fish & Game, whitewater outfitters, and other private groups, as needed. These
46 meetings also would be used to discuss and prioritize future project recreational improvements.
47 PacifiCorp proposes to solicit advisory input from the above-listed entities and create a 5-year action plan

1 to document recreation-related activities for the prior year and upcoming year and planned developments
2 for the following 3-year period. PacifiCorp would make this action plan available for public review after
3 it is completed.¹¹¹

4 PacifiCorp would track and document necessary changes to the plan on an annual basis and
5 amend the plan, if necessary. PacifiCorp would complete a formal review the RRMP every 6 years and
6 revise the plan every 12 years, if needed.¹¹² The Bureau of Land Management specifies that the final
7 RRMP should include provisions for annual review and modification of the plan.

8 *Our Analysis*

9 PacifiCorp proposes to provide an opportunity for stakeholder involvement in ongoing
10 recreational planning in section 4.5 of its draft RRMP which describes annual meetings of an advisory
11 committee. Considering there are multiple entities with recreation management responsibilities and
12 interests at the project, PacifiCorp proposes a reasonable approach to involve other entities to coordinate
13 planned operations and site development.

14 We are concerned that the 5-year rolling plan approach proposed by PacifiCorp in this RRMP
15 program may not provide an adequate notice and planning horizon for recreational development at the
16 project. Specifically, we note that PacifiCorp would solicit input from the advisory committee to
17 formulate plans for the ensuing 3 years and include this information with the current year's planned
18 operation. In our view, a longer¹¹³ planning period should be provided in the action plan to reveal
19 potential conflicts so that they could be avoided. This would ensure visitor use is accommodated during
20 construction and reconstruction at recreational developments. In addition, PacifiCorp indicates it would
21 seek cost sharing with other entities for development and O&M costs. Agencies go through lengthy
22 processes to secure capital improvement funding and a longer planning period would accommodate this
23 potential circumstance. Additionally, some of the planned development may require closing sites during
24 the recreational season which could displace visitors. We consider a 10-year planning horizon, with an
25 annual review as PacifiCorp proposes, to appropriately accommodate these circumstances.

26 PacifiCorp's proposed approach for periodic plan reviews and updates would enable the RRMP
27 to reflect changes in recreational use patterns, address plan deficiencies that may not have been evident
28 during final RRMP development, and accommodate any changes in agency management direction that
29 may occur during the term of a new license. We consider PacifiCorp's proposed measure to be consistent
30 with this aspect of the Bureau of Land Management's preliminary 4(e) condition.

31 Interpretation and Education Program. PacifiCorp proposes to, within 1 year of license issuance,
32 develop and implement a detailed interpretation and education plan in consultation with a working group
33 formed from the entities participating in the annual coordination meetings (see Recreation Integration and
34 Coordination Program). The draft RRMP states that PacifiCorp, as part of the Interpretation and
35 Education Program, would design, place, and provide O&M for about 25 signs or small kiosks within the
36 project area, develop visitor brochures, and provide campfire talks.

37 Interior recommends that PacifiCorp develop an interpretation and education program for the
38 project in consultation with the Bureau of Land Management. The plan would identify interpretive

¹¹¹This information is provided in section 4.5 of the draft RRMP. We assume this to mean the public would be able to receive an informational copy of the action plan; however, PacifiCorp would not provide a formal opportunity for public input to develop the action plan.

¹¹²At the 12-year review, the document would be reprinted if changes were made during the previous two 6-year review periods.

¹¹³A period longer than the 4-year period described in the program.

1 opportunities, including brochures, and signage needs at recreational sites, project facilities, and along
2 project roads. Interpretive kiosks would be considered for Topsy Road, Highway 66, and other major
3 thoroughfares. The plan would address monitoring and maintaining these facilities. It also would include
4 provisions for developing information specific to health and safety, public access, OHV use, illegal
5 dumping, and use of firearms, as well as information regarding public service announcements and early
6 warning systems to provide real-time flow information for the Boyle bypassed and Keno reaches.

7 *Our Analysis*

8 The proposed Interpretation and Education program would (1) improve public access to project
9 recreational facilities by providing directional signs; (2) promote responsible recreational use (e.g., litter
10 reduction, boating use) to minimize harmful effects on sensitive resources at the project; (3) meet the
11 existing high demand for information and education-related activities in the region; (4) repair or replace
12 deficient information-related infrastructure; and (5) update information that is currently provided.

13 Although PacifiCorp proposes measures under this program that would be undertaken within the
14 project boundary, the benefits of this program would extend to the region, as a whole. Accordingly,
15 developing this program in consultation with other agencies that provide recreational facilities and
16 programs in the region would maximize public benefit. This coordination would provide consistency
17 within the region. Developing this program in consultation with the Bureau of Land Management and
18 others, as PacifiCorp proposes, would be consistent with Interior’s recommendation.

19 *Access to Project Lands and Waters*

20 Oregon Fish & Wildlife recommends that PacifiCorp allow the public free access to project water
21 and adjacent project lands owned by the licensee, with the exception that access by motorized vehicles
22 would continue to be restricted during the critical winter period per the Pokegama cooperative road
23 closure agreement.

24 *Our Analysis*

25 PacifiCorp would be required under a standard license condition to allow reasonable public
26 access to project lands and waters for recreational purposes. This condition appears to accommodate
27 Oregon Fish & Wildlife’s objective to provide full public use of such lands and waters for outdoor
28 recreational purposes, including wildlife viewing, angling, and hunting. However, we note the
29 recommendation specifically states, “free access” which, if included in the project license could have two
30 types of implications: (1) unobstructed access; or (2) access without charge. First, access to project lands
31 should consider closures to protect sensitive resources and restrictions to prevent the public from entering
32 unsafe areas. Second, licensees are allowed to collect reasonable fees to recover O&M cost associated
33 with providing recreational facilities. Requiring PacifiCorp to allow “free access” to project lands would
34 not allow the licensee to institute closures to protect sensitive resources or recoup administrative costs, as
35 allowed by the Commission.

36 **3.3.6.2.2 River Recreation**

37 This section includes an analysis of the flow related measures that affect river-based recreational
38 activities at the project. We analyze PacifiCorp’s Whitewater Boating and River-based Fishing Program
39 included in the draft RRMP and the flow measures proposed by PacifiCorp and presented in the
40 stakeholder terms, conditions, and recommendations. Detailed descriptions of the flow measures are
41 provided in section 3.3.3.2.1, *Instream Flows*.

1 *Whitewater Boating and River-based Fishing Program*

2 The draft RRMP program outlines PacifiCorp’s proposal to make capital improvements to and
3 provide O&M for recreational facilities related to whitewater boating and angling use (these measures are
4 discussed in the *Recreational Facility Development* subsection of 3.3.6.2.1 *Recreation Resource*
5 *Management*), operate the project in a manner to provide flows suitable for whitewater boating, and
6 provide flow information.

7 PacifiCorp proposes to increase flows in the J.C. Boyle peaking reach to a minimum of 1,500
8 cfs¹¹⁴ by noon on Sundays, Mondays, Tuesdays, Thursdays, and Fridays and by 10:00 a.m. on Saturdays;
9 there would not be a set schedule for Wednesdays. PacifiCorp states that operating two units (2,525 cfs)
10 would likely occur less often and the daily flow variation would not exceed 1,400 cfs from the J.C. Boyle
11 powerhouse in a 24-hour period. Ramping would not exceed 9 inches per hour. If flows are less than
12 1,000 cfs then ramping would not exceed 4 inches per hour. PacifiCorp proposes to release minimum
13 instream flows below Iron Gate dam to comply with the NMFS BiOp (see table 3-22). Under these
14 requirements PacifiCorp would release between 1,000 to 3,025 cfs, below Iron Gate dam, depending on
15 the month of the year and water year type. PacifiCorp would also continue to provide flow information
16 through a toll-free telephone number and via the project website.

17 Oregon Parks & Rec recommends PacifiCorp develop a whitewater boating opportunity within
18 the J.C. Boyle bypassed reach, which would be coordinated with geomorphic flushing flows to allow for a
19 stable run on the rise or fall of the hydrograph. This opportunity would be developed in collaboration
20 with stakeholders within 1 year of license issuance.

21 The Bureau of Land Management specifies that PacifiCorp operate the project between May 1
22 and October 31 to provide flows between 1,500 to 3,000 cfs a maximum of once a week¹¹⁵ in the J.C.
23 Boyle peaking reach. Oregon Fish & Wildlife and Cal Fish & Game provided an alternative to the
24 Bureau’s preliminary 4(e) condition that would eliminate this 1-day per week flow event, consistent with
25 their section 10(j) recommendations. Upper Klamath Outfitter Association recommends PacifiCorp
26 continue to operate the project in a peaking mode to provide flows of at least 1,500 cfs and consult with
27 them to ensure both beneficial power production and public access to the river (timing, duration, and
28 seasonal aspects of releases). They further recommend increasing whitewater boating opportunities
29 during months with the highest demand (July, August, and September).

30 Oregon Fish & Wildlife, the Forest Service, the Hoopa Valley Tribe, and Cal Fish & Game also
31 made flow recommendations that pertain to releases from Iron Gate dam, described in section 3.3.3.2.1,
32 *Instream Flows*. There are slight variations between these recommendations but, in general, the
33 minimum instream flows would range between 1,000 and 5,400 cfs, depending on the month of the year
34 and water year type. The Forest Service includes a separate recommendation to provide at least 1,000 cfs
35 below Iron Gate dam to support boating-based angling.¹¹⁶

36 Oregon Fish & Wildlife, Oregon Parks & Rec and the Hoopa Valley Tribe recommended
37 PacifiCorp continue to provide a flow phone and other outreach mediums to offer real-time flow
38 projections and daily streamflow information. Posted information would include regularly scheduled
39 project releases, geomorphic and natural spill events, hourly flows, and projected 24-hour flow

¹¹⁴Flows would be provided unless there is a General Alert Status and would be measured at USGS gage no. 11510700, located downstream of the J.C. Boyle powerhouse.

¹¹⁵Priority days for providing this flow event would be Saturday, Sunday and Friday, in that order.

¹¹⁶Their recommendation states that when flows are not available, Iron Gate would be operated in a run-of-river mode.

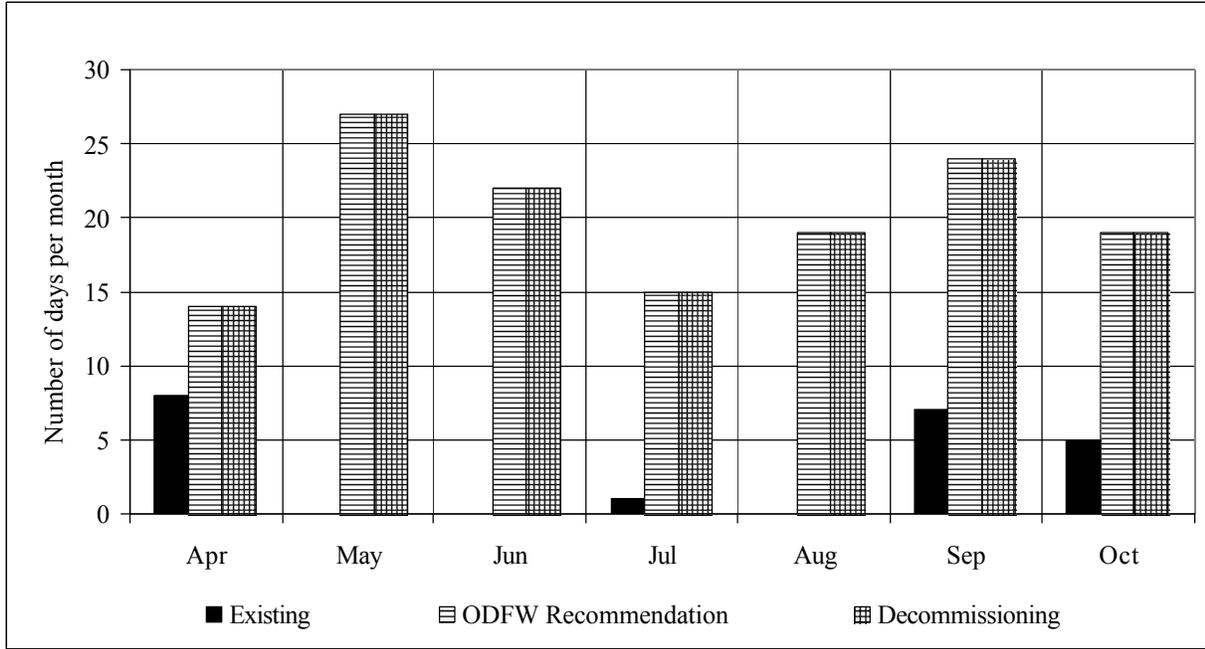
1 information. The Bureau of Land Management specifies that PacifiCorp, within 1 year of license
2 issuance, provide instantaneous 30-minute real time streamflow data in cfs via remote access that is
3 readily available and accessible to the public.

4 *Our Analysis*

5 To analyze the effects of PacifiCorp’s proposal and the recommendations of others we focused on
6 existing and potential recreational opportunities and attributes in the various reaches that could be created
7 or affected by the flow measures. We also focused our analysis on the period of April 1 through October
8 31 because most water-based recreational activities take place during these months. We analyzed the
9 various measures to evaluate how many days would be available in each of these months based on the
10 hydrologic record (see section 3.3.2, *Water Resources*) for above average, average, and below average
11 water years, which represent the majority of water years and is indicative of how alternative flow regimes
12 would influence recreational opportunities. Our analysis took into account ramping rates and we discuss
13 any reach-specific assumptions within the analysis of each reach. Although we analyze the measures
14 relative to angling opportunities, it is important to note that suitable flows reflect an angler’s ability to
15 catch fish (e.g., wading, turbidity), as opposed to the abundance of fish.

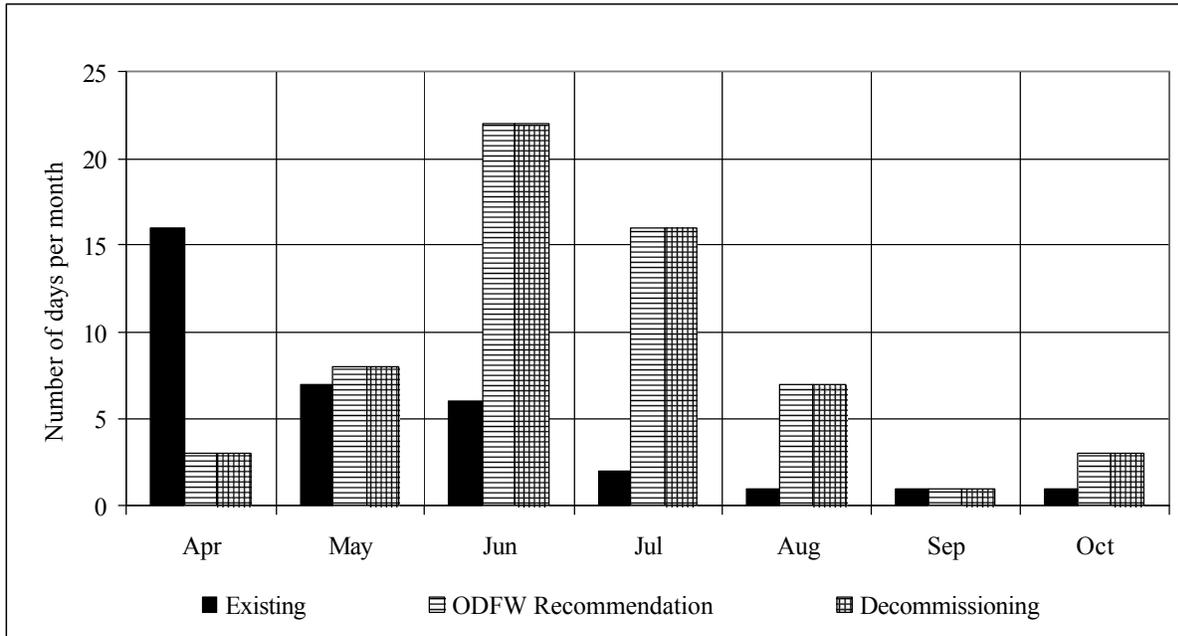
16 Flow Measures, Link River Reach. In analyzing the flow measures for this reach we considered:
17 (1) the reach receives substantial visitor use because of its proximity to Klamath Falls, (2) angling and
18 locational playboating are popular activities at the reach, and (3) during the winter and spring, the typical
19 existing flows in this reach are between 500 and 1,500 cfs. Based on these considerations we determined
20 there would be occasional whitewater playboating opportunities provided by the spill events that would
21 take place under any of the measures. For comparison, we looked at existing conditions and found
22 suitable flows for whitewater boating (between 2,000 and 3,000 cfs) would occur about 3 and 12 days in
23 April and May, respectively, during an average water year.

24 Angling is a more popular activity in the reach, so we based our analysis on the optimal range of
25 angling flows (see section 3.3.6.1.2, *Project Recreational Resources*). This analysis shows that increased
26 angling opportunities would be provided by low flows (figures 3-86, 3-87, and 3-88). All of the measures
27 would provide some angling opportunities during the period, but during above average water years most
28 of the opportunities from April through August would be eliminated with either the Oregon Fish &
29 Wildlife recommendation or decommissioning East Side and West Side developments. Currently,
30 discharge from the East Side development enters the bypassed reach about 3,700 feet downstream from
31 Link River dam. Discharge from West Side development enters the bypassed reach about 5,300 feet
32 downstream of the dam, near the end of the riverine section of Link River.



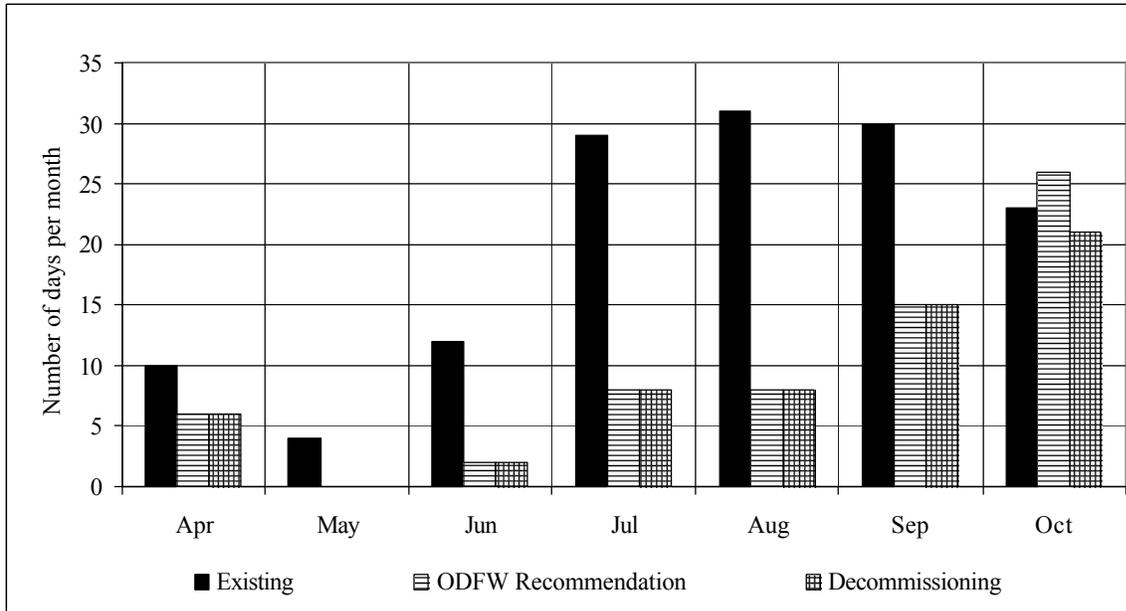
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2 Figure 3-86. Below average water year type, Link River bypassed reach optimal angling
3 (flows between 200 and 1,000 cfs). (Source: PacifiCorp, 2005f, USGS, 2005)

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6 Figure 3-87. Average water year type, Link River bypassed reach optimal angling (flows
7 between 200 and 1,000 cfs). (Source: PacifiCorp, 2005f, USGS, 2005)

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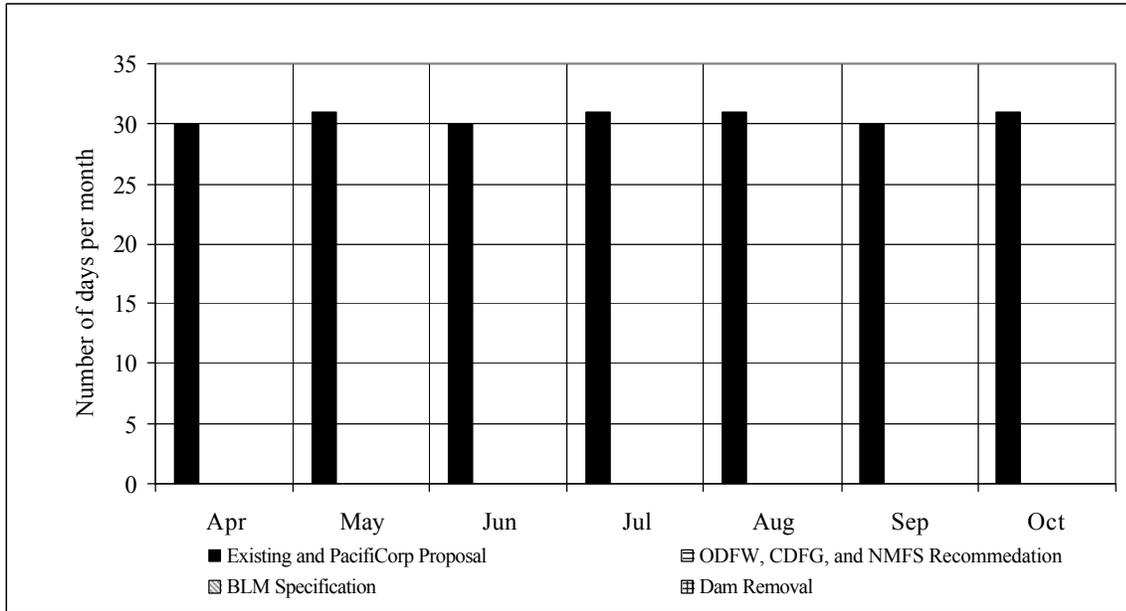
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2 Figure 3-88. Above average water year type, Link River bypassed reach optimal angling
3 (flows between 200 and 1,000 cfs). (Source: PacifiCorp, 2005f, USGS, 2005)

4 Flow Measures, Keno Reach. The agencies flow recommendations would result in run-of-river
5 operation, which would be equivalent to existing conditions. Consequently, the agency recommendations
6 and decommissioning would not cause an appreciable change in the angling and boating opportunities in
7 this reach.

8 Flow Measures, J.C. Boyle Bypassed Reach. In analyzing the flow measures for this reach we
9 considered: (1) this reach is one of the two most important reaches in the project for angling, (2) this
10 reach is suited for private whitewater boating because of the length of the run and access,¹¹⁷ and (3) spill
11 events rarely occur, especially from Memorial Day to Labor Day (see table 3-18). Based on these
12 considerations, we analyzed the effects of flow-related measures relative to the optimum and acceptable
13 ranges of flows for angling and acceptable range of flows for technical kayaking. PacifiCorp currently
14 releases a minimum flow of 100 cfs to the bypassed reach and proposes to release an additional 100 cfs
15 from either the dam or the powerhouse. Our analysis makes the assumption that PacifiCorp would release
16 this additional 100 cfs at the J.C. Boyle dam. Figures 3-89, 3-90, and 3-91 show that that almost all
17 angling opportunities in the optimal range of flows would be eliminated under the Oregon Fish &
18 Wildlife and Bureau of Land Management flow measures and dam removal, but PacifiCorp's proposal
19 would retain opportunities during every month of every water year type. However, it should be noted that
20 the total number of days available within the acceptable range for angling (figures 3-92, 3-93, and 3-94)
21 would be about the same for all of the measures and dam removal. This comparison reflects the
22 sensitivity of the analysis to the selected range of flows. We consider it most appropriate to consider the
23 data set for the acceptable, rather than optimal, range of angling flows recognizing that anglers would still
24 probably attempt to fish even if optimum flow conditions did not exist because of the quality of the
25 fishery. Regarding kayaking opportunities, in average and above average water years (figures 3-95, 3-96,
26 and 3-97), PacifiCorp's and the Bureau of Land Management's measures would provide only occasional
27 opportunities during April, May, and June and essentially no opportunities in July through October.
28 However, there would be frequent opportunities for kayaking in July through October under the Oregon
29 Fish & Wildlife measure and dam removal in all three water year types.

¹¹⁷We assume most private boating use would be in the form of kayaking as opposed to rafting.

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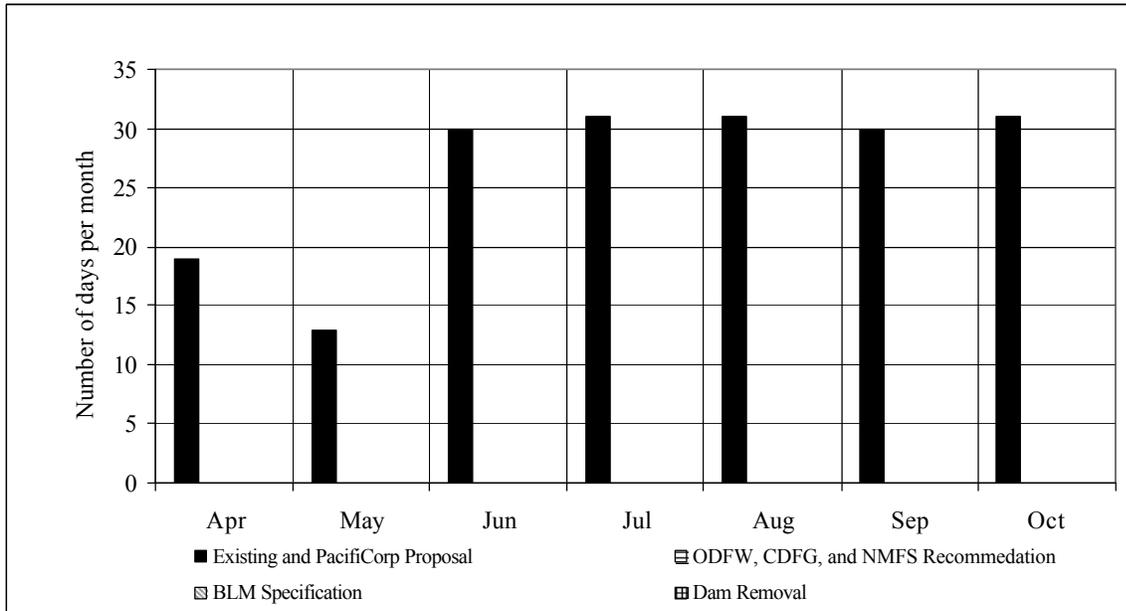
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Figure 3-89. Below average water year type, J.C. Boyle bypassed reach optimal range of flows for angling (flows between 300 and 400 cfs). (Source: PacifiCorp, 2005f; USGS, 2005)

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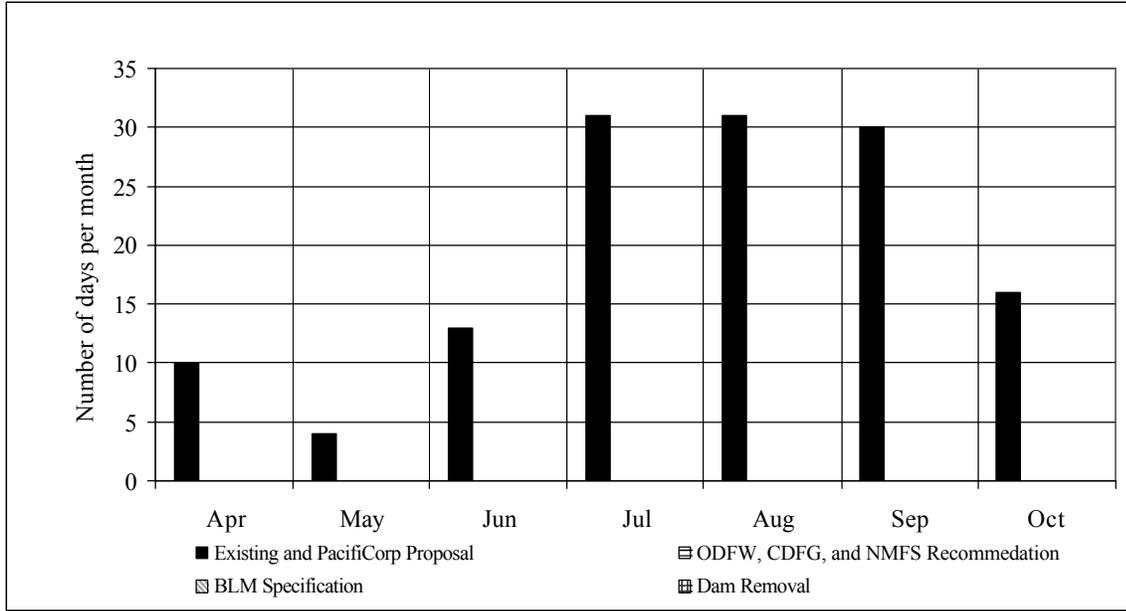
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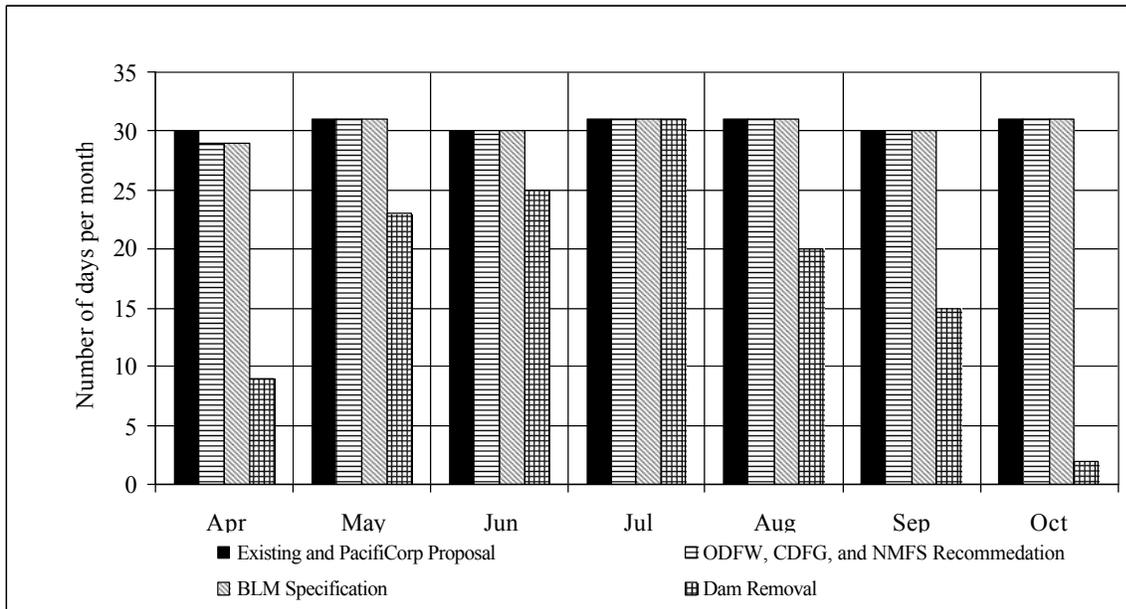
Figure 3-90. Average water year type, J.C. Boyle bypassed reach, optimal range of flows for angling (flows between 300 and 400 cfs). (Source: PacifiCorp, 2005f; USGS, 2005)

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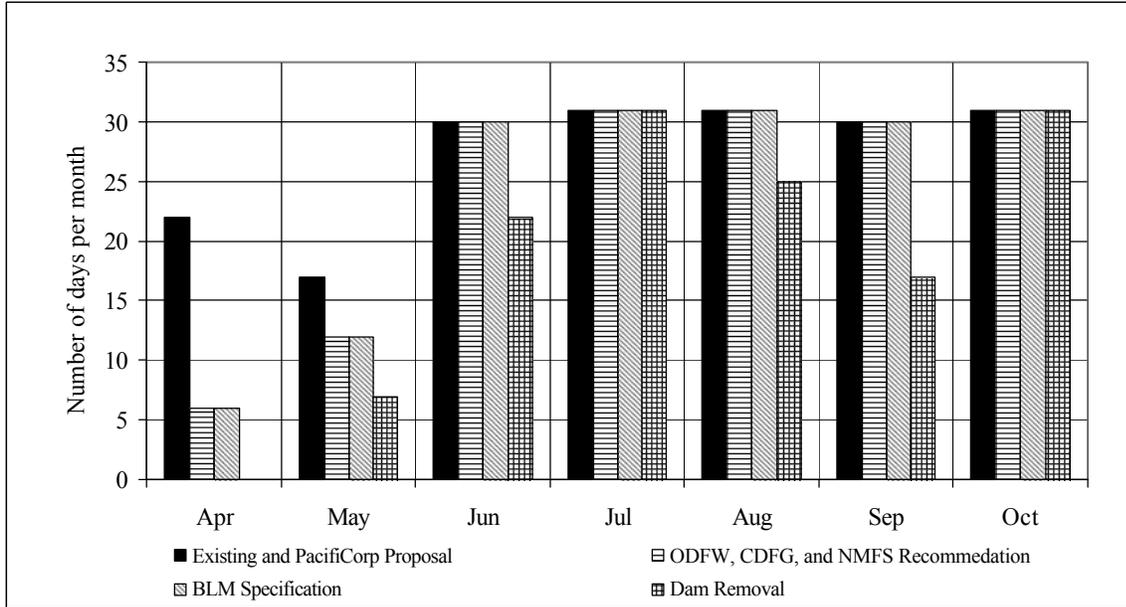


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 2 Figure 3-91. Above average water year type, J.C. Boyle bypassed reach optimal range of
 3 flows for angling (flows between 300 and 400 cfs). (Source: PacifiCorp, 2005f;
 4 USGS, 2005)

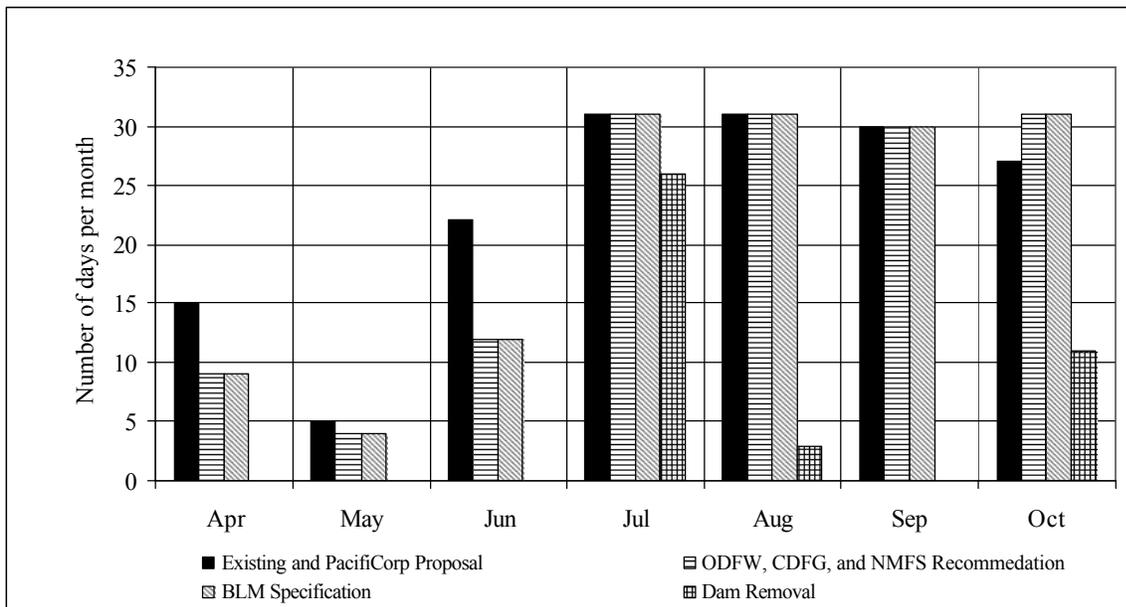


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 6 Figure 3-92. Below average water year type, J.C. Boyle bypassed reach acceptable range of
 7 flows for angling (flows between 200 and 1,000 cfs). (Source: PacifiCorp, 2005f;
 8 USGS, 2005)

