

Chapter 19

1 Socioeconomics

2 19.1 Introduction

3 This Chapter describes socioeconomic conditions in the Study Area; and potential
 4 changes that could occur as a result of implementing the alternatives evaluated in
 5 this Environmental Impact Statement (EIS). Implementation of the alternatives
 6 could affect socioeconomic conditions through potential changes in operation of
 7 the Central Valley Project (CVP) and State Water Project (SWP) that would
 8 change CVP and SWP water supply availability to agricultural water users and
 9 municipal and industrial (M&I) water users. Changes in CVP and SWP
 10 operations also would result in changes to recreational resources at reservoirs that
 11 store CVP and SWP water.

12 Changes in agricultural production, including costs to provide Alternative water
 13 supplies when CVP and SWP water supplies are not available, are presented in
 14 Chapter 12, Agricultural Resources. Changes in reservoir recreational
 15 opportunities that would occur due to reduction in reservoir storage elevations are
 16 presented in Chapter 15, Recreational Resources. The results of these analyses
 17 are summarized in Section 19.4, Environmental Consequences, of this
 18 Chapter and considered in the determination of regional socioeconomics effects.

19 19.2 Regulatory Environment and Compliance 20 Requirements

21 Potential actions that could be implemented under the alternatives evaluated in
 22 this EIS could affect socioeconomic conditions in portions of the Study Area
 23 affected by or served by CVP and SWP water supplies. Actions located on public
 24 agency lands; or implemented, funded, or approved by Federal and state agencies
 25 would need to be compliant with appropriate Federal and state agency policies
 26 and regulations, as summarized in Chapter 4, Approach to Environmental
 27 Analyses.

28 19.3 Affected Environment

29 This section describes socioeconomic conditions that could be potentially affected
 30 by implementation of the alternatives considered in this EIS. The socioeconomic
 31 conditions described in this Chapter are related to population, employment,
 32 income, and taxes.

33 Housing information is not described in this Chapter because implementation of
 34 the No Action Alternative, Second Basis of Comparison, and Alternatives 1
 35 through 5 would not result in changes to land use that would displace or relocate

1 housing stocks. Land use would be the same under the No Action Alternative,
2 Second Basis of Comparison, and Alternatives 1 through 5, as described in
3 Chapter 13, Land Use. The only changes in land use between recent historical
4 conditions and conditions in 2030 for the No Action Alternative, Second Basis of
5 Comparison, and Alternatives 1 through 5 would occur due to ecosystem
6 restoration on agricultural lands, open space, and public lands that do not support
7 housing units.

8 **19.3.1 Characterization of Socioeconomic Conditions**

9 Characterization of the socioeconomic conditions within the Study Area is based
10 upon publically available data sources. The data sources used include the U.S.
11 Census Bureau, U.S. Bureau of Economic Analysis, U.S. Bureau of Labor
12 Statistics, California Department of Finance, California Employment
13 Development Department, and California Board of Equalization. The data were
14 summarized and used to compare historical and current trends in the
15 socioeconomic conditions in the Study Area.

16 Population and income data used to characterize the socioeconomic conditions are
17 reported from 2000 to 2012 by the California Department of Finance.

18 The employment data presented in this Chapter are reported from 2001 to 2008
19 and from 2008 to 2012 (the latest values from consistent data sources). The first
20 period from 2001 to 2008 represents a period of time prior to implementation of
21 the 2008 U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) and
22 the 2009 National Marine Fisheries Service (NMFS) BO. The second period
23 from 2008 to 2012 represents a period of time following implementation of the
24 2008 USFWS BO and 2009 NMFS BO.

25 There are two estimates of employment that are typically used to describe
26 employment. The civilian labor force employment data compiled by the Bureau
27 of Labor Statistics reflect the employment status of individuals that are covered
28 by unemployment insurance by “place of residence,” and includes the self-
29 employed, employees on unpaid leave of absence, unpaid family workers, and
30 household workers. These data do not include sole proprietors, some self-
31 employed, and some farm workers and domestic workers. Employment by
32 industry data compiled by the Bureau of Economic Analysis, including farm
33 employment, reflect jobs by “place of work” and include sole proprietors and
34 active partners, self-employed, farm workers, and domestic workers. Individuals
35 with more than one job are counted only once in civilian labor force data and
36 counted in each job in the employment by industry data. Therefore, the
37 employment by industry data are greater than the civilian labor force data.

38 **19.3.2 Trinity River Region**

39 The Trinity River Region includes the area in Trinity County along the Trinity
40 River from Trinity Lake to the confluence with the Klamath River; and in
41 Humboldt and Del Norte counties along the lower Klamath River from the
42 confluence with the Trinity River to the Pacific Ocean. Tribal lands along the
43 Trinity or lower Klamath River within the Trinity River Region include the

1 Hoopa Valley Indian Reservation, Yurok Indian Reservation, and Resighini
2 Rancheria.

3 Trinity County includes extensive trails, lakes, and the Trinity River Scenic
4 Byway, providing several venues for outdoor enthusiasts and travelers. The
5 recreation and tourism industries are major contributors to the local economy of
6 Trinity County (EDD 2013).

7 Humboldt County is the largest and most populous of the north coast counties. Its
8 2012 population of 134,728 ranked 35th among the 58 counties in California
9 (EDD 2014a). Humboldt County encompasses 2.3 million acres, 80 percent of
10 which is forestlands, protected redwoods and recreation areas (Humboldt County
11 2014). Humboldt County is the leading timber producing county in the state
12 (CDFA 2014). As described in Chapter 13, Land Use, the portion of Humboldt
13 County in the Trinity River Region evaluated in this EIS is located along the
14 Trinity and Klamath rivers. This portion of the county includes the communities
15 of Willow Creek and Orleans within Humboldt County; Hoopa in the Hoopa
16 Valley Indian Reservation; and the communities of Weitchpec, Cappell, Pecwan,
17 and Johnson's in the Yurok Tribe Indian Reservation (Humboldt County 2012).

18 Del Norte County is the northernmost county in California. The county includes
19 Redwood National Park and other state parks making tourism a natural industry in
20 the county (EDD 2014b). As described in Chapter 13, Land Use, the portion of
21 Del Norte County in the Trinity River Region evaluated in this EIS is located
22 along the lower Klamath River. Most of this area is located within the Yurok
23 Indian Reservation, and includes the communities of Requa and Klamath (Del
24 Norte County 2003).

25 **19.3.2.1 Population**

26 Population in the Trinity River Region, by county and for the region as a whole, is
27 presented in Table 19.1. The population of Trinity River Region has increased,
28 although at a small average annual growth rate for the period shown.

29 **Table 19.1 Population Characteristics in Trinity River Region**

Area	Population 2000	Population 2012	Average Annual Growth Rate (percent) 2000-2012
Trinity County	13,022	13,471	0.3
Humboldt County	126,518	134,728	0.5
Del Norte County	27,507	28,527	0.3
Total Trinity River Region	167,047	176,726	0.5
STATE OF CALIFORNIA	33,873,086	37,427,946	0.9

30 Sources: DOF 2013a, 2013b, 2014

1 Tribal enrollment for the Hoopa Valley Tribe, Yurok Tribe, Karuk Tribe, and
 2 Resighini Rancheria as reported by the Bureau of Indian Affairs is presented in
 3 Table 19.2. These values do not necessarily include all members that live within
 4 the area, and should be considered as representative of trends. Values were only
 5 available for the years of 2001, 2003, 2005, and 2013.

6 **Table 19.2 Tribal Enrollment in Trinity River Region**

Tribe	2001	2003	2005	2013
Hoopa Valley Tribe	1,893	1,893	1,893	1,719 ^a
Yurok Tribe	4,466	4,466	4,912	Not available
Karuk Tribe	3,165	3,165	3,427	Not available
Resighini Rancheria	90	175	111	Not available
TOTAL	9,614	9,699	10,343	-

7 Sources: BIA 2003, 2006, 2008, 2014

8 Note:

9 a. Value is reported as population, not enrollment, for Hoopa Valley Tribe in 2013.

10 **19.3.2.2 Employment**

11 Civilian labor force characteristics for the Trinity River Region are presented in
 12 Table 19.3. The civilian labor force (composed of employment and
 13 unemployment) in the Trinity River Region increased between 2001 and 2008 and
 14 between 2008 and 2012 (BLS 2014).

15 **Table 19.3 Civilian Labor Force and Unemployment Rates in Trinity River Region**

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
Trinity County	5,394	4,855	5,019	9.3	12.7	15.8
Humboldt County	60,443	60,039	60,144	6.0	7.2	10.5
Del Norte County	10,221	11,376	11,381	8.0	8.8	13.4
Total Trinity River Region	76,058	76,270	76,544	6.5	7.8	11.2
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	5.4	7.2	10.5

16 Source: BLS 2014

17 Available labor force and unemployment rates for members of the tribes in the
 18 Trinity River Region are presented in Table 19.4. These individuals may or may
 19 not be included in the values presented in Table 19.3 because different sources are
 20 used for each table.

Table 19.4 Available Labor Force and Unemployment Rates Related to the Tribes in Trinity River Region

Area	Civilian Labor Force				Unemployment Rate (percent)			
	2001	2003	2005	2013	2001	2003	2005	2013
Hoopa Valley Tribe	1,043	1,043	1,043	NA	40	40	40	42
Yurok Tribe	2,151	2,151	1,096	NA	74	74	74	38
Karuk Tribe	3,307	3,307	915	NA	14	14	63	29
Resighini Rancheria	37	44	45	NA	57	59	60	NA

Sources: BIA 2003, 2006, 2008, 2014

Note:

NA = Not Available

Total employment and the farm employment in 2001, 2008 and 2012 in the Trinity River Region counties are presented in Table 19.5. The Trinity River Region farm employment represents less than 1 percent of farm employment in the state and the lowest amount of farm employment in counties within the Study Area, as indicated in Figure 19.1.

Table 19.5 Employment in Trinity River Region

Area	Total Employment			Farm Employment ^a		
	2001	2008	2012	2001	2008	2012
Trinity County	4,878	4,930	4,788	155	161	165
Humboldt County	68,596	71,552	68,861	1,662	1,383	1,227
Del Norte County	10,266	11,531	10,720	384	309	231
Total Trinity River Region	83,740	88,013	84,369	2,201	1,853	1,623
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

Source: BEA 2014a.

Note:

a. Farm employment includes employment numbers in forestry, fishing, and related activities.

19.3.2.3 Income

Per capita personal income for the Trinity River Region counties for 2000, 2008, and 2012 is presented in Table 19.6. Humboldt County had the highest per capita income, and Del Norte County had the lowest.

1 **Table 19.6 Per Capita Personal Income in Trinity River Region**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Trinity County	\$20,489	\$28,861	\$34,027	4.4	4.2
Humboldt County	\$23,980	\$32,859	\$35,681	4.0	2.1
Del Norte County	\$18,563	\$26,420	\$30,016	4.5	3.2
Total Trinity River Region	\$22,818	\$31,497	\$34,647	4.1	2.4
STATE OF CALIFORNIA	\$33,404	\$44,003	\$43,647	3.5	1.4

2 Source: BEA 2014e

3 **19.3.2.4 Local Government Finances**

4 The sales tax rates, as of April 1, 2014, were 7.5 percent in all three counties in
 5 the Trinity River Region (BOE 2014). Total annual taxable sales within the
 6 Trinity River Region in 2000, 2008, and 2012 are presented in Table 19.7. The
 7 region’s total taxable sales represents less than one tenth of one percent of total
 8 annual state taxable sales.

9 **Table 19.7 Total Taxable Sales in Trinity River Region**

Area	Total Taxable Sales (millions)			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Trinity County	\$61	\$74	\$87	2.6	3.9
Humboldt County	\$1,293	\$1,693	\$1,768	3.4	1.1
Del Norte County	\$176	\$232	\$226	3.5	-0.6
Total Trinity River Region	\$1,530	\$1,999	\$2,081	3.4	1.0
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

10 Sources: BOE 2000, 2008, 2012

11 Total property tax charges (secured and unsecured) within the Trinity River
 12 Region in Fiscal Year 2011-2012 were \$160.2 million (California State Controller
 13 2012). The Humboldt County share of the total property tax revenues was the
 14 largest at \$126 million. The Del Norte and Trinity counties contributions to the
 15 total were \$19 million and \$13 million, respectively.

16 **19.3.3 Central Valley Region**

17 The Central Valley Region extends from above Shasta Lake to the Tehachapi
 18 Mountains, and includes the Sacramento Valley, San Joaquin Valley, and Delta
 19 and Suisun Marsh subregions.

20 **19.3.3.1 Sacramento Valley**

21 The Sacramento Valley includes the counties of Shasta, Plumas, Tehama, Glenn,
 22 Colusa, Butte, Sutter, Yuba, Nevada, Placer, and El Dorado counties.
 23 Sacramento, Yolo, and Solano counties also are located within the Sacramento

1 Valley; however, these counties are discussed below as part of the Delta and
 2 Suisun Marsh subsection. Other counties in Sacramento Valley are not
 3 anticipated to be affected by changes in CVP and SWP operations, and are not
 4 discussed here, including: Alpine, Sierra, Lassen, and Amador counties.

5 The Sacramento Valley includes major agricultural counties, including Glenn,
 6 Colusa, Sutter and Placer counties, as described in Chapter 12, Agricultural
 7 Resources. The region also includes some of the leading major timber producing
 8 counties of the state. Shasta County is the second and Plumas County is the fifth
 9 among the leading timber producing counties in the state.

10 **19.3.3.1.1 Population**

11 Population characteristics in the Sacramento Valley portion of the Central Valley
 12 Region are presented in Table 19.8. Among the counties evaluated in the
 13 Sacramento Valley portion of the Central Valley Region, Placer County had the
 14 highest average annual population growth rate between 2000 and 2012; and
 15 Plumas County was the only county with a reduction in population.

16 **Table 19.8 Population Characteristics in Central Valley Region – Sacramento Valley**

Area	Population		Average Annual Growth Rate (percent)
	2000	2012	2000-2012
Shasta County	163,256	177,516	0.8
Plumas County	20,824	19,901	-0.4
Tehama County	56,039	62,985	1.1
Glenn County	26,453	28,105	0.6
Colusa County	18,804	21,552	1.2
Butte County	203,171	220,465	0.7
Yuba County	60,219	72,642	1.6
Nevada County	92,033	97,366	0.5
Sutter County	78,930	94,620	1.7
Placer County	248,399	351,463	3.2
El Dorado County	156,299	180,483	1.3
Sacramento Valley Subtotal	1,124,427	1,333,615	1.4
Total Central Valley Region	6,214,316	7,408,750	1.5
STATE OF CALIFORNIA	33,873,086	37,668,804	0.9

17 Sources: DOF 2013a, 2013b, 2014

18

19 Civilian labor force characteristics for the counties in the Sacramento Valley
 20 portion of the Central Valley Region are presented in Table 19.9. The civilian
 21 labor force increased between 2001 and 2012. The data for 2008 represents the
 22 employment situation immediately following the recent economic recession that

1 started in 2007. The average unemployment rate in the civilian labor force
 2 increased from 2001 to 2012. The average unemployment rate in the Sacramento
 3 Valley portion of the Central Valley Region between 2001 and 2012 has been
 4 higher than the state unemployment rate; and lower than for the counties in the
 5 Central Valley Region.

6 **Table 19.9 Civilian Labor Force and Unemployment Rates in Central Valley**
 7 **Region – Sacramento Valley**

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
Shasta County	77,647	82,675	81,245	6.3	10.0	13.4
Plumas County	9,958	9,824	9,478	7.6	10.5	14.7
Tehama County	24,574	25,185	25,251	6.5	9.2	13.9
Glenn County	11,239	12,196	12,841	8.8	10.4	14.7
Colusa County	9,130	10,505	11,860	12.8	13.7	20.0
Butte County	95,216	102,952	102,063	6.6	8.4	12.2
Yuba County	24,862	27,729	27,772	8.5	11.8	16.9
Nevada County	46,947	50,428	50,742	4.4	6.5	9.4
Sutter County	38,457	41,100	42,810	9.7	12.3	17.6
Placer County	139,106	177,243	178,818	4.0	6.4	9.4
El Dorado County	84,064	90,732	90,525	4.3	6.9	10.4
Sacramento Valley Subtotal	561,200	630,569	633,405	5.8	8.3	12.0
Total Central Valley Region	3,519,870	3,885,435	3,990,083	6.8	8.7	12.6
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	4.9	7.2	10.5

8 Source: BLS 2014

9 Total employment and farm employment in 2001, 2008, and 2012 in the
 10 Sacramento Valley portion of the Central Valley Region are presented in
 11 Table 19.10. The contribution of farm employment to the total employment in the
 12 Sacramento Valley portion of the Central Valley Region declined between 2001
 13 and 2008 and increased slightly by 2012.

1 **Table 19.10 Employment in Central Valley Region – Sacramento Valley**

Area	Total Employment			Farm Employment		
	2001	2008	2012	2001	2008	2012
Shasta County	85,937	91,883	86,696	1,821	1,781	1,751
Plumas County	10,813	10,524	9,493	288	140	138
Tehama County	23,760	24,284	22,669	2,716	2,332	3,042
Glenn County	11,526	11,987	11,856	2,873	1,927	2,049
Colusa County	9,770	10,863	11,266	2,943	1,954	1,831
Butte County	99,757	105,703	101,805	5,293	4,618	4,527
Yuba County	26,162	26,473	26,861	2,494	1,722	1,623
Nevada County	51,323	57,968	55,898	1,161	1,153	1,089
Sutter County	39,489	43,764	43,329	5,454	4,165	4,427
Placer County	158,070	192,171	188,729	2,064	1,925	1,844
El Dorado County	78,052	95,608	90,435	1,937	1,849	1,737
Sacramento Valley Subtotal	594,659	671,228	649,037	29,044	23,566	24,058
Total Central Valley Region	3,616,241	3,997,557	3,923,230	256,672	226,321	230,832
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

2 Source: BEA 2014a

3 Note:

4 Farm employment includes employment numbers in forestry, fishing, and related activities.

5 The annual farm employment for the Sacramento Valley portion of the Central
6 Valley Region declined in 2004 and remained relatively stable through 2012, as
7 shown in Figure 19.2. The overall trend in farm employment is influenced by the
8 farm employment trends in Butte, Sutter, Tehama, Colusa, and Glenn counties, as
9 shown in Figure 19.3. The decrease in farm employment is related to the
10 reduction in cultivated acreage during this period, as described in Chapter 12,
11 Agricultural Resources.

