E9.0 SOCIOECONOMIC RESOURCES

This section of the Klamath Hydroelectric Project (Project) Exhibit E reports on socioeconomic resources potentially affected by the Project. The Project has been assigned Federal Energy Regulatory Commission (FERC) Project No. 2082. Title 18 Section 4.51 (f) of the U.S. Code of Federal Regulations (CFR) does not require a report on socioeconomics as part of Exhibit E. However, in Appendix D of FERC's Hydroelectric Project Licensing Handbook (FERC, 2001), FERC encourages the preparation of a socioeconomic report, particularly for "original construction and larger projects where some facility modification is being proposed." No new construction or facility modification is being proposed by PacifiCorp for the Project. FERC's guidelines "for smaller projects without major construction" are as follows:

> "The socioeconomic report can be limited to a discussion of the project's ongoing effects on the local economy and government fiscal position; and estimates should be provided for changes in employment or income associated with any anticipated modifications to recreation use in the project area, such as whitewater rafting, boating, or fishing."

E9.1 EXISTING SOCIOECONOMIC CONDITIONS

The following sections present an overview of the socioeconomic conditions within the study area. For specific information, refer to the Socioeconomic Resources Final Technical Report (FTR), Section 2.7.

The study area for the socioeconomic analysis includes Klamath, Jackson, and Curry counties in Oregon and Siskiyou, Humboldt, and Del Norte counties in California. The existing Project is located within Klamath County, Oregon, and Siskiyou County, California. However, the additional counties are included because their economies, local services, and human resources are potentially affected by the incremental changes to the Project and protection, mitigation, and enhancement (PM&E) measures. Owing to observed differences in how the Klamath River is used above and below Iron Gate dam, the study area was divided into two broad subregions. The upstream regions consist of Klamath and Jackson counties, Oregon, and Siskiyou County, California, and the downstream regions consist of Curry County, Oregon, and Humboldt and Del Norte counties, California.

Socioeconomic data were collected and presented for two additional regions within the above-mentioned state and county boundaries. The regions consist of two corridors extending from the Link River dam down the Klamath River to the Pacific Ocean, and then extending along the coast terminating at the boundaries of the Klamath Management Zone (KMZ) (Humbug Mountain, Oregon and Horse Mountain/Shelter Cove, California). One corridor extends 5 miles on each side of the river and 5 miles inland at the coast (a 5-mile buffer area). The 5-mile corridor is expanded slightly to include the communities of Yreka and Dorris, California, which are considered to have a strong connection to the river but are just outside the 5-mile corridor. For the purpose of collecting socioeconomic information, a second region extends up to 50 miles each side of the river and up to 50 miles inland along the coast, staying within the above-mentioned county and KMZ borders (a 50-mile buffer area). The study reports information for the regions and geographic scales that are most pertinent to study objectives, given the limitations of the data.

In the course of study and in the interim between the draft license application and this final application, PacifiCorp made a few changes to the proposed Project. The newly proposed Project begins at the J.C. Boyle Development and continues downstream to the Iron Gate Development. The Spring Creek diversion is now included in the Fall Creek Development. The East Side, West Side, and Keno developments are no longer part of the proposed Project. Keno dam will remain in operation, but is not included in the proposed FERC Project because the development does not have generation facilities, and its operation does not substantially benefit generation at PacifiCorp's downstream hydroelectric developments.

E9.1.1 Population

The total population within the six-county study area in 2000 was 464,507 (U.S. Census, 2000). The three counties that make up the upstream region have a combined population of 289,345. Table E9-1 shows the contribution of each of the three counties in the upstream region to the upstream region total and the six-county study area total. The combined population of the downstream region is 175,162. Table E9-2 shows the contribution of the individual counties (Curry, Del Norte, and Humboldt) to the downstream region and the combined six-county region. The upstream region contains more than 60 percent of the study area population, with Jackson County, Oregon, containing almost 40 percent of the total study area population. The physical structures of the Project are all within the counties of Klamath and Jackson in Oregon and Siskiyou in California. Ashland, Medford, Klamath Falls, Altamont, Yreka, Mount Shasta, and Weed have the greatest populations among the counties included in the study.

Table E9-1. Year 2000 upstream region population by county.

	Population	**Percent of Upstream Total**	**Percent of Six-County Total**
Jackson	181,269	63	39
Klamath	63,775	22	14
Siskiyou	44,301	15	10
Upstream Region Total	289,345	100	62
Six-County Total	**464,507**		**100**

Source: U.S. Census, 2000.

Table E9-2. Year 2000 downstream region population by county.

	Population	**Percent of Downstream Total**	**Percent of Six-County Total**
Curry	21,137	12	5
Del Norte	27,507	16	6
Humboldt	126,518	72	27
Downstream Region Total	175,162	100	38
Six-County Total	**464,507**		**100**

Source: U.S. Census, 2000.

The population within the 50-mile buffer area is almost equal to the population within the two-county (Siskiyou/Klamath) area. Thus, the 50-mile buffer does not appear to add any new

population information or perspective. The 5-mile buffer area for the upstream counties represents about 20 percent of the upstream county population total. This suggests that it can be important to separate the 5-mile buffer from the county population to better characterize local effects in the Project area. In contrast, the coastal population of the downstream counties captures about 80 percent of the downstream county population total. Thus, the county aggregates are likely to adequately reflect effects felt within the 5-mile coastal corridors.

Over time, the county populations in the study area have exhibited relatively low annual growth rates. The upstream region had an annual average growth of 1.6 percent between 1970 and 2000, and this growth is predicted to slow to 0.6 percent between 2000 and 2040. The downstream region shows a similar pattern, with a 1.1 percent average annual growth rate from 1970 to 2000 and a predicted rate of 0.7 percent for 2000 to 2040. Table E9-3 shows the population estimates and predictions for the years 1970 to 2040 on a county-by-county basis and for the study regions. The population changes have been more severe at the subcounty level, with some of the smaller communities experiencing population reductions during this time period.

Table E9-3. Estimated population (in thousands) and predicted long-term population trends, 1970 to 2040.

									Percent Average Annual Growth Rate	
	1970	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**1970 to 2000**	**2000 to 2040**
Upstream Region	177.8	231.3	248.9	287.3	320.3	353.7	387.0	418.5	1.6	0.9
Downstream Region	127.3	143.7	162.2	178.7	201.4	215.5	227.4	236.4	1.1	0.7
Six-County Region	305.1	375.0	411.1	466.0	521.8	569.2	614.3	654.9	1.4	0.9
California Total	147.5	166.4	186.1	198.3	222.4	236.7	249.1	259.8	1.0	0.7
Oregon Total	157.5	208.6	224.9	267.7	299.4	332.6	365.2	395	1.8	1.0
Two-State Total	305	375	411	466	521.8	569.3	614.3	654.8	1.4	0.9
Curry	13.0	17.0	19.6	24.7	28.6	32.5	35.9	38.6	2.2	1.1
Del Norte	14.6	18.2	23.5	27.5	37.3	41.9	46.4	50.9	2.1	1.5
Humboldt	99.7	108.5	119.1	126.5	135.6	141.1	145.1	146.9	0.8	0.4
Jackson	94.5	132.5	147.4	178.0	199.4	221.7	244.1	264.9	2.1	1.0
Klamath	50.0	59.1	57.9	65.0	71.4	78.4	85.2	91.5	0.9	0.9
Siskiyou	33.2	39.7	43.5	44.3	49.5	53.7	57.6	62.0	1.0	0.8

Sources: U.S. Decennial Census, Office of Economic Analysis, 1997.

The largest racial group in the study area is white, representing more than three-fourths of the population in the study area. The American Indian population constitutes the second largest racial group in all but Jackson County, where the second largest racial group consists of individuals who characterize themselves as being from “Two or More Races.” The downstream region has a slightly more diverse racial makeup. Table E9-4 shows the racial and ethnic makeup of the population by individual county and region.

Table E9-4. Race and ethnic distributions by individual county and by region, 2000 census.

	Total Population	White	Black or African American	American Indian and Alaskan Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic*
Curry County	21,137	93.0	0.1	2.4	0.8	0.0	1.0	2.6	3.3
Del Norte County	27,507	78.8	4.3	5.7	2.2	0.2	3.8	4.9	13.5
Humboldt County	126,518	84.8	0.8	5.6	1.5	0.1	2.4	4.9	6.1
Jackson County	181,269	91.6	0.4	1.1	0.8	0.2	2.9	3.1	6.7
Klamath County	63,775	87.2	0.5	4.1	0.7	0.2	3.6	3.7	7.8
Siskiyou County	44,301	87.0	1.3	3.7	1.3	0.2	2.8	3.7	7.2
Upstream Region	289,345	90.0	0.6	2.2	0.9	0.2	3.0	3.1	7.0
Downstream Region	175,162	84.8	1.3	5.4	1.6	0.2	2.5	4.2	6.9
Six-County Region	464,507	88.0	0.9	3.4	1.2	0.2	2.8	3.5	7.0
California Total	198,326	84.4	1.4	5.4	1.6	0.2	2.7	4.2	7.4
Oregon Total	266,181	90.7	0.4	1.9	0.9	0.2	2.9	3.0	6.7
Two-State Region	464,507	88.0	0.9	3.4	1.2	0.2	2.8	3.5	7.0

Source: U.S. Census, 2000.

* Hispanics or Latinos are those people who classified themselves in one of the specific Spanish, Hispanic, or Latino categories listed on the Census 2000 questionnaire—"Mexican, Mexican Am., Chicano," "Puerto Rican," or "Cuban"—as well as those who indicate that they are "other Spanish/Hispanic/Latino." People who identify their origin as "other Spanish/Hispanic/Latino" may be of any race. Thus, the percent Hispanic should not be added to percentages for racial (i.e., minority) categories.

Within the 5-mile buffer area, the community of Klamath census designated place (CDP) had the highest concentration of minority (nonwhite) population in 2000. About 46 percent of the population of Klamath CDP is nonwhite. Almost three-fourths of the minority population in Klamath CDP, California, is American Indian. Excepting Klamath CDP, the percentage of minority population ranges from 6.5 percent in Ferndale, California, to 22.6 percent in Crescent City, California. Table E9-5 shows the race and ethnic distribution of the population in the communities within the 5-mile buffer area.

Table E9-5. Race and ethnic distributions (percent) by county and community within the 5-mile buffer area, 2000 census.

	Total Population	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Some Other Race (%)	Two or More Races (%)	Hispanic[1] (%)
Curry County	18,082	93.3	0.1	2.4	0.9	0.0	1.0	2.2	3.4
Del Norte County	26,583	78.8	4.3	5.9	2.3	0.2	3.9	4.6	13.7
Humboldt County	101,152	84.0	0.9	6.1	1.7	0.1	2.1	5.0	5.7
Jackson County	785	92.6	0.0	3.4	0.0	0.0	0.0	3.9	0.5
Klamath County	50,970	88.2	0.4	3.6	0.8	0.2	3.3	3.5	7.2

Table E9-5. Race and ethnic distributions (percent) by county and community within the 5-mile buffer area, 2000 census.

	Total Population	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Some Other Race (%)	Two or More Races (%)	Hispanic[1] (%)
Siskiyou County	21,725	86.2	0.5	5.5	1.6	0.2	2.2	3.7	6.2
Arcata City, CA	16,714	83.8	1.3	3.0	1.8	0.0	4.2	5.9	7.1
Bayview CDP, CA	2,355	82.4	0.4	5.0	2.6	0.0	4.8	4.6	9.3
Bertsch-Oceanview CDP, CA	2,097	82.7	0.0	7.4	3.3	0.0	2.7	3.9	7.2
Clear Creek/Fort Goff/ Hamburg, CA[2]	525	78.3	0.4	15.4	1.3	0.0	0.6	4.0	2.1
Copco, CA[2]	1,648	89.3	0.5	5.0	0.0	0.1	1.2	3.9	4.2
Crescent City, CA	3,888	77.4	0.7	6.2	4.9	0.0	5.2	5.6	10.8
Crescent City North CDP, CA	4,069	79.4	0.5	3.4	3.0	0.0	4.1	9.6	9.0
Cutten CDP, CA	3,096	88.6	0.0	6.4	0.2	0.0	1.0	3.8	6.5
Dorris City, CA	902	77.7	0.0	8.1	0.8	0.0	9.8	3.7	19.5
Eureka City, CA	25,929	82.9	1.2	4.2	2.9	0.2	2.3	6.5	7.2
Ferndale City, CA	1,421	93.5	0.1	1.0	0.0	0.0	1.5	3.9	4.2
Gottsville/Henley/ Klamathon, CA[2]	743	86.4	0.4	6.6	0.0	0.1	1.7	4.7	4.3
Happy Camp, CA[2]	667	68.8	0.6	24.9	0.0	0.0	0.0	5.7	3.9
Hornbrook CDP, CA	314	88.5	0.0	6.4	0.0	0.0	1.6	3.5	6.7
Horse Creek, CA[2]	1,749	91.6	0.0	2.1	0.2	0.0	1.7	4.5	7.0
Humboldt Hill CDP, CA	3,252	85.0	2.0	2.2	2.5	0.0	3.4	5.0	7.8
Johnsons/Pecwan/ Kanick/Martin's Ferry/ Surgone/Waseck/ Weitchpec, CA[2]	465	19.6	0.0	69.2	0.0	0.0	2.4	8.8	2.4
Klamath CDP, CA	653	54.2	0.0	39.4	0.0	0.3	1.2	4.9	4.9
Klamath Glen/Requa, CA[2]	1,126	59.7	1.9	28.7	0.9	0.2	2.2	6.5	8.5
Klamath River/Nolton/ Seiad Valley, CA[2]	990	75.2	0.3	15.5	0.8	0.9	0.3	7.1	3.8
McKinleyville CDP, CA	13,601	88.5	0.2	3.5	1.2	0.0	1.3	5.2	4.4
Montague City, CA	1,525	91.3	0.1	3.7	0.0	0.0	1.6	3.2	3.9
Myrtletown CDP, CA	4,375	87.6	2.7	1.6	4.3	0.0	1.3	2.4	3.9
Orleans, CA[2]	601	64.1	0.0	23.6	3.5	0.0	1.3	7.5	3.5
Pine Hills CDP, CA	3,096	93.2	0.8	2.3	0.4	0.0	0.0	3.4	2.8
Somes Bar, CA[2]	891	82.6	0.0	10.9	0.0	0.0	0.4	6.1	2.5
Trinidad City, CA	331	88.8	2.4	1.2	1.5	0.0	1.2	4.8	4.8

Table E9-5. Race and ethnic distributions (percent) by county and community within the 5-mile buffer area, 2000 census.

	Total Population	White (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Some Other Race (%)	Two or More Races (%)	Hispanic[1] (%)
Westhaven-Moonstone CDP, CA	1,046	90.0	0.0	3.0	2.1	0.0	0.3	4.7	4.5
Yreka City, CA	7,442	86.1	0.3	4.1	4.2	0.5	1.8	3.1	5.4
Brookings City, OR	5,363	91.1	0.1	2.3	2.2	0.0	1.5	2.7	4.5
Gold Beach City, OR	1,864	95.9	0.3	1.7	0.0	0.4	0.2	1.6	2.2
Midland, OR[2]	1,301	95.0	0.0	0.7	0.5	0.7	0.0	3.2	8.5
Keno, OR[2]	1,011	93.8	0.0	0.7	0.7	0.0	0.0	4.8	2.4
Klamath Falls City, OR	19,335	85.1	0.7	5.0	1.1	0.3	4.6	3.4	8.8

Source: U.S. Census, 2000.

[1] Hispanics or Latinos are those people who classified themselves in one of the specific Spanish, Hispanic, or Latino categories listed on the Census 2000 questionnaire—"Mexican, Mexican Am., Chicano," "Puerto Rican," or "Cuban"—as well as those who indicate that they are "other Spanish/Hispanic/Latino." People who identify their origin as "other Spanish/Hispanic/Latino" may be of any race. Thus, the percent Hispanic should not be added to percentages for racial (i.e., minority) categories.

[2] These are non-census designated place (CDP) communities. Data for these communities were collected at the census block group level. Although some communities may be distinct on the ground, they may be combined in the same census block group, as reflected by the combinations of communities shown in the table.

Thus, the communities within the 5-mile buffer area, especially the smaller ones along the river, are characterized by higher percentages of minority population than those observed for the individual counties.

Age distributions are similar across communities with about one-fourth of the population under 18 years and one-third above 50 years. The city of Trinidad is the only exception with about 14 percent of its population below 17 years and about half of its population above 50 years.

E9.1.2 Housing

Housing stock, vacancy, and substandard housing information for the study area were derived from the 2000 Census data. Although the U.S. Census does not have a category of housing called "substandard" in its data, certain housing features are considered to be important for a housing unit to be assessed as standard for habitation. The Bureau of Census collects housing information for the Department of Housing and Urban Development and provides these data as the American Housing Survey. According to the American Housing Survey, a housing unit may be categorized as "substandard" if the unit either lacks adequate plumbing or kitchen facilities. For the current study, a housing unit is considered to be "substandard" if it lacks adequate plumbing and kitchen facilities.

The study area has adequate housing as indicated by high vacancy rates. Vacancy rates above 5 percent are generally thought to indicate a surplus of housing units available for rent. Overall, there are about twice as many owner-occupied housing units as there are renter-occupied housing

units. The ratio of owner-occupied housing units is sometimes used as an indicator of community well-being because it is reflective of the relative wealth and commitment of residents to the area (Doak and Kuesel, 1997). Jackson County has the highest percentage of owner-occupied housing and Humboldt County has the lowest percentage.

Tables E9-6 and E9-7 show housing stock, vacancy, and substandard housing information within the 50-mile and 5-mile buffer areas. In general, the 5-mile buffer area has slightly lower vacancy rates, at the county level, indicating that housing, though still above the 5 percent level that is thought to indicate housing shortage, is becoming limited. The only exception is Jackson County, which has a vacancy rate at the 5-mile buffer area that is about five times as high as it is at the 50-mile buffer area.

The ratio of owner-occupied housing units within the 5-mile buffer area is slightly less than that within the 50-mile buffer area. Thus, the closer one is to the Project area, the tighter the housing market and the poorer the community (or the lower the community well-being as measured by the ratio of owner-occupied housing units).

Substandard housing ratios in each county are similar for the 50-mile and 5-mile buffer areas. The only exception is Jackson County, which has about 2 percent of its housing units within the 50-mile buffer area falling under the "substandard housing" category, compared to 18 percent for the 5-mile buffer area.

Table E9-6. Housing stock, vacancy, and substandard information within the 50-mile buffer area, 2000 census.

	Housing Units	Vacant	Percent Vacancy Rate	Owner Occupied	Renter Occupied	Percent Owner Occupied	Percent Substandard Housing*
Curry County	10,237	1,700	16.6	6,213	2,324	60.7	3.0
Del Norte County	10,434	1,264	12.1	5,851	3,319	56.1	1.3
Humboldt County	55,912	4,674	8.4	29,524	21,714	52.8	3.2
Jackson County	75,737	4,205	5.6	47,574	23,958	62.8	1.9
Klamath County	27,563	3,366	12.2	16,380	7,817	59.4	3.5
Siskiyou County	21,947	3,391	15.5	12,475	6,081	56.8	4.6

Source: U.S. Census, 2000.

* Substandard housing consists of housing units that lack adequate plumbing and kitchen facilities.

In addition to summarizing housing information at the 5-mile buffer area within each of the six counties, Table E9-7 also summarizes information for communities (both CDPs and non-CDPs) within the 5-mile buffer area. With the exception of Arcata, Clear Creek/Fort Goff/Hamburg, Crescent City, Crescent City North, Eureka, Happy Camp, Klamath River/Nolton/Seiad Valley, Orleans, Somes Bar, Trinidad and Klamath Falls, the communities within the 5-mile buffer area have a higher ratio of owner-occupied housing units than their respective county averages. The community of Keno has the highest percentage of owner-occupied housing units at 80.8 percent, followed by Humboldt Hill at 72.6 percent, Pine Hills at 72.4 percent, and Westhaven-Moonstone at 64.9 percent.

