

3.15 Socioeconomics

This section describes socioeconomic effects of the four action alternatives and No Action/No Project Alternative. Socioeconomic effects include potential changes to economic output, labor income, and employment in the area of analysis, as well as, fiscal effects on local governments. This section also describes socioeconomic effects on Indian Tribes in the Klamath Basin.

3.15.1 Area of Analysis

The socioeconomic study area includes Del Norte, Humboldt, Modoc, and Siskiyou Counties in California and Curry, Klamath, and Jackson Counties in Oregon. The Four Facilities are in Siskiyou and Klamath Counties. The remaining counties have local economies linked to the Klamath River through fishing, recreation/tourism, or agriculture industries. Indian Tribes' economic and social welfare is also closely linked to the Klamath River. Various economic regions have been developed for the economic analysis based on where the direct economic activity would likely occur. For example, changes to irrigated agriculture as a result of the action alternatives would occur on Klamath Irrigation Project lands in Modoc, Siskiyou, and Klamath Counties; therefore, the economic region for irrigated agriculture effects includes these three counties. Figure 3.15-1 shows all counties in the direct area of analysis. Some economic effects for commercial fishing may occur in counties further from the Klamath Basin, most notably Mendocino, Sonoma, Marin, San Francisco, and San Mateo Counties in California and Lane, Douglas, and Coos Counties in Oregon. Section 3.15.2 defines the regions (groups of counties) and potential span of effects for each economic effect analyzed.

3.15.2 Regulatory Framework

Socioeconomics within the area of analysis is regulated by several federal laws and policies, which are listed below.

3.15.2.1 Federal Authorities and Regulations

- Magnuson Fishery Conservation and Management Act of 1976
- Federal Endangered Species Act (ESA)
- Pacific Coast Salmon Plan and Amendments
- 1993 Solicitor's Opinion Fishing Rights of the Yurok and Hoopa Valley Tribes
- 1994 Northwest Forest Plan

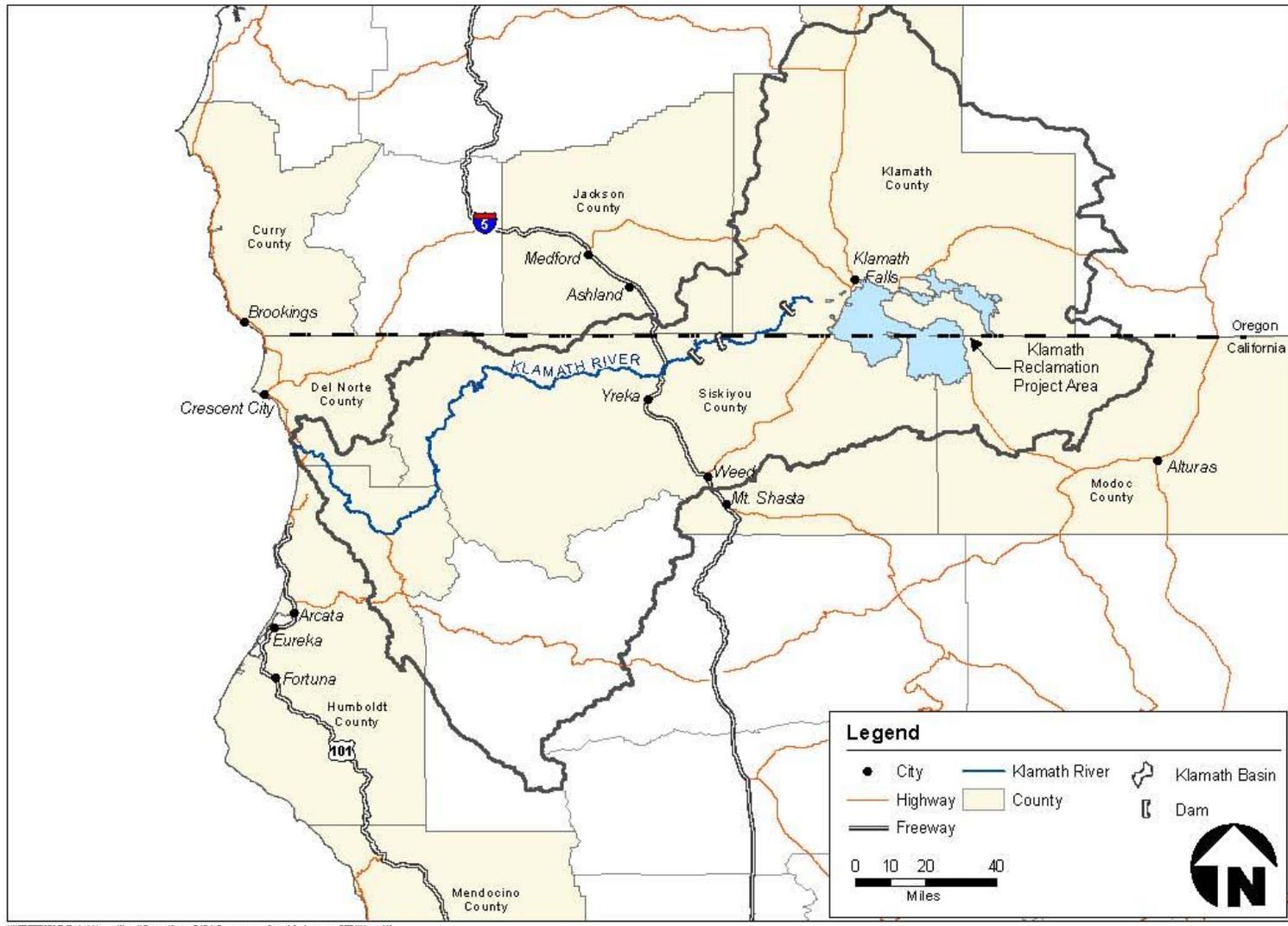


Figure 3.15-1. Socioeconomic Area of Analysis

3.15.3 Existing Conditions/Affected Environment

This section describes regional economic conditions and economic information relevant to the specific industries in which potential economic effects could occur, such as fishing, recreation tourism, or agriculture. The areas of potential effects, which for this analysis are groups of counties, vary depending on the industry and are identified below for each industry. In general, the counties in the area of analysis (except for counties in the San Francisco Bay area) are in rural areas of the states and have resource- and environmental amenity-based economies (e.g., timber, agriculture, fishing, recreation). Similar to many rural areas, the counties in the area of analysis have lower populations, incomes, and economic output and fewer employment opportunities than counties with larger urban centers in California and Oregon. Government entities and services are typically the largest employers in the counties. Appendix O includes detailed regional economic descriptions of each county. The nature and magnitude of economic effects depends on whether the economic industry is prevalent in a county.

Indian Tribes are also affected by the project alternatives. Tribes' cultural practices, subsistence, and economies are closely linked to the Klamath River. This section describes economic conditions of the tribes. Sections 3.12, Tribal Trust and 3.16, Environmental Justice describe Indian Tribes' social and cultural uses of the river in detail.

3.15.3.1 Four Facilities

The area of analysis for the Four Facilities includes Siskiyou and Klamath Counties. Table 3.15-1 summarizes the regional economy in the two counties aggregated into eight industry sector classifications for employment, labor income, and output. 2009 data is presented.

Employment is a measure of the number of jobs related to each industry. The service industry sector was 44 percent of the total regional employment in the region. The government and trade industry sector jobs provided 21 and 14 percent of regional employment, respectively.

Labor income is the sum of employee compensation and proprietor income. The largest portion of labor income in the region, 37 percent, was provided by the service industry sector. The government and trade industry sectors made up 28 and 11 percent of the total regional labor income, respectively.

Industry output represents the value of goods and services produced by businesses within a sector of the economy. The service sector produced the greatest level of output (42 percent) in the region. The manufacturing and government sectors each generated 14 percent of regional output, while the agricultural sector was 10 percent of total output.

Table 3.15-1. Summary of the 2009 Regional Economy for Klamath and Siskiyou Counties

Industry Sector	Employment ¹		Labor Income ²		Output ³	
	Jobs	Percent of Total	\$ (million)	Percent of Total	\$ (million)	Percent of Total
Agriculture	3,232	6.7	107.8	5.6	497.3	9.7
Mining	84	0.2	3.2	0.2	15.7	0.3
Construction	2,174	4.5	90.1	4.7	242.8	4.7
Manufacturing	2,621	5.4	135.7	7.0	703.6	13.7
Transportation, Information, and Public Utilities (TIPU)	1,920	4.0	109.3	5.7	394.6	7.7
Trade	6,886	14.3	220.5	11.4	455.4	8.9
Service	21,197	44.0	722.0	37.4	2,131.2	41.5
Government	10,091	20.9	539.8	28.0	697.9	13.6
Total	48,205	--	1,928.4	--	5,138.5	--

Source: Reclamation 2011.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including positive effects) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Siskiyou County's unemployment rate has been higher than state averages from 1998 through 2010. Unemployment rates in 2009 and 2010 have been the highest the county has had in the past 20 years (California Employment Development Department [EDD] 2010). Klamath County has also had consistently higher unemployment rates than the State. The 2009 unemployment rate was the highest of the 12-year period (Oregon Employment Department 2010).

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

3.15.3.2 Commercial Fishing

The commercial fishing information provided here is taken directly from analyses contained in Reclamation (2011) and National Oceanic and Atmospheric Administration (NOAA Fisheries Service) (2011a). The area of analysis for commercial fishing includes Curry, Coos, Douglas and Lane Counties in Oregon and Del Norte, Humboldt,

Mendocino, San Mateo, San Francisco, Marin, and Sonoma Counties in California. Participants in the ocean commercial fishery potentially affected by the project alternatives consist of small, independently owned and operated trollers that land salmon south of Cape Falcon, Oregon. The fishery is a mixed stock fishery, that is, the commercial harvest includes salmon stocks from different rivers, including the Klamath River. The PFMC manages the salmon fishery on the basis of ‘weak stock management’, whereby regulations are designed to protect weaker stocks, even if that means foregoing some harvest of the healthier stocks that comingle with the weaker ones in the ocean harvest. In the ocean, Klamath River fall Chinook salmon ranges from approximately Point Sur, California to Cape Falcon, Oregon. About 99 percent of the increase in commercial fishery revenue attributable to the project alternatives occurs in the following ocean management areas: (1) San Francisco, (2) Fort Bragg, (3) Klamath Management Zone (KMZ) (Figure 3.15-2) and (4) Central Oregon. The regional impact analysis focuses on these four areas. For purposes of this analysis, the KMZ (which straddles the Oregon-California border) is divided at the border into two areas: KMZ-OR and KMZ-CA. Tables 3.15-2 to 3.15-6 summarize the regional economy for San Francisco (San Mateo, San Francisco, Marin and Sonoma Counties), Fort Bragg (Mendocino County), KMZ-CA (Humboldt and Del Norte Counties), KMZ-OR (Curry County), and Central Oregon (Coos, Douglas and Lane Counties) in terms of employment, labor income, and output. Employment, labor income, and output related to commercial fishing are reflected in various sectors in the tables, including agriculture and services.

While Klamath River fall Chinook salmon abundance routinely constrains the troll fishery in the areas cited above, troll harvest in two additional areas (Monterey and Northern Oregon) may also become more constrained when Klamath River fall Chinook salmon is at low levels of abundance. Table 3.15-7 summarizes landings (numbers of fish) in the last three decades in all management areas south of Cape Falcon, Oregon. Tables 3.15-8 and 3.15-9 describe poundage and ex-vessel value of landings (gross landed value) over 1981-2010. Landings and value decreased from the 1980s to the 1990s. Factors contributing to this decline include more conservative management policies to protect weak stocks (including two Chinook salmon and three coho salmon stocks listed under the Endangered Species Act) and a 1993 opinion by the Department of the Interior Solicitor reserving 50 percent of Klamath-Trinity River salmon for the Yurok Tribe and Hoopa Valley Tribe. Landings are generally highest in San Francisco and lowest in KMZ-CA and KMZ-OR. Landing reductions began occurring in KMZ-CA and KMZ-OR in the mid-1980s to address conservation concerns for Klamath River fall Chinook; low landings remain persistent features in those areas. Landings in most areas rebounded during 2001-2005 but have since fallen to record lows in the past five years.

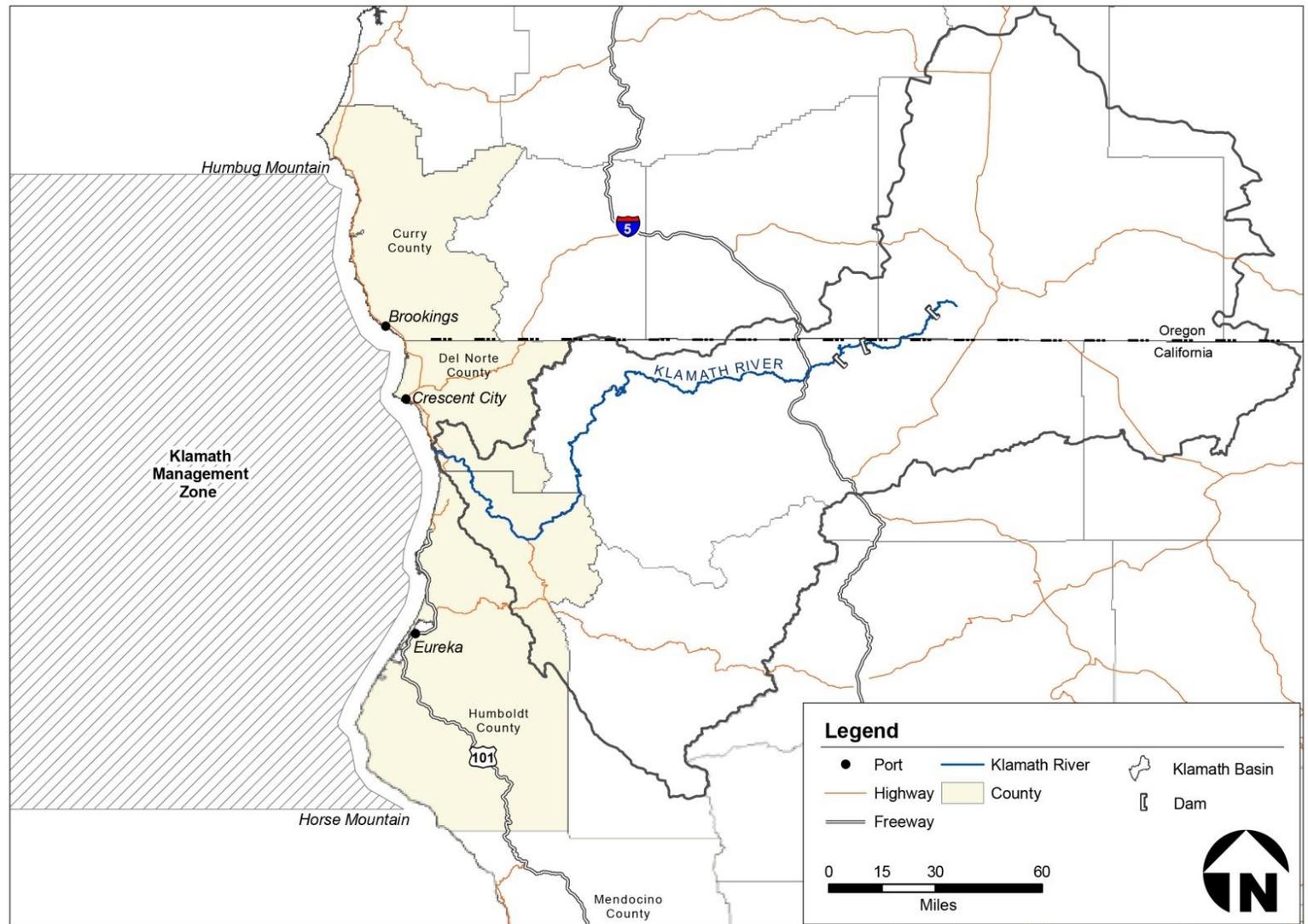


Figure 3.15-2. Klamath Management Zone Boundary and Ports

Table 3.15-2.—Summary of the Regional Economy for the San Francisco Management Area (San Mateo, San Francisco, Marin, and Sonoma Counties CA)

Industry sectors	Employment ¹		Labor income ²		Output ³	
	Jobs	Percent of total	\$ million	Percent of total	\$ million	Percent of total
Agriculture	10,401	0.34	570.53	0.28	1,536.15	0.26
Mining	2,683	0.09	404.25	0.20	1,529.34	0.26
Construction	153,734	5.02	11,116.50	5.43	23,970.50	4.00
Manufacturing	149,053	4.87	17,552.96	8.58	151,443.53	25.28
TIPU	98,914	3.23	6,843.29	3.34	24,426.35	4.08
Trade	372,967	12.19	19,026.25	9.30	42,067.56	7.02
Service	1,933,85	63.19	121,200.87	59.21	318,440.96	53.15
Government	338,759	11.07	27,970.63	13.67	35,749.56	5.97
Total	1,319,896		204,685.28		599,163.95	

Source: Reclamation 2011

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Table 3.15-3.—Summary of the Regional Economy for the Fort Bragg Management Area (Mendocino County CA)

Industry sector	Employment ¹		Labor income ²		Output ³	
	Jobs	Percent of total	\$ million	Percent of total	\$ million	Percent of total
Agriculture	2,339	5.83	118.11	6.82	312.39	6.49
Mining	66	0.17	1.80	0.10	9.14	0.19
Construction	2,233	5.57	115.93	6.70	281.60	5.85
Manufacturing	2,449	6.11	128.21	7.41	808.43	16.79
TIPU	1,093	2.73	58.26	3.37	346.44	7.20
Trade	6,304	15.71	250.07	14.45	520.20	10.81
Service	18,190	45.34	649.96	37.55	1,970.63	40.94
Government	7,442	18.55	408.64	23.61	564.71	11.73
Total	40,116		1,730.98		4,813.54	

Source: Reclamation 2011

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Table 3.15-4. Summary of the 2009 Regional Economy for the KMZ-CA (Humboldt and Del Norte Counties, CA)

Industry sector	Employment ¹		Labor Income ²		Output ³	
	Jobs	Percent of total	\$ million	Percent of total	\$ million	Percent of total
Agriculture	2,481	3.46	111.27	3.73	413.34	5.62
Mining	43	0.06	2.37	0.08	7.38	0.10
Construction	3,672	5.13	192.04	6.44	464.58	6.31
Manufacturing	2,465	3.44	126.28	4.23	798.32	10.85
TIPU	1,967	2.75	105.77	3.55	365.00	4.96
Trade	10,586	14.78	380.59	12.76	777.07	10.56
Service	32,462	45.32	1,113.71	37.34	3,327.87	45.21
Government	17,958	25.07	950.47	31.87	1,206.59	16.39
Total	71,634		2,982.50		7,360.15	

Source: Reclamation 2011

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Table 3.15-5. Summary of the 2009 Regional Economy for the KMZ-OR (Curry County, OR)

Industry sector	Employment ¹		Labor Income ²		Output ³	
	Jobs	Percent of total	\$ million	Percent of total	\$ million	Percent of total
Agriculture	676	7.81	20.60	6.61	53.21	6.20
Mining	25	0.29	1.26	0.41	4.39	0.51
Construction	673	7.78	21.94	7.04	67.28	7.84
Manufacturing	611	7.06	33.42	10.73	130.97	15.25
TIPU	180	2.08	11.33	3.64	43.17	5.03
Trade	1,252	14.47	38.04	12.21	74.43	8.67
Service	3,885	44.88	114.81	36.86	393.11	45.79
Government	1,354	15.64	70.07	22.50	91.97	10.71
Total	8,656		311.47		858.53	

Source: Reclamation 2011

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Table 3.15-6. Summary of the Regional Economy for the Central Oregon Management Area (Coos, Douglas, and Lane Counties OR)

Industry sector	Employment ¹		Labor income ²		Output ³	
	Jobs	Percent of total	\$ million	Percent of total	\$ million	Percent of total
Agriculture	8,718	3.38	273.06	2.68	865.38	3.11
Mining	449	0.17	23.57	0.23	92.68	0.33
Construction	12,681	4.91	547.94	5.39	1,451.52	5.22
Manufacturing	17,716	6.87	1,012.13	9.95	5,480.22	19.70
TIPU	6,726	2.61	332.09	3.27	1,070.39	3.85
Trade	37,815	14.65	1,259.06	12.38	2,657.42	9.55
Service	130,484	50.57	4,415.17	43.41	13,062.44	46.96
Government	43,459	16.84	2,307.17	22.69	3,134.82	11.27
Total	258,048		10,170.19		27,814.87	

Source: Reclamation 2011

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Table 3.15-7. Landings of Troll-Caught Chinook Salmon and Coho Salmon (# fish), 1981-2010, by Management Area

Year(s)	Management Area							Total
	Monterey	San Francisco	Fort Bragg	KMZ-CA	KMZ-OR	Central OR	North OR	
81-85 Avg	85,260	186,680	124,320	124,020	61,320	170,560	190,200	942,360
86-90 Avg	146,460	360,480	278,380	56,120	33,920	385,940	351,700	1,613,000
91-95 Avg	137,720	205,480	14,760	1,540	1,000	36,820	128,240	525,560
96-00 Avg	156,305	195,662	12,529	3,505	3,542	36,042	89,479	497,064
01-05 Avg	64,827	210,228	96,466	12,401	5,245	117,529	151,698	658,393
06-10 Avg	5,330	24,806	7,906	1,752	1,188	7,736	11,598	60,315
2001	35,940	136,630	14,993	5,523	3,599	72,272	195,001	463,958
2002	69,980	242,872	65,336	13,467	6,803	122,174	162,415	683,047
2003	36,099	202,876	248,875	4,044	5,072	132,156	182,066	811,188
2004	64,707	298,229	107,259	31,915	8,484	140,142	100,965	751,701
2005	117,408	170,531	45,869	7,054	2,266	120,900	118,044	582,072
2006	11,204	47,689	10,835	0	738	1,979	21,759	94,204
2007	14,009	75,254	16,116	8,762	4,097	24,096	11,393	153,727
2008	0	0	0	0	236	208	76	520
2009	0	0	0	0	0	979	8,738	9,717
2010	1,435	1,086	12,577	0	869	11,418	16,022	43,407

Sources: PFMC as cited in Reclamation 2011, NOAA Fisheries Service 2011a. 2010 data are preliminary.

Table 3.15-8. Landings of Troll-Caught Chinook Salmon and Coho Salmon (1000s of pounds dressed weight), 1981-2010, by Management Area

Year(s)	Management Area							Total
	Monterey	San Francisco	Fort Bragg	KMZ-CA	KMZ-OR	Central OR	North OR	
81-85 Avg	748	1,849	1,218	967	495	1,140	1,080	7,497
86-90 Avg	1,601	3,700	2,434	624	537	2,765	2,259	13,920
91-95 Avg	1,350	1,949	194	31	32	339	869	4,764
96-00 Avg	1,699	2,155	146	37	92	435	861	5,425
01-05 Avg	756	2,704	1,268	149	204	1,124	1,605	7,810
06-10 Avg	54	318	163	24	40	86	156	841
2001	418	1,735	192	64	152	776	1,898	5,235
2002	912	3,060	872	162	218	1,223	1,722	8,169
2003	498	2,753	3,096	45	142	1,353	1,890	9,777
2004	853	3,712	1,292	373	267	1,214	1,256	8,967
2005	1,098	2,258	889	102	239	1,054	1,259	6,899
2006	87	684	273	0	45	56	290	1,435
2007	165	888	357	115	101	246	160	2,032
2008	0	0	0	0	8	0	20	28
2009	0	0	0	0	5	5	82	92
2010	20	16	187	4	43	122	226	618

Sources: PFMC as cited in Reclamation 2011, NOAA Fisheries Service 2011a. 2010 data are preliminary.

Table 3.15-9. Ex-vessel Value of Troll-Caught Chinook Salmon and Coho Salmon (\$1000s, Base Year=2012), 1981-2010, by Management Area

Year(s)	Management Area							Total
	Monterey	San Francisco	Fort Bragg	KMZ-CA	KMZ-OR	Central OR	North OR	
81-85 Avg	3,671	9,170	5,881	4,536	2,426	4,637	3,965	34,286
86-90 Avg	7,003	16,751	10,884	2,736	2,219	10,983	8,128	58,704
91-95 Avg	4,095	6,097	670	104	98	899	2,349	14,312
96-00 Avg	3,755	4,912	340	81	217	1,038	1,950	12,293
01-05 Avg	2,129	7,422	3,371	440	608	3,206	4,280	21,456
06-10 Avg	307	1,797	925	134	243	500	834	4,740
2001	1,051	4,362	483	161	311	1,586	3,878	11,832
2002	1,766	5,927	1,689	314	420	2,354	3,309	15,779
2003	1,164	6,432	7,233	105	342	3,260	4,539	23,075
2004	2,912	12,672	4,411	1,273	1,096	4,982	5,096	32,442
2005	3,754	7,719	3,039	349	872	3,846	4,577	24,156
2006	497	3,911	1,561	0	275	342	1,757	8,343
2007	925	4,981	2,002	645	607	1,451	789	11,400
2008	0	0	0	0	62	0	150	212
2009	0	0	0	0	27	11	188	226
2010	114	91	1,063	23	245	696	1,286	3,518

Sources: PFMC as cited in Reclamation 2011, NOAA Fisheries Service 2011a. 2010 data are preliminary.

In years where a stock fails to meet its conservation goal for three consecutive years, the Pacific Fishery Management Council declares a conservation concern, and the commercial fishery is closed or otherwise highly constrained, even in areas far removed from the stock's river of origin. Multiple conservation concerns over the past five years have led to record low landings and (in some years and management areas) unprecedented closures of the commercial fishery. In 2006, the failure of Klamath River fall Chinook salmon to meet its escapement floor¹ for the third consecutive year resulted in closure of the commercial salmon fishery in KMZ-CA and major restrictions elsewhere along the coast; landings in 2006 south of Cape Falcon fell to 14 percent of the 2001-2005 average. In 2008 and 2009, the commercial salmon fishery in California was closed statewide (the first time this had occurred in California history) and the Oregon fishery was significantly curtailed due to low escapement of Sacramento River fall Chinook. In 2010, the California commercial fishery reopened, but continuing concerns about Sacramento River fall Chinook salmon prompted restrictive regulations in both California and Oregon. The drastic fishery restrictions associated with the conservation concerns led to the provision of disaster relief for salmon-dependent fishing communities, as described in Chapter 1.

3.15.3.3 Recreation

The area of analysis for recreation includes Curry, Jackson and Klamath Counties in Oregon and Del Norte, Humboldt, and Siskiyou Counties in California. The Klamath Basin offers a myriad of outdoor recreational opportunities. Section 3.20, Recreation, describes recreation activities within the Basin. Recreation is an important asset to the regional economy because it attracts visitors from outside the region that spend money and generate economic activity locally. Recreation expenditures and economic activity generally increase with visitation levels. If recreational opportunities are adversely affected, recreational expenditures may decrease and affect the local economy, unless recreational participants engage in substitute or alternative opportunities in the region. This section describes how existing recreational activities within the Klamath Basin contribute to the regional economy. The affected area for potential economic effects associated with recreation depends on the recreation activity. The following sections identify the potentially affected area for each activity.

Reservoir

In the area of analysis, economic effects could occur to reservoir-based recreation at J.C. Boyle, Copco 1, and Iron Gate Reservoirs in Klamath and Siskiyou Counties. Copco 2 Reservoir does not generate significant recreation activity. Table 3.15-1 summarizes the 2009 regional economy for Siskiyou and Klamath Counties. Employment, labor income, and output related to reservoir recreation are reflected in the services and trade sectors in the table. Section 3.20.3 describes existing recreation opportunities and existing use at the reservoirs. Visitors go to the reservoir areas for overnight and day uses, and activities generally include sightseeing, camping, boating, fishing, picnicking and hiking.

¹ Escapement floor is set by the PFMC as the minimum number of salmonids that are not harvested in ocean and in river fisheries and return to the river for spawning.

Reservoir-based recreation attracts visitors from outside the region; these visitors spend money at local stores, gas stations, and other businesses, contributing to the local economy.

Ocean Sport Fishing

The ocean sport fishing information provided here is taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011h). The area of analysis for ocean sport fishing includes Curry County, Oregon and Del Norte and Humboldt Counties in California. Klamath River fall Chinook salmon is harvested in sport as well as commercial fisheries. About 91 percent of the increase in angler expenditures attributable to the project alternatives occurs in the KMZ-CA and KMZ-OR management areas; therefore, these two areas are the focus of this ocean sport fishing analysis. Tables 3.15-4 and 3.15-5 summarize the 2009 regional economy in those areas. Employment, labor income, and output related to ocean sport fishing are reflected in the services sectors in the tables.