12 The farm employment numbers presented in Table 19.10 include only workers
13 directly involved in farming, forestry, and fishing activities. However, farming is
14 one of the most important basic industries in the Central Valley Region; and
15 supports many other businesses including farm inputs (e.g., fertilizer, seed,
16 machinery, and fuel) and processing of food and fiber grown on farms. As a
17 result, employment both directly on farm and indirectly dependent on farming is
18 higher than the values displayed in Table 19.10.

1 **19.3.3.1.3 Income**

2 The average per capita personal incomes for the counties in the Sacramento
 3 Valley portion of the Central Valley Region are presented in Table 19.11. Per
 4 capita personal incomes increased by an average annual rate of between 3 and
 5 6 percent from 2000 to 2008. Following the economic downturn that started in
 6 2007, the average annual growth in per capita personal income slowed between
 7 2008 and 2012, except in Tehama County.

8 **Table 19.11 Per Capita Personal Income in Central Valley Region –**
 9 **Sacramento Valley**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Shasta County	\$25,385	\$34,995	\$37,593	4.1	1.8
Plumas County	\$26,415	\$38,401	\$43,085	4.8	2.9
Tehama County	\$19,461	\$25,805	\$30,094	3.6	3.9
Glenn County	\$20,210	\$32,054	\$38,568	5.9	4.7
Colusa County	\$24,656	\$39,568	\$45,800	6.1	3.7
Butte County	\$23,143	\$32,379	\$35,696	4.3	2.5
Yuba County	\$19,537	\$27,655	\$32,835	4.4	4.4
Nevada County	\$32,253	\$44,960	\$47,924	4.2	1.6
Sutter County	\$25,581	\$33,117	\$36,243	3.3	2.3
Placer County	\$38,034	\$49,436	\$52,544	3.3	1.5
El Dorado County	\$37,397	\$50,052	\$54,533	3.7	2.2
Average in Sacramento Valley Counties	\$29,317	\$40,177	\$43,873	4.0	2.2
Central Valley Region	\$28,163	\$37,207	\$40,619	3.5	2.2
STATE OF CALIFORNIA	\$33,404	\$44,003	\$46,477	3.5	1.4

10 Source: BEA 2014e

11 **19.3.3.1.4 Local Government Finances**

12 As of April 1, 2014, the county sales tax rates in the counties within the
 13 Sacramento Valley portion of the Central Valley Region was 7.5 percent for all
 14 counties except Nevada County (BOE 2014). The Nevada County sales tax rate
 15 was 7.625 percent. These rates include the state, county, local and district taxes.

16 The total annual taxable sales in the Sacramento Valley portion of the Central
 17 Valley Region in 2000, 2008, and 2012 are presented in Table 19.12. The total
 18 taxable sales represent about 3 percent of total annual state taxable sales. The
 19 lower rates of growth for the period 2008 to 2012 may be attributable to the
 20 effects of the recession that started in 2007 and a decline in employment, as
 21 discussed above.

1 **Table 19.12 Total Taxable Sales in Central Valley Region – Sacramento Valley**

Area	Total Taxable Sales (millions)			Average Annual Growth Rate	
	2000	2008	2012	2000-2008	2008-2012
Shasta County	\$2,055	\$2,641	\$2,642	3.2	0.0
Plumas County	\$187	\$222	\$197	2.1	-2.9
Tehama County	\$470	\$684	\$748	4.8	2.3
Glenn County	\$231	\$318	\$327	4.1	0.7
Colusa County	\$223	\$329	\$337	5.0	0.6
Butte County	\$2,039	\$2,678	\$2,714	3.5	0.3
Yuba County	\$392	\$515	\$486	3.5	-1.4
Nevada County	\$997	\$1,187	\$1,105	2.2	-1.8
Sutter County	\$1,021	\$1,287	\$1,367	2.9	1.5
Placer County	\$4,742	\$6,635	\$7,066	4.3	1.6
El Dorado County	\$1,324	\$1,788	\$1,740	3.8	-0.7
Sacramento Valley Subtotal	\$13,680	\$18,283	\$18,729	3.7	0.6
Central Valley Region	\$83,363	\$109,401	\$114,959	3.5	1.2
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

2 Sources: BOE 2000, 2008, 2012

3 Combined (secured and unsecured) property tax revenues in each of the counties
4 in the Sacramento Valley portion of the Central Valley Region for Fiscal Year
5 2011-2012 are presented in Table 19.13. Total property tax revenues from these
6 counties accounted for about 3 percent of the total state property tax revenues.

7 **Table 19.13 Property Tax Revenues, Fiscal Year 2011-2012,**
8 **in Central Valley Region – Sacramento Valley**

Area	Property Tax Revenues (millions)
Shasta County	\$168
Plumas County	\$41
Tehama County	\$48
Glenn County	\$30
Colusa County	\$36
Butte County	\$203
Yuba County	\$62
Nevada County	\$183
Sutter County	\$103
Placer County	\$692
El Dorado County	\$300
Sacramento Valley Subtotal	\$1,866
Central Valley Region	\$9,874
STATE OF CALIFORNIA	\$55,459

9 Source: California State Controller 2012

1 **19.3.3.2 San Joaquin Valley**

2 The San Joaquin Valley includes the counties of Stanislaus, Merced, Madera,
 3 Fresno, Kings, Tulare, and Kern counties. San Joaquin County also is located
 4 within the San Joaquin Valley; however, this county is discussed below as part of
 5 the Delta and Suisun Marsh subsection. Other counties in the San Joaquin Valley
 6 are not anticipated to be affected by changes in CVP and SWP operations, and are
 7 not discussed here, including: Calaveras, Mariposa, and Tuolumne counties.

8 The San Joaquin Valley includes the major agricultural counties, of Fresno, Kern,
 9 Kings and Tulare, as described in Chapter 12, Agricultural Resources.

10 **19.3.3.2.1 Population**

11 Population characteristics in the San Joaquin Valley portion of the Central Valley
 12 Region are presented in Table 19.14. Among the counties in the San Joaquin
 13 Valley portion of the Central Valley Region, Kern County had the highest average
 14 annual population growth rate between 2000 and 2012; and Stanislaus and Kings
 15 counties had the lowest growth rate.

16 **Table 19.14 Population Characteristics in Central Valley – San Joaquin Valley**

Area	Population		Average Annual Growth Rate (percent)
	2000	2012	2000-2012
Stanislaus County	446,997	519,339	1.3
Madera County	123,109	152,325	1.8
Merced County	210,554	260,029	1.8
Fresno County	799,407	943,493	1.4
Tulare County	368,021	451,540	1.7
Kings County	129,461	151,774	1.3
Kern County	661,653	849,977	2.1
San Joaquin Valley Subtotal	2,739,202	3,328,477	1.6
Total Central Valley Region	6,062,064	7,238,742	1.5
STATE OF CALIFORNIA	33,873,086	37,668,804	0.9

17 Sources: DOF 2013a, 2013b, 2014

18 **19.3.3.2.2 Employment**

19 Civilian labor force characteristics for the counties in the San Joaquin Valley
 20 portion of the Central Valley Region are presented in Table 19.15. The civilian
 21 labor force increased between 2001 and 2012. The data for 2008 represents the
 22 employment situation immediately following the recession that started in 2007.
 23 The average unemployment rate in the civilian labor force increased from 2001 to
 24 2012. The average unemployment rates for the San Joaquin Valley portion of the
 25 Central Valley Region between 2001 and 2012 have been higher than for the
 26 entire Central Valley Region and the state.

Table 19.15 Civilian Labor Force and Unemployment Rates in Central Valley Region – San Joaquin Valley

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
Stanislaus County	214,292	231,965	239,461	8.3	11.0	15.2
Madera County	53,956	65,100	68,167	9.6	9.4	13.6
Merced County	91,825	102,251	111,322	10.1	12.5	17.0
Fresno County	389,805	430,163	442,453	10.7	10.5	15.2
Tulare County	175,357	199,124	207,634	11.4	10.8	15.8
Kings County	50,233	58,801	60,886	10.7	10.5	15.3
Kern County	297,982	359,573	396,657	8.6	9.8	13.3
San Joaquin Valley Subtotal	1,273,450	1,446,977	1,526,580	9.8	10.5	14.9
Total Central Valley Region	3,448,061	3,807,278	3,911,569	6.8	8.7	12.6
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	4.9	7.2	10.5

Source: BLS 2014

Total employment and farm employment in 2001, 2008 and 2012 in the San Joaquin Valley portion of the Central Valley Region are presented in Table 19.16. The contribution of farm employment to the total employment declined between 2001 and 2008, and then increased slightly in 2012, except in Tulare County. In Tulare County, farm employment increased between 2001 and 2008 and decreased between 2008 and 2012.

Table 19.16 Employment in Central Valley Region – San Joaquin Valley

Area	Total Employment			Farm Employment		
	2001	2008	2012	2001	2008	2012
Stanislaus County	208,016	221,632	214,446	18,708	16,000	15,784
Madera County	50,975	59,354	59,027	6,296	4,750	5,186
Merced County	82,803	92,891	93,766	14,147	12,029	8,075
Fresno County	401,025	446,939	437,934	56,655	50,798	51,277
Tulare County	168,523	191,195	186,875	42,851	38,080	36,369
Kings County	48,960	57,513	55,008	4,705	4,061	6,620
Kern County	311,946	369,152	386,642	46,307	47,661	52,583
San Joaquin Valley Subtotal	1,272,248	1,438,676	1,433,698	189,669	173,379	175,894
Total Central Valley Region	3,616,241	3,997,557	3,923,230	256,672	226,321	230,832
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

Source: BEA 2014a

Note:

Farm employment includes employment numbers in forestry, fishing, and related activities.

Annual farm employment for the San Joaquin Valley portion of the Central Valley Region declined in 2004 and continued to fluctuate through 2012, as

1 shown in Figure 19.2. Farm employment in the San Joaquin Valley portion of the
2 Central Valley Region represents a major portion of the overall farm employment
3 in the Central Valley.

4 Within the counties in the San Joaquin Valley portion of the Central Valley
5 Region, farm employment declined between 2003 and 2006 and remained about
6 the same between 2007 and 2012. The overall trend in farm employment is
7 influenced by the farm employment trends in Fresno, Kern, and Tulare counties,
8 as shown in Figure 19.4. The decrease in farm employment is related to the
9 reduction in cultivated acreage during this period, as described in Chapter 12,
10 Agricultural Resources.

11 The farm employment numbers presented in Table 19.16 include only workers
12 directly involved in farming, forestry, and fishing activities. However, farming is
13 one of the most important basic industries in the Central Valley; and supports
14 many other businesses including farm inputs (e.g., fertilizer, seed, machinery, and
15 fuel) and processing of food and fiber grown on farms. As a result, employment
16 both directly on farm and indirectly dependent on farming is higher than the
17 values displayed in Table 19.16.

18 Total farm-dependent employment is not reported in the U.S. Bureau of
19 Economic Analysis or the U.S. Bureau of Labor Statistics; however, the
20 employment values can be estimated by studies of local economies. A study of
21 the local economy in four counties of the San Joaquin Valley found that, for every
22 on-farm job, about two and one-half additional jobs are supported because of
23 inputs purchased for farming operations (NEA 1997). This estimate includes the
24 associated effects of workers on those farms and businesses spending their
25 incomes on other purchases; however, the estimated values do not include
26 employment in the processing sector. Another study indicated that the
27 employment multiplier of the agricultural production and processing industry is
28 1.92, or that for every 100 agricultural production and processing jobs in the
29 San Joaquin Valley, 92 other jobs were created in the San Joaquin Valley
30 (UCAIC 2009).

31 San Joaquin Valley employment also includes employment associated with adult
32 prison facilities. The San Joaquin Valley portion of the Central Valley Region
33 includes eight (or about 24 percent) of the 33 adult prison facilities operated by
34 the California Department of Corrections and Rehabilitation. These prisons are
35 home to about a quarter of the total prison population in the state and employ
36 about a quarter of the total prison staff in the state. Employment for these prisons
37 is summarized in Table 19.17.

1 **Table 19.17 California State Prisons in Central Valley Region - San Joaquin Valley**

Prison Facility	Location	Staff
Central California Women's Facility	Chowchilla, Madera County	1,064
Valley State Prison	Chowchilla, Madera County	1,021
Pleasant Valley State Prison	Coalinga, Fresno County	1,357
Avenal State Prison	Avenal, Kings County	1,475
California State Prison	Corcoran, Kings County	2,003
Wasco State Prison	Wasco, Kern County	1,523
North Kern State Prison	Delano, Kern County	1,393
Kern Valley State Prison	Delano, Kern County	1,545

2 Sources: CDCR 2014a, 2014b, 2014c, 2014d, 2014e, 2014f, 2014g, 2014h

3 Federal prisons are located at Atwater in Merced County, Mendota in Fresno
4 County, and Taft in Kern County within the San Joaquin Valley portion of the
5 Central Valley Region (BOP 2014).

6 **19.3.3.2.3 Income**

7 The average per capita personal income in the San Joaquin Valley portion of the
8 Central Valley Region was lower than that for the entire Central Valley Region,
9 as presented in Table 19.18. The average per capita personal income in the San
10 Joaquin Valley portion of the Central Valley Region was a little more than two-
11 thirds of the average per capita personal income in the Central Valley Region and
12 the state. With the exception of Stanislaus County, most counties in the San
13 Joaquin Valley portion of the Central Valley Region had higher annual average
14 growth in per capita personal income between 2000 and 2008 than the entire
15 Central Valley Region and the state.

16 **Table 19.18 Per Capita Personal Income in Central Valley Region –**
17 **San Joaquin Valley**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Stanislaus County	\$24,284	\$31,093	\$34,138	3.1	2.4
Madera County	\$18,983	\$26,693	\$31,169	4.4	4.0
Merced County	\$19,976	\$26,963	\$30,630	3.8	3.2
Fresno County	\$23,001	\$30,977	\$34,074	3.8	2.4
Tulare County	\$20,070	\$28,035	\$31,307	4.3	2.8
Kings County	\$16,912	\$26,339	\$31,835	5.7	4.9
Kern County	\$21,507	\$29,527	\$34,453	4.0	3.9
Average in San Joaquin Valley Counties	\$21,755	\$29,505	\$33,303	3.9	3.1
Central Valley Region	\$28,183	\$37,198	\$40,601	3.5	2.2
STATE OF CALIFORNIA	\$33,404	\$44,003	\$46,477	3.5	1.4

18 Source: BEA 2014e

1 **19.3.3.2.4 Local Government Finances**

2 As of April 1, 2014, the county sales tax rates in the counties within the San
 3 Joaquin Valley portion of the Central Valley ranged from 7.5 percent in Merced,
 4 Kern, and Kings counties to 8.225 percent in Fresno County (BOE 2014).

5 The total annual taxable sales for the counties in the San Joaquin Valley portion
 6 of the Central Valley Region in 2000, 2008, and 2012 are presented in
 7 Table 19.19. The contribution of the area to California total annual taxable sales
 8 increased between 2000 and 2012. The lower rates of growth for the period 2008
 9 to 2012 may be attributable to the effects of the recession that started in 2007 and
 10 a decline in employment, as discussed above.

11 **Table 19.19 Total Taxable Sales in Central Valley Region – San Joaquin Valley**

Area	Total Taxable Sales (millions)			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Stanislaus County	\$5,195	\$6,729	\$7,178	3.3	1.6
Madera County	\$881	\$1,327	\$1,356	5.2	0.5
Merced County	\$1,740	\$2,388	\$2,512	4.0	1.3
Fresno County	\$8,472	\$11,729	\$12,021	4.2	0.6
Tulare County	\$3,222	\$4,755	\$5,499	5.0	3.7
Kings County	\$888	\$1,389	\$1,386	5.8	-0.1
Kern County	\$6,938	\$12,086	\$14,666	7.2	5.0
Total San Joaquin Valley	\$27,337	\$40,403	\$44,619	5.0	2.5
Central Valley Region	\$81,975	\$107,699	\$113,368	3.5	1.3
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

12 Sources: BOE 2000, 2008, 2012

13 The combined (secured and unsecured) property tax revenues in each of the
 14 counties in the San Joaquin Valley portion of the Central Valley Region for Fiscal
 15 Year 2011-2012 are presented in Table 19.20. Total property tax revenues from
 16 these counties accounted for about 6 percent of the total state property tax
 17 revenues.

1 **Table 19.20 Property Tax Revenues, Fiscal Year 2011-2012,**
 2 **in Central Valley Region – San Joaquin Valley**

Area	Property Tax Revenues (millions)
Stanislaus County	\$426
Madera County	\$128
Merced County	\$197
Fresno County	\$755
Tulare County	\$327
Kings County	\$104
Kern County	\$1,102
San Joaquin Valley Subtotal	\$3,039
Central Valley Region	\$9,874
STATE OF CALIFORNIA	\$55,459

3 Source: California State Controller 2012

4 **19.3.3.3 Delta and Suisun Marsh**

5 The Delta and Suisun Marsh portion of the Central Valley Region includes
 6 Sacramento, Yolo, Solano, San Joaquin, and Contra Costa counties. These
 7 counties include some of the leading agricultural areas in the state. In addition to
 8 agriculture, this area includes important transportation infrastructures including
 9 inland shipping ports (Port of West Sacramento and Port of Stockton); major
 10 employment centers (cities of Sacramento, West Sacramento, Fairfield, Stockton,
 11 and Concord); and water-based recreation activities (e.g., boating, fishing, and
 12 water skiing).