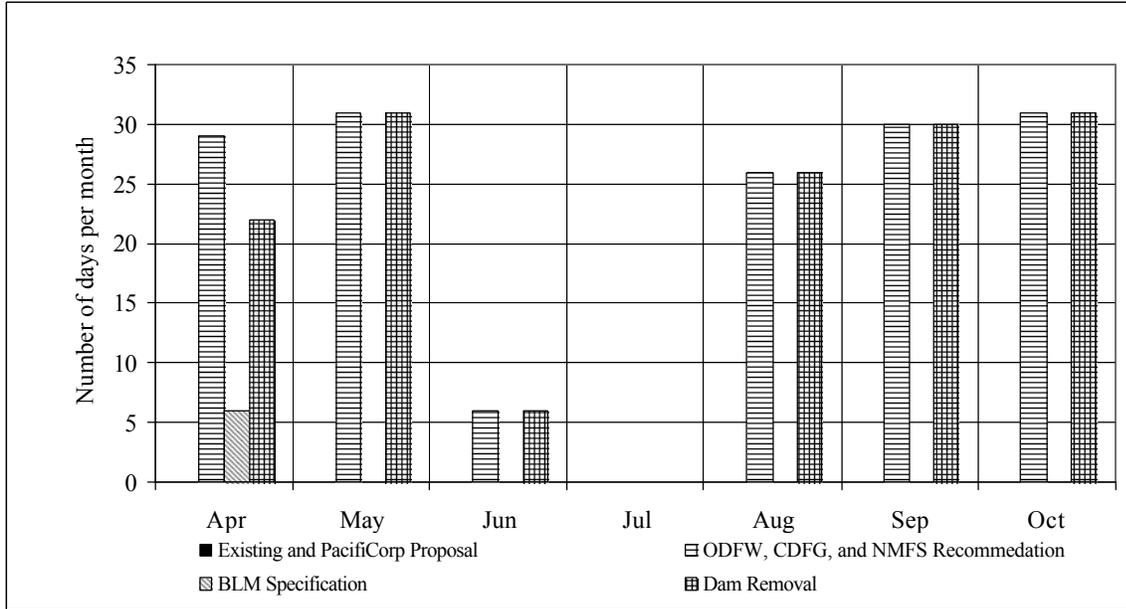
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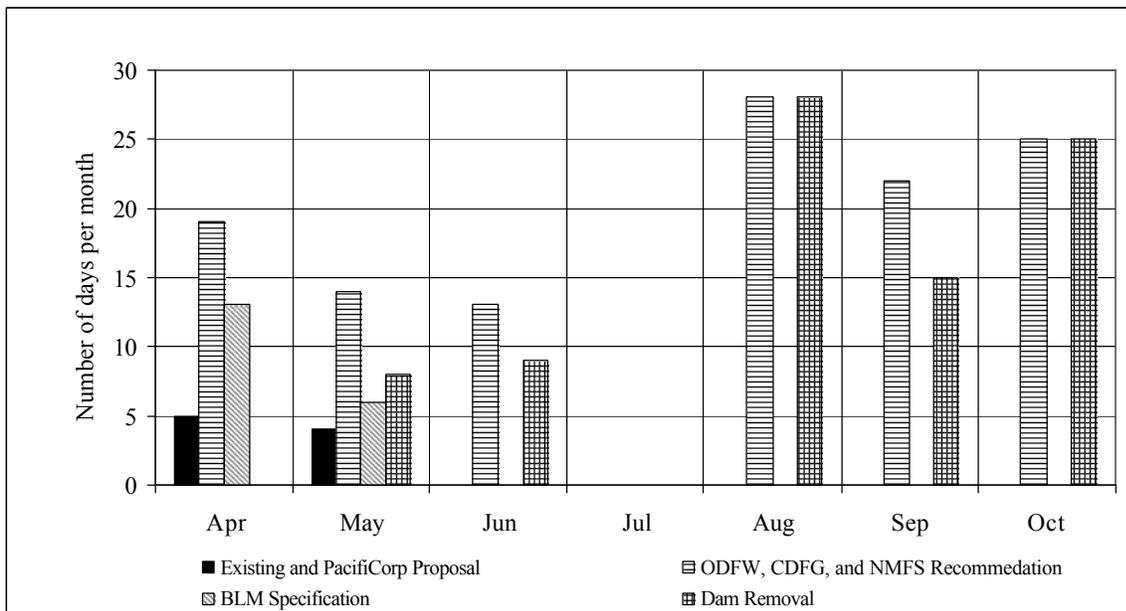
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Figure 3-93. Average water year type, J.C. Boyle bypassed reach acceptable range of flows for angling (flows between 200 and 1,000 cfs). (Source: PacifiCorp, 2005f, USGS, 2005)



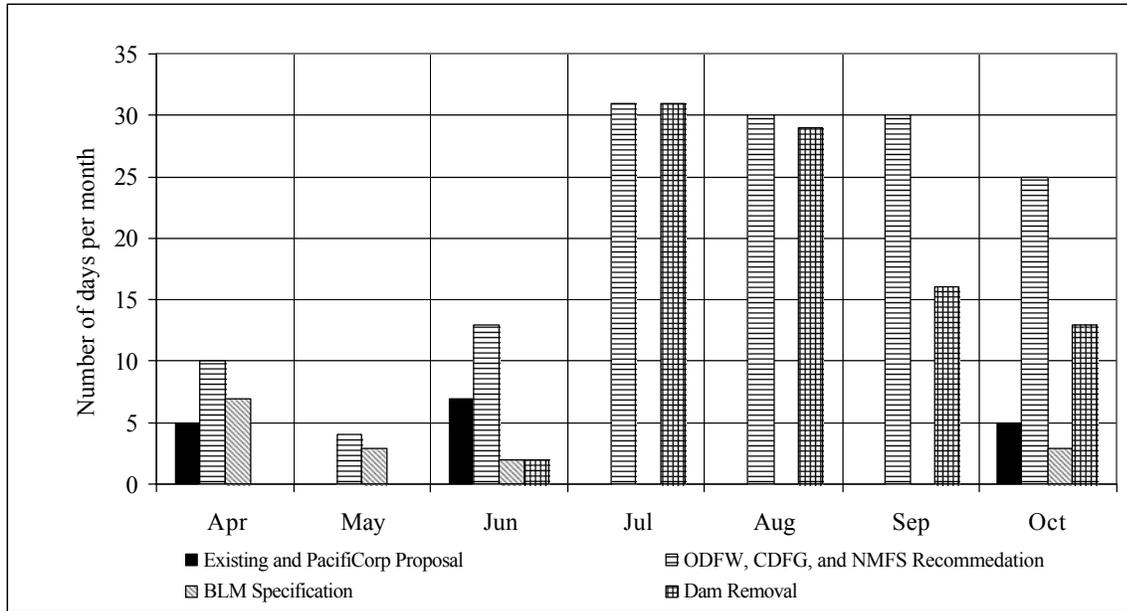
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Figure 3-94. Above average water year type, J.C. Boyle bypassed reach acceptable range of flows for angling (flows between 200 and 1,000 cfs). (Source: PacifiCorp, 2005f, USGS, 2005)



1
 2 Figure 3-95. Below average water year type, J.C. Boyle bypassed reach acceptable range of
 3 flows for technical kayaking (flows between 800 and 1,300 cfs). (Source:
 4 PacifiCorp, 2005f; USGS, 2005)



5
 6 Figure 3-96. Average water year type, J.C. Boyle bypassed reach acceptable range of
 7 flows for technical kayaking (flows between 800 and 1,300 cfs). (Source: PacifiCorp,
 8 2005f; USGS, 2005)
 9



1
2 Figure 3-97. Above average water year type, J.C. Boyle bypassed reach acceptable range of
3 flows for technical kayaking (flows between 800 and 1,300 cfs). (Source:
4 PacifiCorp, 2005f; USGS, 2005)

5 Flow Measures, J.C. Boyle Peaking Reach. In analyzing the flow measures for this reach we
6 considered these factors: (1) this reach is designated a wild and scenic river with ORVs of quality
7 whitewater boating and quality rainbow trout fishery; (2) this reach is best suited for commercial
8 whitewater boating use because of its technical difficulty and complex access; (3) there is a critical
9 transition point at about 1,500 cfs below which whitewater rafting experiences are notably less desirable
10 and present safety concerns; (4) 5,250 of the estimated 12,647 annual recreation days in this reach are
11 attributed to the commercial boating use; (5) only incidental private boating occurs in the reach; and (6)
12 although kayaking is feasible in this reach, providing kayaking opportunities at this reach is a low priority
13 based on documented use levels that show relatively infrequent private boating use (likely caused by the
14 lengthy shuttle and technical difficulty of the estimated 52 almost continuous rapids). Based on these
15 considerations, we analyze the effects relative to the optimum range of flows (1,500 to 2,000 cfs) to
16 provide standard commercial rafting opportunities. Our analysis assumes a 5-hour launch window would
17 provide sufficient time for boaters to complete the run before the flow ramps down. This range of flows
18 and launch window reflects the importance of boater safety and ORVs for this reach. The lower end of
19 the flow range is also consistent with the Bureau of Land Management’s flow measure. To analyze
20 angling opportunities, we evaluated the measures relative to both the acceptable and optimum ranges of
21 flows for this activity.

22 The Bureau of Land Management and Upper Klamath Outfitter Association each provided their
23 analysis of the number of boatable days for the Bureau measure. The Bureau analyzes the data based on 3
24 years of data representing dry, average, and wet years. Upper Klamath Outfitter Guides Association
25 disagrees with the Bureau’s analysis because it states that the agency based its analysis on actual use¹¹⁸

¹¹⁸Commercial outfitters schedule trips when they have a sufficient number of clients to fill at least a couple of rafts, so there may have been days during their selected water years when raftable flows were provided, yet no commercial trips were taken. The Bureau of Land Management appears to have used the actual number of commercial use days that occurred during those years to complete their analysis as opposed to the number of days that were potentially available for commercial rafting.

1 rather than available use (calendar days) which underestimates the existing the number of days available.
2 It also points out that the Bureau's analysis does not disclose that the majority of boatable days that would
3 occur under its measure would occur outside of July and August, the 2 months when the majority (66
4 percent) of the historical commercial use occurs. Upper Klamath Outfitter Association estimates that the
5 8 to 18 boatable days provided under the Bureau's measure during July and August would represent a 70
6 to 80 percent decrease in the number of boatable days from current conditions during these months.

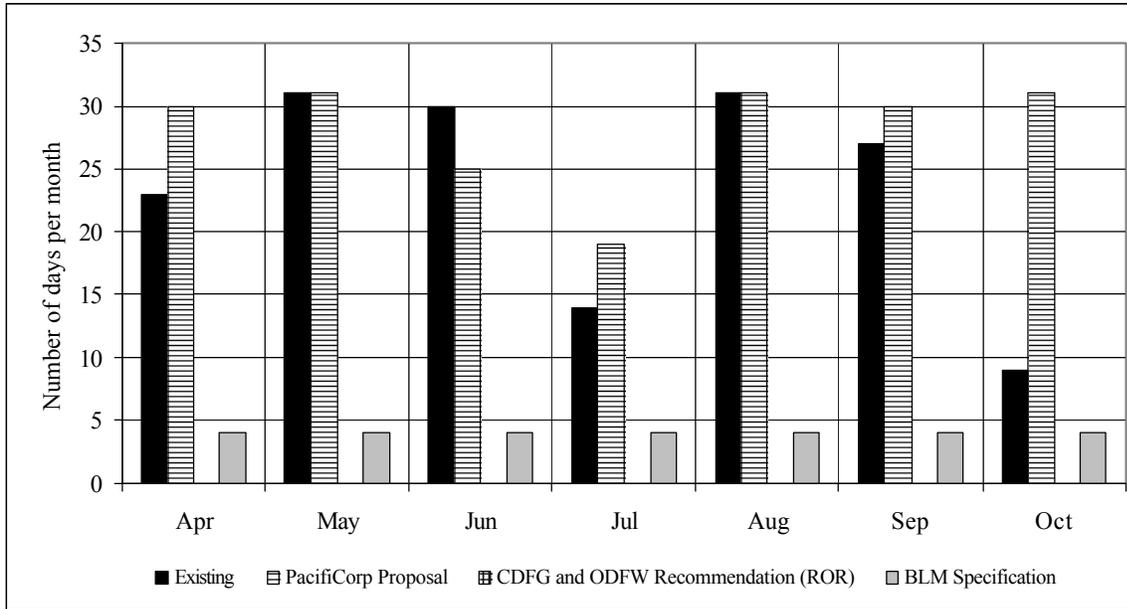
7 During above average, average, and below average water years, our analysis indicates standard
8 whitewater boating opportunities would be largely eliminated between April and October under the Cal
9 Fish & Game and Oregon Fish & Wildlife measures and dam removal scenarios that would each result in
10 run-of-river operation (figures 3-98, 3-99, and 3-100). The Bureau's measure would continue to provide
11 1 day per week of whitewater boating opportunity between May and October. However, this would be
12 substantially lower than PacifiCorp's proposed operation and the Upper Klamath River Outfitter
13 Association's recommendation, which is similar to existing conditions. We note that PacifiCorp's
14 proposed operation would provide slightly more boatable days in below average and average water years
15 than currently exist, because of its proposal to normally limit peaking operations to one unit. Under
16 existing conditions, PacifiCorp occasionally operates two units, resulting in flows in excess of the 1,500
17 to 2,000 cfs range. However, in above average water years where there would typically be less than 5
18 available days per month under existing conditions (because flows frequently exceed 2,000 cfs),
19 PacifiCorp's measure would create optimal flows for commercial whitewater rafting almost every day
20 from July through October (figure 3-100).

21 Our analysis offers compelling evidence that continued peaking operations as proposed by
22 PacifiCorp would provide enhanced whitewater boating opportunities at the peaking reach. The proposed
23 operational mode would support the ORV of whitewater boating for this Congressionally designated Wild
24 and Scenic River. PacifiCorp's proposed operational mode would provide more boating opportunities
25 compared to all other specified and recommended measures. In general, it would provide between 20 and
26 30 days per month from June through October in below and average water years and from July through
27 October during above average water years. The Bureau of Land Management measure would provide
28 about 4 days a month between June and October which would represent only about 13 to 20 percent of the
29 days that would be provided by PacifiCorp's proposed flow measure. Under the Oregon Fish & Wildlife
30 and Cal Fish & Game measures, dam removal scenario, or Bureau of Land Management preliminary 4(e)
31 condition, the opportunity for whitewater boating, an ORV for this Wild and Scenic River, would be
32 severely diminished.

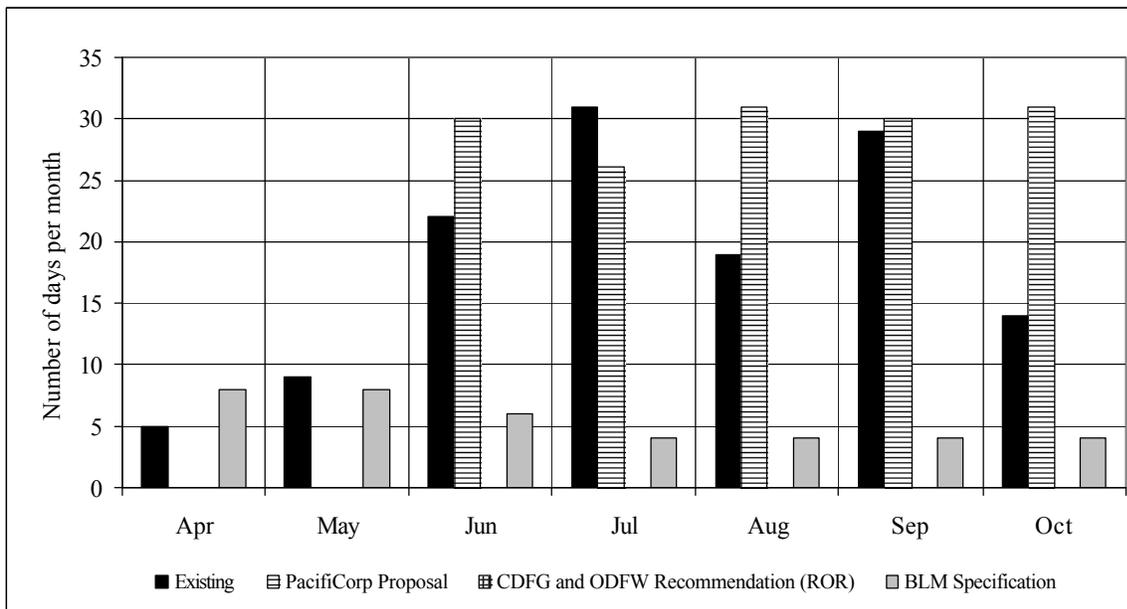
33 Angling is another ORV of this designated Wild and Scenic River and we analyzed the number of
34 days that would be available under the various measures. Our analysis assumed angling opportunities
35 would be provided even on days when peaking flows occur because there would likely be at least several
36 hours with low flows in both the morning and evening hours, which are the preferred times of day to fish,
37 at both the upper and lower ends of the reach where there is the most angling access. Our analysis shows
38 that all of the measures would provide almost daily angling opportunities within an acceptable range of
39 flows between June and October except that the Cal Fish & Game and Oregon Fish & Wildlife alternative
40 measures would eliminate opportunities during the month of June in above average water years (figures
41 3-101 through 3-106). Within the optimum range of angling flows, there would be almost daily optimum
42 flows provided from July through August and most of September under PacifiCorp's and Upper Klamath
43 Outfitter Guides measures. However, there would be no flows within the optimum angling range under
44 the Oregon Fish & Wildlife or Cal Fish & Game measures between April and October.

45 Recognizing that both angling and whitewater boating use contribute to this river's designation as
46 an ORV, we consider the combined effects on both of these attributes. There would be comparable
47 angling opportunities provided under existing conditions, PacifiCorp's proposed operation, and Cal Fish
48 & Game and Oregon Fish & Wildlife's flow measures. In stark contrast, as described above, the
49 alternatives have drastically different effects on whitewater boating, ranging from providing optimal

1 boating opportunities throughout much of the recreational season to opportunities being largely
 2 eliminated. Consequently, PacifiCorp's proposed operation or Upper Klamath Outfitter Association's
 3 flow measures would continue to provide whitewater boating opportunities while providing angling
 4 opportunities that would not be materially different from what the other alternatives would provide.

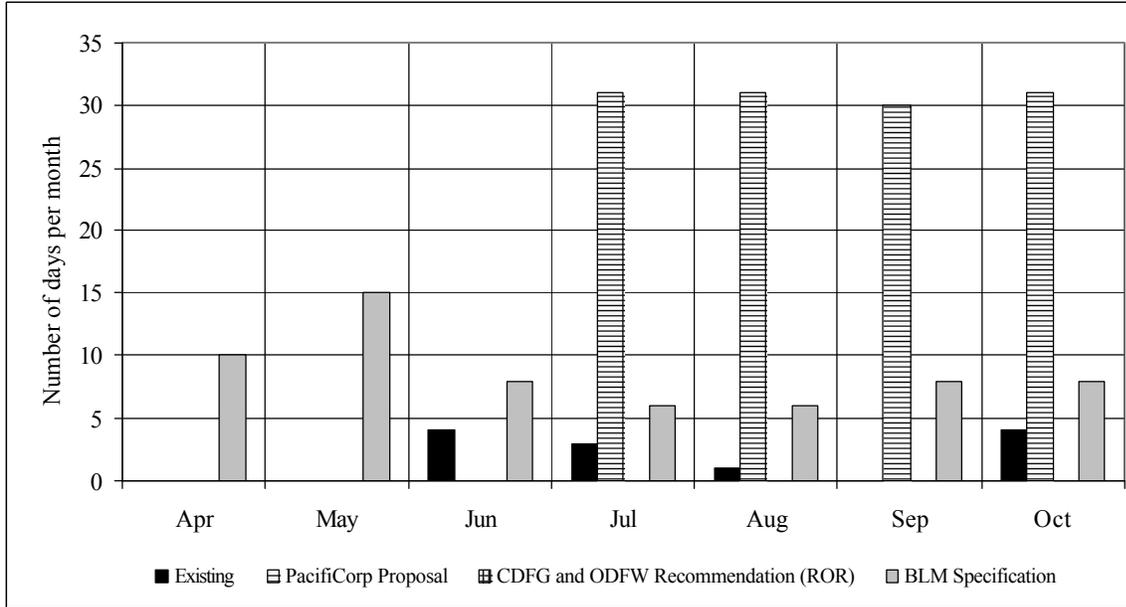


5
 6 Figure 3-98. Below average water year type, J.C. Boyle peaking reach optimal flows for
 7 commercial rafting (flows between 1,500 and 2,000 cfs). (Source: PacifiCorp,
 8 2005f; USGS, 2005)

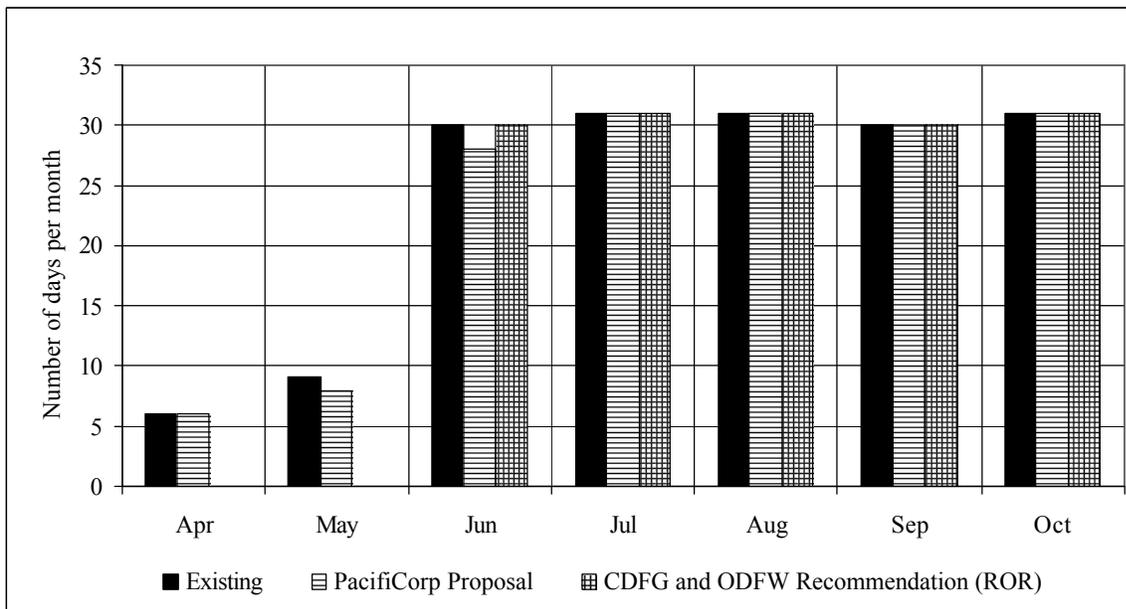


9
 10 Figure 3-99. Average water year type, J.C. Boyle peaking reach, optimal range of flows for
 11 commercial rafting (flows between 1,500 and 2,000 cfs). (Source: PacifiCorp,
 12 2005f; USGS, 2005)

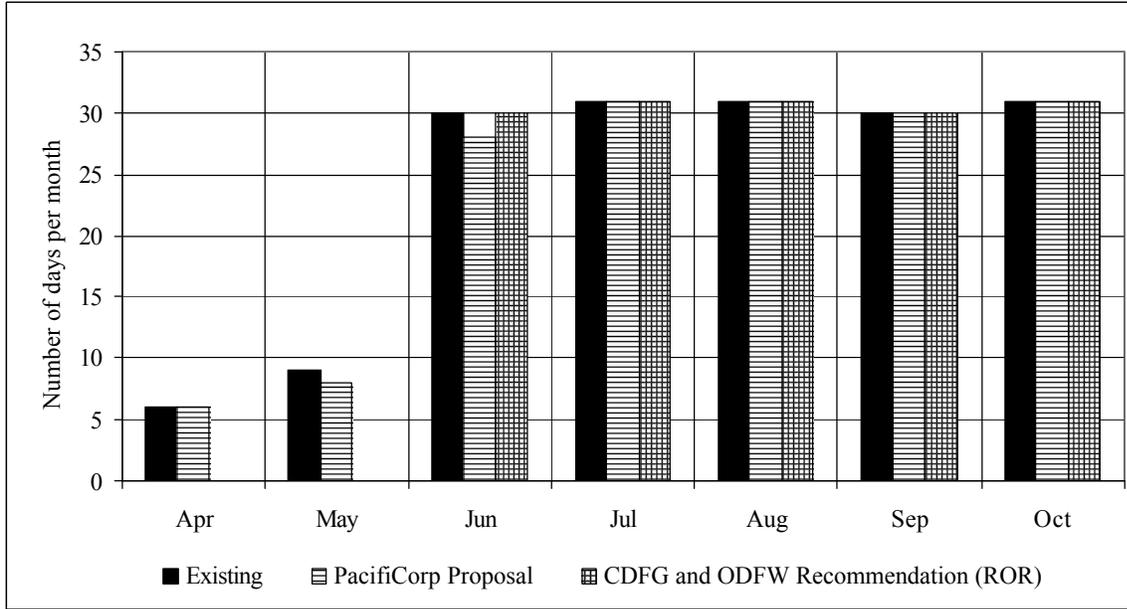
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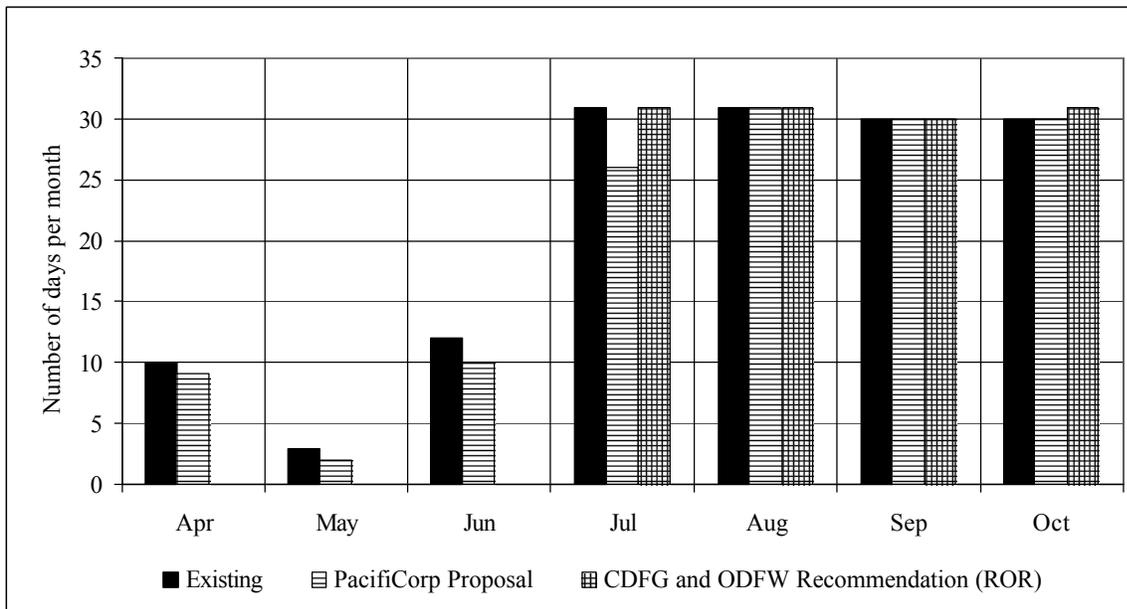
1
2 Figure 3-100. Above average water year type, J.C. Boyle peaking reach optimal range of
3 flows for commercial rafting (flows between 1,500 and 2,000 cfs). (Source:
4 PacifiCorp, 2005f, USGS, 2005)



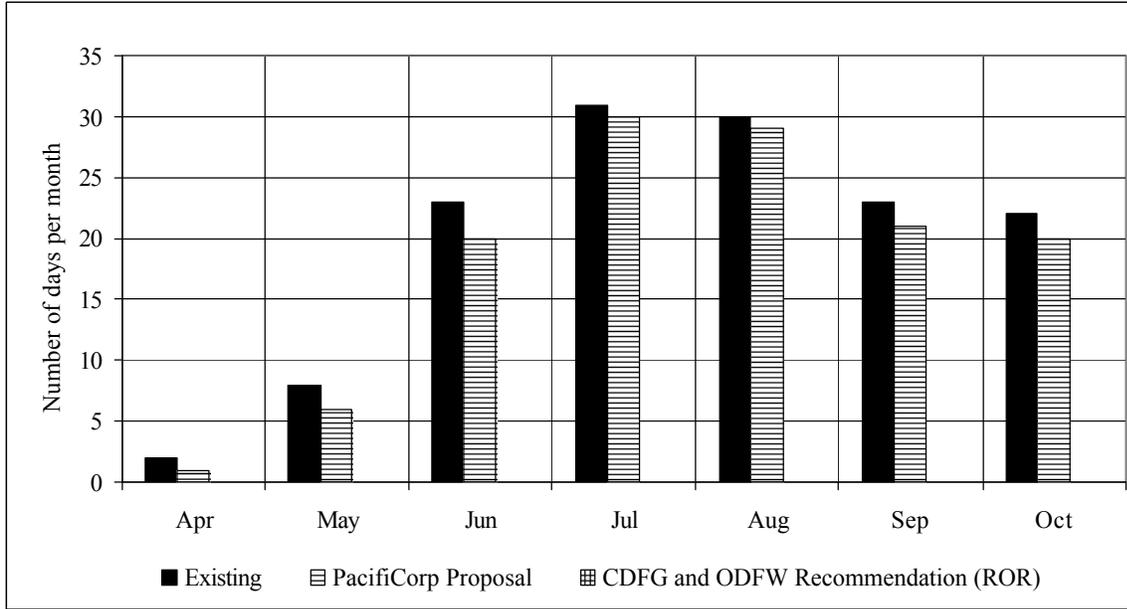
5
6 Figure 3-101. Below average water year type, J.C. Boyle peaking reach acceptable range of
7 flows for angling (flows between 200 and 1,500 cfs). (Source: PacifiCorp,
8 2005f; USGS, 2005)



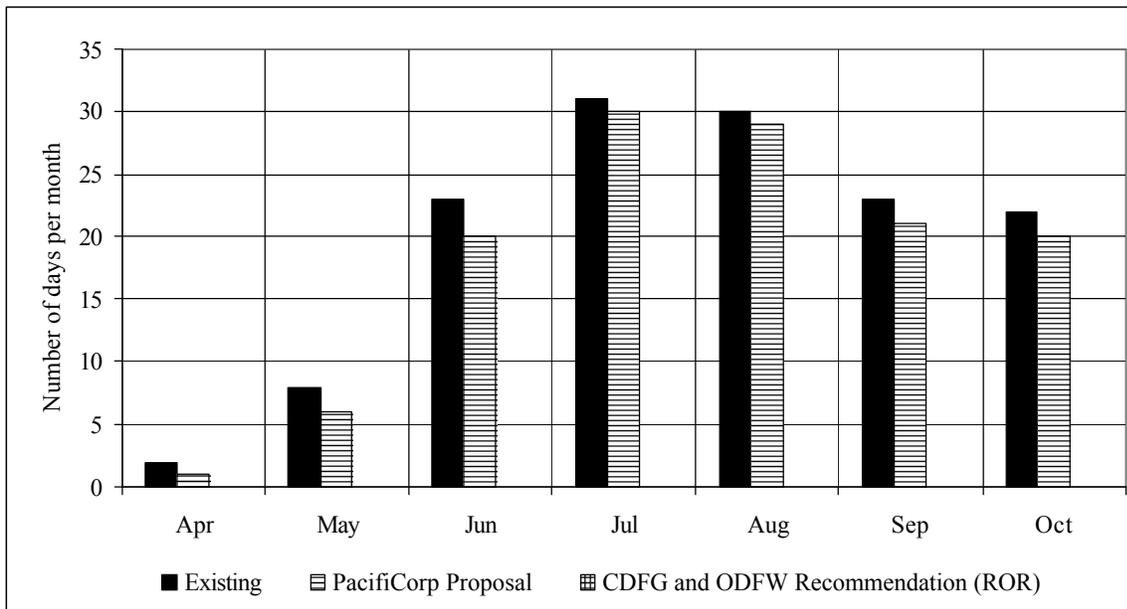
1
2 Figure 3-102. Average water year type, J.C. Boyle peaking reach acceptable range of flows for
3 angling (flows between 200 and 1,500 cfs). (Source: PacifiCorp, 2005f; USGS,
4 2005)



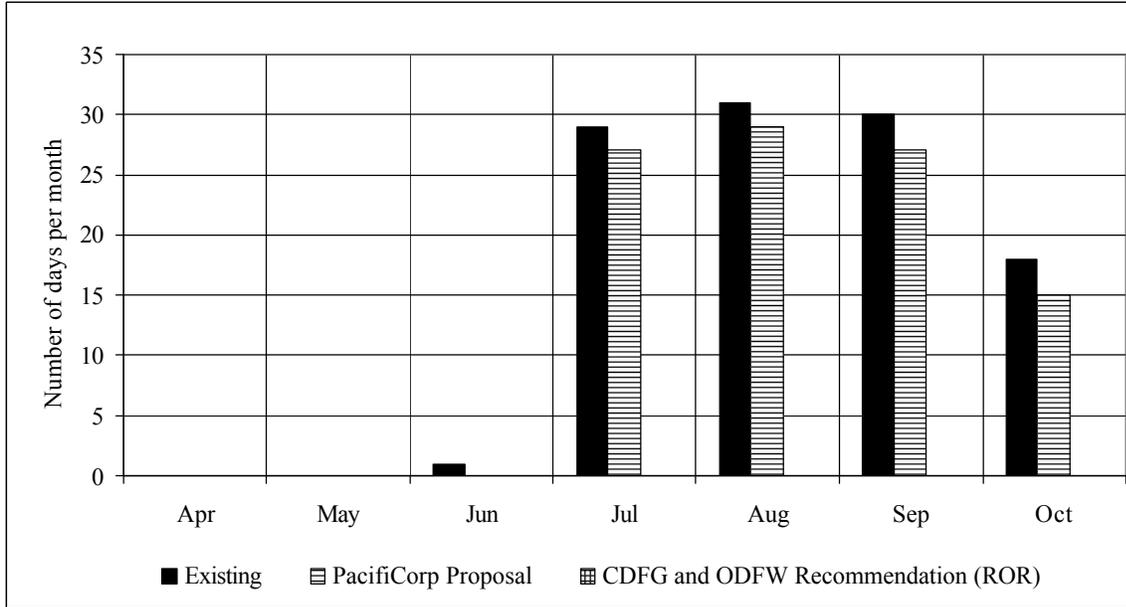
5
6 Figure 3-103. Above average water year type, J.C. Boyle peaking reach acceptable range of
7 flows for angling (flows between 200 and 1,500 cfs). (Source: PacifiCorp,
8 2005f; USGS, 2005)



1
2 Figure 3-104. Below average water year type, J.C. Boyle peaking reach optimal range of flows
3 for angling (flows between 300 and 500 cfs). (Source: PacifiCorp, 2005f;
4 USGS, 2005)



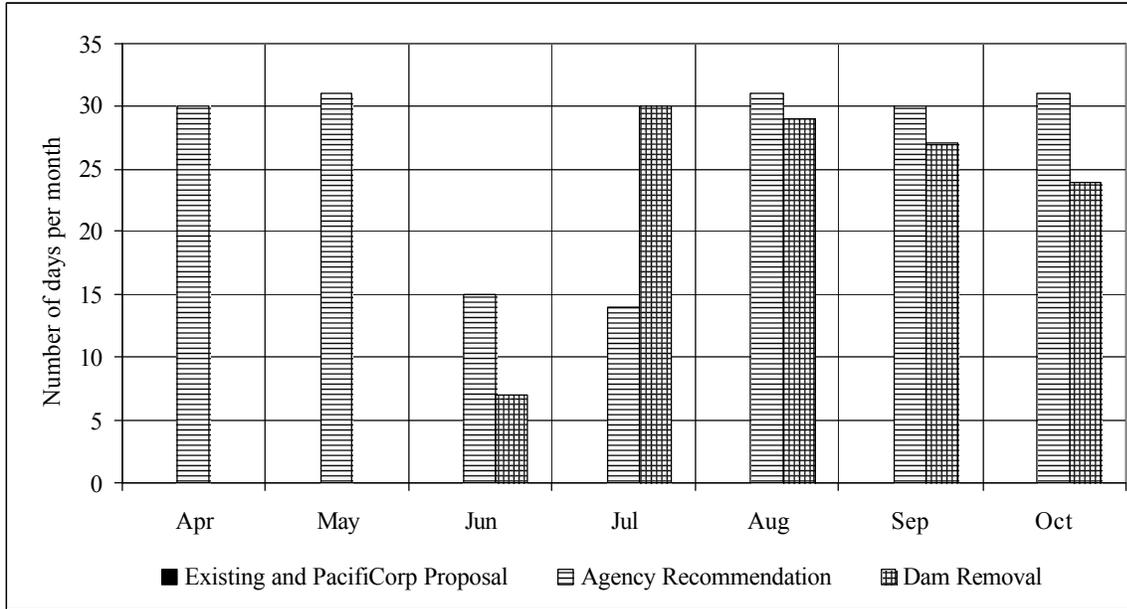
5
6 Figure 3-105. Average water year type, J.C. Boyle peaking reach optimal range of flows for
7 angling (flows between 300 and 500 cfs). (Source: PacifiCorp, 2005f; USGS,
8 2005)



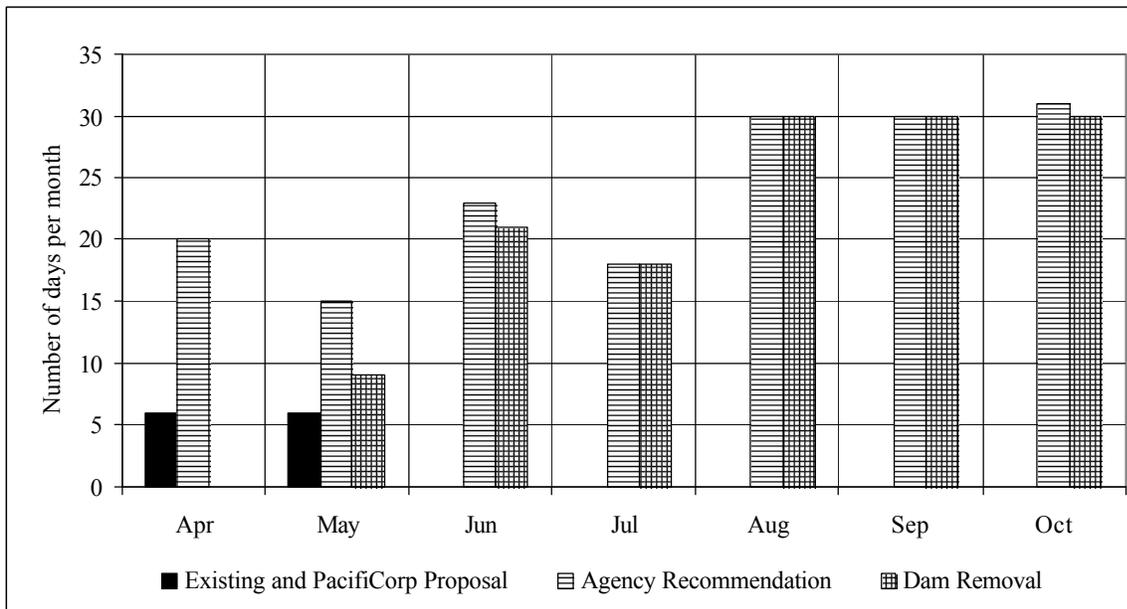
1
2 Figure 3-106. Above average water year type, J.C. Boyle peaking reach optimal range of
3 flows for angling (flows between 300 and 500 cfs). (Source: PacifiCorp,
4 2005f; USGS, 2005)

5 Flow Measures, Copco No. 2 Bypassed Reach. In analyzing the flow measures for this reach we
6 considered: (1) this reach is suited for private whitewater boating because of the length of the run and
7 access,¹¹⁹ and (2) the lack of publicly accessible roads and trails likely limit the amount of recreational
8 use in this reach. Based on these considerations we analyzed the effects of the measures relative to the
9 acceptable range for standard whitewater boating and angling. The agency recommendation and dam
10 removal scenario would enhance whitewater boating opportunities in this reach by providing about 15 to
11 30 days a month with boatable flows from June through October (figures 3-107, 3-108, and 3-109). In
12 comparison, PacifiCorp's proposed operation would provide less than 10 days per month and these would
13 occur primarily in April and May and only in average and above average water years. Very few days
14 with angling opportunities within an acceptable range of flows would be occur under any of the agency-
15 recommended flow-related measures or the dam removal scenario (figures 3-110, 3-111, and 3-112).