The communities within the 5-mile buffer area have, in general, relatively higher percentages of substandard housing. The community with the highest percentage of substandard housing units (at 50.2 percent) is the community of Johnson/Pecwan/Kanick/Martin's Ferry/Surgone/Waseck/ Weitchpec. The community of Orleans has the second highest percentage of substandard housing units (43 percent), followed by the communities of Somes Bar (24.8 percent) and Clear Creek/ Fort Goff/Hamburg (24.6 percent). In addition to the above communities, there are a number of other communities with proportions of substandard housing units that are higher than the proportion observed for the county. These communities, all of which are in Siskiyou County, are Gottsville/Henley/Klamathon (9.1 percent), Happy Camp (9 percent), Hornbrook (9.5 percent), and Klamath River/Nolton/Seiad Valley (9.4 percent). Thus, the communities within the Project area are characterized by higher proportions of substandard housing.

Two conclusions potentially relevant to an assessment of Project-induced changes in the socioeconomic condition can be reached. First, from the vacancy rate information it can be concluded that housing is available to accommodate an influx of temporary or permanent workers should the proposed Project and PM&E measures require additional laborers. Second, the relatively high percentage of substandard housing in communities within the 5-mile area provides one measure suggesting that community well-being is on the low side, and thus these communities might be less resilient to economic losses and benefit more from economic gains than their more wealthy counterparts.

Table E9-7. Housing stock, vacancy, and substandard housing information within the 5-mile buffer area, 2000 census.

	Housing Units	Vacant	Percent Vacancy Rate	Owner Occupied	Renter Occupied	Percent Owner Occupied	Percent Substandard Housing[1]
Curry County	9,666	1,566	16.2	5,877	2,223	72.6	3.1
Del Norte County	9,980	1,164	11.7	5,623	3,193	63.8	1.2
Humboldt County	44,340	3,271	7.4	23,142	17,927	56.3	2.9
Jackson County	432	113	26.2	249	70	78.1	18.1
Klamath County	22,473	2,238	10.0	13,293	6,942	65.7	3.0
Siskiyou County	10,704	1,639	15.3	6,176	2,889	68.1	5.4
Arcata City, CA	7,272	221	3.0	2,646	4,405	36.4	0.5
Bayview CDP, CA	981	45	5.0	604	332	61.6	1.0
Bertsch-Oceanview CDP, CA	924	110	12.0	556	258	60.2	0.0
Clear Creek/Fort Goff/ Hamburg, CA[2]	366	143	39.1	165	58	45.1	24.6
Copco, CA[2]	800	167	20.9	522	111	65.3	5.3
Crescent City, CA	1,754	176	10.0	518	1,060	29.5	0.0
Crescent City North CDP, CA	1,761	194	11.0	780	787	44.3	1.0
Cutten CDP, CA	1,249	52	4.0	717	480	57.4	1.6
Dorris City, CA	396	54	14.0	237	105	59.8	2.4
Eureka City, CA	11,637	680	6.0	5,092	5,865	43.8	1.7

Table E9-7. Housing stock, vacancy, and substandard housing information within the 5-mile buffer area, 2000 census.

	Housing Units	Vacant	Percent Vacancy Rate	Owner Occupied	Renter Occupied	Percent Owner Occupied	Percent Substandard Housing[1]
Ferndale City, CA	663	52	8.0	385	226	58.1	2.0
Gottsville/Henley/ Klamathon, CA[2]	427	91	21.3	245	91	57.4	9.1
Happy Camp, CA[2]	398	80	20.1	173	145	43.5	9.0
Hornbrook CDP, CA	148	28	19.0	84	36	56.8	9.5
Horse Creek, CA[2]	883	125	14.2	528	230	59.8	4.8
Humboldt Hill CDP, CA	1,269	60	5.0	921	288	72.6	1.7
Johnsons/Pecwan/ Kanick/Martin's Ferry/ Surgone/Waseck/ Weitchpec, CA[2]	243	68	28.0	122	53	50.2	50.2
Klamath CDP, CA[2]	365	101	28.0	200	64	54.8	6.4
Klamath Glen/Requa, CA[2]	600	169	28.2	315	116	52.5	5.5
Klamath River/Nolton/ Seiad Valley, CA[2]	598	183	30.6	277	138	46.3	9.4
McKinleyville CDP, CA	5,494	217	4.0	3,444	1,833	62.7	0.8
Montague City, CA	609	49	8.0	377	183	61.9	0.2
Myrtletown CDP, CA	1,827	89	5.0	1,060	678	58.0	0.2
Orleans, CA[2]	321	90	28.0	158	73	49.2	43.0
Pine Hills CDP, CA	1,253	54	4.0	903	296	72.1	1.7
Somes Bar, CA[2]	601	207	34.4	300	94	49.9	24.8
Trinidad City, CA	228	60	26.0	105	63	46.1	4.4
Westhaven-Moonstone CDP, CA	498	45	9.0	323	130	64.9	0.8
Yreka City, CA	3,303	189	6.0	1,797	1,317	54.4	0.5
Brookings City, OR	2,614	305	12.0	1,313	996	50.2	1.2
Gold Beach City, OR	987	158	16.0	550	279	55.7	2.2
Midland, OR[2]	606	100	16.5	452	54	74.6	0.0
Keno, OR[2]	442	41	9.3	357	44	80.8	4.8
Klamath Falls City, OR	8,722	806	9.0	3,906	4,010	44.8	2.6

Source: U.S. Census, 2000.

[1] Substandard housing consists of housing units that lack adequate plumbing and kitchen facilities.

[2] These are non-census designated place (CDP) communities. Data for these communities were collected at the census block group level. Although some communities may be distinct on the ground, they may be combined in the same census block group, as reflected by the combinations of communities shown in the table.

E9.1.3 General Economic Development

Each of the counties in the study area has experienced a net job growth between 1980 and 1999, as shown in Table E9-8. In general, however, the average annual growth rates for the study area counties have been lower than their respective state growth rates, and the study area counties showed negative job growth between 1980 and 1985. The exception is Jackson County, Oregon, which has experienced continuous job growth at average annual rates greater than the Oregon average.

Table E9-8. Historical total employment*, 1980 to 1999, with average growth rates.

						Percent Average Annual Growth Rate	
	1980	1985	1990	1995	1999	1980 to 1990	1990 to 1999
Upstream Region	103,822	105,680	125,391	141,521	156,736	1.9	2.5
Downstream Region	67,007	66,333	79,090	84,591	89,413	1.7	1.4
Six-County Region	170,829	172,013	204,481	226,112	246,149	1.8	2.1
California Total	12,776,835	14,359,725	16,970,340	17,092,816	19,020,930	2.9	1.3
Oregon Total	1,353,338	1,378,693	1,639,255	1,861,197	2,080,821	1.9	2.7
Two-State Total	14,130,173	15,738,418	18,609,595	18,954,013	21,101,751	2.8	1.4
Individual Counties							
Curry County, OR	7,062	6,767	8,633	9,318	10,187	2.0	1.9
Del Norte County, CA	8,338	7,052	9,080	10,067	10,680	0.9	1.8
Humboldt County, CA	51,607	52,514	61,377	65,206	68,546	1.7	1.2
Jackson County, OR	58,792	61,934	76,513	89,057	101,323	2.7	3.2
Klamath County, OR	27,135	26,129	28,667	30,995	33,182	0.6	1.6
Siskiyou County, CA	17,895	17,617	20,211	21,469	22,231	1.2	1.1

Source: USDOC, 2003a.

* Employment trends include seasonal employment.

Table E9-9 shows the distribution of jobs among different industries for the individual counties in the year 1999. Throughout the study region, Services, Retail Trade, and Government are the three industries with the greatest percentage of total county employment. Agriculture varies in importance in terms of employment, with total employment in agriculture (farm employment as well as employment in agricultural services) comprising 8 percent of all jobs in Siskiyou and 7.2 percent of all jobs in Klamath counties, compared with 4.9 percent in Del Norte, 3.8 percent in Curry, 3.4 percent in Humboldt, and 3.2 percent in Jackson counties. Employment in the Fishing, Hunting, and Trapping sector accounts for 1.1 percent of all jobs in Del Norte, 0.9 percent in Curry, and 0.1 percent in Humboldt counties. Employment data in the Fishing, Hunting, and Trapping sector are not available for the other three counties for reasons of confidentiality.

Table E9-9. 1999 employment by industry for individual counties (thousands of jobs)[1].

	Curry		Del Norte		Humboldt		Jackson		Klamath		Siskiyou	
	Jobs	% Total	Jobs	% Total	Jobs	% Total	Jobs	% Total	Jobs	% Total	Jobs	% Total
Total Full- and Part-Time Employment[2]	10.3		10.7		68.8		100.5		32.4		22.2	
Farm Employment[3]	0.4	3	0.5	5	1.7	2	2.7	3	2.2	7	1.6	7
Nonfarm Employment	9.9	97	10.2	95	67.2	98	97.9	97	30.3	93	20.7	93
Agricultural Services, Forestry, Fishing, and Other[4]	0.7	7	0.6	5	2.2	3	2.0	2	(D)		0.9	4
Agricultural Services	0.0	0	0.0	0	0.7	1	0.5	1	0.2	1	0.2	1
Forestry	0.0	0	(D)		0.2	0	0.6	1	0.1	0	0.4	2
Fishing, Hunting, and Trapping	0.1	1	0.1	1	0.1	0	NA		NA		0.0	0
Mining	(D)		(L)		(D)		0.2	0	(D)		(D)	
Construction	0.8	8	0.4	4	3.8	5	6.4	6	1.7	5	(D)	
Manufacturing	0.9	9	0.5	4	7.3	11	10.2	10	4.0	12	1.7	7
Transportation and Public Utilities	0.3	3	0.3	3	2.5	4	4.4	4	1.2	4	1.1	5
Wholesale Trade	(D)		0.2	2	(D)		3.2	3	1.2	4	(D)	
Retail Trade	2.2	22	1.8	17	12.8	19	22.0	22	5.5	17	3.9	18
Finance, Insurance, and Real Estate	0.7	7	0.4	4	4.3	6	6.8	7	1.9	6	1.2	6
Services	2.7	26	3.0	28	21.2	31	31.5	31	9.1	28	6.0	27
Government and Government Enterprises	1.3	13	3.0	28	11.3	16	11.3	11	4.9	15	4.3	19

(D) Estimate not shown to avoid disclosure of confidential information; estimate included in totals. No information about 'D' designated cells can be given, including what triggers the use of 'D' level (Albetski, 2003).

(L) Estimate less than $50,000 or less than 10 jobs; estimate included in totals.

Source: USDOC, 2003a.

[1] Employment trends include seasonal employment.

[2] Employment numbers are first broken down into farm and nonfarm employment. The nonfarm category is further subdivided into the major sectoral categories, e.g., mining, construction, and manufacturing.

[3] Farm employment refers to the number of workers engaged in the direct production of agricultural commodities, either livestock or crops; whether as a sole proprietor, partner, or hired laborer. Farm employment numbers do not include employment in farm service sectors.

[4] The agricultural services, forestry, fishing, and related sectors consist of establishments primarily engaged in agricultural services, forestry, commercial fishing, hunting, trapping, and related services. Agricultural services includes establishments primarily engaged in supplying soil preparation services, crop services, veterinary services, other animal services, farm labor and management services, and landscape and horticultural services, for others on a contract or fee basis. Forestry covers establishments primarily engaged in the operation of timber tracts, tree farms, forest nurseries, and related activities such as the gathering of gums, barks, balsam needles, maple sap, Spanish moss, and other forest products. Logging is considered a manufacturing activity and hence is not included in this sector. Fishing, hunting, and trapping cover establishments primarily engaged in commercial fishing (including crabbing, lobstering, clamming, oystering, and the gathering of sponges and seaweed) and the operation of fish hatcheries and fish and game preserves, in commercial hunting and trapping, and in game propagation.

Table E9-10 shows the industry employment aggregated to the level of upstream and downstream regions. For the region as a whole, farm employment represents 4 percent for the upstream region and 3 percent for the downstream region. As with the individual counties, the industries with the greatest percentage of jobs are Services, Retail Trade, and Government.

Table E9-10. 1999 employment by industry for regions (thousands of jobs)[1].

	Upstream Region Total		Downstream Region		Six-County Region		California Total		Oregon Total	
	Jobs	% Total	Jobs	% Total	Jobs	% Total	Jobs	% Total	Jobs	% Total
Total Full- and Part-Time Employment[2]	155.2		89.8		244.9		101.7		143.2	
Farm Employment[3]	6.4	4.1	2.5	2.8	8.9	3.6	3.7	3.6	5.2	3.6
Nonfarm Employment	148.8	95.9	87.3	97.2	236.1	96.4	98.0	96.4	138.1	96.4
Agricultural Services, Forestry, Fishing, and Other[4]	(D)		3.5	3.9	(D)		3.7	3.7	(D)	
Agricultural Services	0.9	0.6	0.8	0.9	1.7	0.7	0.9	0.9	0.8	0.5
Forestry	1.1	0.7	(D)		(D)		(D)		0.7	0.5
Fishing, Hunting, and Trapping	NA		0.3	0.3	NA		0.2	0.2	NA	
Mining	(D)		(D),(L)		(D),(L)		(D),(L)		(D)	
Construction	(D)		5.0	5.6	(D)		(D)		8.9	6.2
Manufacturing	15.9	10.2	8.7	9.7	24.6	10.1	9.5	9.3	15.2	10.6
Transportation and Public Utilities	6.7	4.3	3.1	3.5	9.8	4.0	3.9	3.9	5.9	4.1
Wholesale Trade	(D)		(D)		(D)		(D)		(D)	
Retail Trade	31.4	20.2	16.9	18.8	48.3	19.7	18.6	18.2	29.7	20.8
Finance, Insurance, and Real Estate	9.9	6.4	5.4	6.1	15.4	6.3	5.9	5.8	9.4	6.6
Services	46.6	30.0	26.8	29.9	73.4	30.0	30.1	29.6	43.3	30.2
Government and Government Enterprises	20.4	13.2	15.6		36.0	14.7	18.6	18.3	17.4	12.2

(D) – Estimate not shown to avoid disclosure of confidential information; estimate included in totals. No information about 'D' designated cells can be given, including what triggers the use of 'D' level (Albetski, 2003).

(L) – Estimate less than $50,000 or less than 10 jobs; estimate included in totals.

Source: USDOC, 2003a.

[1] Employment trends include seasonal employment.

[2] Employment numbers are first broken down into farm and nonfarm employment. The nonfarm category is further subdivided into the major sectoral categories, e.g., mining, construction, manufacturing, etc.

[3] Farm employment refers to the number of workers engaged in the direct production of agricultural commodities, either livestock or crops; whether as a sole proprietor, partner, or hired laborer. Farm employment numbers do not include employment in farm service sectors.

[4] The agricultural services, forestry, fishing, and related sectors consist of establishments primarily engaged in agricultural services, forestry, commercial fishing, hunting, trapping, and related services. Agricultural services includes establishments primarily engaged in supplying soil preparation services, crop services, veterinary services, other animal services, farm labor and management services, and landscape and horticultural services, for others on a contract or fee basis. Forestry covers establishments primarily engaged in the operation of timber tracts, tree farms, forest nurseries, and related activities such as the gathering of gums, barks, balsam needles, maple sap, Spanish moss, and other forest products. Logging is considered a manufacturing activity and hence is not included in this sector. Fishing, hunting, and trapping cover establishments primarily engaged in commercial fishing (including crabbing, lobstering, clamming, oystering, and the gathering of sponges and seaweed) and the operation of fish hatcheries and fish and game preserves, in commercial hunting and trapping, and in game propagation.

Conversations with local community members have indicated that recreation and tourism have become important industries for many of the smaller communities along the river. Recreation and tourism jobs are included in the Services and Retail Trade industries in the databases that track employment at the county level.

Historically, communities along the coast were dependent on ocean commercial and recreational sportfishing. Employment in commercial fishery is included in the estimates for the Agricultural Services, Forestry, Fishing and Other sectors. Along with the commercial fishing, the coastal communities were also dependent on the packing and processing plants that prepared the fish for market. But with the ongoing restriction on fishing of the Klamath salmon, most of the packing and processing plants have closed. Employment in the packing and processing plants are included in the estimates for the Food Processing sector that is aggregated into the Manufacturing sector (shown in Table E9-10).

Thus, throughout the study area, Services, Retail Trade, and Government are the three industries with the greatest percentage of total county employment. For the upstream region as a whole, farm employment represents 4 percent of the total, and for the downstream region it represents 3 percent of the total. Recreation and tourism have become important industries for many of the smaller communities along the river, replacing lost jobs from the timber industry. Recreation and tourism jobs are included in the Services and Retail Trade industries in the databases that track employment at the county level. The Manufacturing industry has experienced a decrease in importance over the past 20 years, whereas the Services industry has seen consistent increase in importance.

For the communities within the 5-mile buffer area, the Services and Retail trade sectors account for about two-thirds of the industry employment. Tables E9-11 and E9-12 show the 1990 and 2000 employment by industry for the communities within the 5-mile buffer area, respectively. A comparison of the 2000 Census data with the 1990 Census data shows a decline in employment in the agriculture, forestry, fishing, and hunting category for several communities, including Dorris, California, from 20.6 percent to 14.3 percent, Gottsville/Henley/Klamathon, California from 19.2 percent to 11.5 percent, Happy Camp, California, from 14.8 percent to 8.7 percent, Keno, Oregon from 11.6 percent to 6 percent, Westhaven-Moonstone CDP, California from 15.3 percent to 0.7 percent, and Gold Beach, Oregon, from 10.1 percent to 4.7 percent. The community of Clear Creek/Fort Goff/Hamburg saw a sharp increase in the share of employment in this category, from 10 percent in 1990 to 25 percent in 2000. A few communities experienced modest growth in the share of employment in this category, most notably Klamath CDP up to 8.9 percent from 5.5 percent.

Most of the communities in the 5-mile buffer area experienced a decline in employment in the manufacturing sectors from what they were in 1990. While most communities experienced a modest decline in the share of employment in manufacturing, the following communities saw a significant decline: Clear Creek/Fort Goff/Hamburg, California from 21.4 percent to 1.8 percent, Happy Camp, California from 30.1 percent to 1.1 percent and Somes Bar, California from 22.8 percent to 1.8 percent.

Table E9-11. Employment by industry by community within the 5-mile buffer area, 2000 census.

Community	Total Employed Civilian Population	Percent Agriculture, Forestry, Fishing, and Hunting	Percent Mining	Percent Construction	Percent Manufacturing	Percent Wholesale Trade	Percent Retail Trade	Percent Transportation and Utilities	Percent Information	Percent F.I.R.E.	Percent Services	Percent Public Administration
Arcata City, CA	8,409	3.3	0.0	2.9	6.6	2.4	11.8	2.2	3.2	3.7	58.8	5.2
Bayview CDP, CA	981	4.9	0.0	2.3	6.3	5.4	13.4	2.8	1.4	8.9	49.9	4.7
Bertsch-Oceanview CDP, CA	761	8.1	0.0	3.9	9.9	2.6	11.0	1.8	1.2	1.1	45.2	15.1
Clear Creek/Fort Goff/Hamburg, CA*	168	25.0	1.2	1.2	1.8	1.8	20.2	9.5	3.0	0.0	31.0	5.4
Copco, CA*	608	11.2	0.0	7.7	8.9	1.8	10.4	5.6	1.3	4.6	42.1	6.4
Crescent City, CA	1,214	4.0	0.0	3.0	3.2	1.1	11.4	1.8	3.5	1.2	51.8	18.9
Crescent City North CDP, CA	1,522	4.9	0.0	5.0	4.6	2.4	12.9	1.7	1.1	1.3	46.1	20.0
Cutten CDP, CA	1,415	1.7	0.0	6.3	6.9	6.4	17.0	3.3	2.3	6.8	41.2	8.2
Dorris City, CA	314	14.3	0.0	9.2	9.9	1.9	14.0	3.8	1.6	4.1	33.8	7.3
Eureka City, CA	10,694	3.6	0.1	6.5	5.6	3.4	14.1	3.9	2.1	6.4	48.5	5.7
Ferndale City, CA	659	5.9	0.0	5.6	8.8	2.4	13.2	5.0	3.6	4.1	43.4	7.9
Gottsville/Henley/Klamathon, CA*	243	11.5	0.0	4.1	7.0	1.2	12.3	4.9	0.8	1.6	44.9	11.5
Happy Camp, CA*	184	8.7	3.3	2.2	1.1	4.3	13.6	2.2	1.6	2.2	51.1	9.8
Hornbrook CDP, CA	90	6.7	0.0	8.9	8.9	3.3	18.9	7.8	2.2	0.0	36.7	6.7
Horse Creek, CA*	626	15.3	0.0	9.3	4.5	1.8	10.7	2.7	2.9	8.3	39.5	5.1
Humboldt Hill CDP, CA	1,350	3.9	0.0	5.1	4.3	3.4	14.4	1.3	1.9	5.3	51.7	8.7
Johnsons/Pecwan/Kanick/Martin's Ferry/ Surgone/Waseck/Weitchpec, CA*	86	16.3	0.0	2.3	1.2	2.3	2.3	0.0	2.3	4.7	66.3	2.3
Klamath CDP, CA	237	8.9	0.0	2.5	6.8	1.3	1.3	0.8	0.0	3.8	51.5	23.2
Klamath Glen/Requa, CA*	436	7.3	0.0	1.4	7.6	3.4	3.0	0.5	0.0	2.1	52.8	22.0
Klamath River/Nolton/Seiad Valley, CA*	281	18.5	0.0	7.8	6.0	1.8	9.6	5.0	2.1	3.6	36.7	8.9
McKinleyville CDP, CA	5,820	4.7	0.0	5.4	10.1	3.1	13.8	4.1	1.5	4.7	47.4	5.4

Table E9-11. Employment by industry by community within the 5-mile buffer area, 2000 census.