13 **19.3.3.3.1 Population**

14 Population characteristics in the counties of the Delta and Suisun Marsh portion
 15 of the Central Valley Region are presented in Table 19.21. San Joaquin County
 16 had the highest average annual population growth rate between 2000 and 2012,
 17 and Solano County had the lowest growth rate.

1 **Table 19.21 Population Characteristics in Central Valley Region – Delta and**
 2 **Suisun Marsh**

Area	Population		Average Annual Growth Rate (percent)
	2000	2012	2000-2012
Sacramento County	1,223,499	1,433,525	1.3
Yolo County	168,660	204,349	1.6
Solano County	394,930	415,787	0.4
San Joaquin County	563,598	692,997	1.7
Contra Costa County	948,816	1,066,602	1.0
Delta and Suisun Marsh Subtotal	3,299,503	3,813,260	1.2
Total Central Valley Region	6,062,064	7,238,742	1.5
STATE OF CALIFORNIA	33,873,086	37,668,804	0.9

3 Sources: DOF 2013a, 2013b, 2014

4 **19.3.3.3.2 Employment**

5 Civilian labor force characteristics for the Sacramento, Yolo, Solano, San
 6 Joaquin, and Contra Costa counties are presented in Table 19.22. The civilian
 7 labor force in these counties increased between 2001 and 2012. The data for 2008
 8 represents the employment situation immediately following the recession in 2007.

9 **Table 19.22 Civilian Labor Force and Unemployment Rates in Central Valley**
 10 **Region – Delta and Suisun Marsh**

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
Sacramento County	624,693	680,373	680,349	4.5	7.2	10.6
Yolo County	88,331	98,438	98,475	5.1	7.4	11.5
Solano County	197,178	211,369	217,024	4.6	6.8	10.1
San Joaquin County	266,288	293,190	298,468	7.5	10.4	15.2
Contra Costa County	508,730	524,519	535,782	4.1	6.2	9.0
Delta and Suisun Marsh Subtotal	1,685,220	1,807,889	1,830,098	4.9	7.4	10.8
Total Central Valley Region	3,448,061	3,807,278	3,911,569	6.8	8.7	12.6
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	4.9	7.2	10.5

11 Source: BLS 2014

1 Total employment and farm employment in 2001, 2008, and 2012 in the
 2 Sacramento, Yolo, Solano, San Joaquin, and Contra Costa counties are presented
 3 in Table 19.23. The contribution of farm employment to the total employment
 4 declined slightly between 2001 and 2008, and then increased slightly between
 5 2008 and 2012.

6 **Table 19.23 Employment in Central Valley Region – Delta and Suisun Marsh**

Area	Total Employment			Farm Employment		
	2001	2008	2012	2001	2008	2012
Sacramento County	739,256	806,976	784,386	5,176	4,019	3,924
Yolo County	110,902	122,054	117,609	5,244	5,364	5,745
Solano County	162,874	174,565	169,096	3,321	2,144	2,116
San Joaquin County	260,809	286,171	277,260	21,088	16,939	17,496
Contra Costa County	475,493	497,887	492,144	3,130	910	1,599
Delta and Suisun Marsh Subtotal	1,749,334	1,887,653	1,840,495	37,959	29,376	30,880
Total Central Valley Region	3,616,241	3,997,557	3,923,230	256,672	226,321	230,832
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

7 Source: BEA 2014a

8 Note:

9 Farm employment includes employment numbers in forestry, fishing, and related activities.

10 Annual farm employment for the Sacramento, Yolo, Solano, San Joaquin, and
 11 Contra Costa counties declined in 2004, slightly increased in 2006, and continued
 12 to fluctuate through 2012, as shown in Figure 19.5. Within these counties, farm
 13 employment started to decline in 2004 and began to increase slightly in 2006, as
 14 shown in Figure 19.5. The overall trend in farm employment in the Delta and
 15 Suisun Marsh portion of the Central Valley Region is influenced by the farm
 16 employment trends in San Joaquin County. The decrease in farm employment is
 17 related to the reduction in cultivated acreage during this period, as described in
 18 Chapter 12, Agricultural Resources.

19 The farm employment numbers presented in Table 19.23 include only workers
 20 directly involved in farming, forestry, and fishing activities. However, farming is
 21 one of the most important basic industries in many counties in the Central Valley
 22 Region; and supports many other businesses including farm inputs (e.g., fertilizer,
 23 seed, machinery, and fuel) and processing of food and fiber grown on farms. As a
 24 result, employment both directly on farm and indirectly dependent on farming is
 25 higher than the values displayed in Table 19.23.

1 **19.3.3.3 Income**

2 The average per capita personal income in the Sacramento, Yolo, Solano, San
 3 Joaquin, and Contra Costa counties was about 15 percent higher than the average
 4 per capita personal income in the entire Central Valley Region, as presented in
 5 Table 19.24. San Joaquin and Contra Costa counties experienced the lowest
 6 average annual growth rates in per capita personal income between 2000 and
 7 2008. Between 2008 and 2012, Yolo County was the only county with a slightly
 8 higher average annual growth rate as compared to the entire Central Valley
 9 Region.

10 **Table 19.24 Per Capita Personal Income in Central Valley Region – Delta and**
 11 **Suisun Marsh**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Sacramento County	\$29,406	\$38,782	\$41,837	3.5	1.9
Yolo County	\$27,093	\$37,488	\$41,811	4.1	2.8
Solano County	\$28,373	\$39,178	\$42,354	4.1	2.0
San Joaquin County	\$25,147	\$31,250	\$33,024	2.8	1.4
Contra Costa County	\$45,576	\$58,547	\$61,638	3.2	1.3
Average in Delta and Suisun Marsh Counties	\$33,079	\$42,861	\$45,829	3.3	1.7
Central Valley Region	\$28,183	\$37,198	\$40,601	3.5	2.2
STATE OF CALIFORNIA	\$33,404	\$44,003	\$46,477	3.5	1.4

12 Source: BEA 2014e

13 **19.3.3.4 Local Government Finances**

14 As of April 1, 2014, the county sales tax rates in the Sacramento, Yolo, Solano,
 15 San Joaquin, and Contra Costa counties ranged between 7.5 percent in Yolo to
 16 8 percent in San Joaquin (BOE 2014).

17 Total annual taxable sales for Sacramento, Yolo, Solano, San Joaquin, and Contra
 18 Costa counties in 2000, 2008, and 2012 are presented in Table 19.25. Between
 19 2000 and 2008 Yolo, Solano, and San Joaquin counties experienced average
 20 annual growth in total taxable sales that were higher than the entire Central Valley
 21 Region and the state. Between 2008 and 2012, Sacramento County experienced
 22 negative average annual growth in total taxable sales.

1 **Table 19.25 Total Taxable Sales in Central Valley Region – Delta and Suisun Marsh**

Area	Total Taxable Sales (millions)			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Sacramento County	\$16,594	\$19,332	\$19,090	1.9	-0.3
Yolo County	\$2,416	\$3,347	\$3,475	4.2	0.9
Solano County	\$4,424	\$6,033	\$6,038	4.0	0.0
San Joaquin County	\$6,582	\$8,696	\$9,011	3.5	0.9
Contra Costa County	\$12,331	\$13,308	\$13,997	1.0	1.3
Delta and Suisun Marsh Counties	\$42,347	\$50,715	\$51,611	2.3	0.4
Central Valley Region	\$81,975	\$107,699	\$113,368	3.5	1.3
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

2 Sources: BOE 2000, 2008, 2012

3 The combined (secured and unsecured) property tax revenues in Sacramento,
4 Yolo, Solano, San Joaquin, and Contra Costa counties for Fiscal Year 2011-2012
5 are presented in Table 19.26. Total property tax revenues from these counties
6 accounted for about 9 percent of the total state property tax revenues.

7 **Table 19.26 Property Tax Revenues, Fiscal Year 2011-2012,**
8 **in Central Valley Region – Delta and Suisun Marsh**

Area	Property Tax Revenues (millions)
Sacramento County	\$1,539
Yolo County	\$270
Solano County	\$497
San Joaquin County	\$684
Contra Costa County	\$1,979
Delta and Suisun Marsh Counties	\$4,969
Central Valley Region	\$9,874
STATE OF CALIFORNIA	\$55,459

9 Source: California State Controller 2012

10 **19.3.4 San Francisco Bay Area Region**

11 The San Francisco Bay Area Region includes portions of Napa, Alameda, Santa
12 Clara, and San Benito counties that are within the CVP and SWP service areas.
13 Contra Costa County also is part of the San Francisco Bay Area Region.
14 However, for this chapter, Contra Costa County is discussed under
15 Section 19.3.4.3, Delta and Suisun Marsh.

1 **19.3.4.1 Population**

2 Population characteristics in the San Francisco Bay Area Region are presented in
 3 Table 19.27. The population of the San Francisco Bay Area Region grew slightly
 4 less than a quarter million, or at an average annual growth rate of less than one
 5 half of one percent between 2000 and 2012.

6 **Table 19.27 Population Characteristics in San Francisco Bay Area Region**

Area	Population		Average Annual Growth Rate (percent)
	2000	2012	2000-2012
Alameda County	1,443,939	1,530,176	0.5
Santa Clara County	1,682,585	1,813,696	0.6
San Benito County	53,234	56,137	0.4
Napa County	124,279	137,731	0.9
Total San Francisco Bay Area Region	3,304,037	3,537,740	0.6
STATE OF CALIFORNIA	33,873,086	37,668,804	0.9

7 Sources: DOF 2013a, 2013b, 2014

8 **19.3.4.2 Employment**

9 Civilian labor force characteristics for the counties in the San Francisco Bay Area
 10 Region are presented in Table 19.28. The civilian labor force in the counties
 11 within the San Francisco Bay Area Region declined between 2001 and 2008, and
 12 then increased between 2008 and 2012. The data for 2008 represents the
 13 employment situation immediately following the onset of the recession in 2007.

14 **Table 19.28 Civilian Labor Force and Unemployment Rates in San Francisco Bay Area Region**
15

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
Alameda County	778,472	757,566	775,855	4.8	6.2	9.0
Santa Clara County	939,501	870,251	910,983	5.1	6.0	8.4
San Benito County	27,461	24,870	26,611	6.3	9.6	13.9
Napa County	70,447	75,670	77,843	3.6	5.1	7.8
Total San Francisco Bay Area Region	1,815,881	1,728,357	1,791,292	4.9	6.1	8.7
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	4.9	7.2	10.5

16 Source: BLS 2014

1 Total employment and farm employment in 2001, 2008 and 2012 in the San
 2 Francisco Bay Area Region are presented in Table 19.29. The contribution of
 3 farm employment to total employment in the San Francisco Bay Area Region
 4 declined slightly between 2001 and 2008, and remained relatively stable between
 5 2008 and 2012.

6 **Table 19.29 Employment in San Francisco Bay Area Region**

	Total Employment			Farm Employment		
	2001	2008	2012	2001	2008	2012
Alameda County	886,316	906,403	894,625	1,704	1,475	1,291
Santa Clara County	1,226,987	1,176,129	1,187,799	5,969	4,436	2,643
San Benito County	21,722	21,827	21,116	1,969	1,244	1,073
Napa County	84,369	91,837	93,050	4,835	5,730	3,148
Total San Francisco Bay Area Region	2,219,394	2,196,196	2,196,590	14,477	12,885	8,155
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

7 Source: BEA 2014a

8 Note:

9 Farm employment includes employment numbers in forestry, fishing, and related activities.

10 As shown in Table 19.29, overall farm employment has declined by 45 percent
 11 between 2001 and 2012, as presented in Figure 19.1. The decrease in farm
 12 employment is related to the reduction in cultivated acreage during this period, as
 13 described in Chapter 12, Agricultural Resources.

14 **19.3.4.3 Income**

15 The average per capita personal incomes for the counties in the San Francisco
 16 Bay Area Region are presented in Table 19.30. Among the four counties in this
 17 region, San Benito County had the lowest per capita personal income. Santa
 18 Clara County had the lowest average annual per capita growth rate between 2000
 19 and 2008. All counties experienced smaller average annual per capita growth
 20 rates between 2008 and 2012 compared to the 2000 to 2008 period.

1 **Table 19.30 Per Capita Personal Income in San Francisco Bay Area Region**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Alameda County	\$39,613	\$50,302	\$54,683	3.0	2.1
Santa Clara County	\$55,588	\$59,927	\$66,535	0.9	2.6
San Benito County	\$29,608	\$36,100	\$38,030	2.5	1.3
Napa County	\$38,854	\$51,712	\$54,807	3.6	1.5
Total San Francisco Bay Area Region	\$47,546	\$55,050	\$60,493	1.8	2.4
STATE OF CALIFORNIA	\$33,404	\$44,003	\$46,477	3.5	1.4

2 Source: BEA 2014e

3 **19.3.4.4 Local Government Finances**

4 As of April 1, 2014, the county sales tax rates in the San Francisco Bay Area
5 region ranged between 7.5 percent in San Benito and 9.0 percent in Alameda
6 (BOE 2014).

7 Total annual taxable sales for the counties in the San Francisco Bay Area Region
8 in 2000, 2008, and 2012 are presented in Table 19.31. Between 2000 and 2008
9 all counties in the region, except Santa Clara County, experienced small increases
10 in average annual growth in total taxable sales. All counties experienced
11 increasing growth rates between 2008 and 2012. Santa Clara County had the
12 highest annual average growth rate in total taxable sales among all the counties in
13 the region during this period.

14 **Table 19.31 Total Taxable Sales in San Francisco Bay Area Region**

Area	Total Taxable Sales (Millions)			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Alameda County	\$23,764	\$23,863	\$25,182	0.1	1.4
Santa Clara County	\$37,304	\$32,274	\$36,220	-1.8	2.9
San Benito County	\$476	\$505	\$530	0.7	1.2
Napa County	\$1,908	\$2,549	\$2,719	3.7	1.6
Total San Francisco Bay Area Region	\$63,451	\$59,191	\$64,651	-0.9	2.2
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

15 Sources: BOE 2000, 2008, 2012

16 The combined (secured and unsecured) property tax revenues in each of the
17 counties in the San Francisco Bay Area Region for Fiscal Year 2011-2012 are
18 presented in Table 19.32. Total property tax revenues in the four counties
19 accounted for about 13 percent of the total state property tax revenues.

1 **Table 19.32 Property Tax Revenues, Fiscal Year 2011-2012,**
 2 **in San Francisco Bay Area Region**

Area	Property Tax Revenues (millions)
Alameda County	\$2,830
Santa Clara County	\$3,973
San Benito County	\$68
Napa County	\$327
Total San Francisco Bay Area Region	\$7,198
STATE OF CALIFORNIA	\$55,459

3 Source: California State Controller 2014

4 **19.3.5 Central Coast Region**

5 The Central Coast Region includes portions of San Luis Obispo and Santa
 6 Barbara counties served by the SWP. San Luis Obispo and Santa Barbara
 7 counties are among the top 15 counties in total agricultural production in the state.

8 **19.3.5.1 Population**

9 Population characteristics in the Central Coast Region are presented in Table
 10 19.33. The population of the Central Coast Region grew by an average annual
 11 growth rate of about one half of one percent between 2000 and 2012.

12 **Table 19.33 Population Characteristics in Central Coast Region**

Area	Population		Average Annual Growth Rate (percent)
	2000	2012	2000-2012
San Luis Obispo County	246,681	271,502	0.8
Santa Barbara County	399,347	426,351	0.5
Total Central Coast Region	646,028	697,853	0.6
STATE OF CALIFORNIA	33,873,086	37,668,804	0.9

13 Sources: DOF 2013a, 2013b, 2014

14 **19.3.5.2 Employment**

15 Civilian labor force characteristics for the counties in the Central Coast Region
 16 are presented in Table 19.34. The civilian labor force in the Central Coast Region
 17 increased between 2000 and 2012.

1 **Table 19.34 Civilian Labor Force and Unemployment Rates in Central Coast Region**

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
San Luis Obispo County	126,176	136,615	138,650	4.0	5.7	9.3
Santa Barbara County	203,039	218,429	225,635	4.4	5.4	8.8
Total Central Coast Region	329,215	355,044	364,285	4.3	5.6	5.9
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	4.9	7.2	10.5

2 Source: BLS 2014

3 Total employment and farm employment in 2001, 2008, and 2012 in the Central
4 Coast Region are presented in Table 19.35. Farm employment accounted for less
5 than ten percent of total employment during this period.

6 **Table 19.35 Employment in Central Coast Region**

Area	Total Employment			Farm Employment		
	2001	2008	2012	2001	2008	2012
San Luis Obispo County	140,320	155,093	156,757	7,775	6,866	7,374
Santa Barbara County	243,955	260,056	257,841	15,228	16,483	18,075
Total Central Coast Region	384,275	415,149	414,598	23,003	23,349	25,449
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

7 Source: BEA 2014a

8 Note:

9 Farm employment includes employment numbers in forestry, fishing, and related activities.

10 The farm employment numbers presented in Table 19.35 include only workers
11 directly involved in farming, forestry, and fishing activities. However, farming is
12 one of the most important basic industries in many counties in the Central Coast
13 Region; and supports many other businesses including farm inputs (e.g., fertilizer,
14 seed, machinery, and fuel) and processing of food and fiber grown on farms. As a
15 result, employment both directly on farm and indirectly dependent on farming is
16 higher than the values displayed in Table 19.35.