While recreational fishery regulations such as closed seasons are generally more stringent in the KMZ, they may also become more constraining in other management areas south of Cape Falcon when Klamath River fall Chinook salmon is at low levels of abundance. Tables 3.15-10 and 3.15-11 summarize recreational effort (angler days) and landings in the KMZ and other management areas south of Cape Falcon. Effort and landings in all areas have generally declined from the 1980s to the 1990s. Factors contributing to this decline include more conservative management policies to protect weak stocks (including two Chinook salmon and three coho salmon stocks listed under the ESA), and a 1993 opinion by the Department of the Interior Solicitor reserving 50 percent of Klamath-Trinity River salmon for the Yurok Tribe and Hoopa Valley Tribe. Effort and landings rebounded during 2001-2005. However, regulation of the recreational fishery has been unusually restrictive over the past five years, due to the failure of Klamath River fall Chinook salmon to meet its conservation objective during 2004-2006 and failure of Sacramento River fall Chinook salmon to meet its conservation objective during 2007-2009. The restrictions triggered by Sacramento River fall Chinook salmon concerns were particularly stringent, including near-closure of the California fishery in 2008-2009 and additional restrictions in Oregon as well.

Table 3.15-10. Ocean Sport Salmon Effort (# angler days) during 1981-2010, by Management Area

Year(s)	Management Area							Total
	Monterey	San Francisco	Fort Bragg	KMZ-CA	KMZ-OR	Central OR	North OR	
81-85 Avg	12,220	78,920	9,560	46,260	56,260	63,720	87,560	354,500
86-90 Avg	49,180	98,580	15,420	77,500	58,380	61,360	103,640	464,060
91-95 Avg	71,240	92,800	20,360	29,100	22,720	25,960	38,520	300,700
96-00 Avg	63,020	94,000	19,140	18,540	18,360	8,260	13,480	234,800
01-05 Avg	47,340	83,560	28,220	21,000	18,300	34,520	48,760	281,700
06-10 Avg	14,320	24,700	9,040	9,300	7,720	14,120	32,660	111,860
2001	38,100	71,500	30,800	24,700	26,100	31,100	40,100	262,400
2002	67,900	88,800	31,800	21,600	19,700	33,400	42,400	305,600
2003	28,500	66,600	23,700	15,800	14,800	42,900	67,500	259,800
2004	56,500	106,100	30,500	25,600	18,300	40,500	68,300	345,800
2005	45,700	84,800	24,300	17,300	12,600	24,700	25,500	234,900
2006	27,700	61,300	21,000	16,400	10,700	17,200	26,300	180,600
2007	25,200	43,100	17,100	20,500	11,100	22,900	41,900	181,800
2008	0	0	400	0	4,800	7,400	14,600	27,200
2009	0	0	0	5,400	6,000	14,400	52,000	77,800
2010	18,700	19,100	6,700	4,200	6,000	8,700	28,500	91,900

Sources: PFMC as cited in Reclamation 2011, NOAA Fisheries Service 2011h. 2010 data are preliminary.

Table 3.15-11. Ocean Sport Chinook Salmon and Coho Salmon Landings (# fish) during 1981-2010, by Management Area

Year(s)	Management Area							Total
	Monterey	San Francisco	Fort Bragg	KMZ-CA	KMZ-OR	Central OR	North OR	
81-85 Avg	6,720	86,800	4,380	34,680	28,460	60,420	70,620	292,080
86-90 Avg	30,400	99,960	10,800	65,680	37,660	74,080	112,860	431,440
91-95 Avg	58,260	93,460	18,620	21,060	10,840	37,840	44,140	284,220
96-00 Avg	52,345	82,804	14,414	8,631	6,178	3,961	5,913	174,246
01-05 Avg	31,408	77,653	24,008	15,885	7,349	27,255	45,485	229,043
06-10 Avg	4,809	15,719	4,378	7,479	2,356	7,655	23,316	65,712
2001	20,256	40,345	26,501	13,010	7,277	28,849	43,613	179,851
2002	47,729	87,308	31,409	16,426	10,042	24,817	32,001	249,732
2003	13,286	56,823	16,289	8,889	5,499	39,125	77,588	217,499
2004	44,863	130,690	23,581	23,404	8,112	30,880	64,595	326,125
2005	30,905	73,097	22,259	17,695	5,817	12,606	9,627	172,006
2006	11,308	55,598	14,368	16,644	2,473	8,783	9,989	119,163
2007	6,381	17,000	5,772	19,297	4,619	14,150	29,834	97,053
2008	0	0	6	0	2,414	3,738	4,503	10,661
2009	0	0	0	680	1,392	9,979	59,417	71,468
2010	6,356	5,995	1,743	774	884	1,623	12,835	30,210

Sources: PFMC as cited in Reclamation 2011, NOAA Fisheries Service 2011h. 2010 data are preliminary.

Angler trips occur on both private and charter vessels. Charter vessels are typically run by local companies that advertise and sell fishing trips to visitors or residents. Private vessels are privately owned boats and owners do not sell trips. The majority of trips from all ports are on private vessels. From 2001 to 2010, trips on charter vessels averaged 25 percent of total salmon angler trips south of Cape Falcon, 7 percent in the KMZ-CA (excluding 2008, when the KMZ-CA was closed), and 3 percent in the KMZ-OR.

In-River Sport Fishing

The in-river sport fishing information provided here is taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011g). In-river Chinook salmon fishing on the Klamath River occurs in Siskiyou, Humboldt, and Del Norte Counties in California. Under the project alternatives, Chinook salmon would be reintroduced in the Upper Basin (Klamath County, Oregon). Table 3.15-12 summarizes the combined regional economy for these four counties. Employment, labor income, and output related to fishing are reflected in the services and trade sectors in the table.

Table 3.20-12 provides recent harvest and effort data for the Klamath River Chinook salmon fishery downstream of Iron Gate Dam. Angler days averaged about 23,809 per year during 2001-2005 and 16,792 during 2006-2010.

Table 3.15-12. Summary of the Regional Economy for Del Norte, Humboldt and Siskiyou Counties in California and Klamath County, OR

Industry sector	Employment ¹		Labor income ²		Output ³	
	Jobs	Percent of total	\$ million	Percent of total	\$ million	Percent of total
Agriculture	5,713	4.77	219.03	4.46	910.68	7.29
Mining	127	0.11	5.58	0.11	23.06	0.18
Construction	5,845	4.88	282.12	5.74	707.41	5.66
Manufacturing	5,086	4.24	261.96	5.33	1,501.95	12.02
TIPU	3,887	3.24	215.09	4.38	759.63	6.08
Trade	17,471	14.58	601.06	12.24	1,232.50	9.86
Service	53,659	44.78	1,835.74	37.38	5,459.12	43.68
Government	28,049	23.41	1,490.23	30.35	1,904.47	15.24
Total	119,837		4,910.81		12,498.82	

Source: Reclamation 2011.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Another popular Klamath River recreational fishery is the steelhead fishery, which also occurs in Siskiyou, Humboldt and Del Norte Counties. Analysis of data from steelhead

report cards collected by the California Department of Fish and Game suggest that approximately 17,155 angler trips occurred annually on the Klamath River during 2003-2008 (Table 3.20-13). This should be interpreted as a conservative estimate of effort, as the report card requirement extends only to steelhead greater than 16 inches and thus provides limited coverage of the half-pounder fishery.

A trophy fishery for redband trout occurs in Klamath County in Upper Klamath Lake, lower Williamson River, Wood River, and the Keno Reach of the Klamath River. According to results of a statistical creel survey conducted by Oregon Department of Fish and Wildlife, about 15,191 angler trips (6,109 bank trips, 9,082 boat trips) occurred in Upper Klamath Lake and Agency Lake during March 18-September 30, 2009 . This estimate should be viewed as conservative, as the creel survey did not cover an entire year of lake fishing and did not include angler effort in the tributaries above Upper Klamath Lake or the mainstem Klamath River below Keno Dam.

Whitewater Boating

The affected region for whitewater boating on the Upper Klamath and Lower Klamath River reaches includes Jackson, Klamath, Siskiyou, and Humboldt Counties. Jackson County, which includes the urban Medford area, contributes substantially to the regional economy for whitewater boating. Many commercial outfitters are based in Jackson County. The Upper Klamath River is defined as the section of the Klamath River upstream of Iron Gate Dam and the Lower Klamath River starts downstream of the Iron Gate Dam. Table 3.15-13 summarizes the 2009 economy in the four-county region. Employment, labor income, and output related to whitewater boating are reflected in services and trade sectors in the table.

Table 3.15-13. Summary of the 2009 Regional Economy for Klamath, Jackson, Humboldt, and Siskiyou Counties

Industry Sector	Employment ¹		Labor Income ²		Output ³	
	Jobs	Percent of Total	\$ (million)	Percent of Total	\$ (million)	Percent of Total
Agriculture	8,337	3.7	306.8	3.5	1,078.2	4.6
Mining	324.7	0.1	12.5	0.1	54.8	0.2
Construction	16,545	7.4	632.9	7.3	1,782.0	7.6
Manufacturing	10,604	4.7	540.8	6.2	3,225.9	13.8
TIPU	7,746	3.4	411.9	4.7	1,400.3	6.0
Trade	37,272	16.6	1,187.9	13.7	2,591.3	11.1
Service	108,382	48.2	3,642.6	42.0	10,690.4	45.8
Government	35,456	15.8	1,946.5	22.4	2,507.6	10.7
Total	224,667	--	8,681.9	--	23,330.5	--

Source: Reclamation 2011.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Section 3.20, Recreation, describes whitewater boating activities on the Klamath River, including annual estimates for number of visitors. Many visitors are from San Francisco Bay Area, southern California, northern Oregon, and other parts of the western U.S. (PacifiCorp 2004). Boating trips can be one- or multi-day trips and typically run from May through October. Multiple outfitters in the region organize and guide boating trips. Tables 3.15-14 and 3.15-15 provide an estimate of commercially guided whitewater boating trips on the Upper and Lower Klamath River, respectively. The estimate of commercially guided trips is based on Bureau of Land Management and United States Forest Service trip card data files (2010). Trip cards are required to be submitted by permitted commercial outfitters when they provide a guided whitewater boating trip on the Klamath River. The whitewater boating outfitters provide jobs to people living in the region.

Table 3.15-14. Commercially Guided Whitewater Boating Trips on Upper Klamath River from 2001 to 2009

Year	Trip Length in Days				Total
	1 Day	2 Days	3 Days	4 Days	
2001	274	17	5	0	296
2002	283	20	2	0	305
2003	248	20	1	1	270
2004	306	31	2	0	339
2005	317	27	0	0	344
2006	243	27	4	0	274
2007	276	28	1	0	305
2008	248	20	1	0	269
2009	220	7	1	0	228
Total	2,415	197	17	1	2,630

Source: Bureau of Land Management 2010, United States Forest Service 2010 as cited in United States Department of the Interior (DOI) 2011b

Table 3.15-15. Commercially Guided Whitewater Boating Trips on Lower Klamath River from 2000 to 2009

Year	Trip Length in Days									Total
	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days	7 Days	8 Days	9 Days	
2000	254	48	80	13	7	1	1	0	0	404
2001	309	68	68	28	3	1	0	0	0	477
2002	242	49	68	10	6	1	1	0	0	377
2003	301	55	57	21	6	1	2	0	0	443
2004	224	47	55	13	6	1	0	1	1	348
2005	366	48	58	15	5	0	0	0	0	492
2006	230	33	44	8	1	2	0	0	0	318
2007	255	47	45	12	1	0	1	3	0	364
2008	237	26	38	18	2	0	0	0	0	321
2009	235	27	44	11	4	1	1	0	0	323
Total	2,653	448	557	149	41	8	6	4	1	3,867

Source: Bureau of Land Management 2010, United States Forest Service 2010 as cited in DOI 2011b

Table 3.15-16 provides an estimate of whitewater boating user days for the Klamath River from 1994 through 2009. A user day is defined as one user engaging in whitewater boating for any part of a day. For example, three people taking a two day whitewater boating trip would equate to six user days (3 users x 2 days: 6 user days). Analysis of data presented in PacifiCorp (2004) show that on average an estimated 93 percent of the total user days for the Upper Klamath are associated with commercial use and 70 percent of total user days for the Lower Klamath are associated with commercial use. These percentages were applied to the estimates of commercial use from 2001 through 2009 to derive estimates of total and private use over this same time period.

Table 3.15-16. Whitewater Boating User Days on the Klamath River from 1994 to 2009

Year	Upper Klamath River			Lower Klamath River			Klamath River		
	Commercial	Private	Total	Commercial	Private	Total	Commercial	Private	Total
1994	4,471	735	5,206	8,491	3,639	12,130	12,962	4,374	17,336
1995	5,763	602	6,365	12,203	5,230	17,433	17,966	5,832	23,798
1996	5,963	244	6,207	10,280	4,406	14,686	16,243	4,650	20,893
1997	5,509	317	5,826	10,529	4,512	15,041	16,038	4,829	20,867
1998	4,081	314	4,395	11,298	4,842	16,140	15,379	5,156	20,535
1999	4,614	283	4,897	11,885	5,094	16,979	16,499	5,377	21,876
2000	5,100	269	5,369	10,449	4,478	14,927	15,549	4,747	20,296
2001	3,290	243	3,533	10,744	4,605	15,349	14,034	4,848	18,882
2002	3,369	249	3,618	9,783	4,193	13,976	13,152	4,442	17,594
2003	3,075	228	3,303	11,143	4,776	15,919	14,218	5,003	19,221
2004	3,800	281	4,081	9,708	4,161	13,869	13,508	4,442	17,950
2005	3,638	269	3,907	10,695	4,584	15,279	14,333	4,853	19,186
2006	3,714	275	3,989	8,226	3,525	11,751	11,940	3,800	15,740
2007	3,505	259	3,764	8,879	3,805	12,684	12,384	4,065	16,449
2008	3,335	247	3,582	8,643	3,704	12,347	11,978	3,951	15,929
2009	2,405	178	2,583	8,230	3,527	11,757	10,635	3,705	14,340
Average (1994-2009)	4,102	312	4,414	10,074	4,317	14,392	14,176	4,630	18,806

Source: PacifiCorp 2004 for the Upper Klamath for 1994 to 2000 (based on figures reported in Table 2.7-41) and Payne 2009 Lower Klamath for 1994 to 1999 as cited in DOI 2011b

3.15.3.4 Indian Tribes

Section 3.16, Environmental Justice, presents demographic and socioeconomic conditions for Indian Tribes in the Klamath Basin. Five of the six federally recognized tribes in the Klamath Basin are potentially affected by the project alternatives. Table 3.15-17 summarizes income, poverty, and unemployment statistics for those tribes. The table and all other tribal information provided here are taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011b-f).

For the tribes of the Klamath Basin, fish are integral to a world view that emphasizes interconnectedness, balance, and mutual respect as guiding principles. The diversity, abundance, distribution, run timing and health of fish are important indicators of how well such balance is being maintained. The seasonal round of harvest provides sustained access to food that is synchronous with the cycles of nature. Fish are honored in rituals such as the First Salmon Ceremony and (for the Klamath Tribes) the Return of the C’waam, which traditionally precede the commencement of fishing for spring Chinook salmon and suckers respectively. Fishing itself is a social and cultural activity – an opportunity to meet with family and friends; to engage in traditional fishing practices; to strengthen community bonds, demonstrate respect and promote food security by sharing fish with elders and others who are unable to fish; and to transmit these traditions to the next generation. Trade and barter occur both within and between tribes as a means of increasing access to fish and other valued goods, and cementing social relationships.

Table 3.15-17. Income, Poverty and Unemployment for Affected Federally Recognized Tribes

Tribes	1999 Median Personal Income (dollars)¹	1999 Individuals below Poverty Level (percent)¹	2005 Unemployment Rate (percent)²
The Klamath Tribes	8,646	40.4	21
Karuk Tribe	4,938	53.9	63
Hoopa Valley Indian Reservation	9,757	34.4	40
Yurok Reservation	6,839	39.7	74
Resighini Rancheria	6,925	NA	60

Based on the following sources, as cited in Reclamation 2011 and NOAA Fisheries Service 2011b-f:

- 1 - U.S. Census Bureau 2000. Income and poverty statistics based on available data as follows: Indians residing in Chiloquin, Oregon used to represent The Klamath Tribes; Resighini Rancheria residents (whether Indian or not) used to represent Resighini Rancheria members; Indians residing on the Karuk, Hoopa Valley and Yurok Indian Reservations used to represent members of the Karuk, Hoopa Valley, and Yurok Indian Tribes respectively.
- 2 - Bureau of Indian Affairs 2005. The unemployment rates provided by the Bureau of Indian Affairs (BIA) pertain to the percentage of adults who are available for work but unemployed, regardless of whether or not they have recently looked for work. These rates differ from and are therefore not comparable to the unemployment rates estimated by the Bureau of Labor Statistics for the general population.

Note: Quartz Valley is not included in the table because the project alternatives would have no direct effects on Quartz Valley and that tribe is not claiming any effects (positive or negative).

Table 3.15-18 summarizes harvests since 1981 by the Yurok Tribe and Hoopa Valley Tribe for commercial, subsistence and ceremonial purposes. The average harvest in the 1990s was much lower than the 1980s and 2000s. Annual harvests over the last decade were lowest in 2005 and 2006 and highest in 2001. For these two tribes, harvest opportunities over the last few decades are much lower than they were historically.

Table 3.15-18. Yurok and Hoopa Valley Reservation Indian Tribes Gillnet Chinook Salmon Spring and Fall Run Harvest (# fish) from 1981 to 2010.

Year	Klamath River	Trinity River	Total
1981–1990 Average	26,466	4,527	30,992
1991–2000 Average	17,130	3,200	20,905
2001	49,460	9,224	58,684
2002	35,508	4,328	39,836
2003	33,973	5,170	39,143
2004	30,938	3,715	34,653
2005	5,754	4,295	12,277
2006	9,111	5,996	15,107
2007	29,790	3,653	33,443
2008	22,869	3,471	26,340
2009	26,040	6,087	32,127
2010 ¹	26,620	5,814	32,434
2001-2010 Average	27,006	5,175	32,404

Sources: PFMC as cited in Reclamation 2011, NOAA Fisheries Service 2011b, 2011f

Notes:

1. 2010 data are preliminary

For other tribes in the Klamath Basin (who fish for subsistence and ceremonial purposes), harvest opportunities for salmonids and other fish have declined to lower levels than those experienced by the Yurok and Hoopa Valley Tribes. For The Klamath Tribes, despite the Treaty of 1864 which reserved fishing rights, their anadromous fisheries were eliminated in 1917 when Copco 1 Dam was constructed without fish ladders. Two other fisheries that had sustained the Tribes were eliminated in 1986 when the Klamath Tribes closed their fisheries for c’wam (Lost River sucker) and qapdo (shortnose sucker) to prevent extinction; both fish were listed as Endangered in 1988. For the Karuk Tribe, current harvest opportunities are limited to a short season at Ishi Pishi Falls. Members of the Resighini Rancheria historically fished and continue to attach cultural and subsistence value to fishing, although their current fishing opportunities are minimal. Section 3.12, Tribal Trust, describes the cultural role of fisheries for the tribes.

3.15.3.5 PacifiCorp Hydroelectric Service

PacifiCorp operates and maintains hydroelectric power plants at the Four Facilities. Operation and maintenance of the facilities provides employment and incomes in Siskiyou and Klamath Counties.

PacifiCorp provides electricity to about 1.7 million customers in six western states, including residential and commercial customers in southern Oregon and northern California (PacifiCorp 2004). Section 3.18, Public Health and Safety, Utilities and Public Services, Solid Waste, and Power, further describes PacifiCorp hydroelectric facilities

and service. PacifiCorp is subject to regulations established by utility authorities in each state, which influences operations, customer rates, and cost recovery. PacifiCorp sets customer rates based on multiple factors, including energy prices, future demands, resource adequacy, overhead costs, and long-term investments. PacifiCorp uses customer rates to recover a portion of operating and investment costs. If expenditures are not directly offset by any associated project revenues or cost reductions, the utility's rates increase, subject to regulatory approvals.

3.15.3.6 Real Estate, Property Tax and Other County Revenues

Establishment of the Copco Dams in the early 1900's and the Iron Gate Dam in the 1960's created reservoirs behind the dams. The reservoirs were opened to the general public and are used for recreational purposes. These recreational uses over time have led to light residential development of some of the privately held real estate surrounding the reservoirs.

At Iron Gate Reservoir, the majority of the land around the reservoir is held by PacifiCorp, and much of the area along the shoreline is designated for recreation use. Private parties do not own any properties that front the reservoir. Iron Gate Lake Estates has five units that have full or partial views of the reservoir. Some parcels outside of Iron Gate Lake Estates have partial views of the reservoir.

Some parcels have views of Copco 1 and Copco 2 Reservoirs. Most of these sites are along the southern shore of the reservoir along Patricia Avenue and Ager Beswick Road. Of the properties that front the reservoir, a few properties have relatively level sites, but most are elevated from the lakeshore water level and have steep terrain to access the reservoir. Properties across the roads have obstructed views due to terrain and heavy tree cover. Where the Klamath River enters Copco Reservoir, some parcels front the river along Copco Road and have views of the river.

PacifiCorp owns all land surrounding J.C. Boyle Reservoir in Klamath County; this land is zoned as rural industrial. Land outside of PacifiCorp's ownership boundary is zoned as forestry with some public lands. Figure 3.14-4 in Section 3.14, Land Use, Agricultural and Forest Resources, shows land ownership around J.C. Boyle Reservoir. There are no private properties with views of the reservoir; therefore, private property land values at J.C. Boyle Reservoir would not be affected by the Proposed Action and alternatives, and are not further analyzed.

Siskiyou and Klamath Counties' receive tax revenues from multiple tax accounts, including property taxes paid by PacifiCorp and landowners, and sales and use tax. The counties use tax receipts for the general fund, which funds many county programs, such as health, education, public assistance, fire and emergency services, and recreation. Taxes are generated through multiple tax accounts.

Siskiyou County provided tax revenue data to the Lead Agencies. Table 3.15-19 summarizes Siskiyou County revenues from tax accounts over a 10-year period, which accounts for normal market fluctuations. On average, from 2000 to 2010, Siskiyou

County received a majority of the total Siskiyou County revenue from property tax and sales and use tax. The remaining accounts provided 0.1 to 3.4 percent of county revenue, on average.

Table 3.15-19. Siskiyou County Average Tax Revenues from 2000 to 2010

Account Description ¹	2000–2010 Annual Average	
	Revenues	Percentage of Total Revenue
Property Taxes		
Prior Secured	\$532,851	3.4%
Prior Supplemental	\$19,963	0.1%
Prior Unsecured	\$10,529	0.1%
Secured	\$8,745,403	53.0%
Current Unsecured	\$535,829	3.3%
Supplemental	\$333,962	2.0%
Property Transfer Tax	\$198,111	1.2%
Race Horse Tax	\$167	0.0%
Sales & Use Tax	\$4,757,226	29.7%
Hotel – Motel Tax	\$438,865	2.7%
Local Transportation	\$276,582	1.7%
Timber Yield	\$391,581	2.5%
Triple Flip	\$207,857	1.1%

Source: Siskiyou County 2011a

Notes

1- Property taxes include the following accounts: secured, current unsecured, supplemental, prior secured, prior unsecured, and prior supplemental

PacifiCorp pays property taxes to Siskiyou County on land owned at the Klamath Hydroelectric Project facilities. Siskiyou County received an average of \$1.4 million from PacifiCorp property taxes annually (Table 3.15-20) over 2000 to 2010. In 2008 and 2009, PacifiCorp indicated that \$305,000 and \$290,000 of property taxes were associated with hydroelectric facilities (PacifiCorp 2009). The variation in tax payments indicated between years in table 3.15-20 was driven by an increase in investment in operating property in Siskiyou County, which has lead to an increase in assessment on property subject to tax.

Table 3.15-20. Siskiyou County Annual Tax Amount Received from PacifiCorp from 2000 to 2011

Tax Year	Tax Amount
2000-2001	\$1,257,537
2001-2002	\$1,187,891
2002-2003	\$1,180,011
2003-2004	\$1,178,678
2004-2005	\$1,184,970
2005-2006	\$1,210,490
2006-2007	\$1,285,173
2007-2008	\$1,513,189
2008-2009	\$1,637,105
2009-2010	\$1,798,210
2010-2011 ¹	\$1,746,074

Source: *Siskiyou County 2011b*

Notes

1. Includes 2nd installment which County will receive in April 2011

In fiscal year 2009–2010, Siskiyou County dispersed property taxes to the following: schools (68.04 percent), county (21.33 percent), cities (6.03 percent), and special districts (4.60 percent). Special districts include cemetery, fire, recreation, community service, flood control, county service, and sanitary districts. Of the 6.03 percent that went to cities, Yreka received 2.2 percent, Mt. Shasta received 1.2 percent, Weed received 0.9 percent, Dunsuir received 0.6 percent, and the remaining cities all received less than 0.35 percent (Siskiyou County 2010).

In 2008, property taxes levied in Klamath County were about \$57.2 million. The majority of taxes were from residential ownership (\$28.5 million). Utilities contributed about 14.7 percent to total property taxes, about \$8.4 million in 2008 (Klamath County Assessor 2008). PacifiCorp pays property taxes to Klamath County on land owned at the Klamath Hydroelectric Project facilities. In 2010-2011, Klamath County anticipates to receive about \$519,000 in property tax revenues from PacifiCorp (Turner 2011).

In Klamath County, property taxes are used to finance local governments, such as cities, school districts, fire districts, park districts, vector control districts, road districts, cemetery districts, sanitary districts, and special districts.

Klamath and Siskiyou Counties also receive funding from Federal sources. The counties received Recovery Act funds to stimulate spending during the economic recession. As of February 2011, Siskiyou County received \$63.5 million and Klamath County received \$55.9 million (Recovery.Gov 2011). Appendix O includes a summary of Recovery Act funds.

3.15.3.7 Irrigated Agriculture

Reclamation’s Klamath Project delivers water to approximately 200,000 farmland acres and 35,000 wetland acres in Klamath, Siskiyou, and Modoc Counties, primarily along the California-Oregon border. Table 3.15-21 provides a summary of the regional economy in Klamath County, Oregon and Siskiyou and Modoc Counties, California. The agricultural sector was 7.3 percent of total regional employment, 6.0 percent of the regional labor income and 10.2 percent of output.

Table 3.15-21. Summary of the 2009 Regional Economy for Klamath, Modoc, and Siskiyou Counties

Industry Sector	Employment ¹		Labor Income ²		Output ³	
	Jobs	Percent of Total	\$ (million)	Percent of Total	\$ (million)	Percent of Total
Agriculture	3,803	7.3	124.2	6.0	560.9	10.2
Mining	85	0.2	3.3	0.2	16.1	0.3
Construction	2,358	4.5	99.3	4.8	265.5	4.8
Manufacturing	2,629	5.0	135.9	6.5	706.1	12.8
TIPU	2,122	4.1	118.1	5.7	426.3	7.8
Trade	7,272	13.9	237.7	11.4	491.6	8.9
Service	22,421	43.0	752.2	36.1	2,245.1	40.8
Government	11,452	22.0	611.8	29.4	785.7	14.3
Total	52,142	--	2,082.5	--	5,497.3	--

Source: Reclamation 2011.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

Table 3.15-22 summarizes crops grown and acreages in Reclamation’s Klamath Project. Alfalfa, pasture, and wheat have the most irrigated acreage.

Table 3.15-22. Crop Acreage Summary for Irrigated Agriculture in Reclamation's Klamath Project Lands (acres)

Crops	2005	2006	2007	2008	2009	Average
Small Grains						
Feed Barley	10,962	13,674	14,083	11,827	8,430	11,795
Malt Barley	0	278	0	4,389	3,513	1,636
Wheat						
Wheat	31,716	24,163	22,172	27,290	31,563	27,381
Oats	2,679	3,334	2,947	2,774	2,809	2,909
Other Cereals	1,006	617	600	247	834	661
Corn	0	12	42	7	5	13
Alfalfa						
Alfalfa	55,197	61,619	65,851	63,701	61,336	61,541
Other Hay	21,032	18,968	17,082	15,710	15,918	17,742
Silage	875	1,000	0	150	400	485
Irrigated Pasture						
Irrigated Pasture	40,046	42,880	43,409	44,846	44,564	43,149
Other Forage	0	93	145	0	0	48
Potatoes						
Chip Potatoes	7,450	5,890	2,640	2,430	6,688	5,020
Fresh Potatoes	3,727	9,549	8,941	9,556	5,951	7,545
Potato Seed	250	430	280	140	150	250
Onions						
Onions	2,863	3,239	3,618	3,441	3,533	3,339
Peppermint	2,394	2,922	2,846	2,682	3,200	2,809
Horseradish	913	734	810	436	421	663
Strawberry	413	259	176	536	505	378
Other	72	423	591	345	258	338
Fallow	11,711	5,949	7,746	6,500	4,962	7,374
Total	193,306	196,033	193,979	197,007	195,040	195,073

Source: Reclamation 2011b.