Community	Total Employed Civilian Population	Percent Agriculture, Forestry, Fishing, and Hunting	Percent Mining	Percent Construction	Percent Manufacturing	Percent Wholesale Trade	Percent Retail Trade	Percent Transportation and Utilities	Percent Information	Percent F.I.R.E.	Percent Services	Percent Public Administration
Montague City, CA	580	4.7	0.3	8.4	12.4	1.4	14.0	3.4	1.4	3.3	44.5	6.2
Myrtletown CDP, CA	2,016	1.2	0.0	5.5	3.7	4.1	11.8	7.4	2.3	7.8	45.1	11.0
Orleans, CA*	234	18.4	0.0	10.3	0.0	0.0	21.8	7.3	0.0	2.6	32.5	7.3
Pine Hills CDP, CA	1,473	2.9	0.0	4.7	5.8	2.6	17.2	4.3	1.4	6.4	44.5	10.0
Somes Bar, CA *	387	19.4	0.0	6.2	1.8	3.6	13.7	8.3	0.3	1.6	38.5	6.7
Trinidad City, CA	167	0.0	0.0	4.2	8.4	2.4	7.8	1.2	4.8	5.4	61.7	4.2
Westhaven-Moonstone CDP, CA	573	0.7	0.0	7.7	4.9	1.6	11.3	3.5	1.2	2.1	63.5	3.5
Yreka City, CA	2,950	2.3	0.0	4.7	5.1	1.1	14.8	3.6	0.8	4.2	52.8	10.4
Brookings City, OR	2,169	5.0	0.0	7.1	9.8	1.8	17.3	2.4	3.4	4.3	37.7	11.2
Gold Beach City, OR	843	4.7	0.0	7.6	5.9	0.7	14.2	4.0	2.4	5.0	45.0	10.4
Midland, OR *	551	12.3	0.0	11.6	11.3	2.0	8.5	15.2	1.1	3.4	22.7	11.8
Keno, OR *	483	6.0	0.0	11.8	11.8	1.7	12.8	9.1	2.3	8.9	34.2	1.4
Klamath Falls City, OR	8,346	3.1	0.1	6.4	12.1	2.9	13.7	3.7	3.8	4.4	46.2	3.6

Source: U.S. Census, 2000.

* These are non-census designated place (CDP) communities. Data for these communities were collected at the census block group level. Although some communities may be distinct on the ground, they may be combined in the same census block group, as reflected by the combinations of communities shown in the table.

Table E9-12. Employment by industry by community within the 5-mile buffer area, 1990 census.

Community	Total Employed Civilian Population	Percent Agriculture, Forestry, Fishing, and Hunting	Percent Mining	Percent Construction	Percent Manufacturing	Percent Wholesale Trade	Percent Retail Trade	Percent Transportation and Utilities	Percent F.I.R.E.	Percent Services	Percent Public Administration
Arcata City, CA	6,881	3.4	0.2	3.4	11.5	3.9	24.0	4.7	3.5	41.9	3.5
Bayview CDP, CA	662	4.2	0.0	4.7	13.9	1.1	32.6	6.3	1.8	31.1	4.2
Bertsch-Oceanview CDP, CA	NA										
Clear Creek/Fort Goff/Hamburg, CA*	220	10.0	9.1	0.0	21.4	0.0	21.8	0.0	4.5	27.3	5.9
Copco, CA*	617	15.6	0.8	3.1	20.1	1.5	13.9	7.8	5.5	25.6	6.2
Crescent City, CA	1,565	2.9	0.0	4.5	10.4	1.8	27.4	5.9	4.9	31.1	11.1
Crescent City North CDP, CA	1,394	5.2	0.0	6.1	7.0	2.5	21.7	3.4	2.7	35.9	15.6
Cutten CDP, CA	767	2.0	0.0	6.4	10.6	5.5	18.1	11.5	8.6	29.1	8.3
Dorris City, CA	233	20.6	0.0	8.2	24.0	3.0	14.2	3.9	0.9	17.6	7.7
Eureka City, CA	11,220	3.1	0.0	5.9	12.3	4.6	21.2	5.6	5.5	37.6	4.3
Ferndale City, CA	543	8.3	0.0	7.9	7.2	2.8	23.0	5.3	4.2	37.6	3.7
Gottsville/Henley/Klamathon, CA*	317	19.2	0.0	12.3	16.4	4.1	19.2	0.0	7.3	21.5	0.0
Happy Camp, CA*	359	14.8	0.0	3.1	30.1	0.0	17.0	7.5	1.7	22.6	3.3
Hornbrook CDP, CA	NA										
Horse Creek, CA*	582	15.1	3.1	9.1	11.7	2.4	19.6	6.9	3.8	24.1	4.3
Humboldt Hill CDP, CA	1,289	2.5	0.0	6.3	13.3	7.0	24.7	3.2	3.3	34.7	5.0
Johnsons/Pecwan/Kanick/Martin's Ferry/ Surgone/Waseck/Weitchpec, CA*	NA										
Klamath CDP, CA	200	5.5	0.0	7.0	17.0	1.0	26.5	4.0	3.5	21.5	14.0
Klamath Glen/Requa, CA1	NA										
Klamath River/Nolton/Seiad Valley, CA*	330	13.9	0.0	8.2	30.9	3.0	13.0	3.6	0.0	27.3	0.0
McKinleyville CDP, CA	4,636	4.9	0.3	6.0	17.0	2.2	19.3	5.6	5.2	37.3	2.2

Table E9-12. Employment by industry by community within the 5-mile buffer area, 1990 census.

Community	Total Employed Civilian Population	Percent Agriculture, Forestry, Fishing, and Hunting	Percent Mining	Percent Construction	Percent Manufacturing	Percent Wholesale Trade	Percent Retail Trade	Percent Transportation and Utilities	Percent F.I.R.E.	Percent Services	Percent Public Administration
Montague City, CA	480	7.3	1.3	4.8	20.0	2.7	24.6	8.3	1.5	24.8	4.8
Myrtletown CDP, CA	2,003	4.8	0.0	6.0	10.7	4.8	18.0	6.8	4.1	38.9	5.7
Orleans, CA*	NA										
Pine Hills CDP, CA	1,435	3.1	0.0	7.0	7.5	2.5	22.9	6.6	3.9	39.8	6.7
Somes Bar, CA*	346	23.4	1.4	5.5	22.8	0.9	7.5	7.8	4.3	21.4	4.9
Trinidad City, CA	141	2.1	0.0	5.0	12.8	0.0	13.5	16.3	1.4	47.5	1.4
Westhaven-Moonstone CDP, CA	444	15.3	0.0	5.9	9.7	4.5	12.6	0.7	2.0	43.0	6.3
Yreka City, CA	2,814	4.9	0.0	2.8	12.5	1.2	21.0	5.9	6.9	34.2	10.5
Brookings City, OR	1,684	4.6	0.0	4.9	9.2	1.8	24.5	2.7	7.8	35.0	9.4
Gold Beach City, OR	661	10.1	0.0	2.9	15.4	1.5	17.1	4.4	4.1	37.4	7.1
Midland, OR*	255	14.1	0.0	0.0	16.9	0.0	30.6	3.5	6.3	21.2	7.5
Keno, OR*	242	11.6	0.0	3.3	22.3	7.0	16.5	7.0	2.5	16.9	12.8
Klamath Falls City, OR	7,255	3.3	0.0	3.5	19.7	3.5	23.1	6.2	4.3	32.4	4.0

Source: U.S. Census, 1990.

* These are non-census designated place (CDP) communities. Data for these communities were collected at the census block group level. Although some communities may be distinct on the ground, they may be combined in the same census block group, thus the combinations of communities shown in the table.

NA = Not available.

The period 1990 to 2000, was characterized by the general loss of manufacturing jobs in almost all the communities in the 5-mile buffer area. For some communities, the loss in manufacturing jobs was offset by gains in the agriculture, forestry, fishing, and hunting sector jobs as well as gains in service sector jobs. The communities of Clear Creek/Fort Goff/Hamburg, Klamath CDP, and Klamath River/Nolton/Seiad Valley, are examples of communities that saw an increase in the share of employment in the agriculture, forestry, fishing, and hunting sector when the share of employment in the manufacturing sector declined. The communities of Klamath CDP, Happy Camp, and Gottsville/Henley/Klamathon, all in California, experienced significant increases in share of employment in the service sector.

Other than short-term changes in construction employment, the recreation and tourism sector and potentially the commercial fishing sector are most likely to be affected by changes in the current Project and PM&E measures under the terms of the new license. In addition, the agriculture sector is tied to the availability and cost of Klamath River water for irrigation purposes, but these factors are not components of the hydropower license.

The county unemployment rates for the year 2000 are higher than the state averages for California and Oregon, both of which had statewide unemployment rates of 4.9 percent in 2000. Figures E9-1 and E9-2 show the trend in unemployment rates for the individual counties over the time period of 1992 to 2001. The figures show that while the county unemployment decreased over this time period, the counties within the study region generally had higher unemployment rates than their respective states. Siskiyou County and Del Norte County experienced the most dramatic decreases in unemployment, but they remain well above 8 percent.

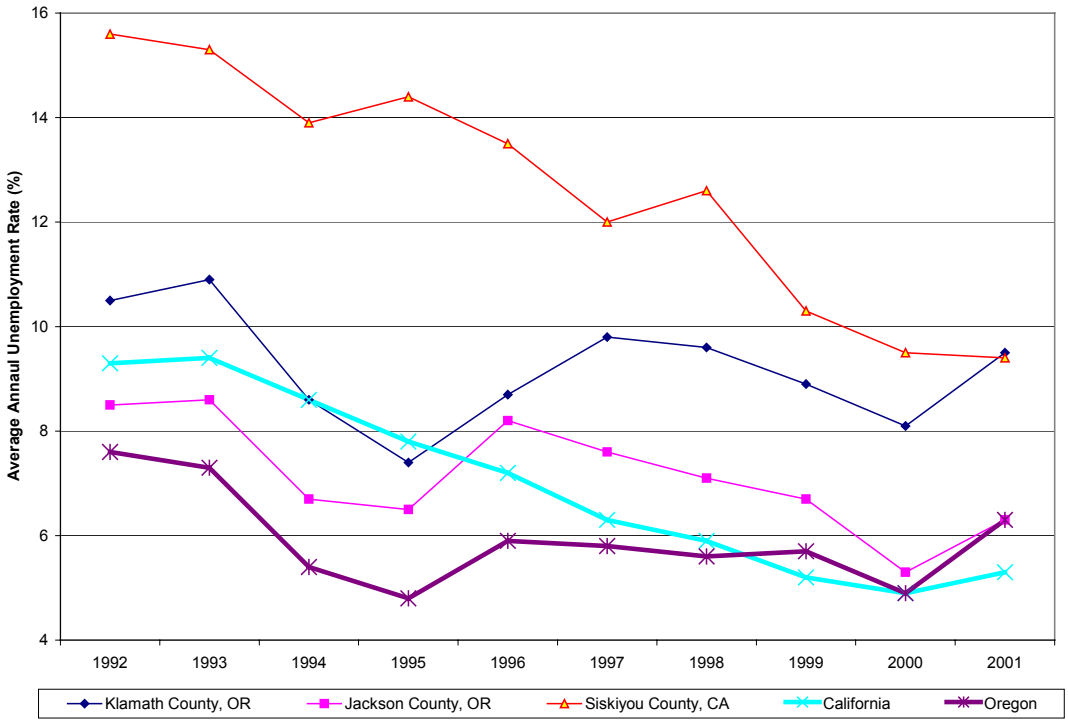

Figure E9-1. Historical unemployment rates for upstream counties, California and Oregon, 1992–2001. (Source: BLS, 2002)

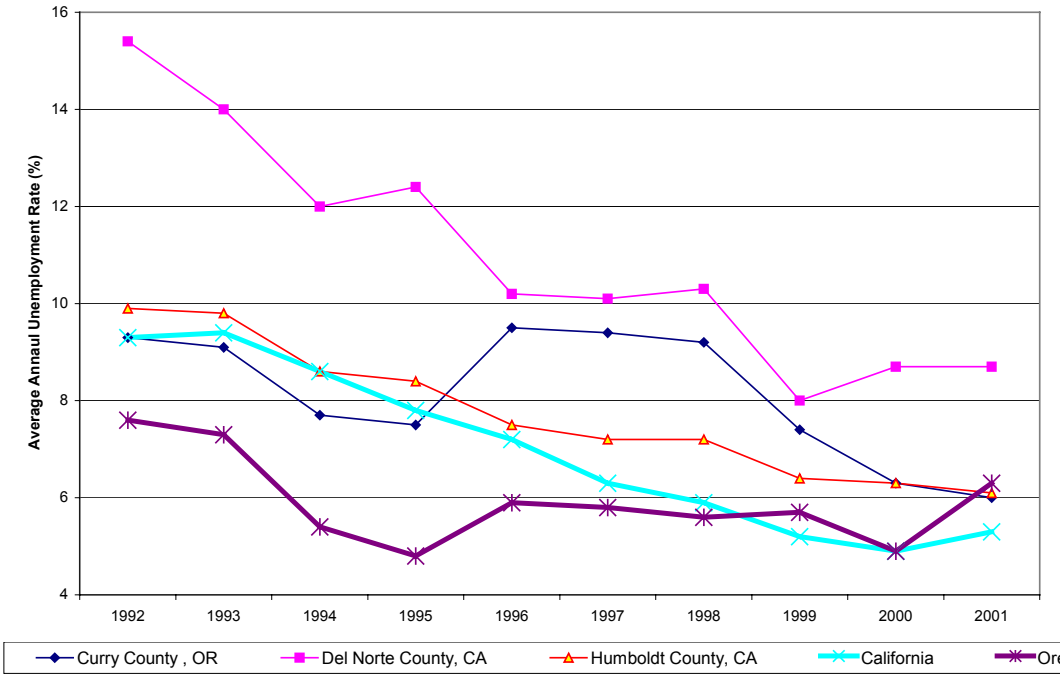

Figure E9-2. Historical unemployment rates for downstream counties, California and Oregon, 1992–2001. (Source: BLS, 2002)

The unemployment situation is even worse at the community level. Excepting Ferndale, Myrtletown, and Pine Hills, most of the communities in the 5-mile buffer area had unemployment rates that were higher than those reported at the county or state level. Tribal authorities report unemployment rates as high as 40 percent in the Tribal community (Waddell, 2002). From a labor availability perspective, these figures suggest that an influx of jobs would be good for the local communities. However, as with the statistics related to substandard housing, the relatively high unemployment rates suggest that the communities within the 5-mile buffer would be less resilient to economic losses and would reap relatively greater benefits from economic gains relative to other parts of the states of Oregon and California. Total 1999 personal income for the combined downstream counties was $3,726 million, with Humboldt County earning $2,776 million, Del Norte County earning $469 million, and Curry County earning $481 million. The upstream county total was nearly twice as high at $6,464 million, with Jackson County earning $4,220 million, Klamath County earning $1,325 million, and Siskiyou County earning $918 million.

County-level per capita personal income for each study area county is less than the state averages for California and Oregon, as shown in Table E9-13. According to the 2000 Census, Jackson County had the highest per capita income of all counties in the study area, while Del Norte County had the lowest. Figures E9-3 and E9-4 show the trend in per capita nominal incomes for the individual counties over the period 1992 to 2001. The figures show that Jackson County has historically had the highest per capita income while Del Norte County has historically had the lowest per capita income. The figures also show that while the county per capita incomes increased over this time period, the counties within the study region generally had lower per capita incomes than their respective states.

Table E9-13. 1999 Personal income measures.

	Personal Income (thousands of dollars)	Population (number of persons)	Per Capita Personal Income
Curry County, OR	481,118	21,170	22,726
Del Norte County, CA	469,221	26,477	17,722
Humboldt County, CA	2,775,569	121,358	22,871
Jackson County, OR	4,220,369	175,822	24,004
Klamath County, OR	1,324,894	63,435	20,886
Siskiyou County, CA	918,982	43,570	21,092
Upstream Region	6,464,245	282,827	22,856
Downstream Region	3,725,908	169,005	22,046
Six-County Region	10,190,153	451,832	22,553
California Total	989,590,237	33,145,121	29,856
Oregon Total	89,397,520	3,316,154	26,958
Two-State Total	1,078,987,757	36,461,275	29,593

Source: USDCO, 2003b.