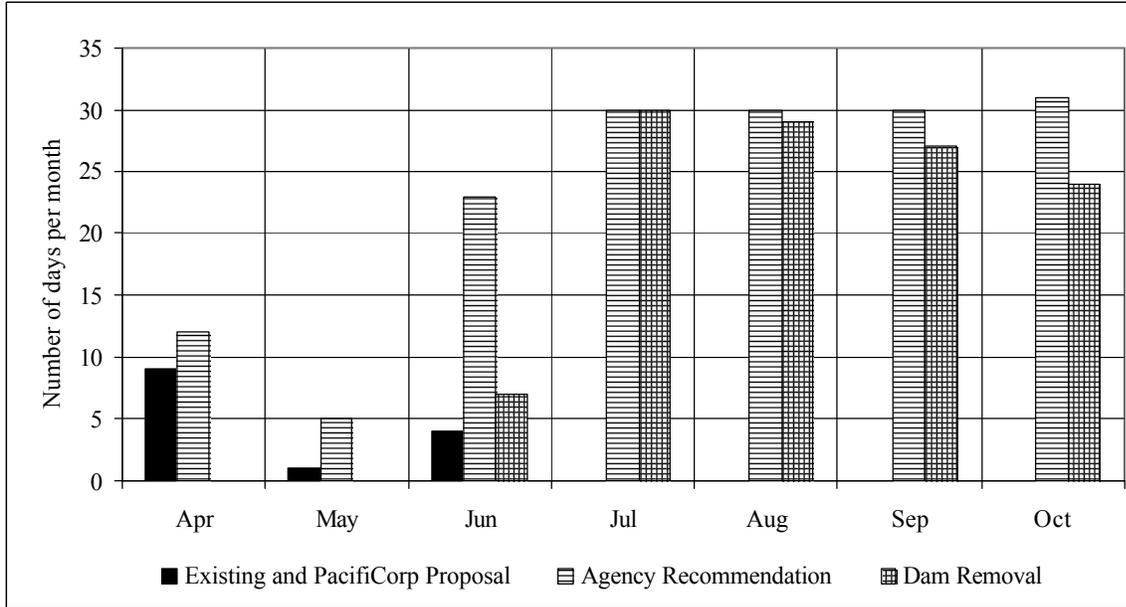
¹¹⁹We assume most private boating use would be from kayaking as opposed to rafting.



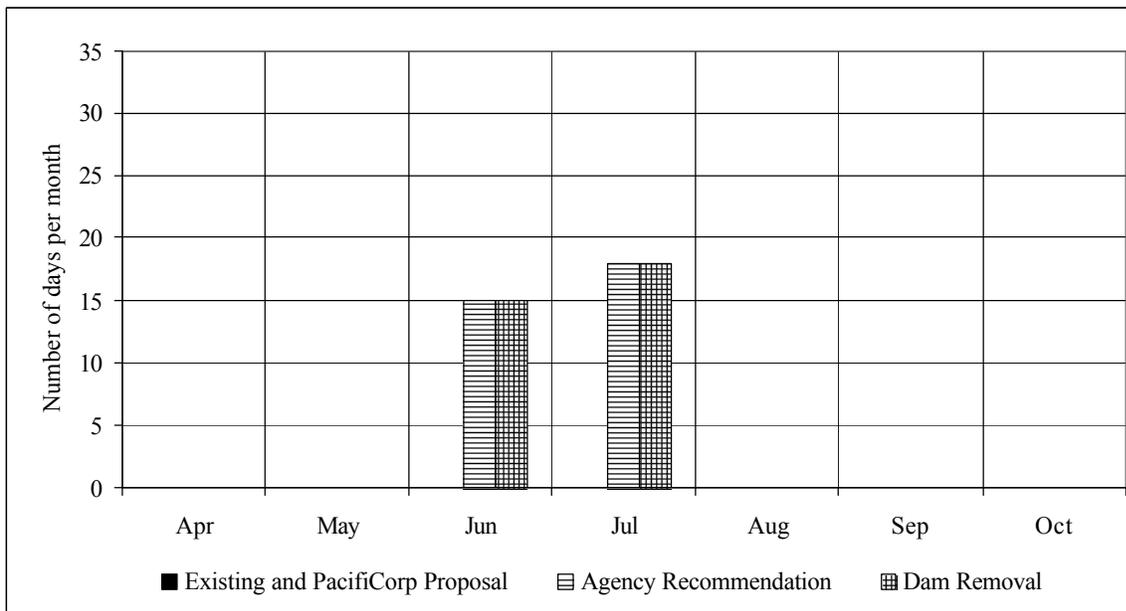
1
 2 Figure 3-107. Below average water year type, Copco No. 2 bypassed reach acceptable range
 3 of flows for standard whitewater boating (flows between 600 and 1,500 cfs).
 4 (Source: PacifiCorp, 2005f; USGS, 2005)



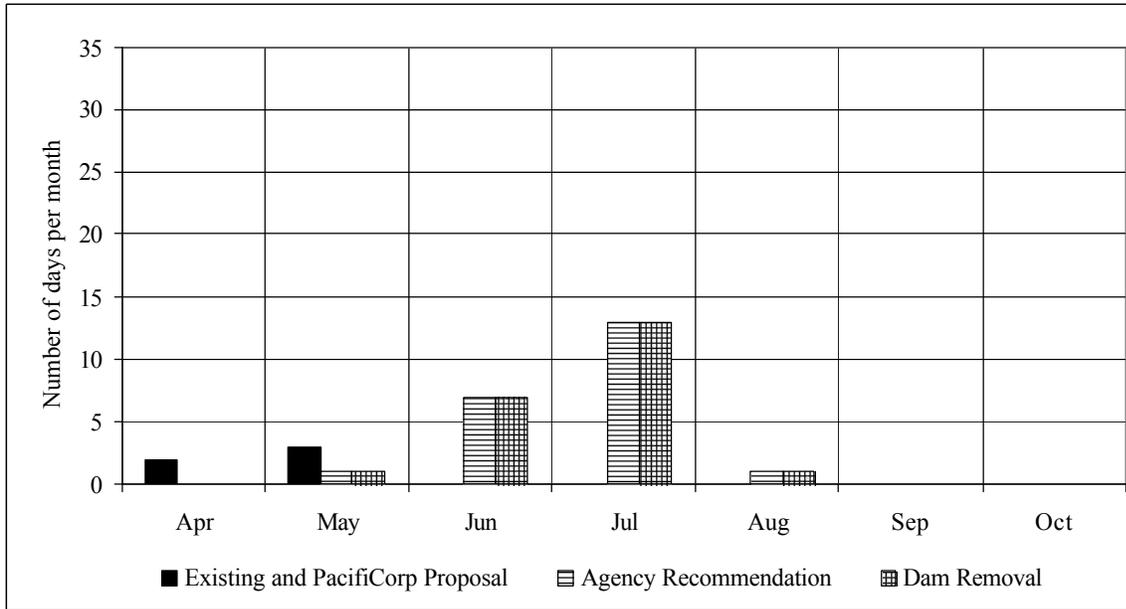
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 6 Figure 3-108. Average water year type, Copco No. 2 bypassed reach acceptable range of flows
 7 for standard whitewater boating (flows between 600 and 1,500 cfs). (Source:
 8 PacifiCorp, 2005f; USGS, 2005)
 9



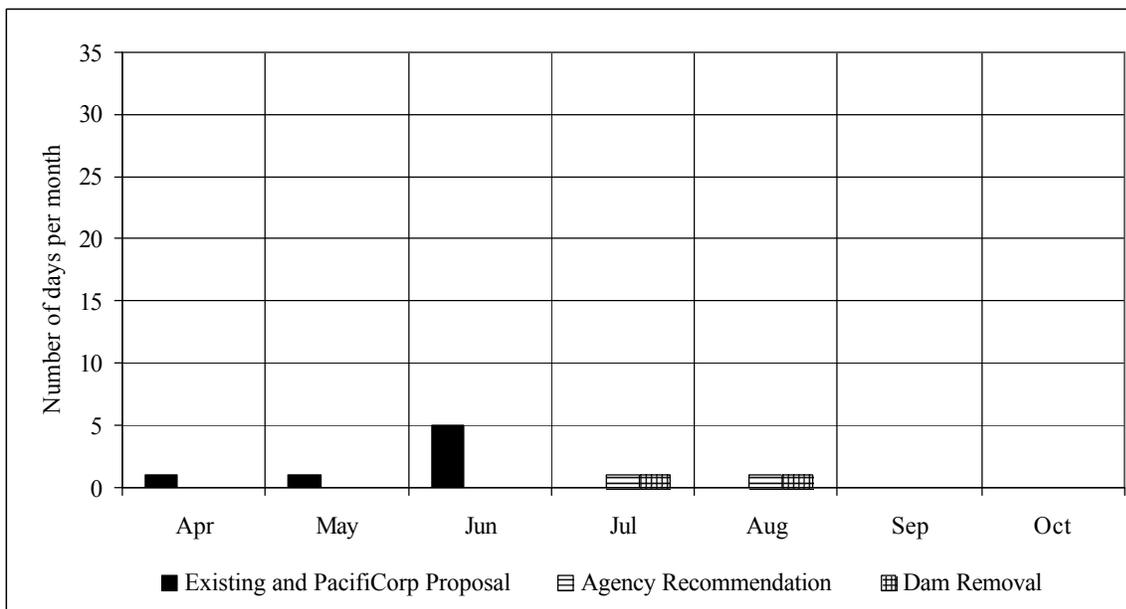
1
 2 Figure 3-109. Above average water year type, Copco No. 2 bypassed reach acceptable range
 3 of flows for standard whitewater boating (flows between 600 and 1,500 cfs).
 4 (Source: PacifiCorp, 2005f; USGS, 2005)



5
 6 Figure 3-110. Below average water year type, Copco No. 2 bypassed reach acceptable range
 7 of flows for angling (flows between 50 and 600 cfs). (Source: PacifiCorp,
 8 2005f; USGS, 2005)



1
2 Figure 3-111. Average water year type, Copco No. 2 bypassed reach acceptable range of flows
3 for angling (flows between 50 and 600 cfs). (Source: PacifiCorp, 2005f;
4 USGS, 2005)



5
6 Figure 3-112. Above average water year type, Copco No. 2 bypassed reach acceptable range
7 of flows for angling (flows between 50 and 600 cfs). (Source: PacifiCorp,
8 2005f; USGS, 2005)

9 Flow Measures, Below Iron Gate dam. Based on PacifiCorp's studies, standard whitewater
10 boating opportunities would be provided at flows generally over 1,500 cfs, boat-based angling
11 opportunities would be reduced at flows less than 1,000 cfs, and flows less than 800 cfs substantially
12 reduce both angling and whitewater boating opportunities. Base flow requirements are set by the NMFS
13 BiOp which are all above 1,000 cfs. This flow scenario would continue to provide boat-based angling
14 and whitewater boating opportunities during May and June but the 1,000 cfs that would exist from July

1 through October would reduce navigability and provide only technical whitewater boating opportunities.
2 However, we do not consider this reduction in boating opportunities to be a project effect, because the
3 flow regime downstream of Iron Gate dam is the result of the 2002 NMFS BiOp and pertains to
4 operations at the Klamath Irrigation Project.

5 Flow Information Measures. Visitors often assess whether riverine conditions are such that they
6 can participate and enjoy their planned activity before committing time or expense to a recreational
7 experience. Whitewater boating and angling opportunities depend on the streamflow in the Klamath
8 River. Although whitewater boaters and anglers make intuitive assessments of expected flows based on
9 factors such as rainfall and snowfall accumulation and snowmelt patterns on unregulated rivers, the
10 regulated flows of the project do not allow visitors to make these determinations on the Klamath River
11 between Link River and Iron Gate dams. Considering access to the project waters requires a considerable
12 travel distance, it is likely that some whitewater and angling opportunities may be forgone because
13 visitors are not willing to commit based on uncertainty related to flows. Consequently, whitewater
14 boating and angling opportunities could exist, but visitors may not take advantage of these conditions
15 simply because they do not know if suitable flows are present. Conversely, after traveling hours to reach
16 the project, visitors may find flows either too high or low to allow them to boat or fish.

17 Providing real-time information with seasonal and daily projections would provide visitors with
18 sufficient information to plan trips. In this way, the public would know when conditions are suitable for
19 their activities so available opportunities would not be forgone and visitors would not make unnecessary
20 trips only to find unsuitable conditions. Considering PacifiCorp proposes to provide flow information as
21 part of a RRMP program, this would be the appropriate place to address flow information needs. As
22 described in the draft RRMP, it is not clear whether PacifiCorp would provide real-time data, daily and
23 seasonal projections, or which locations (gages) would be used to provide this information. Currently, the
24 flow information on PacifiCorp's website is limited to the peaking reach and downstream of Iron Gate
25 dam. The information for the peaking reach shows 4-days of hourly projected flows (the current and
26 succeeding and 2 previous days), projected generation start times over the ensuing week, a planned
27 summer operational schedule and planned outage schedule. The information for Iron Gate dam states the
28 releases required by Reclamation are sufficient to provide whitewater boating use through the summer,
29 but no actual flow information is provided. Considering there are also angling and boating opportunities
30 on the other reaches, expanding this program to include the other project reaches would better enable
31 visitors to make or adjust their plans. Real-time gage information from existing and proposed gages
32 would be the most useful type of information for visitors. We consider these informational elements
33 would be essential to maximize whitewater boating and angling opportunities at the project. Further, the
34 recommendations of others would also probably be accommodated by including these details in a flow
35 information element of the Whitewater Boating and River-based Fishing Program in the final RRMP.

36 **3.3.6.2.3 Development Decommissioning and Dam Removal**

37 Numerous entities have recommended the removal of various project dams, as detailed in
38 previous sections. Removal of the Fall Creek diversion dams would have little or no effect on
39 recreational activities, and is not discussed further. Removal of Copco No. 2 dam would also have little
40 or no effect on recreational activities, because access to the very small reservoir is limited and there are
41 no recreational facilities at this development. In the event of the removal of one or more of the remaining
42 four mainstem project dams, visitors would still be able to access the area for recreational pursuits,
43 assuming most of the roads would likely remain. However the visitors' activities would be focused on a
44 riverine setting rather than large bodies of flatwater. The three most likely affected activities would be
45 flatwater recreation, river-based angling, and whitewater boating use.

46 Decommissioning and removing most mainstem project dams would eliminate the existing
47 opportunities for reservoir-based recreational activities such as powerboating, waterskiing, swimming
48 (lake), and boat angling. PacifiCorp identified 12 boatable lakes in the region similar in size to the four

1 project reservoirs and it is likely existing project recreation visitors would relocate to these other
2 reservoirs. Project recreational facilities constructed to accommodate reservoir recreation would likely
3 remain; however, they would be located at a distance from a water setting which would reduce their
4 attractiveness. Boat ramps would be unnecessary and present a strange appearance to visitors. Although
5 the disposition of the recreational facilities would be a matter dealt with under a decommissioning plan,
6 the decision on their fate should consider annual O&M funding since replacement would not be available
7 from PacifiCorp.

8 Although reservoir-based activities would be eliminated, decommissioning could improve water
9 contact recreation by decreasing the frequency and magnitude of blue-green and other algae blooms (see
10 section 3.3.2, *Water Resources*). Dam removal also would create improved conditions for river angling
11 and whitewater boating.

12 River angling opportunities would be created and likely improved if decommissioning improves
13 the anadromous fishery in the Klamath River (refer to section 3.3.3, *Aquatic Resources*). Expanded river
14 angling opportunities would likely attract increased numbers of anglers to the Klamath River potentially
15 increasing business opportunities for angling guides.

16 PacifiCorp's bathymetric studies indicate most of the flowing sections of the Klamath River
17 between Link River and Iron Gate dam provide suitable channels for whitewater boating. Although it is
18 not known for certain, decommissioning and removal of project dams would probably create a channel
19 where whitewater boating would be feasible. Dams currently impede boat passage. The number of
20 available days and suitability of such opportunities would depend on the flow (see 3.3.6.2.1, *River
21 Recreation*). It is likely that natural flows would reduce the whitewater boating opportunities in the
22 peaking reach because suitable flows would not be consistently or reliably provided during the summer
23 months, which is the most popular time for this activity. Commercial whitewater boating companies
24 would probably not be able to sustain a profitable business with this uncertainty and they would likely go
25 out of business. The decreased whitewater boating opportunities in the peaking reach would also
26 diminish one of the ORVs of this designated Wild and Scenic River.

27 **3.3.6.3 Unavoidable Adverse Effects**

28 None.

29 **3.3.7 Land Use and Aesthetic Resources**

30 **3.3.7.1 Affected Environment**

31 **3.3.7.1.1 Land Use, Ownership, and Management**

32 *Land Use*

33 In its application, PacifiCorp mapped land uses within the existing and proposed project
34 boundaries and 0.25 mile beyond the boundaries, using the following generalized categories (see
35 PacifiCorp, 2004a, figure E8.1-3):

- 36 • Agriculture/grazing – generally intensive agricultural uses such as cropland or pasture, as
37 well as grazing land.
- 38 • Open space and conservation – undeveloped lands not in active use; may include timber
39 production, some grazing, developed and dispersed recreational uses; generally excludes
40 residential.
- 41 • Hydro operations lands – lands used primarily for PacifiCorp hydroelectric operations
42 facilities or maintenance activities.

- 1 • Recreation lands – designated recreational sites.
- 2 • Industrial/undeveloped – currently in industrial use or vacant but zoned industrial.
- 3 • Urban – fully developed, incorporated land.
- 4 • Residential – low-density rural residential, except for city of Klamath Falls, which is higher
- 5 density.

6 The vast majority of the land in the study area is devoted either to agriculture/grazing or to open
7 space and conservation. A small proportion is devoted to hydroelectric operations and recreation sites.
8 Industrial/undeveloped and urban uses occur only in the city of Klamath Falls near East Side and West
9 Side developments. Residential clusters occur in the city of Klamath Falls, in and around the community
10 of Keno and the Keno Recreation Area, and along portions of Copco reservoir. A proposed subdivision
11 east of Iron Gate reservoir, Iron Gate Estates, is mapped as undeveloped and is generally not in residential
12 use except for isolated residences outside the 0.25-mile study area.

13 *Land Ownership*

14 The existing project boundary (see sections 2.1 and 2.2) encompasses lands owned by PacifiCorp,
15 the Bureau of Land Management, the state of Oregon, Klamath County, the city of Klamath Falls, and a
16 few private owners. The Forest Service also owns several parcels outside the project boundary near
17 Copco reservoir. In its report on land ownership and its roadway inventory (PacifiCorp, 2004d),
18 PacifiCorp mapped land ownership within a study area defined to include lands inside the existing project
19 boundary, along the Klamath River between developments, and outward 0.25 mile. Land ownership of
20 project lands and lands in the study area varies among the developments as follows:

- 21 • Most of the land within the project boundary associated with East Side and West Side
22 developments and Link River dam is owned by PacifiCorp, although some is owned by
23 Klamath County, the city of Klamath Falls, and private entities. Private lands predominate
24 beyond the project boundary.
- 25 • At Keno development, the shoreline of Keno reservoir is primarily in private ownership, with
26 some Bureau of Land Management and state ownership, while the area near the dam is
27 PacifiCorp property.
- 28 • PacifiCorp and private entities own the lands along the Klamath River in the Keno reach.
- 29 • PacifiCorp owns most of the land at J.C. Boyle development, concentrated along the reservoir
30 and at the dam, while the project boundary also encompasses a few acres of private property
31 and large tracts of Bureau of Land Management land that include Topsy Campground and
32 much of the land along the access road, power canal, tunnel, and bypassed reach. The project
33 boundary also encompasses state-owned land, which is limited to the Klamath River bed
34 under J.C. Boyle reservoir.
- 35 • Bureau of Land Management ownership predominates along the J.C. Boyle peaking reach of
36 the Klamath River, which also includes some PacifiCorp and other private property. A small
37 amount of Forest Service land lies within the 0.25-mile study area boundary.
- 38 • At the Copco developments, PacifiCorp owns the lands around the powerhouses, dams, and
39 Copco No. 2 reservoir, while most of the land surrounding Copco reservoir is privately
40 owned. The Bureau of Land Management also owns some lands near Copco reservoir and
41 Copco No. 2 dam.
- 42 • PacifiCorp ownership predominates around Fall Creek development, including the diversion,
43 creek, penstock, powerhouse, fish hatchery, and some access road and powerline rights-of-

1 way. Bureau of Land Management and private lands also occur within the 0.25-mile study
 2 area.

- 3 • PacifiCorp owns the land adjacent to the Iron Gate dam, fish hatchery, and powerhouse, as
 4 well as most of the land along the Iron Gate reservoir shoreline and the nearby transmission
 5 line right-of-way. The project boundary and 0.25-mile study area also includes some Bureau
 6 of Land Management ownership and a small amount of private land.

7 PacifiCorp reports more specific land ownership data for its proposed project boundary. The
 8 proposed project boundary, containing 3,736.8 acres of submerged and non-submerged lands,
 9 encompasses lands adjacent to J.C. Boyle, Copco, Fall Creek, and Iron Gate developments, including the
 10 project reservoirs, hydroelectric generation facilities (dams and powerhouses), ancillary facilities such as
 11 fish hatcheries and river recreation areas, and certain transmission lines and access roads. PacifiCorp, the
 12 Bureau of Land Management, the state of Oregon, and a few private landowners own areas within the
 13 proposed project boundary. Table 3-99 shows land ownership within the proposed project boundary.

14 Table 3-99. Land ownership within the proposed project boundary. (Source: PacifiCorp,
 15 2004a)

	Bureau of Land Management	State of Oregon	PacifiCorp	Other Private	Total^a
J.C. Boyle	82.0	135.2	491.3	3.5	718.2
Copco	0.7	0.0	1,498.0	14.4	1,514.1
Fall Creek	9.7	0.0	83.2	9.3	102.2
Iron Gate	63.7	0.0	1,337.5	1.0	1,402.3
Total	156.1	135.2	3,410.0	28.2	3,736.8
Percent of Total	4%	4%	91%	1%	100%

16 ^a All values are approximate, derived from various GIS data sets. Row totals equal the sum of column entries +/-
 17 several acres.

18 *Land Management*

19 Given the number of parties owning lands within or near the project boundary, there are several
 20 relevant land management plans.

21 Bureau of Land Management Redding Resource Management Plan (RMP) and Record of
 22 Decision. The Redding RMP is a 15-year strategy addressing where and how the Bureau of Land
 23 Management will administer public lands under its jurisdiction within the Redding Resource Area, which
 24 includes Butte and Tehoma counties and the majority of Shasta, Siskiyou, and Trinity counties. As such,
 25 it governs management of Bureau of Land Management’s Mallard Cove Recreation Area at Copco
 26 reservoir and several Bureau of Land Management parcels crossed by transmission lines and Copco Road
 27 at Iron Gate reservoir. At Copco reservoir, Mallard Cove Recreation Area is not within the current
 28 project boundary, but would be included in the proposed project boundary. At Iron Gate reservoir, a
 29 portion of Copco Road crossing Bureau of Land Management land is within the current project boundary
 30 but not within the proposed project boundary; the transmission line corridors are within both current and
 31 proposed project boundaries. Other than a transmission line, none of the project facilities are on lands
 32 managed by the Redding District Bureau of Land Management. The RMP focuses on four planning
 33 issues: land tenure adjustment (where the Bureau of Land Management should provide long-term federal
 34 stewardship); recreation management (where and what mixture of recreation activities should be
 35 encouraged or discouraged); access (the ability of public users to physically access their public lands);
 36 and forest management (where forest management should be allowed given existing restrictions and
 37 changing land ownership).

1 In addition to governing management of the Bureau of Land Management lands at Copco and
2 Iron Gate reservoirs, the Redding RMP also directs Bureau of Land Management policies with respect to
3 the Klamath River from the California-Oregon border south to the end of the project,¹²⁰ which is in the
4 Redding Resource Area's Klamath Management Area. Within the Klamath Management Area, the upper
5 Klamath River is named as a resource with objectives to (1) maintain scenic quality, (2) improve riparian
6 vegetation, (3) protect cultural resources, and (4) improve non-motorized recreation opportunities.

7 Bureau of Land Management Klamath Falls Resource Area ROD, RMP, and Rangeland Program
8 Summary. The Klamath Falls RMP outlines the strategy for managing 212,000 acres in Klamath County,
9 Oregon. The RMP provides guidance on how the Bureau of Land Management will use ecological,
10 economic, social, and managerial principles to achieve healthy and sustainable natural systems and
11 maintain the health of aquatic ecosystems. Eleven miles of the Klamath River, from the J.C. Boyle
12 powerhouse to the Oregon-California border, are designated as a protected special area under the RMP,
13 and new hydroelectric development is precluded there. Within this Klamath River Complex Special
14 Resource Management Area, there are several recreational sites and trails; the plan supports the existing
15 cooperative management agreement with PacifiCorp for coordinated recreation trail and facility
16 development.

17 The RMP also directs the management of all Bureau of Land Management-administered land to
18 meet visual quality objectives of various land classes. For further discussion of this topic, see section
19 3.3.7.1.3, *Aesthetic Resources*.

20 Bureau of Land Management Medford District ROD and RMP. The Medford RMP guides the
21 Bureau of Land Management strategy for managing approximately 859,100 acres in Coos, Curry,
22 Douglas, Jackson, and Josephine counties in Oregon. The ecosystem management strategy outlined by
23 the plan comprised several major land use allocations, including late-successional reserves; adaptive
24 management areas; general forest management areas and connectivity/diversity blocks; and a variety of
25 special purpose management areas such as recreation sites, wild and scenic rivers, and visual resources
26 management areas. The Spring Creek diversion facility is located in Jackson County within the Medford
27 RMP area.

28 Forest Service Klamath National Forest Land and Resource Management Plan. The purpose of
29 the plan is to coordinate and disclose programmatic management direction for the Klamath National
30 Forest. The plan establishes the management direction and associated long-range goals and objectives for
31 the forest; specifies the standards, timing, and vicinity of the practices necessary to achieve that direction;
32 and establishes the monitoring and evaluation requirements needed to ensure that the direction is carried
33 out. There are no lands of the Klamath National Forest within the project boundary, although there are
34 some parcels near the east end of Copco reservoir. Those lands are designated in the plan as late-
35 successional reserve, and are managed to enhance habitat for late-successional and old growth-related
36 species.

37 General Plan of Siskiyou County. The General Plan applies to the unincorporated area of
38 Siskiyou County, California, and includes separate elements that were adopted over the course of several
39 years, primarily in the 1970s. Elements cover a range of topics including land use, noise, conservation,
40 energy, seismic safety, geothermal energy, and housing. The preservation of recreational and scenic lands
41 is also emphasized. The General Plan guides land use policy within a large section of the project area,
42 including Copco and Iron Gate reservoirs and the surrounding recreational lands.

43 Siskiyou County Zoning Ordinance. The Siskiyou County zoning ordinance guides land
44 development in unincorporated portions of Siskiyou County by regulating allowable uses in various
45 zones. Zones are grouped by six main uses—residential, commercial, industrial, agricultural, timberland,

¹²⁰Bureau of Land Management lands in this area are near, but do not abut, the Klamath River.

1 and open space. Hydroelectric facilities are subject to local review in part through the zoning code. The
2 project area is located in three zones: AG-1, prime agricultural; AG-2, non-prime agricultural; and RR,
3 rural residential.

4 Comprehensive Plan for Klamath County. Klamath County’s Comprehensive Plan has three
5 parts: policies, an atlas, and a land development code. The goals and objectives contained with the
6 policy portion of the plan are recommended as a broad framework for future planning and development
7 within the unincorporated area of the county. The Land Use Element of the plan describes 10 land use
8 designations that are further broken down into implementing zones. Among other goals, the plan
9 advocates conservation of agricultural and forest lands and preservation of open space and scenic rivers.

10 The land development code portion of the plan guides land development in unincorporated
11 portions of Klamath County. Zones are grouped by six main uses—residential, commercial, industrial,
12 exclusive farm use, forestry, and open space and conservation. Project facilities, including Keno dam,
13 J.C. Boyle dam and powerhouse, and several recreation sites, are located in two zones: forestry (to
14 protect forest ecosystems) and forestry/range zone (to promote the management and conservation of lands
15 of mixed farm and forest use).

16 The Wild and Scenic Rivers Act. The Wild and Scenic Rivers Act (P.L. 90-542) and its
17 amendments protect, in their free-flowing conditions, designated rivers and their immediate environments
18 that possess ORVs. ORVs include scenic, recreational, geologic, fish, wildlife, historic, cultural, or other
19 similar values. Section 7 (a) of the Wild and Scenic Rivers Act states that the Commission shall not
20 license the construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other
21 project works under the FPA on or directly affecting any river designated as a Wild and Scenic River.
22 The Wild and Scenic Rivers Act specifically does not preclude licensing of developments below or above
23 designated wild, scenic, or recreational rivers if the development does not invade the area or unreasonably
24 diminish the scenic, recreational, and fish and wildlife values present in the designated reach.

25 The Wild and Scenic Rivers Act provides for management of a river corridor averaging 320 acres
26 per mile (about 0.25 mile on each side of the river) based on the level of development existing at the time
27 of designation. Management is applied to federal lands within the corridor and is based on three
28 classifications: (1) Wild – segments that are unroaded and undeveloped; (2) Scenic – segments that are
29 generally undeveloped, but may have occasional road crossings and riverside structures that are visually
30 screened from the river; and (3) Recreational – segments that are generally developed, with parallel roads,
31 bridges, and structures.¹²¹

32 As described in section 3.3.6.1.1, *Regional Recreational Setting*, two portions of the Klamath
33 River are currently designated under the Wild and Scenic Rivers Act. In addition to ORVs related to
34 recreation, the 11-mile “scenic” segment from J.C. Boyle powerhouse to the California-Oregon border
35 was named for ORVs related to diverse wildlife, prehistoric sites, habitat for endangered species, historic
36 places, scenery, and evidence of Native American traditional uses. The ORV for the lower portion of the
37 Klamath River beginning below Iron Gate dam to the Pacific Ocean is anadromous fisheries (steelhead
38 and salmon).

¹²¹Designations are intended to protect the free-flowing conditions of the river and the ORVs. Logging, road building, new mining claims, developed campgrounds, and motorized access are generally prohibited on wild segments. On scenic segments, motorized use of trails may or may not be permitted. On recreational segments, all activities normally associated with public lands are permitted subject to the protection of the free-flowing conditions and ORVs of the designated river.

1 **3.3.7.1.2 Road Management**

2 PacifiCorp made a project roads inventory of roads and associated transportation-related
3 structures (bridges, culverts, etc.) in two defined study areas: (1) a broad overall study area and (2) a
4 smaller area that encompasses only the proposed project boundary. The broader study area includes a
5 0.25-mile buffer around all project reservoirs, facilities, the Spring Creek canal and access road, the
6 southern access road to Copco No. 1 dam, and the access road to the Copco No. 2 water supply; the
7 Klamath River from Link River dam to 0.5 mile downstream of Iron Gate Hatchery; the area between the
8 canyon rims from J.C. Boyle dam to the eastern end of Copco reservoir; and all PacifiCorp-owned land
9 adjacent to the project. In total, there are about 323 miles of roads in the broader study area. Table 3-100
10 summarizes the road mileage for which PacifiCorp has whole or partial responsibility within the existing
11 project and proposed project boundaries. Sixteen percent (50.7 miles) of the road miles in the broad area
12 study are within the existing project boundary, where PacifiCorp is solely responsible for maintaining 38
13 percent of the road miles (19.0 miles) and jointly responsible for about 13 percent (6.4 miles). About 13
14 percent (41.3 miles) of the roads in the broad study area are within the proposed project boundary, where
15 PacifiCorp would be solely responsible for maintaining 54 percent of the road miles (22.4 miles) and
16 jointly responsible for about 19 percent (7.7 miles).