17 **19.3.5.3 Income**

18 Per capita personal incomes for the counties in the Central Coast Region are
19 lower than those for the state. Both San Luis Obispo and Santa Barbara had
20 average annual per capita personal income growth rates between 2000 and 2008
21 that were among the highest in the state. Per capita personal income for each of
22 the two counties in the Central Coast Region in 2000, 2008 and 2012 are
23 presented in Table 19.36.

1 **Table 19.36 Per Capita Personal Income in Central Coast Region**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
San Luis Obispo County	\$28,671	\$40,204	\$43,698	4.3	2.1
Santa Barbara County	\$33,317	\$45,997	\$47,862	4.1	1.0
Central Coast Region	\$31,540	\$43,735	\$46,241	4.2	1.4
STATE OF CALIFORNIA	\$33,404	\$44,003	\$46,477	3.5	1.4

2 Source: BEA 2014e

3 **19.3.5.4 Local Government Finances**4 As of April 1, 2014, the county sales tax rates in the San Luis Obispo and Santa
5 Barbara counties were 7.5 percent and 8.0 percent, respectively (BOE 2014).6 Total annual taxable sales for San Luis Obispo and Santa Barbara counties in the
7 Central Coast Region in 2000, 2008, and 2012 are presented in Table 19.37. The
8 Central Coast Region's average annual growth in total taxable sales were higher
9 than for the state.10 **Table 19.37 Total Taxable Sales in Central Coast Region**

Area	Total Taxable Sales (Millions)			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
San Luis Obispo County	\$2,925	\$3,974	\$5,026	3.9	6.0
Santa Barbara County	\$4,823	\$5,884	\$6,051	2.5	0.7
Central Coast Region	\$7,748	\$9,858	\$11,077	3.1	3.0
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

11 Sources: BOE 2000, 2008, 2012

12 The combined (secured and unsecured) property tax revenues in the Central Coast
13 Region for Fiscal Year 2011-2012 are presented in Table 19.38. Total property
14 tax revenues in the two counties accounted for about 2 percent of the total state
15 property tax revenues.16 **Table 19.38 Property Tax Revenues, Fiscal Year 2011-2012,**
17 **in Central Coast Region**

Area	Property Tax Revenues (millions)
San Luis Obispo County	\$443
Santa Barbara County	\$695
Central Coast Region	\$1,138
STATE OF CALIFORNIA	\$55,459

18 Source: California State Controller 2014

19 **19.3.6 Southern California Region**20 The Southern California Region includes portions of Ventura, Los Angeles,
21 Orange, San Diego, Riverside, and San Bernardino counties served by the SWP.

1 **19.3.6.1 Population**

2 Population characteristics in Southern California Region are presented in
 3 Table 19.39. Among the counties in the Southern California Region, Riverside
 4 County had the highest average annual population growth rate, and Los Angeles
 5 County had the lowest average annual population growth rate between 2000
 6 and 2012.

7 **Table 19.39 Population Characteristics in Southern California Region**

Area	Population		Average Annual Growth Rate (percent)
	2000	2012	2000-2012
Ventura County	753,197	829,065	0.8
Los Angeles County	9,519,330	9,889,520	0.3
Orange County	2,846,289	3,057,879	0.6
San Diego County	2,813,833	3,128,734	0.9
Riverside County	1,545,387	2,234,193	3.1
San Bernardino County	1,710,139	2,059,699	1.6
Total Southern California Region	19,188,175	21,199,090	0.8
STATE OF CALIFORNIA	33,873,086	37,668,804	0.9

8 Sources: DOF 2013a, 2013b, 2014

9 **19.3.6.2 Employment**

10 Civilian labor force characteristics for the counties in the Southern California
 11 Region are presented in Table 19.40. The civilian labor force in the Southern
 12 California Region increased between 2001 and 2012. The average unemployment
 13 rates for the Southern California Region have been lower than for the state.

1 **Table 19.40 Civilian Labor Force and Unemployment Rates in Southern**
 2 **California Region**

Area	Civilian Labor Force (subject to unemployment insurance)			Unemployment Rate (percent)		
	2001	2008	2012	2001	2008	2012
Ventura County	399,325	429,444	440,649	4.8	6.3	9.0
Los Angeles County	4,752,839	4,934,756	4,879,674	5.7	7.5	10.9
Orange County	1,513,234	1,618,079	1,618,677	4.0	5.3	7.6
San Diego County	1,409,726	1,548,233	1,599,133	4.2	6.0	8.9
Riverside County	711,134	912,717	944,458	5.5	8.5	12.2
San Bernardino County	763,221	863,293	860,895	5.1	8.0	12.0
Total Southern California Region	9,549,479	10,306,522	10,343,486	5.1	7.0	10.2
STATE OF CALIFORNIA	17,152,106	18,392,000	18,494,881	4.9	7.2	10.5

3 Source: BLS 2014

4 Total employment and farm employment in 2001, 2008, and 2012 in the Southern
 5 California Region are presented in Table 19.41. Farm employment accounted for
 6 less than one percent of total employment.

7 **Table 19.41 Employment in Southern California Region**

Area	Total Employment			Farm Employment ¹		
	2001	2008	2012	2001	2008	2012
Ventura County	399,928	436,031	431,196	21,329	23,430	24,826
Los Angeles County	5,440,785	5,695,501	5,669,105	11,082	8,709	7,589
Orange County	1,845,392	1,999,036	1,963,080	7,888	4,713	3,183
San Diego County	1,723,801	1,901,598	1,887,077	17,871	15,718	14,778
Riverside County	677,214	866,247	864,308	20,892	15,669	15,024
San Bernardino County	730,150	881,700	864,432	6,050	3,931	3,688
Total Southern California Region	10,817,270	11,780,113	11,679,198	85,112	72,170	69,088
STATE OF CALIFORNIA	19,411,367	20,820,306	20,653,860	479,283	438,013	443,764

8 Source: BEA 2014a

9 Note:

10 Farm employment includes employment numbers in forestry, fishing, and related activities.

1 **19.3.6.3 Income**

2 Among the six counties in this region, San Bernardino County had the lowest per
 3 capita personal income in 2000 and 2008, as presented in Table 19.42. In 2012,
 4 Riverside County had the lowest per capita personal income.

5 **Table 19.42 Per Capita Personal Income in Southern California Region**

Area	Per Capita Personal Income			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Ventura County	\$34,296	\$46,634	\$48,837	3.9	1.2
Los Angeles County	\$29,878	\$42,881	\$44,474	4.6	0.9
Orange County	\$38,357	\$49,436	\$52,342	3.2	1.4
San Diego County	\$33,779	\$47,197	\$49,719	4.3	1.3
Riverside County	\$24,528	\$30,842	\$31,742	2.9	0.7
San Bernardino County	\$22,624	\$30,220	\$32,072	3.7	1.5
Total Southern California Region	\$30,801	\$41,078	\$44,004	3.7	1.7
STATE OF CALIFORNIA	\$33,404	\$44,003	\$46,477	3.5	1.4

6 Source: BEA 2014e

7 **19.3.6.4 Local Government Finances**

8 As of April 1, 2014, the county sales tax rates in the Southern California Region
 9 ranged from 7.5 percent in Ventura County to 9.0 percent in Los Angeles County
 10 (BOE 2014).

11 Total annual taxable sales for the counties in the Southern California Region in
 12 2000, 2008, and 2012 are presented in Table 19.43. The counties in this region
 13 have had higher average annual growth rates in total taxable retail sales compared
 14 to the state. Between 2000 and 2008, Riverside and San Bernardino led the
 15 region with higher average annual growth rates. However, between 2008 and
 16 2012, the two counties experienced declining growth rates.

1 **Table 19.43 Total Taxable Sales in Southern California Region**

Area	Total Taxable Sales (millions)			Average Annual Growth Rate (percent)	
	2000	2008	2012	2000-2008	2008-2012
Ventura County	\$9,096	\$11,322	\$11,958	2.8	1.4
Los Angeles County	\$106,674	\$131,882	\$135,296	2.7	0.6
Orange County	\$44,462	\$53,607	\$55,231	2.4	0.7
San Diego County	\$36,245	\$45,329	\$47,947	2.8	1.4
Riverside County	\$16,979	\$26,004	\$28,096	5.5	2.0
San Bernardino County	\$18,885	\$27,778	\$29,532	4.9	1.5
Total Southern California Region	\$232,342	\$295,921	\$308,059	3.1	1.0
STATE OF CALIFORNIA	\$441,854	\$531,654	\$407,714	2.3	-6.4

2 Sources: BOE 2000, 2008, 2012

3 The combined (secured and unsecured) property tax revenues in the Southern
4 California Region for Fiscal Year 2011-2012 are presented in Table 19.44. Total
5 property tax revenues accounted for about 55 percent of the total state property
6 tax revenues.

7 **Table 19.44 Property Tax Revenues, Fiscal Year 2011-2012,**
8 **in Southern California Region**

Area	Property Tax Revenues (millions)
Ventura County	\$1,230
Los Angeles County	\$14,191
Orange County	\$5,046
San Diego County	\$4,646
Riverside County	\$2,812
San Bernardino County	\$2,132
Southern California Region	\$30,057
STATE OF CALIFORNIA	\$55,459

9 Source: California State Controller 2012

10 **19.3.7 Ocean Salmon Fishery**

11 The ocean salmon fishery along the southern Oregon and northern California
12 coast are affected by the population of salmon that rely upon the northern
13 California rivers, including the Sacramento and San Joaquin rivers. Changes in
14 CVP and SWP water operations would affect the flow patterns and water quality
15 of the Sacramento and San Joaquin rivers; and the survivability of the salmon that
16 use those rivers for habitat, as described in Chapter 9, Fish and Aquatic
17 Resources. This section discusses the economic contributions of the Pacific Coast
18 salmon fishery.

1 Management of the California ocean salmon fishery is a combined effort of the
 2 California Department of Fish and Wildlife (CDFW) and the Pacific Fishery
 3 Management Council (PFMC), a regional council of the National Oceanic and
 4 Atmospheric Administration. The California Department of Fish and Wildlife
 5 manages salmon harvest from the shoreline to three nautical miles off the
 6 California coast. From three nautical miles to two hundred nautical miles
 7 offshore is managed by the PFMC. The PFMC is responsible for developing the
 8 Pacific Coast Salmon Fishery Management Plan (FMP) that guides management
 9 of the ocean commercial and recreational fishery in California, Oregon, and
 10 Washington (PFMC 2014a). The annual ocean salmon fishery regulations
 11 promote the maximum amount of harvest while ensuring that suitable population
 12 levels are maintained (NOAA 2014).

13 **19.3.7.1 Commercial Ocean Fisheries for Salmon along the Southern**
 14 **Oregon and Northern California Coasts**

15 The commercial ocean salmon fishery plays a large role in the overall California
 16 commercial ocean industry, as shown in Table 19.45. The total harvest value for
 17 Chinook salmon ranked fourth among all commercially harvested ocean species
 18 in 2012. The harvest value rank of Chinook salmon in California between 2001
 19 and 2012 as compared to the other commercially harvested ocean species are
 20 presented in Table 19.46.

21 **Table 19.45 Top Ten Species by Total Value for Commercially Harvested Ocean**
 22 **Species in California in 2012**

Rank	Species	Total Value
1	Dungeness Crab	\$85,643,530
2	California Market Squid	\$63,883,456
3	California Spiny Lobster	\$13,706,721
4	Chinook Salmon	\$12,841,853
5	Sablefish	\$8,987,599
6	Pacific Oyster	\$8,736,923
7	Sea Urchins	\$8,320,111
8	Spot Shrimp	\$4,462,204
9	Pacific Sardine	\$4,248,504
10	Kumamoto Oyster	\$3,170,760

23 Sources: NMFS 2014a, 2014b, 2014c, 2014d, 2014e, 2014f, 2014g, 2014h, 2014i, 2014j

1 **Table 19.46 Chinook Salmon Total Harvest Value Ranking as compared to Other**
 2 **Commercially Harvested Ocean Species in California**

Year	Total Value of Chinook Salmon Landings	Rank
2001	\$4,760,786	7
2002	\$7,610,882	4
2003	\$12,153,111	3
2004	\$17,770,036	3
2005	\$12,804,188	3
2006	\$5,260,526	4
2007	\$7,835,240	4
2008	Season Closed	
2009	Season Closed	
2010	\$1,214,959	19
2011	\$5,096,433	7
2012	\$12,841,853	4

3 Source: NMFS 2014k

4 Annual revenues from commercial ocean salmon fishery in California have
 5 fluctuated with changes in salmon prices and total landings. The dollar per
 6 dressed pound for Chinook salmon paid to the commercial operator can change
 7 within a season, across seasons, and at different ports, as presented in
 8 Table 19.47. Prices for Chinook salmon have increased over the past years;
 9 however, the costs for fuel, labor, and equipment maintenance also have
 10 increased.

11 **Table 19.47 Average Annual Commercial Chinook Salmon Prices**

Year	Average Annual California Price (dollar per dressed pound)	Average Annual Oregon Price (dollar per dressed pound)
2001	\$1.98	\$1.61
2002	\$1.55	\$1.54
2003	\$1.91	\$1.97
2004	\$2.87	\$3.45
2005	\$2.97	\$3.17
2006	\$5.13	\$5.48
2007	\$5.18	\$5.66
2008	Season Closed	\$7.31
2009	Season Closed	Season Closed
2010	\$5.46	\$5.49
2011	\$5.17	\$5.96
2012	\$5.34	\$5.75

12 Source: PFMC 2014b (Tables D-4, D-5)

1 The total value of landings for the commercial ocean fishery in southern Oregon
 2 and California are presented in Table 19.48.

3 **Table 19.48 Value of Landings for Salmon for the Commercial Ocean**
 4 **Salmon Fishery**

Year	Total Value, California	Total Value, Oregon
2001	\$4,773	\$4,721
2002	\$7,776	\$5,391
2003	\$12,181	\$7,222
2004	\$17,895	\$9,919
2005	\$12,913	\$8,503
2006	\$5,350	\$2,701
2007	\$7,902	\$2,822
2008	Season Closed	\$51,118
2009	Season Closed	\$51,118
2010	\$1,246	\$2,791
2011	\$5,133	\$2,401
2012	\$13,521	\$4,271

5 Sources: PFMC 2014b (Tables D-4, D-5); PacFIN 2014

6 The economic contribution of the California commercial ocean salmon fishery
 7 extends beyond the revenues received by fishermen. Supporting industries
 8 include fish processors, boat manufacturers, repair and maintenance. The
 9 economic contribution of the commercial ocean salmon fishery can be estimated
 10 through the use of Input-Output models. Economic contributions are estimated by
 11 PFMC using an Input-Output model, the Fishery Economic Assessment Model
 12 (FEAM), as summarized in Table 19.49 for the commercial ocean salmon fishery
 13 by management area.

1 **Table 19.49 Estimated Total Economic Impact for the Commercial Fishery by PFMC**

Year	Economic Values by Management Areas (\$1,000)					
	KMZ – Oregon	KMZ – California	Fort Bragg	San Francisco	Monterey	Total
2001	\$635	\$328	\$1,033	\$10,857	\$2,297	\$15,150
2002	\$806	\$797	\$3,730	\$15,516	\$4,179	\$25,028
2003	\$699	\$259	\$15,160	\$15,795	\$2,491	\$34,404
2004	\$1,502	\$2,373	\$7,434	\$23,356	\$5,257	\$39,922
2005	\$1,259	\$582	\$5,420	\$13,496	\$7,083	\$27,840
2006	\$378	\$0	\$2,471	\$6,389	\$985	\$10,223
2007	\$780	\$1,156	\$3,407	\$8,131	\$1,658	\$15,132
2008	\$72	\$0	\$0	\$0	\$0	\$72
2009	\$42	\$0	\$0	\$0	\$0	\$42
2010	\$367	\$35	\$1,780	\$140	\$161	\$2,483
2011	\$504	\$505	\$4,952	\$2,225	\$979	\$9,165
2012	\$698	\$725	\$4,706	\$10,653	\$5,759	\$22,541
2013	\$1,252	\$2,146	\$12,909	\$19,181	\$4,010	\$39,498

2 Source: PFMC 2014b (Tables IV-16, IV-17)

3 Notes:

4 All values estimated using the Fishery Economic Assessment Model, and presented as 2013 dollars.

5 Southern Oregon values include data for Brookings, Oregon which may include values from landings outside of

6 the KMZ.

7 a. KMZ –Oregon represents the area from Humbug Mountain to the Oregon-California Border, and includes

8 landings at the Brookings port and season length and quota values for the entire area including Chetco River

9 Ocean Terminal Area between Twin Rocks and the Oregon-California border.

10 b. KMZ –California represents the area from Oregon-California Border to Humboldt South Jetty, and includes

11 landings at the Crescent City and Eureka ports.

12 Fisherman and industries that rely on the commercial ocean salmon fishery have
 13 access to financial assistance from the federal government in years of low revenue
 14 or closure. The fishery can be declared a failure by the Department of Commerce
 15 after requests are sent by state or local officials and certain criteria have been met.
 16 After a fishery failure is declared, disaster relief can be provided in the form of
 17 monetary compensation, community grants, low-interest loans, habitat restoration,
 18 or fishery capacity reduction. Disaster relief related to the California commercial
 19 ocean salmon fishery has occurred six times between 1994 and 2009, as
 20 summarized in Table 19.50 (CRS 2013). Direct payments may involve a
 21 minimum amount to any permit holder and additional amounts based upon past
 22 landing values (Hackett and Hansen 2008). Disaster relief funds distribution is
 23 conducted by the PFMC and the California Salmon Council.

