

3.16 Environmental Justice

This section identifies minority and low income populations that exist within the Klamath Basin and evaluates whether the environmental impacts of each alternative would result in a disproportionately high and adverse impact on minority and low income populations (Executive Order 12898, February 11, 1994). See Section 3.12, Tribal Trust, for a detailed description of tribal history, and Section 3.13, Cultural and Historic Resources, for additional discussion of other cultural, tribal, and religious freedom issues. See Section 3.8, Water Supply/Water Rights, for a discussion of water rights in the area of analysis.

This section examines, consistent with National Environmental Policy Act (NEPA) regulations and guidelines, the Proposed Action's potential impacts on minority and low income people. As described in the Effects Determination Methods (Section 3.16.4.1), impacts were assessed to determine if any community would bear a disproportionate share of the adverse environmental consequences resulting from the Proposed Action.

The U.S. Environmental Protection Agency (USEPA) Office of Environmental Justice defines environmental justice as the following:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies (USEPA 2011).

3.16.1 Area of Analysis

The area of analysis includes Del Norte, Humboldt, and Siskiyou Counties in northern California and Klamath County in southern Oregon. In addition, all six of the federally recognized tribes with territory within the four counties are included in the area of analysis, specifically The Klamath Tribes, Quartz Valley Indian Reservation Community, Karuk Tribe, Hoopa Valley Indian Tribe, Yurok Tribe, and the Resighini Rancheria. Environmental justice impacts from the Proposed Action and alternatives, including activities associated with implementation of the Klamath Hydroelectric Settlement Agreement (KHSA) and Klamath Basin Restoration Agreement (KBRA) would be limited to these areas.

3.16.2 Regulatory Framework

Environmental justice resources within the area of analysis are regulated by several federal, state, and local laws and policies, which are listed below.

3.16.2.1 Federal Authorities and Regulations

- Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (59 FR 7629)
- Department of Interior (DOI) Environmental Justice Strategic Plan, 1995
- USEPA Environmental Justice Implementation Plan, 1996

3.16.2.2 State Authorities and Regulations

- California Government Code section 65040.12 (G.C. §65040.12)
- California Working Group on Environmental Justice, Senate Bill 89 (2000)
- California Interagency Environmental Justice Strategy, Senate Bill 828 (2001)
- California Environmental Protection Indicators for California, Assembly Bill 1360 (2003)
- Oregon Environmental Justice Task Force, Senate Bill 420 (2007)

3.16.2.3 Local Authorities and Regulations

- Siskiyou County General Plan (1973)
- Humboldt County General Plan (1984)
- Del Norte County General Plan (2003)
- Klamath County Comprehensive Plan (2010)

3.16.3 Existing Conditions/Affected Environment

3.16.3.1 Demographics, Income, and Employment

This section provides demographic information for the analysis of environmental effects and identifies low income and minority populations in the area of analysis.

Race and Ethnicity

Siskiyou, Humboldt, Del Norte, and Klamath Counties constitute the area that could experience direct or indirect effects from implementation of the Proposed Action and alternatives. While cities within these counties would also experience effects of the Proposed Action, demographic information from the counties is generally representative of the cities. Population, race, and ethnicity data from the Census 2005-2009 American Community Survey for California, Oregon, and the four counties are detailed in Table 3.16-1.

Table 3.16-1. Population, Race, and Ethnicity, 2005-2009 American Community Survey

Geographic Area	Total Population	White (percent)	Black or African American (percent)	American Indian and Alaska Native (percent)	Asian (percent)	Native Hawaiian and Other Pacific Islander (percent)	Some Other Race (percent)	Two Races Including Some Other Race (percent)	Two Races Excluding Some Other Race, and Three or More Races (percent)	Hispanic or Latino (of any race) (percent)
California	36,308,527	61.3	6.2	0.8	12.3	0.4	15.5	1.1	2.4	36.1
Del Norte County	28,729	74.1	3.4	5.1	2.9	0.6	7.7	2.6	0.5	16.1
Humboldt County	129,003	83.0	1.1	5.3	2.2	0.3	2.9	1.0	4.1	8.3
Siskiyou County	44,404	87.1	1.4	2.7	1.5	0.2	1.6	0.8	4.9	9.7
Oregon	3,727,407	86.2	1.7	1.6	3.5	0.3	3.3	0.4	2.9	10.6
Klamath County	66,170	88.9	0.5	3.6	0.9	0.2	1.8	0.4	3.8	9.4

Source: U.S. Census Bureau 2009a.

Caucasians (white) represent the highest percentage of the population in Siskiyou, Humboldt, Del Norte, and Klamath Counties. Black or African American, American Indian or Alaska Native, Asian, Pacific Islanders, other races and two or more races combined make a small percentage each county’s population relative to white and are minority populations. The counties in the area of analysis all have greater percentages of American Indians than California and Oregon as a whole. Data indicate that any impacts from the Proposed Action and alternatives could disproportionately affect Indian Tribes in the area of analysis.

Table 3.16-2 shows the tribes in the area of analysis and the total tribal enrollment as of 2005. Tribal enrollment does not mean that all members live within the area of analysis, but it is still useful information for comparison purposes. The Yurok Tribe has the greatest number of tribal members, while the Resighini Rancheria has the fewest number enrolled.

Table 3.16-2. Tribal Enrollment within the Area of Analysis, 2005

Tribe	Tribal Enrollment (number of people)
The Klamath Tribes	3,579
Quartz Valley Indian Reservation Community	222
Karuk Tribe	3,427
Hoop Valley Indian Tribe	1,893
Yurok Tribe	4,912
Resighini Rancheria	111

Source: Bureau of Indian Affairs 2005.

Low Income

Low income populations in the area are identified by several socioeconomic characteristics. Specific characteristics used in this description of the existing environment, as categorized by Census 2000, are income (per capita and median family), percentage of the population below the poverty level (all persons and families), substandard housing, and unemployment rate. Census 2010 data for these categories had not been released at the time of this writing.

As shown in Table 3.16-3, based on income in 1999, as reported in Census 2000, all three California counties have greater percentages of persons and families living below the poverty level than the State of California. Klamath County also has higher percentages of persons and families living below the poverty line than the State of Oregon. All three California counties in the analysis area have lower per capita and median family incomes than the State of California. Similarly, Klamath County has lower per capita and median family incomes than Oregon.

Siskiyou and Klamath Counties output and income have also declined due to reductions in timber harvesting. During the past 10 years, there has been a sharp decline in the Siskiyou County timber industry, which has been an economic base for the county historically. In 2009, the total value of the timber harvest in Siskiyou County was \$11.6 million, about a \$52 million decrease from 2000 (Board of Equalization [BOE] 2010). Timber harvesting also decreased and was at its lowest value in 2009 over the 10-year period. Reductions in timber harvesting have also reduced employment opportunities in the county. Similar to Siskiyou County, timber harvests in Klamath County have been declining in recent years. Timber harvests in 2008 and 2009 showed substantial decreases relative to previous years (Oregon Department of Forestry 2010). Appendix O further describes economic conditions in Siskiyou and Klamath Counties.

Table 3.16-3. Income and Poverty, 1999

Area	Per Capita Money Income (dollars)	Median Family Income (dollars)	Persons Below Poverty Level (percent)	Families Below Poverty Level (percent)
California	22,711	53,025	14.2	10.6
Del Norte County	14,573	36,056	20.2	16.4
Humboldt County	17,203	39,370	19.5	12.9
Siskiyou County	17,570	36,890	18.6	14.0
Oregon	20,940	48,680	11.6	7.9
Klamath County	16,719	38,171	16.8	12.0

Source: U.S. Census Bureau 2000a.

Table 3.16-4 shows census tract data of residents living around the Copco Reservoir in Siskiyou County. The data shows that a lower percentage of people living around the reservoir live below the poverty level relative to the county and state. As such, it is assumed that people living below the poverty level are not disproportionately represented in the areas directly around the reservoirs.

Table 3.16-4. Poverty in Siskiyou County

	Siskiyou County		Block Group 1, Census Tract 3. Siskiyou County	
Total Population	43,699		1,618	
Number of Persons with Income below poverty level in 1999	8,109	18.6%	198	12.24%

Source: U.S. Census Bureau 2000a

In 1989, 85 percent of The Klamath Tribes' population lived below the national poverty level, with a median family income of \$8,750, compared to Klamath County's median family income of \$27,000 (Tribal Council of Klamath Tribes, 2000). Table 3.16-5 shows families living below the poverty level within the other five tribes included in the area of analysis. Except for the Resighini Rancheria, the median household income of the tribes is less than the counties and states in the area of analysis. The tribes also have more families living below the poverty level relative to the counties and states of California and Oregon.

Table 3.16-5. Income and Poverty in Tribes, 1999

Tribes	Median Household Income (dollars)	Families below Poverty Level (percent)		
		All Families	Families with Children under 18 Years of Age	Families with Children under 5 Years of Age
Quartz Valley Indian Community	29,375	37.1	68.4	0.0
Karuk Tribe	18,000	60.0	62.1	73.0
Hoopa Valley Indian Reservation	23,384	29.0	36.9	40.5
Yurok Reservation	20,592	26.8	36.3	60.0
Resighini Rancheria	41,250	0.0	0.0	0.0

Source: U.S. Census Bureau 2000b and Federal Energy Regulatory Commission [FERC] 2007.

Note: Income and Poverty Level information is not available for The Klamath Tribes in the 2000 Census; therefore, a different source was used and relevant data is discussed above.

Other measures of low income, such as substandard housing and unemployment rate, also characterize demographic data (see Table 3.16-6) in relation to environmental justice. Substandard housing units are those that are overcrowded and lacking complete plumbing facilities. As presented in Table 3.16-6, in the area of analysis, the California counties have a smaller percentage of overcrowded housing units and/or units lacking complete plumbing facilities than the State of California. Similarly, the data show that Klamath County has a lower percentage of substandard housing units than the State of Oregon. Consequently, substandard housing is not disproportionately concentrated in the area of analysis and is not an environmental justice concern.

Table 3.16-6. Housing and Employment

Area	Housing Units			Civilian Labor Force
	Total Occupied - 2009 (number of units)	Substandard (1.01 or more occupants/room) - 2009 (percent)	Substandard (incomplete plumbing) - 2009 (percent)	Unemployment Rate - January 2011 (percent)
California	12,187,191	7.8	0.5	12.4
Del Norte County	9,750	3	0.0	13.8
Humboldt County	52,520	2.6	0.8	12.3
Siskiyou County	19,838	2.8	0.7	21.0
Oregon	1,464,196	2.6	0.6	10.4
Klamath County	26,761	2.4	0.9	13.0

Source: U.S. Census Bureau 2009b; Employment Development Department 2011; and Oregon Employment Department 2011.