17 Table 3-100. Road mileage and maintenance responsibility within the Klamath River Project
18 study area, existing project boundary, and proposed project boundary. (Source:
19 PacifiCorp, 2004d)

Maintenance Responsibility	Miles Within Existing Project Boundary	Miles Within Proposed Project Boundary	Road Names
Link River Area			
PacifiCorp	1.83	0	Link River Trail, Mill Street, unnamed private road
Other	0.40	0	
Total	2.23	0	
Keno Reservoir/Keno Reach Area			
PacifiCorp	2.34	0	Keno Dam Road; unnamed OHV trail; Keno Recreation Area access road, area roads, and trail; gage station trail
Other	4.54	0	
Total	6.88	0	
J.C. Boyle Reservoir Area			
PacifiCorp	1.75	1.79	Pioneer Crossing recreation road and west recreation road, reservoir access road at Sportsman's Park, unnamed private road(s), unnamed OHV trail, J.C. Boyle dam access road, Red Barn access roads
Joint	0.86	0.55	Unnamed private road, Sportsman's Park access road and boat launch
Other	3.31	2.76	
Total	5.92	5.10	
J.C. Boyle to Stateline Area			
PacifiCorp	4.73	4.86	J.C. Boyle Dam Road/Spring Island Road, J.C. Boyle canal access road, unnamed private road(s), unnamed transmission line access road, powerhouse river access road, J.C. Boyle tunnel access road

Maintenance Responsibility	Miles Within Existing Project Boundary	Miles Within Proposed Project Boundary	Road Names
Joint	4.69	4.49	Spring Island Road, unnamed private road(s), jointly maintained hydro road, Bureau of Land Management Klamath River Campground road
Other	6.13	0.07	
Total	15.55	9.42	
Stateline to Copco Reservoir Reach			
PacifiCorp	0	0.30	Stateline Take-out road, Shovel Creek access road, Fishing Access Site 6 trail, Fishing Access Site 5 parking, Fishing Access Site 3 trail and parking, Fishing Access Site 2 trail, Fishing Access Site 1 road
Other	0.01	2.21	
Total	0.01	2.51	
Copco Reservoir Area			
PacifiCorp	1.83	2.76	Unnamed transmission line access roads, Mallard Cove recreation road, Copco No. 2 Village Road, unnamed private roads, Copco No. 2 powerhouse road, Copco No. 2 dam north access road, cinder quarry road, Copco Cove Road
Joint	0.02	0.02	Copco Road
Other	0.23	0.82	
Total	2.08	3.60	
Fall Creek/Spring Creek Area			
PacifiCorp	0.49	1.98	Unnamed private road(s)
Joint	0.01	1.33	Unnamed private road(s), Spring Creek Road, Fall Creek access road, Fall Creek Trail, Copco Road
Other	0.01	0.36	
Total	0.51	3.67	
Iron Gate Reservoir Area			
PacifiCorp	6.05	10.72	Unnamed private road(s); Copco Village Road; Schoolhouse Road; Copco Village residence, powerhouse, bunkhouse, water tower, dump, and communications tower roads; Copco Canyon access road; Copco No. 2 dam south access road ; Copco No. 2 Village south access road; Fall Creek recreation road; unnamed transmission line access roads; Jenny Creek recreation road; Camp Creek access, pull off, campground, and day use area roads; Wanaka Springs Road; Juniper Point recreation road; Mirror Cove Road; Old Quarry Road; Overlook Point Road; Long Gulch Recreation Area road; Iron Gate Fish Hatchery boat launch road; Iron Gate dam access road
Joint	0.87	1.29	Copco Road, Iron Gate dam access road, Iron Gate Estates road
Other	10.61	4.94	
Total	17.53	16.95	

Maintenance Responsibility	Miles Within Existing Project Boundary	Miles Within Proposed Project Boundary	Road Names
Total Area			
PacifiCorp	19.02	22.42	
Joint	6.44	7.68	
Other	25.22	11.17	
Total	50.68	41.27	

1 **3.3.7.1.3 Aesthetic Resources**

2 The study area for the visual resource studies includes PacifiCorp facilities and operations on the
3 Klamath River from Link River in the city of Klamath Falls to the Iron Gate Hatchery, just downstream
4 of Iron Gate dam. The topographic characteristics of the project area vary widely from east to west.
5 Along the northernmost, eastern edge of the project area, the Klamath River borders remnants of central
6 Oregon’s Modoc Plateau province. The river flows through a broad, flat valley that gradually transitions
7 to a narrow channel as it crosses the low, rolling ridges of the Cascade Mountains. In the central section
8 of the project, upstream of J.C. Boyle dam, the topography changes dramatically, dropping rapidly into
9 the 1,000-foot-deep upper Klamath River Canyon. The ruggedness of the terrain exemplifies the
10 surrounding landscape, where nearby mountain peaks often reach 5,000 feet in elevation. Less than 5
11 miles downstream of J.C. Boyle dam, the canyon and neighboring ridges gradually become flatter and
12 wider as the river flows southwesterly across the state line and into Copco reservoir. Here, along the
13 project’s western edge, the topography surrounding Copco and Iron Gate reservoirs is open and rolling.

14 As the river passes through the Cascade Mountains, the upper Klamath River Canyon represents a
15 transition from the desert landscape to the east to a mountainous landscape to the west. The steep-walled
16 canyon is the predominant visual element in the region. As it flows through the deep gorge, the river
17 changes from slack, slow-flowing water in the broad, flat valley to a torrent of cascading whitewater.

18 Within the visual resource study area, PacifiCorp evaluated the way in which project features and
19 operations fit into the overall visual landscape using the following three-step process: (1) identifying the
20 Bureau of Land Management visual resource management classifications applicable within the study
21 area; (2) defining viewpoints from which project facilities and operations could be seen; and (3)
22 evaluating whether project facilities and operations, when seen from the viewpoints, conform to the
23 objectives of the management classification in which they are found.

24 As noted above, project facilities fall under three Bureau of Land Management RMPs: Klamath
25 Falls Resource Area, Medford, and Redding District. In the RMPs, the Bureau of Land Management
26 identifies two visual resource management classifications that describe acceptable level of change to the
27 landscape. In Class II (retention areas), the level of change to the characteristic landscape should be low
28 relative to the existing character of the landscape. In Class III (partial retention areas) the level of change
29 to the characteristic landscape should be moderate relative to the existing character of the landscape.

30 PacifiCorp then identified key observation points to represent typical public viewing locations.
31 The locations provide representative views for members of the public seeing project facilities, the river
32 reaches, and the reservoirs from developed vistas and roads in the project area. PacifiCorp designated 57
33 key observation points, including 6 in the Link River area, 7 from Keno reservoir to the J.C. Boyle
34 reservoir, 9 in the J.C. Boyle bypassed reach, 8 in the Hell’s Corner reach (the river between J.C. Boyle
35 powerhouse downstream to Copco reservoir), 7 in the Copco reservoir area, 5 in the Fall Creek area, 12 in
36 the area of Iron Gate reservoir, and 3 downstream of Iron Gate dam.

1 *Project Facilities*

2 PacifiCorp characterized project facilities using Bureau of Land Management visual resource
3 management (VRM) methods, and compared the characterizations to applicable VRM objectives. All but
4 four of the project facilities are in areas designated as Class III,¹²² where management activities may
5 attract attention, but should not dominate the view of the casual observer. The four project features that
6 are located in Class II areas, where non-native elements should not attract the attention of the casual
7 observer, are not consistent with the VRM class.

8 The four facilities in Class II areas—the J.C. Boyle dam, powerhouse, penstocks, and
9 transmission line—are not consistent with the VRM classification because they attract the attention of the
10 casual observer. The dam’s size makes it very apparent in the landscape despite the fact that its line
11 follows the site’s topography. The powerhouse and penstocks are prominent in the landscape because of
12 their color and strong lines, which contrast with the natural setting. The transmission line is noticeable
13 because it crosses a long distance and rises above the other features in the landscape.

14 Five project facilities in Class III areas dominate the view of the casual observer and are therefore
15 not considered consistent with their VRM class: West Side powerhouse, Copco No. 1 dam and
16 powerhouse, Copco No. 2 powerhouse, Fall Creek powerhouse, and Iron Gate Hatchery and fish ladder.
17 The five associated key observation points are located close to the facilities in question, so that the
18 facilities tend to dominate the view because of their size and prominence in relation to the position of the
19 viewer. Two of these facilities—West Side powerhouse and Iron Gate Hatchery and fish ladder—are
20 much less prominent from a slight distance.

21 The remaining facilities, including dams and powerhouses, transmission lines, Fall Creek
22 hatchery facilities, and recreation and trail areas, either fit within the profile of the surrounding area or are
23 seen from a distance or for a short period of time. These facilities and areas do not dominate the view of
24 the casual observer.

25 *River Reaches*

26 The key observation point assessment of free-flowing river reaches from Link River to
27 downstream of Iron Gate dam found the same general characteristics in all the reaches, although the
28 aesthetic differences between high flows and low flows varied depending on the breadth and depth of the
29 water and the variety of physical features in each reach. At low flows, rocks and vegetation are visible at
30 the channel edges, and hydraulic expression is mostly limited to areas where rocks extend above the water
31 surface. As flows increase, fewer rocks and less vegetation are visible. At some locations, hydraulic
32 expression increases as the flow increases.

33 *Reservoirs*

34 PacifiCorp documented visual characteristics of all the project reservoirs except Keno reservoir
35 under high pool and low pool conditions. Because the water level varies little, PacifiCorp documented
36 Keno reservoir visual characteristics only under average pool conditions. At J.C. Boyle reservoir and
37 Copco reservoir, PacifiCorp also documented visual characteristics at the very low levels seen only
38 during maintenance drawdowns.

39 At Keno reservoir, the views are dominated by large expanses of flat blue water. Along most of
40 the shoreline, shrubs and grasses border the reservoir.

¹²²The Class III areas include those designated Class III by an RMP and those for which the Bureau of Land Management has not given a specific VRM class.

1 At J.C. Boyle reservoir, the differences between low and high pool levels at the three associated
2 key observation points are not great because of the relatively small change in water levels. Some
3 differences, however, are visible. At low pool, all three views of the reservoir show an open expanse of
4 relatively flat water with light green vegetation growing up from the lake bottom. Shoreline views vary
5 according to the makeup of the shoreline (dirt, rock face, etc.). From the Topsy Recreation Area, J.C.
6 Boyle dam and a disturbed area next to the dam stand out from the rest of the view. At high pool, the
7 light green vegetation is no longer visible, and less of the shoreline is visible. Under maintenance
8 drawdown conditions, a large area of exposed lake bottom dominates the view.

9 During high pool conditions at Copco reservoir, as seen from Mallard Cove and Copco Cove
10 recreation areas, a small area of nearshore lake bottom is exposed. The area of exposed lake bottom is
11 larger at low pool and the visual quality is lower. As at J.C. Boyle reservoir, a large area of exposed lake
12 bottom dominates the view under maintenance drawdown.

13 PacifiCorp documented views at Iron Gate reservoir from six recreation areas. At high pool, little
14 or no lake bottom is exposed along the shoreline of the recreation areas. At low pool, more lake bottom is
15 visible at all six key observation points; features such as sandbars and driftwood are visible at some.
16 Similar to the other reservoirs, the visual quality is lower at low pool than at high pool.

17 **3.3.7.2 Environmental Effects**

18 **3.3.7.2.1 Land Management and Use**

19 PacifiCorp does not propose any measures that address land management and use. Interior
20 recommends that PacifiCorp enter into a cooperative management agreement with the Bureau of Land
21 Management to ensure that management of Klamath River lands and resources would not be
22 compromised by project operations. Under this recommendation, PacifiCorp would work with the
23 Bureau of Land Management to (1) manage riparian and aquatic habitats; (2) maintain and enhance
24 species of special concern and their habitats; (3) maintain and enhance recreation and scenic resources
25 and provide for safe recreational experiences; (4) manage deer winter range; (5) manage water resources
26 to meet applicable standards; (6) protect and interpret archaeological resources and cultural values; and
27 (7) provide a presence to eliminate or minimize unsafe and unlawful activities.

28 The Bureau of Land Management also specifies several conditions related to land use, and
29 PacifiCorp offers several alternative conditions. Table 3-101 summarizes the land use conditions
30 specified by the Bureau of Land Management and alternative conditions submitted by PacifiCorp that we
31 address in our environmental analysis.¹²³

32 *Our Analysis*

33 In its license application, PacifiCorp states that the existing project facilities are not in conflict
34 with applicable land use and resource management plans and are either consistent with current zoning or
35 allowed as conditional uses. PacifiCorp also states that the consistency with agency resource
36 management plans, primarily Bureau of Land Management plans, arises from the fact that the project
37 provides for some land uses called for in the plans (for example, passive and active recreation) and does
38 not interfere with others (for example, forestry and agriculture).

¹²³Several of the Bureau of Land Management's conditions and PacifiCorp's alternative conditions are primarily administrative in nature; as such, we do not address them further in this EIS.

1 Table 3-101. Specified and alternative land use conditions. (Source: Letter from Interior to the Commission, dated March 27, 2006;
 2 letter from PacifiCorp to Interior dated April 27, 2006; and letters from Oregon Fish & Wildlife and Cal Fish & Game
 3 to Interior, dated April, 26, 2006)

Bureau of Land Management Specified Condition

PacifiCorp Alternative Condition

PacifiCorp should consult with the Bureau of Land Management to identify and resolve potential conflicts with Bureau of Land Management policy and direction prior to initiating activities on Bureau of Land Management-administered land when such activities are beyond the scope of any new Commission license or that have not been already approved by the Bureau of Land Management.

Restricts consultation to proposed activities on Bureau of Land Management reservation lands within the project boundary, and deletes the “beyond the scope of the license” phrase.

PacifiCorp should obtain written approval from the Bureau of Land Management prior to changing the location of any project feature or facility on Bureau of Land Management-managed lands and for any actions that are inconsistent with authorizations for use or occupancy of Bureau of Land Management-managed lands "according the new license." At least 90 days before any such change or departure, PacifiCorp should file a report with the Commission and the Bureau of Land Management describing the change, the reasons, and documentation of Bureau of Land Management approval.

Adds a “reasonable discretion” phrase to its need to obtain written approval from the Bureau of Land Management prior to changing the location of a project, and restricts the scope to Bureau of Land Management reservation lands within the project boundary

PacifiCorp should prepare site-specific plans for Bureau of Land Management approval for PacifiCorp activities required that could affect Bureau of Land Management-managed land or resources. Prior to implementing any action not analyzed on a site-specific basis, PacifiCorp would work with the Bureau of Land Management to evaluate whether the action could affect Bureau of Land Management-managed land or resources. The analysis should be sufficient to meet NEPA requirements and include the following site specific details: (1) a map showing the location of the proposed activity; (2) the land use allocation and management designation including standards and guidelines for the area of the proposed activity; (3) alternative locations, designs, mitigations, and implementation and effectiveness monitoring necessary to meet standards and guidelines; and (4) data from surveys, biological evaluations, or consultation required by regulation, including, if appropriate, biological assessments of federally listed species, and assessments of Bureau of Land Management-designated species of concern.

Adds a “reasonable discretion” phrase to PacifiCorp’s need to obtain written approval from the Bureau of Land Management prior to changing the location of a project feature, and restricts the scope to Bureau of Land Management reservation lands within the project boundary

Bureau of Land Management Specified Condition

PacifiCorp Alternative Condition

PacifiCorp should conduct necessary environmental analysis according to NEPA standards and sufficient for formal consultation for federally administered resources subject to regulation pursuant to the National Historic Preservation Act, Arch. Resources Protection Act, Native American Grave Protection Act, Clean Air Act, Clean Water Act, and ESA. Analysis documentation should be sufficient to comply with Bureau of Land Management direction in the NEPA Handbook.

PacifiCorp would eliminate this condition.

PacifiCorp should develop and file with the Commission 60 days prior to ground-disturbing activity on Bureau of Land Management-managed land (such as construction near roads, trails, recreation area, and facilities) a safety during construction plan that addresses potential hazard areas and measures necessary to protect public safety.

Eliminates the provision to develop a “safety during construction plan” prior to each ground-disturbing activity, but PacifiCorp commits to abide by FERC regulations that pertain to safe operation of hydro projects, and project-specific public safety plans. PacifiCorp also commits to notifying the Commission prior to proposed project modifications, and as requested by the Commission, would file design plans and specifications 60 days prior to initiating project modifications on Bureau of Land Management-managed land within the project boundary.

PacifiCorp should perform daily inspections of its construction operations on Bureau of Land Management-managed land and adjoining fee title property while construction is in progress and provide documentation of inspections to the Bureau of Land Management. During inspections, PacifiCorp should evaluate fire plan compliance, public safety, and environmental protection, and act immediately to address any necessary corrections.

Eliminates the provisions for daily construction inspections on adjoining fee title property, and would restrict the scope of this condition to Bureau of Land Management reservation lands within the project boundary.

Bureau of Land Management Specified Condition

PacifiCorp should restore Bureau of Land Management lands to a condition satisfactory to the Bureau of Land Management prior to any surrender of the project license or abandonment of project facilities. At least 1 year in advance of license surrender, facility abandonment, "or Project boundary change," PacifiCorp should file with the Commission a restoration or maintenance plan approved by the Bureau of Land Management. The plan should identify any capital improvements that would be removed, restoration measures, maintenance of facilities abandoned but not removed, time frames, and costs. In addition, PacifiCorp should commission an audit to assist the Bureau of Land Management in determining whether PacifiCorp has the financial ability to fund the decommissioning and restoration work specified in the plan. If the license is transferred, PacifiCorp should guarantee in a manner satisfactory to the Bureau of Land Management, that PacifiCorp or the transferee would provide for the costs of surrender and restoration. "Any license amendment that authorizes use of Bureau of Land Management-administered lands shall be subject to such conditions the Bureau of Land Management deems necessary to protect and utilize affected Bureau of Land Management reservations."

Licensee should consult with the Bureau of Land Management between September 1 and November 31[sic] each year and prepare a report on the status implementing conditions of the license that could affect Bureau of Land Management lands. The report should include monitoring results from the previous year regarding effectiveness of environmental measures, a review of non-routine maintenance, discussion of foreseeable changes in project facilities or operations, discussion of any needed revisions to plans associated with the license, and discussion of elements of current year maintenance plans, such as road maintenance.

Within 60-days of issuance of the report to the Bureau of Land Management, PacifiCorp should file the record of consultation and any Bureau of Land Management comments and recommendations with the Commission. The Bureau of Land Management reserves the right, after notice, comment, and administrative review, to require changes to Project operation through revision of 4(e) conditions.

PacifiCorp Alternative Condition

Limits the scope of this condition to Bureau of Land Management lands within the project boundary, indicates that the restoration of such lands would not be to a level that is greater than surrounding lands, agrees to provide information to the Bureau of Land Management that PacifiCorp has the ability to fund restoration work specified in the restoration plan, but not by an audit if the information provided is sufficient to document PacifiCorp's financial ability to fund decommissioning. After receiving this information, PacifiCorp agrees that the Bureau of Land Management could request an audit. PacifiCorp recommends deleting the Bureau of Land Management's provision that if the license is transferred, that PacifiCorp should guarantee that the transferee or licensee would provide for the costs of surrender and restoration.

Limits the scope of the annual consultation with the Bureau of Land Management to Bureau of Land Management lands within the project boundary.

Eliminates the Bureau of Land Management's reservation of rights to change its 4(e) conditions after notice, comment, and administrative review.

1 Interior, in its support of a cooperative management agreement between the Bureau of Land
2 Management and PacifiCorp, indicates that a memorandum of understanding among the Bureau of Land
3 Management, PacifiCorp, state and federal wildlife management agencies, and landowners is in effect for
4 the Upper Klamath River, and that in 2001, PacifiCorp evinced interest in a similar arrangement for lands
5 downstream of the J.C. Boyle powerhouse near the Oregon-California border and lands between the
6 border and Copco reservoir. Interior states that some lands are encumbered with licensed facilities, are
7 directly or indirectly affected by the project, and are not proposed for inclusion in the proposed project
8 boundary. While objecting to the omission of such lands from the project boundary (see section 3.3.7.2.3,
9 *Project Boundary*), Interior recommends that the subject lands be covered by a cooperative management
10 agreement. In our view, the coordination needed to develop and implement a cooperative management
11 agreement could help ensure the protection of Bureau of Land Management and project resources.
12 However, we also note that the action may be redundant, because the actions noted in Interior's
13 recommendation would be addressed in other, recommended resource-specific management plans.

14 The Bureau of Land Management specifies several other measures that include, among other
15 things (1) procedures for addressing activities on Bureau of Land Management lands that may be beyond
16 the scope of the license or that have not been approved by the Bureau of Land Management, (2) the need
17 for site-specific plans for activities that could affect Bureau of Land Management lands, and (3) the need
18 for compliance with NEPA standards and other federal laws when conducting activities on Bureau of
19 Land Management lands. In support of these conditions, the Bureau of Land Management cites its need
20 to ensure compliance with laws, regulation, policies, and land use plan decisions that the Bureau of Land
21 Management is responsible for upholding or implementing. PacifiCorp's alternative conditions would
22 provide a narrower application of the first two specifications (see table 3-101), and eliminate the
23 condition related to compliance with NEPA and other federal laws. PacifiCorp supports its position by
24 noting that the Bureau of Land Management's 4(e) conditioning authority applies only to Bureau of Land
25 Management reservation lands within the project boundary, not any other lands, and indicates that the
26 Commission, not the Bureau of Land Management, is responsible for NEPA compliance for the project.

27 With respect to activities on Bureau of Land Management lands and Bureau of Land
28 Management's responsibility to uphold or implement certain laws, this EIS addresses all known ground-
29 disturbing and habitat-altering activities that would be expected to occur under the term of a new license,
30 and addresses the issue of consultation with the Bureau of Land Management as needed for specific
31 actions. If unforeseen future events result in the need for ground-disturbing actions that are not addressed
32 in this NEPA document, then such ground-disturbing actions would require environmental review under
33 the provisions of NEPA and would require PacifiCorp to file an application to amend its license with the
34 Commission. The Commission would then assess the potential environmental effects of the proposed
35 action and, if appropriate, prepare an environmental assessment (or EIS for substantive actions) under
36 NEPA provisions. Consultation with resource agencies would be part of that separate proceeding. Thus,
37 the need for the Bureau of Land Management's conditions in this regard is unclear.

38 With respect to the area to which the Bureau of Land Management's conditions properly apply,
39 PacifiCorp indicates that there are about 7,599 acres of Bureau of Land Management lands within the
40 Klamath River Canyon area between J.C. Boyle dam and Copco reservoir, of which only about 490 acres
41 are within the project boundary. PacifiCorp states that the Bureau of Land Management has 4(e)
42 conditioning authority over only a fraction of that 490 acres. Although we do not address the legal
43 question in this environmental analysis, we note that the Bureau of Land Management's preliminary
44 conditions, as well as PacifiCorp's alternative conditions, would apply only within the area over which
45 the Bureau of Land Management has 4(e) conditioning authority, rather than over any broader area.

46 The conditions of any new license would apply to any project-related activities, regardless of
47 whether they are within the project boundary. Project-related activities occurring on lands outside the
48 project boundary could include, for example, project-related construction vehicles using roads that are not
49 primarily related to the project, and are therefore outside the project boundary. Such project-related

1 activities would be covered by the same license requirements that are applicable within the project
2 boundary. PacifiCorp’s alternative conditions, if applied to all project-related activities, would provide a
3 mechanism for coordination between the Bureau of Land Management and PacifiCorp with regard to
4 activities covered by the license, and would thereby facilitate protection of Bureau of Land Management
5 and project resources.

6 With respect to Bureau of Land Management’s condition specifying that PacifiCorp obtain
7 written approval prior to changing the location of project features or facilities on Bureau of Land
8 Management-managed lands (see table 3-101), what types of activities would be covered should be
9 clarified. The Commission expects PacifiCorp to obtain Commission approval for construction and
10 operations related to the project, and those activities require consultation with the appropriate land
11 management agencies, including the Bureau of Land Management. As previously discussed, this EIS
12 addresses all known ground-disturbing and habitat-altering activities that would be expected to occur
13 under the term of a new license, and thus satisfies this condition with respect to known activities. With
14 respect to unforeseen activities, PacifiCorp’s alternative condition states a need for the Bureau of Land
15 Management to issue approvals pursuant to its “reasonable discretion,” a measure designed to prevent the
16 Bureau of Land Management from denying or conditioning approvals without a reasonable basis for
17 doing so. PacifiCorp’s alternative condition would restrict the scope of this measure to Bureau of Land
18 Management reservation lands within the project boundary.

19 In our view, it may be excessively burdensome for PacifiCorp to obtain prior written approval for
20 routine maintenance items such as moving a picnic table or the garbage cans at a recreation site.
21 Similarly, the standards for approving or disapproving plans should be clear in advance. One option
22 would be for the Bureau of Land Management and PacifiCorp to determine specific criteria that would (1)
23 indicate when PacifiCorp would need to obtain written permission from the Bureau of Land Management
24 before proceeding and (2) provide the standards by which plans would be evaluated. Additionally, any
25 new license would apply to all project-related activities, as we note above.

26 The Bureau of Land Management specifies that PacifiCorp prepare a safety during construction
27 plan, while PacifiCorp’s alternative condition would instead commit PacifiCorp to abide by project-
28 specific safety plans and Commission regulations regarding safe operation of hydroelectric projects (see
29 table 3-101). We expect public protection during construction to be addressed in any site-specific plan
30 for project-related construction near publicly accessible areas, and note that this protection could be
31 achieved either through a safety during construction plan prepared for the site-specific activity, as
32 specified by the Bureau of Land Management, or through the application of a project-wide safety plan, as
33 stated by PacifiCorp. Such provisions, applicable to all project-related activities and not just those
34 occurring on Bureau of Land Management-managed lands, could easily be incorporated into the RRMP,
35 road management plan, or plans for construction projects proposed for implementation during the term of
36 a new license. However, we note that all aspects of public safety are covered by Part 12 of the
37 Commission’s regulations under the FPA. Thus a specific measure to address this would not be necessary
38 in a new license.

39 The Bureau of Land Management specifies that PacifiCorp perform daily inspections of
40 construction operations on Bureau of Land Management-managed lands and adjoining properties, while
41 PacifiCorp’s alternative condition would restrict the condition to Bureau of Land Management reservation
42 lands within the project boundary (see table 3-101). A blanket requirement for daily inspection appears
43 excessively burdensome, given that the intensity of construction activities and need for oversight may
44 vary greatly from day to day. The nature and frequency of oversight inspections would be more
45 appropriately defined in the site-specific plans prepared prior to construction. Such inspections would,
46 however, logically address the items specified by the Bureau of Land Management, including fire plan
47 compliance, public safety, and environmental protection, with immediate action taken to address
48 necessary corrections. With respect to construction activities on Bureau of Land Management lands that
49 might affect adjoining properties, we note that the Bureau of Land Management’s conditioning authority

1 is limited to Bureau of Land Management lands, and would not apply to lands owned by others. In that
2 regard, PacifiCorp's alternative condition seems appropriate with respect to the Bureau of Land
3 Management's conditioning authority, with the understanding, as noted above that project-related
4 activities outside the project boundary would still be covered by any new license.

5 The Bureau of Land Management specifies conditions to be fulfilled by PacifiCorp in the event of
6 license surrender, abandonment of facilities, or project boundary change, while PacifiCorp's alternative
7 condition would limit this condition to Bureau of Land Management reservation lands within the project
8 boundary and recommends other restrictions or clarifications of the condition (see table 3-101). In our
9 consideration of this condition and alternative condition, we note that if PacifiCorp proposes in the future
10 to surrender its project license, abandon any project facility, modify the project boundary, amend its
11 project license, or transfer its license to another entity, a license surrender, decommissioning, amendment,
12 or transfer proceeding would be required. Details regarding standards of restoration would be addressed
13 in that proceeding and in the associated decommissioning plans. Thus, such future actions do not need to
14 be addressed during this relicensing. We note as well that it is up to the Commission, not the Bureau of
15 Land Management, to determine whether a licensee has the necessary financial resources to implement
16 appropriate decommissioning and restoration activities.

17 The Bureau of Land Management specifies procedures that address annual consultation regarding
18 the status of implementing conditions related to Bureau of Land Management lands, while PacifiCorp
19 submitted an alternative condition that would limit the scope to Bureau of Land Management reservation
20 lands within the project boundary (see table 3-101). In our estimation, the reporting and consultation
21 requirements included in resource specific plans proposed, recommended, or specified by various entities
22 would provide ample opportunity to review progress toward meeting various objectives in appropriate
23 resource areas without the need for additional annual consultation with the Bureau of Land Management
24 beyond that specified in specific plans. As such, the annual consultation specified by the Bureau would
25 likely be redundant with other consultations.

26 In a condition related to annual consultation, the Bureau of Land Management specifies that
27 PacifiCorp file a record of the consultation with the Commission, and also reserves the right to require
28 changes in project operations by revising Bureau of Land Management's 4(e) conditions (see table 3-
29 101). PacifiCorp's alternative would eliminate from the condition the Bureau of Land Management's
30 reservation of rights to change its 4(e) conditions. This is primarily an administrative issue, although we
31 note that the Commission would want to be informed of any substantive outcomes of such consultation.
32 With respect to the Bureau of Land Management's specification that the agency could modify its 4(e)
33 conditions at a later time, such an action would require the opening of a license amendment proceeding
34 unless the proposed modifications were minor and could be handled by the Commission in a letter order.
35 Thus, the revision of 4(e) conditions would be the subject of a separate Commission action rather than a
36 function of this relicensing.

37 **3.3.7.2.2 Road Management**

38 The roadway inventory presented in section 3.3.7.1.2, *Road Management*, indicates the roads and
39 road mileage within the existing and proposed project boundaries for which PacifiCorp has complete or
40 partial maintenance responsibilities. PacifiCorp proposes to use its proposed Project Roadway
41 Management Plan (PacifiCorp, 2004d), filed with the Commission on November 2, 2004, to guide its
42 management of project-related transportation facilities within the proposed project boundary during the
43 term of a new license. The purpose and intent of the roadway management plan is to:

- 44 • identify roads and bridges necessary for the continued operation of the project through the
45 term of a new license;
- 46 • identify transportation-related operation and maintenance activities required for the continued
47 operation of the project that occur within the proposed project boundary;

- 1 • identify use- and cost-sharing agreements for project and project-related road and bridge
2 operation and maintenance by PacifiCorp and other agencies/stakeholders responsible for
3 roads and bridges within the proposed project boundary;
- 4 • provide for continued protection of natural and cultural resource along project roadway
5 corridors;
- 6 • identify appropriate standards for the maintenance of project-related roads and bridges; and
- 7 • identify relevant policies and prescriptions included in county, state, and federal
8 transportation plans applicable to roads in the project area.¹²⁴

9 PacifiCorp proposes to facilitate long-term coordination and budgeting between PacifiCorp and
10 other transportation-related management entities (that is, those individuals and agencies jointly
11 responsible for maintaining project roads) by annually preparing a rolling 5-year transportation action
12 plan to help guide anticipated activities for normal or recurrent general maintenance, as well as major
13 maintenance. As proposed by PacifiCorp, the transportation action plan would summarize the project-
14 related road, bridge, and major culvert maintenance and capital improvements performed during the
15 previous year and planned for the current year and subsequent 3 years. The plan also would document
16 incurred and planned costs, including the allocation of joint costs, such as between PacifiCorp and the
17 Bureau of Land Management.

18 The Bureau of Land Management specifies that, within 6 months of license issuance, PacifiCorp
19 should file a project roads inventory analysis and roads management plan for project-related roads that
20 cross Bureau of Land Management land. The purpose of the plan would be to facilitate coordination of
21 transportation maintenance and management, continue to provide for public safety, minimize potential
22 damage to big game winter range, manage transportation access consistent with Bureau of Land
23 Management-management objectives, coordinate OHV management, minimize the spread of noxious
24 weeds, restore hydrologic function in areas that have been affected by use of Bureau of Land
25 Management roads for project purposes, and continue to protect cultural resources. The Bureau of Land
26 Management specifies that the road management plan do the following:

- 27 • specify PacifiCorp’s goals and objectives for transportation management so that the Bureau
28 of Land Management can determine if they are consistent with Bureau of Land Management
29 transportation management goals;
- 30 • identify Bureau of Land Management roads necessary to operate and maintain the project;
- 31 • provide for monitoring the use of roads for recreation access;
- 32 • identify responsible parties for management and maintenance of Bureau of Land
33 Management roads affected by the project;
- 34 • identify Bureau of Land Management roads previously used but no longer needed to operate
35 and maintain the project;
- 36 • identify the levels of use and project future use of Bureau of Land Management roads;

¹²⁴PacifiCorp indicates that these plans include (1) the Oregon Department of Transportation Routine Road Maintenance Water Quality and Habitat Guide: Best Management Practices; (2) the Bureau of Land Management Western Oregon Transportation Management Plan; and (3) the Bureau of Land Management Draft Upper Klamath River Management Plan, Environmental Impact Statement, and Resource Management Plan Amendments.

- 1 • identify effects associated with all project-related Bureau of Land Management road use;
- 2 • develop measures for project-related effects to Bureau of Land Management roads, including
- 3 restoration following soil erosion, road closures, and implementation of best management
- 4 practices for resource protection;
- 5 • identify agreement necessary to implement the road management plan;
- 6 • accommodate unrestricted access by the Bureau of Land Management necessary to manage
- 7 and administer Bureau of Land Management lands and resources that are affected by project
- 8 operations; and
- 9 • provide for consultation with the Bureau of Land Management prior to erecting any project-
- 10 related signs on Bureau of Land Management-administered lands.

11 The Bureau of Land Management specifies that the plan be prepared following consultation with
12 it, and that it reserves the right to require changes to the plan within 30 days of receipt of the draft plan.
13 The Bureau also specifies that PacifiCorp begin implementing the plan upon Commission approval.

14 PacifiCorp's alternative condition would modify the Bureau of Land Management's condition to
15 conform to the content of PacifiCorp's application and its Road Inventory Analysis and Project Roadway
16 Management Plan (PacifiCorp, 2004d). PacifiCorp also would limit the scope of this condition to Bureau
17 of Land Management lands within the project boundary. Consistent with the Bureau of Land
18 Management's preliminary condition, PacifiCorp's alternative calls for finalizing the plan in consultation
19 with the Bureau of Land Management prior to submitting the final plan for Commission approval.

20 *Our Analysis*

21 Although PacifiCorp states that the Bureau of Land Management was provided a copy of the
22 Road Inventory Analysis and Project Roadway Management Plan (PacifiCorp, 2004d), the Bureau of
23 Land Management indicates that the agency did not have the document. Thus, the Bureau of Land
24 Management's preliminary condition does not reflect any review or consideration of PacifiCorp's
25 proposed plan. Nonetheless, PacifiCorp's proposal and the Bureau of Land Management's preliminary
26 condition have many common elements, including intentions to (1) clarify goals, objectives, and
27 standards among the parties; (2) provide for continued protection of natural and cultural resources; and
28 (3) identify cost-sharing agreements needed to implement the plan. PacifiCorp's completed inventory
29 (2004) also already addresses some of the Bureau of Land Management's goals, including identifying
30 Bureau of Land Management roads necessary to operate and maintain the project and roads previously
31 used but no longer needed to operate and maintain the project. PacifiCorp's alternative condition also
32 indicates intentions to consult with the Bureau of Land Management before finalizing the plan.