24 **Table 19.50 Disaster Relief Monies and Programs for the Commercial Ocean**
 25 **Salmon Fishery in California**

Year	Programs	Dollar Value
1994	Fishery capacity reduction, habitat restoration jobs, and data collection jobs	\$12 Million
1995	Similar programs as in 1994	\$13 Million

Year	Programs	Dollar Value
1998	Fishery capacity reduction	\$3.5 Million
2007	Direct payments to fisherman and businesses dependent on the Klamath River salmon	\$60.4 Million
2008	Direct payments to fisherman and businesses dependent on the Sacramento River salmon	\$170 Million
2009-2010	Continuation of 2008 programs	Remainder of the 2008 \$170 Million

1 Source: CRS 2013

2 **19.3.7.2 Ocean Sport Fisheries for Salmon along the Southern Oregon**
 3 **and Northern California Coasts**

4 The PFMC and CDFW also manages the ocean sport fishery. The economic
 5 contribution of the ocean sport salmon fishery can be estimated through the use of
 6 Input-Output models. Economic contributions are estimated by PFMC using an
 7 Input-Output model, the Fishery Economic Assessment Model (FEAM), as
 8 summarized in Table 19.51.

9 **Table 19.51 Estimated Total Economic Impact for the Recreational Fishery**
 10 **by PFMC**

Year	Economic Values by Management Areas (\$1,000)					
	KMZ – Oregon	KMZ- California	Fort Bragg	San Francisco	Monterey	Total
2001	\$1,052	\$1,136	\$2,101	\$7,683	\$3,079	\$2,101
2002	\$775	\$1,026	\$2,221	\$9,646	\$4,752	\$2,221
2003	\$608	\$743	\$1,677	\$6,990	\$2,288	\$1,677
2004	\$751	\$1,229	\$2,175	\$11,310	\$4,439	\$2,175
2005	\$501	\$794	\$1,759	\$8,554	\$3,234	\$1,759
2006	\$426	\$743	\$1,450	\$5,812	\$1,947	\$1,450
2007	\$437	\$977	\$1,170	\$4,119	\$1,427	\$1,170
2008	\$189	\$0	\$26	\$0	\$0	\$26
2009	\$241	\$276	\$0	\$0	\$0	\$0
2010	\$229	\$201	\$421	\$1,712	\$1,140	\$421
2011	\$241	\$744	\$972	\$3,367	\$1,778	\$972
2012	\$732	\$1,614	\$970	\$6,069	\$2,947	\$970

11 Source: PFMC 2014b (Tables IV-16, IV-17)

12 Notes:

13 All values estimated using the Fishery Economic Assessment Model, and presented as 2013 dollars.
 14 Southern Oregon values include data for Brookings, Oregon which may include values from landings outside of
 15 the KMZ.

16 a. KMZ –Oregon represents the area from Humbug Mountain to the Oregon-California Border, and includes
 17 landings at the Brookings port and season length and quota values for the entire area including Chetco River
 18 Ocean Terminal Area between Twin Rocks and the Oregon-California border.

19 b. KMZ –California represents the area from Oregon-California Border to Humboldt South Jetty, and includes
 20 landings at the Crescent City and Eureka ports.

19.3.8 Ocean Salmon Fisheries for the Yurok and Hoopa Valley Tribes

The salmon populations are extremely important to the Yurok Tribe and Hoopa Valley Tribe as part of their lives, cultural traditions, ceremonies, and community health (Reclamation 2012). Fifty percent of the total available salmon in the Trinity River is the federally protected harvest for the Yurok and Hoopa Valley tribes (DOI 1993). Each tribe determines the use of the harvest. Historical landing data for the Yurok and Hoopa Valley tribes are presented in Table 19.52 (Reclamation 2012).

Table 19.52 Salmon Landings by the Yurok Tribe and Hoopa Valley Tribe

Year	Spring Run Chinook Salmon	Fall Run Chinook Salmon	Total
2001	19,640	39,044	58,684
2002	15,136	24,700	39,836
2003	9,065	30,078	39,143
2004	8,682	25,971	34,653
2005	7,302	8,087	15,389
2006	4,409	10,698	15,107
2007	5,849	27,594	33,443
2008	3,439	22,901	26,340
2009	3,562	28,565	32,127
2010	5,023	30,315	35,338
2011	5,005	28,084	33,089
2012	6,477	101,662	108,139
2013 ^a	4,972	63,030	68,002

Source: PFMC 2014b (Table B-5)

Note:

a. 2013 data are preliminary.

Includes landings at the Klamath River estuary, along the Klamath River from the estuary to Weitchpec (at the confluence of the Klamath and Trinity rivers), and along the Trinity River.

19.4 Impact Analysis

This section describes the potential mechanisms and analytical methods for change in socioeconomic factors; results of the impact analysis; potential mitigation measures; and cumulative effects.

This Chapter includes the analysis of overall regional economic changes and economic changes related to changes in CVP and SWP water supplies for M&I water users. More detailed discussions of changes in agricultural production are presented in Chapter 12, Agricultural Resources.

1 **19.4.1 Potential Mechanisms and Analytical Methods**

2 As described in Chapter 4, Approach to Environmental Analysis, the impact
3 assessment considers changes in socioeconomic factors related to changes in CVP
4 and SWP operations under the alternatives as compared to the No Action
5 Alternative and Second Basis of Comparison.

6 Changes in CVP and SWP operations under the alternatives as compared to the
7 No Action Alternative and Second Basis of Comparison could change water
8 supply availability for CVP and SWP water users, recreational opportunities at
9 reservoirs that store CVP and SWP water, and salmon from the Delta watershed
10 that are relied upon by commercial, sport, and tribal fisherman.

11 **19.4.1.1 Regional Changes in Irrigated Agricultural Production Value**

12 Changes in CVP and SWP operations could change the extent of total agricultural
13 production value as compared to the No Action Alternative and the Second Basis
14 of Comparison. As described in Chapter 12, Agricultural Resources, there was no
15 changes in agricultural production in the Central Valley under long-term
16 conditions (over the 81-year model simulation period). Therefore, this analysis
17 only addresses regional economic changes during dry and critical dry years.

18 This analysis uses model output from the Statewide Agricultural Production
19 (SWAP) model and the IMPLAN model. The SWAP model, as described in
20 Chapter 12, is a regional model of irrigated agricultural production and economics
21 that simulates the decisions of producers (farmers) in the Central Valley Region.
22 The model selects the crops, water supplies, and other inputs that maximize profit
23 subject to constraints on water and land, and subject to economic conditions
24 regarding prices, yields, and costs. The SWAP model incorporates CVP and
25 SWP water supplies, other local water supplies represented in the CalSim II
26 model, and groundwater. As conditions change within a SWAP subregion
27 (e.g., the quantity of available project water supply declines), the model optimizes
28 production by adjusting the crop mix, water sources and quantities used, and other
29 inputs. The model also fallows land when that appears to be the most cost-
30 effective response to resource conditions. The analysis only reduces groundwater
31 withdrawals based upon an optimization of agricultural production costs. The
32 analysis does not restrict groundwater withdrawals based upon groundwater
33 overdraft or groundwater quality conditions.

34 As described in Chapter 7, Groundwater Resources and Groundwater Quality,
35 The Sustainable Groundwater Management Act (SGMA) requires preparation of
36 Groundwater Sustainability Plans (GSPs) by 2020 or 2022 for most of the
37 groundwater basins. The GSPs will identify methods to implement measures that
38 will achieve sustainable groundwater operations by 2040 or 2042. The analysis in
39 this Chapter is focused on conditions that would occur in 2030. If local agencies
40 fully implement GSPs prior to the regulatory deadline, increasing groundwater
41 use would be less of an option for agricultural water users. However, to achieve
42 sustainable conditions, some measures could require several years to design and
43 construct new water supply facilities, and sustainable groundwater conditions are
44 not required until the 2040s. Therefore, it was assumed that Central Valley

1 agriculture water users would not reduce groundwater use by 2030, and that
2 groundwater use would increase in response to reduced CVP and SWP
3 water supplies.

4 As described in Chapter 12, the impact to irrigated acreage and agricultural
5 production is relatively small. Most of the change in CVP or SWP irrigation
6 supplies would be offset by changes in groundwater pumping, with only small
7 changes in crop acreage in production. However, this is an aggregate result for
8 the Central Valley. Individual growers that rely on CVP or SWP supply and have
9 no access to groundwater would have their irrigated acreage affected by larger
10 amounts. Some of their change in production can and would be offset by changes
11 on other farms that have access to groundwater or other surface supplies. Over
12 time, growers without the buffer of access to groundwater could be driven to sell
13 to or merge with other farming operations. From the larger, regional perspective,
14 total value of production is estimated to change relatively little.

15 The regional economic analysis was conducted using the results of the impact
16 analysis on agricultural production and M&I water use. The incremental impact
17 results, estimated by the SWAP and CWEST economic models, were input into
18 the regional IMPLAN models as the direct change caused by each of
19 Alternative as compared to the No Action Alternative and the Second Basis of
20 Comparison. Changes in economic effects depend upon loss of production or
21 expenditures for water supplies, interactions within the regional economy, and
22 “leakage” of economic activity between regions. Economic linkages create
23 multiplier effects in a regional economy in the IMPLAN input-output model
24 based upon estimates of county-level final demands and final payments developed
25 from published data, national average matrix of technical coefficients, and
26 mathematical relationships. IMPLAN uses information from the U.S. Department
27 of Commerce’s Bureau of Economic Analysis, U.S. Department of Labor’s
28 Bureau of Labor Statistics, and other federal and state government agencies. Data
29 is collected for 440 different industrial sectors of the national economy per the
30 North American Industry Classification System based on the primary commodity
31 or service produced. Data sets are provided for the IMPLAN model for each
32 county in the United States. In this analysis counties were grouped into the
33 Central Valley Region (does not include Contra Costa County), San Francisco
34 Bay Area Region (does include Contra Costa County), Central Coast Region, and
35 Southern California Region.

36 IMPLAN is a static model that estimates impacts for a snapshot in time when the
37 impacts are expected to occur, based on the makeup of the economy at the time of
38 the underlying IMPLAN data. IMPLAN measures the initial impact to the
39 economy but does not consider long-term adjustments as labor and capital move
40 into Alternative uses.

41 Irrigated acreage occurs in the San Francisco Bay Area, Central Coast, and
42 Southern California regions that use CVP and SWP water. This irrigated acreage
43 is not included in the SWAP model simulation; and therefore, is not evaluated
44 quantitatively in this EIS. However, changes in irrigated acreage in response to

1 reductions in CVP and SWP water deliveries are assumed to occur in a similar
2 manner as projected for the Central Valley Region.

3 **19.4.1.2 Regional Changes in Municipal and Industrial Water Supplies and**
4 **Water Supply Costs**

5 Changes in CVP and SWP operations could change availability of water supplies
6 for M&I water in the study area, related costs of additional supplies or shortages,
7 and changes in regional economics as compared to the No Action Alternative and
8 the Second Basis of Comparison. The quantitative analyses of regional changes
9 related to changes in M&I water supplies and associated costs, employment, and
10 economic output are analyzed using the California Water Economics Spreadsheet
11 Tool (CWEST) model and the IMPLAN model.

12 Changes in M&I water supplies were evaluated using a regional economic model
13 that was specifically modified to address water supply and cost changes to CVP
14 and SWP M&I water users. The CWEST is a regional model that considers the
15 economic costs to M&I water users including the cost of CVP and SWP water
16 supplies, regional surface water supplies (including recycled water), conveyance
17 costs, shortage costs, and changes in groundwater pumping costs. Annual
18 supplies are calculated for each water user based upon CVP and/or SWP water
19 supplies, local surface water and groundwater supplies, surface water and
20 groundwater storage, wastewater effluent and stormwater recycling water
21 treatment, and desalination water treatment.

22 CVP and SWP water supply inputs are provided for the 81-year hydrologic period
23 from the CalSim II model. The CWEST model analyzes the changes in annual
24 conditions over the 81-long-term condition, and averages the overall costs for
25 each Alternative over the 81-long-term condition. The CWEST model evaluates
26 responses to changes in CVP and SWP water supplies separately for the average
27 of wet, above normal, and below normal water year types as compared to
28 responses in dry and critical dry water year types.

29 The goal of the CWEST model is to minimize the cost for the water users to meet
30 2030 water demand. In years when the combination of average existing water
31 supplies (either for the wetter or drier conditions) are greater than the 2030 water
32 demand, the CWEST model assumes that groundwater pumping would be
33 reduced and any overage water amount would be placed into surface water or
34 groundwater storage. The CWEST model assumes that use of regional surface
35 water, other imported water supplies, recycled water use, and desalinated water
36 use would not change; however, during extremely wet years, total CVP and SWP
37 water deliveries may not be delivered if storage facilities are full.

38 In years when annual supplies are less than the 2030 water demand, the model
39 assumes that water users with surface water and groundwater storage would rely
40 upon those supplies, increase groundwater pumping, and participate in water
41 transfers. If shortage and transfer costs occur frequently, the model could select
42 to purchase additional fixed-yield supplies, such as additional desalination water
43 treatment. The model optimizes the additional supply decisions to provide the

1 lowest-cost water supply portfolio to meet 2030 demands throughout the 81-year
2 hydrologic period.

3 The CWEST model input for this EIS is primarily based upon information
4 presented in Urban Water Management Plans (UWMPs) developed by the CVP
5 and SWP contractors. The assumptions related to future water supplies presented
6 in the UWMPs were evaluated to determine if the projects were reasonable and
7 certain to occur by 2030. Projects that had undergone environmental review,
8 were under design, or under construction were considered to exist in 2030 water
9 supply assumptions in the CWEST model. Projects described in the UWMPs that
10 currently were under evaluation are considered as options to increase fixed-yield
11 supplies. Existing and future water supplies considered for municipalities by
12 2030 are presented in Appendix 5B, Future Municipal Water Supplies for CVP
13 and SWP Water Users. For smaller water users that are not addressed in a
14 UWMP, information was obtained from water master plans and integrated
15 regional water management plans.

16 The CWEST model assumes that groundwater pumping would occur up to the
17 amounts included in the UWMPs for wetter and drier conditions. As described
18 above for agricultural production, it is assumed that full implementation of
19 SGMA would not occur by 2030. Therefore, it was assumed that water users that
20 are not currently operating groundwater resources in accordance with adjudication
21 or other types of agreements, would not reduce groundwater use by 2030.

22 The IMPLAN model, described above, also is used to analyze changes in regional
23 economics related to M&I water supplies.

24 **19.4.1.3 Changes in Local Government Finances**

25 Changes in CVP and SWP operations would not result in major changes in land
26 use, as described in Chapter 13, Land Use. Therefore, changes to collection of
27 local taxes and fees are not anticipated under the alternatives as compared to the
28 No Action Alternative and the Second Basis of Comparison. Therefore, changes
29 in local government finances are not evaluated in this EIS.

30 **19.4.1.4 Changes in Recreational Economics**

31 Reservoirs that store CVP and SWP water provide a wide diversity of recreational
32 experiences on the water surface, as described in Chapter 15, Recreational
33 Resources. However, changes to recreational economic opportunities under the
34 alternatives primarily would occur due to changes in surface water elevations at
35 San Luis Reservoir and reduced Striped Bass fishing opportunities under
36 Alternatives 3 and 4.

37 This EIS does not quantitatively analyze potential changes in recreation user days
38 or recreation spending because specific projects or responses to the changes in
39 reservoir elevations are not considered under the purpose and need of this EIS.
40 The qualitative analysis presented in this Chapter is based upon potential changes
41 in recreational use related to changes under the alternatives as compared to the No
42 Action Alternative and the Second Basis of Comparison, as described in
43 Chapter 15, Recreational Resources.

1 **19.4.1.5 Changes in Commercial, Sport, and Tribal Salmon Fishing**
2 **Opportunities**

3 Changes in CVP and SWP operations under the alternatives could change the
4 salmon population as compared to the No Action Alternative and the Second
5 Basis of Comparison. Commercial, sport, and tribal fishing primarily relies upon
6 Fall-run Chinook Salmon because the populations of other runs of salmon are
7 substantially lower. Specific population changes for Fall-run Chinook Salmon are
8 not projected in this EIS. Therefore, this Chapter presents a qualitative analysis
9 of potential changes in socioeconomic factors under the alternatives as compared
10 to the No Action Alternative and the Second Basis of Comparison.

11 **19.4.1.6 Effects of Cross Delta Water Transfers**

12 Historically water transfer programs have been developed on an annual basis.
13 The demand for water transfers is dependent upon the availability of water
14 supplies to meet water demands. Water transfer transactions have increased over
15 time as CVP and SWP water supply availability has decreased, especially during
16 drier water years.

17 Parties seeking water transfers generally acquire water from sellers who have
18 available surface water who can make the water available through releasing
19 previously stored water, pump groundwater instead of using surface water
20 (groundwater substitution); idle crops; or substitute crops that uses less water in
21 order to reduce normal consumptive use of surface water.

22 Water transfers using CVP and SWP Delta pumping plants and south of Delta
23 canals generally occur when there is unused capacity in these facilities. These
24 conditions generally occur drier water year types when the flows from upstream
25 reservoirs plus unregulated flows are adequate to meet the Sacramento Valley
26 water demands and the CVP and SWP export allocations. In non-wet years, the
27 CVP and SWP water allocations would be less than full contract amounts;
28 therefore, capacity may be available in the CVP and SWP conveyance facilities to
29 move water from other sources.

30 Projecting future socioeconomic conditions related to water transfer activities is
31 difficult because specific water transfer actions required to make the water
32 available, convey the water, and/or use the water would change each year due to
33 changing hydrological conditions, CVP and SWP water availability, specific local
34 agency operations, and local cropping patterns. Reclamation recently prepared a
35 long-term regional water transfer environmental document which evaluated
36 potential changes in conditions related to water transfer actions (Reclamation
37 2014c). Results from this analysis were used to inform the impact assessment of
38 potential effects of water transfers under the alternatives as compared to the No
39 Action Alternative and the Second Basis of Comparison.