As presented in Table 3.16-6, the unemployment rate in Humboldt County was about the same as the State of California rate, while the rates in Del Norte and Siskiyou Counties were higher than those of the state. The unemployment rate in Siskiyou County was 21 percent in January 2011, which was much larger than California’s 12.4 percent rate (Employment Development Department [EDD] 2011). The unemployment rate in Klamath County was higher than the State of Oregon rate.

Table 3.16-7 includes labor force and unemployment rate data for each of the six tribes. All six tribes have a much higher unemployment rate than the counties and the states of California and Oregon. The counties in the study area have a substantially higher percentage of low-income population among the Indian population compared to the overall population.

Table 3.16-7. Housing, Labor, and Employment, 2005

Tribe	Available to Work (number of people)	Unemployment Rate (percent)
The Klamath Tribes	1,135	21
Quartz Valley Indian Reservation Community	45	49
Karuk Tribe	915	63
Hoopla Valley Indian Tribe	1,043	40
Yurok Tribe	1,096	74
Resighini Rancheria	45	60

Source: Bureau of Indian Affairs 2005.

Farm laborers, which are often minority and low income persons, could be disproportionately affected by potential effects to agricultural production. Table 3.16-8 includes information about the farm labor force in the area of analysis. Due to the use of undocumented workers during harvests throughout California and Oregon, it is likely that farm labor is actually higher than numbers officially reported in the Census. Data on undocumented workers is not available for the counties; therefore, Census data is used for comparison purposes.

Table 3.16-8. Employment and Labor Force, 2005-2009, American Community Survey

Area	Civilian Labor Force (number of people)	Farm Labor (percent)
California	16,550,706	1.4
Del Norte County	10,357	3.3
Humboldt County	58,877	2.0
Siskiyou County	17,455	3.4
Oregon	1,765,814	1.9
Klamath County	28,101	2.6

Source: U.S. Census Bureau 2009c.

The above data shows that Indian Tribes are minority and low income populations that could be disproportionately affected by the project alternatives. In addition, counties in the area of analysis have lower incomes, higher unemployment rates, and more people and families living in poverty than California and Oregon and could also be disproportionately affected by project alternatives.

Social Programs

Tribes within the area of analysis receive federal and state funds to run social programs, such as Medicaid, food stamps, and education. In addition, local county funds are available to tribal members for social programs, such as foster care and police protection. However, local county funds are not given directly to the tribal governments. Table 3.16-9 shows federal grants and direct payments made to individuals in each of the area of analysis counties. Table 3.16-10 shows the local funds that were distributed to social programs within each county in 2010. Data showing funds received by tribes in the area of analysis are not currently available.

Table 3.16-9. Federal Funds Distribution for Social Programs, 2010

Area	Grants (millions of dollars)				Direct Payments for Individuals (millions of dollars)		
	Medicaid and Other Health-Related	Nutrition and Family Welfare	Education	Other	Social Security and Government Retirement	Medicare	Food Stamps and Supplemental Security Income
California							
Del Norte County	36.5	7.0	2.2	29.4	81.7	41.3	14.5
Humboldt County	210.5	31.9	17.0	108.2	343.5	189.9	49.9
Siskiyou County	75.0	10.7	5.3	32.6	173.4	83.6	17.5
Oregon							
Klamath County	43.1	10.9	7.7	30.8	234.8	80.7	26.6

Source: Gaquin 2010.

Table 3.16-10. Local Funds Distributed for Government Services, 2010

Area	Education (millions of dollars)	Health and Hospitals (millions of dollars)	Police Protection (millions of dollars)	Public Welfare (millions of dollars)	Highways (millions of dollars)
California					
Del Norte County	42.8	6.9	4.2	13.6	4.1
Humboldt County	44.3	9.3	4.1	10.8	4.0
Siskiyou County	44.3	6.8	6.1	9.0	9.7
Oregon					
Klamath County	50.0	7.5	3.3	0.3	6.9

Source: Gaquin 2010.

Distribution of social services to tribal members varies greatly by tribe and geographic area. For instance, the Yurok Tribe provides social services of many types directly to its members, including general assistance, food distribution, Indian Child welfare, and other programs (Yurok Tribe 2011a); The Klamath Tribes provides health and wellness services, homeowner assistance, and drug and substance abuse programs, among other things (Klamath Tribe 2011). Other tribes may provide few or no services directly to their members. Social programs may be funded by the federal government and provided by the tribe, or members may receive assistance directly from their local governments. For example, members of the Yurok Tribe may choose to receive the Temporary Assistance for Needy Families program from the tribe or directly from the county in which they reside (Yurok Tribe 2011b). Therefore, no generalized data are available for social programs for tribal members.

3.16.3.2 Tribal Environmental Justice Concerns

Information about tribal history and environmental justice issues in the area of analysis has been derived from the DOI’s *Effects of PacifiCorp Dams on Indian Trust Resources and Cultural Values in the Klamath Basin: Background Technical Report* (DOI 2011a) also referred to as *Background Technical Report Informing the Secretarial Determination Overview Report: Current Effects of Implementing the KHSA and KBRA on Indian Trust Resources and Cultural Values*.

Prior to Dam Installation

Six different tribal groups live within the area of analysis. Although the language groups and traditional practices vary among the tribes, all of them based their cultures, commerce, and subsistence primarily on the river and its aquatic and terrestrial resources. Salmon, steelhead, sturgeon, Lost River and shortnose suckers, and other fish (such as red band trout, eulachon and lampreys), as well as fresh water clams, fresh water mussels, and other aquatic species, occupy a central place in the diets and belief systems of the native people. Fish, particularly salmon, determined settlement patterns and have historically been the foundation of the daily and seasonal practices, subsistence, and culture of the native people (Federal Energy Regulatory Commission [FERC] 2007). The diverse indigenous peoples of the area of analysis have all retained close connections to the river and its resources and continue to rely on the river and its resources for cultural, economic and social survival (FERC 2007). Similarly, the suckers in Upper Klamath Lake, its tributaries, and nearby bodies of water are religiously and culturally important to The Klamath Tribes.

The Klamath River has the third most productive salmon run on the West Coast, a feature that native people ritually managed for thousands of years (Karuk Tribe 2010, as cited in DOI 2011a). The U.S. Court of Appeals for the Ninth Circuit recognized this importance when it concluded that the fish were “not much less necessary to the existence of the Indians than the atmosphere they breathed” (*Blake v. Arnett*, 663 F.2d 906, 909 (9th Cir. 1981), as cited in DOI 2011a). The abundance of salmon has always been a measure of tribal well being (Gunther 1926, as cited in DOI 2011a). Suckers were historically an important subsistence fish for The Klamath Tribes of the Upper Basin.

Installation of Dams

Dams were put in place on the upper Klamath River to generate electrical power and to supply water for newly established farmland in the Upper Basin (DOI 2011a). Copco 1 Dam was completed in 1918, Copco 2 Dam in 1925, J.C. Boyle Dam in 1958, and Iron Gate Dam in 1962.

The tribes within the area of analysis were not consulted prior to dam construction at any of the four sites analyzed in this EIS/EIR and had no political ability at the time of dam construction to actively oppose the dams. Additionally, none of the affected tribes were beneficiaries of these hydroelectric facilities but were adversely affected by their construction through the impacts to the Klamath River fishery.

Effects of Dams – Subsistence (Fishing, Hunting, and Gathering)

This section describes general effects of the dams that are similar across the tribes, then presents tribe-specific effects of the dams. Additional analysis of specific impacts of the dams to each tribe is presented in Section 3.12, Tribal Trust.

Tribes in the area of analysis have historically fished along the Klamath River and its tributaries for salmon and other anadromous fish at a subsistence level.¹ Due to a decline in fisheries, tribes are currently unable to fish at a subsistence level; however, tribes

¹ Subsistence level means that fishers rely on fish as a major food source.

continue to fish for economic and ceremonial purposes. In addition to fish and other aquatic resources, tribes have historically relied on other plant and wildlife species for subsistence. Subsistence hunting has diminished over the decades, which can be attributed to many factors including the costs of hunting licenses required to comply with strict (state) regulations (Stercho 2006) and indirectly to dam construction. Tribal members still engage in traditional hunting, gathering, and resource management activities (DOI 2011a); however, the current low abundance of wildlife and plant resources do not meet subsistence needs.

Water management, particularly hydroelectric generation, has changed the patterns of water flows throughout the system, affecting the channel geomorphology and spawning and rearing habitat for salmonids, lamprey, and fresh water clams and mussels. The Klamath Hydroelectric Project dams block anadromous and native fish passage to and from the upper river and have converted portions of former riverine habitat to reservoir habitat, which has eliminated anadromous fish habitat and reduced the quality and quantity of salmonid habitat upstream from the dams. For example, although the magnitude of these anadromous fish migrations is unknown, historically, anadromous fish (such as fall and spring run Chinook salmon and winter and summer-run steelhead), lamprey, and Lost River and shortnose suckers could access the Klamath Basin all the way into the rivers that are tributary to Upper Klamath Lake. Currently they are limited to the area downstream of Iron Gate Dam.

The capacity of the mainstem Klamath River downstream of Iron Gate Dam to support the rearing and migration of anadromous species is limited by changes in river flow, high water temperatures, poor water quality, and disease outbreaks, especially during the summer months. The reduction in available habitat, impairment of water quality, increase in water temperatures, changes in channel geomorphology downstream from the dams, water diversions, and factors outside the current operations (e.g., unfavorable ocean conditions) have led to a substantial decrease in salmonid populations in the Klamath Basin (National Oceanic and Atmospheric Administration [NOAA Fisheries Service] 2010, as cited in DOI 2011a). See Section 3.3, Aquatic Resources, for additional information about current conditions and aquatic species found in the Klamath River and Section 3.2, Water Quality, for more information about water quality in the area of analysis.

Prior to construction of dams on the Klamath River, steelhead spawned freely not only in the Klamath and its tributaries, but in the Upper Klamath Lake and beyond. An estimated 650 miles of salmon habitat were lost with the construction of four dams in the Klamath River (Klamath Tribes and Yurok Tribe 2006). This is a significant amount of habitat no longer available for spawning and rearing. Furthermore, steelhead eat juvenile salmon; therefore, without a healthy salmon run, there will not be a healthy steelhead run.