33 In our analysis, we considered both the content of the plan and the area to which it would apply.
34 It is unfortunate that PacifiCorp did not consult with the Bureau of Land Management in preparing its
35 2004 inventory and roadway management plan, because the proposed plan might be closer to final form at
36 this time if some consultation had already taken place. Nonetheless, consulting with the Bureau of Land
37 Management following issuance of any license would help rectify the matter. Rather than addressing
38 roads that affect Bureau of Land Management-managed lands in a separate plan, the most efficient use of
39 project resources could be made by finalizing PacifiCorp's existing plan to reflect input from the Bureau
40 of Land Management and other appropriate agencies. The final content of the plan could be determined
41 during consultation.

42 In our view, all of the elements of PacifiCorp's proposed plan and the Bureau of Land
43 Management's preliminary condition would be appropriate for inclusion in the final plan, within the
44 limits of each party's authority. In particular, we note that PacifiCorp has offered no explanation or
45 reasoning behind its proposal to exclude from the project boundary several roads that are within the

1 existing project boundary. In the rationale for its preliminary condition, the Bureau of Land Management
2 states that the proposed project boundary revision excludes numerous miles of road that PacifiCorp has
3 previously been required to manage and maintain, and that the road management plan must include
4 recommendations on how those roads should be managed, including options for maintenance,
5 improvement, or closure. The plan would be much more useful in defining PacifiCorp's road
6 management responsibilities if it defined the miles, levels of use, and projected future use of roads
7 necessary to operate and maintain the project, and offered a rationale as to why other roads should not be
8 PacifiCorp's responsibility.

9 With respect to the area to which the plan should apply, we note that PacifiCorp is responsible for
10 project-related effects whether within or outside the project boundary, although in general, PacifiCorp's
11 responsibilities should be closely aligned with the project boundary (see the following section). At the
12 same time, the Bureau of Land Management may impose conditions only within the area over which it
13 has legitimate 4(e) conditioning authority.

14 **3.3.7.2.3 Project Boundary**

15 In its response to the Commission's ready for environmental analysis notice, Interior stated that
16 several areas that PacifiCorp excludes from the proposed project boundary should instead be within the
17 project boundary. Interior makes the following comments about specific areas.

- 18 (1) Powerhouse Road - The proposed project boundary excludes 5.6 miles of the (J.C. Boyle)
19 Powerhouse Road, but the southern portion of the road between the Spring Island boat launch
20 and the junction with Topsy Grade should be included because:
 - 21 a. the road is adjacent to the Klamath River and was withdrawn in 1959 for the project;
 - 22 b. the road continues to provide needed access for operation and maintenance of
23 PacifiCorp's transmission lines; and
 - 24 c. regular maintenance of the road is required to prevent resource degradation and provide
25 access to recreation sites associated with the project (i.e., Spring Island boat launch).¹²⁵
- 26 (2) J.C. Boyle Bypassed River Reach – Interior states that the bypassed reach should be included
27 in the project boundary because it would continue to be necessary for operation and
28 maintenance of the project. In particular, Interior notes that both the J.C. Boyle power canal
29 and the emergency spillway are upslope of the bypassed reach, and both have required major
30 repair since 2001 in response to spillway overflows and canal damage that have caused
31 hillslope erosion, river bank erosion, and sediment deposition that have directly affected
32 aquatic and riparian habitat. Corrective measures included excavation of eroded material on
33 the alluvial fan, surface stabilization measures (seeding, mulching), and removal of eroded
34 material from the floodplain. Interior indicates that the same forces that caused these events
35 would continue during the entire term of a new license, creating continuing project-related
36 affects and requiring continuing maintenance and restoration by PacifiCorp.
- 37 (3) Topsy Campground – The proposed boundary change would exclude Topsy Campground,
38 which is covered by the current license. Interior states that Topsy Campground should
39 remain within the project boundary because it is the only developed and staffed camping
40 facility on the J.C. Boyle reservoir and that the demand for camping there is high on most
41 weekends during the summer, despite the limited number of campsites, group sites, and
42 improved day-use sites.

¹²⁵The road also provides access to the Bureau of Land Management's Klamath River
Campground.

1 Additionally, Oregon Parks & Rec recommends that PacifiCorp share with the Bureau of Land
2 Management in the operation and maintenance of Topsy Grade Road, which provides primary access to
3 the river, allowing for whitewater shuttles between Frain Ranch and Stateline Take Out, as well as access
4 to Fishing Access Sites 1 through 6.

5 *Our Analysis*

6 Project boundaries must “enclose only those lands necessary for operation and maintenance of the
7 project and for other project purposes, such as recreation, shoreline control, or protection of the
8 environmental resources.”¹²⁶ Thus, our consideration of PacifiCorp’s proposed project boundary, as well
9 as the project boundary recommendations of others, turns on whether the facilities are used for project
10 purposes or are needed to protect project-related environmental resources. Areas that require long-term
11 maintenance by the licensee fall under the latter definition.

12 With respect to Interior’s comment that Powerhouse Road should be included in the project
13 boundary, we reviewed the record and find that the segment of the road that PacifiCorp includes in the
14 proposed project boundary (that is, from the road network near the dam, past the powerhouse, to just past
15 the Spring Island boater access site) serves project purposes, including serving as a turn-around point for
16 PacifiCorp vehicles. The remainder of the road, south from Spring Island boater access, does not appear
17 to serve any project purpose, in that it does not provide access to project recreation facilities or project
18 transmission lines. The Powerhouse Road Bridge across the Klamath River washed out a number of
19 years ago, thus precluding use of this road for any project purposes.

20 As pointed out by Interior in its comments, the upslope area of the J.C. Boyle bypassed reach
21 between the power canal and emergency spillway and the river have been and are likely to continue to be
22 affected by the project, particularly related to spillway overflows and any canal damage. This area is
23 likely to require PacifiCorp’s long-term commitment to repair project-related environmental damages and
24 prevent their recurrence.

25 With respect to Topsy Campground, we agree with Interior’s comment that it serves as the
26 primary recreational facility on J.C. Boyle reservoir, and was included within the project boundary in the
27 original license. There is no information on the record to indicate that conditions have changed that
28 would suggest the area should be removed from the project boundary (see section 3.3.6.2.1, *Recreation*
29 *Resource Management*).

30 In support of its recommendation that PacifiCorp share operation and maintenance
31 responsibilities for Topsy Grade Road, Oregon Parks & Rec states that the road was built to facilitate
32 construction of the J.C. Boyle powerhouse. In its response to comments, PacifiCorp points out that Topsy
33 Grade Road actually is a historic stage road that predates the project. In our review, we conclude that
34 part, but not all, of Topsy Grade Road serves project purposes. The segment of Topsy Grade Road that
35 serves project purposes includes the section that accesses Topsy Campground and the proposed Boyle
36 Bluffs recreation area and serves as alternative access to the Red Barn and J.C. Boyle dam.

37 In our analysis, we also considered other areas, particularly access roads that might be
38 appropriately included within the project boundary. These include the access road between Ager-
39 Beswick Road and the Stateline Take Out, as well as the access road through Sportsman’s Park to the
40 proposed upper J.C. Boyle reservoir boater access.

41 **3.3.7.2.4 Aesthetic Resources**

42 Project facilities and operations can directly affect the aesthetic character of the project area in
43 several ways. Power generating and substation facilities, transmission lines, and the hardscape elements

¹²⁶18 CFR §4.41(h)(2).

1 of recreational facilities often create contrasts with the natural landscape and can dominate the views in
2 local areas. Operations that affect the flow in downstream river reaches can either enhance or detract
3 from the attractiveness of the river, depending on the volume of water flowing and the characteristics of
4 the riverscape. Reservoirs, too, can either add to or detract from the aesthetic appeal of an area, with high
5 pool conditions generally more appealing than low pool conditions.

6 PacifiCorp proposes to reduce the visibility of several project facilities, thereby reducing the
7 contrast with the surrounding area to comply with the Bureau of Land Management's VRM classes and
8 Siskiyou County's aesthetic policies. The proposed aesthetic measures are included in the draft RRMP
9 and include vegetative screening as well as repainting or recoating facilities. The screening component
10 would be coordinated with PacifiCorp's proposed vegetation resource management plan, and would use
11 native vegetation, including tall shrubs and trees. The repainting or recoating component would include
12 consultation on color choices with the Bureau of Land Management. PacifiCorp proposes the following
13 improvements:

- 14 • at J.C. Boyle dam, painting the Red Barn and adding vegetative screening;
- 15 • at the J.C. Boyle powerhouse, repainting or recoating the powerhouse, penstocks, and surge
16 tank, and screening those facilities and the switching station; and
- 17 • at Iron Gate dam, repainting or recoating the penstock.

18 PacifiCorp proposes to complete photo-simulations of the facilities by the first anniversary of the
19 new license, but does not propose to repaint or recoat facilities until the next painting interval for that
20 facility (although not later than year 15 of a new license term). The photo-simulations would be used in
21 consultation with the Bureau of Land Management to identify color choices that would minimize the
22 visual contrast of the project facilities with the surrounding natural landscape. PacifiCorp proposes to
23 make the final color choices based on the results of the consultation with the Bureau of Land
24 Management, as well as the availability and cost of appropriately colored industrial paints or coatings.

25 The Bureau of Land Management specifies that PacifiCorp include in its RRMP a visual resource
26 management plan that includes provisions and guidelines for managing visual resources on Bureau of
27 Land Management lands from the headwaters of J.C. Boyle reservoir to Iron Gate reservoir. The Bureau
28 of Land Management specifies that the plan describe how the design, maintenance, and construction of
29 project facilities would maintain or preserve visual resource values consistent with the Bureau of Land
30 Management's VRM objectives and guidelines. The Bureau of Land Management provides the following
31 examples of the types of measures that could be used to meet VRM objectives for the project:

- 32 • for the bypass canal and other concrete structures, apply acid/stain agent to reduce contrasts
33 in existing structures, add earthtone coloring agents in the concrete mix for new structures,
34 and use vegetative screening or landscaping;
- 35 • for the switch yards, power houses, buildings, penstocks, power line structures and other
36 metal structures, apply paint/stain in earthtone colors to reduce contrast and use vegetative
37 screening or landscaping;
- 38 • for power lines, replace conductors with non-reflective materials at such time as reflectors
39 would otherwise be replaced;
- 40 • for project recreation facilities, including campgrounds and day-use sites, reduce color and
41 form contrast by vegetative or structural screening of all existing and newly constructed
42 facilities, and use vegetation planning to reduce erosion and improve aesthetics; and
- 43 • for the J.C. Boyle powerhouse and canal access roads, project roads, other landform
44 alterations, and talus slopes and cutbanks, reduce color and form contrast by establishing
45 vegetation, and use soil tackifiers and bio-stimulants if needed to facilitate revegetation.

1 PacifiCorp's alternative to this Bureau of Land Management condition modifies the condition to
2 limit the scope to Bureau of Land Management reservation lands within the project boundary, rather than
3 lands from the headwaters of J.C. Boyle reservoir to Iron Gate reservoir, and would restrict PacifiCorp's
4 responsibilities for managing visual resources associated with roads to only those roads for which the
5 licensee is solely or jointly responsible, as determined by the Commission.

6 The Forest Service makes an instream flow recommendation for the river downstream of Iron
7 Gate dam for salmonid habitat (see section 3.3.3.2.1, *Instream Flows*), and makes the same
8 recommendation for aesthetic purposes.

9 *Our Analysis*

10 PacifiCorp's proposal to improve the appearance of several project features and to reduce their
11 contrast with the surrounding area would clearly improve the aesthetic environment in the vicinity of J.C.
12 Boyle dam, the J.C. Boyle bypassed reach, and Iron Gate dam. The proposed use of photo-simulations in
13 consultation with the Bureau of Land Management would help ensure that the color selected for
14 application in each case would be most appropriate to reducing the visual contrast of that facility.

15 PacifiCorp's proposed improvements would address two of the four project features that are
16 currently not consistent with their Class II VRM classification—the J.C. Boyle powerhouse and penstocks—
17 and would leave two not addressed—the J.C. Boyle dam and transmission line. It would also not address
18 the project facilities that are currently not consistent with their Class III VRM classification—West Side
19 powerhouse, Copco No. 1 dam and powerhouse, Copco No. 2 powerhouse and substation, Fall Creek
20 powerhouse, and Iron Gate Hatchery and fish ladder.

21 Our review indicates that some of the facilities not addressed by PacifiCorp's proposal would not
22 be aesthetically displeasing if left as they are, although they would not meet the Bureau of Land
23 Management VRM class objectives. For example, J.C. Boyle dam, while it attracts the attention of the
24 viewer, presents a horizontal form that matches the scale of the background hillsides and does not
25 dominate the view. Once the J.C. Boyle power house, penstocks, surge tank, and switching station are
26 screened with vegetation and/or repainted or recoated, as PacifiCorp proposes, the transmission line
27 would not be as noticeable to the viewer. The Copco No. 1 dam and powerhouse, while dominant in the
28 view of someone nearby, are placed such that they are not seen by the average visitor to the area. Iron
29 Gate Hatchery and fish ladder are less of an aesthetic issue because they are much less prominent when
30 seen from a slight distance. However, the remaining facilities that are currently not consistent with their
31 VRM classification, the Fall Creek powerhouse and Copco No. 2 powerhouse and substation, are very
32 visible to the public. Without the type of vegetative screening and repainting or recoating proposed by
33 PacifiCorp for other facilities, their aesthetic appearance would remain quite disruptive to viewers.

34 The Bureau of Land Management's specification that the RRMP include a visual resource
35 management plan that includes provisions and guidelines for managing visual resources on Bureau of
36 Land Management lands would ensure that expectations regarding how visual quality objectives would be
37 achieved are clearly understood by PacifiCorp and appropriate agencies. However, such a plan would
38 apply only to project-related facilities, which are all within the project boundary, or as noted by
39 PacifiCorp in its alternative condition for managing visual resources, associated with those roads for
40 which PacifiCorp is solely or jointly responsible, as determined by the Commission.

41 In support of its flow recommendation for the river downstream of Iron Gate dam, the Forest
42 Service states that the recommended flows would be representative of natural scenic variability over time.
43 While this statement is no doubt true, we note that other flows, such as those specified in the BiOp and
44 discussed in section 3.3.3.2, *Instream Flows*, also would provide aesthetic variability throughout the year.

1 **3.3.7.2.5 Development Decommissioning and Dam Removal**

2 If any of the project developments are decommissioned, the decommissioning plans would
3 address the topic of post-decommissioning land use, including the disposition of project-related land uses
4 such as recreational facilities. We cannot speculate at this time on what that disposition might be. Any
5 land owned by PacifiCorp could be sold to other parties.

6 With respect to aesthetic resource values, in section 4.4, *Conceptual Costs of Project Dam*
7 *Removal*, we describe conceptually what would be involved in decommissioning each of the
8 developments if the dams and/or other facilities were removed. The conceptual plans, specific to each
9 development, generally include removal of most facilities, drainage of the reservoirs, and re-grading and
10 re-vegetation of the sites in proximity to the dams. Some areas, such as the downslope channel associated
11 with the J.C. Boyle canal emergency spillway and the tailrace area, would be backfilled and stabilized
12 near the Klamath River. Where transmission line rights-of-way are no longer needed, they would be
13 restored to natural conditions. These provisions, which would be spelled out in any decommissioning
14 plans, would help ensure that the areas would develop a more natural appearance as vegetation matures
15 over time.

16 **3.3.7.3 Unavoidable Adverse Effects**

17 None.

18 **3.3.8 Socioeconomic Resources**

19 **3.3.8.1 Affected Environment**

20 The six-county study area for PacifiCorp’s socioeconomic analysis includes Klamath, Jackson,
21 and Curry counties in Oregon and Siskiyou, Humboldt, and Del Norte counties in California (figure 3-
22 113). Project facilities are in Klamath and Siskiyou counties; the other counties are included because
23 their economies, local services, and human resources could be affected by incremental changes in project
24 investments and operations. PacifiCorp divided the study area into two broad subregions because of
25 differences in how the Klamath River is used upstream and downstream of Iron Gate dam. The upstream
26 subregion includes Klamath, Jackson, and Siskiyou counties and the downstream subregion includes
27 Curry, Humboldt, and Del Norte counties.

28 PacifiCorp collected socioeconomic data for two additional subregions within the same six-
29 county area. These two subregions consist of two corridors that both extend from Link River dam down
30 the Klamath River to the Pacific Ocean, and along the coast terminating at the boundaries of the Klamath
31 Management Zone (KMZ)(Humboldt Mountain, Oregon, and Horse Mountain/Shelter Cove, California)
32 (see figure 3-113). The first corridor, which we refer to as the 5-mile corridor, extends 5 miles on each
33 side of the river and 5 miles inland along the coast. The 5-mile corridor area also includes the
34 communities of Yreka and Dorris, California, which are slightly beyond 5 miles from the river but were
35 considered by PacifiCorp’s study team to have a strong connection to the river. The second corridor, the
36 50-mile corridor, extends up to 50 miles on each side of the river and 50 miles inland along the coast.
37 PacifiCorp’s study reports information for the region and subregions at the geographic scale it deemed
38 most pertinent, given data limitations. Unless otherwise indicated, the following description of the
39 socioeconomic environment is taken from PacifiCorp’s license application, exhibit E.9, *Socioeconomic*
40 *Resources* (PacifiCorp, 2004a) and the associated *Final Technical Report* (PacifiCorp, 2004g).

NON-INTERNET PUBLIC

DEIS

DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE KLAMATH HYDROELECTRIC PROJECT

Docket No. P-2082-027

Section 3
Figure 3-113
Page 3-471

Public access for the above information is available only
through the Public Reference Room, or by e-mail at
public.referenceroom@ferc.gov

1 **3.3.8.1.1 Demographic Characteristics**

2 *Population, Race, and Ethnicity*

3 The total population within the six-county study area in 2000 was 464,507 people, of whom
4 289,345 lived in the upstream subregion and 175,162 lived in the downstream subregion. The 5-mile
5 corridor through the upstream counties represents about 20 percent of the upstream subregion population,
6 while the 5-mile corridor through the downstream counties captures about 80 percent of the downstream
7 counties' population. PacifiCorp concludes that the county-level data for the downstream subregion is
8 likely to be adequately representative of the 5-mile corridor population in the downstream subregion as
9 well, while the county-level upstream subregion population characteristics may not be representative of
10 the 20 percent of the population living in the 5-mile corridor in the upstream subregion.

11 The county populations in the study area have exhibited relatively low annual growth rates since
12 1970, in line with the growth rates of the states as a whole. The average annual growth rate from 1970 to
13 2000 was 1.6 percent in the upstream region, 1.1 percent in the downstream region, 1.8 percent in
14 Oregon, and 1.0 percent in California. Average annual growth rates for 2000 to 2040 are projected to be
15 lower across the board: 0.9 percent in the upstream region, 0.7 percent in the downstream region, 1.0
16 percent in Oregon, and 0.7 percent in California.

17 The largest racial group in the study area is white, representing more than three-fourths of the
18 population. The American Indian population constitutes the second largest racial group in all but Jackson
19 County, where the second largest racial group consists of individuals who characterized themselves in the
20 2000 census as being of "Two or More Races." Within the 5-mile corridor, the community of Klamath,
21 California, census designated place (CDP) had the highest concentration of minority (nonwhite)
22 population in 2000. About 46 percent of the population of the Klamath CDP is nonwhite, with almost
23 three-fourths of the minority population being American Indian. Excepting Klamath CDP, the percentage
24 of minority population ranges from 6.5 percent in Ferndale, California, to 22.6 percent in Crescent City,
25 California. Table 3-102 shows the race and ethnic distribution of the population in the communities
26 within the 5-mile corridor.

1 Table 3-102. Race and ethnic distribution by county and community within the 5-mile corridor,
 2 2000. (Source: PacifiCorp, 2004a)

	Total Population (people)	White (%)	American Indian and Alaskan Native (%)	Two or More Races (%)	Other Races ^a (%)	Hispanic ^b (%)
Upstream Subregion						
Klamath County, OR	50,970	88.2	3.6	3.5	4.7	7.2
Midland	1,301	95.0	0.7	3.2	1.2	8.5
Keno	1,011	93.8	0.7	4.8	0.7	2.4
Klamath Falls City	19,335	85.1	5.0	3.4	6.7	8.8
Jackson County, OR	785	92.6	3.4	3.9	0.0	0.5
Siskiyou County, CA	21,725	86.2	5.5	3.7	4.5	6.2
Clear Creek/Fort Goff/Hamburg	525	78.3	15.4	4.0	2.3	2.1
Copco	1,648	89.3	5.0	3.9	1.8	4.2
Dorris City	902	77.7	8.1	3.7	10.6	19.5
Gottsville/Henley/Klamathon	743	86.4	6.6	4.7	2.2	4.3
Happy Camp	667	68.8	24.9	5.7	0.6	3.9
Hornbrook CDP	314	88.5	6.4	3.5	1.6	6.7
Horse Creek	1,749	91.6	2.1	4.5	1.9	7.0
Klamath River/Nolton/Seiad Valley	990	75.2	15.5	7.1	2.3	3.8
Montague City	1,525	91.3	3.7	3.2	1.7	3.9
Somes Bar	891	82.6	10.9	6.1	0.4	2.5
Yreka City	7,442	86.1	4.1	3.1	6.8	5.4
Downstream Subregion						
Curry County, OR	18,082	93.3	2.4	2.2	2.0	3.4
Brookings City	5,363	91.1	2.3	2.7	3.8	4.5
Gold Beach City	1,864	95.9	1.7	1.6	0.9	2.2
Del Norte County, CA	26,583	78.8	5.9	4.6	10.7	13.7
Bertsch-Oceanview CDP	2,097	82.7	7.4	3.9	6.0	7.2
Crescent City	3,888	77.4	6.2	5.6	10.8	10.8
Crescent City North CDP	4,069	79.2	3.4	9.6	7.6	9.0
Klamath CDP	653	54.2	39.4	4.9	1.5	4.9
Klamath Glen/Requa	1,126	59.7	28.7	6.5	5.2	8.5
Humboldt County, CA	101,152	84.9	6.1	5.0	2.1	5.7
Arcata City	16,714	83.8	3.0	5.9	7.3	7.1
Bayview CDP	2,355	82.4	5.0	4.6	7.8	9.3
Cutten CDP	3,096	88.6	6.4	3.8	1.2	6.5
Eureka City	25,929	82.9	4.2	6.5	6.6	7.2
Ferndale City,	1,421	93.5	1.0	3.9	1.6	4.2
Humboldt Hill CDP	3,252	85.0	2.2	5.0	7.9	7.8

	Total Population (people)	White (%)	American Indian and Alaskan Native (%)	Two or More Races (%)	Other Races^a (%)	Hispanic^b (%)
Johnsons/Pecwan/Kanick/ Martin's Ferry/Surgone/ Waseck/Weitchpec	465	19.6	69.2	8.8	2.4	2.4
McKinleyville CDP	13,601	88.5	3.5	5.2	2.7	4.4
Myrtle town CDP	4,375	87.6	1.6	2.4	8.3	3.9
Orleans	601	64.1	23.6	7.5	4.8	3.5
Pine Hills CDP	3,096	93.2	2.3	3.4	1.2	2.8
Trinidad City	331	88.8	1.2	4.6	5.1	4.8
Westhaven-Moonstone CDP	1,046	90.0	3.0	4.7	2.4	4.5

1 ^a Other races includes Black or African American, Asian, Native Hawaiian and Other Pacific Islander, and
2 "Some Other Race."

3 ^b Hispanics may be of any race.

4 ^c These communities are part of the same census block group; data are not available separately for each
5 community in the group.

6 *Employment and Income*

7 Each county in the study region has experienced net job growth between 1980 and 1999. With
8 the exception of Jackson County, Oregon, however, the average annual growth rates for the study region
9 counties have been lower than their respective state growth rates. From 1990 to 1999, employment grew
10 at an average annual rate of 2.7 percent in Oregon, while growth in the study region counties was 1.9
11 percent in Curry County, 1.6 percent in Klamath County, and 3.2 percent in Jackson County. During the
12 same period, employment grew at an average annual rate of 1.3 percent in California, while growth in the
13 study region counties was 0.9 percent in Del Norte County, 1.2 percent in Humboldt County, and 1.1
14 percent in Siskiyou County.

15 Throughout the study region, services, retail trade, and government are the three industries with
16 the greatest percentage of total county employment. Service employment ranges from 26 percent of
17 employment in Curry County to 31 percent in Humboldt and Jackson counties. Retail trade employment
18 ranges from 17 percent in Del Norte and Klamath counties to 22 percent in Curry and Jackson counties,
19 while government employment ranges from 11 percent in Jackson County to 28 percent in Del Norte
20 County. Agriculture varies in importance in terms of employment, with total employment in agriculture
21 (farm employment as well as employment in agricultural services) comprising a substantially larger
22 portion of all jobs in Siskiyou (8.0 percent) and Klamath (7.2 percent) counties than in Del Norte (4.9
23 percent), Curry (3.8 percent), Humboldt (3.4 percent), and Jackson (3.2 percent) counties. Employment
24 in the fishing, hunting, and trapping sector is low but large enough to be reported in Del Norte (1.1
25 percent), Curry (0.9 percent), and Humboldt (0.1 percent) counties. Employment data for the fishing,
26 hunting, and trapping sector are not reported by the census for the other three counties to avoid disclosing
27 confidential information.

28 Employment related to recreation and tourism is not separately reported in the census, but is
29 reported as part of the services and retail trade sectors. Because that sector is so large, the extent of
30 recreation- and tourism-related employment cannot be discerned from the census data.

31 Historically, communities along the coast were dependent on ocean commercial and recreational
32 sportfishing. Employment in commercial fishing is included in the estimates for the fishing, hunting, and
33 trapping sector noted above. Along with commercial fishing, the coastal communities were also

1 dependent on the packing and processing plants that prepared the fish for market. However, most of the
 2 packing and processing plants, whose employment used to be reported as part of the manufacturing
 3 sector, have closed.

4 For the communities within the 5-mile corridor, the services and retail trade sectors account for
 5 about two-thirds of employment. Comparing the 1990 and 2000 employment data shows a decline in
 6 employment in the agriculture, forestry, fishing, and hunting category for several communities, and an
 7 increase in a few communities (table 3-103).

8 Table 3-103. Distribution of employment (percent) in agriculture, forestry, fishing, and hunting
 9 by community, 1990 and 2000. (Source: PacifiCorp, 2004a)

Community	1990 Employment	2000 Employment
Decline in Employment		
Dorris, CA	20.6	14.3
Gottsville/Henley/Klamathon, CA	19.2	11.5
Happy Camp, CA	14.8	8.7
Keno, OR	11.6	6.0
Westhaven-Moonstone CDP, CA	15.3	0.7
Gold Beach, OR	10.1	4.7
Increase in Employment		
Clear Creek/Fort Goff/Hamburg, CA	10.0	25.0
Klamath CDP, CA	5.5	8.9

10 Additionally, most of the communities in the 5-mile corridor experienced a decline in
 11 manufacturing employment from 1990 to 2000. The most substantial declines occurred in Clear
 12 Creek/Fort Goff/Hamburg, California (from 21.4 to 1.8 percent), Happy Camp, California (from 30.1 to
 13 1.1 percent), and Somes Bar, California (from 22.8 to 1.8 percent).

14 While the period from 1990 to 2000 was characterized by the general loss of manufacturing jobs
 15 in almost all the communities in the 5-mile corridor, those losses were offset in some communities by
 16 gains in the agriculture, forestry, fishing, and hunting sector as well as the services sector. The
 17 communities of Clear Creek/Fort Goff/Hamburg, Klamath CDP, and Klamath River/Nolton/Seiad Valley
 18 gained jobs in the agriculture, forestry, fishing, and hunting sector, while Klamath CDP, Happy Camp,
 19 and Gottsville/Henley/Klamathon gained a substantial number of jobs in the services sector.

20 Between 1992 and 2001, unemployment rates declined in all of the counties, but were generally
 21 above the averages for their respective states throughout the period. Siskiyou and Del Norte counties
 22 experienced the most substantial decreases in unemployment, but their unemployment rates remained
 23 well above 8 percent in 2001. Excepting Ferndale, Myrtle town, and Pile Hills, unemployment rates are
 24 generally higher in the communities in the 5-mile corridor than in their respective counties. The county
 25 unemployment rates in 2001 were higher than the state averages for California and Oregon, both of which
 26 had statewide unemployment rates of 4.9 percent in 2000. Unemployment rates have generally risen
 27 since 2001. In 2004, when the seasonally unadjusted employment rate was 7.4 percent in Oregon and 6.2
 28 percent in California, the unemployment rates in the study region ranged from 6.5 in Humboldt County,
 29 California, to 9.5 percent in Klamath County, Oregon (Bureau of Labor Statistics, 2006).

30 Average per capita personal income in 1999 in each study region county was lower than the
 31 respective state average. Average per capita personal income in Oregon was \$26,958, while it was

1 \$24,004 in Jackson County (89 percent of the state average), \$22,726 in Curry County (84 percent), and
 2 \$20,886 in Klamath County (77 percent). In California, where average per capita income was \$29,858,
 3 the comparable figures were \$22,871 in Humboldt County (77 percent of the state average), \$21,092 in
 4 Siskiyou County (71 percent), and \$17,722 in Del Norte County (59 percent).

5 In general, the communities within the 5-mile corridor had lower per capita incomes than those
 6 reported at the county or state level. The only exception is the city of Trinidad, which had a 1999 per
 7 capita income of \$28,050, equaling 123 percent of the Humboldt County average and 94 percent of the
 8 California state average. In other communities, per capita incomes ranged from a high of \$22,653 in
 9 Somes Bar, California, to a low of \$6,894 in the aggregate representing Johnsons, Peewan, Kanick,
 10 Martin's Ferry, Surgone, Waseck, and Weitchpe, California.

11 The per capita income of the American Indian population in each of the six counties in the study
 12 region is about 50 percent lower than that observed for the entire population in each of the counties.
 13 Additionally, with the exception of Curry County, the counties in the study region have a substantially
 14 higher percentage of low-income population among the American Indian population compared to the
 15 overall population. In 2000, more than two-thirds of the American Indian population in Ferndale and
 16 Myrtle town and more than half of the American Indian population in Klamath Falls and Yreka were low
 17 income. Table 3-104 summarizes the percentage of low income persons in the general population and in
 18 the American Indian population for the communities in the 5-mile corridor. The table also indicates the
 19 percentage of substandard housing by community, another measure of low income status.

20 Table 3-104. Distribution of low incomes and substandard housing (percent) by community in
 21 the 5-mile corridor, 2000. (Source: PacifiCorp, 2004a)

	Low Income Distribution in Total Population		Low Income Distribution in American Indian Population		Substandard Housing
	Persons	%	Persons	%	%
Upstream Subregion					
Klamath County, OR	8,563	16.8	733	39.9	3.0
Midland	53	4.1	0	0.0	0.0
Keno	97	9.6	0	0.0	4.8
Klamath Falls City	4,234	21.9	500	52.2	2.6
Jackson County, OR	98	12.5	5	19.8	18.1
Siskiyou County, CA	4,041	18.6	379	31.7	5.4
Clear Creek/Fort Goff/Hamburg	112	21.3	36	44.4	24.6
Copco	201	12.2	51	61.8	5.3
Dorris City	172	19.1	15	20.5	2.4
Gottsville/Henley/Klamathon	123	16.5	22	43.9	9.1
Happy Camp	168	25.2	73	43.9	9.0
Hornbrook CDP	67	21.3	5	25.0	9.5
Horse Creek	297	17.0	6	16.7	4.8
Klamath River/ Noltan/Seiad Valley	238	24.0	105	68.5	9.4
Montague City	369	24.2	10	17.5	0.2
Somes Bar	122	13.7	36	37.1	24.8
Yreka City	1,578	21.2	159	52.2	0.5

	Low Income Distribution in Total Population		Low Income Distribution in American Indian Population		Substandard Housing
	Persons	%	Persons	%	%
Downstream Subregion					
Curry County, OR	2,206	12.2	64	14.6	3.1
Brookings City	617	11.5	15	12.0	1.2
Gold Beach City	231	12.4	0	0.0	2.2
Del Norte County, CA	5,370	20.2	402	25.8	1.2
Bertsch-Oceanview CDP	380	18.1	57	36.6	0.0
Crescent City	1,345	34.6	96	39.9	0.0
Crescent City North CDP	696	17.1	23	16.5	1.0
Klamath CDP	99	15.2	36	14.0	6.4
Klamath Glen/Requa	163	14.5	75	23.2	23.2
Humboldt County, CA	19,725	19.5	1,926	31.0	2.9
Arcata City	5,382	32.2	195	38.9	0.5
Bayview CDP	544	23.1	50	42.4	1.0
Cuttan CDP	418	13.5	14	7.0	1.6
Eureka City	6,145	23.7	412	37.9	1.7
Ferndale City	101	7.1	10	70.0	2.0
Humboldt Hill CDP	374	11.5	15	20.6	1.7
Johnsons/Pecwan/Kanick/ Martin's Ferry/ Surgone/ Waseck/ Weitchpec	270	58.0	NA	NA	50.2
McKinleyville CDP	2,027	14.9	57	11.8	0.8
Myrtle town CDP	582	13.3	46	66.7	0.2
Orleans	123	20.5	86	60.6	43.0
Pine Hills CDP	297	9.6	7	10.0	1.7
Trinidad City	29	8.8	0	0.0	4.4
Westhaven-Moonstone CDP	147	14.1	15	48.4	0.8

1 NA = not available

2 3.3.8.1.2 Project-related Economic Sectors

3 The project relates to the local economy in many ways. Most directly, the project provides some
4 employment and income, and PacifiCorp pays local and county taxes related to the project. Recreation,
5 commercial fishing, tribal fishing, and agriculture are other economic sectors related to project operations.

6 *Project Employment, Payroll, and Taxes*

7 Currently, the project employs 19 individuals and has a total annual payroll of about \$820,000.
8 During fiscal year 2003-2003, PacifiCorp paid property taxes to the following entities:

- 9 • Klamath County: \$1.58 million, about 4.5 percent of the county's \$35 million in property tax
- 10 revenue
- 11 • City of Klamath Falls: \$105,160

- 1 Siskiyou County: \$1.1 million, about 18 percent of the county's \$6.54 million in property tax
2 revenue

3 PacifiCorp also pays franchise taxes to the city of Yreka. In 2002, PacifiCorp paid \$64,767 in
4 franchise taxes, representing about 1 percent of the city's gross revenue that year.

5 *Recreation*

6 In the upstream subregion, the Klamath River and its reservoirs support a number of recreational
7 pursuits, including whitewater boating (private and commercial), sport fishing (private and commercial),
8 camping, and waterskiing. Based on surveys prepared in connection with project relicensing, PacifiCorp
9 reports that, in 2002, non-local visitors to the upstream subregion spent an estimated \$840,900 to
10 \$909,600 in the 5-mile corridor, and between \$1,648,000 and \$1,716,700 in the 50-mile corridor (EDAW,
11 Inc., 2003, as cited in PacifiCorp, 2004a). Table 3-105 summarizes total and non-local visitor
12 expenditures by participants in various recreational activities in 2002.

13 Table 3-105. Annual recreation use and associated expenditures of total and non-local visitors
14 in the upstream subregion, 2002. (Source: PacifiCorp, 2004a)

Primary Activity	Primary Purpose Recreation Days (User Days)	Expenditure Per Person Per Day (\$)	Total Expenditure			
			Local and Non-local Visitors	Non-local Visitors to the Project Area	Non-local Visitors, 5-Mile Corridor	Non-local Visitors, 50-Mile Corridor
Boat Fishing	30,270	\$5.12	\$154,982	\$119,340	\$119,340	\$136,390
Waterskiing	23,040	\$7.81	\$179,942	\$136,760	\$136,760	\$167,350
Resting/Relaxing	21,120	\$4.06	\$85,747	\$60,020	\$60,020	\$69,450
Shoreline Fishing	15,360	\$17.02	\$261,427	\$130,714	\$130,714	\$209,143
RV Camping	11,520	\$7.05	\$81,216	\$70,660	\$70,660	\$70,660
Whitewater Boating	5,090	\$134.25 - \$149.35	\$683,333 - \$760,191	\$55,736 - \$63,880	\$93,911 - \$162,626	\$627,597 - \$696,311
Other	77,470	\$5.54	\$429,184	\$206,008	\$206,008	\$339,055
No Primary Activity	7,680	\$4.25	\$32,640	\$23,450	\$23,450	\$28,350
Total	192,000	\$9.94 - \$10.34	\$1,908,471 - \$1,985,329	\$802,688 - \$810,832	\$840,863 - \$909,578	\$1,647,995 - \$1,716,709

15 In a letter filed with the Commission on November 22, 2005, Momentum River Expeditions
16 provided information related specifically to whitewater boating on the Hells Corner section of the upper
17 Klamath River, located between J.C. Boyle dam and Copco reservoir. According to Momentum River
18 Expeditions:

- 19 • Commercial operators handle more than 90 percent of the whitewater boating in this section
20 of the river because of the difficult logistics of the run.
- 21 • Twenty-two companies have permits to run this section of the river, many of whom depend
22 directly on this stretch to stay in business.
- 23 • An average of 4,000 to 5,000 people from around the United States and the world run this
24 section of the river with outfitters each year.
- 25 • Outfitters collect an average of \$520,000 in gross revenues annually from trips on this section
26 of the river.