40 **19.4.2 Conditions in Year 2030 without Implementation of**
41 **Alternatives 1 through 5**

42 This EIS includes two bases of comparison, as described in Chapter 3,
43 Description of Alternatives: the No Action Alternative and the Second Basis of

1 Comparison. Both of these bases are evaluated at 2030 conditions. Changes that
 2 would occur over the next 15 years without implementation of the alternatives are
 3 not analyzed in this EIS. However, the changes to socioeconomics that are
 4 assumed to occur by 2030 under the No Action Alternative and the Second Basis
 5 of Comparison are summarized in this section. Many of the changed conditions
 6 would occur in the same manner under both the No Action Alternative and the
 7 Second Basis of Comparison.

8 **19.4.2.1 Common Changes in Conditions under the No Action**
 9 **Alternative and Second Basis of Comparison**

10 Conditions in 2030 would be different than existing conditions due to:

- 11 • Climate change and sea level rise
- 12 • General plan development throughout California, including increased water
 13 demands in portions of Sacramento Valley
- 14 • Implementation of reasonable and foreseeable water resources management
 15 projects to provide water supplies

16 It is anticipated that climate change would result in more short-duration high-
 17 rainfall events and less snowpack in the winter and early spring months. The
 18 reservoirs would be full more frequently by the end of April or May by 2030 than
 19 in recent historical conditions. However, as the water is released in the spring,
 20 there would be less snowpack to refill the reservoirs. This condition would
 21 reduce reservoir storage and available water supplies to downstream uses in the
 22 summer. The reduced end of September storage also would reduce the ability to
 23 release stored water to downstream regional reservoirs. These conditions would
 24 occur for all reservoirs in the California foothills and mountains, including
 25 non-CVP and SWP reservoirs.

26 These changes would result in a decline of the long-term average CVP and SWP
 27 water supply deliveries by 2030 as compared to recent historical long-term
 28 average deliveries under the No Action Alternative and the Second Basis of
 29 Comparison. However, the CVP and SWP water deliveries would be less under
 30 the No Action Alternative as compared to the Second Basis of Comparison, as
 31 described in Chapter 5, Surface Water Resources and Water Supplies, which
 32 could result in more crop idling.

33 Under the No Action Alternative and the Second Basis of Comparison, land uses
 34 in 2030 would occur in accordance with adopted general plans.

35 The No Action Alternative and the Second Basis of Comparison assumes
 36 completion of water resources management and environmental restoration
 37 projects that would have occurred without implementation of Alternatives 1
 38 through 5, including regional and local recycling projects, surface water and
 39 groundwater storage projects, conveyance improvement projects, and desalination
 40 projects, as described in Chapter 3, Description of Alternatives. The No Action
 41 Alternative and the Second Basis of Comparison also assumes implementation of
 42 actions included in the 2008 U.S. Fish and Wildlife Service (USFWS) Biological

1 Opinion (BO) and 2009 National Marine Fisheries Service (NMFS) BO that
 2 would have been implemented without the BOs by 2030, as described in
 3 Chapter 3, Description of Alternatives.

4 **19.4.2.2 Population Projections under the No Action Alternative and**
 5 **Second Basis of Comparison**

6 The 2030 population projections for each region addressed in this EIS are
 7 presented in Tables 19.53 through 19.59.

8 **Table 19.53 Population Projections in Trinity River Region**

Area	Population		Average Annual Growth Rate (percent)
	2012	2030	2012-2030
Trinity County	13,471	15,309	0.7
Humboldt County	134,728	143,811	0.4
Del Norte County	28,527	31,252	0.5
Total Trinity River Region	176,726	190,373	0.4
STATE OF CALIFORNIA	37,427,946	44,574,756	0.9

9 Sources: DOF 2013a, 2013b, 2014

1 **Table 19.54 Population Projections in Central Valley Region – Sacramento Valley**

Area	Population		Average Annual Growth Rate (percent)
	2012	2030	2012-2030
Shasta County	177,516	210,997	0.9
Plumas County	19,901	20,390	0.1
Tehama County	62,985	75,522	1.0
Glenn County	28,105	33,318	0.9
Colusa County	21,552	28,112	1.4
Butte County	220,465	276,009	1.2
Yuba County	72,642	97,037	1.6
Nevada County	97,366	111,836	0.8
Sutter County	94,620	131,390	1.7
Placer County	351,463	454,124	1.4
El Dorado County	180,483	230,503	1.3
Sacramento Valley Subtotal	1,333,615	1,669,238	1.3
Total Central Valley Region	7,408,750	9,677,315	1.5
STATE OF CALIFORNIA	37,668,804	44,574,756	0.9

2 Sources: DOF 2013a, 2013b, 2014

3 **Table 19.55 Population Projections in Central Valley – San Joaquin Valley**

Area	Population		Average Annual Growth Rate (percent)
	2012	2030	2012-2030
Stanislaus County	519,339	666,446	1.4
Madera County	152,325	219,908	2.1
Merced County	260,029	359,798	1.8
Fresno County	943,493	1,232,151	1.5
Tulare County	451,540	636,606	1.9
Kings County	151,774	209,440	1.8
Kern County	849,977	1,276,155	2.3
San Joaquin Valley Subtotal	3,328,477	4,600,505	1.8
Total Central Valley Region	7,238,742	9,468,443	1.5
STATE OF CALIFORNIA	37,668,804	44,574,756	0.9

4 Sources: DOF 2013a, 2013b, 2014

1 **Table 19.56 Population Projections in Central Valley Region – Delta and**
 2 **Suisun Marsh**

Area	Population		Average Annual Growth Rate (percent)
	2012	2030	2012-2030
Sacramento County	1,433,525	1,731,061	1.1
Yolo County	204,349	250,420	1.1
Solano County	415,787	490,381	0.9
San Joaquin County	692,997	935,709	1.7
Contra Costa County	1,066,602	1,263,049	0.9
Delta and Suisun Marsh Subtotal	3,813,260	4,670,621	1.1
Total Central Valley Region	7,238,742	9,468,443	1.5
STATE OF CALIFORNIA	37,668,804	44,574,756	0.9

3 Sources: DOF 2013a, 2013b, 2014

4 **Table 19.57 Population Projections in San Francisco Bay Area Region**

Area	Population		Average Annual Growth Rate (percent)
	2012	2030	2012-2030
Alameda County	1,530,176	1,650,596	0.4
Santa Clara County	1,813,696	2,048,021	0.7
San Benito County	56,137	59,259	0.3
Napa County	137,731	158,538	0.8
Total San Francisco Bay Area Region	3,537,740	3,916,413	0.6
STATE OF CALIFORNIA	37,668,804	44,574,756	0.9

5 Sources: DOF 2013a, 2013b, 2014

6 **Table 19.58 Population Projections in Central Coast Region**

Area	Population		Average Annual Growth Rate (percent)
	2000	2030	2012-2030
San Luis Obispo County	271,502	311,388	0.8
Santa Barbara County	426,351	469,070	0.5
Total Central Coast Region	697,853	780,457	0.6
STATE OF CALIFORNIA	37,668,804	44,574,756	0.9

7 Sources: DOF 2013a, 2013b, 2014

1 **Table 19.59 Population Projections in Southern California Region**

Area	Population		Average Annual Growth Rate (percent)
	2012	2030	2012-2030
Ventura County	829,065	956,324	0.8
Los Angeles County	9,889,520	11,138,280	0.7
Orange County	3,057,879	3,385,762	0.6
San Diego County	3,128,734	3,665,358	0.9
Riverside County	2,234,193	3,145,948	1.9
San Bernardino County	2,059,699	2,588,990	1.3
Total Southern California Region	21,199,090	24,880,663	0.9
STATE OF CALIFORNIA	37,668,804	44,574,756	0.9

2 Sources: DOF 2013a, 2013b, 2014

3 **19.4.3 Evaluation of Alternatives**

4 Alternatives 1 through 5 have been compared to the No Action Alternative; and
5 the No Action Alternative and Alternatives 1 through 5 have been compared to
6 the Second Basis of Comparison.

7 During review of the numerical modeling analyses used in this EIS, an error was
8 determined in the CalSim II model assumptions related to the Stanislaus River
9 operations for the Second Basis of Comparison, Alternative 1, and Alternative 4
10 model runs. Appendix 5C includes a comparison of the CalSim II model run
11 results presented in this Chapter and CalSim II model run results with the error
12 corrected. Appendix 5C also includes a discussion of changes in the comparison
13 of groundwater conditions for the following Alternative analyses.

- 14 • No Action Alternative compared to the Second Basis of Comparison
- 15 • Alternative 1 compared to the No Action Alternative
- 16 • Alternative 3 compared to the Second Basis of Comparison
- 17 • Alternative 5 compared to the Second Basis of Comparison.

18 **19.4.3.1 No Action Alternative**

19 The No Action Alternative is compared to the Second Basis of Comparison.

20 **19.4.3.1.1 Trinity River Region**21 *Regional Changes to Irrigated Agriculture*

22 There are no agricultural lands irrigated with CVP and SWP water supplies in the
23 Trinity River Region. Therefore, there would be no changes in irrigated lands
24 under the No Action Alternative as compared to the Second Basis of Comparison.

1 *Regional Changes to Municipal and Industrial Water Supplies*

2 The CVP would continue to release water in Trinity River for downstream
3 beneficial uses, including water supplies under the No Action Alternative and the
4 Second Basis of Comparison. There are no municipal and industrial CVP or SWP
5 water service contractors in the Trinity River Region.

6 *Regional Changes to Recreational Opportunities*

7 Recreational opportunities would be similar in the Trinity River Region under the
8 No Action Alternative as compared to the Second Basis of Comparison as
9 described in Chapter 15, Recreational Resources.

10 *Regional Changes related to Changes in Salmon Fishing*

11 Trinity River flows would be similar under the No Action Alternative as
12 compared to the Second Basis of Comparison. This could result in similar salmon
13 harvest conditions by the Yurok and Hoopa Valley tribes.

14 **19.4.3.1.2 Central Valley Region**

15 *Regional Changes to Irrigated Agriculture*

16 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
17 and SWP water supplies would be less under the No Action Alternative than
18 under the Second Basis of Comparison. It is anticipated that groundwater use
19 would increase in response to reduced CVP and SWP water supplies in 2030
20 because sustainable groundwater management plans would not be fully
21 implemented until the 2040s, as discussed in Chapter 12, Agricultural Resources.

22 The agricultural production value under long-term average conditions would be
23 reduced by less than 1 percent (\$1.6 million/year in the Sacramento Valley and
24 \$0.5 million/year in the San Joaquin Valley) primarily due to an increase in
25 groundwater pumping of approximately 6 percent. The agricultural production
26 value under dry and critical dry conditions also would be reduced by less than
27 1 percent (\$11.3 million/year in the Sacramento Valley and \$20.3 million/year in
28 the San Joaquin Valley) primarily due to an increase in groundwater pumping.

29 The overall reduction in agricultural production values are less than 0.05 percent
30 under long-term conditions; and, changes in employment and regional economic
31 output would be minimal. Therefore, the analysis of employment and regional
32 economic output is focused on dry and critical dry years.

33 The direct changes in agricultural production would result in changes to
34 employment and regional economic output in the Sacramento and San Joaquin
35 valleys, as summarized in Tables 19.60 and 19.61, respectively.

1 **Table 19.60 Changes in Agricultural-Related Employment and Regional Economic**
 2 **Output for the Sacramento Valley under the No Action Alternative as Compared to**
 3 **the Second Basis of Comparison in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-87	-21	0	-108	-11.3	-1.3	0.0	-12.7
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	-1	0	-1	0.0	-0.1	0.0	-0.2
Manufacturing	0	0	0	0	0.0	-0.1	0.0	-0.1
Transportation, Warehousing & Utilities	0	-1	0	-2	0.0	-0.4	-0.1	-0.5
Wholesale Trade	0	-1	-1	-2	0.0	-0.2	-0.1	-0.3
Retail Trade	0	0	-4	-4	0.0	0.0	-0.3	-0.3
Information	0	0	0	0	0.0	0.0	-0.1	-0.1
Financial Activities	0	-7	-2	-9	0.0	-1.6	-0.8	-2.5
Services	0	-3	-12	-15	0.0	-0.3	-1.0	-1.3
Government	0	0	0	0	0.0	-0.1	0.0	-0.1
Total	-87	-36	-19	-142	-11.3	-4.2	-2.5	-18.1

4 **Table 19.61 Changes in Agricultural-Related Employment and Regional Economic**
 5 **Output for the San Joaquin Valley under the No Action Alternative as Compared to**
 6 **the Second Basis of Comparison in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-139	-53	0	-192	-20.3	-2.3	-0.1	-22.7
Mining & Logging	0	-1	0	-1	0.0	-0.3	0.0	-0.3
Construction	0	-2	0	-2	0.0	-0.2	0.0	-0.2
Manufacturing	0	-1	0	-2	0.0	-1.8	-0.3	-2.1
Transportation, Warehousing & Utilities	0	-3	-1	-4	0.0	-0.8	-0.2	-1.0
Wholesale Trade	0	-2	-1	-3	0.0	-0.4	-0.2	-0.5
Retail Trade	0	0	-7	-8	0.0	0.0	-0.6	-0.6
Information	0	0	0	-1	0.0	-0.1	-0.1	-0.2
Financial Activities	0	-12	-3	-15	0.0	-2.7	-1.5	-4.1
Services	0	-5	-21	-26	0.0	-0.5	-1.7	-2.2
Government	0	-1	0	-1	0.0	-0.2	-0.1	-0.3
Total	-139	-79	-35	-254	-20.3	-9.2	-4.9	-34.4

1 As described in Chapter 11, Geology and Soils Resources, increased groundwater
 2 pumping under the long-term average conditions may result in an additional
 3 increment of subsidence in those areas within the Central Valley. The additional
 4 amount of subsidence and the economic costs associated with it have not been
 5 quantified in this EIS. However, total subsidence-related costs have been shown
 6 to be substantial, as reported by Borchers et al. (2014) who estimated that the cost
 7 of subsidence in San Joaquin Valley between 1955 and 1972 was more than
 8 \$1.3 billion (in 2013 dollars). These estimates are based on the impacts to major
 9 infrastructure in the region including the San Joaquin River, Delta Mendota
 10 Canal, Friant-Kern Canal and San Luis Canal in addition to privately owned
 11 infrastructure. The incremental subsidence-related costs, expressed on an annual
 12 basis, could be an unknown fraction of that cumulative cost.

13 *Regional Changes to Municipal and Industrial Water Supplies*

14 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 15 and SWP water supplies would be less under the No Action Alternative than
 16 under the Second Basis of Comparison. The analysis assumed CVP and SWP
 17 water deliveries, as described in Chapter 5, and determined the need for new
 18 water supplies, changes in water storage and groundwater pumping, water
 19 transfers, water shortage costs, and excess water savings. The factors and basis of
 20 the analysis are described in detail in Appendix 19A, CWEST Model. The
 21 analysis assumes that no new supplies would be implemented until shortages were
 22 greater than 5 percent. The costs of these shortages are included in the analysis.
 23 It is assumed that communities do not have Alternative water supplies (e.g., cities
 24 of Huron and Coalinga) and would utilize water transfers.

25 The average annual water supply costs over the 81-year hydrologic period for
 26 M&I water supplies are presented in Tables 19.62 and 19.63 for the Sacramento
 27 and San Joaquin Valley, respectively.

28 **Table 19.62 Changes in Municipal and Industrial Water Supply Costs for the**
 29 **Sacramento Valley under the No Action Alternative as Compared to the Second**
 30 **Basis of Comparison**

Differences in Total	No Action Alternative	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	447	463	-16
Delivery Cost (\$1,000)	\$8,031	\$8,317	-\$287
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$213	\$207	\$6
Transfer Costs (\$1,000)	\$739	\$517	\$222
Shortage Costs (\$1,000)	\$69	\$68	\$1
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$3,858	-\$3,916	\$58
Excess Water Savings (\$1,000)	-\$2,275	-\$2,563	\$288
Average Annual Changes in Water Supply Costs (\$1,000)	\$2,919	\$2,630	\$288

31 Note:
 32 In 2012 dollars

Table 19.63 Changes in Municipal and Industrial Water Supply Costs for the San Joaquin Valley under the No Action Alternative as Compared to the Second Basis of Comparison

Differences in Total	No Action Alternative	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	214	237	-23
Delivery Cost (\$1,000)	\$3,460	\$3,854	-\$394
Assumed New Supply Deliveries (TAF)	2	0	2
Annualized New Supply Costs (\$1,000)	\$429	\$15	\$414
Water Storage Costs (\$1,000)	\$942	\$820	\$122
Lost Water Sales Revenues (\$1,000)	\$361	\$322	\$39
Transfer Costs (\$1,000)	\$2,673	\$2,623	\$50
Shortage Costs (\$1,000)	\$115	\$102	\$13
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$15,377	-\$16,011	\$634
Excess Water Savings (\$1,000)	-\$1,029	-\$1,318	\$289
Average Annual Changes in Water Supply Costs (\$1,000)	-\$8,427	-\$9,593	\$1,166

Note:
In 2012 dollars

The changes in M&I water supply costs would result in changes to employment and regional economic output in the Sacramento and San Joaquin valleys, as summarized in Tables 19.64 and 19.65, respectively. The M&I average annual water supply costs would increase by 11 percent in the Sacramento Valley and decrease by 12 percent in the San Joaquin Valley.