Dam installation and operation has affected certain plant and wildlife species. Plant species in the Klamath/Trinity Region include the following: willow shoots, cottonwood, wild grape, bulrush, hazel sticks, tules, spearmint, and blackberries (Stercho 2006). An example of the affects of dam installation and operation on plant species includes, the

growth pattern of willow shoots along the river banks are different than before dam installation, and firsthand accounts from tribal members indicate that the new shoots are not suitable for traditional basket weaving (Salter 2003). Wildlife species include bear, for subsistence purposes and bald eagle, blue heron, mallards, fox, otter, and fisher for ceremonial purposes, as well as deer and elk for both subsistence and ceremonial purposes (Stercho 2006). Subsistence wildlife species potentially affected by reduced salmon and steelhead populations include the black bear (DOI 2011a). Other salmon and steelhead-dependent wildlife species significant to tribes beyond their subsistence value include the bald and golden eagles, coyote, and cougar (DOI 2011a).

The Klamath Tribes

Resources (such as hunting, fishing, gathering, trapping, and water rights), especially fish, have played a central role in the physical, social and spiritual well-being of the Klamath people for millennia. The Klamath Basin from Link River to Iron Gate once had an almost continuous geographical distribution of traditional sites and activities.

The Klamath Tribes relied heavily on upland game (e.g., deer, elk, and pronghorn antelope) and plant foods (e.g., yampah, wild plum, and many other fruits and berries), but riverine and especially marsh resources were of equal importance. Salmon and multiple species of sucker, trout, eel, lamprey, and other fish were dietary staples, while marsh and riparian plants such as the yellow pond lily (*Wocus*), tule, cattail, and willow provided staple foods and materials as essential tools and crafts. Salmon were numerous throughout much of The Klamath Tribes' traditional territory. Historically, The Klamath Tribes fished not only for salmon and steelhead, but also for mullet (suckers), eels, and lamprey.

The construction of Copco 1 Dam (1918) blocked anadromous fish runs into the Upper Basin and abruptly ended The Klamath Tribes' access to anadromous fish. Two other major fisheries, resident salmonids (trout) and catostomids, could still be used by The Klamath Tribes after the demise of the anadromous fisheries. The catostomid fishery consisted primarily of c'waam (Lost River sucker) and koptu (shortnose sucker) until the Tribes closed their fishery in 1986 to protect it in the face of severe population declines (DOI 2011a).

Quartz Valley Indian Community

The Indians of the Quartz Valley Reservation are related to Karuk people and thus share their cultural practices and values with the general culture described below for the Karuk Tribe (DOI 2011a).

Karuk Reservation

The Klamath and Salmon River fishery and other resources supported more than 100 ancestral Karuk villages along the Klamath and Salmon Rivers. Karuk established villages on regalia, practice of traditional religious ceremonies, and stewardship of natural resources through the use of fire and harvest management techniques.

The Karuk diet traditionally consisted mostly of salmon, deer, and acorns. Fish, especially salmon, have always been a major food resource and the focus of ceremonies for the tribe. Fish important to the Karuk include spring-run Chinook or king salmon, fall-run Chinook, out-migrating Chinook smolt, Coho, or silver salmon (also called dog salmon), steelhead, trout, sucker, bullhead, sturgeon, and Pacific lamprey. Freshwater mussels also have cultural significance for the Karuk not only for food, but also as important tools.

Since the construction of the dams on the Klamath River, the numbers of a variety of river species have plummeted. Some of these fish had traditionally been a source of food and cultural ceremonies and practices for the Karuk Tribe. Karuk believe one of the most significant impacts of the Klamath River dams is the way that the natural process of seasonal warming and cooling trends in the river is altered by the presence of reservoirs. For Karuk, this translates into a shorter fishing season in the fall. In addition to limiting the number of fishing days available in the fall, the opportunity to harvest spring Chinook salmon has been completely lost to the Karuk since construction of Iron Gate Dam (DOI 2011a).

Hoopa Valley Indian Reservation

The Trinity River is of prime importance to the Hoopa Valley Tribe because it is the river that runs through the Hoopa Valley Indian Reservation. Fish destined for the Trinity River must pass through the lower Klamath River and are therefore affected by Klamath River conditions.

Uses of the Trinity River by the Hupa people are highlighted by maintenance of fisheries and religious ceremonies. Many natural foods were available to the Hupa, with salmon and acorns providing the bulk of the native diet. Other important fish include steelhead, sturgeon, and lamprey eels (DOI 2011a). The decline of the river, including decreased fisheries and water quality, has adversely affected the psychological health of the Hupa.

Yurok Reservation

Deterioration of the Klamath River affects Yurok ceremonial and traditional practices. The lives of the Yurok people have always been intricately tied to the river. Historically, they depend on the river for sustenance, and much of their world was defined in terms of their physical relation to the river. Many of the Yurok cultural sites on the Klamath and lower Trinity rivers are traditional fishing spots owned by families. These are places where the Yurok have lived, fished, gathered, prayed, and buried their dead for centuries. Over time, as the rivers' flows have changed, so have the locations of these cultural sites.

As with all tribes that identify as salmon people, fish have been the Yurok Tribe's most valuable asset and a mainstay of their economy. With fish in abundance, the Yurok could not only feed themselves and their families all year long, but the surplus could be used to acquire products from outside their territory.

Since 1990, tribal commercial harvests have been marginal and have not provided a comfortable standard of livelihood. The decreased harvests have had a significant adverse

impact on the tribe's economies and health. Limited access to resources has restricted the ability of the Yurok to practice some of their most important traditions. This includes freely fishing the once-prolific semi-annual salmon runs and participating in the cycle of ceremonies initiated concurrently with salmon runs (DOI 2011a).

Resighini Rancheria

The Indians of the Resighini Rancheria are Yurok people; consequently they share their cultural practices and values with the general culture described above for the Yurok Tribe (DOI 2011a).

Effects of Dams – Water Quality

Tribal needs for high quality water in the Klamath River are not limited to the biological needs of the fishery. Water quality plays a significant role for tribes in the Klamath Basin because it affects culturally relevant fish, and many tribes rely on the Klamath River for water supplies and use of water in ceremonial activities, such as drinking or bathing. Many tribal ceremonies must be practiced near the river and at times when water quality is at its lowest. Ceremonial practitioners must ritually bathe, submerge and at times even ingest the water from the River. Roots, materials and tribal medicinal plants, and other plants are gathered from the riverbank and require exposure to river water. For example, basketry often requires the weaver to use their teeth to strip bark pulled from the river, offering an avenue of direct exposure to water born toxins.

Under current conditions, water quality in the mainstem of the Klamath River has been listed as impaired due to the following caused or induced conditions (North Coast Regional Water Quality Control Board 2010, as cited in DOI 2011a): organic enrichment, low dissolved oxygen, water temperature impairment, nutrient impairment, and toxic algae (microcystin) impairment. There is a direct cause-and-effect link between current Klamath Hydroelectric Project dam operations and water quality; this link was established in the *Basin Plan for the Klamath River*, prepared by the North Coast Regional Water Quality Control Board (as cited in DOI 2011a). See Section 3.2, Water Quality, for additional information about the link between the Klamath Hydroelectric Project dams and degraded water quality.

Impoundment of water in the four reservoirs shifts the seasonal water temperature patterns, producing cooler than normal water temperatures in the springtime and warmer than normal temperatures in the fall. These water temperature shifts disrupt spawning cycles for salmon and at times can produce stressful or lethal water temperature conditions for aquatic resources. Water with high concentrations of nutrients and organic matter entering these reservoirs leads to low dissolved-oxygen concentrations as organic matter decomposes, algal populations bloom and crash, and organic matter settles to the deeper portions of the reservoirs. Release of this low-dissolved oxygen water from these reservoirs, particularly during the summer and fall, produces stressful or lethal conditions for aquatic resources, such as salmon.

These reservoir algal blooms include blue-green algae, such as *Microcystis aeruginosa*, which release a toxin that can cause skin irritation, sickness, or in extreme cases, death, to

exposed organisms, including humans (World Health Organization 1999). These toxins have been measured in the reservoirs and in the Klamath River for many miles downstream of Iron Gate Dam. Algal blooms have reached levels thousands of times higher than those the World Health Organization says are safe for recreation (DOI 2011a). A survey of aquatic resources (fish and mussels) in the Klamath River showed a bioaccumulation of microcystin in their tissue (Kann 2008).

In addition, preliminary evaluation of dioxin results from the 2009–2010 Klamath River sediment cores (DOI 2011b) indicates that dioxin is present at levels greater than screening levels for sediment disposal. In the J.C. Boyle and Copco 1 Reservoirs, levels are slightly above available national and western United States background values for fish and birds (USEPA 2010). However, dioxin levels indicate no current public health concerns from direct human exposure and the measured levels indicate no current bioaccumulatory concerns (DOI 2011b).

Additionally, PacifiCorp indicated that some of the fish tissue samples from Upper Klamath Lake, Keno Impoundment, J.C. Boyle Reservoir, and Copco 1 Reservoir exceed the suggested wildlife screening value for total dichlorodiphenyltrichloroethane (DDT). Samples also showed that total polychlorinated biphenyl (PCB) values exceed the screening level for subsistence fishing in black bullhead from Keno Impoundment and in largemouth bass from J.C. Boyle, Copco 1, and Iron Gate Reservoirs (PacifiCorp 2004). See Section 3.2, Water Quality, for additional discussion and Appendix Tables E-5 through E-7 for sediment values and screening levels.

Downstream from the hydroelectric facilities, water conditions are also ideal for promoting fish disease, in that they allow parasites to thrive. The stable flows and warm water on the Klamath River, especially between Iron Gate Dam and the Shasta River, contain elevated levels of the parasites that carry the fish diseases *Parvicapsula minibocornis* and *Ceratomyxas shasta* (California Department of Fish and Game 2004, as cited in DOI 2011a). About 80 percent of the juvenile fish in the Klamath River become infected and most die from these diseases (California Department of Fish and Game 2004, as cited in DOI 2011a).

Freshwater mussels have also been adversely affected by the degraded water quality in the Klamath River. Freshwater mussels are an important food source for the Klamath River tribes and an essential part of some tribal ceremonies. During the early 20th century, mussels were gathered for food and for use in rituals late in the season when the river flows were low; unfortunately, this is the time of year when the mussels are most contaminated. Even though there are few to be found, people continue to use freshwater mussels as a food source, but their use in ceremonial celebration has been greatly reduced (DOI 2011a).

The Klamath Tribes

Water quality and flows in the Klamath River and its tributaries associated with current dam operations are an important issue to The Klamath Tribes. Water conditions affect the ability of anadromous fish species to survive. A number of ritual traditions of The

Klamath Tribes depend on access to clean water from natural sources, which is used in ritual purification of people, places, and objects, as well as in rituals associated with drought abatement and other environmentally restorative activities. However, the Klamath River is widely viewed as inappropriate for these ritual uses because of the effects of the dams on water temperature, algae development, and other variables of water quality (DOI 2011a).