- Each outfitter spends a significant portion of gross revenue locally on fuel, food, labor, marketing, and other expenses.
- Other spending by whitewater rafting guests for lodging, dining, shopping, and other activities is estimated at \$3.5 million annually.

Momentum River Expeditions does not cite any sources or the methods used in making the estimates provided in its letter. Its estimate of whitewater boaters (4,000 to 5,000 boaters with commercial outfitters) is similar to the PacifiCorp estimate shown in table 3-105 (5,090 total whitewater boaters), and its estimate of gross outfitter revenue (\$520,000) is relatively similar to PacifiCorp's range of total local and non-local whitewater boater expenditures in the region (\$683,333 to \$760,191). However, its estimate of total whitewater boater expenditures in the region (\$3.5 million) is substantially greater than the figures reported in table 3-105 (\$1.9 to \$2.0 million).

Primary recreation activities in the downstream subregion include whitewater boating, mining, in-river fishing, and ocean sport fishing. In 2002, estimates of expenditures by non-local visitors in the downstream subregion ranged from \$6.2 to \$6.5 million in the 5-mile corridor and from \$7.3 to \$7.7 million in the 50-mile corridor (table 3-106). The recreation-related expenditures represent less than 1 percent of personal income for the six-county study region, as well as the upstream and downstream subregions. However, recreation-related earnings can be substantial for communities within the 5-mile corridor.

Table 3-106. Annual recreation use and associated expenditures of total and non-local visitors in the downstream subregion, 2002. (Source: PacifiCorp, 2004a)

Primary Activity	Total User Days	Commercial User Days	Private User Days	Total Expenditure		
				Local and Non-local Visitors	Non-local Visitors Within 5-Mile Corridor	Non-local Visitors Within 50-Mile Corridor
Whitewater Boating	13,673	9,571	4,102	\$1,566,226 - \$1,771,319	\$371,656 - \$576,748	\$1,566,226 - \$1,771,319
Gold Mining	10,000	0	10,000	\$451,350 - \$586,350	\$451,350 - \$586,350	\$451,350 - \$586,350
Camping	10,526	0	10,526	\$543,462	\$363,835	\$363,835
River Sport Fishing	28,432	204	28,228	\$1,486,990	\$690,900	\$655,070
Ocean Sport Fishing	93,235	7,612	85,623	\$4,300,000	\$4,300,000	\$4,300,000
Total	155,866	17,387	138,479	\$8,348,028 - \$8,688,121	\$6,177,741 - \$6,517,833	\$7,336,481 - \$7,676,574

While Klamath River whitewater boating activity in the downstream subregion has increased over time, in-river fishing has varied from year to year. Angler effort (as measured by angler trips or angler hours) and catch peaked in the mid-1980s at more than 64,000 angler days. Angler effort and catch declined in the late 1980s and early 1990s, recovering somewhat in the late 1990s. The figure noted in table 3-106, 28,432 user days in 2002, indicates a recovery from lower figures in the early 1990s, but is still less than half the mid-1980s peak.

Ocean angler visitor days have followed a similar pattern, reaching their peak of more than 180,000 angler days in 1987 and their low point in 1998 at 32,400 angler days. The 2002 figure of 93,235 user days shown in table 3-106 is slightly more than half the 1987 peak. In 2005, ocean sport fishing was down in part because of management measures taken by the Pacific Fishery Management Council to protect the Klamath River salmon stocks (see section 3.3.3.1.5, *Salmon and Steelhead Harvest and Harvest Management*). As reported by the Eureka Times-Standard (2005), the 2005 ocean sport

1 fishery in the KMZ was limited to the period from May 21 through July 4 and again from August 14 to
 2 September 11. That allowed sport fishing for just 4 days in July, generally the most active fishing month.

3 Other information is also available to estimate the value of the recreational ocean salmon fishery
 4 to the local area. Table 3-107 shows personal income associated with the recreational ocean fishery in the
 5 KMZ since 1976. The pattern is similar to, but less pronounced, than the pattern in the commercial
 6 fishery discussed below; that is, personal income related to the fisheries peaked in the late 1980s, fell
 7 through the 1990s, and has recovered somewhat since 2001.

8 Table 3-107. Estimates of KMZ coastal community personal income (in thousands of real 2005
 9 dollars) from the recreational ocean salmon fishery by port area. (Source:
 10 PFMC, 2006a)

Year	Crescent City, CA	Eureka, CA	Fort Bragg, CA	Brookings, OR	Total
1976-1980	1,153	1,337	779	NA	NA
1981-1985	1,263	1,302	624	2,577	5,766
1986-1990	2,140	2,230	1,086	2,683	8,139
1991-1995	776	836	1,262	1,007	3,881
1996-2000	360	662	1,289	813	3,124
2001	454	934	2,284	1,148	4,820
2002	203	1,036	2,401	857	4,497
2003	115	785	1,807	657	3,364
2004	170	1,310	2,340	813	4,633
2005 ^a	131	828	1,835	550	3,344

11 ^a Preliminary.

12 *Commercial Fishing*

13 Pacific coast salmon compete in the global market, where the competition includes coho and
 14 Chinook salmon as well as other salmon species, nonsalmon fish species, other protein sources such as
 15 chicken and beef, and farm-raised salmon and trout. The magnitude of west coast Chinook salmon
 16 production is comparable to Canadian and Alaskan production, but coho production on the west coast is
 17 minor relative to Alaskan production. Currently, salmon products contribute less than 1 percent to the
 18 economies of the west coast states. This was not always the case, however, and the contributions of
 19 commercial fishing can still be substantial to some coastal communities.

20 Numerous sources have documented the history of anadromous fish populations and the roles
 21 they have played in the economies and cultures of Pacific Coast communities and tribes. PacifiCorp
 22 (2004a, g) cites a number of examples, including Lichatowich (1999), Northwest Power Planning Council
 23 (NPPC, 1986), PFMC (1999), The Research Group (2000), Spranger and Anderson (1988), and Taylor
 24 (1996). Other studies have been submitted related to this licensing proceeding, including reports by
 25 Meyer Resources, Inc. (1984) and Norgaard (2005). Historically, and in contrast to the current situation,
 26 the commercial salmon fishery and the associated canneries were substantial components of the west
 27 coast economies. The more recent history (1976 to the present) is characterized by downward trends in
 28 market prices, poor ocean condition cycles, and adverse habitat alterations (including construction of
 29 hydroelectric facilities) for all regions along the west coast of North America. These trends have caused
 30 substantial decreases in the amount of income and jobs in economies where salmon and steelhead fishing
 31 have historically been important. Coastal communities and tribes have experienced the greatest losses in
 32 this regard.

1 The commercial fishing fleet within the study region (KMZ) boundaries (see figure 3-58) consists
 2 of ships that generally fish in waters relatively close to their home ports and land their catch at ports close
 3 to the waters where the fish are caught. The KMZ falls under the jurisdiction of the states of California
 4 and Oregon, as well as PFMC. PFMC tracks fish landings and fishing effort by port, and generally
 5 publishes data for major port areas. The major port areas in the KMZ include Brookings in Oregon and
 6 Crescent City, Eureka, and Fort Bragg¹²⁷ in California.

7 Historically, significant Chinook salmon and coho salmon fisheries used the waters now
 8 designated as the KMZ. As noted in section 3.3.3.1.5, *Salmon and Steelhead Harvest and Harvest*
 9 *Management*, the harvest levels of Klamath River fall Chinook salmon in the KMZ were much higher in
 10 the mid- to late-1980s (in the tens of thousands of fish) than in the 1990s (in the tens or hundreds of fish)
 11 (see table 3-55). The harvest level recovered somewhat from 2001 to 2005, with the catch in the range of
 12 1,400 to 3,900 fish. This pattern in Klamath River fall Chinook harvest levels, coupled with changes
 13 (both up and down) in the ex-vessel price of all salmon caught in the KMZ, has been mirrored in the
 14 personal income received by commercial fishermen in the KMZ (table 3-108).

15 Table 3-108. Estimates of KMZ coastal community personal income (in thousands of real 2005
 16 dollars) from the troll ocean salmon fishery by port area. (Source: PFMC, 2006)

Year	Crescent City, CA	Eureka, CA	Fort Bragg, CA ^a	Brookings, OR	Total
1976–1980 ^b	5,931	15,065	14,772	7,355	43,123
1981–1985 ^b	3,005	3,625	8,484	2,850	17,964
1986–1990 ^b	1,132	2,801	14,902	2,704	21,539
1991–1995 ^b	9	133	937	126	1,205
1996–2000 ^b	10	158	663	375	1,206
2001	13	269	889	547	1,718
2002	235	450	3,204	692	4,581
2003	190	33	13,017	600	13,840
2004	1,671	368	6,391	1,254	9,684
2005 ^c	84	339	2,627	1,087	4,137

17 ^a The Fort Bragg area includes the ports of Fort Bragg, Noyo Harbor, Mendocino, Pt. Arena, and Shelter Cove.
 18 Of these ports, only Shelter Cove is included in the KMZ.

19 ^b Incomes associated with these multiple year periods represent averages over the period.

20 Across all four ports, personal income associated with the troll fishery was at its highest point
 21 (more than \$43 million) from 1976 to 1980 and at its lowest point in the 1990s. In 2001, the figure was
 22 back up to almost \$2 million, which is still less than 5 percent of the 1976 to 1980 average. The best year
 23 since the 1980s was 2003, when personal income related to the salmon troll fishery in the KMZ reached
 24 \$13.8 million, about one-third of the 1976 to 1980 average.

25 More recently, as discussed in section 3.3.3.1.5, *Salmon and Steelhead Harvest and Harvest*
 26 *Management*, management measures taken by the Pacific Fishery Management Council to protect the
 27 Klamath salmon stock have reduced the potential income of commercial salmon fishermen. As table 3-
 28 108 shows, this is reflected in the lower preliminary personal income figures for 2005.

¹²⁷The Fort Bragg area includes the ports of Fort Bragg, Noyo Harbor, Mendocino, Pt. Arena, and Shelter Cove. Of these ports, only Shelter Cove is included in the KMZ.

1 *Tribal Fishery*

2 Citing PFMC (2002a), PacifiCorp reports that recent data are not available on the value of harvest
3 by the Yurok and Hoopa Valley reservation commercial gillnet fisheries on the Klamath River.
4 PacifiCorp cites figures from earlier years to provide insight into the market value of earlier harvests.
5 From 1987 through 1989, commercial tribal harvests of Chinook salmon averaged about 27,500 fish per
6 year. The 1989 harvest, at an average weight of 15.4 pounds per fish, sold for \$852,000 (\$1.1 million in
7 2001 dollars). The 1996 harvest was 43,276 fall and spring Chinook salmon at an average weight of 13.5
8 pounds per fish, which were sold for \$525,000 (\$575,000 in 2001 dollars). The decrease in total revenue
9 can be only partially explained by the decrease in weight and number of fish. Because of increased
10 supplies from other sources, the market price for salmon had fallen from 1989 to 1996. The 1999 harvest
11 was 2,077 fall Chinook salmon, increasing to 4,922 fall Chinook salmon in 2000 and 9,345 fall Chinook
12 salmon in 2001. Assuming the sellers received market price for their fish, and assuming an average
13 weight of 13 pounds per fish, PacifiCorp estimates that revenue from the tribal catch would have been
14 about \$195,590 in 2001.

15 In addition to commercial harvest, these tribes also fish salmon for subsistence and ceremonial
16 purposes. As noted in section 3.3.3.1.5, *Salmon and Steelhead Harvest and Harvest Management*, the
17 subsistence fishery has sometimes exceeded the tribes' commercial fishery, but in 2003 and 2004 the
18 trend was reversed, with the commercial harvest more than double the subsistence fishery. The
19 subsistence fishery has a cultural importance to the tribes beyond its importance as a food source, yet the
20 food value is substantial in and of itself. Norgaard (2005) reports that the estimated diabetes rate among
21 the Karuk Tribe is 21 percent, four times higher than the U.S. average, and the estimated rate of heart
22 disease for the Karuk Tribe is 39.6 percent, three times the U.S. average. Norgaard attributes the high
23 rates of these and other health problems, such as hypertension, to the Tribe's loss of its traditional foods,
24 particularly salmon, as well as other foods from plants, animals, and fungi. Norgaard cites statistics by
25 Hewes (1973) indicating that traditional fish consumption among the Karuk Tribe was 450 pounds per
26 person per year, compared to current estimates of about 5 pounds per person per year in 2003 and less
27 than one-half pound per person in 2004 (Norgaard, 2005).

28 *Irrigated Agriculture*

29 Reclamation's Klamath Irrigation Project provides irrigation water for both agricultural and
30 wildlife refuge lands in the Klamath River Basin. In addition, the Klamath Irrigation Project provides
31 flood control along the Klamath River and downstream of the hydroelectric project. The Klamath
32 Irrigation Project provides irrigation water to approximately 240,000 acres of agricultural land, most of
33 which is in Klamath County, Oregon, and Siskiyou and Modoc counties, California. According to the
34 1997 Census of Agriculture, 1,744 farms and ranches used irrigation water supplied by the Klamath
35 Irrigation Project. Approximately 50 percent of these farms are in Klamath County and 30 percent are in
36 Siskiyou County, both located in the six-county study region. The remaining 20 percent are in Modoc
37 County, outside the study region.

38 The water diverted by the Klamath Irrigation Project from Keno reservoir supports about 490
39 farms, or 41 percent of the total number of farms supported by the irrigation project, and irrigates about
40 95,600 acres of irrigation project farmland and 4,000 acres of non-project farmland. Thus, water diverted
41 through Keno reservoir irrigates about 45 percent of the total irrigated acres in the Klamath Irrigation
42 Project. As noted in section 3.3.8.1.1, *Demographic Characteristics*, agricultural employment in Klamath
43 and Siskiyou counties is substantially higher than in the other study region counties. Although the area
44 irrigated by the Klamath Irrigation Project does not account for all the agricultural income in the two
45 counties, it does contribute to the high agricultural employment.

1 **3.3.8.2 Environmental Effects**

2 In section 3.3.8.1.2, *Project-Related Economic Sectors*, we discuss current project-related effects
3 in terms of project employment, payroll, and taxes; recreation; commercial fishing; the tribal fishery; and
4 irrigated agriculture. In this section of the EIS, we consider the extent to which proposed and
5 recommended changes in project operations may affect those same socioeconomic resources. We
6 consider the socioeconomic effects of PacifiCorp’s Proposal and other recommendations as they relate to
7 four issues: (1) the effects of relicensing the project on the socioeconomic conditions of communities
8 influenced by project operations; (2) the potential effect of PacifiCorp’s proposed change in the project
9 boundary to exclude East Side, West Side, and Keno developments on socioeconomic conditions of
10 communities in the vicinity of these developments; (3) the potential effects on socioeconomic conditions
11 of retiring additional developments; and (4) whether relicensing the project would disproportionately
12 affect any minority and low-income populations.

13 **3.3.8.2.1 Project Employment, Payroll, and Taxes**

14 The project’s current direct employment (19 people), payroll (\$820,000 annually), and taxes
15 (about \$2.8 million annually¹²⁸) are relatively small in the context of the six-county economy. PacifiCorp
16 has not proposed and other parties have not recommended measures specifically designed to affect
17 employment, payroll, or taxes. However, PacifiCorp’s proposal to remove East Side, West Side, and
18 Keno developments from the project would affect those parameters. Similarly, recommendations to
19 remove additional developments from the project would affect project employment, payroll, and taxes.

20 *Our Analysis*

21 East Side, West Side, and Keno developments are all located in Klamath County, and their
22 removal from the project would reduce PacifiCorp’s tax payments to Klamath County by 31 percent
23 (\$490,000), or about 1.4 percent of Klamath County’s \$35 million annual tax revenue. It would also
24 eliminate PacifiCorp’s annual tax payment to the city of Klamath Falls. Removal of these developments
25 also would have a small negative effect on project employment and payroll.

26 The potential direct effects of retiring other developments would vary by development.
27 Retirement of J.C. Boyle and Fall Creek developments, added to removal of East Side, West Side, and
28 Keno developments, would eliminate the remainder of the tax payments to Klamath County, or about \$1.1
29 million, almost all of which would be associated with retirement of J.C. Boyle development. Retirement
30 of Copco No.1, Copco No. 2, Fall Creek, and Iron Gate developments would eliminate the taxes currently
31 paid to Siskiyou County by about \$264,000, \$297,000, \$22,000, and \$506,000 respectively, or about 18
32 percent of the county’s property tax revenue. Retirement of these developments also would mean the loss
33 of all or most of PacifiCorp’s jobs and payroll in the area, although, as we note above, these are small
34 compared to the size of the area economy.

35 In our evaluation of PacifiCorp’s proposal to remove Keno development from the project and
36 other parties’ recommendations to retire other developments, we considered dam removal as well as
37 retirement with the facilities left in place. In section 4.4, *Conceptual Costs of Dam Removal*, we give an
38 estimated cost for removal of each dam and describe how the removal could be accomplished. Short-term
39 employment associated with removal of the dams could total about 95 full-time equivalent (FTE)¹²⁹ jobs

¹²⁸See footnote in section 3.3.8.1.2, *Project-related Economic Sectors*. This figure could be as low as \$420,000. For our analysis, we assume that the \$2.8 million figure is correct, and we base our analysis on that assumption.

¹²⁹A full-time job in construction is equal to 1,600 work hours, or one person working 8 hours per day for 200 days per year. One FTE can be any combination of workers totaling 1,600 hours.

1 and \$7.0 million dollars in earnings, including those at Keno development (3.3 FTEs; \$243,800 in
2 earnings), J.C. Boyle (16.8 FTEs, \$1,237,400 in earnings), Copco No. 1 (11.6 FTEs; \$855,600 in
3 earnings), Copco No. 2 (2.8 FTEs; \$207,000 in earnings), Fall Creek (1.3 FTEs; \$96,600 in earnings), and
4 Iron Gate (59.3 FTEs; \$4,365,400 in earnings). Given the six-county study area’s total employment of
5 more than 250,000, the jobs associated with dam removal would provide a very small increase during the
6 period of dam removal.

7 **3.3.8.2.2 Recreation**

8 *Recreation Site Improvements and Resource Management*

9 PacifiCorp proposes and other parties recommend numerous measures designed to create new or
10 improve existing camping, hiking, boating, and other day-use sites at the project, as well as to improve
11 public access and site operation and maintenance. In section 3.3.6.2.1, *Recreation Resource*
12 *Management*, we describe those measures and the anticipated effects on recreation. In that section, we
13 describe the effects of the measures in qualitative terms, such as providing more camping sites, easier
14 access to bank fishing locations, more diverse hiking opportunities, and better maintained sites. Any
15 attempt to translate these qualitative improvements into a quantitative measure of the number of
16 recreation visits to the project would be purely hypothetical, and we do not make that attempt.

17 *Our Analysis*

18 Given our lack of a quantitative estimate of the effect of improved site conditions or site
19 management on recreation days spent at the project, we cannot make any definitive estimate of their
20 effect on socioeconomic resources, such as visitor spending. To provide some context for considering the
21 potential socioeconomic effect of improved site conditions or site management, table 3-109 shows the
22 effect on visitor spending if the number of certain recreation visitors increased by 5 percent and 15
23 percent. Table 3-109 reflects participation in activities such as camping, hiking, and boat fishing, and
24 does not include more specialized activities such as whitewater boating, river sport fishing, and ocean
25 sport fishing, which we address in later sections. Although our choice of 5 and 15 percent as measures of
26 change is somewhat arbitrary, this is in keeping with the Oregon and California State Comprehensive
27 Outdoor Recreation Plans, which indicate a projected growing demand by recreation users for boat
28 launches, campgrounds (RV and tent), hiking trails, day-use facilities, and interpretation facilities (see
29 section 3.3.6.1.1, *Regional Recreational Setting*), the same types of facilities proposed and recommended
30 for the Klamath Hydroelectric Project.¹³⁰

31 Table 3-109 indicates that, with spending per person per day held constant, a 5 percent increase in
32 the number of recreation user days in the upstream subregion would increase total non-local visitor
33 spending in the 5-mile corridor to \$784,300 per year (about \$37,300 above 2002 spending), while a 15
34 percent increase in recreation user days would bring spending in the same area to \$858,995 per year
35 (about \$112,000 above 2002 spending). In the downstream subregion, a 5 percent increase in user days
36 would raise spending in the 5-mile corridor to \$855,944 to \$997,694 (about \$40,800 to \$47,500 more than
37 in 2002), and a 15 percent increase would raise spending in the same area to \$937,463 to \$1,092,713
38 (about \$122,300 to \$142,500 above 2002 spending).

¹³⁰PacifiCorp (2004a) reports that recreation use in the study area is projected to increase by 47 percent by 2040, primarily due to projected population growth. Our estimates of 5 and 15 percent are not intended to reflect that growth, which is expected even without project improvements. These are estimates of a reasonable range of additional use that might be anticipated because of the addition of new facilities or improvements to existing ones under the conditions of a new license.

1 Table 3-109. Annual recreation use and associated expenditures of total and non-local visitors engaged
 2 in selected recreational activities in the upstream and downstream subregions in 2002 and
 3 with 5 and 15 percent growth. (Source: PacifiCorp, 2004a, and staff)

Primary Activity	Recreation Days (User Days)	Expenditure Per Person Per Day (\$)	Total Expenditure by Local and Non-local Visitors	Total Expenditure by Non-local Visitors to the Project Area	Total Expenditure by Non-local Visitors, 5-Mile Corridor	Total Expenditure by Non-local Visitors, 50-Mile Corridor
Upstream Subregion^a						
2002	186,460	\$6.57	\$1,225,138	\$746,952	\$746,952	\$1,020,398
+5 percent	195,783	\$6.57	\$1,286,395	\$784,300	\$784,300	\$1,071,418
+15 percent	214,429	\$6.57	\$1,408,909	\$858,995	\$858,995	\$1,173,458
Downstream Subregion^b						
2002	20,526	NA	\$994,812 - \$1,129,812	NA	\$815,185 - \$950,185	\$815,185 - \$950,185
+5 percent	21,552	NA	\$1,044,553 - \$1,186,303	NA	\$855,944 - \$997,694	\$855,944 - \$997,694
+15 percent	24,785	NA	\$1,144,034 - \$1,299,284	NA	\$937,463 - \$1,092,713	\$937,463 - \$1,092,713

4 ^a Upstream subregion activities include boat fishing, waterskiing, resting/relaxing, shoreline fishing,
 5 RV camping, other, and no primary activity; see table 3-105 for 2002 figures by activity.

6 ^b Downstream subregion activities include gold mining and camping; see table 3-106 for 2002 figures
 7 by activity.

8 NA = estimates not available

9 Removal of East Side, West Side, and/or Keno developments from the project might or might not
 10 affect the condition and use of the associated recreational facilities, including the Link River Trail and the
 11 Keno Recreation Area. The facilities could continue to be maintained for public use by PacifiCorp or
 12 other entities, depending upon the outcome of future decommissioning plans and jurisdictional
 13 proceedings.

14 As noted in section 3.3.6.2.3, *Development Decommissioning and Dam Removal*, removal of Fall
 15 Creek diversion dams and Copco No. 2 dam would have little or no effect on recreational activities and,
 16 thus, on recreation-related spending in the project area. Removal of one or more of the remaining four
 17 mainstem project dams would likely focus visitor activities on more riverine activities rather than on
 18 reservoir-based activities such as powerboating, waterskiing, lake swimming, and boat angling. Much of
 19 the current reservoir-based recreational use and associated spending would likely move to other areas of
 20 the region. This would include much of the camping and other activities that take place at project
 21 campgrounds. Although the recreational facilities could remain in place, the lack of proximity to a
 22 reservoir would decrease their attractiveness for many users. Much of the spending associated with these
 23 activities could remain in the six-county region and the 50-mile corridor, but would likely be lost to
 24 businesses in the 5-mile corridor. As we discuss in the following section, some or all of this loss of
 25 spending could potentially be replaced by the spending of other recreational users drawn to the new
 26 riverine opportunities.

27 *Whitewater Boating and River-based Fishing*

28 PacifiCorp proposes flow measures that would affect whitewater boating and river-based fishing
 29 opportunities in various parts of the project. Other parties, including Oregon Fish & Wildlife, Cal Fish &

1 Game, the Bureau of Land Management, and NMFS recommend other flow measures. Detailed
2 descriptions of the flow measures are provided in section 3.3.3.2.1, *Instream Flows*. The anticipated
3 effects of those flow measures on whitewater boating and river-based fishing opportunities are described
4 in section 3.3.6.2.2, *River Recreation*. In that section, figures 3-86 through 3-112 graphically compare the
5 whitewater boating and river-based fishing opportunities associated with various flow measures.

6 *Our Analysis*

7 Our analysis focuses on the likelihood that either an increase or decrease in optimal or acceptable
8 flows would lead to an increase or decrease in recreation use of the project. Following our discussion of
9 effects on recreation use, we discuss the potential associated increase or decrease in recreation-related
10 spending in the project area. All analyses are based on a 7-month recreation season (April through
11 October).

12 Link River Reach. Either decommissioning East Side and West Side developments or
13 implementing Oregon Fish and Wildlife’s flow recommendation would more than double the number of
14 days when optimal angling flows would be available under current conditions for all 7 months in below
15 average water years and 4 months in average water years (see figures 3-86 to 3-88). The same flow
16 recommendations would produce opportunities similar to current conditions in 2 months in average water
17 years and 1 month in above average water years, and would produce a lot fewer opportunities during 1
18 month in average water years and 6 months in above average water years. Thus, decommissioning or
19 implementing Oregon Fish and Wildlife’s flow recommendations would greatly increase angling
20 opportunities in this popular reach during below average water years when other opportunities in the
21 region would likely be scarce, and greatly reduce opportunities during above average water years when
22 opportunities on other rivers would likely be greater. Although we cannot estimate how these
23 opportunities might translate into actual recreation days, we conclude that implementing Oregon Fish and
24 Wildlife’s recommendation or decommissioning, as proposed by PacifiCorp, would likely lead to an
25 increase in fishing overall.

26 Keno Reach. The agencies’ flow recommendations and PacifiCorp’s Proposal would maintain
27 the status quo with respect to the Keno reach, and thus would not have an appreciable effect on angling
28 and boating opportunities in this reach.

29 J.C. Boyle Bypassed Reach. PacifiCorp’s Proposal, the Bureau of Land Management’s flow
30 specification, and the recommendations of Oregon Fish and Wildlife, Cal Fish & Game, and NMFS
31 would all produce about the same number of days of acceptable angling flows in the bypassed reach
32 during 7 months in below average water years and 5 months in average and above average water years
33 (see figures 3-89 to 3-91). Compared to PacifiCorp’s proposal and current conditions, the agency
34 recommendations would reduce the number of days with acceptable flows during 2 months (April and
35 May) in average water years and 2 months (April and June) in above average water years, both times
36 when fishing opportunities are likely to be available in other regional rivers and streams. We conclude
37 that PacifiCorp’s Proposal and the agency flow recommendations would not likely have an appreciable
38 effect on fishing overall. By contrast, removal of J.C. Boyle dam would diminish the number of days of
39 acceptable angling flows by 15 to 90 percent in almost all months of below average and average water
40 years and completely eliminate acceptable angling flows during 4 months in above average water years.

41 Regarding kayaking opportunities, in average and above average water years, PacifiCorp’s and
42 the Bureau of Land Management’s measures would provide only occasional opportunities during April,
43 May, and June and essentially no opportunities in July through October. However, there would be
44 frequent opportunities for kayaking in July through October under the Oregon Fish & Wildlife flow
45 recommendation and dam removal in all three water year types, and our conclusion is that there could be
46 substantially more technical kayaking use of the bypassed reach under the Oregon Fish & Wildlife flow
47 recommendation or with dam removal.

1 J.C. Boyle Peaking Reach. The analysis we present in section 3.3.6.2.2, *River Recreation*,
2 concludes that continued peaking operations as PacifiCorp proposes would provide enhanced whitewater
3 boating (commercial rafting) opportunities at the peaking reach, particularly in above average water years
4 (see figures 3-98 to 3-100). In general, it would provide between 20 and 30 days per month from June
5 through October in below average and average water years and from July through October during above
6 average water years. Our conclusion is that commercial rafting use of the peaking reach would likely
7 increase somewhat under PacifiCorp's Proposal. Because the increase in whitewater flow days would be
8 primarily in above average water years when flows would likely be high in other regional rivers as well,
9 the expected increase in use would likely not be proportional to the increase in whitewater flow days.

10 The Bureau of Land Management measure would provide about 4 days a month between June
11 and October, which would represent only about 13 to 20 percent of the days that would be provided by
12 PacifiCorp's proposed flow measure. Commercial rafting opportunities would be largely eliminated
13 between April and October under the Cal Fish & Game and Oregon Fish & Wildlife measures and dam
14 removal scenarios, each of which would result in run-of-river operation (see figures 3-98 to 3-100).

15 With respect to angling opportunities in the peaking reach, we conclude in section 3.3.6.2.2, *River*
16 *Recreation*, that the opportunities associated with PacifiCorp's proposal and the agency recommendations
17 would all be roughly comparable to current conditions.

18 Copco 2 Bypassed Reach. The analysis we present in section 3.3.6.2.2, *River Recreation*,
19 concludes that the agency recommendation and dam removal scenario would enhance whitewater boating
20 opportunities in this reach by providing about 15 to 30 days a month with boatable flows from June
21 through October (figures 3-107 to 3-109), while PacifiCorp's proposed operation would provide less than
22 10 days per month and these would occur primarily in April and May, and only in average and above
23 average water years. Very few days with angling opportunities within an acceptable range of flows
24 would occur under any of the flow-related measures or the dam removal scenario (see figures 3-110 to 3-
25 112). We conclude that whitewater boating use of the bypassed reach could increase under the agency-
26 recommended flows or dam removal scenario.

27 Below Iron Gate Dam. Whitewater boating opportunities below Iron Gate dam are affected by
28 the base flow requirements set by the NMFS BiOp. Because this is not a project-related effect, we do not
29 consider its effect on recreational boating.

30 As we note in our discussion of other recreational use of the project, it is not usually possible to
31 reliably translate a change in opportunities to a change in actual recreation days. Following the same
32 rationale we established in table 3-109, table 3-110 shows the change in spending that would result from a
33 5 or 15 percent increase in participation in river-based activities if spending per person per day remained
34 constant. For example, a 5 percent increase in the number of whitewater boating days in the downstream
35 subregion would bring total non-local visitor spending in the 5-mile corridor to \$390,239 to \$605,585 per
36 year (about \$18,600 to \$28,800 above 2002 spending), while a 15 percent increase in recreation days
37 would bring spending in the same area to \$427,404 to \$663,260 per year (about \$55,800 to \$86,500 above
38 2002 spending). In the downstream subregion, a 5 percent increase in sport river fishing would raise
39 spending in the 5-mile corridor to \$725,445 (about \$34,500 more than in 2002), and a 15 percent increase
40 would raise spending in the same area to \$794,535 (about \$103,600 above 2002 spending). Thus, the
41 flows proposed by PacifiCorp and recommended by agencies that would potentially increase recreation
42 days would generally increase recreational spending in the 5-mile corridor, and even in the 50-mile
43 corridor, by less than \$100,000 per year, and probably substantially less. On the other hand, flow
44 measures or dam removal that would reduce or eliminate activities, such as commercial rafting in the J.C.
45 Boyle peaking reach, could eliminate \$465,567 to \$739,374 in spending in the upstream and downstream
46 region 5-mile corridor and \$2.2 million to \$2.5 million in spending in the 50-mile corridor. Because
47 commercial outfitters that run trips on the peaking reach depend on that reach for most of their business,
48 those that could not run trips on other rivers would likely go out of business.

1 Table 3-110. Annual recreation use and associated expenditures of total and non-local visitors engaged
 2 in whitewater boating and river-based angling in the upstream and downstream
 3 subregions in 2002 and with 5 percent and 15 percent growth. (Source: PacifiCorp,
 4 2004a, and staff)

Primary Activity	Recreation Days (User Days)	Expenditure Per Person Per Day (\$)	Total Expenditure			
			Local and Non-local Visitors	Non-local Visitors to the Project Area	Non-local Visitors, 5-Mile Corridor	Non-local Visitors, 50-Mile Corridor
Upstream Subregion^a						
Whitewater Boating - 2002	5,090	\$134.25 - \$149.35	\$683,333 - \$760,191	\$55,736 - \$63,880	\$93,911 - \$162,626	\$627,597 - \$696,311
+5 percent	5,345		\$717,500 - \$798,201	\$58,523 - \$67,074	\$98,607 - \$170,757	\$658,977 - \$731,127
+15 percent	5,854		\$785,833 - \$874,220	\$64,096 - \$73,462	\$107,998 - \$187,020	\$721,737 - \$800,758
Downstream Subregion^a						
Whitewater Boating - 2002	13,673	NA	\$1,566,226 - \$1,771,319	NA	\$371,656 - \$576,748	\$1,566,226 - \$1,771,319
+5 percent	14,357	NA	\$1,644,537 - \$1,859,885	NA	\$390,239 - \$605,585	\$1,644,537 - \$1,859,885
+15 percent	15,724	NA	\$1,801,160 - \$2,037,017	NA	\$427,404 - \$663,260	\$1,801,160 - \$2,037,017
River Sport Fishing - 2002	28,432	NA	\$1,486,990	NA	\$690,900	\$655,070
+5 percent	29,854	NA	\$1,561,340	NA	\$725,445	\$687,824
+15 percent	32,697	NA	\$1,710,039	NA	\$794,535	\$753,331

5 ^a 2002 figures are from table 3-106.

6 NA = estimates not available

7 3.3.8.2.3 Commercial Fishing, Recreational Ocean Fishing, and the Tribal 8 Fishery

9 As we describe in section 3.3.3.1.5, *Salmon and Steelhead Harvest and Harvest Management*,
 10 PFMC harvest-related actions for fall Chinook salmon are triggered by whether there are predicted to be
 11 at least 35,000 natural spawners returning to the Klamath River in a given year. Where insufficient
 12 returns to the Klamath River trigger restricted fishing seasons or closures, the economic effects go far
 13 beyond the value of the Klamath River salmon, because the season is restricted or closed for other fish as
 14 well. Thus, virtually all of the measures proposed by PacifiCorp or recommended by other parties that
 15 would affect Klamath River fall Chinook salmon also would affect the commercial, tribal, and
 16 recreational ocean fishery. Because all those fisheries depend upon the same fish populations, we discuss
 17 the socioeconomic effects of all the fisheries here. We describe the relevant proposed and recommended
 18 resource measures and their potential effects on aquatic resources in detail in sections 3.3.3.2.1, *Instream*
 19 *Flows*; 3.3.3.2.2, *Fish Passage*; 3.3.3.2.3, *Disease Management*; 3.3.3.2.4, *Dam Removal or*
 20 *Decommissioning*; and 3.3.3.2.5, *Anadromous Fish Restoration*.

21 *Our Analysis*

22 Table 3-106 in section 3.3.8.1.2, *Project-related Economic Sectors*, indicates that spending in the
 23 5-mile and 50-mile corridors related to recreational ocean fishing equaled \$4.3 million in 2002, which
 24 makes it by far the most important recreational economic sector related to management of the Klamath

1 River Project. That spending was associated with 93,235 recreation days, including 7,612 commercial
2 user days and 85,623 private user days. Table 3-107 in the same section indicates that personal income
3 from the KMZ personal salmon fishery ranged from \$3.1 to \$8.1 million dollars from 1976 through 2005,
4 with preliminary figures equaling \$3.3 million in 2005 (in 2005 real dollars), or 59 percent below the
5 1986-1990 average. This decline is associated primarily with decreasing angler trips, which in turn are
6 based on fewer fish and the shorter fishing seasons prescribed by PFMC.