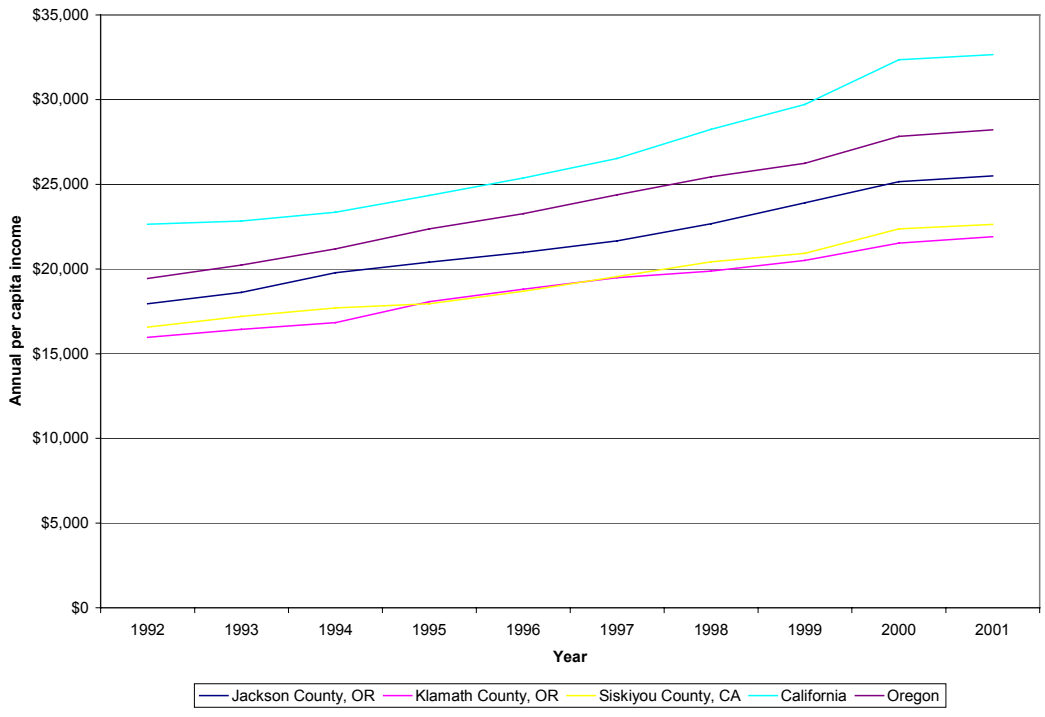

Figure E9-3. Historical per capita nominal incomes for Upper Klamath counties, California and Oregon, 1992–2001.
(Source: BEA, 2003)

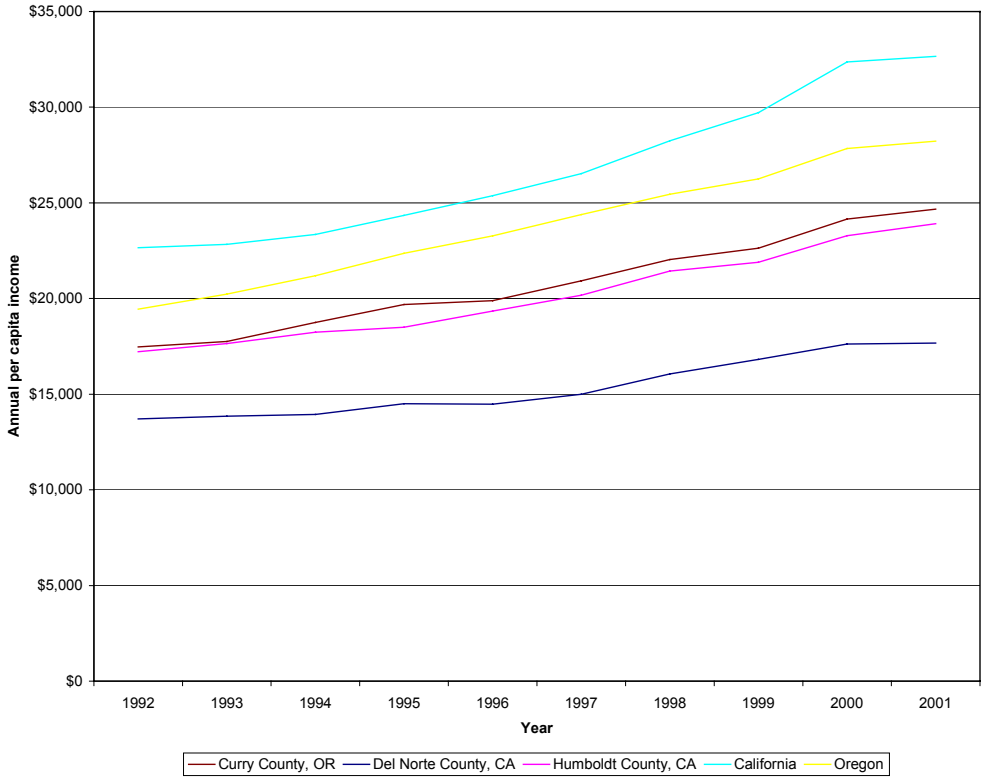

Figure E9-4. Historical per capita nominal incomes for Lower Klamath counties, California and Oregon, 1992–2001.
(Source: BEA, 2003)

In general, the communities within the 5-mile buffer area are characterized by lower median household and per capita incomes than those observed at the county or state levels (see Table E9-14). The only exception is the city of Trinidad, which has a higher per capita and median household income than the state average. The lower levels of income probably are the result of the lower-paying jobs in the service sector that have replaced the timber and wood products industry as the primary employment sector in the area. The higher unemployment rates observed in these communities also result from the shift to service sector jobs, which typically are more seasonal and thus have higher unemployment rates associated with them.

Table E9-14. Income measures by community within the 5-mile buffer area, 2000 census.

Geography	Median Household Income in 1999	Per Capita Income in 1999	Percent Low Income
Arcata City, CA	$22,315	$15,531	32.2
Bayview CDP, CA	$26,023	$14,119	23.1
Bertsch-Oceanview CDP, CA	$26,300	$12,661	18.1
Clear Creek/Fort Goff/Hamburg, CA*	$23,015	$16,675	21.3
Copco, CA*	$30,464	$15,684	12.2
Crescent City, CA	$20,133	$12,833	34.6
Crescent City North CDP, CA	$29,478	$14,649	17.1

Table E9-14. Income measures by community within the 5-mile buffer area, 2000 census.

Geography	Median Household Income in 1999	Per Capita Income in 1999	Percent Low Income
Cutten CDP, CA	$35,786	$19,317	13.5
Dorris City, CA	$21,801	$11,447	19.1
Eureka City, CA	$25,849	$16,174	23.7
Ferndale City, CA	$37,955	$21,727	7.1
Gottsville/Henley/Klamathon, CA*	$26,818	$17,775	16.5
Happy Camp, CA*	$20,500	$13,939	25.2
Hornbrook CDP, CA	$26,094	$14,907	21.3
Horse Creek, CA*	$30,076	$17,702	17.0
Humboldt Hill CDP, CA	$37,121	$16,222	11.5
Johnsons/Pecwan/Kanick/Martin's Ferry/ Surgone/Waseck/Weitchpec, CA*	$10,000	$6,894	58.0
Klamath CDP, CA*	$29,231	$13,660	15.2
Klamath River/Nolton/Seiad Valley, CA*	$23,375	$14,235	24.0
McKinleyville CDP, CA	$38,047	$17,870	14.9
Montague City, CA	$22,991	$12,661	24.2
Myrtletown CDP, CA	$37,417	$19,057	13.3
Orleans, CA*	$26,023	$12,448	20.5
Pine Hills CDP, CA	$43,527	$20,786	9.6
Somes Bar, CA*	$33,125	$22,653	13.7
Trinidad City, CA	$40,000	$28,050	8.8
Westhaven-Moonstone CDP, CA	$36,000	$21,493	14.1
Yreka City, CA	$27,398	$16,664	21.2
Brookings City, OR	$31,656	$17,010	11.5
Gold Beach City, OR	$30,243	$16,717	12.4
Midland, OR*	$47,981	$18,838	4.1
Keno, OR*	$32,813	$22,169	9.6
Klamath Falls City, OR	$28,498	$16,710	21.9
Klamath Glen/Requa, OR*	$31,953	$17,739	14.5

Source: U.S. Census, 2000.

* These are non-census designated place (CDP) communities. Data for these communities were collected at the census block group level. Although some communities may be distinct on the ground, they may be combined in the same census block group, as reflected by the combinations of communities shown in the table.

The per capita income of the American Indian population in each of the six counties is significantly lower (about 50 percent lower) than that observed for the entire population in each of the six counties. In addition to per capita income, low-income status is another income measure that is typically included in a socioeconomic discussion. With the exception of Curry County, the counties in the study area have a significantly higher percentage of low-income population among the American Indian population compared to the overall population in the

county. Table E9-15 shows the county-level income and low-income status of the American Indian population in the study area.

Table E9-15. Census 2000 income measures for American Indian population by county and region.

	Total American Indian Population	American Indian Per Capita Income	Low-Income* American Indian Population	Percent Low-Income American Indian Population	Percent Low-Income Overall Population
Del Norte County, CA	1,451	9,638	374	25.8	20.2
Humboldt County, CA	6,931	11,532	2,147	31.0	19.5
Siskiyou County, CA	1,595	8,305	505	31.7	18.6
Curry County, OR	501	11,835	73	14.6	12.2
Jackson County, OR	1,859	13,112	368	19.8	12.5
Klamath County, OR	2,617	10,457	1,044	39.9	16.8
Upstream Region	6,071	NA	1,917	31.6	14.4
Downstream Region	8,883	NA	2,594	29.2	18.7
Six-County Region	14,954	NA	4,511	30.2	16.0
California Total	9,977	NA	3,026	30.3	19.4
Oregon Total	4,977	NA	1,485	29.8	13.5
Two-State Total	14,954	NA	4,511	30.2	16.0

Source: U.S. Census, 2000.

* Low-income population consists of all those individuals whose 1999 income to poverty ratio was less than 1.

Although American Indians constitute less than 10 percent of the general population in the Project area, the incidence of low income in this population group is higher than that of the general population. Table E9-16 shows the distribution of low-income American Indian population by community within the 5-mile buffer area. According to the 2000 Census, the distribution of low-income population among American Indians in the communities within the 5-mile buffer area was significantly higher than that of the general population in those communities or at the county level. More than two-thirds of the American Indian population in Ferndale and Myrtletown and more than half of the American Indian population in Klamath Falls and Yreka were low income. The percentage of low-income population among the general population in Ferndale and Myrtletown in 1999 was 7 percent and 13 percent, respectively, while that in Klamath Falls and Yreka was 21 percent and 22 percent, respectively. Thus, the communities within the 5-mile buffer area are characterized by pockets of low-income American Indians.

Table E9-16. Distribution of low-income American Indian population within the 5-mile buffer area, 2000 census.

Geography	Percent Low-Income Population	Percent American Indian in Overall Population	Percent Low-Income American Indian Population
Oregon	11.6	1.3	22.2
California	14.2	0.9	21.9
Curry County, OR	12.2	2.4	14.6
Del Norte County, CA	20.2	6.1	25.8
Humboldt County, CA	19.5	5.6	31.0
Jackson County, OR	12.5	1.0	19.8
Klamath County, OR	16.8	4.1	39.9
Siskiyou County, CA	18.6	3.7	31.7
Arcata City, CA	32.2	3.0	38.9
Bayview CDP, CA	23.1	5.0	42.4
Bertsch-Oceanview CDP, CA	18.1	7.4	36.6
Clear Creek/Fort Goff/Hamburg, CA*	21.3	15.4	44.4
Copco, CA*	12.2	5.0	61.8
Crescent City, CA	34.6	6.2	39.9
Crescent City North CDP, CA	17.1	3.4	16.5
Cutten CDP, CA	13.5	6.4	7.0
Dorris City, CA	19.1	8.1	20.5
Eureka City, CA	23.7	4.2	37.9
Ferndale City, CA	7.1	1.0	70.0
Gottsville/Henley/Klamathon, CA*	16.5	6.6	43.9
Happy Camp, CA*	25.2	24.9	43.9
Hornbrook CDP, CA	21.3	6.4	25.0
Horse Creek, CA*	17.0	2.1	16.7
Humboldt Hill CDP, CA	11.5	2.2	20.6
Johnsons/Pecwan/Kanick/Martin's Ferry/ Surgone/Waseck/Weitchpec, CA*	58.0	69.2	121.6
Klamath CDP, CA*	15.2	39.4	14.0
Klamath River/Nolton/Seiad Valley, CA*	24.0	15.5	68. 5
McKinleyville CDP, CA	14.9	3.5	11.8
Montague City, CA	24.2	3.7	17.5
Myrtletown CDP, CA	13.3	1.6	66.7
Orleans, CA*	20.5	23.6	60.6
Pine Hills CDP, CA	9.6	2.3	10.0
Somes Bar, CA*	13.7	10.9	37.1
Trinidad City, CA	8.8	1.2	0.0
Westhaven-Moonstone CDP, CA	14.1	3.0	48.4
Yreka City, CA	21.2	4.1	52.2

Table E9-16. Distribution of low-income American Indian population within the 5-mile buffer area, 2000 census.

Geography	Percent Low-Income Population	Percent American Indian in Overall Population	Percent Low-Income American Indian Population
Brookings City, OR	11.5	2.3	12.0
Gold Beach City, OR	12.4	1.7	0.0
Midland, OR*	4.1	0.7	0.0
Keno, OR*	9.6	0.7	0.0
Klamath Falls City, OR	21.9	5.0	52.2
Klamath Glen/Requa, OR*	14.5	28.7	23.2

Source: U.S. Census, 2000.

* These are non-census designated place (CDP) communities. Data for these communities were collected at the census block group level. Although some communities may be distinct on the ground, they may be combined in the same census block group, as reflected by the combinations of communities shown in the table.

With lower personal income, higher poverty rates, higher unemployment rates, and greater reliance on the Klamath River for their livelihood, communities within the 5-mile buffer have a keen interest in how changes in the current Project and PM&E measures may affect their livelihood and way of life.

E9.1.4 Specific Economic Development

Under current conditions, the Project influences the economy in the Project area and perhaps the economies of the broader study area. PacifiCorp contributes to local employment in the Project area. The operation and maintenance of the Project facilities results in the employment of 19 individuals for a total annual payroll of about $820,000.

E9.1.4.1 Recreation

The Upper Klamath River area is the area from Link River dam to Iron Gate dam. Recreation is a major component of the Project area economy. The Klamath River and its reservoirs support the recreation industry including, especially, whitewater boating (private and commercial), sports fishing (private and commercial), camping, and waterskiing. Other activities are also enjoyed on or near the river, but to avoid double counting, trips are generally classified by primary purpose. Because the type and quality of recreation activities vary by location, the contributions of recreation services to the economies in the study area are described separately for the Upper Klamath River area (i.e., from Link River dam to Iron Gate dam) and Lower Klamath River area (i.e., below Iron Gate dam). For 2002, total nonlocal expenditures for all recreational activities that remained in the 5-mile buffer area in the Upper Klamath River area are estimated to range from $840,900 to $909,600. Total nonlocal expenditures for all recreational activities for the 50-mile buffer area on the Upper Klamath River are estimated at $1,648,000 to $1,716,700. Table E9-17 summarizes the annual recreation use and the associated expenditures of nonlocal visitors in the Upper Klamath River area. These figures do not include hunting or wildlife viewing.

Table E9-17. Annual recreation use and the associated expenditures of nonlocal visitors in the Upper Klamath River area[1].

Activity	Primary Purpose Recreation Days (User Days)	$/Person/ Day	Total Expenditure[2]	Total Expenditures by Local Visitors, Project Area[3]	Total Expenditures by Nonlocal Visitors, Project Area[3] (5-Mile Buffer)	Total Expenditures by All Nonlocal Visitors[4] (50-Mile Buffer[5])
Boat Fishing	30,270	$5.12	$154,982	$119,340	$119,340	$136,390
Waterskiing	23,040	$7.81	$179,942	$136,760	$136,760	$167,350
Resting/Relaxing	21,120	$4.06	$85,747	$60,020	$60,020	$69,450
Shoreline Fishing	15,360	$17.02	$261,427	$130,714	$130,714	$209,143
RV Camping	11,520	$7.05	$81,216	$70,660	$70,660	$70,660
Whitewater Boating	5,090		$683,333 - $760,191	$55,736 - $63,880	$93,911 - $162,626	$627,597 - $696,311
Other	77,470	$5.54	$429,184	$206,008	$206,008	$339,055
No Primary	7,680	$4.25	$32,640	$23,450	$23,450	$28,350
Total	**192,000**		**$1,908,471 - $1,985,329**	**$802,688 - $810,832**	**$840,863 - $909,578**	**$1,647,995 - $1,716,709**

Sources: Edaw, Inc., 2003 for the estimates of user days and expenditures with the exception of whitewater boating. Weidenbach, 2003, for the whitewater boating days.

[1] Upper Klamath River area is the area from Link River dam to Iron Gate dam.

[2] Total expenditures consist of expenditures by all visitors, including those visitors who live in the Project area or nearby.

[3] Total expenditures consist of expenditures by all visitors who stay overnight in the Project area.

[4] Total expenditures consist of expenditures by all visitors who stay overnight outside the Project area.

[5] The 50-mile buffer area is inclusive of the 5-mile buffer area.

In the Lower Klamath River area (from Iron Gate dam to the town of Orleans), recreation activities include primarily whitewater boating, mining, in-river fishing, and ocean sport fishing. In 2002, expenditures ranged from $6,177,700 to $6,517,800 in the 5-mile area and from $7,336,500 to $7,677,600 for the area that extends to the 50-mile buffer. The recreation expenditures represent less than 1 percent of personal income for the six-county study area, or even the three-county Upper and Lower Klamath study areas. However, these recreation earnings can be substantial for communities within the 5-mile buffer. Table E9-18 summarizes recreation use and the associated expenditures of nonlocal visitors and all visitors in the Lower Klamath River area.

Table E9-18. Average annual recreation use and the associated expenditures of nonlocal visitors in the Lower Klamath River area1 by buffer area, and total expenditures by all visitors combined.

Activity	Total User Days	Commercial User Days	Private User Days	Total Expenditures[2]	Total Expenditures by Nonlocal Visitors, Project Area[3] (5-Mile Buffer)	Total Expenditures by All Nonlocal Visitors[4] (50-Mile Buffer[5])
Whitewater Boating	13,673	9,571	4,102	1,566,226 - $1,771,319	$371,656 - $576,748	$1,566,226 - $1,771,319
Gold Mining	10,000		10,000	$451,350 - $586,350	$451,350 - $586,350	$451,350 - $586,350
Camping	10,526		10,526	$543,462	$363,835	$363,835
River Sport Fishing[6]	28,432	204	28,228	$1,486,990	$690,900	$655,070
Ocean Sport Fishing[7]	93,235	7,612	85,623	$4,300,000	$4,300,000	$4,300,000
Total	**155,866**	**17,387**	**138,479**	**$8,348,028 - $8,688,121**	**$6,177,741 - $6,517,833**	**$7,336,481 - $7,676,574**

[1] Lower Klamath River area refers to the area from Iron Gate dam to the town of Orleans.

[2] Total expenditures consist of expenditures by all visitors, including those visitors who live in the Project area or nearby. For whitewater boating and mining, it is assumed that all visitors are nonlocal. For in-river fishing, the expenditures per angler day (i.e., $52.30) include dollars spent outside of the six-county region as well as dollars spent by county residents, neither of which represent new expenditures for the county (i.e., 50-mile buffer) (Research Group, 1991). For ocean fishing, personal income impacts are reported instead of expenditures. These estimates of personal income impacts are from PFMC, 2002, and are based on the per day estimates associated with recreational angler expenditures from the Fishery Economic Assessment Model. There is no differentiation between money new to the area and money which would otherwise have been expended in other sectors in the area. For this reason, total personal income impacts will be identical to impacts in the 5-mile buffer and the 50-mile buffer or county.

[3] Total expenditures for whitewater boaters and miners include expenditures by all nonlocal visitors who stay overnight in the 5-mile buffer area. For river sportfishing, it is assumed that all the estimated destination expenditures (i.e., $24.30) (Research Group, 1991) by all anglers represent an injection of new dollars into the 5-mile buffer. For ocean fishers, this estimate represents the personal income impact rather than simply expenditures. These estimates of personal income impacts were provided in PFMC, 2002, and are reported here because they were developed specifically for the communities in the study area, are derived from the ocean angler expenditures, and provide a better measure of the local community impact of the ocean angling activity.

[4] Total expenditures in the 50-mile buffer include expenditures by all nonlocal visitors. It is assumed that all nonlocal whitewater and mining visitors stay overnight at some location within the 50-mile buffer. For river sportfishing, the California Department of Fish and Game (CDFG) data indicate that 72 percent of nonlocal visitors are from outside the six-county study area so that their destination expenditures and a portion of their en route expenditures represent an injection of about $32.0 in new dollars to the county and 50-mile buffer. All residents of the counties are assumed to find other expenditure alternative within the region, if they cannot fish the Klamath for salmon. For ocean sportfishing, personal income impacts are reported instead of expenditures. It is assumed that the expenditures and personal income impacts for the 50-mile buffer and the county are the same as for the 5-mile buffer.

[5] The 50-mile buffer area is inclusive of the 5-mile buffer area.

[6] Average user days for river sportfishing are based on estimates shown in Table 2.7-52 in the Socioeconomic Resources Final Technical Report (FTR), and are for the period 1978 to 2002 .

[7] Average user days for ocean sportfishing are based on estimates given in Table 2.7-53 in the Socioeconomic Resources FTR, and are for the period 1976 to 2001.

While whitewater boating activity on the Klamath River has increased over time, in-river fishing has varied from year to year. Angler effort (as measured by angler trips or angler hours), and catch increased from 1979 to 1982. Effort as well as catch declined in 1983 and 1984. The period 1985 to 1988 saw an increase of 60 percent in angling effort and catch, when it reached its peak

at over 64,000 angler days. The late 1980s and early 1990s were characterized by declining effort and catch. Although the sportfishing industry on the Lower Klamath River seems to have recovered from the declines in the early 1990s by approaching 25,000 angler days in 2001, angler effort and catch have never come close to the numbers seen in the mid-1980s (CDFG, 2002). Ocean angler visitor days follow a similar pattern, reaching their peak of more than 180,000 angler days in 1987, their low point in 1998 of 32,400, and back up to 80,000 angler days in 2001 (PFMC, 2002).

E9.1.4.2 Commercial Fishing

Pacific coast salmon compete in the global market, where the competition includes coho and Chinook as well as other salmon species (i.e., sockeye, chum, pink, and Atlantic), nonsalmon species (e.g., sablefish), other protein sources, and farm-raised salmon and trout. West coast Chinook production is comparable to Canadian and Alaskan production, but coho production on the west coast is minor relative to Alaskan production. Currently, salmon products contribute less than 1 percent to the economies of west coast states. However, this was not always the case and the contributions of commercial fishing to coastal communities can still be significant.