Quartz Valley Indian Community

The Indians of the Quartz Valley Reservation are related to Karuk people and thus share their cultural practices and values with the general culture described below for the Karuk Tribe (DOI 2011a).

Karuk Reservation

The Karuk Tribe only has two public water systems, one at Happy Camp and the other at Orleans, which requires most residents to rely on individual wells and/or surface waters for domestic use (Karuk Tribe 2001).

Water quality plays a very significant role in Karuk tribal culture because its effects on culturally relevant aquatic species. Water quality also affects the ability of *Fataveenan*, or World Renewal Priests, to conduct ceremonies. *Pikiavish* starts with the Spring Salmon Ceremony in early spring and continues throughout late summer into early fall. Key ceremonial participants bathe multiple times a day in the Klamath River for 10 days in a row. This is the time of year when the blooms of the toxic algae, *Microcystis aeruginosa*, are at their peak. Bathing in the river is an important part of most Karuk ceremonies. Bathing is also associated with funeral services, subsistence practices, recreational swimming, courtship, and individual hygiene.

Karuk tribal members collect willow roots, wild grape, cottonwood, and willow in the riparian zone along the Klamath River and use these materials to make baskets. Traditional collection of these basketry materials often involves wading in the water, and washing and cleaning the materials in the river. Willows are peeled by mouth following cleaning with river water, and plants are also collected for food, medicine, and other cultural functions. Given current degraded water quality conditions, ingestion of water as a result of traditional cultural activities or use of materials harvested from the river may pose a potential health risk (DOI 2011a).

Hoopa Valley Indian Reservation

The Hoopa Valley Indian Reservation hosts a seasonal abundance of surface water for drinking water supply while in contrast, groundwater aquifers are quite limited. Increased areas of groundwater contamination are occurring, which makes it more difficult to use groundwater as a source of drinking water. The tribe is now faced with the challenge of meeting the increase demands for drinking water supply, while maintaining quality surface water in streams to protect fish, wildlife and other beneficial uses (Hoopa Valley Tribe 2008).

Yurok Reservation

Limited access to resources has restricted the ability of Yurok to practice some of their most important traditions. This includes freely fishing the once-prolific semi-annual salmon runs and participating in the cycle of ceremonies initiated concurrently. In the past, the Yurok were not inclined to leave their territory; currently, several factors, including an inability to meet subsistence needs from the fishery and a perception that the rivers are dirty, prompt younger tribal members to leave the area to find work (DOI 2011a).

Resighini Rancheria

The Indians of the Resighini Rancheria are Yurok people; consequently they share their cultural practices and values with the general culture described above for the Yurok Tribe.

Both the Yurok and the Yurok of the Resighini Rancheria bathe in the river and use its water for daily and ritualistic purposes. Because of their reliance on the river for so many aspects of their lives, they are concerned about the quality of its water. The Klamath Hydroelectric Project has effects on water quality and related environmental issues, such as watershed health, riparian habitats, erosion, sediment, turbidity, sources of pollution and temperature changes, algae blooms, low dissolved oxygen, high pH, and un-ionized ammonia. The cumulative effects may result in health problems, not just for the people who live on the Rancheria, but also for the tourists who come and camp in the area every year, and for people who use the water for business purposes or who work for those businesses (DOI 2011a)

Effects of Dams – Tribal Health

Secondary, or indirect, effects of the Klamath Hydroelectric Project dams on tribes within the area of analysis include physical and emotional health issues.

The loss of naturally occurring resources, such as fish, lamprey, freshwater clams, and mussels, can leave tribal members with no other option than to supplement their diets with government-provided subsidies and/or store-bought food. Studies have found that supplementing or replacing traditional diets of Indian people is often detrimental to their health, contributing to the widespread occurrence of obesity and related diabetes in Indian populations today (Norgaard 2004; Yurok Tribe 2006, Acton et al. 2003; California Rural Indian Health Board 2004; Trafzer and Weiner 2001, as cited in DOI 2011a).

Poor water quality, as demonstrated in recurring toxic algal blooms in the Klamath River has the potential to affect human health, as water from the river plays a central role in tribal ceremonies. Poor water quality also affects drinking water, fish, freshwater clams, and mussels that the tribes eat as discussed above. Bioaccumulation screening levels for DDT and dioxins were exceeded in sediment samples taken from the Klamath River. While levels now indicate no current public health concerns from direct human exposure, there is the potential for bioaccumulation to occur in the Klamath Hydroelectric Project reservoirs.

Emotional and social health of the individuals in the tribes has also been affected indirectly by dam installation. When a people's identity and cultural practices are closely associated with a species that no longer thrives, a sense of connection and belonging is lost (Norgaard 2004, as cited in DOI 2011a). Young people may feel this loss of belonging because they have never experienced the Klamath River as previous generations once did. The decline of the resource makes seasonal celebrations of the salmon runs difficult to understand and to carry out. The Yurok and Hoopa Valley Tribes continue to perform down-river boat ceremonies; however, sometimes the water is so shallow it is necessary to call federal agencies to request water flow increases to perform the ceremony. These factors indirectly affect the emotional and social health of the tribes within the area of analysis (DOI 2011a).

The Klamath Tribes

Because salmon was the first dietary staple to be lost to The Klamath Tribes, its depletion was said to have initiated dramatic dietary shifts among tribal members. For a time, this fostered increased consumption of deer and mullet (suckers), which some tribal members believe resulted in localized overuse of these resources when taken in combination with fish and game management practices of the State of Oregon. For some, the loss of the salmon was the catalyst for a dietary transition that led to the ultimate dependence of The Klamath Tribes on the purchase of processed foods and the use of supplementary commodity goods.

Tribal members attribute a number of historical health problems to the loss of salmon. Recent Indian Health Service studies endorsed by The Klamath Tribes concluded that a host of physical ailments plaguing members of The Klamath Tribes have been linked to the demise of the aboriginal diet. Diabetes, hypertension, obesity, and related cardiovascular ailments are particularly widespread, reflecting dramatic changes in food consumption and procurement patterns (DOI 2011a).

Quartz Valley Indian Community

The members of the Quartz Valley Reservation refrained from making any comments regarding health effects (DOI 2011a).

Karuk Reservation

The Karuk have been denied traditional food sources such as salmon over the last 150 years, and have increasingly adopted western foods. The decrease in the availability of traditional foods, including salmon, trout, eel (various species of lamprey), mussels, and sturgeon, is responsible for many diet-related illnesses among Indians, including diabetes, obesity, heart disease, tuberculosis, hypertension, kidney problems, and strokes (Joe and Young [1993] as cited by Nogaard [2003] in Karuk Department of Natural Resources [2007]). The estimated diabetes rate for the Karuk Tribe is 21 percent, nearly four times the U.S. average, and the estimated rate of heart disease for the Karuk is 39.6 percent, three times the U.S. average. These conditions result from the lack of proper nutrient content in foods consumed without fishing and gathering food.

Difficulty in meeting basic needs can result in overwhelming physical and psychological stress. Traditionally, fishing is done by Karuk men. With the loss of the salmon comes a loss of a man's sense of pride in being able to provide food for his family and tribe. For a tribe that has called itself The People of the Fish, there is an indisputable loss of identity when there are no fish. For a people whose belief system includes their specific role on earth, that they have a predefined relationship with nature that needs to be honored, there is a sense of failure when they are unable to fulfill that role.

The changes that have caused wildlife to become scarce and the rivers to become polluted may make it hard for young people to understand the ways of their parents and grandparents. Never having seen it themselves, they do not understand that in the past there could be eight yearly runs of salmon in the Klamath when all they see is one-half of a fall run. Without tradition as an anchor, young people are sometimes drawn to gangs to establish a feeling of belonging, and leave Karuk territory for cities (DOI 2011).

Hoopa Valley Indian Reservation

The secondary effects of the Klamath River dams on the people of the Hoopa Valley Tribe include emotional and physical health effects such as increased obesity, diabetes, heart disease due to loss of the traditional salmon diet, and depression, alienation, and suicide. Additionally, the tribal members experience a loss of opportunity for intergenerational transmission of traditional knowledge. These conditions result in tribal members, especially young people, leaving the reservation for opportunity elsewhere (DOI 2011).

Yurok Reservation

Secondary effects of the Klamath River dams on the Yurok Tribe include emotional and physical conditions such as increased obesity, diabetes, and heart disease due to loss of traditional salmon diet, and depression and alienation that can result in suicide (DOI 2011).

Resighini Rancheria

Secondary effects of the Klamath River dams on the people of the Resighini Rancheria include emotional and physical health effects such as increased obesity, diabetes, heart disease due to loss of the traditional salmon diet, and depression, alienation, and suicide. Additionally, the tribal members experience a loss of opportunity for inter-generational transmission of traditional knowledge. These conditions result in tribal members, especially young people, leaving the reservation for opportunities elsewhere (DOI 2011a).

Effects of Dams – Economy (Commercial Fishing)

Historically, and in contrast to the current situation, the commercial salmon fishery and the associated canneries were substantial components of the West Coast resource-based economies. The numerous local anadromous fisheries allowed tribes, such as the Karuk and Yurok, to develop subsistence economies highly specialized in fishing (Stercho 2006). The more recent history (1976 to the present) is characterized by poor ocean condition cycles, and adverse habitat alterations (including construction of hydroelectric

facilities) for all regions along the West Coast of North America (FERC 2007). These trends have caused substantial decreases in the amount of income and jobs in economies where salmon and steelhead fishing have historically been important. Coastal communities and tribes have experienced the greatest losses in this regard (FERC 2007).

The Klamath Tribes

The current operations of the dams have had a range of secondary effects on The Klamath Tribes. Among these effects are the decline in fish and wildlife other than anadromous fish (DOI 2011a). These declines have resulted in a diminished economy. The Klamath Tribes were forced to close their c'waam fishery in 1986 to protect it in the face of severe (fish) population declines (DOI 2001a).

The decline in fish populations has contributed to the decline of various fish dependent species. Several salmon-dependent wildlife species are of traditional cultural significance to members of The Klamath Tribes beyond their subsistence value. Many non-salmon species and ecologically linked plants are significant for the cultural and economic well-being of The Klamath Tribes. The Klamath Tribes members traditionally used pelts, feathers, and other body parts from some of these animals in ceremonial regalia, traditional crafts, and for other purposes. In a few cases, tribal members relied on the sale of pelts from some of these species for supplemental income.