7 Table 3-108 in the same section indicates that personal income from the KMZ commercial troll
8 salmon fishery averaged \$43.1 million annually from 1976 to 1980, fell to as low as \$1.2 million from
9 1991 through 2000, and since 2000 has ranged between \$13.8 million in 2003 and a preliminary figure of
10 \$4.1 million in 2005 (PFMC, 2006). The lower figures since the 1970s are attributable to many factors,
11 but particularly to declining numbers of fish and the resulting restricted fishing season.

12 As we describe in section 3.3.8.1.2, *Project-related Economic Sectors*, the value of the tribal
13 commercial fishery in 2001 is estimated at about \$195,590 (PacifiCorp, 2004a). Salmon are also an
14 important subsistence resource, which we discuss below in section 3.3.8.2.4, *Minority and Low Income*
15 *Populations*.

16 In addition to the adverse effect that declining Klamath River stocks have had on incomes in the
17 KMZ communities, the effect of harvest restrictions has had a much more widespread effect, leading to
18 harvest restrictions throughout the entire west coast fishery. In June 2006, California Governor
19 Schwarzenegger proclaimed a state of emergency in 10 California counties due to PFMC's harvest
20 restrictions along the coast of California and Oregon. Reports in the press cite a figure of \$81 million in
21 losses "that fishermen and fishing dependent communities are expecting to endure because of the
22 Klamath River fishery collapse" (Whitney, 2006).

23 In our analysis, we define several scenarios as a means of analyzing the results of combining
24 various proposed and recommended measures with respect to instream flows, fish passage, disease
25 management, anadromous fish restoration, and dam removal or decommissioning. For the reasons
26 described in detail in section 3.3.3.2, we summarize our conclusions as follows:

27 Best Case Without Dam Removal. The best case that does not include dam removal would
28 provide for volitional passage or trap and haul passage to the upper basin, and would have to solve the
29 mainstem corridor disease problems. The estimated results of this scenario would include the following:

- 30 • Chinook salmon ocean troll harvest in the KMZ returned to the 1986 to 1989 levels of
31 12,000 to 43,000 fish (see table 3-54);
- 32 • Chinook salmon ocean sport harvest in the KMZ returned to the 1986 to 1989 levels of
33 6,000 to 21,000 fish (see table 3-54);
- 34 • steelhead recreational harvest back to the 1985 to 1987 levels of 4,000 to 7,000 fish (see
35 table 3-56);
- 36 • an additional 3,000 to 30,000 fall Chinook salmon due to successful passage (see table 3-
37 76);
- 38 • an additional 1,300 to 2,700 spring Chinook salmon due to successful passage (see table
39 3-76); and
- 40 • an additional 300 to 400 steelhead due to successful passage (see table 3-76).

41 Best Case With Dam Removal. Removing Iron Gate and Copco 1 dams, providing volitional or
42 trap and haul fish passage at Copco 2 and J.C. Boyle, and solving the mainstem corridor disease problems
43 would be the best combination of actions for restoring the economic benefits associated with recreational,
44 commercial, and tribal fishing. This option is the most likely route to successfully addressing problems
45 with the downstream migratory corridor, and would allow inundated habitat within the project to return to

1 production. It would produce results as good as or better than those described above for the *Best Case*
2 *Without Dam Removal* scenario.

3 Middle Ground. Implementing measures that would not ensure that fish passage is immediately
4 successful and that left some mainstem corridor disease issues unresolved would lead to a middle ground
5 situation, including the following:

- 6 • Chinook salmon ocean troll quotas in the KZM remaining at the 2005 and 2006 levels of
7 7,100 to 8,400 adult fish (see table 3-53);
- 8 • Chinook salmon ocean sport quota in the KZM remaining at the 2005 and 2006 levels of
9 900 to 1,200 adult fish (see table 3-53);
- 10 • Chinook salmon federally recognized tribal harvest quota remaining at the 2005 and 2006
11 levels of 8,300 to 10,000 adult fish to the Yurok and Hoopa tribal fisheries;
- 12 • no rebound in steelhead recreational harvest; and
- 13 • minimal increase in fall Chinook salmon, spring Chinook salmon, and steelhead due to
14 successful passage.

15 Worst Case. In the worst case, mainstem corridor disease conditions would continue to worsen,
16 and there would be no commercial, recreational, or tribal harvest of KMZ stocks. This would be the case
17 regardless of whether fish passage was provided through the project.

18 Given these assumptions, the effect of relicensing on the local economy and the whole coastal
19 economy would largely depend upon the degree to which the conditions of any new license address the
20 issue of disease problems in the mainstem corridor, and thus the health of the Chinook salmon and the
21 salmon fisheries.

22 **3.3.8.2.4 Minority and Low Income Populations**

23 In section 3.3.8.1.1, *Demographic Characteristics*, we note that the per capita income of the
24 American Indian population in each of the six counties in the study region is about 50 percent lower than
25 that observed for the entire population in each of the counties. Additionally, with the exception of Curry
26 County, the counties in the study region have a substantially higher percentage of low-income population
27 among the American Indian population compared to the overall population. Because of the importance of
28 salmon to the tribal culture, the aquatic resource measures discussed above are equally relevant to project
29 effects on minority and low income populations.

30 *Our Analysis*

31 As noted in section 3.3.3.1 5, *Salmon and Steelhead Harvest and Harvest Management*, the
32 subsistence fishery has sometimes exceeded the tribes' commercial fishery, but in 2003 and 2004 the
33 trend was reversed, with the commercial harvest more than double the subsistence fishery. The
34 subsistence fishery provides a cultural benefit as well as a health benefit, however, based on the role of
35 salmon in the tribal culture and because of the high levels of diabetes and heart disease found among (at
36 least) the Karuk Tribe (Norgaard, 2005). Norgaard's findings are consistent with the results of
37 epidemiological studies conducted on tribes in various locations in the United States. For example,
38 Smith-Morris (2004) reports that more than half of Pima Indians (southern Arizona) over 35 years of age
39 have diabetes. The Indian Health Service (2006) states that diabetes is 4 to 8 times more common in
40 American Indians compared to the general U.S. population. The causes for this disproportionately higher
41 rate of diabetes (and its associated diseases, including heart and kidney disease) among Native Americans
42 are believed to include genetics (e.g., the thrifty gene [Neel, 1982]), and a change from a traditional diet
43 to a "modern" diet high in fat and carbohydrates. We also note, however, an increasing trend in these
44 diseases in the U.S. population at large. According to the Center for Disease Control and Prevention, the

1 number of Americans with diagnosed cases of diabetes increased from 5.8 million in 1980 to 14.7 million
2 in 2004, a 153 percent increase in 24 years (CDC, 2006). Risk factors for the population as a whole have
3 been identified as obesity, inactivity, and family history, among others.

4 The best, middle ground, and worst cases discussed above are relevant to the effects of
5 relicensing on minority and low income populations, as follows:

6 Best Case With or Without Dam Removal. Given the level of salmon restoration that could be
7 achieved by implementing measures that would provide for volitional passage or trap and haul passage to
8 the upper basin and would solve the mainstem corridor disease problems, this scenario would have a
9 substantial positive effect on the harvest quotas available to the tribes to restore their commercial and
10 subsistence salmon harvest to levels seen in the 1980s. Increased salmon populations and harvests would
11 in turn allow access to a more traditional diet and lifestyle for the Karuks (and other tribes), resulting in
12 improved physical, cultural, and spiritual health. Because it would include the restoration of salmon to
13 areas where they have not been since construction of the Copco development in the early 1900s, this
14 scenario would benefit the Klamath Tribe as well as the downstream tribes.

15 Middle Ground. Implementing measures that would not ensure that fish passage is immediately
16 successful and that left some mainstem corridor disease issues unresolved would likely lead to a status
17 quo or continued deterioration of salmon abundance in the river, which would at best leave the tribes in
18 their current state and would at worst exacerbate their low income status.

19 Worst Case. If measures are not implemented to substantially improve mainstem corridor disease
20 conditions, the harvest of KMZ stocks could easily be eliminated entirely, exacerbating the low income
21 status of the tribes that depend on the Klamath River stocks for income and cultural and dietary purposes.

22 **3.3.8.3 Cumulative Effects**

23 **3.3.8.3.1 Fisheries**

24 Employment has grown consistently in the six-county region in the past 25 years, but at a pace
25 slower than the Oregon and California averages. Employment growth has been accompanied by a shift in
26 jobs away from the manufacturing sector and into other sectors, including services, retail trade, and
27 government, as well as agriculture in some areas. Historically, communities along the coast were
28 dependent on ocean commercial and recreational sportfishing. Along with commercial fishing, the
29 coastal communities also depended on the packing and processing plants that prepared the fish for market.
30 However, most of the packing and processing plants, whose employment used to be reported as part of
31 the manufacturing sector, have closed.

32 The effects of continued project operation under PacifiCorp's proposed alternative, with
33 implementation of measures recommended by other parties, or by retiring various developments would
34 conflate with the effects of other past, present, and reasonably foreseeable future actions. A particularly
35 important factor in the assessment of cumulative effects on socioeconomic resources is a pending action
36 by PFMC, which in June 2006 began analysis of a range of alternatives to amend the Salmon Fishery
37 Management Plan by which it manages the fall Chinook salmon harvest in the KMZ (see section
38 3.3.3.1.5, *Salmon and Steelhead Harvest and Harvest Management*, for additional information). PFMC is
39 scheduled to adopt a preferred alternative for public review in September 2006 and take final action in
40 November 2006. If PFMC adopts an alternative that provides some minimal level of ocean fishing
41 opportunities even in years when Klamath River Chinook salmon escapement is not expected to reach the
42 target of 35,000 adult spawners, that action alone could increase the income potential associated with
43 recreational and commercial ocean fishing by millions of dollars annually, regardless of the measures that
44 are implemented at the Klamath River Project. Such an action would temper the effects we describe
45 above with respect to the middle ground and worst case scenarios on the ocean sport and commercial
46 fisheries, as well as the tribal fishery.

1 Also important are the future actions taken by other parties. Because the blockage of Chinook
2 salmon from historical upstream habitat is not solely the result of the project dams, the actions of other
3 agencies, including Reclamation, would continue to affect the likelihood of salmon recovery in the
4 Klamath River Basin, either supporting or running counter to actions taken at the Klamath River Project.

5 3.3.8.3.2 Agriculture

6 During scoping for the Klamath River Project relicensing, several parties raised the issue of the
7 April 16, 2006, expiration of the 1956 Contract between the California Oregon Power Company (Copco,
8 which preceded PacifiCorp as owner of the Klamath Project) and Interior, which, among other things,
9 provided energy at below-market rates to Klamath Irrigation Project irrigators (see section 2.1.1.2, *Keno*
10 *Development*). Expiration of the contract would increase the price of electricity used by irrigators to
11 pump water to and through their irrigation systems, jeopardizing the profitability and even the continued
12 viability of some agricultural operations. In light of the 1956 Contract expiration, the Oregon Public
13 Utilities Commission and the California Public Utility Commission initiated proceedings to set the rates
14 for irrigators that formerly received power under the contract. Both states ruled that the irrigators should
15 be included under their standard irrigation rates. However, both states included “rate shock” provisions,
16 whereby the transition to market rates would be phased in over a 4-year (California) to 7-year (Oregon)
17 period.

18 In a detailed evaluation of the relationship of energy pricing and irrigated agriculture in the upper
19 Klamath River Basin, an Oregon State University Extension Service study (Jaeger, 2004) reported the
20 following:

- 21 (1) Under the contract, PacifiCorp has been providing energy to irrigators at about one-tenth the
22 rate PacifiCorp charges irrigators not covered by the contract;
- 23 (2) Costs of farming would increase by roughly \$40 per acre if the irrigators were paying market
24 rates¹³¹;
- 25 (3) Profits accruing to landowners using sprinkler irrigation would decline significantly with a
26 change in energy pricing, but farming would not become unprofitable on Class II and Class
27 III irrigated lands,¹³²
- 28 (4) Sprinkler-based irrigated agriculture could become unprofitable on 193,000 Class IV and
29 Class V lands, including about 88,000 acres in the Klamath Irrigation Project and 65,000
30 acres outside the irrigation project; and
- 31 (5) Irrigation diversions could decline as a result of price-induced water conservation on some
32 irrigated lands and the cessation of irrigation on other lands.¹³³

¹³¹Jaeger (2004) provides more detailed estimates of per acre costs based on variations in crops, crop rotation, technology, pump size, number of acres irrigated, etc., and uses \$40 per acre as a central estimate based on both energy consumption data and engineering estimates.

¹³²Farmland soils are classified according to soil capability classes as follows: Class I soils have slight limitations that restrict their use; Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices; Class III soils have severe limitations that reduce the choice of plants or require special conservation practices, or both; Class IV soils have very severe limitations that restrict the choice of plants or require very careful management, or both; Class V soils have little or no hazard of erosion but have other limitations, impractical to remove, that limit their use mainly to pasture, range, forestland, or wildlife food and cover. Classes VI through VIII are not considered suitable for agriculture.

1 Jaeger concludes that most of the irrigated lands in the upper Klamath River Basin, and
2 particularly those in the Klamath Irrigation Project, are highly productive and would continue to be
3 profitable, although owners would experience lower profits. Nonetheless, water diversions would likely
4 decline, especially on Class IV and V lands devoted to hay and pasture, which would become unprofitable
5 to irrigate at higher energy prices. The effects are likely to unfold over time because of the multi-year
6 phase-in of market rates provided for by the Oregon and California Public Utility Commissions. With
7 respect to actions implemented at the Klamath River Project as the result of a new license, any actions
8 that would have adverse socioeconomic effects would add to the negative consequences of this loss of
9 agricultural profit, while measures that had positive socioeconomic effects might offset some or all of the
10 agricultural income loss to the regional economy.

11 **3.3.8.4 Unavoidable Adverse Effects**

12 If the project is relicensed as proposed, it would continue to block anadromous fish from the
13 upper Klamath River Basin. Water quality conditions downstream of Iron Gate dam would continue to
14 adversely affect Chinook salmon and steelhead during their outmigration through the lower Klamath
15 River. This would continue to have a depressing effect on socioeconomic sectors dependent on the
16 salmon harvest.

17 **3.3.9 Cultural Resources**

18 **3.3.9.1 Affected Environment**

19 **3.3.9.1.1 Definition of Cultural Resources, Historic Properties, Effects, and Area** 20 **of Potential Effects**

21 Historic properties are cultural resources listed or eligible for listing in the National Register of
22 Historic Places (National Register). Historic properties can be buildings, structures, objects, districts (a
23 term that includes historical and cultural landscapes), or sites (archaeological sites or locations of
24 important events). Historic properties also may be resources of traditional religious and cultural
25 importance to Native American tribes that meet the National Register criteria; these properties are known
26 as Traditional Cultural Properties (TCPs). In most cases, cultural resources less than 50 years old are not
27 considered eligible for the National Register. Cultural resources also have to have enough internal
28 contextual integrity to be considered historic properties. For example, dilapidated structures or heavily
29 disturbed archeological sites may not have enough contextual integrity to be considered eligible.

30 Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (Section
31 106), requires “federal agencies” including the Commission, to consider the effects of their undertakings
32 on historic properties. An undertaking means a project, activity, or program funded in whole or in part
33 under the direct or indirect jurisdiction of a federal agency, including, among other things, processes
34 requiring a federal permit, license, or approval. The Advisory Council on Historic Preservation’s
35 (Advisory Council’s) regulations implementing Section 106 define effects on historic properties as those
36 that change characteristics that qualify those properties for inclusion in the National Register. In this
37 case, the undertaking is the proposed issuance of a new license for the project; potential effects of

¹³³Jaeger does not estimate the total decline in irrigation diversions that could occur, but notes that one-fifth (30,000 acres) of the Class IV and V sprinkler-irrigated lands represent about 7 percent of the total irrigated acres in the upper basin but only about 3.5 percent of the net income from irrigated agriculture. The consumptive water use on these 30,000 acres of hay and pasture is about 75,000 acre-feet (Jaeger, 2004).

1 relicensing may result from day-to-day operation and maintenance of the project, or from other actions
2 required by the license, such as those associated with land or natural resource management, or recreation.

3 Determination of effects on historic properties first requires identification of historic properties in
4 the area of potential effects (APE) of an undertaking. The Advisory Council's regulations define the APE
5 as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in
6 the character or use of historic properties, if any such properties exist. APEs for relicensing of
7 hydroelectric projects normally include lands within the project boundary as it is delineated in the existing
8 FERC license, plus any locations outside the project boundary where continued project operations may
9 affect the character or use of historic properties. PacifiCorp's proposed APE for the Klamath
10 Hydroelectric Project is based on its proposal to modify the existing project by decommissioning certain
11 developments, modifying others, and adding the Spring Creek diversion to the project (see section 2.2.1,
12 *Proposed Project Facilities*). This proposed APE includes all project hydropower facilities, recreation
13 sites, and proposed wildlife enhancement lands, and encompasses all lands within the current project
14 boundary, all lands within PacifiCorp's proposed project boundary (see section 2.2.4, *Proposed Project*
15 *Boundary*), and river reaches downstream of each development.

16 The Advisory Council's regulations also require the Commission to seek concurrence from the
17 State Historic Preservation Officer (SHPO) on any finding involving effects or no effects on historic
18 properties, and allow the Advisory Council an opportunity to comment on any finding of adverse effects.
19 In addition, the regulations require the Commission to consult with interested Native American tribes that
20 might attach religious or cultural significance to historic properties within the APE.

21 3.3.9.1.2 Culture History Overview

22 The project is located in a region of overlapping cultural traits from the California, Great Basin,
23 and Columbia Plateau culture areas. The earliest human occupation of the area occurred in the
24 Paleoarchaic period (12,000 to 7,000 years before present [B.P.]). These people were hunter-gatherers
25 with a broad-spectrum subsistence economy geared toward large game animals and supplemented by fish,
26 birds, and plants. High seasonal and annual mobility, low population densities, and a technology geared
27 toward maximum flexibility define this period. The Early Archaic period (7,000 to 4,500 B.P.) witnessed
28 the first use of semisubterranean house pits in the Plateau region, suggesting at least some people were
29 living a less mobile lifestyle. During the Middle Archaic period (4,500 to 2,500 B.P.), there was an
30 increased use of riverine and marsh environments (salmon and root species). The Late Archaic/Late
31 Prehistoric period (2,500 to 200 B.P.) saw numerous changes to the social framework, including the
32 widespread use of pit houses, a heavy reliance on fishing, the use of storage pits for salmon, exploitation
33 of the roots and bulbs of the camas lily, and emergence of seasonal land use patterns. This is the period
34 when bow and arrow technology developed. Extensive trade networks were in place by 1,500 B.P., as
35 evidenced by archaeological sites containing obsidian tools made from material found at sources more
36 than 100 miles away.

37 At the time of contact with Euroamericans in the early 19th century, seven Native American tribes
38 of various language groups counted portions of the Klamath River drainage as part of their ancestral
39 territories. The Klamath and Modoc tribes, as well as some elements of the Snake peoples, were located
40 in the upper reaches of the drainage. The Shasta (whose territory primarily consisted of river systems
41 located at an elevation above 2500 feet) were represented along the Klamath River by one of the tribe's
42 four internal subgroups, the Wairuhikwaiiruka or Kammatwa. The Karuk tribe was most closely
43 associated with the middle reaches of the Klamath River, while ancestral territory of the Yurok included
44 not only the lowest reach of the river and mouth but also stretches along the Pacific coast. The Hoopa
45 were less closely associated with the mainstem of the Klamath River, their ancestral territory focused
46 more on the Trinity River, a main tributary of the Klamath River.

1 Although the Klamath River tribes are from various language groups and have their own distinct
2 cultural traditions and practices, they derived their cultures and subsistence wholly (the Klamath, Shasta,
3 Hoopa, and Karuk), or in large part (the Yurok), from the river and its aquatic and terrestrial resources.
4 Salmon, steelhead, and other fish (such as suckers and lampreys), taken with weirs, nets, baskets,
5 harpoons or spears occupied central place in the diets of these peoples. As a result, fish (particularly
6 salmon) were at the foundation of the tribes' settlement and seasonal subsistence patterns and at the core
7 of their belief systems.

8 The Klamath River tribes also made extensive use of a wide variety of plants from riparian and
9 upland environments not only for food but also as raw material for clothing, tools, weapons and domestic
10 items, and for medicinal and ceremonial purposes. Although the particular biotic environments each of
11 the tribes occupied were the primary plant sources for each tribe, extensive travel and trading up and
12 down the river made plant materials from throughout the Klamath River drainage (and beyond) available
13 to all the tribes. The Yurok manufactured canoes from fallen redwood, as did the Klamath from
14 ponderosa pine. Roots of redwood, pine, spruce, alder, willow and cottonwood were gathered, most
15 frequently along the river banks where they were easily harvested with minimal disruption of the trees
16 themselves. Riparian environments were a rich source of edible fruits (huckleberry, gooseberry, currant,
17 grapes, and sallal), and upslope locations provided filberts and acorns. Other food was derived from
18 wocas (yellow pond lily), cattail, camas bulbs, and a wide variety of seeds and roots. Plant materials such
19 as willow shoots and bark, hazel withes, grapevines, beargrass, ferns, nettle, cattail, tule, and woodwardia
20 found use in the manufacture of nets, baskets, and other items. Even leaves of wild iris, gathered at much
21 higher elevations, were used to make fine mesh nets. Geologic and topographic elements (particular
22 rocks or landforms along the river, as well as upland locations) were featured prominently in the tribes'
23 cultural "maps" of their ancestral territories, as places of year-round or seasonal settlement, traditional
24 fishing, hunting and gathering sites, and sites of spiritual and ceremonial significance.

25 The arrival of Euroamericans in the region greatly affected tribes along the Klamath River.
26 Native populations suffered from introduced diseases, the dislocation and ultimately forced relocation of
27 survivors, disruption of traditional subsistence patterns and resources, and eventual suppression of native
28 religious practices and language in non-Indian schools. The earliest Euroamericans to appear were
29 trappers, who arrived in the mid-1820s in search of fur-bearing animals. Next to come, during the period
30 of 1841-1855, were scientific expeditions, among them the Klamath Exploring Expedition of 1850 which
31 looked for potential gold mining sites and locations for settlement.

32 Permanent Euroamerican settlement in the Klamath River watershed began in the 1850s, on the
33 heels of prospectors for gold. Completion of the Southern Emigrant Road, also known as the Applegate
34 Trail, in 1846 brought prospectors to the region and helped to establish communities such as Henley
35 (Cottonwood), Gottville, Happy Camp, and Somes Bar. Fertile soil, level terrain, and plentiful water
36 sources also made various portions of the area favorable for agriculture and ranching. Large scale
37 settlement did not occur, however, until after 1875 when the Topsy Grade Road was completed. This
38 road could accommodate wagons and served as the main stage and mail route between Yreka, California
39 and Linkville (Klamath Falls), Oregon.

40 Mining proved of limited importance in the Euroamerican development of the region, despite its
41 effect on native inhabitants, and logging did not occur to any substantial degree until railroads reached the
42 area. The Oregon & California Railroad (O&CRR) was the first railway through the region (1877),
43 extending from Siskiyou County, California, to Jackson County, Oregon, en route from Sacramento to
44 Portland. Other local railroads, developed to support logging operations, eventually supplanted the stage
45 lines. The Southern Pacific Railroad Company acquired the O&CRR that same year, and by 1909
46 connected the Klamath River area to a nationwide market. Rail connection outside the local area
47 provided relatively inexpensive and efficient transport for agricultural commodities to wider markets.

1 The local timber industry began in the 1860s with a sawmill constructed by the United States
2 Army along the Wood River near Fort Klamath (1863), and a privately owned sawmill in the Keno,
3 Oregon area (1869). Sustained logging enterprises first appeared in the mid- to late 1880s. Early
4 companies were small, family-run businesses typically run by ranching families trying to supplement their
5 income. In the early 1890s, larger scale logging companies such as Pokegama Sugar Pine Lumber
6 Company and Klamath River Lumber and Improvement Company were established on the north rim of
7 the Klamath River Canyon. The settlements that grew up around the logging companies provided loggers
8 and businessmen with multiple services, including stores, post offices, and schools. Local ranchers and
9 farmers frequently provided meat and produce to adjacent logging camps.

10 The acreage available for agriculture was greatly increased following the passage of the
11 Reclamation Act by the United States Congress in 1902. The act allowed for a new round of
12 homesteading as portions of the Klamath basin were “reclaimed” from wetlands for agricultural use.
13 Increased demand for arable lands led to initiation of the Klamath Irrigation Project in 1905. Seven dams
14 (including Link River dam), hundreds of miles of irrigation ditches and canals, and 45 pumping plants
15 were eventually built under the auspices of Reclamation for the project. Reclamation homestead
16 allotments took place from 1917 to 1949.

17 Also in the early 1900s, the federal government created refuges within the Klamath watershed to
18 preserve some areas of wetlands for wildlife habitat. In 1908, President Theodore Roosevelt created the
19 80,000-acre Lower Klamath Lake National Wildlife Refuge. The Tule Lake and Upper Klamath Lake
20 National Wildlife Refuges were created in 1928. Wildlife conservationists were not pleased when
21 portions of the Tule Lake National Wildlife Refuge, approximately 22,000 acres, were released to
22 homesteading in the 1940s. In 1964, passage of the Kuchel Act ended homesteading on lands in the area
23 of the Klamath Hydroelectric Project.

24 Although timber production declined in the early 1900s, the industry began to improve around
25 1910. In the mid-1920s, the Weyerhaeuser Timber Company built a major mill in Klamath Falls and was
26 a major economic power in the area for decades. Rapid growth in the lumbering business occurred in the
27 1920s, resulting in construction of numerous spur railroads to support logging efforts and increased use of
28 mechanized equipment. The Depression, however, brought operations to a halt. By 1932, timber
29 production had fallen to 55 percent of the pre-Depression volume, and roughly half of all timber-related
30 jobs were lost. Logging revived during World War II, but fell on hard times again in the late 20th century.

31 The first hydroelectric development in the Klamath basin was established in 1891 in the Shasta
32 River Canyon below Yreka Creek to provide electricity to the town of Yreka. Four years later, the
33 Klamath Falls Light & Water company built a generating facility on the east bank of the Link River
34 (known as East Side) to supply power to the community of Klamath Falls. Both ventures soon attracted
35 competitors: the Siskiyou Electric Power Company’s Fall Creek plant (1903) serving Yreka, and the
36 Klamath Light & Power Company’s West Side plant on the Link River (1908) serving Klamath Falls.

37 By 1912, these and many other small producers throughout the region were brought together as
38 the California-Oregon Power Company (Copco). Copco subsequently embarked on a period of major
39 expansion, with its Copco No. 1 development (1918, expansion 1921-22) the first on the Klamath
40 mainstem, and Copco No. 2 (1925). As a result of Reclamation’s construction (1921) of Link River dam
41 for the Klamath Irrigation Project, Copco rebuilt the old East Side facility (1924) and expanded the West
42 Side plant (1920s). After World War II, regional population growth prompted a new round of
43 hydroelectric power expansion with Copco’s Big Bend (1958) and Iron Gate (1962) developments.
44 While Iron Gate was still under construction, Copco was merged into Pacific Power & Light (today
45 PacifiCorp). In 1966, a new regulating dam replaced a 1931 dam of equivalent function that had replaced
46 an older dam and powerhouse built by the Keno Power Company in the early years of the 20th century.

47 Of the seven Native American tribes in the Klamath River drainage, two (Hoopa and Yurok)
48 today have their own reservation lands in this area—the Hoopa around the Trinity River, and the Yurok

1 on the lower reaches of the Klamath River. Tribes whose ancestral territories lie upriver have
2 experienced different fates.

3 In the Klamath Treaty of 1864, the federal government set off a large area at the headwaters to
4 which it relocated surviving Klamath, Modoc, and Yahooskin, today together known as “The Klamath
5 Tribes.” Ninety years later, however, both their government-recognized tribal status and their reservation
6 were terminated, resulting not only in loss of the land base but also of much of their tribal identity.
7 Through lengthy court action, the Klamath Tribes were able to regain their status as a federally
8 recognized tribe in 1986, but have had to acquire such land as they now hold on their own.

9 The California Gold Rush and Rogue River Wars (1850-1857) pushed most of the Shasta out of
10 their traditional Oregon and Northern California territory. The increasingly marginalized people formed
11 small communities near ranches throughout northwest California and southwestern Oregon, including
12 those at Frain Ranch and Bogus Tom Smith’s Rancheria in the Klamath River area. These communities
13 were able to benefit somewhat from a 1910 amendment to the 1887 Dawes Act, that made vacant land
14 available to “landless” Native Americans if properly allotted by an Indian Agent, but the Shasta have no
15 official reservation or formal U.S. government recognition. Some Shasta, along with Karuk and Upper
16 Klamath, live at the Quartz Valley Rancheria, established in 1938 as the Shasta and Upper Klamath
17 Indian Reservation. Federal supervision of this Quartz Valley Reservation was terminated in 1967; since
18 then the tribe has been gradually reacquiring land.

19 The Karuk Tribe, today one of the largest tribes in California, has a very small land base. The
20 federal government did not establish a reservation specifically for the Karuk (although as indicated above
21 some Karuk are members of the Quartz Valley Rancheria). Most Karuk live in Siskiyou County,
22 primarily in the districts of Orleans, Happy Camp, and Yreka, and in the Forks of the Salmon region. The
23 Karuk Tribe gained federal recognition in the 1980s.

24 The Klamath River Reserve in traditional Yurok territory was created by Executive Order in
25 1856; it encompassed a mile of land on each side of the Klamath River from the Pacific Coast to Tectah
26 Creek, approximately 20 miles. The U.S. government established the Reserve with the intent of
27 relocating members of the Yurok, Tolowa, and Hoopa Valley tribes. However, only the Yurok and a few
28 Tolowa moved. As a result of an 1864 treaty (unratified) with the Hoopa and several other tribes, the
29 Superintendent of Indian Affairs for the state of California that year announced the location of a new
30 Hoopa Valley Reservation, the boundaries of which were formally defined 13 years later in an Executive
31 Order. This reservation, early on known as “the square” for its shape, was established around the Trinity
32 River from its confluence with the Klamath. In 1891, the Hoopa Indian Reservation was enlarged (again
33 by Executive Order) to include the Yurok Tribe’s Klamath River Reserve plus an “extension” covering 1
34 mile on either side of the Klamath River between the two formerly separate reservations. The following
35 year, the entire newly-constituted reservation was opened to non-Indian settlement (following government
36 “allotment” of selected land for tribal use), resulting in substantial displacement, particularly of members
37 of the Yurok Tribe. Some Yurok eventually settled on the Resighini Rancheria near Klamath, California,
38 a tract of land within the Klamath Reserve acquired by the federal government from rancher Augustus
39 Resighini under the Wheeler-Howard Act of 1934.

40 In 1988, the Hoopa Valley Reservation created in 1891 was partitioned into two: the original
41 Hoopa square (for the Hoopa Valley Tribe), and a reservation for the Yurok that included both the
42 original 1855 reservation at the mouth of the Klamath and the later upriver “extension.” Within it lies the
43 Resighini Rancheria, federally recognized in 1975 as the Coast Indian Community of the Resighini
44 Rancheria.

45 **3.3.9.1.3 Prehistoric and Historic Archaeological Resources**

46 Prior to delineating its APE, PacifiCorp, in conjunction with the Cultural Resources Working
47 Group made up of agency stakeholders and tribal representatives delineated a field inventory corridor for

1 purposes of archaeological survey. This field inventory corridor encompassed the current and proposed
2 project boundaries, riparian and hydrologically connected areas along project-affected reaches, and
3 culturally sensitive lands within the Klamath River Canyon from ridgetop to ridgetop, or rim to rim.

4 PacifiCorp contracted with Historical Research Associates (HRA) to complete a pedestrian
5 survey of the field inventory corridor. HRA defined pedestrian transect intervals based on landform and
6 vegetation cover, but these transects were to be at greater than 10-meter intervals and oriented parallel to
7 watercourses. At least one crew member was instructed to walk in (if dry) or adjacent to watercourses to
8 systematically examine cut bank soil exposures. The pedestrian survey began in 2002 and was finished in
9 2003. This survey resulted in the documentation of 165 archaeological sites.

10 The prehistoric sites are divided into five types: (1) open-air sites, with flaked stone artifacts
11 only; (2) open-air sites, with flaked stone and ground stone artifacts; (3) village or temporary habitation
12 sites without apparent house pit features; (4) village or temporary habitation sites with house pit features;
13 and (5) special use sites (burial sites, rockshelters, pictograph sites, and quarries). HRA recommended 93
14 prehistoric sites, or components of sites, as potentially eligible for the National Register, although further
15 testing would be required to verify their information potential. HRA also obtained sufficient field
16 information to conclude that an additional 33 prehistoric sites or components appeared to meet National
17 Register Criteria without the need for further survey. PacifiCorp agrees with HRA's evaluations.

18 The consultants identified five areas of multiple prehistoric sites, which are probably associated
19 and are all located in the same section of the river, as a potential National Register district. This potential
20 archaeological district would include:

- 21 • various sites in the vicinity of Link River, including a house pit village site (JS-04) and Site
22 CB-05, and sites near Upper Klamath Lake;
- 23 • a complex of non-house pit sites near Teeter's Landing (FH-14, FH-15, and FH-16);
- 24 • sites in the vicinity of J.C. Boyle reservoir (35KL1942, CB-2, CB-3, CB-20, JS-7, JS-5,
25 JC03-9, and JC03-10);
- 26 • a fishing station complex called Laik'elmi (collectively Sites 35KL554/35KL17, 35KL20,
27 and 35KL21/35KL786) on the west bank and 35KL567, 35KL18, 35KL578, 35KL19, and
28 35KL23/35KL566 on the east bank in the upper Klamath River Canyon; and
- 29 • three large village sites (CA-SIS-2403, JC03-01, and CB-10) near Copco reservoir.

30 Another archaeologist (Mack, 2003), who has been conducting research in the region unrelated to
31 project relicensing, has suggested that the Freedom Site (CA-SIS-1721) and Lion's Village (CA-SIS-
32 2646), located near one another on the east side of the Klamath River just below the California-Oregon
33 border, and isolated finds associated with both sites, may also constitute a National Register-eligible
34 prehistoric archaeological historic district.

35 Identified historic-period archaeological sites are categorized according to six historical themes:
36 (1) logging; (2) agricultural settlements or features (homesteads); (3) commercial or educational
37 enterprises; (4) cemeteries; (5) public works (hydroelectric); and (6) transportation. Sites yielding limited
38 data, such as ditches, rock walls, and piled rock in agricultural fields are described as "minor agriculture-
39 related sites." Four historic-period trash scatters could not be applied to any specific theme. HRA's
40 evaluation states there are nine historic sites or components of sites potentially eligible for and six historic
41 sites or components eligible for the National Register. PacifiCorp agrees with HRA's evaluations.

42 One potential historic period archaeological district is the Frain Ranch, which is associated with
43 an early homesteader and the beginning of ranching and agriculture within the upper Klamath River
44 Canyon. Included within the Frain Ranch property are the main ranch area (35KL578H) and portions of
45 Sites 35KL567, 35KL1083, and JC03-29.

1 **3.3.9.1.4 Historic Buildings and Structures**

2 No buildings or structures in the APE have been listed in the National Register. PacifiCorp’s
3 cultural resource team conducted a survey and evaluation of all project facilities 41 years old or older in
4 2003 and prepared site documentation and individual resource forms, for potentially significant
5 hydroelectric resources. PacifiCorp prepared a multiple property submission for the entire project to
6 document these interrelated resources and multimodal groupings. The survey and evaluation documented
7 110 structures.