Table 19.64 Changes in Municipal and Industrial Water Supply Related Employment and Regional Economic Output for the Sacramento Valley under the No Action Alternative as Compared to the Second Basis of Comparison

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.1	-1.7	-1.6
Mining & Logging	0	0	0	0	0.0	0.4	-0.3	0.1
Construction	0	0	0	0	0.0	29.0	-2.5	26.5
Manufacturing	0	0	0	0	0.0	3.1	-22.2	-19.1
Transportation, Warehousing & Utilities	1	0	0	1	286.4	2.8	-18.0	271.2
Wholesale Trade	0	0	0	0	0.0	1.0	-27.1	-26.1
Retail Trade	0	0	-1	-1	0.0	0.9	-46.6	-45.6
Information	0	0	0	0	0.0	3.4	-20.6	-17.2
Financial Activities	0	0	0	0	0.0	13.0	-147.7	-134.6
Services	0	0	-2	-1	0.0	30.8	-154.7	-123.9
Government	0	0	0	0	0.0	0.2	-3.8	-3.7
Total	1	1	-3	-1	286.4	84.8	-445.2	-74.0

Note:
In 2012 dollars

1 **Table 19.65 Changes in Municipal and Industrial Water Supply Related**
 2 **Employment and Regional Economic Output for the San Joaquin Valley under the**
 3 **No Action Alternative as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	-6.7	-6.7
Mining & Logging	0	0	0	0	0.0	-0.4	-6.4	-6.8
Construction	0	0	0	0	0.0	-13.3	-5.6	-18.9
Manufacturing	0	0	0	0	0.0	-1.4	-46.4	-47.8
Transportation, Warehousing & Utilities	-1	0	0	-1	-140.8	-1.4	-44.7	-186.9
Wholesale Trade	0	0	0	0	0.0	-0.4	-39.0	-39.3
Retail Trade	0	0	-1	-1	0.0	-0.4	-97.4	-97.8
Information	0	0	0	0	0.0	-1.0	-27.0	-28.0
Financial Activities	0	0	-1	-1	0.0	-4.3	-263.7	-268.0
Services	0	0	-3	-3	0.0	-11.7	-292.3	-303.9
Government	0	0	0	0	0.0	-0.1	-12.9	-13.0
Total	-1	0	-6	-7	-140.8	-34.3	-842.0	-1,017.2

4 Note:
 5 In 2012 dollars

6 *Regional Changes to Recreational Opportunities*

7 Recreational opportunities would decrease at San Luis Reservoir by 6 percent
 8 under the No Action Alternative as compared to the Second Basis of Comparison,
 9 as described in Chapter 15, Recreation Resources. Therefore, it is anticipated that
 10 recreational economic factors would be reduced under the No Action
 11 Alternative as compared to the Second Basis of Comparison.

12 *Effects Related to Cross Delta Water Transfers*

13 Potential effects to socioeconomic factors could be similar to those identified in a
 14 recent environmental analysis conducted by Reclamation for long-term water
 15 transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c).
 16 Potential effects to socioeconomic factors were identified as adverse in the
 17 seller's service area related to loss of income to farm workers and the associated
 18 agriculturally-related businesses and retail enterprises if crop idling methods were
 19 used to provide transfer water. The analysis also identified that local sales taxes
 20 could decline due to the loss of household income. If groundwater substitution
 21 was used to provide transfer water, agricultural production values could decline
 22 due to additional cost of pumping. However, income from the water transfer
 23 could increase operating income for the sellers. The regional impact would
 24 depend upon the extent of lands involved in the water transfer program in any
 25 specific year.

26 Under the No Action Alternative, the timing of cross Delta water transfers would
 27 be limited to July through September and include annual volumetric limits, in
 28 accordance with the 2008 USFWS BO and 2009 NMFS BO. Under the Second

1 Basis of Comparison, water could be transferred throughout the year without an
 2 annual volumetric limit. Overall, the potential for cross Delta water transfers
 3 would be less under the No Action Alternative than under the Second Basis of
 4 Comparison.

5 **19.4.3.1.3 San Francisco Bay Area Region**

6 *Regional Changes to Irrigated Agriculture*

7 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
 8 water supplies within the San Francisco Bay Area Region would not result in
 9 reductions in long-term irrigated acreage or land use changes due to the use of
 10 other water supplies. However, there could be a reduction in irrigated acreage in
 11 dry and critical dry years under the No Action Alternative as compared to the
 12 Second Basis of Comparison.

13 *Regional Changes to Municipal and Industrial Water Supplies*

14 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 15 and SWP water supplies would be less under the No Action Alternative than
 16 under the Second Basis of Comparison. The analysis assumed CVP and SWP
 17 water deliveries, as described in Chapter 5, and determined the need for new
 18 water supplies, changes in water storage and groundwater pumping, water
 19 transfers, water shortage costs, and excess water savings. The factors and basis of
 20 the analysis is described in detail in Appendix 19A, CWEST Model. The analysis
 21 assumes that no new supplies would be implemented until shortages were greater
 22 than 5 percent. The costs of these shortages are included in the analysis.

23 The average annual water supply costs over the 81-year hydrologic period for
 24 M&I water supplies would increase by 44 percent, as presented in Table 19.66.

25 **Table 19.66 Changes in Municipal and Industrial Water Supply Costs for the San**
 26 **Francisco Bay Area Region under the No Action Alternative as Compared to the**
 27 **Second Basis of Comparison**

Differences in Total	No Action Alternative	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	396	445	-48
Delivery Cost (\$1,000)	\$11,044	\$12,515	-\$1,471
Assumed New Supply Deliveries (TAF)	18	16	2
Annualized New Supply Costs (\$1,000)	\$599	\$234	\$365
Water Storage Costs (\$1,000)	\$1,577	\$1,963	-\$386
Lost Water Sales Revenues (\$1,000)	\$4,286	\$1,595	\$2,691
Transfer Costs (\$1,000)	\$5,722	\$1,154	\$4,568
Shortage Costs (\$1,000)	\$1,410	\$523	\$887
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$493	-\$792	\$298
Excess Water Savings (\$1,000)	-\$225	-\$549	\$324
Average Annual Changes in Water Supply Costs (\$1,000)	\$23,919	\$16,643	\$7,276

28 Note:
 29 In 2012 dollars

1 The changes in M&I water supply costs would result in changes to employment
 2 and regional economic output, as summarized in Table 19.67.

3 **Table 19.67 Changes in Municipal and Industrial Water Supply Related**
 4 **Employment and Regional Economic Output for the San Francisco Bay Area**
 5 **Region under the No Action Alternative as Compared to the Second Basis of**
 6 **Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.1	-7.9	-7.8
Mining & Logging	0	0	0	0	0.0	1.6	-5.0	-3.4
Construction	0	1	0	1	0.0	158.8	-37.1	121.7
Manufacturing	0	0	0	0	0.0	28.8	-478.0	-449.1
Transportation, Warehousing & Utilities	5	0	-1	4	1,492.4	11.2	-183.5	1,320.1
Wholesale Trade	0	0	-1	-1	0.0	5.0	-350.6	-345.7
Retail Trade	0	0	-6	-6	0.0	4.2	-567.2	-563.0
Information	0	0	-1	-1	0.0	16.8	-306.6	-289.8
Financial Activities	0	0	-5	-4	0.0	55.8	-1,740.5	-1,684.7
Services	0	1	-20	-19	0.0	133.7	-2,162.8	-2,029.1
Government	0	0	0	0	0.0	0.7	-55.1	-54.4
Total	5	3	-35	-27	1,492.4	416.7	-5,894.3	-3,985.2

7 Note:
 8 In 2012 dollars

9 *Regional Changes to Recreational Opportunities*

10 Changes in CVP and SWP water supplies and operations under the No Action
 11 Alternative as compared to the Second Basis of Comparison generally would
 12 result in lower reservoir elevations in reservoirs (up to 10 to 18 percent) that store
 13 CVP and SWP water; and would result in reduced recreational economic factors
 14 under the No Action Alternative as compared to the Second Basis of Comparison.

15 *Regional Changes to Salmon Fishing*

16 Changes in commercial and sport ocean salmon fishing primarily would be
 17 related to the presence of fall-run Chinook Salmon from Central Valley
 18 hatcheries. It is assumed that the production of hatchery fish would be similar
 19 under the No Action Alternative and the Second Basis of Comparison. However,
 20 survival of the fall-run Chinook Salmon hatchery fish to the Pacific Ocean could
 21 be related to changes in CVP and SWP operations. As described in Chapter 9,
 22 Fish and Aquatic Resources, there would be little change in through-Delta
 23 survival by emigrating natural juvenile fall-run Chinook Salmon under the No
 24 Action Alternative as compared to the Second Basis of Comparison. It is
 25 assumed that the survival of the hatchery juvenile fall-run Chinook Salmon would
 26 be similar to the survival of the natural juvenile fall-run Chinook Salmon.
 27 Therefore, the availability of fish for commercial and sport ocean salmon fishing

1 and the associated economic conditions for the fishing industry would be similar
2 under the No Action Alternative and the Second Basis of Comparison.

3 **19.4.3.1.4 Central Coast Region**

4 *Regional Changes to Irrigated Agriculture*

5 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
6 water supplies within the Central Coast Region would not result in reductions in
7 long-term irrigated acreage or land use changes due to the use of other water
8 supplies. However, there could be a reduction in irrigated acreage in dry and
9 critical dry years under the No Action Alternative as compared to the Second
10 Basis of Comparison.

11 *Regional Changes to Municipal and Industrial Water Supplies*

12 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
13 and SWP water supplies would be less under the No Action Alternative than
14 under the Second Basis of Comparison. The analysis assumed CVP and SWP
15 water deliveries, as described in Chapter 5, and determined the need for new
16 water supplies, changes in water storage and groundwater pumping, water
17 transfers, water shortage costs, and excess water savings. The factors and basis of
18 the analysis is described in detail in Appendix 19A, CWEST Model. The analysis
19 assumes that no new supplies would be implemented until shortages were greater
20 than 5 percent. The costs of these shortages are included in the analysis. It is
21 assumed that communities do not have Alternative water supplies would utilize
22 water transfers.

23 The average annual water supply costs over the 81-year hydrologic period for
24 M&I water supplies would decrease by 6 percent, as presented in Table 19.68.

25 **Table 19.68 Changes in Municipal and Industrial Water Supply Costs for the**
26 **Central Coast Region under the No Action Alternative as Compared to the Second**
27 **Basis of Comparison**

Differences in Total	No Action Alternative	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	44	54	-10
Delivery Cost (\$1,000)	\$6,663	\$8,174	-\$1,510
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$0	\$0	\$0
Transfer Costs (\$1,000)	\$0	\$0	\$0
Shortage Costs (\$1,000)	\$0	\$0	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$8,068	-\$8,643	\$575
Excess Water Savings (\$1,000)	-\$2,970	-\$4,176	\$1,206
Average Annual Changes in Water Supply Costs (\$1,000)	-\$4,374	-\$4,645	\$271

28 Note:
29 In 2012 dollars

1 The changes in M&I water supply costs would result in changes to employment
 2 and regional economic output, as summarized in Table 19.69.

3 **Table 19.69 Changes in Municipal and Industrial Water Supply Related**
 4 **Employment and Regional Economic Output for the Central Coast Region under**
 5 **the No Action Alternative as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.6	-4.0	-3.4
Mining & Logging	0	0	0	0	0.0	6.4	-9.3	-2.9
Construction	0	2	0	2	0.0	201.9	-9.7	192.2
Manufacturing	0	0	0	0	0.0	26.8	-51.8	-25.0
Transportation, Warehousing & Utilities	6	0	0	6	1,510.8	17.0	-56.2	1,471.6
Wholesale Trade	0	0	0	0	0.0	4.8	-58.6	-53.8
Retail Trade	0	0	-1	-1	0.0	6.1	-118.5	-112.4
Information	0	0	0	0	0.0	12.0	-39.0	-27.0
Financial Activities	0	0	-1	-1	0.0	68.9	-352.0	-283.2
Services	0	2	-5	-3	0.0	167.1	-447.4	-280.3
Government	0	0	0	0	0.0	0.9	-13.2	-12.3
Total	6	4	-8	2	1,510.8	512.7	-1,159.9	863.6

6 Note:
 7 In 2012 dollars

8 *Regional Changes to Recreational Opportunities*

9 Changes in CVP and SWP water supplies and operations under the No Action
 10 Alternative as compared to the Second Basis of Comparison generally would
 11 result in lower reservoir elevations in reservoirs that store CVP and SWP water
 12 (up to 10 to 18 percent) that store CVP and SWP water; and would result in
 13 reduced recreational economic factors under the No Action Alternative as
 14 compared to the Second Basis of Comparison..

15 **19.4.3.1.5 Southern California Region**

16 *Regional Changes to Irrigated Agriculture*

17 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
 18 water supplies within the Southern California Region would not result in
 19 reductions in long-term irrigated acreage or land use changes due to the use of
 20 other water supplies. However, there could be a reduction in irrigated acreage in
 21 dry and critical dry years under the No Action Alternative as compared to the
 22 Second Basis of Comparison.

23 *Regional Changes to Municipal and Industrial Water Supplies*

24 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 25 and SWP water supplies would be less under the No Action Alternative than
 26 under the Second Basis of Comparison. The analysis assumed CVP and SWP

1 water deliveries, as described in Chapter 5, and determined the need for new
 2 water supplies, changes in water storage and groundwater pumping, water
 3 transfers, water shortage costs, and excess water savings. The factors and basis of
 4 the analysis is described in detail in Appendix 19A, CWEST Model. The analysis
 5 assumes that no new supplies would be implemented until shortages were greater
 6 than 5 percent. The costs of these shortages are included in the analysis. It is
 7 assumed that communities do not have Alternative water supplies would utilize
 8 water transfers.

9 The average annual water supply costs over the 81-year hydrologic period for
 10 M&I water supplies would increase by 17 percent, as presented in Table 19.70.

11 **Table 19.70 Changes in Municipal and Industrial Water Supply Costs for the**
 12 **Southern California Region under the No Action Alternative as Compared to the**
 13 **Second Basis of Comparison**

Differences in Total	No Action Alternative	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	1,932	2,394	-461
Delivery Cost (\$1,000)	\$239,692	\$296,795	-\$57,103
Assumed New Supply Deliveries (TAF)	47	11	35
Annualized New Supply Costs (\$1,000)	\$12,688	\$4,032	\$8,656
Water Storage Costs (\$1,000)	\$7,598	\$2,824	\$4,774
Lost Water Sales Revenues (\$1,000)	\$14,614	\$1,119	\$13,495
Transfer Costs (\$1,000)	\$11,484	\$3,705	\$7,779
Shortage Costs (\$1,000)	\$17,319	\$353	\$16,966
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$57,474	-\$91,507	\$34,033
Excess Water Savings (\$1,000)	-\$4,629	-\$10,573	\$5,944
Average Annual Changes in Water Supply Costs (\$1,000)	\$241,291	\$206,749	\$34,542

14 Note:
 15 In 2012 dollars

16 The changes in M&I water supply costs would result in changes to employment
 17 and regional economic output, as summarized in Table 19.71.

1 **Table 19.71 Changes in Municipal and Industrial Water Supply Related**
 2 **Employment and Regional Economic Output for the Southern California Region**
 3 **under the No Action Alternative as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	2	0	0.0	-12.5	272.7	260.2
Mining & Logging	0	-1	1	0	0.0	-164.2	369.0	204.8
Construction	0	-43	3	0	0.0	-5,205.5	395.5	-4,810.0
Manufacturing	0	-2	10	0	0.0	-1,452.6	6,814.5	5,361.9
Transportation, Warehousing & Utilities	-175	-2	12	-175	-43,673.4	-592.0	2,602.9	-41,662.5
Wholesale Trade	0	-1	20	0	0.0	-275.3	4,339.0	4,063.8
Retail Trade	0	-2	58	0	0.0	-170.6	5,106.3	4,935.7
Information	0	-1	6	0	0.0	-637.5	2,962.1	2,324.6
Financial Activities	0	-9	52	0	0.0	-2,528.7	17,797.9	15,269.1
Services	0	-46	212	0	0.0	-5,542.2	20,430.6	14,888.4
Government	0	0	3	0	0.0	-29.8	587.3	557.5
Total	-175	-108	378	-175	-43,673.4	-16,611.0	61,677.8	1,393.5

4 Note:
 5 In 2012 dollars

6 *Regional Changes to Recreational Opportunities*

7 Changes in CVP and SWP water supplies and operations under the No Action
 8 Alternative as compared to the Second Basis of Comparison generally would
 9 result in lower reservoir elevations in reservoirs that store CVP and SWP water,
 10 (up to 10 to 18 percent) that store CVP and SWP water; and would result in
 11 reduced recreational economic factors under the No Action Alternative as
 12 compared to the Second Basis of Comparison..

13 **19.4.3.2 Alternative 1**

14 As described in Chapter 3, Description of Alternatives, Alternative 1 is identical
 15 to the Second Basis of Comparison. As described in Chapter 4, Approach to
 16 Environmental Analysis, Alternative 1 as compared to the No Action
 17 Alternative and the Second Basis of Comparison. However, because
 18 socioeconomic factors under Alternative 1 are identical to socioeconomic factors
 19 under the Second Basis of Comparison; Alternative 1 is only compared to the No
 20 Action Alternative.

1 **19.4.3.2.1 Alternative 1 Compared to the No Action Alternative**

2 *Trinity River Region*

3 *Regional Changes to Irrigated Agriculture*

4 There are no agricultural lands irrigated with CVP and SWP water supplies in the
5 Trinity River Region. Therefore, there would be no changes in irrigated lands
6 under Alternative 1 as compared to the No Action Alternative.

7 *Regional Changes to Municipal and Industrial Water Supplies*

8 The CVP would continue to release water in Trinity River for downstream
9 beneficial uses, including water supplies under Alternative 1 as compared to the
10 No Action Alternative. There are no CVP or SWP water contractors in the
11 Trinity River Region.

12 *Regional Changes to Recreational Opportunities*

13 Recreational opportunities would be similar in the Trinity River Region under
14 Alternative 1 as compared to the No Action Alternative as described in
15 Chapter 15, Recreational Resources.

16 *Regional Changes to Salmon Fishing*

17 Trinity River flows would be similar under Alternative 1 as compared to the No
18 Action Alternative. This could result in similar salmon harvest conditions by the
19 Yurok and Hoopa Valley tribes.