Large gatherings associated with the fish harvest once served as a venue for economic exchanges. The demise of the fish population has interrupted the performance of the important economic, social and cultural functions.

Although The Klamath Tribes have the most direct interest in resources upstream from the four hydroelectric dams, the current operations of the Klamath Hydroelectric Project have affected The Klamath Tribes' (through a complete end to the anadromous fishery) in the upper Basin and resource interest in the footprint of the dams and impoundments, and downstream from the dams in lands ceded to The Klamath Tribes. Plants, animals, soil, and rocks are all of concern to The Klamath Tribes members, both economically and environmentally (DOI 2011a).

Quartz Valley Indian Community

The Indians of the Quartz Valley Reservation are related to Karuk people and thus share their cultural practices and values with the general cultural described for the Karuk Tribe below.

Karuk Reservation

The lack of fish in the local economy has secondary effects on general (Karuk) tribal health and cultural wellbeing. Since the construction of the dams on the Klamath River, the numbers of a variety of river species have plummeted. Some of these fish had traditionally been a source of food and cultural ceremonies and practices for the Karuk Tribe, as well as a means of trade and income.

The lack of migratory steelhead affects the local economy and the wellbeing of the Karuk Tribe. Steelhead fisherman from outside the area used to pay for the privilege of fishing for the Klamath steelhead, bringing money into the local economy to the benefit of the Karuk Tribe. Today, the number of steelhead is so low that the sport is no longer viable (DOI 2011a).

Hoopa Valley Indian Reservation

The Hoopa Valley Tribe maintains a modest commercial fishery program (DOI 2011a). The Trinity River, like most West Coast Rivers, has experienced a decline in Chinook salmon, steelhead, and Coho runs. The Trinity's Coho salmon is currently listed as threatened under the Endangered Species Act (Hoopa Valley Tribal Fisheries).

Yurok Reservation

Fish are the Yurok Tribe's most valuable asset and a mainstay of their economy. Abundant fish allow Yurok to feed themselves and their families and to acquire products from outside their territory through trade. Fish was a trading commodity available to any enterprising man. A young man who diligently fished and successfully traded fish for other items could amass sufficient wealth to buy a boat, travel to collect all of the necessary items to fashion intricate ceremonial regalia, and to allow him to marry. Fish were the baseline resource that facilitated the acquisition of wealth and upward social mobility in Yurok culture.

The Yurok Tribe voluntarily closes its commercial fishery in critical years out of concern for the survival of Klamath River salmon. These closures adversely affect the tribal community which relies heavily on income from the short commercial season for harvesting fall Chinook salmon. In general, declines in total numbers of fish stocks have adversely affected the ability of the Yurok Tribe to harvest for commercial purposes. In the past, the Yurok were not inclined to leave their territory; currently, several factors, including an inability to meet subsistence needs from the fishery prompt younger tribal members to leave the area to find work (DOI 2011a).

Resighini Rancheria

The original "Merin" proposal to create the Resighini Rancheria described the tract of land as "agricultural" with conditions that are "ideal for farming or dairying." However, the value of the land as agricultural was directly connected to the loss of traditional fisheries. In past years, commercial and subsistence fishing was a primary means of economic and subsistence support for the Yurok including the Resighini along the Klamath River. However, with the closure and restrictions on tribal fishing, this means of support was lost. While the "fish wars" and accompanying litigation of the 1970s and 1980s reinstated Yurok fishing rights and the Hoopa-Yurok Settlement Act further confirmed that the Yurok Tribe had fishing rights, Rancheria members were left out of that settlement.

Effects of the Dams – Electricity Distribution

On February 24, 1917, the California Oregon Power Company (now PacifiCorp) entered into an agreement with the Klamath Water Users Protective Association (irrigators) to

extend to the water users of the Klamath Hydroelectric Project certain preferential power rates (Klamath Water Users Association 2004). This agreement was amended and further extended for a 50-year period on April 16, 1956 (Klamath Water Users Association 2004). No similar power agreement was extended to the tribes located within the area of analysis because preferential power rates are normally provided only for on-farm agricultural use. To date, non-farm irrigating Tribes in the area of analysis still do not receive energy benefits from the Klamath Hydroelectric Project operations.

Summary of Environmental Justice Issues

Although many other historic and current factors, such as mining, timber extraction, agricultural production, and cattle grazing, affect the environmental integrity of the Klamath Basin, the current operations of the four Klamath Hydroelectric Project dams also substantially affect water quality and fishing resources of the Klamath Basin tribes and, by extension, their way of life. Due to tribes' resource-based economy, culture and disproportionate representation of tribal members in consultation, dam installation has directly and indirectly resulted in environmental concerns related to fishing, water quality, health, and the economy that disproportionately affects tribes in comparison to the general population in the area of analysis. While the tribes experienced disproportionately greater adverse effects of dam installation and operation, they did not receive any benefits of the project, including fixed-price electricity.

Current dam operations substantially contribute to compromised water quality, loss of habitat for anadromous and other aquatic species, and altered riverine ecosystem functions. These contributing factors have led to the decline of the anadromous fishery and other inter-related aquatic populations important to the continuance of an Indian river-based way of life. The decline of the anadromous fishery is directly and indirectly linked to the decline and scattering of the people, culture and language of the "Salmon People" of the Klamath Basin. The decline is manifested particularly in physical illness, mental illness, the loss of traditional knowledge, and social conflict among native peoples and between native peoples and non-natives also residing in the Klamath Basin (DOI 2011a).

Summary of Tribal Involvement in KHSA and KBRA

As described in Chapter 1 (Introduction), the KHSA and the KBRA were signed in February 2010 by representatives of 45 organizations, including three tribes: Karuk Tribe, the Klamath Tribes, and Yurok Tribe.

In addition, comments from the tribes were solicited during the scoping period for the EIS/EIR. Comment letters were received from the following tribes: The Klamath Tribes; Karuk Tribe; Hoopa Valley Tribe; Yurok Tribe; Resighini Rancheria; and Modoc Nation. Applicable scoping comments from the tribes have been addressed throughout the EIS/EIR.

The Klamath Tribes, Karuk Tribe, Hoopa Valley Tribe, Yurok Tribe and Resighini Rancheria have all signed a Memorandum of Understanding as a Cooperating Agency. As Cooperating Agencies they were all afforded a review of a Cooperating Agency Draft

EIS/EIR. Comment letters were received and those comments are addressed in this Draft EIS/EIR.

3.16.4 Environmental Consequences

3.16.4.1 Effects Determination Methods

This discussion of environmental consequences focuses on evaluating potential disproportionate adverse effects (including social, health, economic, or other environmental impacts) on low income or minority populations. This section also identifies potential benefits to low income and minority populations. The analysis relies on demographic and income data obtained from the federal and local governments to identify disproportionate low income and minority populations in the area of analysis. The analysis does not examine alternative locations for the Proposed Action that would reduce environmental justice effects on such populations because the dams are already in place and thus the Proposed Action to remove the dams cannot take place elsewhere.

Four factors were used to determine if there were a disproportionate number of low-income individuals in the area of analysis: income, poverty, substandard housing, and unemployment. It was found that the area of analysis does not have disproportionately more substandard housing than Oregon or California; therefore no low income individuals were identified on this basis. Data does show that there are disproportionately more individuals with low incomes, living in poverty, or unemployed at a county level relative to the state(s). As shown in Table 3.16-4, within Siskiyou County, there are not disproportionately more people living below the poverty level in the Census tract that contains the Copco Reservoir (the area adjacent to the potential project deconstruction activities). These data suggest that low income individuals are not represented in the immediate area of dam deconstruction and there would be no disproportionate effects. Therefore, this analysis instead focuses on potential environmental justice effects on county residents as a whole where there are a high proportion of low income and minority individuals relative to the state.

The Lead Agencies did determine that the percentage of persons identifying as Indian reflected minority and low income populations that could be disproportionately affected. Due to minority and low income status, as well as the past Klamath watershed history, existing qualitative reports (DOI 2011b), and information gathered during scoping, it was determined that tribal communities might experience disproportionate impacts from the Proposed Action that might raise environmental justice concerns. While the area of analysis examines specific tribes located within the four counties, there is the potential for members of other tribal groups to live along the Klamath River.

The area of analysis also has a substantial population of farm workers, which are mostly minority and low income individuals. Because actions related to KBRA might disproportionately affect farmers, an analysis of potential environmental justice impacts on farm workers was conducted.

The analysis of social concerns, including environmental justice, is based on an understanding of how the resources in the area of analysis are used (e.g., for fishing, ceremonies, and cultural practices) and by whom, as well as the indirect economic effects on the local community. This includes the dependence of individuals and businesses on the Klamath River resources. Based on these parameters, a qualitative analysis of social and environmental justice concerns was conducted.

NEPA requires an analysis of social, economic, and environmental justice effects; however, there is no standard set of criteria for evaluating environmental justice impacts. According to CEQA, economic and social impacts are not considered significant effects on the environment. Therefore, there is no guidance in the Initial Study Checklist included in the CEQA Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387), and no significance determinations are made or mitigation measures required in the impact analyses.

For the purposes of this EIS/EIR, the No Action/No Project Alternative is the basis of comparison, as required by NEPA. The No Action/No Project Alternative also represents the continuation of past environmental justice issues for tribal people that occurred since the dams were constructed.

3.16.4.2 Effects Determinations

Alternative 1: No Action/No Project Alternative

Continued impoundment of water at the reservoir and decline in fisheries could disproportionately affect tribal people. The issue of dam removal has been brought forward by the affected Indian Tribes in response to the long-standing environmental concerns that are a direct result of the construction and continued operation of the four Klamath Hydroelectric Project dams. In the short and long term, the four subject dams would continue to operate along the Klamath River, thus continuing the historical environmental justice impacts to tribes resulting from dam construction and operation.

The river and its aquatic resources are a central part of cultural heritages of tribal communities. As such, tribes in the area of analysis have been disproportionately affected by the Four Facilities along the Klamath River. Under this alternative, an increase in salmonid populations and improvements in water quality and aquatic species populations in the Klamath Basin would not be likely. The Klamath Tribes would continue to suffer from lack of a salmon and steelhead fishery in the Upper Basin, which would prolong disproportionate adverse impacts to The Klamath Tribes' culture, subsistence and income. The Lost River and shortnose sucker fishery would also remain closed to protect severely decreased populations in the Upper Basin. This would also continue existing environmental injustices to The Klamath Tribes.