8 PacifiCorp and its consultants have evaluated 60 out of 110 structures as retaining sufficient
9 integrity to relate their association with the project and possessing significance for association with the
10 industrial and economic development of southern Oregon and northern California. National Register-
11 eligible resources include dams, water conveyance features (flumes, penstock lines, penstock intakes,
12 spillways, spillgates, headgates, pipelines, spillway houses, tunnels, surge tanks, earthen canals),
13 powerhouses, turbines, generators, substations, warehouses, gatehouses, gate hoist system/rails, guest
14 houses, houses and garages, a mortared stone wall, timber cribbing, a coffer dam, an oil and gas shed, a
15 cookhouse/bunkhouse, a transformer house/office, and a fish hatchery. The California SHPO provided its
16 opinion that none of the Iron Gate complex’s structures are eligible for the National Register (letter from
17 Dr. K. Mellon, State Historic Preservation Officer, California Office of Historic Preservation, to M.
18 Strickler, Hydro Resources Project Manager, PacifiCorp, dated May 28, 2003).

19 **3.3.9.1.5 Traditional Cultural Properties**

20 As a result of deliberations with the Cultural Resources Working Group, PacifiCorp funded tribal
21 ethnographic studies prepared by the Klamath, Shasta, Karuk, and Yurok tribes. These studies combined
22 ethnography with extensive oral interviews to describe each tribe’s culture and relationship to the
23 Klamath River.¹³⁴ Although functioning as tribe-specific documents, they were also intended to be used
24 in a separate, “integration” report on the importance of the river to the area’s Native Americans as a
25 whole.

26 The Klamath Tribes’ report (Deur, 2003), based largely on oral interviews and site visits on the
27 part of the consultant in company with interviewees, identified 11 “riverine and lacustrine” locations
28 (including settlements and fishing stations) associated with the tribes’ historical, cultural, and economic
29 reliance on salmonid fisheries as potential TCPs. Link River, Big Bend, and Miller Island Oxbow were
30 locations of major settlements and associated burial and ceremonial sites, as well as numerous
31 encampments and fishing sites. The latter was also an important center for wocas (yellow pond lily) seed
32 collection. The other eight potential TCPs lie further upriver on the headwaters: (1) Chiloquin Forks; (2)
33 Braymill/Cave Mountain; (3) Beatty Springs; (4) Knapp’s Dam/Williamson River Canyon; (5) the mouth
34 of the Wood River; (6) Klamath March/Wocus Bay; (7) Olene Gap; and (8) Rocky Ford/Jackson Creek.
35 The first five sites were all traditional salmonid fishing sites. The last three locations were of importance
36 to Klamath subsistence and culture, as gathering sites (particularly Klamath Marsh), and camp sites for
37 hunting and trout fishing.

38 The Karuk and Yurok ethnographies were in particular designed as foundations for the
39 “integration” report. The Karuk Tribe’s report (Salter, 2003) presented a broad discussion of the tribe’s
40 use of natural resources (flora, fauna, and geological resources) within the Klamath River corridor and the
41 traditional centrality of the river and its resources (particularly salmon) to the tribe’s subsistence, its
42 material and spiritual culture, and identity. The report used ethnographic and other writings to describe

¹³⁴As of this writing, the Shasta Tribe’s ethnographic report has not been completed nor filed with the Commission. A preliminary, partial draft containing results of review of ethnographic literature was however included in a confidential technical appendix to PacifiCorp’s final license application (Daniels, 2003).

1 the natural setting and early patterns of Karuk habitation in the river basin. Interviews with tribal
2 members focused on their own and their recalled use of the river and its resources (water, fish, cultural
3 features, and vegetation).

4 The Yurok Tribe’s report (Sloan, 2003) also drew upon extensive ethnographical literature in its
5 presentation of this tribe’s historical relationship to the Klamath River, organized around the topics of
6 natural resources (water, fish, landforms, vegetation), cultural features (ceremonial practices, fishing
7 places, geologic features, gathering, and habitation), and other topics such as transportation,
8 communication, language, and relations with neighboring up-river tribes.

9 The Klamath River Inter-Tribal Fish and Water Commission (KRITWFC) incorporated
10 information from these tribal studies, plus information provided by the Hoopa Valley Tribe from a
11 previous study unrelated to the relicensing of the Klamath River project, in the “integration report”
12 (King, 2004) focusing on the Klamath River as a cultural “riverscape” potentially eligible for the National
13 Register for its association with the broad patterns of tribal culture including environmental stewardship,
14 spiritual and ceremonial tradition and practice, and subsistence. This approach was developed through a
15 “regulatory analysis” prepared by the Yurok Tribal Heritage Preservation Office (Gates, 2003) that
16 classified the riverscape as a form of district (a district being one of the five types of historic properties
17 defined in National Register Criteria), specifically an ethnographic/cultural landscape with a river as its
18 focus. Elements contributing to the potentially eligible riverscape, as described in the integration report,
19 include the Klamath River and its associated water and landforms, its “living population” of fish,
20 terrestrial fauna and plants, and specific locations associated with cultural beliefs and/or practices,
21 including but not limited to archaeological sites.

22 **3.3.9.2 Environmental Effects**

23 In this section we consider how actions proposed by PacifiCorp and other parties could affect
24 cultural resources. We consider project operations first, and then move on to consider the proposed
25 actions to manage cultural resources.

26 **3.3.9.2.1 Effects of Project Operations on Cultural Resources**

27 *Historic Buildings and Structures*

28 Buildings and structures require maintenance, repair, and sometimes replacement of components
29 if they are to remain functional. However, necessary repairs and upgrades to the structures could degrade
30 the character-defining elements that qualify these resources for inclusion in the National Register.
31 Underused historic buildings and structures are vulnerable to deterioration or even removal. In this
32 section, we evaluate the effects that proposed and alternative operations would have on historic project
33 facilities (e.g., dams, powerhouses) and on buildings and structures historically associated with these
34 facilities.

35 PacifiCorp proposes to continue operating the J.C. Boyle, Copco No. 1, Copco No. 2, Fall Creek
36 (including the Spring Creek diversion facilities), and Iron Gate developments, and to undertake minor
37 modifications at all but Copco No. 2 to improve operations or to manage aquatic resources. PacifiCorp
38 also proposes to decommission East Side and West Side developments, and to remove Keno
39 development from the licensed project.

40 *Our Analysis*

41 With continued project operation, historic facilities such as the dams and powerhouses would
42 remain in active use, since they are integral to the functioning of the hydroelectric project. Other
43 buildings and structures may become obsolete or simply unnecessary to project operation, potentially
44 leaving them vulnerable to neglect or demolition. Continued use of historic buildings and structures, as

1 proposed by PacifiCorp for the developments retained in the project, would enhance the likelihood that
2 they would be repaired as needed and maintained in good condition.

3 The decommissioning and removal from the project license of East Side and West Side
4 developments would end the Commission’s jurisdiction over these historic hydroelectric facilities, and
5 potentially remove the facilities from the protection afforded by NHPA. No longer in productive use,
6 these facilities could be adversely affected by demolition or by abandonment without provision for proper
7 maintenance and repair. With decommissioning, the Commission would require PacifiCorp to include in
8 its decommissioning plans provisions for resolution of such adverse effects to historic project facilities,
9 developed in consultation with the Oregon SHPO. This would also hold true for decommissioning any
10 other generating development in the project except for Iron Gate, whose facilities and related buildings
11 and structures the CA SHPO has determined ineligible for inclusion in the National Register.

12 *Archaeological Sites*

13 Archaeological sites can be disturbed by any action (natural, animal, or human) that disturbs or
14 destabilizes the soils or ground surfaces on which they occur. Sites on shorelines may be eroded by
15 natural or project flows, changes in water levels and by wind- or boat-induced wave action. During
16 drawdowns, normally inundated sites may be revealed and are subject to damage, both from authorized
17 recreational activities and also from illegal “pothunting” (removal of artifacts) along the shorelines. Sites
18 in upland locations may experience erosion from wind action or when their soils slide following heavy
19 rains. Public use of both developed and “informal” recreation areas, as well as use of OHVs, frequently
20 result in surface and subsurface disturbances that damage or destroy archaeological sites. Although many
21 recreation-related effects to archaeological resources may be inadvertent, vandalism and unauthorized
22 artifact collection are also associated with public use. Additionally, archaeological sites are susceptible to
23 disturbance from grazing, excavation of irrigation canals, and construction of agricultural access roads.

24 In its application, PacifiCorp has argued that bank erosion in the Boyle peaking reach and below
25 Iron Gate dam is attributable to flows above full project capacity (3,000 cfs at J.C. Boyle, 1,800 cfs at
26 Iron Gate), and therefore that the effects of erosion to archaeological sites above the geographic limits of
27 project capacity are not caused by project operations. However, the application also notes that
28 archaeological sites “very close to the active channel” could be affected by project effects on
29 geomorphology and sediment transport. In its revised HPMP, PacifiCorp also maintains that because the
30 adjacent land-managing agency (Bureau of Land Management) regulates public access and recreational
31 activities along the J.C. Boyle peaking reach, any effects to archaeological sites resulting from land use
32 such as grazing and recreation are not attributable to the project.

33 *Our Analysis*

34 Fluctuation of water levels can destabilize soils and lead to seepage failure that affects not only
35 shorelines but also archaeological materials that may be present in those soils. Erosion of soils containing
36 archaeological materials can result in displacement or loss of artifacts, and also to exposure of artifacts
37 making them vulnerable to unauthorized collecting or inadvertent damage. Because the project has
38 limited ability to control high flows, it would follow that erosion from flows beyond the project’s capacity
39 would not be attributable to project operations. In section 3.3.1.2.1, *Shoreline Erosion*, we conclude that
40 the evident erosion of certain archaeological sites in the Boyle peaking reach and below Iron Gate dam is
41 attributable to extreme high flow events beyond the project dams’ limited ability to control. However, as
42 discussed in section 3.3.1.2.5, *Fluvial Geomorphic Effects on Riparian Vegetation*, project-related flow
43 fluctuations are inhibiting recruitment and growth of riparian vegetation in the fluctuation zones, which
44 could leave landforms containing archaeological sites vulnerable to destabilization and erosion. We
45 therefore conclude that archaeological sites within geographic range of project capacity, including both
46 below Iron Gate and in the J.C. Boyle peaking reach, could be affected by continued project operations.

1 The surface visibility of many archaeological sites leaves them vulnerable to damage or
2 destruction. During archaeological surveys commissioned by PacifiCorp, archaeologists noted numerous
3 instances of pothunting on reservoir margins, particularly at Keno and J.C. Boyle reservoirs.
4 Archaeologists also described effects of vandalism and looting on sites in the river reaches, including the
5 J.C. Boyle peaking reach. To the extent of PacifiCorp's obligations under the license to provide
6 recreational and other public uses of project lands and waters, effects resulting from public access to
7 locations containing archaeological sites may be considered attributable to project operations.
8 PacifiCorp's HPMP contains measures for monitoring and, as necessary, further treatment of
9 archaeological sites affected by the project, including those potentially subject to adverse effects from its
10 proposed recreational measures (see section 3.3.6, *Recreation Resources*). We analyze PacifiCorp's
11 proposals and agencies' recommendations for treatment of archaeological sites threatened by vandalism
12 and other inappropriate activity in section 3.3.9.2.3, *Treatment of Archaeological Resources*.

13 The decommissioning of East Side and West Side developments, and the removal of these and
14 Keno development from the project license, would end the Commission's jurisdiction over lands
15 containing significant archaeological resources, potentially removing them from the protection afforded
16 by NHPA. Additionally, removal of the hydroelectric facilities and re-grading could involve substantial
17 ground disturbance by mechanical equipment and could inadvertently damage or destroy sites. In the
18 event of decommissioning, the Commission would require PacifiCorp to include in its decommissioning
19 plans provisions for resolution of adverse effects to archaeological sites and TCPs, developed in
20 consultation with the SHPOs. This would also hold true for decommissioning of any other development
21 in the project.

22 *Traditional Cultural Properties*

23 The Klamath Project area has been used by Native peoples since prehistoric times, and their
24 modern day descendants continue to do so today. Places and elements (including but not limited to
25 archaeological sites) that tribes consider part of their traditional culture and history may be affected in
26 various ways by project operation, depending on the kind of resource and source or agent of the effect. In
27 subsection *Archaeological Resources*, we previously discuss the effects of proposed and alternative
28 operations on archaeological resources, a class of resources that includes prehistoric sites that Native
29 Americans also value as traditional cultural properties.

30 As discussed in section 3.3.9.1.5, *Traditional Cultural Properties*, studies by the Klamath Tribes
31 have identified three locations in or adjacent to the project that they recommend as eligible for the
32 National Register as TCPs. These TCPs (Link River, Miller Island and Big Bend) have played important
33 roles in the subsistence—and therefore cultural—traditions of the tribes, as locations in which the natural
34 environment offered good fishing and gathering and hunting areas. Similarly, but on a larger scale, the
35 Klamath Riverscape encompasses archaeological sites, locations of traditional subsistence and ceremonial
36 activities, and associated natural environment of landforms, moving water, fish and terrestrial resources.

37 Under PacifiCorp's proposed decommissioning of East Side and West Side developments, the
38 reach between Link River dam and Keno reservoir, would be removed from the project and from the
39 Commission's jurisdiction, thereby also removing the Link River TCP (within which is a location for
40 traditional ceremonial activities that has been recorded as an archaeological site) from the protections
41 afforded by NHPA. On the other hand, the Millers Island Oxbow TCP (in which no archaeological sites
42 have been identified) is located in the Klamath National/State Wildlife Area and would therefore remain
43 under federal jurisdiction in the event that Keno development was removed from the project.

44 The Klamath Tribes describe the Big Bend TCP on the J.C. Boyle bypassed reach as the former
45 location of an important village and trading center visited by Shastas, Modocs, and Klamath as well as a
46 salmon fishing site, and as such remains important in the cultural traditions of the Klamath Tribes. No
47 known Native American archaeological sites are associated with this TCP. PacifiCorp proposes to

1 improve fishing access along the lower portion of Big Bend with installation of parking, an ADA-
2 accessible fishing access platform, and an improved access trail.

3 *Our Analysis*

4 The decommissioning of East Side and West Side developments would end the Commission’s
5 jurisdiction over lands in which the Link River TCP is located, potentially removing all or portions of this
6 TCP from the protection afforded by NHPA. Additionally, removal of hydroelectric facilities and re-
7 grading could involve substantial ground disturbance by mechanical equipment that could inadvertently
8 damage or destroy archaeological or other features that contribute to the significance of this TCP. In the
9 event of decommissioning, the Commission would require PacifiCorp to include in its decommissioning
10 plans provisions for resolution of such adverse effects, developed in consultation with the Oregon SHPO.
11 This would also hold true for decommissioning of any other development in the project.

12 We would not anticipate that removal of Keno development from the licensed project would
13 adversely affect the Miller Island Oxbow TCP, as that action would not involve any actions involving
14 ground disturbance in that area, and the land containing the TCP would remain under federal jurisdiction
15 through FWS ownership.

16 Enhancement of fishing access along Big Bend near the J.C. Boyle powerhouse, as proposed by
17 PacifiCorp, could increase opportunities for Native Americans to use a traditional fishing area. However,
18 such opportunities would also be available to the public at large, and increased visitation could result in
19 inadvertent or purposeful damage or destruction of landforms and other resources at Big Bend that are
20 associated with the TCP at this location.

21 With respect to the Klamath Cultural Riverscape, our resource-specific analyses (sections 3.3.1,
22 *Geology and Soils*, 3.3.2, *Water Resources*, 3.3.3, *Aquatic Resources*, and 3.3.4, *Terrestrial Resources*)
23 show that project operations as proposed by PacifiCorp would continue to affect resources that contribute
24 to the significance of the Klamath Cultural Riverscape. Measures for addressing these effects are
25 presented in the following section.

26 **3.3.9.2.2 Management of Cultural Resources**

27 As part of its application, PacifiCorp drafted an HPMP (revised in March 2006 in response to
28 Commission comments) describing the policies and procedures it proposes to follow to manage cultural
29 resources in the project over the term of a new license. In this section we analyze key components of
30 PacifiCorp’s HPMP and also recommendations for cultural resource management from agencies.

31 *Area of Potential Effects*

32 In section 3.3.9.1.1 we provide the Advisory Council’s definition of an APE, and describe the
33 original and subsequent (March 2006) APE proposed by PacifiCorp as the geographic extent of its
34 cultural resource management responsibilities under a new license. PacifiCorp’s original APE was based
35 on the existing project. PacifiCorp subsequently revised its proposed APE to reflect its proposal to
36 decommission East Side and West Side developments and to remove Keno development from the project;
37 PacifiCorp’s currently proposed APE thus essentially conforms to PacifiCorp’s proposed project
38 boundary. The SHPOs, agencies, and tribes have not concurred with PacifiCorp’s proposed APE.

39 *Our Analysis*

40 The issuance of a license to operate a hydroelectric project is considered a federal undertaking
41 subject to Section 106 of NHPA. In the licensing process, the Commission uses existing conditions as the
42 baseline for its assessment of the effects of licensing. The minimum APE for hydroelectric project
43 relicensing customarily encompasses all lands within an existing project boundary, as well as those areas

1 outside the project boundary, regardless of ownership, in which continued operation of a project could
2 affect cultural resources. PacifiCorp's originally proposed APE is generally consistent with this
3 customary minimum APE. PacifiCorp's currently proposed APE, however, would exclude lands
4 (including portions of the existing project) for which the Commission needs to consider the effects of the
5 proposed decommissioning and removal from the licensed project on cultural resources.

6 Inclusion of land within an APE does not mean that an undertaking would affect any or all
7 cultural resources within that area. An APE is a hypothetical construct intended to establish a geographic
8 framework in which there is reasonable possibility that an undertaking could affect historic properties. As
9 such, it is a starting point for analyses that uses information about historic properties and the nature and
10 scale of the undertaking to determine whether or not the undertaking would affect historic properties, and
11 if so, which properties, in what ways, and to what extent. Once this determination is made, appropriate
12 measures to resolve any adverse effects (through avoidance, minimization or mitigation), and the
13 geographic area, or areas, in which such measures should be applied, can be identified.

14 On the basis of the foregoing considerations, we conclude that the APE for relicensing the
15 Klamath Hydroelectric Project appropriately encompasses (1) the entirety of the APE as delineated by
16 PacifiCorp in its October 2004 draft HPMP and (2) that portion of the river reach from Iron Gate dam to
17 the Scott River confluence. We have included this reach below Iron Gate dam in consideration of
18 geographic extent of project alterations to geomorphic processes, water quality and quantity, riparian
19 vegetation, and aquatic resources, which, in turn, affect cultural resources in this area.

20 *Treatment of Historic Project Facilities*

21 In its HPMP, PacifiCorp has proposed a series of review procedures that include consultation
22 with the appropriate SHPO, to evaluate and minimize adverse effects on historic project facilities.
23 PacifiCorp also proposes to develop within 1 year of license issuance Historic Resource Maintenance
24 Guidelines for use by staff responsible for repair and maintenance of historic project facilities.

25 *Our Analysis*

26 Development and implementation of Historic Building Maintenance Guidelines, as proposed by
27 PacifiCorp, would ensure that significant characteristics of historic buildings and structures are not
28 inadvertently damaged, inappropriately altered, or lost. When adverse effects on historic buildings or
29 structures, such as alterations affecting their historical integrity or demolition, cannot be avoided,
30 consultation with the SHPO as proposed by PacifiCorp in the "Review Procedures for Evaluating and
31 Minimizing Adverse Effects on Historic Properties" appendix of its HPMP, would ensure that such
32 adverse effects are resolved in a manner consistent with the requirements of section 106 of NHPA.

33 *Treatment of Archaeological Sites*

34 A first step in treatment of archaeological resources is assessment of their existing condition and
35 periodic monitoring thereafter to determine whether the condition of a given resource has changed, and if
36 so, why. Monitoring may indicate that project operations do, or are likely to, adversely affect the
37 condition of a resource. In that case, the next step is to develop and implement treatments to repair
38 damage where possible, and prevent further deterioration or loss. Such treatments take into consideration
39 the type and significance of the resource as well as the agent and extent of the effect. For archaeological
40 sites and traditional cultural properties, stabilization, fencing or barriers to access, and redirection of
41 activities away from resource locations are examples of common treatments. Resources that are
42 stabilized remain in place, protected by vegetative or other coverings from further harm. Data recovery
43 (removal of archaeological materials from a threatened site) is a treatment of last resort, to collect and
44 preserve information from the site when the site cannot be preserved in place.

1 In its March 2006 HPMP, PacifiCorp developed an archaeological monitoring plan responding to
2 major kinds of effects to National Register-eligible archaeological sites within its proposed APE. The
3 plan has two separate but related operational components. The first is a plan to patrol archaeologically
4 sensitive (and vulnerable) areas to monitor effects of public access (authorized and unauthorized) on
5 archaeological resources. The patrol program would be developed and implemented in consultation with
6 appropriate law enforcement officials, and would be coordinated with drawdown schedules, seasonal
7 changes in public use, and observed threats such as illicit artifact collection.

8 The second component of this plan is an inspection program, conducted by professional
9 archaeologists, to monitor conditions of sites in reservoir drawdown zones that are or may be affected by
10 erosion. Annual inspection during the first 3 years of implementation would produce baseline
11 information regarding site conditions and stability that would be used to reprioritize, if appropriate,
12 frequency of inspection or further treatment.

13 PacifiCorp has prioritized these ongoing treatment measures depending upon site conditions and
14 known threats. Priority 1 sites would be scheduled for monitoring and patrol every 4 months, Priority 2
15 sites every 8 months, and Priority 3 sites every 12 months, in all cases beginning within 6 months of
16 license issuance. Results would be reviewed annually, and sites reprioritized as appropriate based on
17 these results and also results of any further treatments (such as stabilization or capping).

18 As site conditions indicate, PacifiCorp would implement further treatment to protect threatened
19 archaeological sites within its proposed APE. Schedules for implementation would be based on the
20 priority assigned to each site. PacifiCorp's HPMP describes a wide variety of possible treatment
21 measures. Measures to restrict access include closure of informal roads and tracks, and of informal
22 recreational use sites; limitation of OHV use; modification or elimination of ranching activities; and
23 closure of selected developed recreation areas immediately adjacent to or within a large, significant
24 archaeological site. Other measures include capping sites with gravel, using native vegetation to conceal
25 sites, and erecting signage that directs visitors away from sensitive areas. PacifiCorp has also identified
26 several measures for erosion control at sites along reservoir shorelines, such as armoring with bulkheads
27 or revetments, installation of hay bales to deflect wave surges, and emplacement of geotextile fabric,
28 gabions, or in-water wave booms.

29 Although PacifiCorp has not proposed any specific data recovery actions, it identifies site CA-
30 SIS-2579 as a possible candidate for emergency data recovery if subsurface testing indicates that the site
31 is eligible for the National Register. In the event that any data recovery actions are needed during the
32 license term, PacifiCorp proposes to consult first with the SHPO and tribes. If the action is to occur on
33 federal land, PacifiCorp assumes that the relevant federal land management agency would formally
34 consult with the tribes and SHPO regarding the proposed investigation.

35 The Bureau of Land Management specifies that PacifiCorp conduct archaeological survey on
36 77.2 acres of Bureau of Land Management land (delineated by the Bureau of Land Management as Units
37 A through P) located within the APE as originally proposed by PacifiCorp that were not covered in
38 PacifiCorp's pre-application surveys. These lands are located along the J.C. Boyle bypassed reach at Big
39 Bend and along the J.C. Boyle peaking reach.

40 The Bureau of Land Management specifies that PacifiCorp revise its HPMP to specifically
41 provide for monitoring and (as necessary) further treatment of archaeological sites on Bureau of Land
42 Management land within the APE. The Bureau of Land Management also specifies that PacifiCorp
43 include at least 20 percent of sites on Bureau of Land Management managed land in the APE in its annual
44 site monitoring, and prepare an annual report to the tribes and the Bureau of Land Management regarding
45 monitoring and other actions. PacifiCorp's alternative 4(e) conditions to the Bureau of Land
46 Management's 4(e) conditions would limit the geographical scope of those measures to the Bureau of
47 Land Management land within the project boundary as delineated in the new license.

1 Interior recommends that PacifiCorp develop and implement an erosion protection program
2 within 1 year of license issuance, to protect and stabilize cultural resources affected by unauthorized OHV
3 and other human causes. Interior also recommends that PacifiCorp's monitoring plan should be
4 developed in consultation with the tribes and the Bureau of Indian Affairs and should include use of
5 surveillance cameras and periodic patrols that include tribal staff equipped with communications
6 equipment for notification of local law enforcement.

7 The Oregon SHPO recommends that PacifiCorp consult with the tribes, SHPO and appropriate
8 land managers, and sign a Memorandum of Agreement, prior to capping any archaeological sites.

9 *Our Analysis*

10 PacifiCorp's proposed archaeological monitoring program provides appropriately differing
11 approaches toward addressing the different effects caused by public access and shoreline erosion and
12 determining the most appropriate ways to resolve those effects. Development and implementation of the
13 patrolling program in consultation with appropriate law enforcement agencies should ensure that the roles
14 and responsibilities of the patrol members are clearly and appropriately established, and that the methods
15 and equipment used during patrols are appropriate for the task. Involvement of state and federal law
16 enforcement organizations, as well as county officials, in development of the patrolling program would be
17 appropriate given the amount of public land in or adjacent to the project. Efforts to include tribal
18 members as part of the trained patrol staff, as recommended by Interior would enhance tribal involvement
19 in protection and management of resources important in their traditions and cultures.

20 Consistent with Interior's recommendation, PacifiCorp's proposed archaeological inspection
21 program includes provisions for close monitoring to determine the rates and variation of erosion at sites
22 along reservoir margins. This information would provide a basis for determining which treatment
23 measures are appropriate for each site. The inspection program also provides for inspection of sites in the
24 project that are damaged by other means, including OHVs, and the development and implementation of
25 appropriate protective measures. Consistent with Oregon SHPO's recommendation PacifiCorp would
26 consult with the tribes and SHPOs regarding protective site treatments (including data recovery, if
27 necessary) on a case-by-case basis prior to implementation of any such treatment. Consultation with the
28 appropriate federal land management agency would also be appropriate in the event that the affected site
29 in question is on or immediately adjacent to federal land.

30 Concerning the Bureau of Land Management's 4(e) conditions and PacifiCorp's alternative
31 conditions, regarding identification and treatment of archaeological sites on Bureau of Land Management
32 land, we conclude that completing archaeological identification surveys within those portions of Units L
33 through P lying within geographic limits of project capacity in the J.C. Boyle peaking reach, and in Units
34 B, D, F, and G on the inside of the J.C. Boyle bypassed reach at Big Bend, would ensure that any
35 significant archaeological sites in those locations that could be affected by project operations or project-
36 related recreational enhancements would be appropriately treated.

37 *Treatment of Traditional Cultural Properties*

38 In its draft HPMP, PacifiCorp proposes to provide the tribes with the opportunity to review and
39 comment in advance of any proposed action, and to consult with the tribes, SHPOs, appropriate land
40 management agencies, and the Commission in the event that a National Register-eligible TCP would be
41 affected by such action.

42 *Our Analysis*

43 TCPs (including cultural landscapes) can encompass a wide variety of resource types requiring
44 very different kinds of management and protection. For example, a prehistoric archaeological site in
45 which cultural materials lie inert within a soil matrix should be preserved in place to the greatest extent

1 practicable, while a native plant species important to Native American culture and subsistence is dynamic,
2 subject to its natural life cycles as well as conditions brought about by human and natural forces.
3 Therefore, although individual plants cannot be “preserved in place” in the same manner as an
4 archaeological site, external conditions can be modified, enhanced, or maintained to maintain
5 environments conducive to the continuance of that plant species as a whole. Although PacifiCorp has
6 proposed no measures specific to treatment of TCPs, nor have any such measures been recommended by
7 others, in sections 3.3.1, *Geology and Soils*, 3.3.2, *Water Resources*, 3.3.3, *Aquatic Resources*, and 3.3.4,
8 *Terrestrial Resources*, we describe and analyze proposed and recommended measures to address effects
9 of project operations on such resources, and thereby, by extension, to address effects of project operations
10 on TCPs consisting of or containing such resources. Implementing such measures also would resolve
11 many, if not all, of the existing project-related adverse effects on the various contributing elements
12 associated with the Klamath Cultural Riverscape.

13 *Other Cultural Resource Management Measures*

14 PacifiCorp’s draft HPMP includes a variety of other measures for management of cultural
15 resources and implementation of the HPMP:

- 16 • Appointment of a Historic Properties Coordinator responsible for overseeing implementation
17 of the HPMP.
- 18 • Review of the HPMP every 3 years, with revision of the HPMP, as appropriate, based on
19 previous years’ results and experience, and on comments from the SHPOs and tribes; annual
20 review of applicable state/federal laws to determine if there have been changes that require
21 revision of the HPMP or changes to procedures; and annual contact with representatives of
22 the tribes to discuss the status of historic properties management in the project and any
23 potential changes to management measures.
- 24 • Annual training sessions for PacifiCorp staff that interact with the public or conduct activities
25 potentially affecting historic properties. PacifiCorp would sponsor the attendance of a
26 representative of the Klamath Tribes or the Shasta Tribe at each training session.
- 27 • Pre-action review by the Historic Properties Coordinator of planned actions involving ground
28 disturbance in accordance with procedures for review and consultation with SHPOs,
29 appropriate tribes, and appropriate land management agencies specified in the HPMP.
- 30 • Development of public educational materials and programs that provide information about
31 cultural resources, their significance, the need for their protection, and applicable laws, as
32 part of PacifiCorp’s proposed Interpretation and Education Plan.
- 33 • Implementation of specific protocols specified in the HPMP in the event of inadvertent
34 discovery of a previously unknown cultural resource or human remains.
- 35 • Development and implementation, in consultation with the SHPOs and the Bureau of Land
36 Management Klamath Falls and Redding Resource Offices, of guidelines meeting federal and
37 state standards for curation of archaeological materials recovered in the project, including
38 those owned by PacifiCorp that are temporarily in the possession of individual researchers
39 and/or universities outside the Oregon/northern California region. Possible curation facilities
40 to be considered are the museum at the Klamath Tribes’ headquarters and the University of
41 Oregon’s Museum of Natural History.
- 42 • Confining implementation of the HPMP to resources and locations within PacifiCorp’s
43 proposed project boundary.

1 The Bureau of Land Management specifies that PacifiCorp consult with the Bureau of Land
2 Management and the tribes every 5 years to determine whether the HPMP needs to be revised.

3 Interior recommends that PacifiCorp, in consultation with the tribes, SHPO and the Bureau of
4 Indian Affairs, develop a vandalism awareness program to educate visitors and local area residents about
5 legal and ethical implications of disturbing or destroying cultural sites. Interior also recommends that
6 PacifiCorp develop a program to provide tribal members with access to traditional gathering areas, while
7 at the same time limiting access by others.

8 Oregon SHPO recommends that the state Commission on Indian Services be contacted, along
9 with the SHPO, state police, and tribes, in the event of discovery of human remains in Oregon.

10 Interior recommends that PacifiCorp invite tribal staff to participate in its annual emergency plan
11 exercise and meeting. Interior also recommends that PacifiCorp allocate annual funding for tribal staff
12 participation in cultural resource-related programs.

13 *Our Analysis*

14 PacifiCorp's proposals to appoint an Historic Properties Coordinator with local knowledge of the
15 project's cultural resources, familiarity with applicable state and federal laws and regulations, and
16 professional experience in cultural resources management, and to review (and as appropriate, revise) the
17 HPMP every 3 years would provide a sound basis for implementation of the HPMP over the license term.
18 Review every 3 years would enable more timely revision of the document than would review every 5
19 years as specified by the Bureau of Land Management. PacifiCorp's proposal for annual discussion with
20 the tribes on the status of overall cultural resources management would provide a regularly scheduled
21 forum for tribal expression of views and recommendations about management of cultural resources.
22 Affording appropriate federal land-management agencies the opportunity to comment, along with the
23 SHPOs and tribes, on proposed revisions to the HPMP would ensure that federal agencies with interest in
24 the management of cultural resources on or adjacent to their lands would be able to contribute their views.

25 PacifiCorp's proposal to conduct annual training sessions for staff involved with the public or
26 involved in planning and implementation of actions potentially affecting significant cultural resources
27 would ensure that new employees are educated in a timely manner. These sessions would also ensure that
28 all employees are regularly informed about issues, procedures and protocols regarding cultural resource
29 management in the project. Inviting the participation of a tribal representative at each training session
30 would contribute toward staff understanding of Native American perspectives on cultural resources.

31 PacifiCorp's implementation review procedures during the planning of various actions, and
32 protocols for inadvertent discovery of previously unknown cultural resources and human remains, as
33 specified in its HPMP would ensure that significant cultural resources are not inadvertently harmed by
34 project-related actions, and that resources and human remains would be appropriately treated. Including
35 the Oregon State Commission on Indian Services in notification of any discoveries of human remains on
36 lands of that state, as recommended by the Oregon SHPO, would enable the state to participate, as
37 appropriate to its jurisdiction, in decisions regarding the treatment of those remains.

38 PacifiCorp's proposal to develop public information materials and programs about cultural
39 resources, their significance, the need for their protection, and applicable laws as part of its larger
40 Interpretation and Education Plan, would provide an effective vehicle for educating the public about
41 vandalism, its effects, and its potential legal consequences.

42 PacifiCorp's proposal to develop and implement guidelines for curation of archaeological
43 materials recovered in the project that are in accordance with federal and state requirements would ensure
44 that such materials are properly conserved and also accessible, under properly controlled conditions, to
45 those with appropriate research or cultural interests.

1 Native peoples continue to reside in the project area and carry on traditional practices that include
2 the use of traditional plants. Efforts to protect locations where traditional plants occur and to provide
3 access to these locations to members of the tribes, as recommended by Interior would assist with the
4 continuation of traditional practices over the term of any license issued for the project.

5 Tribal participation in PacifiCorp’s annual emergency plan exercise and meeting, as
6 recommended by Interior, is not an issue for the Commission to consider in relicensing. The
7 Commission’s Portland Regional Office coordinates site-specific Emergency Action Plans, and would
8 have information pertaining to these activities.

9 Financial support for tribal participation in measures related to cultural resources management in
10 the project, as recommended by Interior, could potentially enhance the involvement of interested tribal
11 members who might otherwise find it difficult to participate.

12 Commission staff intends to execute a programmatic agreement stipulating that PacifiCorp
13 complete and file a final HPMP with the Commission within 1 year after license issuance. In the event of
14 the decommissioning of portions of the existing project, the Commission would most likely require
15 PacifiCorp to develop and implement one or more decommissioning plans. Such plans would specify
16 measures by which the Commission would ensure that adverse effects on historic properties, as a result of
17 removal of lands and resources from the protection afforded by federal jurisdiction, would be resolved.

18 **3.3.9.3 Unavoidable Adverse Effects**

19 None.

20 **3.4 NO-ACTION ALTERNATIVE**

21 Under the No-action Alternative as defined by the staff, the project would continue to operate as
22 it is currently. There would be no significant change to the existing environmental setting or project
23 operation. No new environmental measures would be implemented.

24 **3.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

25 Relicensing the existing project would not irreversibly or irretrievably commit any significant
26 developmental or nondevelopmental resources in the Klamath River Basin. In the future, project facilities
27 could be modified or removed and operations could be altered. No major new capacity or construction is
28 proposed or recommended that would commit lands or resources in an irreversible manner.

29 **3.6 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM 30 PRODUCTIVITY**

31 PacifiCorp’s Proposal for the project is expected to provide an average of 676,455 MWh of
32 energy each year to the region. This long-term energy productivity would extend for at least as long as
33 the duration of the new license. Our evaluations are designed to identify and then minimize or avoid
34 long-term decreases in biological productivity of the system, as well as enhance aquatic habitat and local
35 and regional recreational opportunities.

36 If the project were operated solely to maximize hydroelectric generation, there would be a loss of
37 long-term productivity of the river fisheries due to decreases in water quality and fish habitat. Moreover,
38 many efforts to enhance recreational opportunities at the project would be foregone.

39 With the proposed operating mode, as well as with proposed and recommended enhancement and
40 protection measures, the project would continue to provide a low-cost, environmentally sound source of
41 power. The project would further many of the goals and objectives identified by agencies, tribes, and
42 other interested parties.