For analysis purposes, crops in Table 3.15-22 are aggregated based on the availability of data on crop prices, production costs, and yields and each group is assigned a representative crop. Table 3.15-23 shows prices of the representative crops. Prices vary annually based on market conditions.

Table 3.15-24 shows gross farm revenues, based on crop yields and prices. Alfalfa had the highest gross revenue of the crops, likely a result of the consistently high percentage of the land base dedicated to the crop and the relatively high price of alfalfa per ton. Potatoes and onions also had high gross revenues related to other crops. The onions group, as shown in Table 3.15-22, contains a number of other vegetables and specialty crops that have had increasing amounts of acreage in past years.

Table 3.15-23. Representative Crop Prices from 2005 to 2009

Year	Small Grains	Wheat	Irrigated Pasture	Potato	Onions	Alfalfa
	\$/Ton	\$/Ton	\$/AUM	\$/Ton	\$/Ton	\$/Ton
2005	82.00	103.47	14.50	159.89	99.00	128.94
2006	120.00	136.06	15.40	99.43	99.00	135.00
2007	164.99	272.00	16.50	129.36	110.00	140.00
2008	300.02	225.00	16.50	155.96	126.00	200.00
2009	300.02	200.24	17.80	127.57	128.60	154.71
Average	193.41	187.35	16.14	134.44	112.52	151.73

Sources: Reclamation 2011b.

Key:

AUM: annual unit month

Table 3.15-24. Average Gross Farm Revenue Generated on Reclamation’s Klamath Project Lands from 2005 to 2009

Representative Crop	Gross Revenue (\$1,000)	Gross Revenue per Acre (\$/acre) ¹
Alfalfa Hay	\$58,769.60	\$736.76
Irrigated Pasture	\$6,996.10	\$161.96
Onions	\$21,108.20	\$2,804.33
Potato	\$39,910.10	\$3,114.33
Small Grain	\$4,706.10	\$350.39
Wheat	\$17,119.20	\$552.87
Total Gross Revenue	\$148,609.40	--

Source: Klamath Basin Hydro-Economic Model (KB_HEM) , as cited in Reclamation 2011b

1 – Gross revenue per acre based on average acreages in Table 3.15-22

3.15.3.8 Refuge Recreation

Reclamation’s Klamath Project provides water supply to the Tule Lake National Wildlife Refuge (NWR) and Lower Klamath NWR. The refuges attract visitors to Klamath and Siskiyou Counties for hunting and wildlife viewing. Table 3.15-1 presents a summary of regional economy in Klamath and Siskiyou Counties. Employment, labor income, and output related to refuge recreation are reflected in services and trade sectors in the table. In 2009, the two refuges reported a combined total of 96,300 wildlife watching visits and 10,526 hunting visits. In general, visitation to the refuges has been declining over the past decade.

3.15.4 Environmental Consequences

For purposes of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR), economic or social effects must be discussed if they are inter-related to the natural or physical environmental effects of a project. Since economic effects of the project are related to physical environmental effects, a National Environmental Policy

Act (NEPA) economic analysis is required. However, NEPA does not require that economic effects be judged for significance. The California Environmental Quality Act (CEQA) does not consider economic or social changes resulting from a project as adverse effects on the environment. If a physical change in the environment is caused by economic or social effects, the physical change may be regarded as an adverse effect. Physical effects of the project alternatives are evaluated separately and do not require economic analysis; therefore, CEQA analysis and associated significance criteria are not required. The following sections describe analysis methods and potential economic effects of the project alternatives.

3.15.4.1 Effects Determination Methods

The modeling package used to assess the regional economic impacts from the expenditures associated with each alternative was IMPLAN (IMpact analysis for PLANning). IMPLAN is an economic input-output modeling system that estimates the effects of economic changes in a defined analysis area.

IMPLAN is a static model that estimates impacts for a snapshot in time when the impacts are expected to occur, based on the makeup of the economy at the time of the underlying IMPLAN data (2009 data is used for this analysis). IMPLAN measures the initial impact to the economy but does not consider long-term adjustments as labor and capital move into alternative uses. This approach is used to compare the alternatives. Realistically, the structure of the economy will adapt and change; therefore, the IMPLAN results can only be used to compare relative changes between the No Action/No Project Alternative and the action alternatives and cannot be used to predict or forecast future employment, labor income, or output (sales).

Input-output models measure commodity flows from producers to intermediate and final consumers. Purchases for final use (final demand), or direct effects, are inputs into the model and drive the results. Industries produce goods and services for final demand and purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakages from the analysis area (imports and value added) stop the cycle. These indirect and induced effects (the effects of household spending) can be mathematically derived using a set of multipliers. The multipliers describe the change in output for each regional industry caused by a 1-dollar change in final demand. Multipliers are built into IMPLAN.

This analysis used 2009 IMPLAN data for the counties which encompass the economic regions. IMPLAN data files for the analysis area are compiled from a variety of sources including, but not limited to, the U.S. Bureau of Economic Analysis (BOE), the U.S. Bureau of Labor (BOL), and the U.S. Census Bureau.

Methods and assumptions for the regional impact analysis are further described in Reclamation 2011. The following sections identify specific technical reports as relevant. This section presents the total economic effects of the project alternatives. Total effects are equal to the sum of direct, indirect, and induced effects, described above.

Regional economic total effects are presented in terms of employment, labor income, and output. IMPLAN defines these parameters as follows:

- Employment – Number of jobs, a job can be full-time, part-time, or temporary.
- Labor Income - All forms of employment income, including employee compensation (wages and benefits) and proprietor income.
- Output - Value of industry production. In IMPLAN these are annual production estimates for the year of the data set.

Using IMPLAN, this section presents quantified results for regional economic effects from changes in expenditures or revenues associated with:

- Dam decommissioning, operation and maintenance (O&M), mitigation
- Commercial fishing
- Reservoir recreation
- Ocean sport fishing
- In-river sport fishing
- Whitewater recreation
- Klamath Basin Restoration Agreement (KBRA) Fisheries, Water Resources and Tribal Programs
- Irrigated agriculture related to KBRA actions
- Refuge recreation related to KBRA actions

The KHSA Section 3.2.1(iii), signed by Secretary of the Interior Ken Salazar on February 18, 2010, directs the Secretary to undertake environmental review in support of the Secretarial Determination. All alternatives carried forward for further analysis in the EIS/EIR were analyzed using existing studies and other appropriate data as suggested in KHSA Section 3.2.1 (i), where such analysis met criteria in (40 CFR 1502.22 and 43 CFR 46.125) to incorporate available information. As part of developing the basis for the Secretarial Determination, the KHSA requires in Section 3.3.2 that the Secretary prepare a Detailed Plan, including the identification, qualifications, management, and oversight of a non-federal DRE, if any, that the Secretary may designate. KHSA Section 3.3.4.D requires that an estimate of costs be prepared as part of the Detailed Plan. The Detailed Plan analysis provides most of the information for the project description for Alternatives 2 and 3, and this information was used to analyze these two action alternatives. As described in KHSA Section 3.2.1(i), the FERC record is used to form the project description for Alternatives 4 and 5. Alternatives 4 and 5 were analyzed to ensure that the review of reasonable fish passage alternatives was comprehensive. In addition, at the time of developing a reasonable range of alternatives, the lead agencies recognized that the inclusion of Alternatives 4 and 5 would provide an assessment of the short- and long-term effects from a broader range of reasonable alternatives. Alternatives 4 and 5 are outside the authority of the Department of the Interior, the four facilities proposed for removal are privately owned structures, and there was no provision in the KHSA to include them in the Detailed Plan. The result is differing levels of available information

for alternatives carried forward in the EIS/EIR consistent with the elements of each action alternative.

Regional economic effects were quantified for the No Action/No Project Alternative, the Proposed Action, and the Partial Facilities Removal of Four Dams Alternative. These regional economic effects provide the broadest range of economic impacts expected from implementation of any of the alternatives and bookend the expected economic impact to the area of analysis. Once that information was developed, a comparative analysis of the Fish Passage at Four Dams Alternative and Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative provide the information required to evaluate the relative impacts of each action alternative within the identified range of economic effects.

Specific economic effects for construction and changes in commercial fishing, recreation, and irrigated agriculture were not individually quantified for Fish Passage at Four Dams Alternative and Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative. The missing data is relevant to reasonable foreseeable significant adverse human effects on the environment. However, that unavailable data is not essential to a reasoned choice among alternatives because potential impacts can be compared to the data developed for the No Action/No Project Alternative, the Proposed Action, and Partial Facilities Removal of Four Dams Alternative. The range of impacts anticipated for the two alternatives for which data is missing falls within the range of impacts analyzed and data developed for the remaining alternatives, though the ratio of expenditures to impacts might not have the same proportional effect across the various economic sectors. The comparative analysis required by NEPA is achieved using this qualitative method.

The socioeconomic section of the EIS/EIR addresses primarily regional economic impacts on employment, income and output that occur within the Klamath region and related ocean areas, as well as qualitative information related to tribal effects, real estate, property tax revenues, and PacifiCorp's customers' energy rates. However, changes in some resources may have effects that take the form of economic benefits and costs that may extend to individuals or entities outside and inside the regional impact area and are separate and distinct from the regional impacts considered in the EIS/EIR. For example, economic effects on hydropower resources (beyond just the rates PacifiCorp charges to individual in the region) are not evaluated as part of the regional analysis. In addition, the EIS/EIR does not include an evaluation of any non-use values held by individuals both within and outside the region. In the context of the Klamath Basin, non-use values accrue to members of the public who value Klamath Basin environmental restoration regardless of whether they consume Klamath River fish or visit the Basin. Both hydropower and non-use values - as well as other benefits and costs - are addressed in the Secretarial Determination Overview Report, a separate document from the EIS/EIR.

Four Facilities

Deconstruction of the dams would result in economic effects in Siskiyou and Klamath Counties. Deconstruction or construction activities would create jobs and generate additional economic activity within the region during the period of construction. Direct effects represent equipment rentals, purchase of materials, and payment for labor.

An important consideration in evaluating regional economic effects is how much money is spent within the region for construction supplies and equipment, and how many workers are employed that originate from the region. Costs for dam decommissioning were divided into expenditures that would be made inside and outside of Siskiyou and Klamath Counties. The expenditures assumed to be spent within the counties were used in IMPLAN to estimate employment, labor income, and output from dam decommissioning. Dam decommissioning expenditures made outside the analysis area would have no impact on the local economy.

Reclamation estimated total dam decommissioning costs and allocated the costs associated to within-region expenditures. Dam decommissioning costs assumed to be spent within the region are described in more detail in the Benefit Cost and Regional Economic Development (RED) Technical Report (Reclamation 2011a). The analysis assumed that the onsite construction workforce would be hired from within the region. Some workers would be brought into the region from outside areas. Money from out-of-region workers spent on goods and services within Siskiyou and Klamath Counties contributes to regional economy, while money that originates from in-region workers is much less likely to generate regional economic effects because spending from sources within the region represents a redistribution of income and output.

O&M expenditures made in the region would generate positive economic effects to the regional economy. Annual O&M expenditures for each alternative are summarized in the Benefit Cost and RED Technical Report (Reclamation 2011a). Based on estimates from Reclamation, it was assumed that 80 percent of the O&M expenditures would be made inside the two-county area. This analysis measures annual O&M effects after dam removal in the year 2020. Like the dam commissioning expenditures, in-region O&M expenditures associated were placed into relevant sectors of the economy and run through IMPLAN to estimate effects to the regional economy. This analysis does not quantify the positive effects resulting from periodic replacement costs. O&M effects would occur annually.

The in-region mitigation costs associated with the action alternatives were also analyzed in IMPLAN to estimate employment, labor income, and output effects in the regional economy. The costs associated with the major dam mitigation activities were allocated to within-region expenditures. Dam mitigation costs assumed to be spent within the region are described in more detail in the Benefit Cost and Regional Economic Development Technical Report (Reclamation 2011a). Like the dam decommissioning analysis, the onsite mitigation workforce would be hired from within Siskiyou and Klamath Counties. The regional economic effects associated with dam mitigation costs would be spread over the 2018-2025 period and would vary year-by-year proportionate to actual expenditures.

Commercial Fishing

The commercial fishing information is taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011a). The regional economic analysis evaluates effects from changes in commercial fishing in the area of analysis based on annual gross revenues projected under the project alternatives. Section 3.3, Aquatic Resources, evaluates effects to fish. Five of the seven management areas

account for 99 percent of total gross revenue attributable to Klamath River Chinook salmon abundance under the No Action/No Project Alternative and project alternatives. Thus the regional economic analysis focuses on those five areas: San Francisco, Fort Bragg, KMZ-CA, KMZ-OR, and Central Oregon.

The estimates of gross revenue used in this analysis are based on relative projections of Klamath River Chinook salmon harvest provided by the Evaluation of Dam Removal and Restoration of Anadromy (EDRRA) model (Hendrix 2011). The EDRRA model is a simulation model that provides 50-year projections of Klamath River Chinook salmon escapement and harvest under the alternatives. The EDRRA harvest projections pertain to Klamath River Chinook salmon and do not distinguish between spring and fall runs. Harvest is estimated for each simulated year on the basis of a new Klamath River fall Chinook salmon harvest control rule recommended by the Pacific Fishery Management Council (PFMC) to the NOAA Fisheries Service in June 2011. The model allocates total Klamath River Chinook salmon harvest among fisheries as follows: 50 percent to tribal fisheries, 7.5 percent to the in-river recreational fishery (up to a maximum of 25,000 fish – with any surplus above 25,000 allocated to escapement), 34 percent to the ocean commercial fishery, and 8.5 percent to the ocean recreational fishery. The 50/50 tribal/non-tribal split is a “hard” allocation specified by the United States Department of the Interior (DOI) (1993). The remaining allocations are “soft” allocations as they represent customary practice rather than mandatory conditions.

For the No Action/No Project Alternative, fishery conditions are characterized in terms of average annual troll harvest of Klamath River fall Chinook salmon during 2001-05. The years 2001-05 were selected as the base period for the following reasons: Klamath River fall Chinook salmon fell within a ‘normal’ range of abundance during those years, abundance of Sacramento River fall Chinook salmon (the other salmon stock targeted south of Cape Falcon) also fell within a ‘normal’ range, and constraints and policies that are likely to continue into the future (e.g., the PFMC’s weak stock management policy, consultation standards for ESA-listed salmonids, 50-50 tribal/non-tribal harvest allocation) were well established by that time. For the project alternatives, harvest is estimated on the basis of the 43 percent increase in troll harvest projected by the EDRRA model, scaled to average annual troll harvest of Klamath River fall Chinook salmon during 2001-2005.

The following steps were taken to estimate gross revenues and regional economic effects under the No Action/No Project Alternative and the project alternatives:

- Klamath River Chinook salmon harvest was expanded to account for total salmon harvest (all stocks) in the troll fishery due to the availability of Klamath River Chinook.
- Total salmon harvest (all stocks) was converted from numbers of fish to pounds dressed weight, using 2001-2005 data on average weight of troll-caught Chinook salmon (PFMC 2011).
- Total salmon harvest (all stocks) was converted from pounds to gross revenue, using 2004-2005 data on ex-vessel price per pound (PFMC 2011).

The analysis assumes that salmon troll revenues are spent in the management area where the landings occur. The gross revenue estimates by management area were used in IMPLAN to estimate employment, labor income, and output from commercial fishing.

Recreation

Depending on the recreation activity, visitors typically spend money on guide fees, food, hotels, restaurants, gasoline, equipment rentals, and/or other supplies required for outdoor activities. Any change to recreation opportunities that would result from implementation of the Proposed Action or alternatives would affect visitor spending and the region's economy. Increases in recreation spending would be considered a positive effect and decreases would be an adverse effect. This recreation economic impact analysis evaluates potential changes in direct visitor spending for recreation activities and subsequent, secondary economic effects. Estimates for changes in number of visitors and daily visitor spending are needed to calculate total reduction in recreation expenditures. IMPLAN is used to evaluate secondary effects in the regional economy. The economic effects presented in this section are directly related to the recreation effects discussed in Section 3.20, Recreation.

To estimate direct effects of visitor spending on a regional economy, it is important to consider the number of local visitors to the project area versus the number of visitors that originate from outside the region, or non-local visitors. If visitors are from the region, it is more likely that recreational spending intended for the project area would be spent elsewhere in the regional economy and there would be no net change in economic activity in the region. Non-local visitors bring money into the region that would not otherwise be there, and generate new economic activity. Changes in visits by non-locals largely drive the changes in recreational spending that would occur under the project alternatives. Therefore, this analysis requires data on the number of local visitors versus non-local visitors to estimate recreation-related economic effects.

Another important consideration is the availability and proximity of alternate recreation locations in the area. If visitors have multiple regional options for recreation similar to that available in the project area, they could substitute those areas for Klamath Hydroelectric Project area recreation and continue to spend money within the regional economy. Section 3.20, Recreation, describes alternate recreation sites in the area.

Reservoir

The reservoir recreation information is taken directly from analyses contained in Reclamation 2011 and Reclamation 2011d. The affected area is defined as Siskiyou and Klamath Counties, which include J.C. Boyle, Copco 1 and Iron Gate Reservoirs, where reservoir recreation occurs. Nonlocal visitors to the three reservoirs (J.C. Boyle, Copco 1, and Iron Gate) spend money in the region purchasing gas, food and drink, lodging, guide services, and other items. These expenditures generate economic activity measured in terms of total industry output, labor income, and employment within the two-county economic region. Economic activity could change under the project alternatives.

Within region reservoir recreation expenditures per visit were obtained from the recreation survey presented in the PacifiCorp (2004) report. The expenditure information was gathered by expenditure category such as accommodations, food, gas, supplies and guide fees. This analysis assumes an average of \$15.35 per visit. Changes to average annual within region, nonlocal visitor expenditures were run through IMPLAN to estimate regional economic effects associated with the Full and Partial Facilities Removal Alternatives.

Ocean Sport Fishing

The ocean sport fishing information is taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011h). This analysis focuses on economic effects of expenditures for ocean sport fishing in the KMZ-CA and KMZ-OR (where the effects of Klamath River fall Chinook salmon abundance are largely felt). Expenditures within the region by resident and nonresident anglers generate economic activity measured in terms of industry output, labor income, and employment. A basic assumption underlying this analysis is that any increase in expenditures by resident anglers associated with expanded fishing opportunities would be accommodated by reducing expenditures on other locally purchased goods and services, with no net change in local economic activity. For nonresident anglers, however, increases in local expenditures associated with increases in local fishing opportunities would be accomplished by diverting money that they would otherwise spend in their area of residence. Thus the economic analysis focuses on nonresident angler expenditures, which represent 'new money' whose injection serves to stimulate the local economy.

For the No Action/No Project Alternative, fishery conditions are characterized in terms of average annual ocean recreational harvest of Klamath River fall Chinook salmon during 2001-2005. For the project alternatives, Klamath River fall Chinook salmon harvest is estimated on the basis of the 43 percent increase in ocean recreational harvest of Klamath River Chinook salmon projected by the EDRRA model (Hendrix 2011), scaled to average annual harvest during 2001-2005.

The following steps were taken to estimate nonresident angler expenditures and regional economic effects under the project alternatives:

- Klamath River Chinook salmon harvest was expanded to account for total salmon harvest (all stocks) in the ocean recreational fishery due to the availability of Klamath River Chinook.
- Total salmon harvest (all stocks) was converted to angler days, using 2001-2005 fishery data (PFMC 2011).
- Number of angler days by fishing mode (party/charter, private boat) was estimated by multiplying total effort by the proportion of effort attributable to each mode, estimated using 2001-2005 fishery data (PFMC 2011).

- Number of angler days by nonresident anglers was estimated by using zip code of residence data collected in ocean recreational creel surveys conducted by the California Department of Fish and Game (CDFG) and Oregon Department of Fish and Wildlife (ODFW) to estimate the proportion of effort in each mode and area attributable to nonresident anglers.
- Average expenditures per angler day by nonresident anglers (for lodging, food, gasoline, fishing gear, party/charter boat fees, private boat fuel, equipment rental, access fees, and bait/ice) was estimated to be \$200.02 for party/charter mode and \$54.66 for private boat mode (in 2012 dollars), based on data collected in a 2000 economic survey of saltwater anglers conducted by NOAA Fisheries Service.
- Total within region expenditures by nonresident anglers were estimated by multiplying nonresident angler days by average nonresident expenditures per angler day. Total within region direct expenditures were run through IMPLAN to estimate regional economic impacts.

In-River Sport Fishing

The in-river sport fishing information is taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011g). For the in-river salmon fishery, the affected area includes Klamath, Siskiyou, Humboldt, and Del Norte Counties. The three California counties cover the current location of the in-river salmon and steelhead fisheries; Klamath County covers the area above the dams where salmon and steelhead could potentially recolonize under the action alternatives. Details regarding the methods, assumptions, and conclusions underlying this analysis are in the In-River Sport Fishing Economics Technical Report (NOAA Fisheries Service 2011g).

Klamath River Chinook

For the No Action/No Project Alternative, fishery conditions are characterized in terms of in-river recreational harvest of Klamath River fall Chinook salmon during 2001-2005. For the project alternatives, Klamath River fall Chinook salmon harvest is estimated on the basis of the eight percent increase in in-river recreational harvest of Klamath River fall Chinook salmon projected by the EDRRA model (Hendrix 2011), scaled to average annual harvest during 2001-2005. For all alternatives, harvest was converted to angler days, using 2001-2005 data on the ratio of angler days to harvest (NOAA Fisheries Service 2011g)

The proportion of angler days attributable to nonresident anglers was calculated on the basis of location-of-residence data collected in the Klamath River creel survey conducted by CDFG (Borok 2009). Location of residence is reported in the creel survey as the first three digits of the angler's zip code of residence. Each three-digit location corresponds to a Sectional Center Facility (SCF) of the U.S. Postal Service – a processing and distribution center that serves zip code destinations beginning with those three digits. For purposes of this analysis, anglers identified with SCF 955 and SCF 960 are defined as resident anglers. Because these SCFs extend beyond the boundaries of the four-county regional economic impact area, the analysis provided here likely understates expenditures by nonresident anglers and their contribution to the regional economy. Average

expenditures per angler day by nonresident anglers (for lodging, food, gasoline, fishing gear, private boat fuel, and guide services) is \$105.02 (in 2012 dollars), based on data from a 2004 economic survey of in-river salmon and steelhead anglers sponsored by National Marine Fisheries Service (NMFS).

Steelhead

Economic effects of the No Action/No Project Alternative on the in-river steelhead fishery were analyzed on the basis of current fishery conditions, as little change in the status of steelhead is anticipated under that alternative. Estimation of regional effects for the action alternatives was precluded due to data limitations; instead those effects are expressed in qualitative terms.

The No Action/No Project Alternative is characterized in terms of average annual 2003-2008 steelhead fishing effort on the Klamath River, estimated from CDFG steelhead report card data in collaboration with Terry Jackson (CDFG). The proportion of total effort attributable to nonresident anglers is based on report card data on city/state of residence. Average nonresident expenditures per angler day (for lodging, food, gasoline, fishing gear, boat fuel, guide fees) is assumed to be \$105.98 (2012 dollars), based on data from a 2004 economic survey of in-river salmon and steelhead anglers sponsored by NOAA Fisheries.

Half-pounders are an important component of the steelhead fishery (Hopelain 1998). However, half-pounder catch is not included on steelhead report cards (Jackson 2007), and data for this fishery from other sources is sparse. Thus the regional effects estimated for the No Action/No Project Alternative should be viewed as conservative.

Redband Trout

The recreational redband trout fishery is a well-known trophy fishery. Major fishing sites include Upper Klamath Lake, the lower Williamson and Wood Rivers, and the Keno Reach of the Klamath River. Effort estimates for Upper Klamath Lake and Agency Lake are available from a statistical creel conducted by ODFW in 2009. However similar estimates are not available for the lower Williamson and Wood Rivers or for the Keno Reach – making it difficult to infer how much is spent on this fishery. Regional economic effects of this fishery are qualitatively assessed.

Sucker

The recreational sucker fishery is not considered in the regional analysis, as that fishery closed in 1987 and is unlikely to re-open under the No Action/No Project Alternative and action alternatives.

Whitewater Boating

The affected area for whitewater boating is defined as Jackson, Klamath, Siskiyou, and Humboldt Counties. Klamath River users that engage in whitewater boating recreation spend money in the region purchasing gas, food and drink, lodging, guide services, and other items. The expenditures associated with these trips generate economic activity

measured in terms of total industry output, labor income, and employment within the four county economic region.

Reclamation (2011) and the Whitewater Boating Recreation Economics Technical Report (DOI 2011b) discusses the methods and results of the whitewater boating recreation regional economic impact analysis summarized in this section. The technical report also provides estimates of average annual whitewater boating user days for the Upper Klamath and Lower Klamath Rivers. The estimate of average annual total direct expenditures for whitewater boating was derived from expenditures per user day and the number of whitewater boating user days, and total number of user days are differentiated by local versus nonlocal and commercial versus private.

Johnson and Moore (1993) estimated 78 percent of total whitewater boating activity on the Upper Klamath River is by non-local users. This same percentage was applied for activity on the Lower Klamath River. The number of local user days was further adjusted to account for those local users that would have engaged in a substitute activity outside of the local area if the Klamath River was not available. Following Johnson and Moore (1993), it was assumed that 11 percent of the local user days would have been substituted to an activity outside of the local region if the Klamath River was not available. Expenditures associated with these user days represent increased economic activity to the local region and are included in the estimation of total direct expenditures. The expenditures associated with the other 89 percent of local user days would have still occurred in the local area if the Klamath River was not available and therefore, do not represent an increase in economic activity to the local region and are not included.

Expenditures per user day are differentiated by private and commercial users, where commercial use is associated with the use of a whitewater boating outfitter. Table 3.15-15 shows annual and average private and commercial user days on the Upper and Lower Klamath River between 1994 and 2009. Whitewater boating outfitter fees vary among Upper Klamath River and Lower Klamath River trips and private and commercial trips. Table 3.15-25 shows average visitor expenditures per user day on whitewater boating trips. Expenditures other than outfitter fees (e.g., accommodations, food, gas, supplies, and shuttle services) were based on Johnson and Moore (1993) and inflated to 2012 dollars. Total whitewater boating expenditures were input in the IMPLAN model to determine total economic effects.

Table 3.15-25. Expenditures per User Day for Whitewater Boating on the Klamath River (2012 dollars)

Expenditure	Upper Klamath River		Lower Klamath River	
	Private	Commercial	Private	Commercial
Outfitter Fees	\$0	\$157	\$0	\$130
Gasoline/fuel	\$26	\$26	\$26	\$26
Meals/food	\$59	\$59	\$59	\$59
Accommodations	\$59	\$59	\$59	\$59
Retail/supplies	\$21	\$21	\$21	\$21
Shuttle Services	\$11	\$11	\$11	\$11
Total	\$176	\$333	\$176	\$306

Source: DOI 2011b

Indian Tribes

This analysis focuses on fishing opportunities, related cultural and social practices, standard of living, and health for five of the six federally recognized tribes in the Klamath Basin (Klamath Tribes, Karuk Tribe, Resighini Rancheria, Yurok Tribe, Hoopa Valley Tribe). The sixth tribe, the Quartz Valley Indian Community, is not expected to be directly affected by the outcome of the Secretarial Determination. The tribal information is taken directly from analyses contained in Reclamation (2011) and NOAA Fisheries Service (2011b-f). Sections 3.12, Tribal Trust, and 3.16, Environmental Justice, include more detailed analysis on potential social effects to Indian Tribes.

PacifiCorp Hydroelectric Service

The analysis qualitatively discusses potential effects to PacifiCorp customer rates.