The history of anadromous fish populations and the roles they have played in the economies and cultures of Pacific Coast communities and tribes has been documented by a number of sources, including Lichatowich (1999); NPPC (1986); PFMC (1999); The Research Group (2000); Spranger and Anderson (1988); and Taylor (1996). In contrast to the current condition, historically, the fishery was a significant component of the west coast economies, especially with the introduction and expansion of canning operations. The more recent history (i.e., 1976 to present) is characterized by downward trends in market prices, poor ocean condition cycles, and adverse habitat alterations for all regions along the west coast of North America. These trends have caused substantial decreases in the amount of income and jobs in economies where salmon and steelhead fishing has historically been important and coastal communities and tribes have suffered the most.

The commercial fishing fleet within the study region (KMZ) boundaries of Humbug Mountain to Horse Mountain consists of ships that generally fish in waters relatively close to their home ports and land their catch at ports close to the waters where the fish are caught. The KMZ falls under the jurisdiction of the states of California and Oregon, and the Pacific Fishery Management Council (PFMC). Fish landings and fishing effort are tracked by port and data are generally published for major port areas. The major port areas that are included in the KMZ include Brookings in Oregon and Crescent City, Eureka, and Fort Bragg in California. The Fort Bragg area includes the ports of Fort Bragg, Noyo Harbor, Mendocino, Pt. Arena, and Shelter Cove. Of these ports, only Shelter Cove is included in the KMZ.

Historically, significant Chinook and coho fisheries used the waters now designated as the KMZ. Figures E9-5 and E9-6 show the historical salmon landings measured in thousands of fish and thousands of pounds landed for the KMZ ports combined. The adult salmon that can be found in this area include Chinook and coho salmon that could have spawned in freshwater streams ranging from the Central Valley of California to Washington. Commercial salmon fishing in the KMZ is currently managed to protect the Klamath River coho, which are listed as threatened under the Federal Endangered Species Act (ESA), and the Klamath River Chinook. As a result of the ESA listing, the landing of coho is prohibited. To protect the Klamath River Chinook and

coho stocks, the KMZ salmon fishery and much of the west coast salmon fishery is restricted to some extent. These management actions together with declining populations explain the dramatic reduction in coho landed from an average of 209,000 fish during the period of 1976 to 1980 to no landings after the year 1991, and the major reductions in the landings of Chinook.

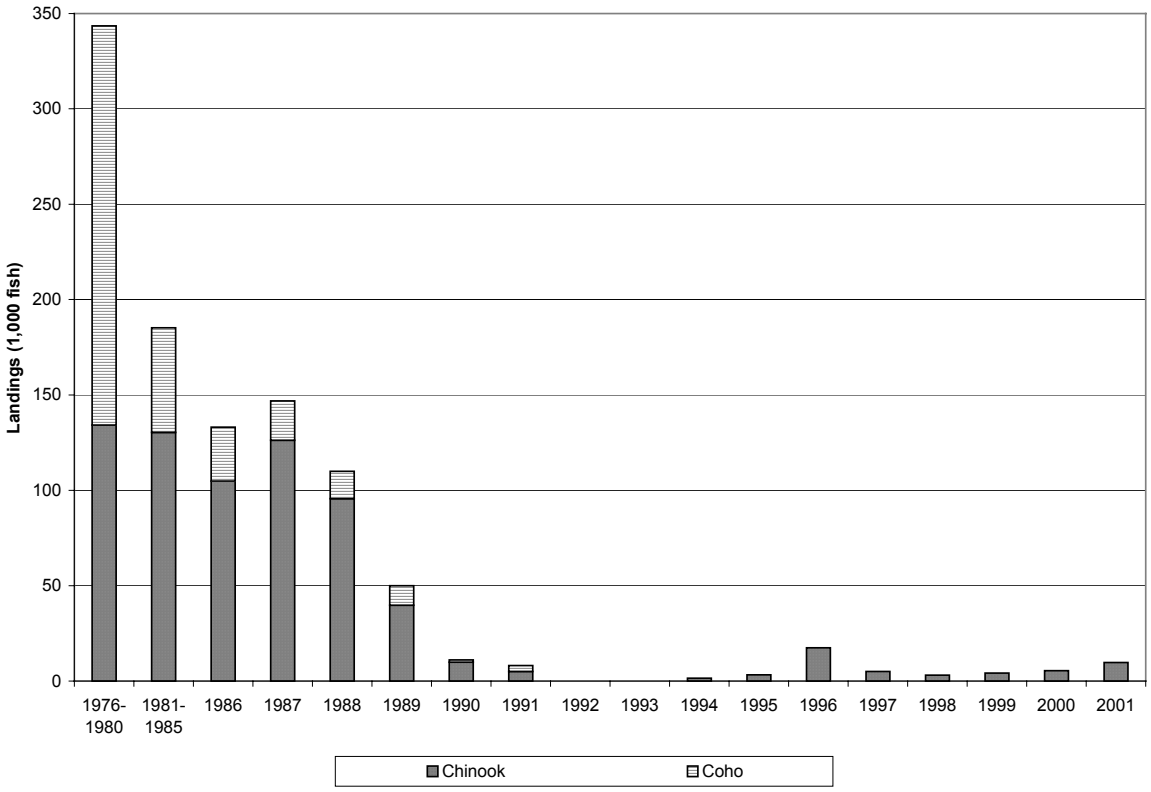

Figure E9-5. Historical salmon landing for KMZ port areas in thousands of fish.
(Source: PFMC, 2002)

Figure E9-6. Historical salmon landing for KMZ port areas in thousands of pounds.
(Source: PFMC, 2002)

The real market price of salmon has experienced a general decline in recent history, from a high of about $4.80 per pound over the 1976 to 1980 period to a low of $1.61 per pound in 2001. This, coupled with declining harvests, has contributed to the shift of resources out of salmon harvests and into other species (PFMC, 2002). Figure E9-7 (Figure IV-3 in the PFMC 2002 study) shows the west coast non-Indian ocean commercial salmon annual ex-vessel price trends in 2001 dollars.

Just as with the recreational ocean salmon fishery, the PFMC (2002) has also estimated personal income impacts associated with the troll salmon fishery for the major ports in the KMZ. These income impacts were estimated on a per pound basis provided from output of the Fishery Economic Assessment Model (FEAM). The personal income impact is a better measure of the importance of the troll fishery to the coastal communities than ex-vessel revenue or troll fishery expenditures, because it provides a direct measure of how those expenditures affect the economic well-being of the local community. No attempt was made to determine whether or not any of the expenditures would accrue to other sectors in the local community, absent the troll fishery. The personal income impacts largely track the landings data, but also reflect the steep decline in the ex-vessel price of salmon over the period.

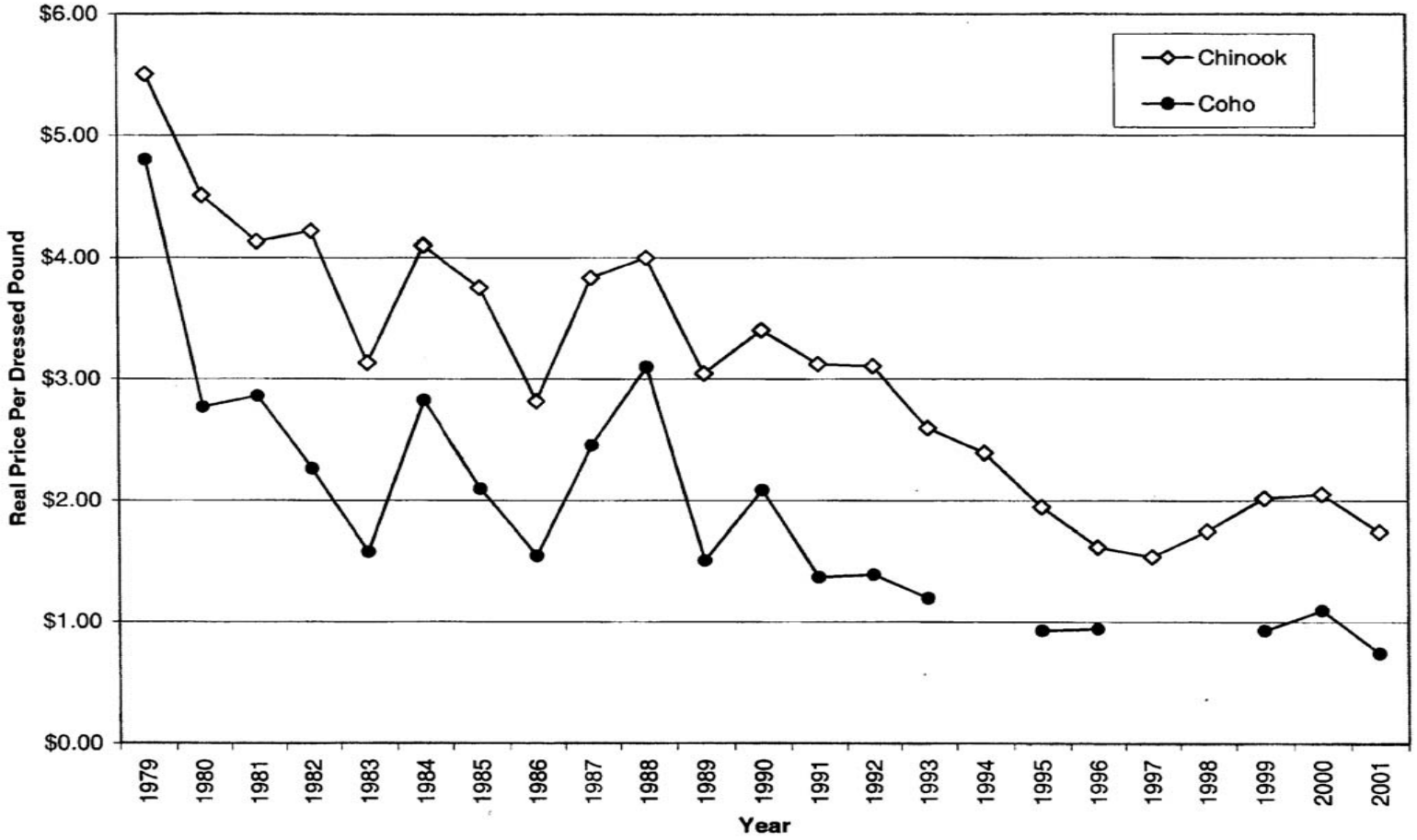

Figure E9-7. West coast non-Indian ocean commercial salmon annual ex-vessel price trends (2001 dollars).
Source: PFMC, 2002

Across all four ports, personal income impacts were at their highest point (i.e., almost $40 million) during the 1976 to 1980 period (2001 dollars). They almost approached this high point again in 1988 when they reached about $35 million. Personal income impacts reached their bottom at $139,000 in 1992. In 2001, they were back up to $2 million, which is only 5 percent of the 1976 to 1980 average. Had the price held firm over the period, the personal income impacts would have been three times as great, but would still have fallen far short of the high mark. These personal income impacts are reported by year and port in Tables IV-16 and IV-17 of the 2002 PFMC study. Table E9-19 shows the estimates of the coastal community and state personal income impacts of troll ocean salmon fishery for the ports in the KMZ. The numbers in Table E9-19 were compiled from Tables IV-16 and IV-17 of the PFMC 2002 study.

Table E9-19. Estimates of KMZ coastal community personal state income impacts of the troll ocean salmon fishery by port area[1].

Year	Crescent City	Eureka	Fort Bragg	Brookings[2]	Total
Ocean Troll (thousands of dollars)[3]					
1976-1980	5,445	13,831	13,584	6,755	39,615
1981-1985	2,768	3,340	7,813	2,625	16,546
1986	800	2,227	10,199	1,890	15,116
1987	2,379	4,672	19,556	3,950	30,557
1988	89	3,953	27,203	3,676	34,921
1989	651	1,201	7,232	2,024	11,108
1990	2	62	4,303	890	5,257
1991	18	444	2,498	94	3,054
1992	0	4	106	29	139
1993	7	45	911	103	1,066
1994	0	27	337	192	556
1995	14	91	451	160	716
1996	10	303	834	400	1,547
1997	1	46	118	213	378
1998	4	83	136	169	392
1999	13	114	130	296	553
2000	8	71	1,370	368	1,817
2001[4]	15	230	673	417	1,335

Source: PFMC, 2002.

[1] Expressed in 2001 dollars. Per pound and per day estimates of income impacts provided by the Pacific Fishery Economic Assessment (PFMC) model. These are the income impacts associated with expenditures in the troll or recreational sectors. There is no differentiation between money new to the area and money which would otherwise have been expended in other sectors. It is assumed that all fish landed at a port is processed in the port area.

[2] On average, between 1976 and 1991 more than 50 percent of the troll fishery community income impacts for the Brookings port area originated from landings in Brookings and Gold Beach. For 1986-1990, an average of about 40 percent of the impacts for the Brookings port area originated in landing made through Brookings and Gold Beach. In 1992 and 1993, impacts originating through these two ports averaged less than 18 percent and 11 percent, respectively, of the total for the Brookings port area.

[3] Excludes pink salmon.

[4] Preliminary.

While salmon landings in KMZ ports have dropped significantly, total landings for the commercial fishery have not been affected to the same extent. Figure E9-8 shows the historical landings (all species) for the port areas included in the KMZ for the period of 1981 to 2001. While each of the port areas has experienced variability in landings over this period, they have all experienced general reductions in the total pounds of fish landed, though not to the same degree as salmon landings have been reduced. It is likely that some of the commercial fleet that used to fish for salmon have regeared and switched their effort to other species as a result of the salmon restrictions. This shift in fishing effort could be responsible for overfishing of some of the targeted species.

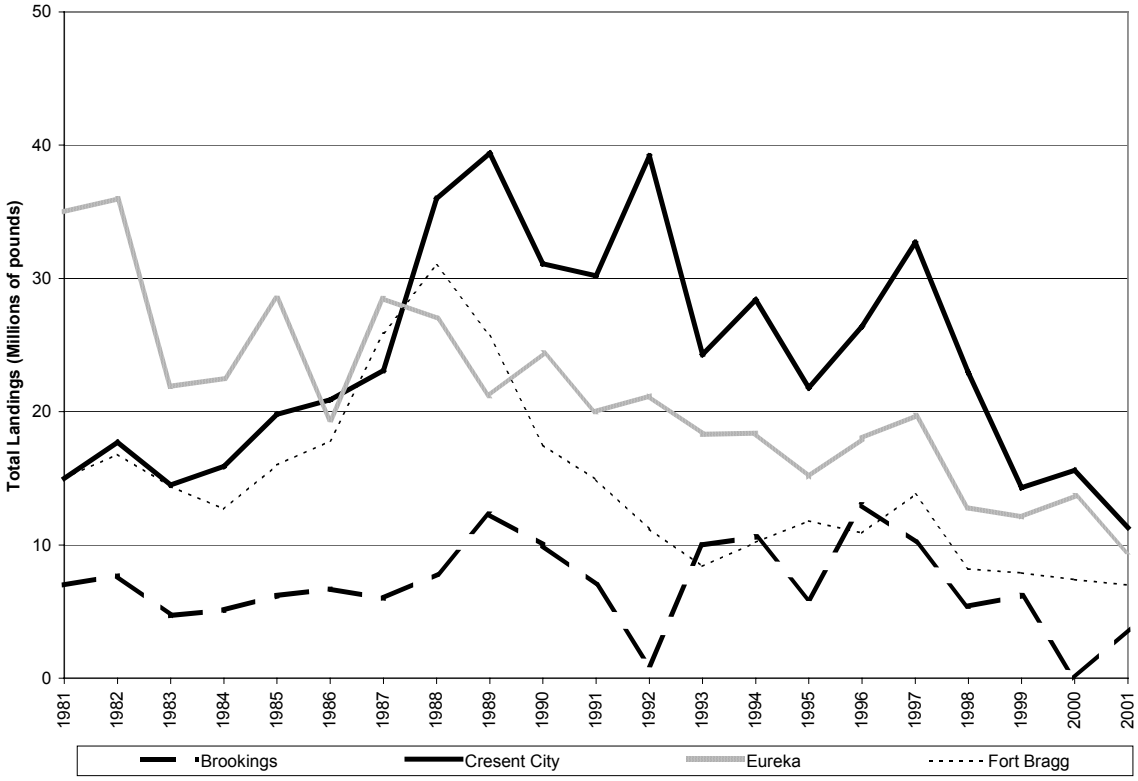

Figure E9-8. Total historical commercial fisheries landings for KMZ port areas.
Source: National Marine Fisheries Service Total Commercial Fishery Landings at an Individual U. S. Port for All Years After 1980 http://www.st.nmfs.gov/st1/commercial/landings/lport_hist.html.

E9.1.4.3 American Indian Fishing

It is important to observe that this economic summary of commercial and subsistence salmon fishing does not provide the tribal perspective on the role that salmon plays in their culture. One tribal perspective is conveyed in the following excerpt from PFMC (1999):

> The Native People of the Klamath River Basin have depended on the Salmon since time immemorial. The awesome cyclical nature of the salmon's yearly migrations over the centuries influenced almost every aspect of their lives. Religion, lore, law and technology all evolved from the Indian's relationship with the salmon and other fish of the Basin. The Supreme Court recognized the importance of salmon to the Northwest Tribes such as these,

> when it concluded that access to the fisheries was 'not much less necessary to the existence of the Indians than the air they breathed'.

Of the fish resources available in the basin, 50 percent must, by law, go to the Yurok and Hoopa Valley tribes (Viele, 2002). The Yurok Tribe receives 80 percent of the tribal allocation and the Hoopa Tribe receives the remaining 20 percent. The Karuk Tribe fishing is regulated to a spot at the Ishi-Pishi Falls (Tripp, 2003) and is not limited to a specific allocation. Individual tribal members are assigned shares of the tribal allocation under the regulatory authority of the tribes. According to PFMC (2002), recent data on the value of harvests by the Yurok and Hoopa Valley reservation commercial Indian gillnet fisheries in the Klamath River are not available. This is because of the practice by each Indian fisher of independently marketing his or her own catch since 1999. Data from earlier years can be used to provide insight into the market value of recent harvests. From 1987 through 1989, commercial tribal harvests of Chinook averaged about 27,500 a year. In 1989, the harvest, at an average weight of 15.4 pounds, sold for $852,000 ($1.1 million in 2001 dollars). The 1996 harvest was 43,276 fall and spring Chinook (average weight of 13.5 pounds), which sold for $525,000 ($575,000 in 2001 dollars). The decrease in total revenue can only partially be explained by the decrease in weight and number of fish. Because of increased supplies from other sources, the market price for salmon had fallen over the period. The 1999 harvest was 2,077 fall Chinook, increasing to 4,922 fall Chinook in 2000 and then increasing again to 9,345 fall Chinook in 2001. Assuming that the fishers received the market price for their catch, and assuming an average weight of 13 pounds, suggests that 2001 revenues may have been around $195,590.

In addition to commercial harvest, these tribes also fish salmon for subsistence and for ceremonial reasons. Historical catch for all three purposes is summarized in Table E9-20. In many years, the subsistence fishery has dominated the commercial fishery, especially in years when the commercial fishery was absent such as 1990 to 1995 and 1997 to 1998. Excluding the Trinity River, in recent years (1999 to 2001), the subsistence fishery has exceeded the commercial harvest by about four to five times. For example, the 2001 subsistence catch was 32,591 fish. Although the tribal significance of fishing for salmon extends well beyond its commercial value and its value as a source of food, these economic factors are nonetheless important considering the high percentage of low-income American Indians in the study area. Salmon fishing continues to play a role in the economic well-being of the American Indian people in the study area.

Table E9-20. Estimates of Yurok and Hoopa Valley reservation Indian gillnet harvest[1].