The Quartz Valley Indian Community, Karuk, Hoopa Valley, Yurok, and Resighini Rancheria Tribes in the Lower Basin would continue to experience a declined salmon and steelhead fishery in the Klamath River under the No Action/No Project Alternative. There would be continued disproportionate adverse effect on tribes' cultural and ceremonial practices with limited access to resources. Because of decreased fisheries and

shorter or no fishing seasons, Indian Tribes would be unable to meet subsistence needs and tribal incomes would remain low from reduced fishing opportunities.

Therefore, in the long term, tribes in the area of analysis would continue to be disproportionately affected by the dams, and their situation would remain an environmental concern under this alternative.

Increased traffic, air quality emissions, and noise associated with construction could disproportionately affect county residents and tribal people. Under the No Action/No Project Alternative, no deconstruction or construction would be required. Therefore, no short term deconstruction- or construction-related impacts, such as increased traffic on local roads, air pollutants, or noise, would disproportionately affect county residents or tribal people in the area of analysis.

Release of sediment from reservoirs could cause disproportionate short term impacts on county residents and tribal people. Under the No Action/No Project Alternative, sediment would not be released from the reservoirs and there would be no disproportionate short term impacts on county residents and tribal people.

Continued impoundment of water at the reservoirs could cause disproportionate long term water quality impacts on county residents and tribal people. Under the No Action/No Project Alternative, water quality in the reservoirs and Klamath River would continue to degrade with ongoing operation of the Klamath Hydroelectric Project facilities. Degraded water quality would affect recreation opportunities for county residents and tribal people, if there is reduced access to the reservoirs and rivers. All residents and out-of-region visitors would be affected equally by loss of access to recreation. As described in Section 3.20, Recreation, there are many other recreation sites within the region that could substitute for river and reservoir recreation activities. There would be no disproportionate effects to county residents and tribal people by long-term water quality impacts to recreation.

Degraded water quality under the No Action/No Project Alternative would extend an existing environmental justice impact on the tribal communities. Poor water quality would continue to affect culturally relevant fish, water supplies, and use of water in ceremonial activities that include drinking or bathing for all tribes in the area of analysis. For example, The Klamath Tribes would continue to not be able to perform rituals that rely on clean water from natural sources because of high water temperatures and algal development. Toxic algal blooms during the summer would also continue to affect annual work renewal ceremonies for the Karuk, Hoopa Valley, and Yurok Tribes. Similarly, the Resighini Rancheria would also be unable to bathe in the river and use its water for daily and ritualistic purposes under the No Action/No Project Alternative. Degraded water quality also affects salmon, steelhead, freshwater mussels, and other aquatic species that provide subsistence or commercial fishing revenues for the tribes. Continued seasonal and annual toxic algal blooms, high water temperatures, and other water quality impairments under the No Action Alternative would continue disproportionate effects and environmental justice concerns on the tribes in the Klamath Basin.

Changes in county revenues could decrease county funding of social programs used by county residents. The reservoirs and Klamath River would not be altered under the No Action/No Project Alternative. As such, no short or long term changes to property values or local tax revenues would occur under this alternative associated with dam removal. County residents would not be disproportionately affected.

Continued impoundment of water could disproportionately impact tribal health and social wellbeing in the long term. Under the No Action/No Project Alternative, the dams would remain and current conditions in the Klamath River would continue in the short and long term. Under this alternative, the ecosystem would not be improved and aquatic species populations would not increase. Consequently, tribes would not have increased access to fish and other aquatic resources. Without access to these traditional diets, tribal members would be required to continue supplementing their diets with store-bought food or government-provided subsidies, most of which have high concentrations of sodium, sugar, and unhealthy fats. As such, high levels of diet-related diseases, such as diabetes, obesity, and heart disease in the tribal community have the potential to continue in the long term (Norgaard 2004; Yurok Tribe 2006, Acton et al. 2003; California Rural Indian Health Board 2004; Trafzer and Weiner 2001, as cited in DOI 2011a). For example, a host of physical ailments plaguing members of The Klamath Tribes have been linked to the demise of the aboriginal diet. Diabetes, hypertension, obesity, and related cardiovascular ailments are particularly widespread, reflecting dramatic changes in food consumption and procurement patterns (DOI 2011a). Reduced tribal health would likely reduce social wellbeing of tribes because of increased sickness, disease, and stress.

In addition, aquatic resources are a critical component of traditional culture, and without any improvement to these resources, tribal members could continue to suffer from emotional and social health issues due to a loss of access to traditional resources required for continued ceremonial and cultural lifestyle and practices in the long term.

Additionally, the No Action/No Project Alternative would not result in short term concentrations of inorganic and organic contaminants at levels that adversely affect beneficial uses or are toxic to humans in the area of analysis. However, there is the potential for continued long term bioaccumulation of dioxins and DDT to occur (see Section 3.2, Water Quality, for additional bioaccumulation discussion). Therefore, under the No Action/No Project Alternative, long term improvements in tribal health and social well being would not likely occur.

Alternative 2: Full Facilities Removal of Four Dams (the Proposed Action)

Dam removal activities could affect fisheries and disproportionately affect tribal people. Dam removal would occur in 2020. Effects until the dams are removed would be similar to the No Action/No Project Alternative. After 2020, dam removal would improve anadromous fisheries in the Klamath River and help recovery of the endangered sucker fisheries. Restored fisheries would help reverse the environmental justice impacts to the tribes that the dams created. The tribes would be able to rely on the river to provide fish for subsistence and some tribes could resume commercial fishing operations to increase revenues. The tribes would also be able to perform cultural practices and ceremonies

without restrictions because of decreased fish populations. The Proposed Action would be a benefit relative to environmental justice compared to the No Action/No Project Alternative.

Increased air pollutants and noise associated with dam removal activities could disproportionately affect county residents and tribal people. Full removal of all Four Facilities in a single year would require a large amount of construction equipment and personnel. Construction crews would be housed in towns near the reservoirs and staging of equipment would need to occur in the months leading up to the removal. The Proposed Action would require a build-up of equipment and personnel prior to reservoir drawdown and a post-construction period after the removal is complete. Equipment, personnel, and activities directly related to the drawdown and removal could be needed for months before and after actual dam removal. Temporary, short term air quality and noise impacts from deconstruction would occur (See Sections 3.9, Air Quality, and 3.23, Noise and Vibration) that would disproportionately affect Siskiyou and Klamath County residents and tribal people, which as a whole are low income relative to California and Oregon. Implementation of mitigation measures in Sections 3.9, Air Quality, and 3.23, Noise and Vibrations, would reduce the severity of these short term construction impacts. Environmental justice effects on county residents and tribal people from deconstruction would be greater under the Proposed Action relative to the No Action/No Project Alternative.

The traffic on the associated haul roads could disproportionately affect county residents and tribal people. The Proposed Action would require heavy equipment, such as large excavators, bulldozers, large dump trucks, cranes, and support equipment, to be brought to the construction area. Construction workers driving to and from the deconstruction area would also increase traffic along local roads. Section 3.22, Traffic and Transportation, identifies short term traffic impacts along haul roads that would occur as a result of deconstruction activities. These impacts include traffic flow and safety impacts. Residents in Siskiyou and Klamath Counties would be disproportionately affected by increased traffic on local roads during the construction period. Residents would be subject to short term impacts, such as increased congestion, potential traffic delays, slow moving trucks and potential safety hazards. Section 3.22, Traffic and Transportation, identifies measures to be taken to reduce traffic effects of the Proposed Action.

Tribes could be similarly affected by increased traffic. Figure 3.16-1 shows haul routes relative to tribal lands. The Klamath Tribes are the only tribe within relative distance to any of the identified haul routes; however, they are not within close enough proximity to cause a disproportionate effect. Section 3.22, Traffic and Transportation, identifies measures to be taken to reduce traffic effects of the Proposed Action. There would be no adverse environmental justice effects from traffic on tribes within the area of analysis.

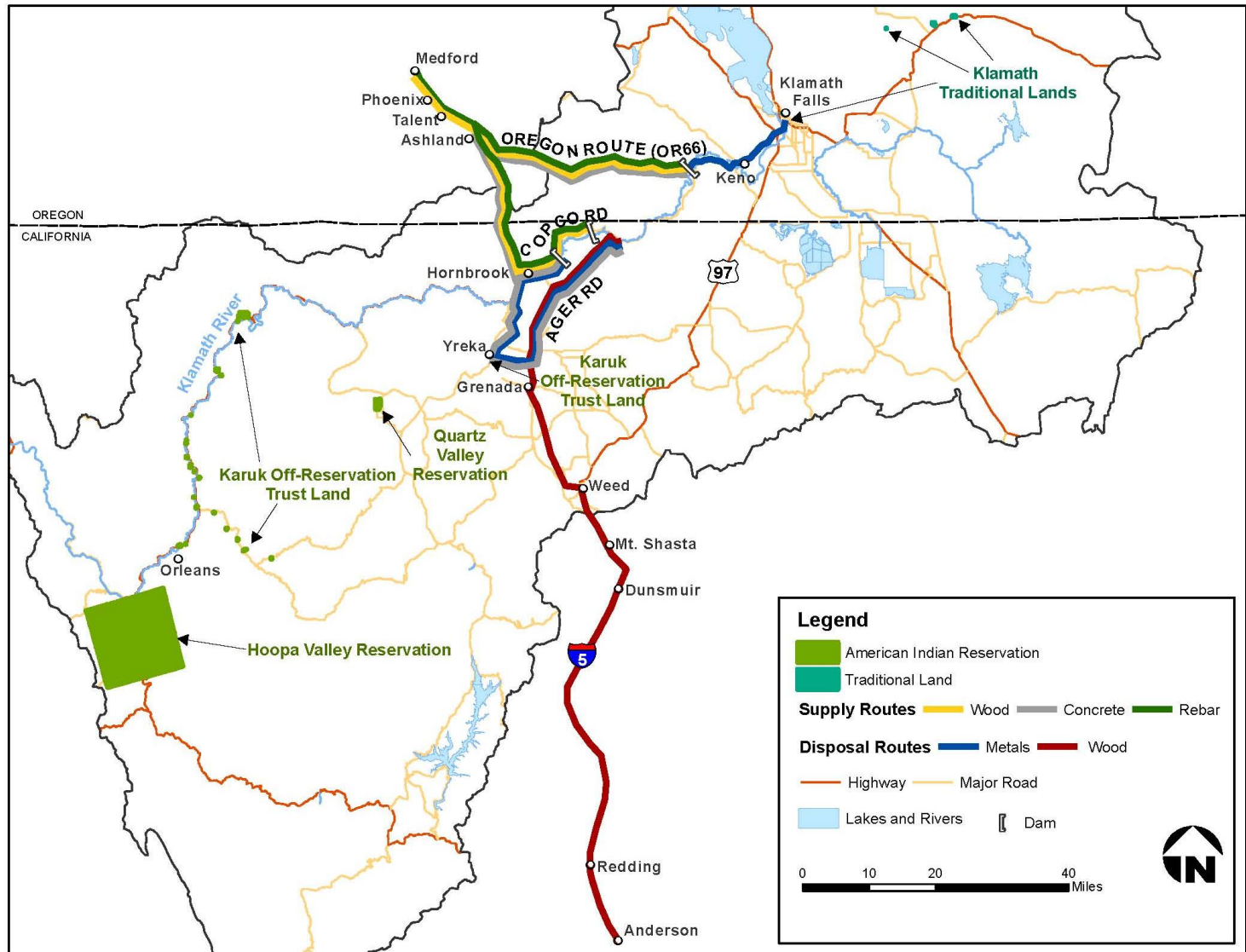


Figure 3.16-1. Tribal Lands near Haul Routes

Dam removal activities could provide jobs for county residents and tribal people that are low income and minority. Deconstruction activities would generate jobs in the area of analysis. Approximately 90 construction workers would be hired locally during peak deconstruction period and about 60 workers would be hired locally on average during the deconstruction period from Klamath or Siskiyou Counties. Increased employment would support low income individuals, resulting in a beneficial effect. This short-term benefit of the Proposed Action would be greater than under the No Action/No Project Alternative, which would not create any new jobs in the area of analysis.