Property Values around Reservoirs

All else equal, the removal of the four facilities including loss of the reservoirs could impact real estate values of parcels surrounding Copco 1, and Iron Gate Reservoirs in Siskiyou County by changing a reservoir view to a river view. The “Dam Removal Real Estate Evaluation Report” (DOI 2011a) evaluates potential short term effects of dam removal on property values. The discussion in this EIS/EIR discusses potential effects qualitatively. Dam removal could also potentially increase the value of property near and adjacent to the Klamath River downstream of Iron Gate Dam due to improved water quality and more robust runs of anadromous fish. The net value of the changes, and the time over which such changes might be observed in market prices, is uncertain.

In concept, to evaluate impacts on real estate values, one would collect market sales data for different properties with different characteristics, which would include “view amenities.” This data would include market values for land that had reservoir views, river view, and no views. All else equal, the difference in the land values for properties with different amenities would represent the impacts on real estate values. This is a challenging exercise in thin markets, where the long-term value changes are not known,

and where other exogenous factors affecting real estate markets may overwhelm the effects of dam removal.

PacifiCorp Property Taxes

This analysis discusses effects to county property tax revenues qualitatively. PacifiCorp pays property taxes to Siskiyou and Klamath Counties. After dam removal, the States of California and Oregon would assume payment of property tax assessments in the form of in-lieu fees for the lands underneath and adjacent to the reservoirs that will come under state management. In-lieu fees would be equivalent to the current assessment paid by PacifiCorp for hydroelectric properties, as defined by California Fish and Game Code Section 1504 and Oregon Revised Statutes Section 496.340:

California Fish and Game Code Section 1504. (a) When income is derived directly from real property acquired and operated by the state as wildlife management areas, and regardless of whether income is derived from property acquired after October 1, 1949, the department shall pay annually to the county in which the property is located an amount equal to the county taxes levied upon the property at the time title to the property was transferred to the state. The department shall also pay the assessments levied upon the property by any irrigation, drainage, or reclamation district.

Oregon Revised Statutes Section 496.340. Except as provided in subsection (3) of this section, whenever real property owned by the State Fish and Wildlife Commission is exempt from taxation on January 1 of any year by reason of its ownership by the state, the commission shall pay to the county in which the property is situated an amount equal to the ad valorem taxes that would have been charged against the property if it had been assessed to a taxable owner as of January 1 of such year as provided in subsection (2) of this section. The county assessor shall determine the value of such property and shall notify the commission of the determination of the county assessor. Upon request of the commission, the Department of Revenue shall review the determination of value and shall re-determine the value if it concludes the value initially determined was substantially incorrect.

KBRA

The KBRA identified 112 actions that could result in new economic activity in the counties within the Klamath Basin. Actions focus on fisheries restoration, monitoring, reintroduction, water resources, agriculture, and economic development for tribes and counties in the Klamath Basin. Chapter 2 describes programs and actions included in the KBRA. Appendix P includes the detailed KBRA regional economic effects analysis.

KBRA actions would increase labor income, output and employment in the region through planning and implementation of local projects and funding to local governments. The KBRA would be implemented over a 15 year period from 2012 to 2026. Federal and state agencies provided funding estimates for KBRA actions. This analysis uses funding estimates and the IMPLAN model to estimate regional economic effects of each KBRA action. Beyond the funding programmed in the KBRA in year 15, the expectation is that

federal financial support in the Klamath Basin would return to existing conditions. Additional funds would be subject to annual appropriations.

Federal agencies identified initial base funding values for actions listed in the KBRA. Base funding was provided on an annual basis for each year that the KBRA would be implemented (2012-2026). The base funding dollars are assumed to be spent whether the KBRA is implemented or not; therefore, the base funding values are assumed for the No Action/No Project Alternative. Base funding values were run in IMPLAN to determine effects of the No Action/No Project Alternative. The KBRA funding would be in addition to the base funding that would be spent under the No Action/No Project Alternative.

To estimate in-region spending for the KBRA, project experts from federal and state agencies and tribes were interviewed regarding the percentage of total costs that would be spent in the region. Experts were from U.S. Fish and Wildlife Service (USFWS), Bureau of Reclamation, NOAA, United State Geologic Survey, U.S. Forest Service, U.S. Department of the Interior, California Department of Fish and Game, Oregon Department of Fish and Wildlife, Karuk Tribe, Yurok Tribe, and The Klamath Tribes. Appendix P summarizes personal communication records, which are referenced as personal communications at the end of this section. Project experts considered project requirements, similar past projects, existing industries and work force in the counties to determine a percentage for in-region costs. Percentages were applied to both base funding and KBRA funding.

Once in-region spending percentages were agreed upon, project experts helped identify the appropriate industry or institution that would experience the direct economic effect, or change in demand. For the majority of actions, money would be spent in the construction sector or in local and state governments to implement activities. This analysis uses the total funds over the 15-year period and does not evaluate effects on an annual basis. The KBRA effects shown in this analysis are not annual effects; instead, they are effects over the entire 15 year period.

Irrigated Agriculture

Some KBRA actions would change agricultural water supply, on-farm pumping costs, and water acquisitions in Reclamation's Klamath Project area, which would affect irrigated agriculture and farm revenues. Details on the methodology and results of the economic analysis are in Reclamation 2011 and the Irrigated Agriculture Economics Technical Report (Reclamation 2011b).

Hydrology modeling was based on Biological Opinions for the No Action/No Project Alternative and incorporated KBRA criteria for the Full Facilities Removal Alternative, including the On-Project Water Users Program (KBRA Section 15) and the Drought Plan (KBRA Section 19). The hydrology modeling drives the agricultural regional analysis (Reclamation 2011c). The Klamath Basin Hydro-Economics model (KB_HEM) evaluated effects to Reclamation's Klamath Project irrigators based on the hydrology. KB_HEM measures changes to cropping patterns and gross farm revenue. Gross farm revenue was used in IMPLAN to measure regional economic effects.

KB_HEM also evaluated current pumping rates for lands irrigated within Reclamation's Klamath Project, which were compared to estimates of reduced cost of electricity and the cost of pumping groundwater for irrigation under the KBRA. IMPLAN was then used to estimate regional effects from pumping cost changes. Because KBRA does not provide enough information to quantify the effects from power rates to off-project irrigators, this analysis describes those effects in qualitative terms.

KBRA programs such as the Water Use Retirement Program, the Off-Project Reliance Program, and Interim Flow and Lake Level Program were also evaluated in IMPLAN. These programs encourage voluntary water right sales or short term water leasing. The regional economic impact of water right transfers or short term water leases are measured in two stages: (1) regional economic effects from the reduction in irrigated agricultural production and (2) the regional economic impact of the water transfer compensation or lease payment to growers. Water transfer/lease payments may offset negative economic effects from reduced irrigated crop production. The net regional economic impact is the sum of the stage one and stage two effects.

Refuge Recreation

Some KBRA actions would change water supply for refuges; therefore, refuge recreation is described under the KBRA. Visitors target the refuge primarily for one of two recreational purposes: wildlife viewing or waterfowl hunting. Visitation to refuges typically lasts for no more than one-half a day. Reclamation 2011 and the Refuge Recreation Economics Technical Report (Maillett 2011) discusses in greater detail the methodology followed and the results derived associated with the direct economic contribution to the local area associated with the economic expenditures of nonlocal refuge visitors.

Expenditures associated with visitation include lodging, food and beverages, transportation, and equipment. Expenditure data was obtained from the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Expenditures were prorated to prevent over-estimation of the contribution based on the amount of time a typical visitor spends on the Refuge. Table 3.15-26 shows estimated daily expenditures by visitors to the NWRs for hunting and wildlife viewing activities (in 2012 dollars). Non-residents spend more on recreation than residents, and all visitors spend more on hunting than on wildlife viewing.

Table 3.15-26. Daily Expenditures per Person for Hunting and Wildlife Viewing (2012 dollars)

Economic Sector	Migratory Bird Hunting		Wildlife Viewing	
	Resident	Non-Resident	Resident	Non-Resident
Lodging	\$2.54	\$12.78	\$9.12	\$36.44
Food/drink	\$16.75	\$50.25	\$11.74	\$38.66
Air transport	\$25.39	\$107.57	\$9.27	\$33.09
Other transport	\$ -	\$11.95	\$1.51	\$3.59
Other	\$13.25	\$18.33	\$3.13	\$14.95
Total	\$57.93	\$200.87	\$34.76	\$126.73

Source: 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, U.S. Fish and Wildlife Service. Expenditures updated to 2012 dollars using Western Region Consumer Price Index, U.S. Census.

3.15.4.2 Effects Determinations

As described above, the following effects determinations comply with the required NEPA analysis of socioeconomic effects. Effects of the project alternatives are compared to the No Action/No Project Alternative.

Alternative 1: No Action/No Project Alternative

Four Facilities

The Four Facilities would be retained under the No Action/No Project Alternative; therefore, there would be no construction activities and short-term construction related effects associated with dam removal.

Annual O&M expenditures required to continue the operation of the existing facilities could result in long-term economic effects to jobs, labor income, and employment. Table 3.15-27 summarizes the regional effects from annual O&M expenditures. IMPLAN results indicate that existing O&M generates approximately 49 jobs. Labor income and output from O&M expenditures were estimated at \$2.05 million and \$5.19 million, respectively. Annual O&M expenditures and associated effects to employment, labor income, and output would remain the same under the No Action/No Project Alternative relative to existing conditions for the long term.

Table 3.15-27. Regional Economic Effects from Annual O&M Expenditures for the No Action/No Project Alternative

	Employment ¹ (Jobs)	Labor income ² (\$ millions)	Output ³ (\$ millions)
Total effect ⁴	49	2.05	5.19

Source: Reclamation 2011 presented in 2012 dollars

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Commercial Fishing

Changes in commercial fishing harvests could change fishing revenues and affect employment, labor income, and output in the regional economy. Under the No Action/No Project Alternative, Klamath River fall Chinook salmon would continue to be the constraining stock for the troll fishery in San Francisco, Fort Bragg, KMZ-CA, KMZ-OR, and Central Oregon. In years of low Klamath River Chinook salmon abundance, troll restrictions to protect that stock would extend to Monterey and Northern Oregon and be more widespread than the areas identified above. Annual gross revenue projected for each of the five areas under the No Action/No Project Alternative is described in Table 3.15-28. Revenues range from \$266,900 in KMZ-OR to \$9.126 million in San Francisco (Reclamation 2011, NOAA Fisheries Service 2011a).

Table 3.15-28. Annual Ex-Vessel Revenue for Management Areas for the No Action/No Project Alternative

Management area	Revenue (2012 dollars)
San Francisco	9,125,553
Fort Bragg	4,202,992
KMZ-CA	328,574
KMZ-OR	266,894
Central Oregon	6,847,058

Table 3.15-29 shows the regional economic effects from ocean commercial fishing under the No Action/No Project Alternative. Employment ranges from 26 to 510 jobs. Labor income ranges from \$0.15 million to \$6.10 million. Output ranges from \$0.32 million to \$15.52 million.

Table 3.15-29. Regional Economic Total Effects from Ocean Commercial Fishing under No Action/No Project Alternative

Management Area	Total Effects ¹		
	Employment ² (Jobs)	Labor income ³ (\$ millions)	Output ⁴ (\$ millions)
Central Oregon	319	4.15	9.55
Fort Bragg	162	2.45	5.62
KMZ-CA	44	0.19	0.45
KMZ-OR	26	0.15	0.33
San Francisco	510	6.1	15.52

Source: Reclamation 2011 presented in 2012 dollars.

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Commercial fishing harvests and associated effects on employment, labor income, and output in the regional economy would be similar to current conditions for the long term.

Recreation

Reservoir

Changes to reservoir recreation expenditures could affect jobs, labor income, and employment in the regional economy under the No Action/No Project Alternative. The reservoir recreation analysis assumes that 71,584 non-local visitors would recreate at Copco 1, Iron Gate and J.C. Boyle Reservoirs under the No Action/No Project Alternative. It should be noted that a substantial blue-green algae problem exists at Copco 1 and Iron Gate Reservoirs (but not at J.C. Boyle Reservoir) sufficient to warrant health advisories related to water ingestion or contact. These advisories suggest avoiding use of water for cooking and washing, as well as avoiding the consumption of fish. While these advisories have been in place for several years, no data exists as to their impact on recreation visitation. Should these algae problems under the No Action/No Project Alternative continue, a large percentage of visits at Copco 1 and Iron Gate Reservoirs may be lost. This could reduce the level of reservoir recreation visitation. At this point, the impact of the blue-green algae problem on visitation is unknown, therefore attempting to provide algae adjusted visitation estimates are speculative. Non-local recreation at Copco 1, Iron Gate, and J.C. Boyle Reservoirs would generate average annual spending of about \$1.1 million per year, which would result in regional economic activity shown in Table 3.15-30. Reservoir recreation under the No Action/No Project Alternative would be the same as existing conditions for the long term.

Table 3.15-30. Regional Economic Effects from Reservoir Recreation for the No Action/No Project Alternative

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	7	0.22	0.54

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

In-River Sport Fishing

Changes to in-river sport fishing opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy. Annual salmon fishing effort on the Klamath River is estimated at 24,683 angler days under the No Action/No Project Alternative. The portion of this effort attributable to nonresident anglers is 15,822 angler days. Annual expenditures in the region by nonresident anglers would be \$1.7 million (2012 dollars). Table 3.15-31 shows the regional economic effects from in river salmon fishing trip expenditures for the No Action/No Project Alternative (Reclamation 2011, NOAA Fisheries Service 2011g).

Table 3.15-31. Regional Economic Effects from In-river Salmon Fishing for the No Action/No Project Alternative

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	34	0.93	2.01

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Annual steelhead fishing effort on the Klamath River is estimated at 17,155 angler days under the No Action/No Project Alternative, of which 11,103 were attributable to nonresident anglers. Annual expenditures by nonresidents in the region would be \$1.2 million. Table 3.15-32 shows the estimated regional effects from in-river steelhead fishing trip expenditures for the No Action/No Project Alternative (Reclamation 2011, NOAA Fisheries Service 2011g).

Table 3.15-32. Regional Economic Effects from In-river Steelhead Fishing for the No Action/No Project Alternative

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	20	0.62	1.31

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

According to results of a creel survey conducted during May-September 2009, fishing effort for redband trout on Upper Klamath Lake totaled 15,191 angler days during that period (pers. comm. William Tinniswood, ODFW). County-of-residence data collected as part of the survey indicate that 24 percent of this effort was by nonresident anglers. Effort estimates for other major fishing sites (lower Williamson and Wood Rivers, Keno Reach of the Klamath River) are not available. A popular guide fishery occurs on the lower Williamson River. Given that demand for guide trips is generally higher among nonresident than resident anglers, the proportion of trips by nonresident anglers is likely higher on the Williamson River than in Upper Klamath Lake; however, data are lacking to verify this. The redband trout fishery would remain similar under the No Action/No Project Alternative relative to existing conditions (Reclamation 2011, NOAA Fisheries Service 2011g).

In conclusion, in-river sport fishing opportunities and associated effects on employment, labor income, and output in the regional economy under the No Action/No Project Alternative would remain similar to existing conditions for the long term.

Ocean Sport Fishing

Changes to ocean sport fishing opportunities associated with dam removal could affect recreational expenditures in the regional economy. Table 3.15-33 summarizes annual ocean sport salmon fishing effort (in total and by nonresident anglers) and nonresident angler expenditures under the No Action/No Project Alternative. Annual nonresident expenditures total \$981,500 in KMZ-CA and \$223,500 in KMZ-OR (Reclamation 2011, NOAA Fisheries Service 2011h).

Table 3.15-33. Total Annual Recreational Salmon Effort, Nonresident Effort and Nonresident Expenditures for the No Action/No Project Alternative

Management area	Angler days (Total)		Angler days (Nonresident)		Expenditures (Nonresident [2012 dollars])	
	Party/charter	Private	Party/charter	Private	Party/charter	Private
KMZ-CA	1,665	23,569	1,538	11,926	313,644	667,856
KMZ-OR	382	14,293	197	3,273	40,174	183,288

Table 3.15-34 shows the estimated regional economic effects from ocean sport fishing trip expenditures for the No Action/No Project Alternative for KMZ-CA and KMZ-OR, respectively.

Table 3.15-34. Regional Economic Effects from Ocean Sport Salmon Fishing for the No Action/No Project Alternative

Management Area	Total Effects ¹		
	Employment ² (Jobs)	Labor income ³ (\$ millions)	Output ⁴ (\$ millions)
KMZ-CA	13	0.42	1.12
KMZ-OR	3	0.08	0.21

Source: Reclamation 2011 presented in 2012 dollars

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

In conclusion, ocean sport fishing opportunities and associated effects on employment, labor income, and output in the regional economy under the No Action/No Project Alternative would be similar to existing conditions for the long term.

Whitewater Boating

Changes to whitewater boating opportunities could affect recreational expenditures and employment, labor income, and output in the regional economy. Regional economic activity under the No Action/No Project Alternative is based on the average annual whitewater boating use and in-region expenditures per user day for the Upper Klamath River and Lower Klamath River. Total average annual visitation for the Klamath River was estimated at 18,806 user days, where the associated within region expenditures were estimated at \$4.2 million for the No Action/No Project Alternative. Table 3.15-35 displays estimates of whitewater boating recreation regional economic effects for the No Action/No Project Alternative. Whitewater boating under the No Action/No Project Alternative would remain similar to existing conditions for the long term.

Table 3.15-35. Regional Economic Effects from Whitewater Recreation for the No Action/No Project Alternative

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	56	1.56	4.31

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Indian Tribes

The continuation of dam operations would result in no change to the existing economic conditions of Indian Tribes in the area of analysis. Access to fish has declined relative to historical levels due to reductions in abundance and distribution and loss of access to traditional fishing sites. Opportunities to utilize fish for subsistence and ceremonial purposes and trade and barter would continue to be limited under the No Action/No Project Alternative similar to existing conditions. The information contained in this section is taken directly from Reclamation (2011) and NOAA Fisheries Service (2011b-f).

The Klamath Tribes

The decline in spring run Chinook salmon began prior to construction of Copco 1 Dam due to factors such as mining and unregulated cannery operations at the river mouth (Snyder 1931). Construction of Copco 1 Dam eliminated much of the spawning and rearing habitat for the spring run (Hamilton et al. 2010). For the Klamath Tribes, access to both fall and spring Chinook salmon ceased completely with the construct of Copco 1 Dam. Out-of-area fishing and barter proved to be untenable as a regular practice due to

the distances traveled, the relatively small amounts of salmon obtained, and the need to meet obligations closer to home. Moreover, salmon obtained elsewhere did not have the same cultural significance as salmon harvested by tribal members on their own fishing grounds. After almost a century without salmon, first salmon ceremonies have ceased and been replaced by ceremonies focused on other species or prayers for the return of salmon. Efforts by the Klamath Tribes to educate the younger generations regarding the cultural and social importance of salmon are challenged by the lack of direct experience with salmon in their daily lives (Deur 2011).

Lost River (c'waam) and shortnose (qapdo) suckers were also important sources of sustenance and became increasingly so after the loss of salmon harvest opportunities. Studies conducted by The Klamath Tribes, ODFW, and the USFWS in the early 1980s revealed the poor status of these populations. The Klamath Tribes drastically curtailed their sucker fishery in 1985 and closed it entirely in 1986 (Markle and Cooperman 2001). The only fish species currently available to the Klamath Tribes is redband trout. Klamath tribal regulations allow subsistence harvest of trout, five fish per day on the Williamson River and up to ten fish per day in other areas.

Karuk Tribe

The Karuk Tribe does not have federally recognized fishing rights. However, the California Fish and Game Commission allows members of the Tribe to fish with traditional hand-held dip nets at their indigenous fishing site at Ishi Pishi Falls. Karuk tribal fishing is bound by California sport fishing regulations, including bag and possession limits. The seasonal round at Ishi Pishi is much diminished and consists mostly of fall Chinook, available in modest numbers and for a very limited period. The First Salmon Ceremony has not been practiced in traditional form in the spring for decades, due to the dramatic decline in spring Chinook. Lamprey have also declined in abundance to such an extent that traditional family eeling spots are no longer used (Lewis 2009). Quantities of fish harvested are not sufficient to meet subsistence needs, engage in trade and barter, or even provide adequately for tribal elders.

The Karuk Tribe routinely participates in the posting of health warnings along the river in the summer that advise people to avoid contact with the water and ingestion of fish livers and to thoroughly wash fish before consumption. The Tribe's concerns extend not only to finfish but also to freshwater mussels, crayfish and food plants that contribute to their diet (Norgaard 2005). Water quality also affects cultural practices, as the Piky'avish ceremonies (which require some participants to ritually immerse themselves in the river) extend into the summer months, when water quality is at its worst. Other tribal activities (e.g., basket making, use of medicinal plants) also involve contact with the river. Basket makers wade in the river to collect basket materials such as willows and cottonwood, wash the materials in the river, and strip the willows with their teeth. Medicinal plants are often washed in the river and some water is consumed along with the plants (Karuk Tribe undated, Gates and Novell 2011).

Resighini Rancheria

The Resighini do not have tribal fishing rights but retain a strong affinity to fishing and other cultural practices such as basket weaving and use of medicinal plants. Resighini members regularly participate in World Renewal Ceremonies hosted by neighboring tribes. Today candlefish and sturgeon are rarely seen on the Klamath River, coho salmon has been listed as ‘threatened’ under the Endangered Species Act, and Pacific lamprey and spring Chinook salmon are at very low levels of abundance. The declines in fish abundances have impacted the modest fishing opportunities available to the Resighini Rancheria.

Poor water quality at certain times of year affects the quantity and quality of basket materials and also exposes basket makers (who wade in the river and also strip willows and other materials with their teeth) to adverse water conditions. Gathering and use of medicinal plants is also adversely affected by poor water quality.

Yurok Tribe

Historical declines in fish abundances has impaired the ability of Yurok tribal members to meet their subsistence needs and engage in trade and barter and commercial fishing. With the decline of spring Chinook, the First Salmon Ceremony and the Cappell Weir have not been practiced for many decades. Water quality problems interfere with fishing operations by causing algae to become entangled in fishing nets.

The Yurok Tribe hosts the World Renewal Ceremonies, which include the Deerskin Dance and Jump Dance, every other year in the Lower Basin in rotation with the Hoopa Valley Tribe. When fish harvest is low, the Yurok Tribe must supplement the harvest with sources off the reservation to meet their obligation to share salmon and other food with ceremonial participants and attendees (USFWS et al. 1999, Gates and Novell 2011). The World Renewal Ceremonies, Brush Dance and Flower Dance involve the use of basket materials that grow along the river and immersion of some ceremonialists in the river. Poor water quality at certain times of year affects the quantity and quality of basket materials and also exposes basket makers (who wade in the river and also strip willows and other materials with their teeth) and ceremonialists (who engage in ritual immersion) to adverse water conditions. Gathering and use of medicinal plants is also adversely affected by poor water quality.

Hoopa Valley Tribe

The decline in fish abundances on the Trinity River has impaired the ability of Hoopa tribal members to meet their subsistence needs and utilize fish for trade and barter. The Hupa incorporate traditional cultural understandings and ceremonies into their everyday life, including fish harvesting (USFWS et al. 1999). Due to the decline of spring Chinook, they have not had a First Salmon Ceremony in decades. However, they are active participants in the World Renewal Ceremonies, which they host every other year in the Lower Basin in rotation with the Yurok. When fish harvest is low, the Hupa must supplement the harvest with sources off the reservation to meet their obligation to share salmon and other food with ceremonial participants and attendees (USFWS et al. 1999, Gates and Novell 2011).

Ceremonial and cultural practices affected by Trinity River water quality include ritual immersion of some ceremonial participants in the river, basket making (which requires basket makers to wade in the river and also strip willows and other materials with their teeth), and gathering and use of medicinal plants.

In conclusion, under the No Action/No Project Alternative, the economic conditions of the Klamath, Karuk, Resighini Rancheria, Yurok and Hoopa Valley Indian Tribes would be the same as existing conditions.

PacifiCorp Hydroelectric Service

Energy rates for PacifiCorp customers would be uncertain under the No Action/No Project Alternative. Under the No Action/No Project Alternative PacifiCorp would continue to operate under the current annual license, PacifiCorp customers would stop paying surcharges associated with dam removal costs. Funds collected would be returned to rate payers or used for restoration actions. While the modified mandatory terms and conditions and prescriptions developed by the DOI and the NMFS in the FERC relicensing proceedings are not included in the No Action/No Project Alternative, the potential changes in customer energy rates that could be generated by implementation of these terms and conditions are characterized below in the analysis of Alternative 4. PacifiCorp considers many factors in setting customer rates which in turn are subject to Oregon Public Utilities Commission (OPUC) and California Public Utilities Commission (CPUC) approval; therefore, it is difficult to assess the size of potential rate effects or even the extent to which rates might increase at all under the No Action/No Project Alternative.

Property Values

Property values surrounding Iron Gate and Copco Reservoirs could change under the No Action/No Project Alternative. Property values of parcels around the reservoir and along the river would be subject to, and fluctuate, based on economic conditions. Values around Copco 1 and Iron Gate Reservoirs could decline in the future if the current trend of postings of health advisories for microcystin algal toxins continues. This analysis does not attempt to predict market conditions and future housing values. Market trends would be similar under the No Action/No Project Alternative relative to existing conditions and property values would be affected similarly. The No Action/No Project Alternative would not affect property values relative to existing conditions.

PacifiCorps Property Taxes

PacifiCorp's property tax payments to Siskiyou and Klamath Counties could change under the No Action/No Project Alternative. PacifiCorp would continue to operate the Klamath Hydroelectric Project and pay property taxes to Siskiyou and Klamath Counties. In 2008 and 2009, PacifiCorp indicated that \$305,000 and \$290,000 of property taxes were associated with hydroelectric facilities in Siskiyou County (PacifiCorp 2009). PacifiCorp would continue to pay a similar amount annually to Siskiyou and Klamath Counties under the No Action/No Project Alternative. There would be no substantial

changes in property tax revenues to the counties under the No Action/No Project Alternative relative to existing conditions.

Ongoing Restoration Activities

Ongoing restoration activities could generate employment, labor income, and output in the regional economy. Federal agencies have identified funding for ongoing restoration actions under the No Action/No Project Alternative. Table 3.15-36 summarizes regional economic effects of ongoing restoration actions under the No Action/No Project Alternative. Effects would occur in Klamath, Siskiyou, Humboldt, and Del Norte Counties. The regional economic impacts associated with ongoing restoration actions would be spread over the 2012-2026 period and would vary year-by-year proportionate to actual expenditures. Spending on local actions would affect employment, labor income, and output in the regional economy. Impacts would mostly occur in local or state governments and the construction sector. Effects would be the same as existing conditions. Effects would be temporary and only occur during the implementation period.