Year	Area	Chinook Salmon (numbers of fish)					
		Spring Run			Fall Run		
		Jack	Adult	Total	Jack	Adult	Total
1990	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	0	386	386	13	3,536	3,549
	Middle Klamath	0	521	521	36	1,116	1,152
	Upper Klamath	0	504	504	102	2,331	2,433
	Trinity	24	865	889	36	811	847
	Total	24	2,276	2,302	187	7,794	7,981
1991	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	0	70	70	7	3,902	3,909
	Middle Klamath	0	46	46	9	1,765	1,774
	Upper Klamath	3	167	170	16	3,251	3,267
	Trinity	0	263	263	30	1,310	1,342
	Total	3	546	549	62	10,228	10,290
1992	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	0	15	15	124	1,152	1,275
	Middle Klamath	0	97	97	62	1,107	1,159
	Upper Klamath	0	284	284	148	2,580	2,726
	Trinity	0	346	346	42	946	988
	Total	0	742	742	366	5,785	6,151
1993	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	0	19	19	62	3,017	3,079
	Middle Klamath	0	320	320	33	1,632	1,865
	Upper Klamath	0	211	211	47	3,495	3,542
	Trinity	0	228	226	33	1,492	1,525
	Total	0	778	778	175	9,636	9,811
1994	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	9	152	161	80	4,341	4,421
	Middle Klamath	14	110	124	4	1,448	1,452
	Upper Klamath	3	239	242	71	3,658	3,729
	Trinity	0	255	255	94	2,266	2,360
	Total	26	756	782	249	11,713	11,962
1995	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	0	656	656	117	5,200	5,317
	Middle Klamath	0	1,312	1,312	44	2,415	2,459
	Upper Klamath	0	824	624	47	4,610	4,657
	Trinity	93	1,175	1,268	268	3,383	3,651
	Total	93	3,767	3,860	476	15,608	16,084

Table E9-20. Estimates of Yurok and Hoopa Valley reservation Indian gillnet harvest[1].

Year	Area	Chinook Salmon (numbers of fish)					
		Spring Run			Fall Run		
		Jack	Adult	Total	Jack	Adult	Total
1996	Commercial Estuary	16	3,113	3,129	127	40,020	40,147
	Subsistence Estuary	1	1,851	1,852	36	9,093	9,129
	Middle Klamath	9	673	682	7	1,570	1,577
	Upper Klamath	3	268	271	12	3,023	3,035
	Trinity	6	1,162	1,186	8	2,770	2,776
	Total	35	7,086	7,122	190	56,476	56,668
1997	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	0	2,919	2,919	21	5,574	5,596
	Middle Klamath	0	1,102	1,102	3	1,479	1,482
	Upper Klamath	0	1,416	1,419	5	3,796	3,801
	Trinity	1	1,250	1,251	6	1,238	1,244
	Total	1	8,690	6,691	35	12,087	12,122
1998	Commercial Estuary	-	-	-	-	-	-
	Subsistence Estuary	2	621	623	16	3,454	3,470
	Middle Klamath	0	937	937	9	1,324	1,333
	Upper Klamath	0	780	780	23	3,874	3,897
	Trinity	45	426	471	5	1,535	1,540
	Total	47	2,764	2,811	53	10,187	10,240
1999	Commercial Estuary	-	-	-	-	2,077	2,077
	Subsistence Estuary	2	456	456	127	2,315	2,442
	Middle Klamath	0	1,343	1,343	49	2,261	2,310
	Upper Klamath	0	593	593	237	4,784	5,021
	Trinity	13	776	769	96	2,978	3,074
	Total	15	3,188	3,183	509	14,415	14,924
2000	Commercial Estuary	-	-	-	-	3,933	3,933
	Middle Klamath	-	-	-	-	175	175
	Upper Klamath	-	-	-	-	814	814
	Subsistence Estuary	0	1,778	1,778	51	13,380	13,431
	Middle Klamath	0	511	511	25	1,089	1,114
	Upper Klamath	0	918	918	79	4,237	4,316
	Trinity	29	1,325	1,354	303	5,962	6,090
	Total	29	4,532	4,561	458	29,590	30,048
2001[2]	Commercial Estuary	-	-	-	-	8,958	8,956
	Upper Klamath	-	-	-	-	389	389
	Subsistence Estuary	1	12,915	13,094	422	27,394	27,616
	Middle Klamath	178	92	83	26	1,701	1,727

Table E9-20. Estimates of Yurok and Hoopa Valley reservation Indian gillnet harvest[1].

Year	Area	Chinook Salmon (numbers of fish)					
		Spring Run			Fall Run		
		Jack	Adult	Total	Jack	Adult	Total
	Upper Klamath	14	1,163	1,177	47	3,011	3,058
	Trinity	47	4,290	4,337	35	4,979	5,014
	Total	240	18,481	18,701	530	46,430	46,760

Source: PFMC, Table B-5, 2002.

[1] The U.S. Fish and Wildlife Service (USFWS) generated estimates for Klamath River portion from 1983 to 1993. The Fisheries Department of the Hoope Valley Business Council has monitored the Trinity River fishery since 1982. The Yurok Tribe Fisheries Program monitored the Klamath River portion in 1994 and 1995.

[2] Preliminary.

- = Estimate not made.

E9.1.4.4 Irrigated Agriculture

The U.S. Bureau of Reclamation (USBR) Klamath Irrigation Project (Klamath Project) provides irrigation water for both agricultural and wildlife refuge lands in the Klamath River basin. In addition, the Klamath Project provides flood control along the Klamath River and downstream of PacifiCorp's Klamath Hydroelectric Project area. The Klamath Project provides irrigation water to approximately 240,000 acres of agricultural land, most of which is in Klamath County, Oregon, and Siskiyou and Modoc counties, California. According to the 1997 U.S. Census of Agriculture, 1,744 farms and ranches used irrigation water supplied by the Klamath Project. Approximately 50 percent of these farms and ranches are in Klamath County, 30 percent are in Siskiyou County, and the remaining 20 percent are in Modoc County. Of the total farms and ranches using irrigation water, 80 percent are in Siskiyou and Klamath counties, the two counties that are in the Project area.

The Klamath Project and the Klamath Hydroelectric Project are connected through the Keno reservoir. Although the total project water supply delivered from Keno reservoir ranges between 250,000 acre-feet and 450,000 acre-feet, on an average, the Klamath Project diverts only 150,000 acre-feet of water per year. The USBR has the following diversion points out of Keno reservoir: North Canal, Ady Canal, and the Lost River diversion channel to the Klamath Project.

The water diverted through Keno supports about 490 farmers (or 41 percent of the total number of farmers supported by the Klamath Project) and irrigates about 95,600 acres of project farmland and 4,000 acres of nonproject land. Thus, water diverted through Keno irrigates about 45 percent of the total irrigated acres in the Klamath Project (Green, 2003).

E9.1.5 Local Fiscal Conditions

In addition to employment, PacifiCorp contributes to the economies of the Project area through various taxes. During fiscal year (FY) 2002 to 2003, Klamath County received a total of $35 million in property taxes. PacifiCorp's contribution was about $1.7 million ($105,160 to the city of Klamath Falls and $1.58 million to Klamath County) in FY 2002 to 2003, or about 4.5 percent of the total (Long, 2003). In addition to the property taxes levied at the county level,

the city of Klamath Falls also levies property taxes (about $5,000) on the East Side and West Side facilities. Siskiyou County received a total of $6.54 million in property taxes in FY 2002 to 2003. PacifiCorp's contribution was about $1.1 million, or about 18 percent of the total property tax receipts (Hammar, 2003). In 2002, the city of Yreka received $64,767.03 (1 percent of $647,670.30 in gross revenues) in franchise taxes from PacifiCorp (Ramirez, 2003).

E9.1.6 Public Services

Project area public service providers include fire, police, schools, and medical services. Although the Project facilities in Oregon are outside its service area, the Keno Fire Protection District (FPD) has come to the aid of PacifiCorp in the past (Ketchum, 2003). The station at 14800 Puckett Road serves as the headquarters for the Keno FPD and is the nearest fire station to the Project facilities. Keno FPD also provides emergency medical service. Keno FPD has mutual assistance agreements with all other fire districts in Klamath County. Keno FPD indicated that it would take approximately 4 minutes to respond to an emergency call from the Project facilities at Keno. The average response time to an emergency call from the J.C. Boyle dam is 15 minutes, while the response time to the J.C. Boyle powerhouse is 20 to 25 minutes (Ketchum, 2003).

The Project facilities in California (Copcos, Iron Gate, and Fall Creek) are all within the jurisdiction of the Hornbrook Fire District. Hornbrook Fire District is a volunteer fire department dispatched through the California Department of Forestry. Northern Siskiyou Ambulance in Siskiyou County provides emergency services within the Project area. Northern Siskiyou Ambulance is a privately-owned, emergency medical provider that provides round-the-clock emergency medical service to its service area. Average response times to the Project facilities is 20 to 25 minutes. The breakdown is approximately 15 minutes to the dam and another 10 minutes to the powerhouse. The ambulances also work with the California Department of Forestry and the Hornbrook Volunteer Fire Department, who are the first responders and normally have about a 10-minute head start. The ambulances provide transport to helicopter landing zones when necessary (Frost, 2003).

The Klamath County Sheriff's Department provides law enforcement services to the Project facilities in Klamath County, Oregon, and has a dispatch center out of Klamath Falls. The response time to an emergency call into any one of the Project facilities in Klamath County is 10 to 15 minutes (Dailey, 2003). Siskiyou County Sheriff's Department provides law enforcement services to the Project facilities in Siskiyou County, California. The area within the Project facilities (i.e., the Yreka area), is served by the station located at 311 Lane Street. The response time to an emergency call from one of the Project facilities in Siskiyou County is 30 to 45 minutes.

The schools in Klamath County, Oregon, are within the Jackson Education Service District. Within this service district, the Klamath County School District has a total of 20 schools and the Klamath Falls City Schools consist of nine additional schools. In California, the Project facilities are all in Siskiyou County, which has 28 school districts. Children living in the vicinity of Iron Gate reservoir and Copco Lake are likely to attend an elementary school in the Hornbrook, Willow Creek, Bogus, or Montague school district, all of which feed into Yreka High School.

E9.1.7 Infrastructure

Table 2.7-71 in the Socioeconomic Resources FTR shows the water, stormwater, wastewater, and solid waste disposal service providers for the Project facilities.

Electricity in the Project area of Klamath County, Oregon, and Siskiyou County, California, is provided by Pacific Power and Light (PPL). Generation capacity is derived from hydroelectric, natural gas, and coal-fired plants. The Project represents approximately 14 percent of PacifiCorp's total hydroelectric generation capacity and 2 percent of its total capacity. PacifiCorp also purchases power to meet its regulatory supply obligations to customers.

The Project area is reasonably accessible via a transportation network of federal, state, local, and private roads.

E9.1.8 Environmental Justice.

On February 11, 1994, President Clinton issued Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations." The purpose of the EO is to avoid the disproportionate placement of any adverse environmental, economic, social, or health impacts from federal actions and policies on minority and low-income populations. The President directed the U.S. Environmental Protection Agency (EPA) to ensure that agencies analyze the environmental effects (including human health, social, and economic effects) on minority and low-income communities.

A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than the general population of the larger surrounding area. The term "minority population" includes persons who identify themselves as African American, Asian or Pacific Islander, American Indian or Alaskan Native, or Hispanic. Race refers to Census respondents' self-identification of racial background. Hispanic origin refers to ethnicity and language, not race, and may include persons whose heritage is Puerto Rican, Cuban, Mexican, or Central or South American.

The U.S. Census Bureau does not provide a specific definition for "low-income." Rather, the term is used interchangeably with "poverty." For this study, low-income populations were identified using the Census Bureau's ratio of income in 1999 to poverty level. Individuals whose income to poverty ratios are below one are considered low income.

Section E9.1.1 of this document identifies the low-income or minority populations living within the study area, based on U.S. 2000 Census data (see Table E9-5). Attempts at obtaining information from the tribes to augment these data were not successful..

E9.1.9 Property Value

The development of the Project facilities at Keno in Klamath County, Oregon, and Copco in Siskiyou County, California, have contributed to the value of the land adjacent to these two facilities. There are 157 parcels (or 805 acres) of land adjacent to Keno reservoir, of which 135 (or 637 acres) are privately owned. According to the Klamath County Assessor's Office, the total assessed value of all private property adjacent to Keno reservoir for the FY 2003-2004 was $25,731,910. The total property tax due on these properties for the FY 2003-2004 was $222,728

(Shaw, 2003). In the case of Copco reservoir, there are 226 parcels (or 2,402 acres), of which 204 (or 811 acres) are privately owned. Private property adjacent to the Copco facilities had a total assessed value, in FY 2003-2004, of $8,111,212, with $84,818 due in property taxes (Hammar, 2003).

Several of these properties include docks, which can be affected by changes in reservoir levels. For example, lower reservoir levels can require extending the docks in order for them to continue to be in deep enough water to be accessible to the boats. Copco reservoir has about 47 docks and Keno reservoir has about 22 docks. These figures include private and publicly owned docks. Additional docks within the Project area include two each at Iron Gate, J.C. Boyle, and Link River bypass and three at Lake Ewauna.

E9.2 AFFECTED SOCIOECONOMIC ENVIRONMENT

This section describes the anticipated changes in the socioeconomic condition in the study area resulting from the differences in the proposed Project and the current Project, including PM&E measures (e.g., new environmental and social measures). Only the incremental effects resulting from any changes in the current Project (i.e., facilities, operations, and PM&E measures) are examined. Thus, the goal is to characterize the differences between the socioeconomic condition under continued operations of the current Project (i.e., FERC baseline condition) and the proposed Project. The analysis does not attempt to fully characterize the future socioeconomic condition under these two states of the world, but rather to describe the anticipated differences between the two states. In so doing, the socioeconomic study takes as given the description of the proposed Project and PM&E measures, the anticipated Project-induced changes in affected resources, and future trends in socioeconomic variables.

E9.2.1 Description of the Proposed Project

This section summarizes the proposed Project and PM&E measures as they relate to changes in resources that impact the socioeconomic condition. The proposed Project-induced resource changes and PM&E measures that could affect the socioeconomic condition include the following:

E9.2.1.1 Recreation Resources

Proposed improvements and increased management presence at selected recreation sites (primarily on Iron Gate reservoir) would allow for some increased use levels while minimizing visitor and resource conflicts. These proposed improvements are summarized in the Executive Summary to the final license application (Section ES7.0) and are described in detail in the Recreation Resource Management Plan (RRMP). In addition, the recreation specialists used the available information from the fish, hydrology, and water quality specialists and their best professional judgement to assess potential Project-induced affects on the suitability of the Project area to support the various types of recreation activities. It is estimated that recreation visitor days will increase in the Upper Klamath River area over time and that a portion of that increase would result from the proposed PM&E measures. The induced increment to annual visitation would increase from about 3,300 recreation days on implementing the new measures to about 19,000 visitor days per year.

E9.2.1.2 Water Quality and Fish Habitat

The decommissioning plan, the Fish and Water Quality FTRs, and sections of Exhibit E are the resources to consult for additional details. Removing the Link River hydroelectric development from service will result in a net benefit to the listed sucker species (and other species) by eliminating entrainment and by improving water quality in the Link River. Although this action will not lead to allowable harvests of the sucker species, it is of cultural consequence to the Klamath tribes. In addition, this action will increase the amount of usable habitat for all aquatic species, including state of Oregon sensitive species redband trout (also recognized as a species of concern by federal resource management agencies) and slender sculpin, and it will aid in fish migration through the Link River reach. The Oregon Department of Fish and Wildlife (ODFW) (1997) reported that redband trout in the Klamath River are a unique stock indigenous to the river and its tributaries and referred to them as the "Klamath River redband stock." These enhancements are not expected to lead to changes in sport or subsistence catch.

In all, the fish and water quality PM&E measures are expected to increase water quality and habitat for resident species, increasing spawning habitat for trout and other resident species, enhance trout habitat connectivity and have a dampening affect on stranding, which is already negligible. Several PM&E measures are anticipated to benefit anadromous populations downstream of Iron Gate dam. Continued operations of the Iron Gate fish hatchery are expected to maintain their contribution to downstream populations. There would likely be a significant loss in harvestable fish, absent the Iron Gate fish hatchery. Two other measures would contribute favorably to downstream populations: (1) Heating of steelhead egg incubation water will allow for larger smolt size at release and increased smolt-to-adult survival, and (2) An enhanced data collection effort is proposed to improve management and thus the long-term viability of the in-river anadromous fishery. These changes would benefit the downstream in-river sportfishery, American Indian commercial and subsistence fisheries, ocean salmon sportfishery, and commercial fishery.

E9.2.1.3 Wildlife and Botanical Resources

The terrestrial PM&E measures will (1) reduce the level of adverse impact to vegetation and wildlife next to Project facilities, recreation sites, roads, and power lines; (2) improve wildlife habitat connectivity through enhanced flows for riparian habitat in the J.C. Boyle and peaking reach and on-site habitat restoration activities along Project reservoirs and river reaches; and (3) provide a monitoring plan to track habitat improvements. The details on these measures and enhancements are provided in the Terrestrial Resources FTR. The net effect of these enhance-ments would be to increase the value of wildlife and botanical resources and the quantity and quality of the ecological services that these resources provide to the public.

E9.2.1.4 Visual and Aesthetic Resources

The visual and aesthetic resources study identified several Project facilities that present a moderate or high degree of contrast with the natural environment that could be reduced through painting and/or vegetative screening. The benefit of implementing these visual enhancements would be improved quality of the visual environment.

Proposed measures for enhancing visual and aesthetic resources in the Project area are described below and in further detail in the RRMP.

J.C. Boyle

- Red Barn—The operations and maintenance building (known as the "red barn") is visible across the Boyle Reservoir from Topsy Recreation Site and presents a moderate degree of contrast. The visibility of the barn could be reduced through vegetative screening or painting it a more neutral color.

- Powerhouse Facilities—The J.C. Boyle power facilities present a high degree of contrast with the natural landscape. In particular, the penstock, surge tank, and powerhouse covers are painted a light tan color that is highly visible from local areas. The visual contrast of some or all of these facilities could be reduced through vegetative screening or painting a more neutral color. The substation (a non-Project facility) adjacent to the powerhouse also is visible from nearby areas; visibility could be reduced through vegetative screening.

Iron Gate

- Powerhouse Facilities—The Iron Gate penstock is painted a light tan color that contrasts with the reddish iron color of the back of the Iron Gate dam. This contrast is observed down river. The contrast could be reduced by painting the penstock and powerhouse covers a color that matches the color of the dam.

These enhancements would tend to increase the quality of the recreation and sightseeing opportunities in the affected areas.

E9.2.1.5 Cultural Resources

PacifiCorp contracted with the Klamath River Inter-Tribal Fish and Water Commission to produce an integration report that will be based on the results of tribal ethnographic studies prepared by the Klamath, Shasta, Karuk and Yurok tribes (see the Cultural Resources FTR and the cultural resource sections of the final license application for details). The individual tribal studies documented the critical importance of the Klamath River and its salmon and other associated resources to their past culture and to the continuation of their present and future culture. The tribal reports urged recognition and documentation of a National Register of Historic Places (NRHP)-eligible ethnographic riverscape. The forthcoming integration report will discuss common themes among the Klamath Basin tribes and provide a basinwide overview, evaluation, and assessment of broad tribal concerns about basinwide water management and its effects on historic properties. Management implications of possible designation of an NRHP-eligible riverscape will be explored in the integration report.

Enhancement measures for cultural resources are primarily embodied within the FERC-required Historic Properties Management Plan (HPMP). The HPMP will:

- Take into consideration the management actions prescribed in other plans required by the new license such as recreation plans, wildlife management plans, or fisheries plans

- Identify the nature and significance of historic properties that may be affected by Project maintenance and operation and any proposed improvements to Project facilities and public access

- Identify goals for the preservation of historic properties, establish guidelines for routine maintenance and operation, and establish procedures for consulting with appropriate State Historic Preservation Offices (SHPOs), Tribal Heritage Preservation Officers (THPOs), Indian tribes, historic preservation experts, and the interested public concerning effects to historic properties or contributing elements of a historic district

E9.2.1.6 Power Production

As described in Exhibit D, PM&E changes to operation of the Project will result in a 23.2 million kilowatt-hour (kWh) reduction in average annual power generated at the Project.

E9.2.1.7 Other Resources

Any proposed Project-induced changes in municipal water supply, flood control, irrigated agriculture, or property values are expected to be minimal.

E9.2.2 Assessment of Project Impacts

This section summarizes the results from the analyses designed to address the key socioeconomic questions related to the proposed Project and PM&E measures. The above-proposed Project-induced resource changes and PM&E measures affect various aspects of the socioeconomic condition through their effect on local economic development (i.e., employment and earnings), economic development-induced changes in other local socioeconomic resources (e.g., population growth, use of community resources), and net social benefits.