Release of sediment from reservoirs could cause disproportionate short term impacts on county residents and tribal people. The Proposed Action would release sediment into the Klamath River during dam removal. Results from chemistry analysis and tests, discussed in Section 3.2, Water Quality, indicate that short term sediment release associated with the Proposed Action would not cause increases in concentrations of inorganic and organic contaminants that would adversely affect beneficial uses, be toxic to humans, or result in bioaccumulation in the Lower Klamath Basin. As such, county residents and tribal people would not be disproportionately affected by the release of sediment in the short term.

As described in Section 3.3, Aquatic Resources, the Proposed Action could reduce mussel populations in the short term as a result of sediment release. This would continue to affect subsistence for tribes that rely on freshwater mussels as a food source. Specifically, the Karuk Tribe depends on freshwater mussels for not only substance, but also for cultural and economical value (DOI 2011a). This would be a disproportionate adverse effect to the food source of tribal people in the short term. As described in Section 3.3, Aquatic Resources, implementation of Mitigation Measure AR-7 would reduce the short- and long-term effects of the Proposed Action on freshwater mussels. With implementation of Mitigation Measure AR-7 there would still be adverse affects on a portion of the freshwater mussel population and the disproportionate adverse effect to the food source of tribal people in the short term would be reduced but not completely avoided.

Dam removal activities could cause disproportionate long term water quality impacts on county residents and tribal people. Dam removal would occur in 2020. Effects until the dams are removed would be similar to the No Action/No Project Alternative. After dam removal, water quality would be expected to improve in the Hydroelectric Reach over the long term. Additionally, there would be long term beneficial effects on dissolved oxygen concentrations and decreased water temperatures downstream of Iron Gate Dam. Similar to improved fisheries, improved water quality would help reduce some of the environmental injustices that the dams have caused to Klamath Basin tribes. Improved water quality would further support restoration of anadromous and sucker fisheries, which would benefits tribes' cultural practices, subsistence, and economies. Based on proposed increased habitat availability and habitat quality, the Proposed Action would also have beneficial effects on mussels in the long term, further supporting subsistence for tribes. Reduced algal blooms would allow for contact recreation during the summer months, which would benefit tribes and county residents. The Proposed Action would be

a benefit relative to environmental justice compared to the No Action/No Project Alternative.

Changes in county revenues associated with dam removal could decrease county funding of social programs. As described in Section 3.15, Socioeconomics, the Proposed Action could cause a short and long term decline in tax revenue to the counties associated with a discontinuation of tax revenue from PacifiCorp and a potential decrease in property values near the reservoirs. There could be an additional long term increase in property tax revenues resulting from increased property values near and adjacent to the Klamath River due to improved water quality. Counties use tax revenues to support programs for public health, public welfare, education and various other services. Decreases in tax receipts could reduce funding for these programs and adversely affect individuals in Siskiyou and Klamath Counties that rely on government support. Conversely increases in tax receipts could improve funding for these programs improving conditions for individuals in Siskiyou and Klamath Counties who rely on government support. It is speculative to quantify short- and long-term impacts on county social programs because many of these programs receive funding from the state and federal governments in addition to county funds. If funding to social programs is reduced, effects would disproportionately affect low income county residents.

Dam removal activities could disproportionately impact tribal health and social wellbeing in the long term. The Proposed Action would be beneficial to fall- and spring-run Chinook salmon, Coho salmon, and summer and winter steelhead, as described in Section 3.3, Aquatic Resources, in the long term. Fish population increases would allow the tribes to increase subsistence fishing and once again make fish a larger component of their diet and ceremonies. Improved water quality would reduce effects to mussels, which could allow tribes to increase consumption of mussels. Consequently, they could rely less on store-bought and/or government-subsidized food (DOI 2011b). In the long term, greater access to their traditional diet has the potential to positively affect the emotional, physical, and social health of the tribes (DOI 2011b). Improved water quality and fish populations would also improve recreation on the Klamath River and potentially allow the Tribes to take advantage of potential recreation-tourism opportunities to improve economic welfare.

The increased flows in the Klamath River and increased fish populations could also allow ceremonies to become more relevant to younger tribe members, allow a greater sense of community within the tribe, and eventually positively affect the social wellbeing of the tribe. As such, implementation of the Proposed Action could beneficially affect tribal health in the long term. The Proposed Action could allow tribal people to gain increased self-reliance and self-sufficiency through increased subsistence and the restoration of the tribal commercial fishery.

The installation of the Yreka water supply pipeline could disproportionately affect county residents or tribal people. The existing water supply pipeline for the City of Yreka would be relocated prior to the decommissioning of the Iron Gate Reservoir. This relocation effort would not require major construction efforts and would not disproportionately impact tribes or county residents. There would be no environmental justice impacts as a result of the Yreka pipeline relocation.

Relocation of existing recreation facilities from the banks of the existing reservoirs down slope to the new river bed could disproportionately affect county residents or tribal people. Recreation facilities, such as campgrounds and boat ramps, currently located on the reservoir banks will need to be relocated down slope to be near the new river bed once the reservoir is removed. Impacts specific to the relocation of the recreation facilities are discussed in Section 3.20, Recreation. There would be no environmental justice impacts as a result of the relocation of the recreation facilities.

Keno Transfer

The Keno Transfer could have adverse effects on environmental justice issues. The Keno Transfer is a transfer of title for the Keno Facility from PacifiCorp to the Bureau of Reclamation. This transfer would not result in the generation of new environmental justice effects impacts compared with existing facility operations. Following transfer of title, Bureau of Reclamation would operate Keno in compliance with applicable law and would provide water levels upstream of Keno Dam for diversion and canal maintenance consistent with agreements and historic practice (KHSA Section 7.5.4). Therefore, the Keno Transfer would have no effect on environmental justice.

East and West Side Facilities

The East and West Side Facilities decommissioning could have adverse effects on environmental justice issues. Decommissioning of the East and West Side canals and hydropower facilities of the Link River Dam by PacifiCorp as a part of the KHSA will redirect water flows currently diverted at Link River Dam into the two canals, back in to Link River. Following decommissioning of the facilities there will be no change in outflow from Upper Klamath Lake or inflow into Lake Ewauna. Therefore, the decommissioning of these facilities would have no effect on environmental justice issues.

KBRA

The KBRA has several programs that could disproportionately affect low income and minority populations. Specific KBRA programs potentially affecting environmental justice include:

- Phases I and II Fisheries Restoration Plans
- Fisheries Monitoring Plan
- Fisheries Reintroduction and Management Plan
- Water Use Retirement Program
- Off-Project Water Reliance Program
- Interim Flow and Lake Level Program
- Tribal Fisheries and Conservation Management Program

- Tribal Programs Economic Revitalization
- Klamath River Tribes Interim Fishing Site
- Mazama Forest Project
- Klamath County Economic Development Plan
- California Water Bond Legislation

Implementation of the Phases I and II Fisheries Restoration Plans, the Fisheries Monitoring Plan, the Fisheries Reintroduction and Management Plan, and the Klamath River Tribes Interim Fishing Site could disproportionately affect tribal populations. The Fishery Programs of the KBRA include restoration, monitoring, and reintroduction projects. Similar to dam removal, projects under the Fishery Programs would help restore anadromous fisheries and the sucker fishery in the Klamath Basin. Additionally the improvements in anadromous fisheries and the sucker fishery generated by the restoration, monitoring, and reintroduction projects would contribute to the effects of hydroelectric facility removal analyzed above. Tribes would be able to fish for cultural, subsistence, and commercial purposes similar to condition before the dams were installed. Fisheries restoration would help reverse past environmental injustices to the tribes.

Implementation of the Water Use Retirement Program, Off-Project Reliance Program, and Interim Flow and Lake Level Program could disproportionately affect low income and minority farm workers. The KBRA proposes voluntary land fallowing and permanent water right sales which could disproportionately affect farm workers in Klamath, Siskiyou and Modoc Counties. Loss of farm labor jobs could disproportionately affect low-income, minority farm workers, who could lose a portion of their income if farms no longer required their labor. This would be a disproportionate effect on farm workers. Actions associated with hydroelectric facilities removal would not be expected to generate any farm labor jobs and would not be expected to contribute to this short term disproportionate effect. The loss of farm jobs as a result of voluntary land fallowing and permanent water right sales would not be influenced by hydroelectric facility removal above given that facility removal does not affect irrigated agriculture and would not cause any farm job losses.

However, the core of the KBRA is to provide water reliability to farmers, which would ensure continuation of agricultural jobs in the area of analysis. In the long term, the KBRA has the potential to offset the loss of agricultural jobs and would not result in a long term environmental justice issue for farm workers.

Implementation of the Tribal Fisheries and Conservation Management Program could disproportionately affect the tribes. Implementation of the Tribal Fisheries and Conservation Management Program would provide funding to assist the tribes in developing their capacity to participate in resource management activities within the basin, particularly relating to tribal fishing and revitalization of tribal subsistence and other economic activities. The program would provide job opportunities to tribal members, which could help reduce unemployment and increase income. Fisheries and conservation projects would also support fisheries restoration to increase fish abundance.