Table 3.15-36. Total Economic Effects over a 15 year period of In-Region Spending for Ongoing Restoration Actions under the No Action/No Project Alternative

Ongoing Action	Total In-Region Spending (1000\$)	Total Economic Effects ¹		
		Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
Coordination and Oversight	\$1,350	22	\$1,024	\$1,622
Planning & Implementation--Phase I and II Restoration Plans	\$420	7	\$319	\$505
Williamson River aquatic habitat restoration	\$3,735	50	\$2,378	\$5,277
Sprague River aquatic habitat restoration	\$11,216	147	\$7,000	\$16,086
Wood River Valley aquatic habitat restoration	\$2,997	39	\$1,801	\$4,420
Williamson & Sprague USFS uplands	\$4,680	62	\$2,921	\$6,712
Upper Klamath Lake aquatic habitat restoration	\$2,997	38	\$1,770	\$4,476
UKL watershed USFS uplands	\$1,159	16	\$724	\$1,663
Keno Impoundment wetlands restoration	\$2,250	29	\$1,325	\$3,369
Keno to Iron Gate upland USFS	\$504	8	\$311	\$732
Shasta River aquatic habitat restoration	\$16,674	166	\$7,991	\$17,613
Shasta River USFS uplands	\$606	9	\$373	\$878
Scott River aquatic habitat restoration	\$18,720	241	\$11,515	\$27,139
Scott River USFS uplands	\$958	14	\$590	\$1,389
Scott River private uplands	\$2,100	29	\$1,368	\$3,205
Mid Klamath River & tributaries aquatic habitat restoration	\$6,750	88	\$4,152	\$9,786
Mid Klamath tributaries USFS upland	\$3,600	47	\$2,215	\$5,220
Mid Klamath tributaries private upland	\$4,200	55	\$2,585	\$6,090
Lower Klamath River & tributaries aquatic habitat restoration	\$18,200	234	\$11,196	\$26,385
Lower Klamath private uplands	\$9,900	128	\$6,090	\$14,352
Salmon River aquatic habitat restoration	\$1,650	23	\$1,029	\$2,400
Salmon River USFS upland	\$2,082	28	\$1,281	\$3,018
Adult Salmonids	\$7,400	115	\$5,608	\$8,890
Juvenile Salmonids	\$4,110	64	\$3,115	\$4,938
Genetics Otololith	\$2,055	35	\$1,720	\$2,719
Hatchery Tagging	\$315	6	\$240	\$380
Disease	\$316	6	\$241	\$380
Green Sturgeon	\$2,480	39	\$1,880	\$2,979

Table 3.15-36. Total Economic Effects over a 15 year period of In-Region Spending for Ongoing Restoration Actions under the No Action/No Project Alternative

Ongoing Action	Total In-Region Spending (1000\$)	Total Economic Effects ¹		
		Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
Lamprey	\$371	7	\$282	\$446
Geomorphology	\$153	3	\$116	\$184
Water Quality	\$1,545	26	\$1,176	\$1,985
UKL bloom dynamics	\$1,545	26	\$1,176	\$1,985
UKL water quality/phytoplankton/zooplankton	\$2,020	34	\$1,537	\$2,595
UKL internal load/bloom dynamics	\$1,800	30	\$1,370	\$2,313
UKL external nutrient loading	\$60	2	\$46	\$78
UKL listed suckers	\$8,985	146	\$6,834	\$11,542
Tributaries listed suckers	\$930	16	\$708	\$1,196
Keno Impoundment water quality/algae/nutrients	\$70	2	\$54	\$91

Source: Source: Barry 2011; Bird 2011; Hicks 2011; Mahan 2011; Nota 2011; Radford 2011; Stopher 2011; Wise 2011
2012 dollars as estimated using IMPLAN

UKL: Upper Klamath Lake USFS: United States Forest Service

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Irrigated Agriculture

Changes in Reclamation's Klamath Project hydrology could affect farm revenues, employment, labor income, and output in the regional economy. Under the No Action/No Project Alternative, KB_HEM model results predict five drought years for Reclamation's Klamath Project. Table 3.15-37 shows the gross farm revenue by IMPLAN sector for drought years, which was used in IMPLAN to estimate the potential regional economic effects from on farm production in drought years. Table 3.15-38 summarizes regional economic effects from agriculture during drought years. The three-county region supports a total of approximately 52,000 jobs, \$2,082.6 in labor income, and \$5,497 million in output by comparison. Under the No Action/No Project Alternative, farm revenues would remain the same as existing conditions.

Table 3.15-37. Gross Farm Revenue for the No Action/No Project Alternative during Drought Years

IMPLAN Crop Sectors	Gross Farm Revenue for Drought Years (1,000 \$)				
	2027	2043	2045	2052	2059
Grains	19,189	4,519	11,462	17,078	20,300
Vegetables	60,675	55,966	58,562	60,127	60,791
Other (Hay & Pasture)	58,387	27,640	47,250	55,815	60,457
Total	138,251	88,125	117,274	133,020	141,548

Source: KB_HEM estimated gross farm revenue by IMPLAN crop sectors as cited in Reclamation 2011b.

Table 3.15-38. Regional Economic Effects from Irrigated Agriculture for the No Action/No Project Alternative during Drought Years

Drought Year	Total Effect ¹		
	Employment ² (Jobs)	Labor income ³ (\$ millions)	Output ⁴ (\$ millions)
2027	1,361	45.20	183.56
2043	766	33.21	118.30
2045	1,076	40.24	156.34
2051	1,286	43.97	176.78
2059	1,403	45.94	187.84

Source: Reclamation 2011b presented in 2012 dollars.

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Changes in on-farm pumping costs could affect farm revenues, employment, labor income, and output in the regional economy. Electricity costs and on farm groundwater pumping costs would not be impacted under the No Action/No Project Alternative.

Water acquisitions could affect farm revenues, employment, labor income, and output in the regional economy. Under the No Action/No Project Alternative, water acquisitions would not impact the regional economy. The Klamath Water and Power Association currently manages the Water Use Mitigation Plan. This plan is similar to a water leasing mitigation program in which farmers are paid to idle land in exchange for the use of the water to reduce on project demand. This is a pilot project whose authorization ends in 2012; therefore it was assumed this program will not continue under the No Action/No Project Alternative. Thus, water acquisitions would have no effect under the No Action/No Project Alternative.

Refuge Recreation

Changes in water supply could affect visitor spending for refuge recreation and affect employment, labor income, and output in the regional economy. Water supply would be similar to historical water supply operations, and therefore recreation quality and opportunities would not change. Visitor expenditures for refuge recreation under the No Action/No Project Alternative would be the same as existing conditions. Table 3.15-39 shows the regional economic effects from refuge hunting trip expenditures for the No Action/No Project Alternative. Visitor spending for the long term would not change under the No Action/No Project Alternative, and the regional economy would not be affected relative to existing conditions.

Table 3.15-39. Regional Economic Effects from Refuge Hunting for the No Action/No Project Alternative

	Employment ¹ (Jobs)	Labor income ² (\$ millions)	Output ³ (\$ millions)
Total effect ⁴	11	0.26	0.62

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Tribal Program

Ongoing fisheries and conservation management by The Klamath Tribes, Karuk Tribe, and Yurok Tribe could generate employment, labor income, and output in the regional economy. Federal agencies have identified funding for fisheries and conservation management actions to be implemented by tribes under the No Action/No Project Alternative. Table 3.15-40 summarizes in-region spending and regional economic effects of tribal program actions under the No Action/No Project Alternative. Effects would occur in Klamath, Siskiyou, Humboldt and Del Norte Counties where tribes are located. The regional economic impacts associated with tribal program actions would be spread over the 2012-2026 period and would vary year-by-year proportionate to actual expenditures. Spending on local actions would affect employment, labor income, and output in the regional economy. Most actions would be implemented by tribal staff and would positively affect the economic conditions of the tribes. A portion of the funding would result in positive effects in the construction sector and professional and technical services sector. Economic effects would be the same as existing conditions.

Table 3.15-40. Total Economic Effects over a 15-year Period of In-Region Spending for Tribal Program Under the No Action/No Project Alternative

Action	Total In-Region Spending (1000\$)	Total Economic Effects ¹		
		Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
Fisheries Management, Karuk Tribe	\$10,468	169	\$7,505	\$11,643
Fisheries Management, The Klamath Tribes	\$8,997	118	\$5,935	\$9,717
Fisheries Management, Yurok Tribe	\$8,934	141	\$6,792	\$12,108
Conservation Management, Karuk Tribe	\$4,200	68	\$3,012	\$4,672
Conservation Management, The Klamath Tribes	\$4,200	56	\$2,771	\$4,537
Conservation Management, Yurok Tribe	\$4,200	67	\$3,188	\$5,724

Source: Dunsmoor 2011; Tucker 2011; Hillemeier 2011

2012 dollars as estimated using IMPLAN

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Alternative 2: Proposed Action – Full Facilities Removal of Four Dams

Four Facilities

Construction activities associated with dam removal would increase economic output, employment, and labor income during the construction period in Klamath and Siskiyou Counties. Effects from dam decommissioning expenditures would occur for one year in 2020. The costs for full facility removal would be approximately \$178.4 million² in 2012 dollars. Not all dollars would be spent within the region. Approximately \$114.3 million of \$178.4 million would be spent in Klamath and Siskiyou Counties. For more detail on the cost estimates and in-region spending, see the Benefit Cost and RED Technical Report (Reclamation 2011a).

IMPLAN results for employment, labor income and output are shown in Table 3.15-41. Only in-region expenditures would generate positive regional economic effects. Dam decommissioning would support approximately 1,400 jobs and generate approximately \$60 million in labor income and \$163 million in output. Most economic effects would be in the sector where the direct impact occurs. For dam deconstruction expenditures, this analysis assumes direct effects would mostly occur in the construction sector. Employment created in this sector would be full and part time jobs and include contractors and subcontractors directly engaged in construction operations (such as equipment operators, drillers, carpenters, electricians, mechanics, apprentices, skilled and unskilled laborers, truck drivers, on-site record keepers and security guards), and any of their related office or administrative staff (in executive, purchasing, accounting, personnel, professional, technical activities and routine office functions, and supervisory employees). The Proposed Action would result in short term positive effects to output, employment, and labor income in the region relative to the No Action/No Project Alternative. Effects would only occur during the construction period.

Table 3.15-41. Regional Economic Effects from Dam Decommissioning for Alternative 2, the Proposed Action

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	1,423	59.70	163.32

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production

⁴ Total Effect = Direct + Indirect + Induced Effects

² Dam removal as described in this EIS/R would occur from May 2019 through December 2020. For this socioeconomic analysis, all effects have been described in 2012 dollars to compare economic effects of alternatives. These costs for facilities removal should not be considered a most probable cost estimate for dam removal in 2020. For a more detailed analysis of the cost of dam removal please see Detailed Plan for Dam Removal – Klamath River Dams, June 2011.

Dam removal would reduce annual O&M expenditures for the Klamath Hydroelectric Project and could affect employment, labor income, and output in the regional economy. The Proposed Action would not require any long term annual O&M expenditures for operation of hydroelectric facilities. As a result, there would be a decrease in expenditures in the region under the Proposed Action relative to the No Action/No Project Alternative. As shown in Table 3.15-42, the regional economy would lose 49 jobs, \$2.05 million in labor income and \$5.19 million in output relative to the No Action/No Project Alternative. For reduced O&M expenditures, this analysis assumes direct effects would occur in the construction sector. Employment created in this sector could be full time or part time and include various types of jobs, such as engineer, management, and administrative jobs. Reduction of O&M associated with the Four Facilities under the Proposed Action would result in adverse, long-term economic effect on employment, labor income, and output in the regional economy relative to the No Action/No Project Alternative.

Table 3.15-42. Regional Economic Effects from O&M Expenditures between the No Action/No Project Alternative and Alternative 2, the Proposed Action

	Employment ¹		Labor income ²		Output ³	
	Jobs	% Change from No Action	\$ millions	% Change from No Action	\$ millions	% Change from No Action
Total effect ⁴	-49	-100.0	-2.05	-100.0	-4.61	-100.0

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Mitigation spending after the deconstruction period could increase economic output, employment, and labor income in the regional economy. Mitigation costs associated with the Proposed Action are presented on an annual basis in Table 3.15-43. Spending on mitigation would occur within the region after construction is complete. Mitigation would generally include repaving roads, replanting vegetation, restoring river banks, and monitoring. Not all mitigation dollars would be spent within the region. Klamath County has highway, street, and bridge construction companies that provide asphalt and asphalt products for road construction. Siskiyou and Klamath Counties also have county road crews. Much of the roadwork could be done by local workers and businesses. Local workers could also provide much of the replanting and habitat restoration required for mitigation. The Benefit Cost and RED Technical Report (Reclamation 2011a) includes percentages of mitigation costs assumed to be spent within the region.

Table 3.15-43. Mitigation Costs by Facility and Year (2012 \$) for Alternative 2, the Proposed Action

Year	J.C. Boyle	Copco 1	Copco 2	Iron Gate	Yreka Water Supply	Total
2018	1,770,000	0	0	2,420,000	0	4,190,000
2019	2,080,000	4,200,000	3,340,000	5,400,000	0	15,020,000
2020	3,250,000	10,000,000	960,000	5,020,000	1,000,000	20,230,000
2021	2,290,000	4,700,000	0	2,790,000	0	9,780,000
2022	280,000	0	0	390,000	0	670,000
2023	280,000	0	0	390,000	0	670,000
2024	280,000	0	0	390,000	0	670,000
2025	280,000	0	0	390,000	0	670,000

Mitigation spending would be temporary and would vary year by year from 2018-2025. Spending would increase employment, labor income and output in the region, as presented in Table 3.15-44. Approximately 220 jobs, \$10 million in labor income, and \$31 million in output between the years 2018-2025 would be generated by mitigation expenditures for the Proposed Action. For mitigation expenditures, this analysis assumes direct effects would occur in the construction sector. Employment created in this sector could be full time or part time and include construction, management, administrative and other types of jobs. The Proposed Action would result in positive, temporary effects to employment, labor income, and output during the mitigation period (2018-2025) relative to the No Action/No Project Alternative.

Table 3.15-44. Regional Economic Effects from Mitigation Expenditures for Alternative 2, the Proposed Action

	Employment ¹ (Jobs)	Labor income ² (\$ millions)	Output ³ (\$ millions)
Total effect ⁴	217	10.01	30.86

Source: Reclamation 2011 data presented in 2012 dollars.

¹ Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

After construction and mitigation activities are complete, there would no longer be increased spending or employment in the region as a result of the Proposed Action. Some longer term monitoring activities would continue, but it would be substantially less than spending during the construction period. Output, employment, and labor incomes within the region would largely return to levels prior to construction. Some wholesale suppliers, retail businesses, hotels, motels, and restaurants that served the influx of construction workers would have increased profits for potential investments, but sales would return to pre-construction levels. Mitigation activities would return most resources, such as roads and public utilities, to at least pre-construction conditions.

Commercial Fishing

Increases in commercial fishing harvests would increase fishing revenues and associated jobs, labor income, and output in the regional economy. The Proposed Action would restore a more natural Klamath River flow regime and improve and expand spawning and rearing habitat for salmon on the Klamath River, which would benefit salmon populations. Commercial fishing landings would increase because of increased salmon abundance, which would increase fishing revenues. Table 3.15-45 shows projected revenue under the Proposed Action and changes in revenues under the Proposed Action relative to the No Action/No Project Alternative in each management area. The differences range from about \$114,000 in KMZ-OR to \$3.9 million in San Francisco (Reclamation 2011, NOAA Fisheries Service 2011a).

Table 3.15-45. Annual Ex-vessel Revenue for Management Areas (2012 dollars)

Management area	Revenue under Proposed Action (\$)	Change in Revenue relative to No Action/No Project Alternative (\$)
San Francisco	13,028,998	3,903,445
Fort Bragg	6,000,817	1,797,825
KMZ-CA	469,121	140,547
KMZ-OR	381,058	114,164
Central Oregon	9,775,879	2,928,821

Table 3.15-46 summarizes regional economic effects from the change in ocean commercial fishing revenue between the No Action/No Project Alternative and the Proposed Action. Additional employment would range from 11 to 218 jobs, labor income would increase between \$0.06 million to \$2.56 million, and output would increase from \$0.13 million to \$6.6 million compared to the No Action/No Project Alternative. Most employment, labor income, and output effects would occur in the agricultural sector of the regional economy. Employment created in this sector could be full time or part time and include various types of services, such as fishing, provision of fuel, bait, and ice, and other supporting jobs. Increases in fish landings and revenues under the Proposed Action would have a long term, positive impact on employment, labor income and output in the regional economy relative to the No Action/No Project Alternative.

Table 3.15-46 Regional Economic Effects from Ocean Commercial Fishing between the No Action Alternative and Alternative 2, the Proposed Action

Management Area	Total Effects					
	Employment ¹		Labor income ²		Output ³	
	Jobs	Percent Change	\$ millions	Percent Change	\$ millions	Percent Change
Central Oregon	136	42.6	1.74	42	4.07	42.6
Fort Bragg	69	42.7	1.05	42.8	2.41	42.8
KMZ-CA	19	41.7	0.07	42	0.19	42.6
KMZ-OR	11	43.8	0.06	42.8	0.13	42.8
San Francisco	218	42.7	2.56	42	6.6	42.6

Source: Reclamation 2011 presented in 2012 dollars.

¹ Total Effect = Direct + Indirect + Induced Effects.

² Employment is measured in number of jobs.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Recreation

Reservoir

Dam removal would eliminate in-reservoir recreation activities, which could reduce recreational expenditures and affect employment, labor income, and output in the regional economy. Under the Proposed Action, dam removal would eliminate reservoir recreation activities in the short- and long-term. This analysis assumes the loss of recreation at Copco 1, Iron Gate, and J.C. Boyle Reservoirs under the Proposed Action relative to the No Action/No Project Alternative.

This analysis assumes an average annual reduction of 40,901 visits under the Proposed Action relative to the No Action/No Project Alternative. The change in average annual expenditures would be a reduction of \$627,838. Table 3.15-47 summarizes results that compare expenditures under the Proposed Action relative to the No Action/No Project Alternative. Most employment, labor income, and output effects would occur in the services sector. Employment affected in this sector could be full time or part time. Lost reservoir recreation would be a long term adverse effect to the regional economy under the Proposed Action relative to the No Action/No Project Alternative.

Table 3.15-47. Regional Economic Effects from Reservoir Recreation between the No Action/No Project Alternative and Alternative 2, the Proposed Action

	Employment ¹		Labor income ²		Output ³	
	Jobs	% Change from No Action	\$ millions	% Change from No Action	\$ millions	% Change from No Action
Total effect ⁴	-4	-57.4	-0.13	-59.1	-0.31	-56.9

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Ocean Sport Fishing

Changes to ocean sport fishing recreation opportunities could affect recreational expenditures in the regional economy. Increased salmon populations would attract more ocean recreational fishing effort, which would increase spending in the regional economy. Table 3.15-48 summarizes annual salmon fishing effort (in total and by nonresident anglers) and nonresident angler expenditures for the Proposed Action (Reclamation 2011, NOAA Fisheries Service 2011h).

Table 3.15-48. Total Annual Recreational Salmon Effort, Nonresident Effort and Nonresident Expenditures by Fishing Mode and Management Area for Alternative 2, the Proposed Action

Management area	Angler days total		Angler days nonresident		Expenditures nonresident (2012 dollars)	
	Party/charter	Private	Party/charter	Private	Party/charter	Private
KMZ-CA	2,378	33,650	2,197	17,027	448,034	953,512
KMZ-OR	545	20,407	281	4,673	57,304	261,688

Table 3.15-49 summarizes regional economic effects of ocean sport fishing in the KMZ under the Proposed Action relative to the No Action/No Project Alternative. The Proposed Action would support and increase in regional activity because of increased angler expenditures. Most employment, labor income, and output effects associated with ocean sport fishing would occur in the services sector. Employment created in this sector could be full time or part time. Recreational expenditures for ocean sport fishing would increase under the Proposed Action relative to the No Action/No Project Alternative, which would increase employment, labor income and output in the region. Effects would be long term.

Table 3.15-49. Regional Economic Effects from Ocean Sport Salmon Fishing between the No Action/No Project Alternative and Alternative 2, the Proposed Action

Management Area	Total Effects ¹					
	Employment ²		Labor income ³		Output ⁴	
	Jobs	Percent change from No Action	\$ millions	Percent change from No Action	\$ millions	Percent change from No Action
KMZ-CA	5.5	42.3	0.18	42.8	0.48	42.8
KMZ-OR	1.2	41.4	0.02	42.7	0.09	42.7

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

In-River Sport Fishing

Changes to in-river sport fishing opportunities associated with dam removal could affect recreational expenditures in the local economy. Annual salmon fishing effort on the Klamath River is estimated at 26,578 angler days under the Proposed Action. The portion of this effort attributable to nonresident anglers is 17,036 angler days. Expenditures in the region by nonresident anglers are estimated at \$1.789 million (2012 dollars). The annual increase in nonresident expenditures under the Proposed Action relative to Alternative would be \$127,000. Table 3.15-50 summarizes increased economic activity supported by the Proposed Action relative to the No Action/No Project Alternative (Reclamation 2011, NOAA Fisheries Service 2011g).

The Proposed Action would result in increased numbers of steelhead spawners and provide conditions conducive to establishment of a steelhead fishery above Iron Gate Dam (Hamilton et al. 2010). However, because these changes were not quantified, it is not possible to quantify the effects of the Proposed Action on the steelhead fishery. However, expansion of that fishery would likely generate additional expenditures, jobs, labor income, and output in the regional economy.

Table 3.15-50. Regional Economic Effects from In-river Salmon Fishing between the No Action/No Project Alternative and Alternative 2, the Proposed Action

	Employment ¹		Labor income ²		Output ³	
	Jobs	Percent change from No Action	\$ millions	Percent change from No Action	\$ millions	Percent change from No Action
Total effect ⁴	2.6	7.6	0.07	7.7	0.15	7.7

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

The Proposed Action would result in increased abundance and distribution of redband trout in Upper Klamath Lake and its tributaries and a potential seven-fold expansion of the fishery below Keno Dam (Buchanan et al. 2011). The effects of this increase could not be quantified with available data but would likely yield a notable increase in economic impacts, given the size of the potential increase in the fishery noted.

Most employment, labor income, and output effects associated with in-river sport fishing would occur in the services sector. Employment created in this sector could be full time or part time. In conclusion, employment, labor income and output in the regional economy would increase as a result of increased in-river fishing expenditures under the Proposed Action relative to the No Action/No Project Alternative. Effects would be long term.

Whitewater Boating

Changes to whitewater boating recreation opportunities associated with dam removal could affect recreational expenditures, employment, labor income and output in the regional economy. The primary area of whitewater boating on the Upper Klamath River occurs on the Hell's Corner Reach, which is heavily dependent on releases from the J.C. Boyle Dam to provide sufficient and predictable whitewater flows. The Lower Klamath River is not dependant on reservoir releases to maintain sufficient whitewater flow, and hydrologic modeling indicated that the average number of days with acceptable flow conditions suitable for whitewater boating on the Lower Klamath River would not be impacted by dam removal (see Section 3.20, Recreation).

On the Upper Klamath River, the average number of days with acceptable flow conditions for whitewater boating in the Hell's Corner Reach would decrease under the Proposed Action. The Hell's Corner Reach is somewhat unique in the project area in that it provides Class V rapids during the late summer months. Analysis of predicted hydrology modeling shows that the average number days with acceptable flows for whitewater boating on the Hell's Corner Reach are estimated to decline by 47.3 percent

during the five month period from May through September (months when the majority of whitewater boating activity occurs annually) and decline by 29.5, 36.4, and 88.2 percent in June, July and August, respectively, relative to the No Action/No Project Alternative. The combination of the decline in the number of days with acceptable flows, particularly during the three months when most of the use is observed (June, July, and August), and the lack of consistency and predictability of days with acceptable flows could make it more challenging for outfitters to continue offering trips for this reach of the Upper Klamath River in the future. Therefore, it is assumed whitewater boating activity on the Upper Klamath River would be negatively affected under the Proposed Action for the long term.

The economic analysis for the Lower Klamath River assumes that there would not be a measurable change in visitation levels for whitewater boating on the Lower Klamath River after dam removal. Whitewater boaters would continue to spend money in the local economy. Expenditures would be similar to existing levels described for the No Action/No Project Alternative.

Table 3.15-51 summarizes estimates of the changes in whitewater boating recreation regional economic activity for the Proposed Action compared to the No Action/No Project Alternative. The loss of whitewater boating activity on the Upper Klamath River (primarily the Hell’s Corner Reach) would result in losses in expenditures and regional economic activity in the local region as compared to the No Action/No Project Alternative. Annual losses would begin in 2020. The difference in total average annual user days between the Proposed Action and the No Action/No Project Alternative was estimated at 2,763 user days. The difference in average annual lost expenditures between the Proposed Action and the No Action/No Project Alternative was estimated as \$715,903. Most employment, labor income, and output effects associated with whitewater boating would occur in the services sector. Employment created in this sector could be full time or part time. Reduced whitewater boating expenditures would result in long term adverse effects to the regional economy under the Proposed Action relative to the No Action/No Project Alternative.

Table 3.15-51. Regional Economic Effects from Whitewater Recreation between the No Action/No Project Alternative and Alternative 2, the Proposed Action

	Employment ¹		Labor income ²		Output ³	
	Jobs	% Change from No Action	\$ millions	% Change from No Action	\$ millions	% Change from No Action
Total effect ⁴	-14	-25.2	-0.43	-27.6	-0.89	-20.6

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Indian Tribes

Dam removal would increase fish harvest for subsistence, cultural practices and commercial uses and provide economically beneficial opportunities for Indian Tribes residing on the Klamath River (excluding the Hoopa Valley Tribe, who reside on the Trinity River). Tribal harvest opportunities for Chinook, Pacific lamprey and steelhead are expected to increase in varying degrees under the Proposed Action relative to the No Action/No Project Alternative. The information contained in this section is taken directly from Reclamation (2011) and NOAA Fisheries Service (2011b-f).

The Klamath Tribes

The return of Chinook salmon to the Upper Basin (even in small numbers) would have great cultural significance for the Klamath Tribes, who have not experienced Chinook salmon in the Upper Basin for almost a century. Spring Chinook salmon is of particular importance, as it would allow for the revival of the First Salmon Ceremony. Should spring Chinook salmon become sufficiently abundant to support subsistence, it would also lengthen the duration of the seasonal round for salmon. Opportunities for subsistence harvest of suckers (which has not occurred since 1986) and redband trout are also likely to increase over the long term.

Benefits to be derived from this increased access to fish would include greater social and cultural cohesion associated with harvesting activities and associated ceremonies, greater opportunity to transmit cultural values and practices to the younger generation, and greater ability to provide food security, care for elders in the community, and engage in trade and barter. Poverty and rural isolation have constrained the ability of tribal members to replace fish with healthy food alternatives. Improved fishing opportunities would increase opportunities for healthy food consumption.

Karuk Tribe

Fish population effects would provide greater opportunities for the Karuk Tribe to engage in subsistence fishing and associated cultural practices (e.g., sharing fish with elders, transmitting values to the next generation, trade and barter). Spring Chinook salmon is of particular importance, as it could lead to revival of the traditional First Salmon Ceremony in the spring. Also, spring Chinook salmon are highly desirable for their fat content and would provide quality benefits to the subsistence fishery and lengthen the duration of the seasonal round for salmon. Improved fishing opportunities would increase opportunities for healthy food consumption.

Resighini Rancheria

The Proposed Action may yield benefits to Resighini Rancheria members in terms of improved access to salmonids and other fish (through fishing and trade and barter). Improved fishing opportunities would increase opportunities for healthy food consumption. Also, given their current dedication to attending ceremonies, it is likely that the Resighini would welcome a revival of the First Salmon Ceremony that may accompany improvements in the status of spring Chinook.

Yurok Tribe

Fish population effects would provide greater opportunities for the Yurok Tribe to engage in subsistence and commercial fishing and associated cultural practices (e.g., sharing of fish with elders, transmitting values to the next generation, trade and barter). Spring Chinook salmon is of particular importance and would allow for revival of the First Salmon Ceremony. Also, spring Chinook salmon are highly desirable for their fat content and would provide quality benefits to the subsistence and commercial fisheries and lengthen the duration of the seasonal round for salmon. The tribal guide fishery would benefit and also bring additional money into the community. Improved fishing opportunities would increase opportunities for healthy food consumption.

Hoopa Valley Tribe

Demand for water exports from the Klamath and Trinity Rivers originates from two separate sources: the Reclamation's Klamath Project in the case of the Klamath River, and the Central Valley Project's Trinity River Division in the case of the Trinity River. Anadromous fish that return to the Trinity River are generally distinct from fish that return to the Klamath River, although Trinity River fish must first pass through 42 miles of the Klamath River before reaching the Trinity River.

To the extent that dam removal activities cause sedimentation in areas below the confluence with the Trinity River, such activities may adversely affect Trinity River fish and fisheries (including Hupa fisheries); however, these effects are expected to be short lived (Close *et al.* 2010, Dunne *et al.* 2011, Goodman *et al.* 2011). Potential long-term benefits to anadromous Klamath River fish populations associated with dam removal are likely to have little effect on Trinity River (including Hupa) fisheries, as beneficiaries of those actions are stocks that return to the Klamath River rather than the Trinity River.

Effects of implementation of the KBRA Tribal Program are described below in the section KBRA Effects.

PacifiCorp Hydroelectric Service

Removal of the Four Facilities could result in increased energy rates for PacifiCorp customers. PacifiCorp has added an approximately 2 percent surcharge to customer rates in Oregon and California to cover costs of dam removal. Under the Klamath Hydroelectric Settlement Agreement (KHSAs), ratepayer liability is capped at \$200 million, prorated between PacifiCorp's customers in Oregon (up to \$184 million) and California (up to \$16 million). The OPUC and CPUC issued rulings that approved dam removal surcharges for PacifiCorp customers in Oregon and California (OPUC 2010, CPUC 2011). Under the Proposed Action, customer rates would not likely increase above the existing surcharges as a direct result of dam removal costs.