E9.2.3 Regional Economic Impacts

The impacts to the construction sector were separately evaluated for the construction and operation phases of the project. The construction of proposed PM&E measures is expected to occur over a 5-year period beginning in 2006. The total capital cost over the 5-year period for these project improvements and enhancements is $34,405,778 in 2003 dollars. Annual capital expenditures are expected to be the same for each year. The local portions of the annual labor and materials expenditures are $2,096,849 and $2,277,464, respectively.

The operation of proposed Project and PM&E measures is expected to occur during a 30-year period beginning 2006. O&M costs over the 30-year period total $43,956,840 in 2003 dollars. Annual O&M expenditures are expected to be the same for each year, with local labor and material accounting for $511,600 and $617,635, respectively.

E9.2.3.1 Construction Phase Impacts

In addition to the direct employment (about 40 per year)[1] resulting from the local construction payroll expenditure, the construction phase of the proposed PM&E measures would result in secondary (indirect and induced) employment within the upstream region. Thus, the estimated annual indirect and induced employment within the upstream region would be 26 and 27 jobs, respectively. The annual estimated indirect and induced income within the region would be $981,219 and $664,202, respectively, while the annual estimated indirect and induced industry output would be $2,546,923 and $2,402,639, respectively, in 2003 dollars.

Owing to the short-term nature of construction, the regional economic impacts associated with the construction of the proposed PM&Es are temporary.

E9.2.3.2 Operation Phase Impacts

The impacts from the operation of the proposed Project and PM&E measures are estimated at eight additional full-time equivalent (FTEs) in direct employment plus an additional 11 and 15 jobs in indirect and induced employment, respectively. The annual estimated indirect and induced income within the region would be $400,151 and $371,829, respectively, while the annual estimated indirect and induced industry output would be $865,490 and $1,013,267, respectively, in 2003 dollars.

Owing to the longer-term nature of operation, the regional economic impacts associated with the operation of the proposed Project and PM&E measures are permanent. However, these economic impacts are likely to change if the underlying economic linkages and leakages that produced them change during the operation of the proposed Project and PM&E measures. Moreover, economies adjust over time such that what may be seen as an increase in income and employment may actually be the result of shifts in resource use between the various industries in the economy. Thus, the additional jobs and income discussed in the preceding paragraphs may not necessarily represent a net gain for the region in the long-term.

E9.2.3.3 Recreation and Tourism Sector

Regional economic impacts of recreation are typically assessed on the basis of visitor trip expenditures[2]. The money spent by visitors on food, lodging, and transportation is the input into the local economy. Proposed improvements and increased management presence that impact/ affect the amount or type of money spent will affect the local economy. For this study, the economic impacts evaluated are those resulting from the incremental changes in visitation levels that are caused by the changes in Project operations and PM&E measures under the terms of the proposed Project measured relative to a continuation of the existing Project.

[1] Assuming an average hourly construction wage of $25.50, including benefits, which translates to an annual FTE construction wage of $53,000.

[2] Expenditures on capital goods are not included because (1) these goods are mostly likely purchased in the visitors' home county /state (in which case none of that money finds its way into the local economy of the recreational area) and (2) there is no easy way of splitting the cost among the various recreation trip destinations.

The regional economic impacts of recreation are evaluated using an IMPLAN IO model of the upstream region. The inputs into the IO model are the incremental nonlocal visitor expenditures by recreation activity[3] for 2010 (the first year after all the proposed PM&E measures have been implemented) and 2036 (the end of the license period) for all recreation activities.

In 2010, the incremental changes in recreation contributes to the well being of the upstream region through the direct and secondary (indirect and induced) economic impacts resulting from visitor trip expenditures. Visitor expenditures are expected to generate one to two additional jobs in indirect employment and one additional job in induced employment. Visitor expenditures also generate $23,930 to $28,717 in indirect personal income and $5,373 to $6,442 in induced personal income to the regional economy of the upstream region. In addition, there would be an annual estimated $61,515 to $74,201 in indirect and $14,768 to $17,709 in induced industry output.

In 2036, visitor expenditures are expected to generate five to six additional jobs in indirect employment and one additional job in induced employment. Visitor expenditures would also generate $81,032 to $97,486 in indirect personal income and $18,195 and $21,872 in induced personal income to the regional economy of the upstream region. In addition, there would be an annual estimated $208,328 to $251,929 in indirect and $50,011 to $60,116 in induced industry output.

Most of the changes in employment and income are expected to occur within the 5-mile buffer area given that this is the area where most of the recreation activities occur. Since the 5-mile buffer area is contained within the 50-mile buffer area, the expected changes in employment and income also occur within the 50-mile buffer area. In the case of whitewater boating, the majority of outfitters are from outside the 5-mile buffer area, thus the impacts associated with guide fees are expected to primarily occur in the 50-mile buffer area and not in the 5-mile buffer area.

Lower Klamath River Recreation Area

The ongoing operations of the Iron Gate hatchery are considered a PM&E under the terms of the proposed Project. About 80 percent of total hatchery operation costs have historically been absorbed by PacifiCorp. To the extent that the Iron Gate fish hatchery contributes to fish harvest allocations to the in-river sport fishery and ocean sport fishery it contributes to the regional economic activity of the recreation sector in the Lower Klamath River area, including the coastal communities along the KMZ. The Iron Gate fish hatchery contributes about half of the total hatchery fish in the system with the remaining coming from the Trinity hatchery . According to Klamath River Technical Advisory Team report (KRTAT, 2003) hatchery fish accounted for about 38 percent of ocean abundance of Klamath River fall Chinook in 2003. Combining all of these factors and assuming a proportionate relationship between ocean abundance, harvest allocations, and recreational fishing effort, suggests that the Iron Gate fish hatchery operations PM&E contributes to about 15 percent (i.e., 0.8*0.5*0.38) of the in-river and ocean sport recreation associated expenditures. For an average year over the course of the past quarter century, we estimated in Section 2.7.3.3. that these sportfishing activities have contributed roughly $5 million a year to the local economy in the Lower Klamath River area. At 15 percent,

[3] Shown in Tables 4.4-7 and 4.4-8 (of the Socioeconomic Resources FTR), which are derived by multiplying the values in the two preceding tables, i.e., Tables 4.4-5 and 4.4.-6, for the year 2010 and 2036, respectively.

this means that the share due to the Iron Gate fish hatchery is about $0.75 million a year in income.

Other Industry Sectors

It is not anticipated that the incremental changes resulting from the proposed Project and PM&E measures would affect changes in employment and earnings in any other sectors of the economy in Klamath and Jackson counties, Oregon, and Siskiyou County, California. Any changes in American Indian subsistence fishing in this region are anticipated to be minimal.

Downstream of Iron Gate dam, there are potential effects on American Indian commercial and subsistence fisheries and the ocean salmon commercial fishery resulting from the Iron Gate fish hatchery PM&E measures. Although the precise contribution is not known, a ballpark figure of 15 percent is estimated. In recent years, the ocean salmon fishery has contributed about $2 million a year to the incomes of the coastal communities in the study area, suggesting that the Iron Gate fish hatchery may have contributed about $0.3 million (see section 2.7.3.3.). Because half the allowable harvest is allocated to the tribes, the American Indian commercial and subsistence fisheries are likely enhanced by an amount roughly equivalent to all other recreational and sport fisheries combined. The subsistence benefits are estimated in the national social benefits and costs section below. The ballpark figure of $700,000 in average annual subsistence benefits attributable to the on-going operations of the Iron Gate fish hatchery represents a contribution to the economic well-being of the tribes in the region. In recent history, the American Indian commercial fishery is much smaller by comparison.

Because the Klamath Irrigation Project is a separate entity from the Klamath Hydroelectric Project, changes in the proposed Project and PM&E measures are not anticipated to have any discernible effect on irrigated agriculture.

E9.2.4 Other Regional Effects

Because construction is a temporary activity and most of the construction workers are expected to commute from either inside the upstream region or from neighboring counties, impacts to population and housing are expected to be minimal.

Changes in property values are anticipated to be minimal because (1) the anticipated improvements in water quality, terrestrial habitat, and aquatic habitat are not likely to lead to increased property values in the area, and (2) the anticipated changes in reservoir water levels do not appear to be significant enough to change property values near the reservoirs.

The only anticipated changes in property tax payments are those related to the East Side and West Side facilities. The decommissioning of these facilities might lead to the removal of a relatively small amount of property from the property tax rolls. The taxes paid on the property represent less than 0.1 percent of the annual property taxes that Klamath County and the city of Klamath Falls collected during fiscal year 2002 to 2003. As a result of the anticipated minimal changes in population, the proposed Project and PM&E measures are expected to have minimal impacts on local infrastructure and public services**.**

Incremental Project expenditures will need to be recovered through PacifiCorp's rate charges to its customers in its six-state service area. Because incremental Project expenditures will not be

directly offset by any associated project revenues or cost reductions, the utility's rates will need to be increased relative to their level under continued Klamath generation without the incremental Project expenditures. Given the size of PacifiCorp's service area, expenditures on any one project have a relatively small impact on rates charged to retail customers. Nonetheless, PacifiCorp makes every effort to make prudent expenditures on each project so that the cumulative effect of expenditures on all projects keeps PacifiCorp's rates as low as possible while still providing safe, reliable, and environmentally responsible service.

PacifiCorp believes that Project expenditures meet this criterion. Expenditures are being prudently made. While they will significantly increase Project costs, there will be numerous, valuable environmental benefits.

E9.2.5 Environmental Justice

In so far as the impacts resulting from the incremental changes in the proposed Project and PM&E measures have a beneficial or minimal impact on the environment, the impacts to low-income or minority populations living in the study are beneficial though minimal. Thus, there are no disproportionate placements of any adverse environmental, economic, social, or health impacts on minority or low-income populations from the incremental changes in the proposed Project and PM&E measures.

E9.2.6 Net Social Benefits

This section identifies and evaluates the social costs and benefits related to the differences between the proposed Project and the current Project. The purpose of the benefit-cost analysis is to identify and describe the expected market and nonmarket economic benefits and costs associated with the proposed changes to the current Project. To the extent that such effects are quantified in dollar terms, they are aggregated to compute net economic benefits. In addition, some net benefits are described in qualitative terms and/or quantitative terms using nonmonetary metrics (e.g., ecological metrics), so that they, too, can be factored into the assessment of economic efficiency. The benefit-cost analysis is not a precise science. Rather, it is intended to summarize the available information to support judgements about the economic efficiency (i.e., Do the benefits exceed the costs?) of the action as a whole. First the social costs are summarized and then the social benefits.

E9.2.6.1 Social costs

The incremental social costs of the changes in the Project will include investment in PM&E facilities, associated increases in operating costs, and losses in power generation.

Investment in PM&E facilities is projected to be $34.4 million. These investments will be made in specific resource areas, as shown in Table E9-21:

Table E9-21. PM&E resource area investments.

Resource Area	PM&E Investment (millions of 2003 $)
Aquatic	$15.1
Water Resources	$1.0
Terrestrial	$0.8
Recreation, Land Use, and Visual	$11.3
Cultural	$5.4
Decommissioning	$0.8
Total	$34.4

The investments will be made between 2006 and 2010, the first 5 years of Project operation under the new FERC license. As shown in Table E9-22, average annual investment will be about $6.9 million during the 5-year timeframe.

Annual operating costs for the PM&E facilities are also shown in Table E9-22. They will total approximately $1.5 million per year, with specific resource costs ranging from $76,000 for operation of the terrestrial facilities to $893,000 for operation of the aquatic facilities.

As described in Exhibit D, PM&E changes to operation of the Project will result in a 23.2 million kWh reduction in average annual power generated at the Project. The value of this lost power resource was estimated to be approximately $1.6 million per year. This estimate is based on an average incremental power value of $70 per MW hour. This value of power was generated by PacifiCorp's internal market clearing price models and represent the marginal opportunity cost (or market value) of power, using an average of California-Oregon-Border (COB) and Mid-Columbia values. The basis for this calculation is discussed in more detail in Exhibit D.

The present value of all PM&E costs over the proposed 30-year operation of the Project was calculated under two alternative discount rates: 2 percent and 7 percent. This range of discount rates covers the alternative use of the funds used for the Project and estimates of the time value of money associated with those alternative uses. The lower bound of the range corresponds to consumers' real rate of time preference (i.e., how much more they require in future goods and services in order to forego current consumption). EPA recommends a rate of 2 percent to 3 percent for public projects to reflect the consumers' real rate of interest (EPA, 2000). The upper bound of this range relates to the average real rate of return on private investment and represents the opportunity cost of capital that could be invested elsewhere in the economy. For public and regulatory investments, the Office of Management and Budget recommends a 7 percent rate, as an estimate of the average pre-tax rate of return generated by private sector investments (OMB, 1992).

As shown in Table E9-22**,** the present value of all costs over the 30-year planning period is $101.6 million at a 2 percent discount rate and $66.6 million at a 7 percent discount rate.

Table E9-22. Estimated project costs (2003$).

	Capital Costs							Operating Costs							
Year	Aquatic	Water Resources	Terrestrial	Recreation, Visual, and Land Use	Cultural	Decommissioning	Total	Aquatic	Water Resources	Terrestrial	Recreation, Visual, and Land Use	Cultural	Total	Reduced Power Generation	Total
2006	3,014,600	202,000	167,400	2,253,200	1,074,000	170,000	6,881,200	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	9,971,553
2007	3,014,600	202,000	167,400	2,253,200	1,074,000	170,000	6,881,200	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	9,971,553
2008	3,014,600	202,000	167,400	2,253,200	1,074,000	170,000	6,881,200	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	9,971,553
2009	3,014,600	202,000	167,400	2,253,200	1,074,000	170,000	6,881,200	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	9,971,553
2010	3,014,600	202,000	167,400	2,253,200	1,074,000	170,000	6,881,200	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	9,971,553
2011	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2012	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2013	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2014	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2015	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2016	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2017	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2018	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2019	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2020	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2021	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2022	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2023	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2024	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2025	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2026	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2027	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2028	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2029	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2030	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2031	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2032	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2033	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2034	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
2035	-	-	-	-	-	-	-	892,533	173,000	76,333	231,700	91,667	1,465,233	1,625,120	3,090,353
Present Value															
@ 2% Discount Rate							32,434,258						32,816,033	36,396,928	101,647,219
@ 7% Discount Rate							28,214,279						18,182,141	20,166,181	66,562,600

E9.2.6.2 Social Benefits

As described in Section 4.7.1, the proposed Project and PM&E measures will lead to a number of changes in valued resources, including recreation opportunities, fish populations, aquatic and terrestrial habitat for fish and wildlife, and aesthetics. The assessment of the value of the changes in recreation opportunities in the Upper Klamath River area and the Lower Klamath River area is documented in Appendix 4B of the Socioeconomic Resources FTR. This analysis included the expected changes resulting from the changed facilities and management in the Project area as well as those resulting from all resource area PM&E measures, especially as they related to fish populations. This appendix does not include nonrecreation benefits, however, and these benefits are described here along with the recreation benefits.

Recreation Benefits

The incremental recreation benefits in the Upper Klamath River area resulting from the proposed Project and PM&E measures are estimated using the product of the projected increases in recreation activity days over time (EDAW, 2003) and the associated dollar values per recreation user day (see Appendix 4B of the Socioeconomic Resources FTR). The net present value (NPV) of the incremental recreation stream is about $9.9 million at a 2 percent rate of discount and about $3.9 million using a 7 percent discount rate.

The incremental recreation benefits in the Lower Klamath River area result primarily from the fish PM&E measures summarized above, especially the continued operation of the Iron Gate fish hatchery. Continued operations of the Iron Gate fish hatchery is considered an aquatic PM&E under the terms of the proposed Project. To the extent that these operations contribute to anadromous fish populations and harvest allocations to the in-river and ocean sport fisheries, they are responsible for generating the recreational fishing effort and consumer surplus that is tied to the fish populations. About 80 percent of total hatchery operation costs have historically been absorbed by PacifiCorp. The Iron Gate fish hatchery contributes about half of the total hatchery fish in the system with the remaining coming from the Trinity hatchery. According to Klamath River Technical Advisory Team report (KRTAT, 2003) hatchery fish accounted for about 38 percent of ocean abundance of Klamath River fall Chinook in 2003. Combining all of these factors and assuming a proportionate relationship between ocean abundance, harvest allocations, and recreational fishing effort, suggests that the Iron Gate fish hatchery operations PM&E contributes to about 15 percent (i.e., .8*.5*.38) of the in-river and ocean sport recreation user days.

Unlike the Upper Klamath River area, we do not project a growth in downriver fishing over time. Rather, we use as our best estimate of future fishing days based upon the average effort from the past 25 years. For each year, over the term of the new license from 2006 to 2036, the in-river fishery would generate 28,400 angling days, of which about 4,620 days are attributed to the aquatics PM&E measures, for a total average value of $231,000 (2003 dollars). Similar calculations for the ocean salmon sport fishery gives average annual value of $838,800. Summing across the two sportfisheries and taking the net present value from 2006 to 2036 using a 2 percent discount rate, gives $ 23.6 million NPV and using a 7 percent discount rate gives $11.7 million.

Combining the estimates for Lower Klamath River area and Upper Klamath River area recreation benefits gives $33.5 million NPV at a 2 percent discount rate and $15.6 million NPV at a 7 percent discount rate. This estimate of recreation benefits does not include the benefits to the Tribal commercial or subsistence fisheries or any passive use values associated with contributing toward a sustainable harvest of anadromous species. These and other benefits associated with the proposed Project and PM&E measures are discussed next.

American Indian Commercial and Subsistence Fisheries

Of the fish resources available in the basin, 50 percent must, by law, go to the Yurok and Hoopa Valley Tribes. The Yurok receive 80 percent of the tribal allocation and the Hoopa receive the remaining 20 percent. The Karuk Tribe fishing is regulated to a spot at the Ishi-Pishi Falls (Tripp, 2003) and is not limited to a specific allocation.

Annual allocation recommendations for the remaining fish are made by the Klamath Fishery Management Council and the Pacific Fishery Management Council. The guidelines for allocating the remaining 50 percent are as follows: 15 percent of the nontribal share is allocated to the river recreational fishery, 17 percent of the nontribal share is allocated to the ocean recreation within the KMZ, and 68 percent of the nontribal share is allocated to commercial KMZ and non-KMZ recreational ocean fisheries. What this suggests is that Aquatics PM&E measures as they relate to the allocation of fish resources to the tribes is over twice as important as is the smaller allocation to the recreational fisheries. However, it is difficult to assign a dollar value to these tribal resources. The cultural significance of the fishery is valued by the tribes in ways that do not lend themselves to a monetary translation. In addition, the value of the fish to the American Indian Commercial fishery would typically be measured in terms of the changes in producer and consumer surpluses, but the tribes no longer keep records of their commercial sales. Also, the salmon market is a price-taker on the world market, so that it is unlikely that any rents are being earned in that market. Finally, the American Indian subsistence fishery has absorbed most of the tribal allocation. (See Table 2.7-66.)

Recognizing that we would not be capturing the cultural value of the subsistence fishery, it is possible to obtain a ballpark estimate the economic benefit to the tribes. From 1990 to 2001, Klamath River subsistence take of fall and spring Chinook salmon has averaged about 30,800 fish (see Table E9-23). The weight of the fish has been variable, but assuming an average of about 14 lbs per fish, and using 2001 prices, gives an average value of $700,000 per year and a NPV of $15.3 million at a 2 percent discount rate and $7.6 million at a 7 percent discount rate. This represents the wholesale value of the fish. It is a conservative underestimate of the value of subsistence fishing because it does not reflect any consumer surplus associated with catching or eating the fish. For perspective, the in-river and ocean recreational sport fisheries were estimated to generate $23.6 million (2 percent discount rate) or $11.7 million (7 percent discount rate) in consumer surplus, and they have less than half the tribal allocation. However, the methods of estimating consumer surplus associated with the sport fisheries do not apply to the subsistence fishery.

Table E9-23. Klamath River subsistence take of fall and spring Chinook salmon (1990-2001).

Year	Subsistence Take
1990	17,092
1991	18,470
1992	11,118
1993	17,674
1994	20,258
1995	30,050
1996	33,117
1997	34,636
1998	22,080
1999	24,374
2000	46,289
2001	94,526

Average Annual Subsistence Catch = 30,807.

Average Annual Value of Subsistence Catch = $700,000.00.