Restored fisheries would help reverse the environmental justice impacts to the tribes that the dams created. The tribes would be able to rely on the river to provide fish for subsistence and some tribes could resume commercial fishing operations to increase revenues. The tribes would also be able to perform cultural practices and ceremonies without restrictions. The timing of and specific locations where these resource management actions could be undertaken is not certain but they would contribute to environmental justice benefits related to hydroelectric facility removal. This would benefit tribes relative to environmental justice.

Implementation of the Tribal Programs Economic Revitalization could disproportionately affect the tribes. This action includes funding for the Klamath, Karuk, and Yurok Tribes to develop economic revitalization plans, programs and projects. Implementation of the plan could potentially increase jobs and income for the Tribes. This would help reduce high poverty and unemployment rates among the Tribes. The timing of and specific locations where these economic revitalization plans, programs and projects could be undertaken is not certain but the improvements they are anticipated to support relative to environmental justice would contribute to the positive effects of hydroelectric facility removal. This would be a benefit relative to environmental justice.

Implementation of the Mazama Forest Project could disproportionately affect the tribes. The Mazama Forest Project would transfer 90,000 acres of privately owned timberland, which were formerly owned by the Klamath Tribes, back to the Klamath Tribes. With ownership of the lands, the tribe could hunt, harvest timber, or use the land for other purposes. The improvement in environmental justice generated by the Mazama Forest Project would contribute to the effects of hydroelectric facility removal. This would be a beneficial effect to the Klamath Tribes relative to environmental justice concerns.

Implementation of the Klamath County Economic Development Plan could disproportionately affect low income and minority people in Klamath County. This action would provide \$3.2 million of funding to Klamath County. Funding would support long-term economic growth in Klamath County and could create new job opportunities and improve public programs for county residents. The improvement in environmental justice generated by the Klamath County Economic Development Plan would contribute to the effects of construction activities associated with the hydroelectric facility removal activities. Depending on how funding is used within the county, this action could benefit low income and minority populations.

Implementation of the California Water Bond Legislation could disproportionately affect low income and minority people in Siskiyou County. If approved, bond funds would provide \$20 million to Siskiyou County to use for economic development. It cannot be determined at this time how Siskiyou would distribute funds from the California Water Bond Legislation; this is a general discussion. The bond funds could assist Siskiyou County in addressing unemployment, poverty, bankruptcy, and social problems and continuing funding for other county programs. The improvement in environmental justice generated by the California Water Bond Legislation would contribute to the effects of

construction activities associated with the hydroelectric facility removal activities. Programs could benefit low income and minority populations in Siskiyou County.

Alternative 3: Partial Facilities Removal of Four Dams

Short and long term impacts under the Partial Facilities Removal of Four Dams Alternative would be the same as those described under the Full Facilities Removal Alternative. This alternative would include the full implementation of the KBRA, the Keno Transfer, and the East and West Side Facilities decommissioning. Environmental justice effects of KBRA would be the same as described for the Proposed Action.

Alternative 4: Fish Passage at Four Dams

This alternative does not include implementation of the KBRA.

Fish passage at the four dams could affect fisheries and disproportionately affect tribal people. Tribes would benefit from increased anadromous and native fish populations as a result of this alternative. Restored fisheries would help reverse the environmental justice impacts to the tribes that the dams created. This alternative would not result in disproportionate effects to tribal people relative to the No Action/No Project Alternative.

Increased air pollutants and noise associated with fish passage construction activities could disproportionately affect county residents and tribal people. Environmental justice impacts to county residents and tribal people associated with increased air pollutants associated with dam removal would be similar to those discussed under the Proposed Action. Environmental justice impacts on county residents and tribal people would be greater under the Fish Passage at Four Dams Alternative relative to the No Action/No Project Alternative.

The traffic on the associated haul roads could disproportionately affect county residents and tribal people. Environmental justice impacts to county residents or tribal people associated with traffic on associated haul roads would be similar to those discussed under the Proposed Action. Fish Passage at Four Dams Alternative would not result in adverse long term environmental justice impacts from traffic on county residents or tribes within the area of analysis.

Construction of fish passage could provide jobs for county residents and tribal people that are low income and minority. Construction activities would generate jobs in the area of analysis. Increased employment would support low income individuals, resulting in a beneficial effect. This short-term benefit to low income and minority populations of the Fish Passage at Four Dams Alternative would be greater than under the No Action/No Project Alternative.

Continued impoundment of water at the reservoirs could cause disproportionate long term water quality impacts on county residents and tribal people. Environmental justice impacts to county residents and tribal people associated with continued impoundment of water at the reservoirs causing disproportionate long-term water quality impacts would be similar to those discussed under the No Action/No Project Alternative. Fish Passage at

Four Dams would degrade water quality for aquatic species that provide subsistence or commercial fishing revenues for tribes, and would continue to create disproportionate effects and environmental justice concerns on the tribes in the Klamath Basin.

Changes in county revenues could decrease county funding of social programs used by county residents. Environmental justice impacts to county residents associated with county revenues and funding for social programs would be similar to those discussed in the No Action/No Project Alternative. Fish Passage at Four Dams would not create short or long term changes to property values or local tax revenues relative to the No Action/No Project Alternative, thus county residents would not be disproportionately affected.

Fish passage and continued impoundment of water could disproportionately impact tribal health and social wellbeing in the long term. Fish passage would increase fish abundance for tribes to practice cultural traditions and to catch fish for commercial and subsistence purposes. Fish passage would improve tribal health and social wellbeing relative to the No Action/No Project Alternative. However, continued impoundment of water under the Fish Passage at Four Dams Alternative would not improve water quality in the long term, which would result in ongoing effects to fish, mussels, and habitat. Continued impoundment of water in the reservoir would not improve tribal health and social well being. Therefore, fish passage combined with continued impoundment of water would continue existing environmental injustices to the tribes and the tribes would continue to be disproportionately affected relative to the No Action/No Project Alternative.

Alternative 5: Fish Passage at Two Dams, Remove Copco 1 and Iron Gate

This alternative does not include implementation of the KBRA.

Dam removal activities could affect fisheries and disproportionately affect tribal people. Tribes would benefit from increased anadromous and native fish populations as a result of this alternative. Restored fisheries would help reverse the environmental justice impacts to the tribes that the dams created. This alternative would not result in disproportionate effects to tribal people relative to the No Action/No Project Alternative.

Increased air pollutants and noise associated with fish passage and dam removal activities could disproportionately affect county residents and tribal people. Environmental justice impacts to county residents and tribal people associated with increased air pollutants associated with dam removal would be similar to those discussed under the Proposed Action. Environmental justice impacts on county residents and tribal people would be greater under the Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative relative to the No Action/No Project Alternative.

The traffic on the associated haul roads could disproportionately affect county residents and tribal people. Environmental justice impacts to county residents or tribal people associated with traffic on associated haul roads would be similar to those discussed under the Proposed Action. Fish Passage at Two Dams, Remove Copco 1 and Iron Gate

Alternative would not result in adverse long term environmental justice impacts from traffic on county residents or tribes within the area of analysis.

Construction of fish passage could provide jobs for county residents and tribal people that are low income and minority. Construction activities would generate jobs in the area of analysis. Increased employment would support low income individuals, resulting in a beneficial effect. This short-term benefit to low income and minority populations of the Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative would be greater than under the No Action/No Project Alternative.

Continued impoundment of water at the reservoirs could cause disproportionate long term water quality impacts on county residents and tribal people. Continued impoundment of water under the Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative would degrade water quality for aquatic species that provide subsistence or commercial fishing revenues for tribes, and would continue to create disproportionate effects and environmental justice concerns on the tribes in the Klamath Basin.

Changes in county revenues could decrease county funding of social programs used by county residents. Environmental justice impacts to county residents or tribal people associated with changes in county revenues associated with dam removal would be the same as discussed under the Proposed Action. Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative would disproportionately affect low income county residents, if funding to social programs is reduced.

Fish passage and continued impoundment of water could disproportionately impact tribal health and social wellbeing in the long term. Fish passage would increase fish abundance for tribes to practice cultural traditions and to catch fish for commercial and subsistence purposes. Fish passage would improve tribal health and social wellbeing relative to the No Action/No Project Alternative. However, continued impoundment of water under the Fish Passage at Four Dams Alternative would not improve water quality in the long term, which would result in ongoing effects to fish, mussels, and habitat. Continued impoundment of water in the reservoir would not improve tribal health and social well being. Therefore, fish passage combined with continued impoundment of water would continue existing environmental injustices to the tribes and the tribes would continue to be disproportionately affected relative to the No Action/No Project Alternative.

3.16.4.3 Mitigation Measure Analysis **Mitigation Measure by Consequence Summary**

Implementation of mitigation measures in Section 3.9, Air Quality, and Section 3.23, Noise and Vibration, would reduce environmental justice effects related to construction.

3.16.4.4 Mitigation Measures Associated with other Resources

Mitigation measure REC-1 would create a plan to develop recreational facilities and access points along the newly formed river channel between J.C. Boyle Reservoir and Iron Gate Dam. Recreation facilities, such as campgrounds and boat ramps, currently located on the edge of the reservoir would need to be replaced in appropriate areas near

the new river channel once the reservoir is removed. These developments would take place on lands that are currently inundated and would not create environmental justice issues for tribal members or farm workers. There would be no impact to environmental justice as a result of implementing REC-1.

3.16.4.5 Summary of Beneficial Effects

Table 3.16-11 summarizes the beneficial effects of the Proposed Action and alternatives.

Table 3.16-11. Beneficial Effects of the Proposed Action and Alternatives

Effect	Alternatives				
	1	2	3	4	5
Dam removal could improve fisheries and benefit tribes’ cultural practices, subsistence and commercial fishing	NE	B	B	B	B
Construction could create jobs for county residents and tribal people	NE	B	B	B	B
Dam removal could reverse long term water quality impacts on tribal people	NE	B	B	NE	B (partial)
Dam removal could decrease disproportionate effects to tribal health and social well being	NE	B	B	NE	B (partial)
Fisheries restoration could improve fisheries and benefit tribes’ cultural practices, subsistence and commercial fishing	NE	B	B	NE	NE
Improve water supply reliability to agriculture could increase farm revenues	NE	B	B	NE	NE
Funding to Klamath and Siskiyou Counties could improve county economic and social conditions	NE	B	B	NE	NE
Funding to tribes for conservation management, fisheries management, and economic revitalization would improve economic and social conditions of tribes	NE	B	B	NE	NE

Key:

- Alternative 1 = No Action/No Project Alternative
- Alternative 2 = Full Facilities Removal of Four Dams (Proposed Action)
- Alternative 3 = Partial Facilities Removal of Four Dams Alternative
- Alternative 4 = Fish Passage at Four Dams Alternative
- Alternative 5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative
- B = Beneficial
- NE = No effect

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