Property Values and Local Government Revenues

Removal of the Four Facilities could affect property values of parcels near Copco 1 and Iron Gate Reservoirs. Private parcels with partial reservoir views, frontage/access or with river views subsequent to the action, could be affected by the Proposed Action. Parcels were excluded from consideration if they were (1) publicly owned, (2) PacifiCorp owned,

(3) had no assessed value, (4) in an area influenced by river, (5) above the reservoir ridge and/or (6) larger than 50 acres. The evaluation identified 1,467 parcels that could be affected (DOI 2011a).

Of the 1,467 applicable parcels, about 46 percent (668) were in an area that would be affected by dam removal (DOI 2011a). Table 3.15-52 shows affected private parcels by land use category. A majority of the applicable private parcels are vacant residential land and single-family residential. The assessed land value of affected parcels was about \$9.0 million (DOI 2011a).

Table 3.15-52. Potentially Affected and Affected Parcels by Land Use in Siskiyou County

Land Use Category	Potentially Affected Private Parcels (<50 acres)	Affected Parcels
Agricultural	7	0
Commercial	5	5
Rural Single-Family Residential*	3	0
Rural*	5	3
Single-Family Residential	163	127
Timber	1	0
Vacant Commercial	4	2
Vacant Residential Land	1,246	518
Vacant Rural Land*	33	13
Total Parcels	1,467	668

Source: DOI 2011a
1. 20 acre minimum

In the short term, property values would be adversely affected by changing parcels from a reservoir view to a river view and eliminating access to a reservoir. It is also clear that dam removal would affect property values over the long-term. However, the net magnitude of these changes is difficult to forecast. In the long-term, land values of parcels downstream of Iron Gate Dam with river views could increase because of restoration of the river, including improved water quality and more robust anadromous fish runs. Land that currently has reservoir views could decline in value. However, any declines could be at least partially offset by improvements in water quality. It is difficult to evaluate the magnitude of the net changes under the Proposed Action in the long term.

Changes in real estate values around Copco 1 and Iron Gate Reservoirs could affect property tax revenues to Siskiyou County. In the short term, if property values are reduced, there could be adverse effects to property tax revenues to Siskiyou County. In the long term, if some land values are permanently reduced and there are no offsetting increases in other property values, Siskiyou County property tax revenues might decline relative to the No Action/No Project Alternative, assuming nothing else changes that might impact property tax revenues (e.g., tax rates). If property values increase in the long term, tax revenues to Siskiyou County could increase. Effects to property values are uncertain in the long term; therefore, it is unknown how property tax revenues would be affected.

Removal of the Four Facilities could affect property tax revenues to Siskiyou and Klamath Counties from PacifiCorp. PacifiCorp owns property around the reservoirs and pays property taxes annually to Siskiyou and Klamath Counties. PacifiCorp pays in the range of \$290,000 to \$305,000 in property taxes on land attributable to hydroelectric facilities at Copco and Iron Gate Dams and about \$132,000 in property taxes for land attributable to hydroelectric facilities at J.C. Boyle Dam. Under the Proposed Action, the states would assume ownership of these lands and PacifiCorp would not pay property taxes on the relinquished land to the counties.

The states of California and Oregon would pay in-lieu payments on the transferred land. In California, in-lieu fees would be equivalent to the current assessment paid by PacifiCorp for hydroelectric properties, as required by California Fish and Game Code Section 1504. To make in-lieu payments to counties, the California legislature has to authorize payments. It is unknown if the California legislature would authorize payments in future years. Lost tax revenues to Siskiyou County would be an adverse economic effect. Similar to California, Oregon law (State Wildlife Fund Section 496.340) requires the state to pay the current assessed value on transferred lands. The State Department of Revenue can review and revise assessed values if it is determined substantially incorrect.

The loss in tax revenue from PacifiCorp owned lands would impact the regional economy. However, if Siskiyou and Klamath Counties receive in-lieu payments of equal value to PacifiCorp property tax payment, there would be no net effect to county revenues under the Proposed Action relative to the No Action/No Project Alternative.

Construction worker spending could increase sales and use tax receipts in Siskiyou and Klamath Counties. Construction crews for dam removal in Siskiyou and Klamath Counties would purchase goods and services from local restaurants and stores, which would increase sales tax revenues for the counties. Sales and use tax revenues are an important receipt for Siskiyou County to fund general government, health, and social programs. In 2010, sales tax in Siskiyou County was 8.25 percent (BOE 2010a). Some workers that are brought to the area would stay in hotels, motels, or campgrounds, which could also produce additional sales tax for the county. For workers staying in hotels or motels, the county could receive additional hotel-motel tax. From 2000 through 2010, hotel-motel tax made up an average of 2.7 percent of Siskiyou County tax receipts. As a result of construction worker spending, county sales tax revenues would increase during the construction period. Similar positive tax effects as described for Siskiyou County would accrue to Klamath County during the construction period. Construction worker spending would be a temporary and positive effect to Siskiyou and Klamath Counties under the Proposed Action relative to the No Action/No Project Alternative.

Changes in visitation for recreation activities could affect sales tax revenues. Similar to construction worker spending, increased visitation to the counties offering recreation activities would increase sale tax revenues within the counties. Any adverse effects on visitation expenditures would decrease sales tax revenues. Changes in sales tax revenues would affect funding for county programs, such as health, education, social services and other programs funded through sales taxes. For increases in in-river recreation activities

and ocean fishing, increases in sales tax revenues would be a long-term and positive effect. Decreases in reservoir recreation in Siskiyou and Klamath Counties could reduce sales tax revenues, which would be a long-term and adverse effect of the Proposed Action relative to the No Action/No Project Alternative. Reductions in whitewater boating expenditures would also be a long term, adverse effect to county sales tax. The net effect to sales tax revenues from changes in recreation expenditures is unknown.

KBRA

The KBRA has several programs that could have socioeconomic effects. Specific KBRA programs potentially affecting socioeconomics include:

- Phases I and II Fisheries Restoration Plans
- Fisheries Monitoring Plan
- Fisheries Reintroduction and Management Plan
- Agency Lake and Barnes Ranches
- Wood River Wetland Restoration
- Water Diversion Limitations
- On-Project Plan
- Future Storage Opportunities
- Water Use Retirement Program
- Power for Water Management
- Off-Project Water Settlement
- Off-Project Water Reliance Program
- Emergency Response Plan
- Climate Change Assessment and Adaptive Management
- Interim Flow and Lake Level Program
- Fish Entrainment Reduction
- Upper Klamath Lake and Keno Nutrient Reduction
- Tribal Fisheries and Conservation Management Program
- Tribal Programs Economic Revitalization
- Klamath River Tribes Interim Fishing Site
- Mazama Forest Project
- Klamath County Economic Development Plan
- California Water Bond Legislation
- Drought Plan

Fisheries Program

Fish habitat restoration for the Fisheries Program could affect employment, labor income, and output in the regional economy. The KBRA includes fishery restoration, reintroduction and monitoring actions in the Upper and Lower Basin. Restoration activities would involve some degree of construction including floodplain rehabilitation, large woody debris placement/replacement, fish passage correction, cattle exclusion fencing, and riparian vegetation planting. It is likely that much of the construction could be done by local construction workers from the region. The KBRA also includes construction of new fish facilities, which may require more out of region contractors. State and local government workers in the region would likely implement many actions,

including monitoring and administration. KBRA actions would provide new jobs and increase labor income within the region during the implementation period. Table 3.15-53 summarizes regional economic effects from implementation of the Fishery Program actions under the KBRA relative to the No Action/No Project Alternative. These effects are incremental to base funding being implemented under the No Action/No Project Alternative. Effects are based on funding levels identified by federal agencies in a revised Table C-2 of the KBRA. Effects would occur over the KBRA implementation period (2012-2026) and would vary year-by-year proportionate to actual expenditures. Some actions would be completed in less than 15 years. Table C-2 (included in Appendix O) identified the timeline for action implementation.

Implementation of Fishery Program actions would increase employment, labor income, and output in the regional economy relative to the No Action/No Project Alternative. Effects would only last during the implementation period for each action. The increases in employment, labor income, and output in the regional economy generated by Fishery Program actions would add to economic effects generated by hydroelectric facility removal that are analyzed above during the years that the project implementation overlaps.

In the long-term, the Fisheries Program could support increased fish abundance in the Klamath River and tributaries and improve regional economic conditions. The increased abundance could allow for increased catch limits and fewer catch-and-release requirements, and could decrease the potential for closures of entire fishing seasons. This would attract anglers to the region and increase economic activity. An increase in fish abundance would generate additional jobs, labor income and output and would be a long-term and positive economic effect. The increases in fish abundance generated by Fishery Program actions would be expected to build upon the fish abundance improvements generated by hydroelectric facility removal that are analyzed above.

Table 3.15-53. Regional Economic Effects of KBRA Fishery Program Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (does not include Base Funds)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
1	Coordination and Oversight	\$117	3	\$90	\$142
2	Planning & Implementation--Phase I and II Restoration Plans	\$1,211	20	\$918	\$1,456
3	Williamson River aquatic habitat restoration	\$890	12	\$568	\$1,258
4	Sprague River aquatic habitat restoration	\$41,994	546	\$26,206	\$60,228
5	Wood River Valley aquatic habitat restoration	\$10,777	136	\$6,476	\$15,892
6	Williamson Sprague Wood Screening Diversion	\$2,232	28	\$1,334	\$3,306
7	Williamson & Sprague USFS uplands	\$4,886	64	\$3,049	\$7,007
8	Upper Klamath Lake aquatic habitat restoration	\$10,785	134	\$6,365	\$16,105

Table 3.15-53. Regional Economic Effects of KBRA Fishery Program Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (does not include Base Funds)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
9	Screening of UKL pumps	\$425	6	\$255	\$632
10	UKL watershed USFS uplands	\$1,641	23	\$1,024	\$2,354
11	Keno Impoundment water quality studies & remediation actions	\$29,647	366	\$17,443	\$44,360
12	Keno Impoundment wetlands restoration	\$1,008	13	\$594	\$1,508
13	Keno to Iron Gate upland private & BLM	\$0	0	\$0	\$0
14	Keno to Iron Gate upland USFS	\$713	10	\$440	\$1,036
15	Keno to Iron Gate mainstem restoration	\$951	13	\$620	\$1,321
16	Keno to Iron Gate tributaries - diversions & riparian	\$1,141	16	\$744	\$1,585
17	Shasta River aquatic habitat restoration	\$0	0	\$0	\$0
18	Shasta River USFS uplands	\$0	0	\$0	\$0
19	Scott River aquatic habitat restoration	\$0	0	\$0	\$0
20	Scott River USFS uplands	\$460	6	\$284	\$668
21	Scott River private uplands	\$0	0	\$0	\$0
22	Mid Klamath River & tributaries aquatic habitat restoration	\$0	0	\$0	\$0
23	Mid Klamath tributaries USFS upland	\$4,574	59	\$2,815	\$6,631
24	Mid Klamath tributaries private upland	\$1,887	25	\$1,162	\$2,736
25	Lower Klamath River & tributaries aquatic habitat restoration	\$0	0	\$0	\$0
26	Lower Klamath private uplands	\$25,428	326	\$15,641	\$36,863
27	Salmon River aquatic habitat restoration	\$1,959	26	\$1,206	\$2,840
28	Salmon River USFS upland	\$2,701	35	\$1,662	\$3,916
29	Reintroduction Plan	\$1,631	26	\$1,236	\$1,960
30	Collection Facility	\$6,014	78	\$3,700	\$8,719
31	Production Facility	\$6,113	79	\$3,762	\$8,865
32	Acclimation Facility	\$4,709	61	\$2,898	\$6,827
33	Transport	\$826	13	\$627	\$994
34	Monitoring and Evaluation – Oregon	\$29,828	461	\$22,601	\$35,828
35	Monitoring and Evaluation – California	\$2,995	47	\$2,270	\$3,599
36	New Hatchery	\$5,546	72	\$3,412	\$8,041
37	Adult Salmonids	\$9,952	154	\$7,542	\$11,954
38	Juvenile Salmonids	\$14,630	227	\$11,086	\$17,573
39	Genetics Otololith	\$0	0	\$0	\$0
40	Hatchery Tagging	\$0	0	\$0	\$0
41	Disease	\$5,214	82	\$3,952	\$6,264
42	Green Sturgeon	\$0	0	\$0	\$0
43	Lamprey	\$1,837	29	\$1,393	\$2,208
44	Geomorphology	\$1,608	26	\$1,219	\$1,933
45	Habitat Monitoring	\$2,641	42	\$2,002	\$3,173
46	Water Quality	\$86	2	\$65	\$110
47	UKL bloom dynamics	\$0	0	\$0	\$0
48	UKL water quality/phytoplankton/zooplankton	\$4,143	68	\$3,153	\$5,324
49	UKL internal load/bloom dynamics	\$1,244	21	\$947	\$1,599

Table 3.15-53. Regional Economic Effects of KBRA Fishery Program Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (does not include Base Funds)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
50	UKL external nutrient loading	\$3,881	64	\$2,952	\$4,985
51	UKL analysis of long-term data sets	\$652	11	\$497	\$838
52	UKL listed suckers	\$4,331	71	\$3,294	\$5,564
53	Tributaries water quality/nutrients/sediment	\$4,718	77	\$3,589	\$6,061
54	Tributaries geomorphology/riparian vegetation	\$3,637	60	\$2,767	\$4,672
55	Tributaries physical habitat	\$3,241	53	\$2,466	\$4,164
56	Tributaries listed suckers	\$4,777	77	\$3,634	\$6,136
57	Keno Impoundment water quality/algae/nutrients	\$6,048	99	\$4,601	\$7,770
58	Keno Impoundment to Tributaries: Meteorology (weather stations)	\$3,044	50	\$2,316	\$3,911
59	Remote Sensing acquisition and analysis	--	No in-region spending, no regional economic effects		

Source: Barry 2011; Bird 2011; Hicks 2011; Mahan 2011; Nota 2011; Radford 2011; Stopher 2011; Wise 2011

2012 dollars as estimated using IMPLAN

UKL: Upper Klamath Lake

USFS: United States Forest Service

BLM: Bureau of Land Management

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Water Resource Program

Construction, analysis, and monitoring activities under the Water Resources Program could affect employment, labor income, and output in the regional economy. The KBRA includes water resource actions to improve water supply reliability in Reclamation's Klamath Project. Actions include monitoring, analysis, and construction. It is likely that much of the construction could be done by local construction workers from the region. State and local government workers in the region would likely implement many actions, including monitoring, analysis, and administration. KBRA actions would provide new jobs and increase labor income within the region during the implementation period. Table 3.15-54 summarizes regional economic effects from implementation of the Water Resources Program actions under the KBRA relative to the No Action/No Project Alternative. Some actions could affect irrigated agriculture or refuge recreation; these programs are evaluated below.

Table 3.15-54. Regional Economic Effects of KBRA Water Resources Program Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (not including base funding)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
60	Keno Dam fish passage	--	No in-region spending, no regional economic effects		
61	Data Analysis and evaluation	\$168	3	\$126	\$197
62	Development of predictive techniques	\$391	7	\$298	\$471
63	Klamath Basin Wildlife Refuges: O&M North and P Canals	--	No funding identified in C2		
64	Klamath Basin Wildlife Refuges: Walking Wetland Construction	\$2,500	40	\$1,955	\$3,799
65	Klamath Basin Wildlife Refuges: Big Pond Dike Construction	--	No funding identified in C2		
66	On Project water plan	--	Evaluated in Irrigated Agriculture		
67	Groundwater Technical Investigation	--	No in-region spending, no regional economic effects		
68	Costs Associated with Remedy for Adverse Impact	--	No funding identified in C2		
69	D Pumping Plant	--	Transfer of funds, no regional economic effects		
70	Water Use Retirement Plan	\$0	Evaluated in Irrigated Agriculture		
71	Off Project Plan and Program: Use of 30,000 ac ft above UKL	\$0	Evaluated in Irrigated Agriculture		
72	Interim Power Sustainability	\$0	Evaluated in Irrigated Agriculture		
73	Federal Power	--	Transfer of funds, no regional economic effects		
74	Energy Efficiency and Renewable Resources	\$4,402	54	\$2,278	\$6,211
75	Renewable Power Program Financial and Engineering Plan	--	No in-region spending, no regional economic effects		
76	UKL Wetlands Restoration: Agency/Barnes	\$2,717	34	\$1,576	\$4,108
77	UKL Wetlands Restoration: Wood River	\$2,717	34	\$1,576	\$4,108
78	Drought Plan Development	--	No funding identified in C2		
79	Drought Plan Restoration Agreement Fund	--	Evaluated in Irrigated Agriculture		
80	Emergency Response Plan	--	No funding identified in C2		
81	Emergency Response Fund	--	No funding identified in C2		
82	Technical Assessment of Climate Change	--	No in-region spending, no regional economic effects		
83	Off-Project Reliance Program	--	Evaluated in Irrigated Agriculture		
84	Real Time Water Management	--	No funding identified in C2		
85	Real Time Water Management: Water Flow Monitoring and Gauges	\$3,239	51	\$2,455	\$3,892
86	Snowpack Gauges	--	No funding identified in C2		
87	Adaptive Management: Science and Analysis	\$1,087	17	\$824	\$1,307
88	Real Time Management: Calibration and improvements to KLAMSIM or other modeling and predictions	\$109	3	\$84	\$131
89	Interim Flow and Lake Level Program	--	Evaluated in Irrigated Agriculture		

Source: Barry 2011; Hicks 2011

2012 dollars as estimated using IMPLAN

UKL: Upper Klamath Lake

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed

Table 3.15-54. Regional Economic Effects of KBRA Water Resources Program Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (not including base funding)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)

¹ individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Regional economic effects would be in addition to base funding being implemented under the No Action/No Project Alternative. Effects are based on funding levels identified by federal agencies in a revised Table C-2 of the KBRA. Effects would occur over the KBRA implementation period (2012-2026) and would vary year-by-year proportionate to actual expenditures. Some actions would be completed in less than 15 years.

Implementation of Water Resource Program actions would increase employment, labor income, and output in the regional economy relative to the No Action/No Project Alternative. Effects would only last during the implementation period. The increases in employment, labor income, and output in the regional economy generated by Water Resource actions would add to economic effects generated by hydroelectric facility removal that are analyzed above during the years that the project implementation overlaps.

Irrigated Agriculture

Changes in the Reclamation's Klamath Project hydrology could affect gross farm revenue and the regional economy. Model results indicated gross farm revenue would be equal in all years under the Proposed Action relative to the No Action/No Project Alternative except for five drought years 2027, 2043, 2045, 2051, and 2059 which correspond to the years 1975, 1992, 1994, 2001, and 2008 in the historical period of record. For the five drought years 2027, 2043, 2045, 2051, and 2059, the gross farm revenue increased under the Proposed Action from the No Action/No Project Alternative. Table 3.15-55 shows gross farm revenue under the Proposed Action and the change relative to the No Action/No Project Alternative. For all drought years, regional employment, labor income and output increase over the No Action/No Project Alternative, shown in Table 3.15-56. This would be a long term, positive effect of the Proposed Action relative to the No Action/No Project Alternative. The increases in gross farm revenue and output in the regional economy would change hydroelectric facility removal effects because facility removal does not affect irrigated agriculture.

Table 3.15-55. Gross Farm Revenue by IMPLAN crop sectors between the No Action/No Project Alternative and Alternative 2, the Proposed Action for Drought Years (1,000 \$)

Drought Years	Grains		Vegetables		Other (Hay & Pasture)		Total	
	Proposed Action	Change from No Action	Proposed Action	Change from No Action	Proposed Action	Change from No Action	Proposed Action	Change from No Action
2027	21,857	2,667	60,993	319	65,688	7,301	148,537	10,287
2043	21,664	17,145	60,966	5,000	64,439	36,798	147,069	58,944
2045	21,857	10,394	60,993	2,432	65,688	18,438	148,537	31,263
2052	21,857	4,779	60,993	866	65,688	9,872	148,537	15,517
2059	21,857	1,556	60,993	203	65,688	5,231	148,537	6,990

Source: KB_HEM estimated gross farm revenue by IMPLAN crop sectors as cited in Reclamation 2011b.

Table 3.15-56. Regional Economic Effects from Gross Farm Revenue between the No Action/No Project Alternative and Alternative 2, the Proposed Action

Modeled Drought Years	Total Effects ¹					
	Employment ²		Labor income ³		Output ⁴	
	Jobs	% Change from No Action	\$ millions	% Change from No Action	\$ millions	% Change from No Action
2027	112	8.2	2.3	5.2	13.0	7.3
2043	695	90.6	11.2	33.8	84.0	71.4
2045	397	36.9	7.3	18.1	41.0	26.0
2052	187	14.5	3.6	8.1	20.0	11.4
2059	70	5.0	1.6	3.5	9.0	4.8

Source: Reclamation 2011b data presented in 2012 dollars.

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Increases in on-farm pumping costs could affect household income and reduce employment, labor income, and output in the regional economy. Regional employment, labor income, and output under the Proposed Action are equal to the No Action/No Project Alternative in all non-drought years. The regional effects are the same in all drought years due to groundwater substitution. Irrigators are pumping more groundwater in the Proposed Action compared to No Action/No Project Alternative and therefore are paying more for electricity under the Proposed Action even with a decrease in electricity rates assumed in the Proposed Action (Reclamation 2011b and Reclamation 2011b). The average annual cost of pumping groundwater would be \$178,000 per year.

Table 3.15-57 shows the regional economic effects as result of increased pumping costs. Because farmers are paying more for electricity to pump groundwater under the Proposed Action household income would reduce by the additional money spent to pump groundwater. A reduced household income due to increased pumping costs would have a

relatively small negative impact on the regional economy. The increased pumping costs under the Proposed Action would not change effects of hydroelectric facility removal because facility removal does not affect irrigated agriculture.

Table 3.15-57. Regional Economic Effects from Increased Pumping Costs between the No Action/No Project Alternative and Alternative 2, the Proposed Action

Impact type	Employment ¹ (Jobs)	Labor income ² (\$)	Output ³ (\$)
Total effect ⁴	-1	-40,907	-120,933

Source: Reclamation 2011 data presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Water acquisitions via permanent, voluntary water rights sales could affect farm revenues and reduce employment, labor income, and output in the regional economy. The water acquisition programs, including the Water Use Retirement Program (WURP) and the Off-Project Reliance programs, could result in a negative regional impact. WURP would be implemented to generate on an average annual basis an additional 30,000 acre-feet of inflow to Upper Klamath Lake. The KBRA states that WURP would provide for increased stream flow and inflow into Upper Klamath Lake through actions that could include the voluntary retirement of water rights or water uses. The KBRA states that “acquisition of water rights or uses to achieve the WURP purpose will be compensated, as applicable, through market mechanisms based upon values mutually agreed to by purchaser and seller, as informed by appraisals.”

Water right transfers proposed as part of WURP could affect the regional economy. The land once irrigated with the surface water right would be converted to either dryland production or fallow. If all or part of the land is converted to dryland and/or fallow, the losses to economy would be the gross revenue produced on this land.

The second aspect of WURP that could potentially affect the regional economy is the compensation for the water right. Water right holders, or the growers, would be compensated for the value of the water right. However, no compensation would be paid to those in the regional economy who do not own the water right but are affected by the grower’s activities. Farm workers, agribusiness firms such as fertilizer and chemical dealers, wholesale and agricultural service providers are examples of those who do not receive compensation but would be affected by the water right sale.

The land currently being irrigated by the water rights proposed to be acquired under the WURP program are off project in the Sprague River sub-basin, the Sycan River, the Williamson River sub-basin, and the Wood River sub-basin. This land is mostly used to grow irrigated pasture to support local livestock operations.

Table 3.15-58 presents the combined impact of the lost irrigated pasture production and the associated livestock forward linkage from the 30,000 acre-foot water right sale proposed under the WURP. However, it should be noted that a portion of these effects would be offset from household induced effects resulting from household wages that are spent as a result of the compensation made to the water right holder.

Table 3.15-58. Regional Economic Effects from Lost Agricultural Production for the WURP

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	34	0.86	5.85

Source: Reclamation 2011b, results presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

More information is needed to measure the direct effect on household spending of payments for water purchases proposed in the KBRA. The direct household spending is determined after accounting for debt retirement and leakages related to outside investments, household savings, and household tax payments. It is unknown how much to account for debt retirement and leakages. It can be assumed that a small amount of the regional effects shown in Table 3.15-67 would be offset by household spending (Howe and Goemans 2003). The water purchases proposed in the KBRA would not change any effects generated by hydroelectric facility removal given that facility removal does not affect irrigated agriculture.

Water acquisitions via short-term water leasing could decrease farm revenues and reduce employment, labor income, and output in the regional economy. Other programs in KBRA, like the Off-Project Reliance Program and the Interim Flow and Lake Level Program, suggest the use of water lease programs in drought years. Water lease programs are short term programs that may have negative effects to the regional economy during water short years. The programs allow farmers to sell or lease their water for fisheries programs on a short term basis when sufficient water is unavailable for fish. The regional economy would be affected by the loss in gross farm revenue generated on the land idled by farmers who voluntarily lease water. Some of these regional effects would be offset by household induced effects when farmers spend a portion of the

compensation in the local area. Since the KBRA does not specify what crops would be idled, is not possible to use IMPLAN to measure these effects. Short-term water leasing is expected to have a short term, adverse effect on the regional economy. The short-term water leasing proposed in the KBRA would not change any effects generated by hydroelectric facility removal given that facility removal does not affect irrigated agriculture.

Refuge Recreation

Changes in water supply could affect refuge recreation expenditures and employment, labor income, and output in the regional economy. Additional water supply could improve hunting and wildlife viewing, which could attract more visitors to the area. Under the Proposed Action, there would be an additional 193,830 waterfowl and 3,634 hunting trips. The addition of these trips would result in a total of \$255,500 in direct expenditures within the local economies. As shown in Table 3.15-59, the Proposed Action would create an estimated 5 additional jobs, increase labor income by \$0.12 million and output by \$0.27 million compared to the No Action/No Project Alternative. Increased refuge water supply under the Proposed Action would improve or maintain current recreational expenditures and would positively affect the regional economy relative to the No Action/No Project Alternative.

Table 3.15-59. Regional Economic Effects from Refuge Recreation between the No Action/No Project Alternative and Alternative 2, the Proposed Action

	Employment ¹		Labor income ²		Output ³	
	Jobs	% Change from No Action	\$ millions	% Change from No Action	\$ millions	% Change from No Action
Total effect ⁴	5	47.2	0.12	47.0	0.27	47.0

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Regulatory Assurances

Implementation of regulatory assurances under the KBRA could support employment, labor income, and output in the regional economy. The KBRA includes regulatory assurance actions that generally include planning and construction. State and local government workers in the region would likely develop plans. There would be some local construction for the Keno Impoundment Screening action. Actions would provide new jobs and increase labor income within the region during the implementation period. Table 3.15-60 summarizes regional economic effects from implementation of Regulatory Assurance action under the KBRA relative to the No Action/No Project Alternative.

Regional economic effects would be in addition to base funding being implemented under the No Action/No Project Alternative. Effects are based on funding levels identified by federal agencies in a revised Table C-2 of the KBRA. Effects would occur

over the KBRA implementation period (2012-2026) and would vary year-by-year proportionate to actual expenditures. The Keno Impoundment Screening action would be complete in 4 years and the Federal General Conservation Plans/Habitat Conservation Plans would be implemented over 8 years. The regulatory assurance actions proposed in the KBRA would add to the effects generated by hydroelectric facility removal on employment, labor income, and output in the regional economy during years that the projects overlap.

Table 3.15-60. Regional Economic Effects of KBRA Regulatory Assurance Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (not including base funding)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
90	Keno Impoundment Screening	\$5,470	67	\$3,170	\$8,270
91	Federal GCP/HCP	\$5,082	79	\$3,851	\$6,105

Source: Barry 2011 ; Hicks 2011

2012 dollars as estimated using IMPLAN

GCP/HCP: General Conservation Plan/Habitat Conservation Plan

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

The KBRA identified actions to develop laws for California and Oregon. The states would be responsible for implementing these actions. These actions would provide some local employment to state government staff in the region. Much of the work would occur by state workers outside of the region, which would not affect the regional economy.

County Programs

Implementation of the Klamath County Economic Development Plan could support long-term economic growth in Klamath County. The Klamath County Economic Development Plan would include a study and implementation of projects for economic development associated with fisheries restoration and reintroduction, tourism and recreational development, agricultural development, alternative energy development, and The Klamath Tribes economic development (KBRA 27.3.1). Appendix C-2 of the KBRA indicates \$3.2 million of funding for the plan in 2016. Implementation of these actions would support long-term economic growth in Klamath County, by providing jobs, attracting visitors, attracting new businesses to establish in the area, supporting the agricultural economy, and supporting economic growth of tribes.