Average value = 14 pounds. Average price = $1.61/pound.

Note: These estimates of take do not include the American Indian commercial take or any take from the Trinity River.

U.S. Fish and Wildlife Service (USFWS) estimates for Klamath River portion in 1983-1993. The Fisheries Department of the Hoope Valley Business Council has monitored the Trinity River fishery since 1982. The Yurok Tribe Fisheries Program monitored the Klamath River portion in 1994 and 1995.

Source: Table B-5, PFMC, 2002.

Commercial Fishery

As was mentioned above, the ocean salmon fishery participates in the global market, which is a competitive market. Therefore it is unlikely to generate producer surplus. In addition, it is assumed that the substitutes for salmon caught in these waters preclude generating consumer surplus.

Other Social Benefits

Several additional resource enhancements will result from the proposed Project and PM&E measures, including reductions in entrainment of sucker species, increases in water quality and aquatic habitat and connectivity, improvements in wildlife habitat connectivity, reductions in visual disamenities, and improved resource management planning such as adaptive management. These resource changes would lead to an increase in valued ecological service flows that ultimately contribute to human needs and wants. A dollar value was not assigned to these improvements, but it is important to include them in this discussion and in the balancing of the resource costs and benefits associated with the proposed license. Likewise, characterization of the cultural significance of the incremental changes resulting from the proposed Project and PM&E measures relative to continued operations of the existing Project was not attempted. Please consult the Cultural Resources FTR for these discussions. However, it was observed that the reduction in entrainment of sucker species, the improvements to aquatic and terrestrial

habitat, and the maintenance of anadromous fish populations are movements in a positive direction.

In the socioeconomic study plan, the potential for changes in property values, flood moderation, municipal water supply, and irrigation water supply was identified as an area of study. However, no such Project-induced effects were identified.

In summary, the quantifiable social benefits of the proposed Project and PM&E measures are conservatively estimated to have an NPV of about $48.8 (2 percent discount rate) or $22.2 million (7 percent discount rate) (see Table E9-24). Omitted from the quantitative analysis is society's willingness to pay for the enhancements to fish populations, aquatic habitat and connectivity, wildlife habitat connectivity, aesthetics, American Indian commercial catch, and the consumer surplus from the tribal subsistence fishery. These values are only partially reflected in the value of recreation opportunities and wholesale subsistence fish.

Table E9-24. Net present value of social benefits.

Benefit Category	2 Percent Discount Rate	7 Percent Discount Rate
Upper Klamath River Recreation	$9.9 million	$3.9 million
Lower Klamath River Recreation	$23.6 million	$11.7 million
American Indian Subsistence Fishing	$15.3 million	$ 7.6 million
Total Quantified Benefits	$48.8 million	$22.2 million

E9.2.6.3 Discussion

The socioeconomic study addresses the employment and earnings impacts on the regional economy, the associated changes in related socioeconomic variables such as population and local public services, and the net social benefits and costs of the proposed Project and PM&E measures measured relative to continued operations of the existing Project.

For the upstream counties, of the two major sectors whose regional economic impacts were evaluated in this section, construction has the larger impact on employment, income and output. The impacts from recreation expenditures are relatively small. The creation of an additional 53 (construction phase) or 26 (operations phase) jobs is not significant enough to help reduce the high unemployment rates observed for the communities within the 5-mile or 50-mile buffer areas. Similarly, the additional income and output, though welcome, is not significant enough to help raise the low per capita incomes observed for these communities.

Although any additional jobs and income are a welcome boon to the economies of the communities within the 5-mile and 50-mile buffer area during a period of relatively high unemployment, it is quite possible that the magnitude of these changes may be smaller than the model predicts. Economies adjust over time such that what may be seen as an increase in income and employment may actually be temporary. Over time, shifts in resource use between the various industries in the economy may lead to an increase in local employment even without the proposed Project. Thus, after the first few years, the additional jobs and income may not necessarily represent a net gain for the region.

For the communities downstream of Iron Gate dam, the recreation, subsistence and commercial salmon fisheries are likely to be affected by the proposed Project. The available information suggest that the Iron Gate fish hatchery PM&E measures could contribute roughly 15 percent of the income that is currently generated by these sectors. Other aquatics PM&E measures could also contribute positively toward sustaining these fisheries.

Owing to the minimal changes in employment in the upstream counties, it is not anticipated that the proposed Project will induce changes in local populations or demands for local services, such as schools and housing. Likewise, the proposed Project is not expected to induce increased demands for local public services, such as emergency response services. The increase in recreation visitors will be modest. The proposed Project may result in a very small (less than .1 percent) decrease in local property taxes paid to Klamath County. Owing to the anticipated minimal (though beneficial) impacts from the proposed PM&E measures, there are no disproportionate adverse environmental, economic, social, or health impacts on minority or low-income populations living in the study area. Thus, the proposed PM&E measures are not expected to result in any environmental justice issues.

The NPV of social costs was estimated at $101.6 million using a 2 percent discount rate and $66.6 million using a 7 percent discount rate. The quantifiable social benefits of the proposed Project and PM&E measures are conservatively estimated to have an NPV of about $43.9 million (2 percent discount rate) or $19.2 million (7 percent discount rate). This includes (1) the improved recreation opportunities in the Upper Klamath River area; (2) the protected Lower Klamath River in-river and ocean sport fisheries; and (3) the wholesale value of the Lower Klamath River tribal subsistence fishery. Omitted from the quantitative analysis is society's willingness to pay for the enhancements to fish populations, aquatic habitat and connectivity, wildlife habitat connectivity, aesthetics, American Indian commercial catch, and the consumer surplus from the tribal subsistence fishery. These economic values are only partially reflected in the value of recreation opportunities and the wholesale value of subsistence fish.

The lower bound estimate should not be interpreted as a precise figure. Rather, it provides a ballpark estimate of the lower bound based on a series of assumptions and analyses documented in the Socioeconomics FTR. The upper bound on the social benefits was not estimated and depends on the nature and extent of the resource improvements and how they contribute to supporting human needs and wants. For example, characterization of the cultural significance of the incremental changes resulting from the proposed Project and PM&E measures relative to continued operations of the existing Project was not attempted (see the Cultural Resources FTR for these discussions). However, it was observed that the reduction in entrainment of sucker species, the improvements to aquatic and terrestrial habitat, and the maintenance of anadromous fish populations are movements in a positive direction.

E9.3 CONSULTATION WITH APPLICABLE AGENCIES, TRIBES, AND THE PUBLIC

PacifiCorp began its relicensing consultation effort for the Project using the basic approach established by the Traditional Licensing Process. The Traditional Licensing Process was initiated in December 2000 by the distribution of the First Stage Consultation Document, in which PacifiCorp provided an overview of the Project and resources in the Project area, and proposed certain studies needed to support development of the license application. Formal stakeholder

comments on this document included more than 175 letters and conveyed broad-ranging concerns with the adequacy of the study plans, PacifiCorp's decision not to study dam decommissioning, and the level of collaboration in developing study plans.

In response to these comments, PacifiCorp revised their proposed study plans and redistributed them in the form of a draft Second Stage Consultation document. Stakeholder response was again vigorous and reiterated the concerns expressed in the first round of comments. In response to these strong stakeholder interest and concerns, this initial process has evolved into a robust collaborative effort with more than 40 stakeholders engaged in a long-term collaborative effort to develop and approve study plans, review and interpret results, and potentially agree on PM&E measures. Details of the consultation effort to date are provided in the document titled PacifiCorp consultation record (Appendix E-1A of Exhibit E).

Beginning in February 2002, stakeholders developed a Process Protocol to guide the long-term collaborative effort and a collaborative structure consisting of a plenary group (all interested stakeholders) and seven technical working groups. The groups convene each month for facilitated meetings. One of the technical working groups is the socioeconomic work group (SWG). Between April 2002 and November 2003, the SWG met 16 times to review and discuss the socioeconomic study plans. The meetings and results as related to socioeconomic resources are listed below in chronological order.

April 17, 2002: This meeting provided the first opportunity to discuss the draft Socioeconomic Resources Study Plan. The plan purpose was discussed, namely to describe the existing socioeconomic environment and assess the changes to the socioeconomic environment resulting from the proposed Project. Work group members suggested revisions to the plan, including expanding the geographic extent of the study area, attempting to assess benefits and costs at the community level (as opposed to the county level), and specifying the time span for the analysis. PacifiCorp agreed to incorporate the suggested revisions. The issue of the Link River Agreement between USBR and PacifiCorp was raised, but PacifiCorp stipulated that the contract related to USBR's Klamath Project was not a licensing issue.

July 11, 2002: During this meeting, revisions to the draft study plan were discussed and work group members raised several issues needing further clarification, including the baseline condition, sensitivity analysis of the agricultural sector, what alternative or alternatives would be evaluated, and the inclusion of a comprehensive benefit-cost analysis. Methodological differences were discussed. PacifiCorp indicated that the SWG would receive the preferred Project alternative(s) from the plenary group. Also, PacifiCorp agreed to consider the issues raised by work group participants and prepare an outline of PacifiCorp's proposed approach toward assessing the changes to the socioeconomic condition as a result of the proposed Project.

August 6, 2002: The work group recommended splitting the socioeconomic study plan into two separate study plans, where the Phase 1 study was to describe the existing socioeconomic condition in the study area. This was accomplished during the meeting and the Phase 1 study plan (i.e., Study Plan 7.1) was recommended to the plenary group for approval. The plenary group later approved the Phase 1 study plan.

September 9, 2002: Refinements to the draft Phase 2 study plan were discussed and work group members reiterated their interest in evaluating the socioeconomic condition with and without the

current Project in place. PacifiCorp indicated that the socioeconomic study would evaluate the proposed Project in terms of any incremental changes from the existing condition (i.e., continued operation of the current Project in the current environment), but that a high-level analysis of other options was under discussion in the plenary group. Any such options defined by the plenary group would then also be given high-level consideration by the SWG.

October 9, 2002: The work group discussed process issues and revisited the issues related to evaluating a range in alternatives and an analysis with and without the current Project in place.

November 12, 2002: The objective of this meeting was to discuss the FERC Exhibit E license requirements with respect to socioeconomic considerations as well as the level and type of socioeconomic analysis FERC will conduct in the post-application National Environmental Policy Act (NEPA) process. By clarifying FERC requirements of the applicant, it was hoped that the work group participants could move forward on approving the Phase 2 study outline.

January 8, 2003: The work group agreed to have PacifiCorp develop a Phase 2 study plan from the existing outline, where the objective of the study was to assess the changes in the socioeconomic condition in the study area resulting from the differences in the proposed Project and the current Project. The work group also agreed to separately address the high-level alternatives analysis. It appeared that work group participants were willing to agree to disagree on methodological issues relating to (1) the FERC baseline, (2) an analysis of the historical condition of anadromous fish populations and the influence of hydropower operations on that condition disentangled from other influences (e.g., ocean conditions, overharvesting, habitat alteration resulting from USBR's Klamath Project, timber harvest activities, and other habitat altering activities in the Klamath River basin), (3) a comprehensive analysis of a full range in alternatives, including dam decommissioning alternatives, and (4) an analysis of the changes in farming behavior that might result from a potential future increase in the price of power for irrigated agriculture and how those behavioral changes might affect the regional socioeconomic condition as well as induce changes in Klamath River resources such as flow, water quality, and ultimately anadromous fish populations.

March 6, 2003: The purpose of this meeting was to discuss and receive comments on the Phase 2 study plan. It was decided to introduce a new Phase 2 study plan related to the high-level socioeconomic analysis of the landscape alternatives defined by the plenary group. The current Phase 2 study plan then became the Phase 3 study plan and was renamed "7.3 Analysis of Effects of Differences Between the Proposed Project and the Current Project on the Socioeconomic Environment—Phase 3 of the Socioeconomic Study."

April 10, 2003: The work group discussed the format of the proposed Phase 2 study plan and provided comments on the draft Phase 3 study plan.

May 6, 2003: The purpose of this meeting was to obtain final comments on the Phase 3 study plan. Work group members postponed a final decision until a conference call scheduled for later in the month to discuss a few remaining issues. The work group had received the first draft of the Phase 2 study plan, "7.2 High-Level Socioeconomic Analysis of the Landscape Options—Phase 2 of the Socioeconomic Study," but discussion on it was deferred until the June meeting.

June 3, 2003: The participants in the work group continued to focus on their differences as summarized above under the January 2003 meeting. Although work group members acknowledged that PacifiCorp was offering more in the way of socioeconomic analysis than was required in a traditional licensing process, there was disagreement about interpreting FERC requirements and about what should be required of an applicant independent of what FERC requires. It was suggested that these differences could be identified as outstanding issues in the study plan. Work group participants agreed to give more thought to additional consideration language. During a follow-up conference call on June 12, 2003, it was decided that PacifiCorp and other work group members would draft additional consideration language.

July 2003: No work group meeting was held this month.

August 7, 2003: The purpose of this meeting was to obtain early feedback on the Phase 1 study to expedite revisions and to then reflect on how to move forward on developing additional consideration language to incorporate into the Phase 2 and Phase 3 study plans. Work group members offered several suggestions, including adding detail to the license application based on work already reported in the Socioeconomic Resources FTR, as well as adding information on low-income minority populations (i.e., American Indians, Hispanic groups), information on communities that were within the study area but had been omitted because they were not census designated places, and finer detail on industry categories and on irrigated agriculture. Work group members were not yet prepared to finalize language related to additional considerations.

September 10, 2003: This meeting was held via a conference call. At this meeting, work group participants learned that the plenary was having ongoing discussions relating to the high-level analysis of landscape options. Thus, approval of the proposed Phase 2 socioeconomic study was placed on hold awaiting direction from the plenary. Also, because critical stakeholders were absent from the meeting, discussion related to additional consideration language and approval of the Phase 3 study plan was postponed.

October 10, 2003: The plenary redirected the work groups to identify subgroups tasked with populating the System Landscape Options Matrix (SLOM) as per the plan developed by the members of the Process subgroup. This direction from the plenary rendered the Phase 2 study plan irrelevant except in so far as it provides reference material for the socioeconomic members of the subgroup. In lieu of incorporating additional consideration language into the Phase 3 study plan, work group members decided to develop a socioeconomic issues paper. By identifying areas of disagreement among work group participants, the issues paper explains why the Phase 3 study plan was not approved by stakeholders. See Exhibit E Appendix E-1A for the socioeconomics issue paper.

November 4, 2003: The work group received information and direction on populating the SLOM. PacifiCorp provided preliminary information related to their anticipated proposed Project.

For additional information about consultation with applicable agencies, tribes, and the public regarding socioeconomics, refer to Appendix E-1A.

E9.4 SOCIOECONOMIC STUDIES

E9.4.1 Previously Conducted Studies

Several economic analyses have been performed in the Project area and are listed in Section E9.5, Information Sources. However, no studies have been conducted previously that include the breadth and depth of what has been prepared as part of the Project relicensing process. Therefore, PacifiCorp has built on previous studies for particular economic conditions and within specific locales to create a Project-wide socioeconomic analysis for the purpose of improving its knowledge of the socioeconomic resources or the Project's potential effects on those resources.

The draft Phase 1 socioeconomic study describes the existing socioeconomic condition in the study area as it relates to the current Project and currently implemented environmental and social measures. This phase was largely a data- and information-gathering effort. As such, it did not involve separate studies, but it did include several surveys as a means of obtaining site-specific information to augment published data sources. The results are summarized in Section E9.1, Existing Socioeconomic Conditions.

The Phase 3 socioeconomic study primarily assesses the changes in the socioeconomic condition in the study area resulting from the differences in the proposed Project and the current Project, which includes PM&E measures (e.g., new environmental and social measures). This study involved examining only the incremental effects resulting from any changes in the current Project and PM&E measures.

The Phase 3 study addresses the following key questions related to estimating expected changes in the socioeconomic condition resulting from differences between the proposed Project and the current Project:

- Which major economic sectors will be affected and what would be the effects on those sectors?
- How would the effects on economic sectors translate into changes in employment and earnings in the economies of the study area?
- What would be the effects on population growth and community services in the study area?
- What would be the changes in market and nonmarket economic benefits and costs (i.e., described in monetary, nonmonetary, or qualitative terms)?
- How would the potential benefits and costs be distributed within and across regions in the study area (i.e., which societal groups would bear the burdens and who would reap the benefits)?

The critical element of the Phase 3 study process is that the SWG reviewed the study specifics proposed by PacifiCorp, and with the exception of the issues raised in the socioeconomic issues paper, the revisions suggested by work group participants were incorporated into the final draft.

The study plan developed to address the key study questions includes the following analyses:

- Regional economic impact analysis to capture changes in local employment, output, and earnings in the study area resulting from differences between the proposed Project and the current Project. A component of the regional economic impact analysis is the sector analysis, which defines the effect of the proposed Project on major economic sectors (e.g., recreation and tourism, construction, commercial fishing, agriculture).

- Descriptions of the changes in other socioeconomic resources (e.g., population, community services) in the study area resulting from differences between the proposed Project and the current Project.

- National level economic benefit-cost analysis to capture the changes in net benefits to the public resulting from differences between the proposed Project and the current Project.

E9.4.2 Studies Currently Underway

A study currently underway involves populating the SLOM for anticipated effects on the socioeconomic condition. A collaborative work group process subgroup is responsible for the SLOM effort. This effort has replaced the proposed Phase 2 study plan described in the Socioeconomic Resources FTR.

E9.4.3 Proposed Studies

No additional socioeconomic studies are proposed.

E9.4.4 Outstanding Study Issues

Some work group members requested that PacifiCorp identify the environmental and social effects of the Project by (1) predicting what environmental and social conditions would exist if the Project were removed and Project lands restored, and (2) using this predicted future as a point of comparison to identify the effects of ongoing Project operations. They believe this information is critical for FERC to make a public interest determination as to whether the public interest is best met by dam removal and restoration, or the continued operation of the Project. They further suggested that this information be used to determine the measures needed to offset (i.e., mitigate for) any negative Project effects. PacifiCorp has argued that such an analysis would not serve the FERC purpose of conducting forward-looking analyses that shed light on actions to improve the current environment.

Additionally, some work group members have asked PacifiCorp to conduct a comprehensive analysis of the socioeconomic consequences of a full range of alternatives, including various forms of decommissioning some or all hydropower Project facilities. PacifiCorp has agreed to conduct a high-level socioeconomic analysis of the landscape options defined by the plenary group, but believes that a formal alternatives analysis should instead be conducted by FERC during the post-application stage of the relicensing process. For the purpose of moving forward on the license application, work group members agreed to attempt to develop language where they could disagree with PacifiCorp's position. As an outcome, an issues paper was drafted. (See Exhibit E Appendix E-1A.)

Other outstanding issues raised by work group members and stakeholders and documented in the draft issues paper are as follows:

- Some SWG members have requested an historical study that describes the economies and infrastructure that Klamath River basin anadromous fisheries have supported over time, the decline over time of the Klamath basin's anadromous fisheries resource, the resulting declines in river and coastal economies, and an estimate of the contribution the Project has made to that decline.

- SWG members have also objected to the use of FERC's current condition baseline. They maintain that for some variables, sufficient information on alternative future values warrants conducting a sensitivity analysis based on alternative futures.

- Some SWG members believe that an analysis of alternatives—including the "high-level" analysis described in the draft Phase 2 socioeconomic study plan—should assume that investments which have been made toward restoring watersheds, water quality, and fisheries as well as regulatory mechanisms including total maximum daily loads (TMDLs), will have the effect of improving watersheds, water quality, and fisheries habitat to the point where anadromous fish will be able to successfully recolonize most or all former habitat.

- Some stakeholders to the collaborative process have requested an assessment of the ongoing impacts of the hydroelectric project and the effects of decommissioning all or parts of the Project. PacifiCorp believes that FERC rules require only an assessment of the changes in the socioeconomic condition in the study area based on the differences between the current Project and the proposed Project.

- Some stakeholders are concerned that effects on the agricultural community are not properly addressed in the socioeconomics studies given that Keno dam is not in the proposed Project. Stakeholders feel that effects need to be quantified to determine the consequences in a shift in Project boundary that would exclude Keno dam.

- Some work group members have also expressed concerns that the socioeconomic analysis will not capture the potential impacts to their respective cultures. PacifiCorp acknowledged that the socioeconomic study would not include a study of cultural changes. This topic is addressed in the cultural resource studies.

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