The Klamath County Development Plan also calls for Klamath County to be compensated for the loss of property tax revenues from reduced agricultural land values in Reclamation's Klamath Project due to a reduction of water deliveries and reduced agricultural land values in the areas upstream of Upper Klamath Lake due to the

surrender of significant water rights. Compensation of property tax losses would allow Klamath County to continue funding county programs, including education, social services, emergency services, and to put money into the general fund. The Klamath County Development Plan would positively impact the regional economy and would allow the County to continue funding county programs. The long-term effects of implementation of the Klamath County Economic Development Plan proposed in the KBRA would add to the effects generated by hydroelectric facility removal on employment, labor income, and output in the regional economy.

Funds from the California Water Bond Legislation could be used by Siskiyou County to improve economic conditions in the County and to support future economic growth. California legislation passed in 2009 proposes a bond measure to fund an economic development plan for Siskiyou County and for hydroelectric facilities removal. The bond measure, if passed, would also fund other mitigation measures to reduce the potential effect of dam removal. The California Water Bond funding legislation is scheduled for a vote in 2012. If approved, bond funds would be used for economic development in Siskiyou County (\$20 million) and for hydroelectric facilities removal including mitigation for CEQA effects and protection of City of Yreka water supply (\$250 million). Humboldt and Del Norte Counties are not included in the economic development fund. Remaining funds may be used for fisheries restoration projects in Siskiyou, Humboldt and Del Norte Counties, including removal or improvement of bridges, culverts, diversions, or other obstructions to fish passage.

The economic downturn that began in 2008 has adversely affected Siskiyou County. Appendix O presents economic measures and trends for Siskiyou County. Siskiyou County's 2009 and 2010 unemployment rates are the highest in the county since the early 1990s, and unemployment and poverty rates are consistently well above state averages.

It cannot be determined at this time how Siskiyou would distribute funds from the California Water Bond Legislation; this is a general discussion. However, the bond funds could assist Siskiyou County in addressing unemployment, poverty, bankruptcy, and social problems and continuing funding for other county programs. Typical programs to address economic stressors include adult education programs, job opportunity and skills services, financial support programs, and childcare subsidy programs. Some funds could be used for programs to address social problems, such as substance abuse prevention and treatment, teen pregnancy prevention, and crime prevention.

Funding could also be used for programs that have had recent budget cuts, including library, fire, museum, and farm advisor. Other county programs that have struggled with funding include public health, child support services, human services, and behavioral health. Special districts would also likely receive some additional funding. More teachers could be hired, fire stations could be upgraded, or fire staff could increase. Siskiyou County could also invest in redevelopment of commercial areas and improve recreation facilities to attract more tourism to the area. Increased tourism would bring additional money into the county's economy. Siskiyou County could spend the California Water Bond Legislation funds in many ways to improve economic conditions

in the county and support future economic growth. Spending would likely increase employment opportunities and labor incomes in the county. This would be a long-term, positive economic effect. The long-term effects of the California Water Bond funding proposed in the KBRA would add to the effects generated by hydroelectric facility removal on employment, labor income, and output in the regional economy.

Some funds from the California Water Legislation may be left over for fishery restoration projects in Siskiyou, Humboldt and Del Norte Counties. Implementation of these projects would result in similar economic effects described for the Fisheries Restoration Program. Fishery restoration projects implemented by the California Water Legislation would result in a long-term and positive economic effect.

Tribal Program

This section describes effects of KBRA actions defined under the Tribal Program. Socioeconomic effects to tribes related to increased fish abundance and harvest are described above in the Indian Tribes Effects section.

Construction and monitoring activities associated with Tribal Program actions would increase jobs, labor income, and output for The Klamath Tribes, Karuk Tribe, and Yurok Tribe. Federal agencies have identified funding for fisheries and conservation management actions to be implemented by tribes under the Proposed Action. Table 3.15-61 summarizes in-region spending and regional economic effects of tribal program actions under the KBRA. Effects would occur in Klamath, Siskiyou, Humboldt and Del Norte Counties where tribes are located. The regional economic impacts associated with Fisheries and Conservation Management actions would be spread over the 2012-2026 period and would vary year-by-year proportionate to actual expenditures. Some actions would not be implemented in each year of the 15-year period. For example, the Economic Development actions would be completed in one year.

Table 3.15-61. Regional Economic Effects of KBRA Tribal Program Actions Relative to No Action/No Project Alternative over a 15-year period (2012 dollars)

Table C-2 Line #	KBRA Action	15 year KBRA In Region Spending (1000 \$)	Total Effects ¹ of KBRA Funding (not including base funding)		
			Employment ² (Jobs)	Labor Income ³ (1000\$)	Output ⁴ (1000\$)
100	Fisheries Management Karuk	\$4,032	66	\$2,891	\$4,485
101	Fisheries Management Klamath	\$5,503	73	\$3,630	\$5,943
102	Fisheries Management Yurok	\$5,566	89	\$4,252	\$7,581
104	Conservation Management Karuk	\$3,050	50	\$2,187	\$3,393
105	Conservation Management Klamath	\$3,050	41	\$2,013	\$3,296
106	Conservation Management Yurok	\$3,050	49	\$2,315	\$4,156
108	Economic Development Study Karuk	\$250	6	\$197	\$406
109	Economic Development Study Klamath	\$250	6	\$197	\$406
110	Economic Development Study Yurok	\$250	6	\$197	\$406
111	Klamath Tribes: Mazama Forest Project	--	Transfer of funds to private owner for land purchase for tribe. Regional effects not quantified. Tribes would benefit in future from use of forest lands.		
112	Fishing Sites	--	No funding in KBRA		

Source: Source: Dunsmoor 2011; Tucker 2011; Hillemeier 2011

2012 dollars as estimated using IMPLAN

¹ Total Effect = Direct + Indirect + Induced Effects

² Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

³ Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

⁴ Output represents the dollar value of industry production.

Spending on local actions would affect employment, labor income, and output in the regional economy. Most actions would be implemented by tribal staff and would positively affect the economic conditions of the tribes. A portion of the funding would result in positive effects in the construction sector and professional and technical services sector. Implementation of the Tribal Program actions would increase employment, labor income, and output in the regional economy relative to the No Action/No Project Alternative. The Tribal Program actions could add to the effects of the hydroelectric facility removal actions analyzed above if tribal members are employed for dam deconstruction activities. The additive effects would only occur in years that project implementation overlaps.

Alternative 3: Partial Facilities Removal of Four Dams

Four Facilities

Construction activities could increase jobs, labor income, and output in the regional economy during the construction period in Klamath and Siskiyou Counties. Partial facilities removal is estimated to cost approximately \$135.4 million³ in 2012 dollars

³ Dam removal as described in this EIS/R would occur from May 2019 through December 2020. For this socioeconomic analysis all effects have been described in 2012 dollars to allow comparison between economic effects and alternatives. These costs for facilities removal should not be considered a most probable cost estimate for dam removal in 2020. For a more detailed analysis of the cost of dam removal please see Detailed Plan for Dam Removal – Klamath River Dams, June 2011.

(Reclamation 2011). Expenditures associated with the Partial Facilities Removal of Four Dams Alternative spent within the region were estimated to be \$84.7 million (Reclamation 2011).

The effects of partial facility removal on employment, labor income, and output are shown in Table 3.15-62. Effects would be short-term and occur only during dam decommissioning, which would occur in 2020 for the duration of one year. Most economic effects would be in the sector where the direct impact occurs. For dam deconstruction expenditures, this analysis assumes direct effects would mostly occur in the construction sector. Employment created in this sector could be full time or part time and include various types of jobs, similar to those described for the Proposed Action.

Table 3.15-62. Regional Economic Effects from Dam Decommissioning for Alternative 3

	Employment¹ (Jobs)	Labor income² (\$ millions)	Output³ (\$ millions)
Total effect ⁴	1,138	48.11	131.84

Source: Reclamation 2011 data presented in 2012 dollars.

¹ Employment is measured in number of jobs. Construction-related employment estimates include the in-field workforce plus all additional jobs generated by project construction expenditures, e.g., in retail, services, manufacturing, and other related sectors throughout the economy.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Changes in annual O&M expenditures for the Partial Facilities Removal of Four Dams Alternative could reduce jobs, labor income, and output in the regional economy. Annual O&M expenditures for the Partial Facilities Removal of Four Dams Alternative were estimated at \$129,000. These annual O&M expenditures would partially offset the lost O&M expenditures under the No Action/No Project Alternative. However, under the Partial Facilities Removal of Four Dams Alternative annual O&M expenditures would result in a long term loss to the regional economy compared to the No Action/No Project Alternative, shown in Table 3.15-63. For reduced O&M expenditures, this analysis assumes direct effects would occur in the construction sector. Economic effects under Partial Facilities Removal of Four Dams Alternative would be long term and adverse relative to the No Action/No Project Alternative.

Table 3.15-63. Regional Economic Effects from O&M Expenditures between the No Action/No Project Alternative and Alternative 3

	Employment ¹		Labor income ²		Output ³	
	Jobs	% Change from No Action	\$ millions	% Change from No Action	\$ millions	% Change from No Action
Total effect ⁴	-47.4	-96.0	-1.98	-96.0	-5.00	-96.0

Source: Reclamation 2011 presented in 2012 dollars.

¹ Employment is measured in number of jobs.

² Income is the dollar value of total payroll (including benefits) for each industry in the analysis area plus income received by self-employed individuals located within the analysis area.

³ Output represents the dollar value of industry production.

⁴ Total Effect = Direct + Indirect + Induced Effects

Mitigation spending after the deconstruction period could increase economic output, employment, and labor income. Effects from mitigation spending would be temporary, short-term effects and would vary year by year from 2018-2025. Partial facility mitigation costs by facility and year are shown in Table 3.15-64.

Table 3.15-64. Mitigation Costs by Facility Year (2012 \$) for Alternative 3

Year	J.C. Boyle	Copco 1	Copco 2	Iron Gate	Yreka Water Supply	Total
2018	1,520,000	0	0	2,910,000	0	4,430,000
2019	1,790,000	3,800,000	2,020,000	6,500,000	0	14,110,000
2020	2,780,000	9,050,000	580,000	6,040,000	1,000,000	19,450,000
2021	1,970,000	4,250,000	0	3,360,000	0	9,580,000
2022	240,000	0	0	470,000	0	710,000
2023	240,000	0	0	470,000	0	710,000
2024	240,000	0	0	470,000	0	710,000
2025	240,000	0	0	470,000	0	710,000
					Total	50,410,000

Source: Reclamation 2011

The regional economic effects related to dam decommissioning mitigation for the Partial Facilities Removal of Four Dams Alternative were assumed to be the same as the Proposed Action. For mitigation expenditures, this analysis assumes direct effects would occur in the construction sector. Economic effects under Partial Facilities Removal of Four Dams Alternative would be positive and short term relative to the No Action/No Project Alternative.

Commercial Fishing, Recreation, Indian Tribe, PacifiCorp Hydroelectric Service, Property Values and Local Government Revenues, PacifiCorp Property Taxes, and KBRA

Economic effects of the Partial Facilities Removal of Four Dams Alternative would be the same as the Proposed Action.

Alternative 4: Fish Passage at Four Dams

The KHSA Section 3.2.1(iii), signed by Secretary of the Interior Ken Salazar on February 18, 2010, directs the Secretary to undertake environmental review in support of the Secretarial Determination. All alternatives carried forward for further analysis in the EIS/EIR were analyzed using existing studies and other appropriate data as suggested in KHSA Section 3.2.1 (i), where such analysis met criteria in (40 CFR 1502.22 and 43 CFR 46.125) to incorporate available information. As part of developing the basis for the Secretarial Determination, the KHSA requires in Section 3.3.2 that the Secretary prepare a Detailed Plan, including the identification, qualifications, management, and oversight of a non-federal DRE, if any, that the Secretary may designate. KHSA Section 3.3.4.D requires that an estimate of costs be prepared as part of the Detailed Plan. The Detailed Plan analysis provides most of the information for the project description for Alternatives 2 and 3, and this information was used to analyze these two action alternatives. As described in KHSA Section 3.2.1(i), the FERC record is used to form the project description for Alternatives 4 and 5. Alternatives 4 and 5 were analyzed to ensure that the review of reasonable fish passage alternatives was comprehensive. In addition, at the time of developing a reasonable range of alternatives, the lead agencies recognized that the inclusion of Alternatives 4 and 5 would provide an assessment of the short- and long-term effects from a broader range of reasonable alternatives. Alternatives 4 and 5 are outside the authority of the DOI, the four facilities proposed for removal are privately owned structures, and there was no provision in the KHSA to include them in the Detailed Plan. The result is differing levels of available information for alternatives carried forward in the EIS/EIR consistent with the elements of each action alternative.

Regional economic effects were quantified for the No Action/No Project Alternative, the Proposed Action, and the Partial Facilities Removal of Four Dams Alternative. These regional economic effects provide the broadest range of economic impacts expected from implementation of any of the alternatives and bookend the expected economic impact to the area of analysis. Once that information was developed, a comparative analysis of the Fish Passage at Four Dams Alternative and Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative provide the information required to evaluate the relative impacts of each action alternative within the identified range of economic effects. Specific economic effects for construction and changes in commercial fishing, recreation, and irrigated agriculture were not individually quantified for Fish Passage at Four Dams Alternative and Fish Passage at Two Dams, Remove Copco 1 and Iron Gate Alternative. The missing data is relevant to reasonable foreseeable significant adverse human effects on the environment. However that unavailable data is not essential to a reasoned choice among alternatives because potential impacts can be compared to the data developed for the No Action/No Project Alternative, the Proposed Action, and Partial Facilities Removal of Four Dams Alternative. The range of impacts anticipated for the two alternatives for which data is missing falls within the range of impacts analyzed and data developed for the remaining alternatives, though the ratio of expenditures to impacts might not have the same proportional effect across the various economic sectors. The comparative analysis required by NEPA is achieved using this qualitative method.

Four Facilities

Construction of fish passage facilities, O&M expenditures, and mitigation spending could increase jobs, labor income, and output in the regional economy during the construction period. Expenditures would occur in the region to support construction of fish passage facilities. In-region spending would increase jobs, labor income and output in Klamath and Siskiyou Counties relative to the No Action/No Project Alternative. Positive regional economic effects would only occur during the construction period. Hydroelectric facilities would continue to operate under this alternative; therefore, O&M annual expenditures would continue similar to the No Action/No Project Alternative. Some mitigation would be required for this alternative, which would result in increased in-region spending relative to the No Action/No Project Alternative.

Commercial Fishing

Changes in commercial fishing harvests could change fishing revenues and affect employment, labor income and output in the regional economy. Construction of fish passage facilities would increase migratory fish habitat availability above Iron Gate Dam, and as described in Section 3.3, Aquatic Resources, would result in increased commercial fishery populations when compared to existing conditions. Positive effects related to increased fish harvests would increase relative to the No Action/No Project Alternative, but these effects would not be as great as Alternative 2 or 3.

Recreation (Reservoir, In-River Sport Fishing, Ocean Sport Fishing, Whitewater Boating)

Changes in recreational opportunities could affect the regional economy. The dams would remain in place and visitors could use the reservoirs for existing activities, including boating, water skiing, and fishing. Spending in the region related to reservoir recreation would continue at existing levels.

The development of fish passage facilities may also have a positive effect on visitation levels and expenditures for ocean sport fishing trips relative to the No Action/No Project Alternative, but these effects would not be as great as Alternatives 2 or 3.

The fish passage facilities may also have a positive effect on visitation levels and expenditures for ocean sport fishing trips relative to the No Action/No Project Alternative, but these effects would not be as great as Alternatives 2 or 3.

Implementation of the Fish Passage at Four Dams Alternative would result in a loss of acceptable flows for whitewater boating opportunities in the Hell's Corner Reach as compared to existing conditions. The flow conditions and prescriptions outlined in Chapter 2 would reduce the current daily peaking flows, which support whitewater rafting in the Hell's Corner Reach, to a minimum streamflow of 1,500 cfs, which must be provided no more than once per week. This would result in an adverse reduction in rafting trips and recreation expenditures.

Indian Tribes

Fish passage at the four dams could affect the existing economic conditions of Indian Tribes in the area of analysis. Implementation of the Fish Passage at Four Dams

Alternative would generate a positive effect on fish populations and tribal harvests for subsistence, cultural practices and commercial uses relative to the No Action/No Project Alternative. The positive economic effects generated by the KBRA for the tribes would not be realized under this alternative, and the positive economic effects generated by the development of fish passage facilities would be smaller than the effects anticipated under the Proposed Action as a result. However, increased fish harvest for subsistence, cultural practices and commercial uses would represent an economically positive effect for Indian Tribes, although this effect would not be as great as under Alternatives 2 or 3.

PacifiCorp Hydroelectric Service

Fish passage at four dams could result in increased energy rates for PacifiCorp customers. PacifiCorp estimated that costs to develop fish passage at the Four Facilities consistent with the Mandatory Conditions imposed by the DOI and the United States Department of Commerce (DOC) would cost more than implementation of the KHSA (OPUC 2010). In its ruling to approve KHSA surcharges, the OPUC concluded that PacifiCorp “has demonstrated that customer costs under the KHSA are capped below projected costs to relicense and continue operation of the Klamath dams.” Further, the OPUC concluded the following:

“Ratepayers will be responsible for significant future costs for the Klamath Project (regardless of the disposition of the dams). The nature and scope of these costs has been unclear, however, since 2000 when Pacific Power [PacifiCorp] first provided notice of the Company's need to seek federal relicensing of the Project. We are persuaded that continued pursuit of the relicensing option would pose significant risks to ratepayers. The nature and scope of the costs involved with relicensing would remain uncertain and subject to significant escalation for a considerable period of time.

The KHSA in contrast, offers a more certain path for the Project's future, providing a timeline for continued operation until December 31, 2010, followed by transfer of the facilities to a third party responsible for removing the dams. The KHSA also caps customer costs and liabilities for Klamath dam removal and the environmental restoration of the Klamath River at a reasonable level, while providing customers with renewable replacement power. Further, we believe that Pacific Power has reasonably estimated the cost of replacement power if the Klamath dams are decommissioned. Due to significant tangible and intangible benefits associated with the KHSA, we conclude it is in the best interest of customers and find the KHSA surcharges to be fair, just and reasonable.

We reviewed the detailed economic studies of the KHSA surcharges, we analyzed the projected costs of both relicensing and decommissioning of the dams, and we asked specific questions of Pacific Power, Staff and the parties at a workshop. We considered both the quantifiable and unquantifiable benefits and risks of the KHSA and relicensing options.

We are persuaded that Pacific Power carefully analyzed the nature and scope of projected costs for both futures for the dams. As Staff and others do, we believe that there are substantial unquantified risks associated with continued pursuit of a FERC license that is not captured in the economic analysis. Pacific Power and parties deeply involved in the relicensing process, such as the Intervenor State Agencies and the Joint Parties, all testified that the relicensing option analysis significantly underestimates the true cost of relicensing.

These parties indicate that the projected relicensing costs are subject to significant risk of escalation with no guarantee that a FERC license will ever be issued due, in particular, to great uncertainty about water quality certification. Yet, even though the full expected costs of the relicensing option is not captured in Pacific Power's analysis, the analysis still shows that the KHSA results in lower rates for Oregon customers, as well as all customers of Pacific Power. If the risks associated with the relicensing scenario could be quantified, we believe that the relative economic benefits of the KHSA would likely be great.

We observe that no party testified that the relicensing option would likely result in lower rates and better service for customers. Industrial Customers of Northwest Utilities (ICNU) criticizes the KHSA surcharge rates, but does so in comparison to hypothesized "normal" ratemaking for costs associated with removing a hydroelectric dam. Ten years into a process to resolve the future of the Reclamation's Klamath Project with no "normal" resolution in sight, we conclude that it's not reasonable to compare proposed solutions to so-called "normal" ratemaking scenarios.

Because the KHSA limits costs and manages risk better than relicensing, we find the KHSA to be in the best interest of customers, and we determine that the KHSA surcharges are, therefore, fair, just and reasonable.” (OPUC 2010).

Therefore, it is assumed that, under the Fish Passage at Four Dams Alternative, customer rates would likely increase above the existing surcharges as a direct result of construction, operations and maintenance costs for fish passage facilities. The degree to which the cost could be passed to the ratepayers is not known and would be subject to Oregon and CPUCs.

Property Values and Local Government Revenues

Property values could be affected by the fish passage at four dams near Copco I and Iron Gate Reservoir. The dams would remain in place under this alternative; therefore, the property values of parcels with full or partial reservoir views would not change. Land values would be the same as the No Action/No Project Alternative. Property tax revenues to Klamath and Siskiyou Counties would also not change relative to the No Action/No Project Alternative.

Fish passage at four dams could affect property tax revenues to Siskiyou and Klamath Counties from PacifiCorp. PacifiCorp would continue to own and operate hydroelectric

facilities and would continue to pay property taxes. County tax revenues would not change relative to the No Action/No Project Alternative.

KBRA

Under this alternative, the KBRA would not be fully implemented, and the socioeconomic effects related to implementation of ongoing resource management plans would be similar to those for the No Action/No Project Alternative.

Alternative 5: Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate

Analysis of Alternative 5 was conducted in a similar approach to Alternative 4. See discussion of effects analysis approach under Alternative 4 above.

Four Facilities

Construction of fish passage facilities, O&M expenditures, and mitigation spending could increase jobs, labor income, and output in the regional economy during the construction period. Expenditures would occur in the region to support construction of fish passage facilities. In-region spending would increase jobs, labor income and output in Klamath and Siskiyou Counties relative to the No Action/No Project Alternative. Positive regional economic effects would only occur during the construction period. Hydroelectric facilities at J.C. Boyle and Copco 2 Reservoirs would continue to operate under this alternative; therefore, O&M annual expenditures would continue for these sites. Positive regional economic effects would increase relative to the No Action/No Project Alternative, but be less than the Proposed Action. Some mitigation would be required for this alternative, which would result in increased in-region spending relative to the No Action/No Project Alternative.

Commercial Fishing

Changes in commercial fishing harvests could change fishing revenues and affect employment, labor income and output in the regional economy. Removal of the Copco 1 and Iron Gate dams and the construction of fish passage facilities at J.C. Boyle and Copco 2 dams would increase migratory fish habitat availability above Iron Gate Dam, and as described in Section 3.3, Aquatic Resources, would result in increased commercial fishery populations when compared to existing conditions. Positive effects related to increased fish harvests would increase relative to the No Action/No Project Alternative, although this effect would not be as large as Alternatives 2 or 3.

Recreation (Reservoir, In-River Sport Fishing, Ocean Sport Fishing, Whitewater Boating)

Changes in recreational opportunities could affect the regional economy. Iron Gate and Copco 1 Facilities would be removed, eliminating in-reservoir recreation at these sites. Effects would be similar to the Proposed Action. Reservoir recreation at J.C. Boyle Reservoir would continue, which would have economic effects similar to the No Action/No Project Alternative.

Visitation levels and expenditures for in-river fishing would increase because of increased fish populations under this alternative relative to the No Action/No Project Alternative, although this effect would not be as great as Alternatives 2 or 3.

Ocean sport fishing trips could also increase relative to the No Action/No Project Alternative, which would increase employment, labor income, and output in the regional economy; however, this effect would not be as great as Alternatives 2 or 3.

The loss of peaking flows in the Hell’s Corner Reach would result in the river returning to natural flow conditions, with no ability to re-regulate peaking flows. Thus, there would be diminished whitewater boating opportunities in this reach. This would result in fewer rafting trips and reduced recreation expenditures and be a long-term adverse effect.

Indian Tribes

Alternative 5 could affect the existing economic conditions of Indian Tribes in the area of analysis. Implementation of Alternative 5 would generate a positive effect on fish populations and tribal harvests for subsistence, cultural practices and commercial uses relative to the No Action/No Project Alternative. The positive economic effects generated by the KBRA for the tribes would not be realized under this alternative, and the positive economic effects to tribes would be smaller than the effects anticipated under the Proposed Action as a result. However, increased fish harvest for subsistence, cultural practices and commercial uses would represent an economically positive effect for Indian Tribes, although this effect would not be as great as with Alternatives 2 or 3.

PacifiCorp Hydroelectric Service

Removal of two dams and fish passage at two dams could result in increased energy rates for PacifiCorp customers. The costs for the removal of two dams and fish ladders would not be covered under the KHSA agreement and would likely become the responsibility of PacifiCorp and its ratepayers. The cost for removal of the Iron Gate and Copco 1 Dams is approximately \$124 million⁴ in 2012 dollars, as estimated for removal of these two dams for the Proposed Action (Reclamation 2011a). As described above for Alternative 4, PacifiCorp has estimated that fish passage would be more costly than dam removal; therefore, it is assumed that fish passage at Copco 2 and J.C. Boyle Dams would be more than dam removal costs. Therefore, under this alternative, customer rates would likely increase above the existing surcharges as a direct result of construction, operations and maintenance costs for fish passage facilities at two dams and the removal of Iron Gate and Copco 1 Dams. The degree to which the cost could be passed to the ratepayers is not known and would be subject to Oregon and California PUCs.

Property Values and Local Government Revenues

Property values could be affected by the fish passage at four dams near Copco 1 and Iron Gate Reservoir. Parcels with views of Copco 2 Reservoir would not be affected under

⁴ Dam removal as described in this EIS/R would occur from May 2019 through December 2020. For this socioeconomic analysis, all effects have been described in 2012 dollars to compare economic effects of alternatives. These costs for facilities removal should not be considered a most probable cost estimate for dam removal in 2020. For a more detailed analysis of the cost of dam removal please see Detailed Plan for Dam Removal – Klamath River Dams, June 2011.

this alternative. As described in the affected environment, there are no parcels with views of J.C. Boyle Reservoir. Property tax payments to Siskiyou County from affected parcels around Copco 1 and Iron Gate Reservoirs would decrease relative to the No Action/No Project Alternative. In the long-term, river views associated with the parcels could increase property values.

Alternative 5 could affect property tax revenues to Siskiyou and Klamath Counties from PacifiCorp Changes in ownership of hydroelectric facilities could reduce county property tax revenues. PacifiCorp property tax payments to Siskiyou County from land ownership of Copco 1 and Iron Gate Reservoirs would discontinue relative to the No Action/No Project Alternative. Effects would be similar in magnitude to the Proposed Action.

KBRA

Under this alternative, the KBRA would not be fully implemented. Under this alternative, socioeconomic effects related to implementation of ongoing resource management plans would be similar to those for the No Action/No Project Alternative.

Summary of Economic Effects

Table 3.15-65 summarizes economic effects quantified in this section. Table 3.15-66 summarize effects of ongoing restoration actions and the KBRA under each alternative.

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>Dam Decommissioning</p> <p>Economic Region: Klamath County OR Siskiyou County CA</p> <p>Regional Economy: Employment (Jobs): 48,204 Labor Income: \$1,928 million Output: \$5,139 million</p>	<p>No dam decommissioning under Alternative 1.</p>	<p>Short-term effects during the one year decommissioning. Increase of approximately 1,400 jobs, \$60 million in labor income, and \$163 million in output.</p>	<p>Short-term effects during the one year decommissioning. Increase of approximately 1,100 jobs, \$48 million in labor income, and \$132 million in output.</p>	<p>Short-term effects during the construction period. Would increase jobs, labor income, and output relative to Alternative 1.</p>	<p>Short-term effects during the construction period. Would increase jobs, labor income, and output relative to Alternative 1.</p>
<p>Operation and Maintenance</p> <p>Economic Region: Klamath County OR Siskiyou County CA</p> <p>Regional Economy: Employment (Jobs): 48,204 Labor Income: \$1,928 million Output: \$5,139 million</p>	<p>O&M expenditures would support 49 jobs, \$2 million in labor income and \$5 million in output.</p>	<p>No long-term annual O&M expenditures. Decrease of approximately 49 jobs, \$2 million of labor income, and \$5 million in output.</p>	<p>Decrease of approximately 2 jobs. Labor income and output would remain the same compared to Alternative 1</p>	<p>O&M expenditures and effect on regional economy would be similar to Alternative 1.</p>	<p>Decrease O&M expenditures and adversely affect the regional economy.</p>

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>Mitigation</p> <p>Economic Region: Klamath County OR Siskiyou County CA</p> <p>Regional Economy: Employment (Jobs): 48,204 Labor Income: \$1,928 million Output: \$5,139 million</p>	None mitigation under Alternative 1.	Temporary, short-term effects from 2018-2025. Increase of approximately 220 jobs, \$10 million in labor income, and \$31 million in output.	Same as Alternative 2.	Some mitigation would be required. Increase relative to Alternative 1.	Some mitigation would be required. Increase relative to Alternative 1.

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>Irrigated Agriculture</p> <p>Economic Region: Klamath County OR Siskiyou and Modoc Counties CA</p> <p>Regional Economy: Employment (Jobs): 52,141 Labor Income: \$2,083 million Output: \$5,497 million</p>	<p>Effects equal for all years except drought years of 1975, 1992, 1994, 2001, and 2008.</p> <p>2027 — Jobs 1,361 Labor Income \$45 million Output \$184 million</p> <p>2043 — Jobs 766 Labor Income \$33 million Output \$118 million</p> <p>2045 — Jobs 1,076 Labor Income \$40 million Output \$156 million</p> <p>2051 — Jobs 1,286 Labor Income \$44 million Output \$177 million</p> <p>2059 — Jobs 1,403 Labor Income \$46 million Output \$188 million</p>	<p>Effects equal for all years except drought years. Increased job, labor income, and employment in drought years relative to Alternative 1.</p> <p>2027 — Jobs +112 Labor Income +\$2 million Output +\$13 million</p> <p>2043 — Jobs +695 Labor Income +\$11 million Output +\$84 million</p> <p>2045 — Jobs +397 Labor Income +\$7 million Output +\$41 million</p> <p>2051 — Jobs +187 Labor Income +\$4 million Output \$20 million</p> <p>2059 — Jobs +70 Labor Income +\$2 million Output +\$9 million</p>	<p>Same as Alternative 2</p>	<p>Same as Alternative 1.</p>	<p>Same as Alternative 1.</p>

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>Commercial Fishing</p> <p>San Francisco Management Area Employment (Jobs): 3,060,366 Labor Income: \$204,685 million Output: \$599,164 million</p> <p>Fort Bragg Management Area Employment (Jobs): 40,117 Labor Income: \$1,731 million Output: \$4,814 million</p> <p>KMZ-CA Employment (Jobs): 71,633 Labor Income: \$2,983 million Output: \$7,360 million</p> <p>KMZ-OR Employment (Jobs): 8,656 Labor Income: \$311 million Output: \$859 million</p> <p>Central Oregon Management Area Employment (Jobs): 258,047 Labor Income: \$10,170 million Output: \$27,815 million</p>	<p>Regional economic effects supported by ocean commercial fishing</p> <p>San Francisco Management Area Jobs: 510 Labor Income: \$6.10 million Output: \$15.52 million</p> <p>Fort Bragg Management Area Jobs: 162 Labor Income: \$2.45 million Output: \$5.62 million</p> <p>KMZ-CA Jobs: 44 Labor Income: \$0.19 million Output: \$0.45 million</p> <p>KMZ-OR Jobs: 26 Labor Income: \$0.15 million Output: \$0.33 million</p> <p>Central Oregon Management Area Jobs: 319 Labor Income: \$4.15 million Output: \$9.55 million</p>	<p>Increased job, labor income, and employment relative to Alternative 1.</p> <p>San Francisco Management Area Jobs: +218 Labor Income: +\$2.56 million Output: +\$6.6 million</p> <p>Fort Bragg Management Area Jobs: +69 Labor Income: +\$1.05 million Output: +\$2.41 million</p> <p>KMZ-CA Jobs: +19 Labor Income: +\$0.07 million Output: +\$0.19 million</p> <p>KMZ-OR Jobs: +11 Labor Income: +\$0.06 million Output: +\$0.13 million</p> <p>Central Oregon Management Area Jobs: +136 Labor Income: +\$1.74 million Output: +\$4.07 million</p>	<p>Same as Alternative 2.</p>	<p>Positive, long-term effects. Increase relative to Alternative 1, but less than the Proposed Action and Alternative 3.</p>	<p>Positive, long-term effects. Increase relative to Alternative 1, but less than the Proposed Action and Alternative 3.</p>

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>In-River Sport Fishing</p> <p>Economic Region: Klamath County OR Del Norte, Humboldt, and Siskiyou Counties CA</p> <p>Regional Economy: Employment (Jobs): 119,837 Labor Income: \$4,911 million Output: \$12,499 million</p>	<p>Recreational Salmon Fishery In river salmon fishing trip expenditures support 34 jobs, \$0.93 million of labor income and \$2.01 million in output.</p> <p>Recreational Steelhead Fishery In river salmon fishing trip expenditures support 20 jobs, \$0.62 million of labor income and \$1.31 million in output.</p> <p>Recreational Redband Trout Fishery Non-resident angler trips likely to remain similar to Existing Conditions. Insufficient data to quantify regional economic impacts.</p>	<p>Recreational Salmon Fishery Increase of 3 jobs and \$0.07 million of labor income and \$0.15 million in output.</p> <p>Recreational Steelhead Fishery Possible increase in steelhead abundance. Insufficient data to quantify regional economic impacts.</p> <p>Recreational Redband Trout Fishery Probable increase in Redband abundance and distribution. Insufficient data to quantify regional economic impacts.</p>	<p>Same as Alternative 2</p>	<p>Positive, long-term effects. Increase relative to Alternative 1, but less than the Proposed Action and Alternative 3.</p>	<p>Positive, long-term effects. Increase relative to Alternative 1, but less than the Proposed Action and Alternative 3.</p>

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>Ocean Sport Fishing</p> <p>KMZ-OR Ocean sport fishing supports 3 jobs, \$0.08 million of labor income, and \$0.21 million in output.</p> <p>KMZ-CA Ocean sport fishing supports 13 jobs, \$0.42 million of labor income, and \$1.12 million in output.</p> <p>KMZ-OR Employment (Jobs): 8,656 Labor Income: \$311 million Output: \$859 million</p> <p>KMZ-CA Employment (Jobs): 71,633 Labor Income: \$2,983 million Output: \$7,360 million</p>	<p>KMZ-OR Ocean sport fishing supports 3 jobs, \$0.08 million of labor income, and \$0.21 million in output.</p> <p>KMZ-CA Ocean sport fishing supports 13 jobs, \$0.42 million of labor income, and \$1.12 million in output.</p>	<p>KMZ-OR Increase of approximately 1 job, \$0.02 million in labor income, and \$0.09 million.</p> <p>KMZ-CA Increase of 5 jobs, \$0.18 million of labor income, and \$0.48 million in output.</p>	<p>Same as Alternative 2.</p>	<p>Positive, long-term effects. Increase relative to Alternative 1, but less than the Proposed Action and Alternative 3.</p>	<p>Positive, long-term effects. Increase relative to Alternative 1, but less than the Proposed Action and Alternative 3.</p>
<p>Refuge Recreation</p> <p>Economic Region: Klamath County OR Siskiyou County CA</p> <p>Regional Economy: Employment (Jobs): 48,204 Labor Income: \$1,928 million Output: \$5,139 million</p>	<p>Refuge hunting expenditures supports 11 jobs, \$0.26 million of labor income and \$0.62 million in output.</p>	<p>Increase of 5 jobs, \$0.12 million in labor income, and \$0.27 million in output.</p>	<p>Same as Alternative 2.</p>	<p>Similar to Alternative 1.</p>	<p>Similar to Alternative 1.</p>

Table 3.15-65. Summary of Regional Economic Effects for Each Alternative

Category	Alternative 1 - No Action	Alternative 2 - Full Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 3 - Partial Facilities Removal of Four Dams Incremental changes from Alternative 1	Alternative 4 - Fish Passage at Four Dams Incremental changes from Alternative 1	Alternative 5 - Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Incremental changes from Alternative 1
<p>Reservoir Recreation</p> <p>Economic Region: Klamath County OR Siskiyou County CA</p> <p>Regional Economy: Employment (Jobs): 48,204 Labor Income: \$1,928 million Output: \$5,139 million</p>	<p>Reservoir recreation expenditures supports 7 jobs, \$0.22 million in labor income and \$0.54 million in output.</p>	<p>Decrease of approximately 4 jobs, \$0.13 million in labor income and \$0.31 in output.</p>	<p>Same as Alternative 2.</p>	<p>Same as Alternative 1.</p>	<p>Same as Alternative 2 for recreation losses at Iron Gate and Copco 1 Reservoirs. Same as Alternative 1 because of maintained recreation at J.C. Boyle Reservoir.</p>
<p>Whitewater Recreation</p> <p>Economic Region: Klamath, Jackson Humboldt, and Siskiyou counties</p> <p>Regional Economy: Employment (Jobs): 224,667 Labor Income:\$8,682 million Output: \$23,330 million</p>	<p>Whitewater boating expenditures supports 56 jobs, \$1.56 million in labor income and \$4.31 million in output.</p>	<p>Decrease of approximately 14 jobs, \$0.43 million in labor income and \$0.89 million in output.</p>	<p>Same as Alternative 2.</p>	<p>Negative, long-term effects on the regional economy. Decrease relative to Alternative 1.</p>	<p>Negative, long-term effects on the regional economy. Decrease relative to Alternative 1.</p>

Source: Reclamation 2011 for Alternatives 1, 2, and 3

Table 3.15-66. Summary of Regional Economic Effects over 15 Years of Ongoing Restoration Activities and KBRA Implementation

KBRA Program	Alternative 1 - No Action/No Project Alternative	Alternative 2, Proposed Action, Incremental Changes to Alternative 1	Alternative 3 Incremental Changes to Alternative 1	Alternative 4 Incremental Changes to Alternative 1	Alternative 5 Incremental Changes to Alternative 1
<p>Fisheries Program</p> <p>Economic Region: Klamath County OR Del Norte, Humboldt, and Siskiyou Counties CA</p> <p>Regional Economy: Employment (Jobs): 119,837 Labor Income: \$4,911 million Output: \$12,499 million</p>	<p>Fishery restoration, reintroduction and monitoring expenditures supports 2,015 jobs, \$95 million in labor income and \$203 million in output.</p>	<p>Increase of approximately 3,917 jobs, \$186.8 million in labor income and \$380 million in output.</p>	<p>Same as Alternative 2.</p>	<p>Similar to Alternative 1.</p>	<p>Similar to Alternative 1.</p>
<p>Water Resources Program</p> <p>Economic Region: Klamath County OR Del Norte, Humboldt, and Siskiyou Counties CA</p> <p>Regional Economy: Employment (Jobs): 119,837 Labor Income: \$4,911 million Output: \$12,499 million</p> <p>Economic Region (related to Klamath Project): Klamath County OR Modoc and Siskiyou Counties CA</p> <p>Regional Economy: Employment (Jobs): 52,140 Labor Income: \$2,082 million Output: \$5,498 million</p>	<p>No ongoing activities under the water resources program.</p>	<p>Water resources program expenditures supports 243 jobs, \$11.2 million in labor income and \$24.2 million in output.</p> <p>See for Irrigated Agriculture and Refuge Recreation Table 3.15-65 for effects of KBRA actions.</p>	<p>Same as Alternative 2.</p>	<p>Similar to Alternative 1.</p>	<p>Similar to Alternative 1.</p>

Table 3.15-66. Summary of Regional Economic Effects over 15 Years of Ongoing Restoration Activities and KBRA Implementation

KBRA Program	Alternative 1 - No Action/No Project Alternative	Alternative 2, Proposed Action, Incremental Changes to Alternative 1	Alternative 3 Incremental Changes to Alternative 1	Alternative 4 Incremental Changes to Alternative 1	Alternative 5 Incremental Changes to Alternative 1
<p>Regulatory Assurances:</p> <p>Economic Region: Klamath County OR Del Norte, Humboldt, and Siskiyou Counties CA</p> <p>Regional Economy: Employment (Jobs): 119,837 Labor Income: \$4,911 million Output: \$12,499 million</p>	No ongoing activities	Implementation of regulatory assurances would support 146 jobs, \$7 million in labor income and \$14.4 million in output.	Same as Alternative 2.	Similar to Alternative 1.	Similar to Alternative 1.
<p>County Program:</p> <p>Siskiyou County CA Employment (Jobs): 17,679 Labor Income: \$755 million Output: \$2,107 million</p> <p>Klamath County OR Employment (Jobs): 30,525 Labor Income: \$1,174 million Output: \$3,032 million</p>	No ongoing activities	<p>\$20 million of funding for Siskiyou County would increase jobs, labor income and output.</p> <p>\$3.2 million of funding for Klamath County would increase jobs, labor income and output.</p>	Same as Alternative 2.	Similar to Alternative 1.	Similar to Alternative 1.

Table 3.15-66. Summary of Regional Economic Effects over 15 Years of Ongoing Restoration Activities and KBRA Implementation

KBRA Program	Alternative 1 - No Action/No Project Alternative	Alternative 2, Proposed Action, Incremental Changes to Alternative 1	Alternative 3 Incremental Changes to Alternative 1	Alternative 4 Incremental Changes to Alternative 1	Alternative 5 Incremental Changes to Alternative 1
<p>Tribal Program:</p> <p>Karuk Tribes: Siskiyou County CA Employment (Jobs): 17,679 Labor Income: \$755 million Output: \$2,107 million</p> <p>Klamath Tribes: Klamath County OR Employment (Jobs): 30,525 Labor Income: \$1,174 million Output: \$3,032 million</p> <p>Yurok Tribes: Humboldt County CA Employment (Jobs): 60,789 Labor Income: \$2,529 million Output: \$6,388 million</p>	<p>Karuk Tribal Program expenditures supports 237 jobs, \$10.5 million in labor income and \$16.3 million in output.</p> <p>Klamath Tribal Program expenditures supports 174 jobs, \$8.7 million in labor income and \$14.3 million in output.</p> <p>Yurok Tribal Program expenditures supports 208 jobs, \$10 million in labor income and \$17.8 million in output.</p>	<p>Increase of approximately 122 jobs, \$5.2 million in labor income and \$8.3 million in output.</p> <p>Increase of approximately 120 jobs, \$5.8 million in labor income and \$9.6 million in output.</p> <p>Increase of approximately 144 jobs, \$6.8 million in labor income and \$12.1 million in output.</p>	<p>Same as Alternative 2.</p>	<p>Similar to Alternative 1.</p>	<p>Similar to Alternative 1.</p>

Source: Barry 2011; Bird 2011; Dunsmoor 2011; Hicks 2011; Hillemeier 2011; Lynch 2011; Mahan. L et al. 2011; Nota 2011; Radford 2011; Stopher 2011; Tucker 2011; Wise 2011

Summary of Positive Economic Effects

Table 3.15-67 summarizes the positive economic effects of the Proposed Action and alternatives.

Table 3.15-67. Positive Effects of the Proposed Action and Alternatives

Effect	Alternatives				
	1	2	3	4	5
Changes in commercial fishing harvests could change fishing revenues and personal incomes.	NE	PE ² (long-term effect)	PE ³ (long-term effect)	PE (long-term effect)	PE (long-term effect)
Changes in tribal fishing commercial harvests could affect tribal revenues.	NE	PE ² (long-term effect)	PE ³ (long-term effect)	PE (long-term effect)	PE (long-term effect)
Changes to recreational in-river fishing opportunities could affect recreational expenditures in the regional economy.	NE	PE ² (long-term effect)	PE ³ (long-term effect)	PE (long-term effect)	PE (long-term effect)
Changes to recreational ocean fishing opportunities associated with dam removal could affect recreational expenditures in the regional economy.	NE	PE ² (long-term effect)	PE ³ (long-term effect)	PE (long-term effect)	PE (long-term effect)
Construction activities associated with dam removal would increase economic output, employment, and labor income during the construction period in Klamath and Siskiyou Counties.	NE	PE (temporary effect)	PE (temporary effect)	PE (temporary effect)	PE (temporary effect)
Mitigation spending after the deconstruction period could increase economic output, employment, and labor income.	NE	PE (temporary effect)	PE (temporary effect)	PE (temporary effect)	PE (temporary effect)
Removal of Four Facilities could increase property values of parcels near Copco 1 and Iron Gate Reservoirs.	NE	PE ¹ (long-term effect)	PE ¹ (long-term effect)	NE	PE ¹ (long-term effect)
Changes in real estate values around Copco 1 and Iron Gate Reservoirs could increase property tax revenues to Siskiyou County.	NE	PE ¹ (long-term effect)	PE ¹ (long-term effect)	NE	PE ¹ (long-term effect)
Construction worker spending could increase sales and use tax receipts in Siskiyou and Klamath Counties.	NE	PE (temporary effect)	PE (temporary effect)	PE (temporary effect)	PE (temporary effect)
KBRA actions could increase employment, labor income, and output in the regional economy.	NE	PE (temporary effect)	PE (temporary effect)	NE	NE
KBRA Water Resource Program actions could increase farm revenues to irrigators	NE	PE (long-term effect)	PE (long-term effect)	NE	NE
KBRA Water Resource Program actions could increase recreational expenditures at refuges	NE	PE (long-term effect)	PE (long-term effect)	NE	NE

Key:

Alternative 1 = No Action/No Project Alternative

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

Alternative 3 = Partial Facilities Removal of Four Dams Alternative

Alternative 4 = Fish Passage at Four Dams Alternative

Alternative 5 = Fish Passage at J.C. Boyle and Copco 2, Remove Copco 1 and Iron Gate Alternative

PE = Positive Effect

NE = No effect

1- Positive effects possible in future years, may be adverse effects in the short term.

2- Relative to Alternative 1, the long term positive effects of Alternative 2 are larger than the positive effect of Alternatives 4 and 5.

3- Same as Alternative 2.

3.15.4 References

Barry, Matthew. 2011. (USFWS). Phone correspondence with Gina Veronese of CDM, Carlsbad, California. May 18, 2011.

Bird, Jerry (U.S. Forest Service). 2011. Email correspondence with Gina Veronese of CDM, Carlsbad, California. June 08, 2011.

Borok, S. 2009. Task 5 – Angler Creel Surveys in the Lower Klamath River. In: Sinnen, W. et al. Annual Report – Trinity River Basin Salmon and Steelhead Monitoring Project, 2006-2007 Season. State of California, The Resources Agency, Department of Fish and Game.

Buchanan, D. et al. 2011. Klamath River Expert Panel Final Report – Scientific Assessment of Two Dam Removal Alternatives on Resident Fish. With the assistance of PBS&J, Portland, OR.

Bureau of Land Management. 2010. Trip Cards.

Bureau of Reclamation (Reclamation). 2011. Economics and Tribal Summary Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon. Bureau of Reclamation, Technical Service Center, Denver, CO.

Reclamation. 2011a. Benefit Cost and Regional Economic Development Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon. Bureau of Reclamation, Technical Service Center, Denver, CO.

Reclamation. 2011b. Irrigated Agriculture Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon. Bureau of Reclamation, Technical Service Center, Denver, CO.

Reclamation. 2011c. Hydrology, Hydraulics and Sediment Transport Studies for the Secretary's Determination on Klamath River Dam Removal and Basin Restoration. Technical Report No. SRH-2011-02. Bureau of Reclamation, Technical Service Center, Denver, CO

Reclamation. 2011d. Reservoir Recreation Economics Technical Report for the Klamath Hydroelectric Settlement Agreement and the Klamath Basin Restoration Agreement Including the Secretarial Determination on Whether to Remove Four Dams in California and Oregon.

California Employment Development Department (EDD). 2010. Unemployment Rates (Labor Force). Accessed: February 17, 2011. Available at:
<http://www.labormarketinfo.edd.ca.gov/cgi/dataanalysis/AreaSelection.asp?tableName=Labforce&geogArea=0601000000>

California Public Utilities Commission (CPUC). 2011. Decision Approving a Rate Increase for PacifiCorp pursuant to the Klamath Hydroelectric Settlement Agreement. Decision 11-005-002 May 5, 2011.

California State Board of Equalization (BOE). 2010a. California City & County Sales and Use Tax Rates. Accessed: February 16, 2011. Available at: <http://www.boe.ca.gov/cgi-bin/rates.cgi?LETTER=S&LIST=CITY>

BOE. 2010b. California Timber Harvest By County Year 2009. Accessed: February 17, 2011. Available at: <http://www.boe.ca.gov/proptaxes/pdf/ytr362009.pdf>.

Close, D. et al. 2010. Klamath River Expert Panel Final Report – Scientific Assessment of Two Dam Removal Alternatives on Lamprey. With the assistance of PBS&J, Portland, OR.

Deur, D. 2011. The Klamath Tribes – An Ethnographic Assessment of Cultural Resource Impacts. Secretarial Determination, Klamath Hydroelectric Project EIS.

Department of the Interior (DOI), Office of the Solicitor. 1993. Memorandum M-36979 on the subject of "Fishing Rights of the Yurok and Hoopa Valley Tribe".

DOI, Reclamation. 2011a. Dam Removal Real Estate Evaluation Report. March 22, 2011.

DOI, 2011b. Whitewater Boating Recreation Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

Dunne, T. et al. April 25, 2011. Klamath River Expert Panel Final Report – Scientific Assessment of Two Dam Removal Alternatives on Coho Salmon and Steelhead. With the assistance of PBS&J, Portland, OR.

Dunsmoor, Larry (Water Management Liaison Klamath Tribes). 2011. Email correspondence with Dennis Lynch, Program Manager Klamath Basin Secretarial Determination. July 7, 2011.

Federal Energy Regulatory Commission (FERC). 2007. Final Environmental Impact Statement for hydropower license. Klamath Hydroelectric Project (FERC Project No. 2082-027). <http://www.ferc.gov/industries/hydropower/enviro/eis/2007/11-16-07.asp>.

Gates, T. and M. Novell. 2011. Effects of PacifiCorp Dams on Indian Trust Resources and Cultural Values in the Klamath River Basin – Background Technical Report. Prepared for Bureau of Indian Affairs, Cultural/Tribal Sub-team, Sacramento, California, Contract GS-10F-0008S.

Goodman, D. et al. 2011. Klamath River Expert Panel Addendum to Final Report – Scientific Assessment of Two Dam Removal Alternatives on Chinook Salmon. With the assistance of PBS&J, Portland, OR.

Hamilton, J. et al. 2010. Synthesis of the Effects to Fish Species of Two Management Scenarios for the Secretarial Determination on Removal of the Lower Four Dams on the Klamath River. Prepared by the Biological Subgroup (BSG) for the Secretarial Determination (SD) Regarding Potential Removal of the Lower Four Dams on the Klamath River. Final draft dated November, 23, 2010.

Hendrix, N. 2011. Forecasting the response of Klamath Basin Chinook populations to dam removal and restoration of anadromy versus no action. R2 Resource Consultants, Inc., Redmond WA.

Hicks, Jon (Bureau of Reclamation). 2011. Phone correspondence with Gina Veronese of CDM, Carlsbad, California. May 20, 2011.

Hillemeier, Dave (Klamath Coordinator Yurok Tribe). 2011. Email correspondence with Dennis Lynch, Program Manager Klamath Basin Secretarial Determination. July 8, 2011.

Howe and Goemans. 2003. Water Transfers and their Impacts: Lessons from Three Colorado Water Markets. *Journal of the American Water Resources Association* 39(5):1055-1065.

IMPLAN (Minnesota IMPLAN Group, Inc.), 2010. 2009 IMPLAN Data.

Jackson, T.A. 2007. California Steelhead Fishing Report-Restoration Card: A Report to the Legislature. State of California, The Resources Agency, Department of Fish and Game.

Karuk Tribe. Undated. Karuk Cultural Impacts of Dam Removal. Prepared by the Karuk Tribe for use in the development of environmental reports associated with the Secretarial Public Trust Determination on Klamath Dam Removal.

Klamath County Assessor. 2008. Ownership Breakdown-2008 Generated 10/13/2008 br. Accessed: February 2, 2011. Available at:
<http://klamathcounty.org/depts/assessor/Ownership.pdf>

Lewis, R.S.P. 2009. Yurok and Karuk traditional ecological knowledge: insights into Pacific lamprey populations of the Lower Klamath Basin. *American Fisheries Society Symposium*. 72: 1-39.

Lynch, Dennis (U.S. Geological Survey). 2011. Phone correspondence with Gina Veronese of CDM, Carlsbad, California. July 6, 2011.

Mahan, Leah (NOAA Fisheries Service); Golightly, Paula and Hetrick, Nick (USFWS). 2011. Phone correspondence with Gina Veronese of CDM, Carlsbad, California. May 23, 2011.

Maillett, Edward. U.S. Fish and Wildlife Service, Division of Economics. Refuge Recreation Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon. 2011.

Markle, D.F. and M.S. Cooperman. 2001. Relationships between Lost River and shortnose sucker biology and management of Upper Klamath Lake. In: Water Allocation in the Klamath Reclamation Project, 2001: An Assessment of Natural Resource, Economic, Social, and Institutional issues with a Focus on Upper Klamath Basin. Oregon State University, University of California.

National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. 2011a. Commercial Fishing Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011b. Hoopa Valley Tribe Fishery Socioeconomics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011c. Karuk Tribe Fishery Socioeconomics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011d. Klamath Tribes Fishery Socioeconomics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011e. Resighini Rancheria Fishery Socioeconomics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011f. Yurok Tribe Fishery Socioeconomics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011g. In-River Sport Fishing Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

NOAA Fisheries Service. 2011h. Ocean Sport Fishing Economics Technical Report for the Secretarial Determination on Whether to Remove Four Dams on the Klamath River in California and Oregon.

Nota, Christine (U.S. Forest Service). 2011. Phone correspondence with Dave Auslam of CDM, Irvine, California. June 2, 2011.

Norgaard, K.M. 2005. The Effects of Altered Diet on the Health of the Karuk People. Submitted to Federal Energy Regulatory Commission Docket #P-2082 on Behalf of the Karuk Tribe of California.

Oregon Department of Forestry. 2010. Annual Timber Harvest Reports. Accessed: August 8, 2011. Available at:
http://www.oregon.gov/ODF/STATE_FORESTS/FRP/annual_reports.shtml

Oregon Employment Department. 2010. Labor Force Data Unemployment Rate Annual Data. Accessed: February 17, 2011. Available at:
<http://www.qualityinfo.org/olmisj/labforce?stat=unemprate&periodtype=01&year=2009&year=2008&year=2007&year=2006&year=2005&year=2004&year=2003&year=2002&year=2001&year=2000&year=1999&year=1998&month=00&ysort=asc&msort=asc&key=Continue>

Oregon Public Utility Commission (OPUC). 2010. US 219 Order in the Matter of PacifiCorp Application to Implement the Provisions of Senate Bill 76.

Pacific Fishery Management Council (PFMC). 2011. Review of 2010 Ocean Salmon Fisheries.

PacifiCorp. 2004. Final Technical Report. Klamath Hydroelectric Project (FERC Project No. 2082) Socioeconomic Resources. Version: February 2004.

PacifiCorp. 2009. Siskiyou County Payroll of PacifiCorp. Data from 2009.

Payne. 2009. Klamath National Forest River Management Report.

Radford, Linda (California Department of Fish and Game). 2011. Phone correspondence with Dave Auslam of CDM, Irvine, California. May 25, 2011.

Recovery.gov. 2011. Recipients Reported Awards Map. Accessed: May 3, 2011. Available at: <http://www.recovery.gov/Pages/default.aspx>

Siskiyou County. 2010. Siskiyou County California Final Budget July 1, 2010 to June 30, 2011.

Siskiyou County. 2011a. Siskiyou County Tax Information. Email communication between Dave Auslam of CDM and Jennie Ebejer of Siskiyou County on February 2, 2011.

Siskiyou County. 2011b. PacifiCorp Taxes Paid. Email communication between Dave Auslam of CDM and Wayne Hammar of Siskiyou County on February 3, 2011.

Snyder, J.O. 1931. Salmon of the Klamath River, California. Division of Fish and Game of California. Fish Bulletin No. 34.

Stopher, Mark. 2011. (Department of Fish and Game). Phone correspondence with Gina Veronese of CDM, Carlsbad, California. May 19, 2011.

Turner. 2011. Utility Property Tax Statement. Email communication between Dave Auslam of CDM and Laura Turner of Klamath County Commissioners on February 28, 2011.

Tucker, Craig (Klamath Coordinator Karuk Tribe). 2011. Email correspondence with Dennis Lynch, Program Manager Klamath Basin Secretarial Determination. July 6, 2011.

U.S. Fish and Wildlife Service (USFWS) et al. 1999. Trinity River Mainstem Fishery Restoration. Public Draft Environmental Impact Statement/Report, Section 3.6. Tribal Trust.

U.S. Forest Service. 2010. Trip Cards.

Wise, Ted (Oregon State). 2011. Phone correspondence with Gina Veronese of CDM, Carlsbad, California. May 26, 2011.