20 *Central Valley Region*

21 *Regional Changes to Irrigated Agriculture*

22 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
23 and SWP water supplies would be greater under Alternative 1 as compared to the
24 No Action Alternative. It is anticipated that groundwater use would decrease in
25 response to increased CVP and SWP water supplies in 2030; and sustainable
26 groundwater management plans would not be fully implemented until the 2040s,
27 as discussed in Chapter 12, Agricultural Resources.

28 The agricultural production value under long-term average conditions would be
29 increased by less than 1 percent (\$1.6 million/year in the Sacramento Valley and
30 \$0.5 million/year in the San Joaquin Valley) primarily due to a decrease in
31 groundwater pumping of approximately 7 percent. The agricultural production
32 value under dry and critical dry conditions also would be increased by less than
33 1 percent (\$11.3 million/year in the Sacramento Valley and \$20.3 million/year in
34 the San Joaquin Valley) primarily due to a decrease in groundwater pumping.

35 The overall increase in agricultural production values are less than 0.05 percent
36 under long-term conditions; and, changes in employment and regional economic
37 output would be minimal. Therefore, the analysis of employment and regional
38 economic output is focused on dry and critical dry years.

39 The direct changes in agricultural production would result in changes to
40 employment and regional economic output in the Sacramento and San Joaquin
41 valleys, as summarized in Tables 19.72 and 19.73, respectively.

1 **Table 19.72 Changes in Agricultural-Related Employment and Regional Economic**
 2 **Output for the Sacramento Valley under Alternative 1 as compared to the No**
 3 **Action Alternative in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	87	21	0	108	11.3	1.3	0	12.7
Mining & Logging	0	0	0	0	0	0	0	0
Construction	0	1	0	1	0	0.1	0	0.2
Manufacturing	0	0	0	0	0	0.1	0	0.1
Transportation, Warehousing & Utilities	0	1	0	2	0	0.4	0.1	0.5
Wholesale Trade	0	1	1	2	0	0.2	0.1	0.3
Retail Trade	0	0	4	4	0	0	0.3	0.3
Information	0	0	0	0	0	0	0.1	0.1
Financial Activities	0	7	2	9	0	1.6	0.8	2.5
Services	0	3	12	15	0	0.3	1	1.3
Government	0	0	0	0	0	0.1	0	0.1
Total	87	36	19	142	11.3	4.2	2.5	18.1

4 Note:
 5 In 2012 dollars.

6 **Table 19.73 Changes in Agricultural-Related Employment and Regional Economic**
 7 **Output for the San Joaquin Valley under Alternative 1 as compared to the No**
 8 **Action Alternative in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	139	53	0	192	20.3	2.3	0.1	22.7
Mining & Logging	0	1	0	1	0	0.3	0	0.3
Construction	0	2	0	2	0	0.2	0	0.2
Manufacturing	0	1	0	2	0	1.8	0.3	2.1
Transportation, Warehousing & Utilities	0	3	1	4	0	0.8	0.2	1
Wholesale Trade	0	2	1	3	0	0.4	0.2	0.5
Retail Trade	0	0	7	8	0	0	0.6	0.6
Information	0	0	0	1	0	0.1	0.1	0.2
Financial Activities	0	12	3	15	0	2.7	1.5	4.1
Services	0	5	21	26	0	0.5	1.7	2.2
Government	0	1	0	1	0	0.2	0.1	0.3
Total	139	79	35	254	20.3	9.2	4.9	34.4

9 Note:
 10 In 2012 dollars.

1 As described in Chapter 11, Geology and Soils Resources, increased groundwater
 2 pumping under the long-term average conditions may result in an additional
 3 increment of subsidence in those areas within the Central Valley. The additional
 4 amount of subsidence and the economic costs associated with it have not been
 5 quantified in this EIS. However, total subsidence-related costs have been shown
 6 to be substantial, as reported by Borchers et al. (2014) who estimated that the cost
 7 of subsidence in San Joaquin Valley between 1955 and 1972 was more than
 8 \$1.3 billion (in 2013 dollars). These estimates are based on the impacts to major
 9 infrastructure in the region including the San Joaquin River, Delta Mendota
 10 Canal, Friant-Kern Canal and San Luis Canal in addition to privately owned
 11 infrastructure. The incremental subsidence-related costs, expressed on an annual
 12 basis, could be an unknown fraction of that cumulative cost.

13 *Regional Changes to Municipal and Industrial Water Supplies*

14 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 15 and SWP water supplies would increase under Alternative 1 as compared to the
 16 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
 17 described in Chapter 5, and determined the need for new water supplies, changes
 18 in water storage and groundwater pumping, water transfers, water shortage costs,
 19 and excess water savings. The factors and basis of the analysis are described in
 20 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 21 supplies would be implemented until shortages were greater than 5 percent. The
 22 costs of these shortages are included in the analysis. It is assumed that
 23 communities do not have Alternative water supplies would utilize water transfers.

24 The average annual water supply costs over the 81-year hydrologic period for
 25 M&I water supplies are presented in Tables 19.74 and 19.75 for the Sacramento
 26 and San Joaquin Valley, respectively. The average annual water supply costs
 27 would decrease in the Sacramento Valley by 10 percent and increase in the San
 28 Joaquin Valley by 14 percent.

29 **Table 19.74 Changes in Municipal and Industrial Water Supply Costs for the**
 30 **Sacramento Valley under Alternative 1 as compared to the No Action Alternative**

Differences in Total	Alternative 1	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	463	447	16
Delivery Cost (\$1,000)	\$8,317	\$8,031	\$287
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$207	\$213	-\$6
Transfer Costs (\$1,000)	\$517	\$739	-\$222
Shortage Costs (\$1,000)	\$68	\$69	-\$1
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$3,916	-\$3,858	-\$58
Excess Water Savings (\$1,000)	-\$2,563	-\$2,275	-\$288
Average Annual Changes in Water Supply Costs (\$1,000)	\$2,630	\$2,919	-\$288

31 Note:
 32 In 2012 dollars

1 **Table 19.75 Changes in Municipal and Industrial Water Supply Costs for the San**
 2 **Joaquin Valley under Alternative 1 as compared to the No Action Alternative**

Differences in Total	Alternative 1	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	237	214	23
Delivery Cost (\$1,000)	\$3,854	\$3,460	\$394
Assumed New Supply Deliveries (TAF)	0	2	-2
Annualized New Supply Costs (\$1,000)	\$15	\$429	-\$414
Water Storage Costs (\$1,000)	\$820	\$942	-\$122
Lost Water Sales Revenues (\$1,000)	\$322	\$361	-\$39
Transfer Costs (\$1,000)	\$2,623	\$2,673	-\$50
Shortage Costs (\$1,000)	\$102	\$115	-\$13
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$16,011	-\$15,377	-\$634
Excess Water Savings (\$1,000)	-\$1,318	-\$1,029	-\$289
Average Annual Changes in Water Supply Costs (\$1,000)	-\$9,593	-\$8,427	-\$1,166

3 The changes in M&I water supply costs would result in changes to employment
 4 and regional economic output in the Sacramento and San Joaquin valleys, as
 5 summarized in Tables 19.76 and 19.77, respectively.

6 **Table 19.76 Changes in Municipal and Industrial Water Supply Related**
 7 **Employment and Regional Economic Output for the Sacramento Valley under**
 8 **Alternative 1 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.1	1.7	1.6
Mining & Logging	0	0	0	0	0.0	-0.4	0.3	-0.1
Construction	0	0	0	0	0.0	-29.0	2.5	-26.5
Manufacturing	0	0	0	0	0.0	-3.1	22.2	19.1
Transportation, Warehousing & Utilities	-1	0	0	-1	-286.4	-2.8	18.0	-271.2
Wholesale Trade	0	0	0	0	0.0	-1.0	27.1	26.1
Retail Trade	0	0	1	1	0.0	-0.9	46.6	45.6
Information	0	0	0	0	0.0	-3.4	20.6	17.2
Financial Activities	0	0	0	0	0.0	-13.0	147.7	134.6
Services	0	0	2	-1	0.0	-30.8	154.7	123.9
Government	0	0	0	0	0.0	-0.2	3.8	3.7
Total	-1	-1	3	-1	-286.4	-84.8	445.2	74.0

9 Note:
 10 In 2012 dollars

1 **Table 19.77 Changes in Municipal and Industrial Water Supply Related**
 2 **Employment and Regional Economic Output for the San Joaquin Valley under**
 3 **Alternative 1 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	6.7	6.7
Mining & Logging	0	0	0	0	0.0	0.4	6.4	6.8
Construction	0	0	0	0	0.0	13.3	5.6	18.9
Manufacturing	0	0	0	0	0.0	1.4	46.4	47.8
Transportation, Warehousing & Utilities	1	0	0	1	140.8	1.4	44.7	186.9
Wholesale Trade	0	0	0	0	0.0	0.4	39.0	39.3
Retail Trade	0	0	1	1	0.0	0.4	97.4	97.8
Information	0	0	0	0	0.0	1.0	27.0	28.0
Financial Activities	0	0	1	1	0.0	4.3	263.7	268.0
Services	0	0	3	3	0.0	11.7	292.3	303.9
Government	0	0	0	0	0.0	0.1	12.9	13.0
Total	1	0	6	7	140.8	34.3	842.0	1,017.2

4 Note:
 5 In 2012 dollars

6 *Regional Changes to Recreational Opportunities*

7 Recreational opportunities would increase at San Luis Reservoir by 6 percent
 8 under Alternative 1 as compared to the No Action Alternative, as described in
 9 Chapter 15, Recreation Resources. Therefore, it is anticipated that recreational
 10 economic factors would be increased under Alternative 1 as compared to the No
 11 Action Alternative.

12 *Effects Related to Cross Delta Water Transfers*

13 Potential effects to socioeconomic factors could be similar to those identified in a
 14 recent environmental analysis conducted by Reclamation for long-term water
 15 transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as
 16 described above under the No Action Alternative compared to the Second Basis
 17 of Comparison. For the purposes of this EIS, it is anticipated that similar
 18 conditions would occur during implementation of cross Delta water transfers
 19 under Alternative 1 and the No Action Alternative, and that impacts on
 20 socioeconomic factors could be adverse in the seller's service area.

21 Under Alternative 1, water could be transferred throughout the year without an
 22 annual volumetric limit. Under the No Action Alternative, the timing of cross
 23 Delta water transfers would be limited to July through September and include
 24 annual volumetric limits, in accordance with the 2008 USFWS BO and 2009
 25 NMFS BO. Overall, the potential for cross Delta water transfers would be
 26 increased under Alternative 1 as compared to the No Action Alternative.

1 *San Francisco Bay Area Region*

2 *Regional Changes to Irrigated Agriculture*

3 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
 4 water supplies within the San Francisco Bay Area Region would not result in
 5 changes in long-term irrigated acreage or land use changes due to the use of other
 6 water supplies. However, there could be an increase in irrigated acreage in dry
 7 and critical dry years under Alternative 1 as compared to the No Action
 8 Alternative.

9 *Regional Changes to Municipal and Industrial Water Supplies*

10 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 11 and SWP water supplies would increase under Alternative 1 as compared to the
 12 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
 13 described in Chapter 5, and determined the need for new water supplies, changes
 14 in water storage and groundwater pumping, water transfers, water shortage costs,
 15 and excess water savings. The factors and basis of the analysis is described in
 16 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 17 supplies would be implemented until shortages were greater than 5 percent. The
 18 costs of these shortages are included in the analysis.

19 The average annual water supply costs over the 81-year hydrologic period for
 20 M&I water supplies would decrease by 30 percent, as presented in Table 19.78.

21 **Table 19.78 Changes in Municipal and Industrial Water Supply Costs for the San**
 22 **Francisco Bay Area Region under Alternative 1 as compared to the No Action**
 23 **Alternative**

Differences in Total	Alternative 1	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	445	396	48
Delivery Cost (\$1,000)	\$12,515	\$11,044	\$1,471
Assumed New Supply Deliveries (TAF)	16	18	-2
Annualized New Supply Costs (\$1,000)	\$234	\$599	-\$365
Water Storage Costs (\$1,000)	\$1,963	\$1,577	\$386
Lost Water Sales Revenues (\$1,000)	\$1,595	\$4,286	-\$2,691
Transfer Costs (\$1,000)	\$1,154	\$5,722	-\$4,568
Shortage Costs (\$1,000)	\$523	\$1,410	-\$887
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$792	-\$493	-\$298
Excess Water Savings (\$1,000)	-\$549	-\$225	-\$324
Average Annual Changes in Water Supply Costs (\$1,000)	\$16,643	\$23,919	-\$7,276

24 Note:
 25 In 2012 dollars

26 The changes in M&I water supply costs would result in changes to employment
 27 and regional economic output, as summarized in Table 19.79.

Table 19.79 Changes in Municipal and Industrial Water Supply Related Employment and Regional Economic Output for the San Francisco Bay Area Region under Alternative 1 as compared to the No Action Alternative

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.1	7.9	7.8
Mining & Logging	0	0	0	0	0.0	-1.6	5.0	3.4
Construction	0	-1	0	-1	0.0	-158.8	37.1	-121.7
Manufacturing	0	0	0	0	0.0	-28.8	478.0	449.1
Transportation, Warehousing & Utilities	-5	0	1	-4	-1,492.4	-11.2	183.5	-1,320.1
Wholesale Trade	0	0	1	1	0.0	-5.0	350.6	345.7
Retail Trade	0	0	6	6	0.0	-4.2	567.2	563.0
Information	0	0	1	1	0.0	-16.8	306.6	289.8
Financial Activities	0	0	5	4	0.0	-55.8	1,740.5	1,684.7
Services	0	-1	20	19	0.0	-133.7	2,162.8	2,029.1
Government	0	0	0	0	0.0	-0.7	55.1	54.4
Total	-5	-3	35	27	-1,492.4	-416.7	5,894.3	3,985.2

Note:
In 2012 dollars

Regional Changes to Recreational Opportunities

Changes in CVP and SWP water supplies and operations under Alternative 1 as compared to the No Action Alternative generally would result in higher reservoir elevations in reservoirs that store CVP and SWP water (up to 11 to 21 percent); and would result in increased recreational economic factors under Alternative 1 as compared to the No Action Alternative.

Regional Changes to Salmon Fishing

Changes in commercial and sport ocean salmon fishing primarily would be related to the presence of fall-run Chinook Salmon from Central Valley hatcheries. It is assumed that the production of hatchery fish would be similar under Alternative 1 and the No Action Alternative. However, survival of the fall-run Chinook Salmon hatchery fish to the Pacific Ocean could be related to changes in CVP and SWP operations. As described in Chapter 9, Fish and Aquatic Resources, there would be little change in through-Delta survival by emigrating natural juvenile fall-run Chinook Salmon under Alternative 1 and the No Action Alternative. It is assumed that the survival of the hatchery juvenile fall-run Chinook Salmon would be similar to the survival of the natural juvenile fall-run Chinook Salmon. Therefore, the availability of fish for commercial and sport ocean salmon fishing and the associated economic conditions for the fishing industry would be similar under Alternative 1 and the No Action Alternative.

1 *Central Coast Region*

2 *Regional Changes to Irrigated Agriculture*

3 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
 4 water supplies within the Central Coast Region would not result in increases in
 5 long-term irrigated acreage or land use changes due to the use of other water
 6 supplies. However, there could be increased irrigated acreage in dry and critical
 7 dry years under Alternative 1 as compared to the No Action Alternative.

8 *Regional Changes to Municipal and Industrial Water Supplies*

9 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 10 and SWP water supplies would be higher under Alternative 1 as compared to the
 11 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
 12 described in Chapter 5, and determined the need for new water supplies, changes
 13 in water storage and groundwater pumping, water transfers, water shortage costs,
 14 and excess water savings. The factors and basis of the analysis is described in
 15 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 16 supplies would be implemented until shortages were greater than 5 percent. The
 17 costs of these shortages are included in the analysis. It is assumed that
 18 communities do not have Alternative water supplies would utilize water transfers.

19 The average annual water supply costs over the 81-year hydrologic period for
 20 M&I water supplies would increase 6 percent, as presented in Table 19.80.

21 **Table 19.80 Changes in Municipal and Industrial Water Supply Costs for the**
 22 **Central Coast Region under Alternative 1 as compared to the No Action Alternative**

Differences in Total	Alternative 1	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	54	44	10
Delivery Cost (\$1,000)	\$8,174	\$6,663	\$1,510
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$0	\$0	\$0
Transfer Costs (\$1,000)	\$0	\$0	\$0
Shortage Costs (\$1,000)	\$0	\$0	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$8,643	-\$8,068	-\$575
Excess Water Savings (\$1,000)	-\$4,176	-\$2,970	-\$1,206
Average Annual Changes in Water Supply Costs (\$1,000)	-\$4,645	-\$4,374	-\$271

23 Note:
 24 In 2012 dollars

25 The changes in M&I water supply costs would result in changes to employment
 26 and regional economic output, as summarized in Table 19.81.

1 **Table 19.81 Changes in Municipal and Industrial Water Supply Related**
 2 **Employment and Regional Economic Output for the Central Coast Region under**
 3 **Alternative 1 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.6	4.0	3.4
Mining & Logging	0	0	0	0	0.0	-6.4	9.3	2.9
Construction	0	-2	0	-2	0.0	-201.9	9.7	-192.2
Manufacturing	0	0	0	0	0.0	-26.8	51.8	25.0
Transportation, Warehousing & Utilities	-6	0	0	-6	-1,510.8	-17.0	56.2	-1,471.6
Wholesale Trade	0	0	0	0	0.0	-4.8	58.6	53.8
Retail Trade	0	0	1	1	0.0	-6.1	118.5	112.4
Information	0	0	0	0	0.0	-12.0	39.0	27.0
Financial Activities	0	0	1	1	0.0	-68.9	352.0	283.2
Services	0	-2	5	3	0.0	-167.1	447.4	280.3
Government	0	0	0	0	0.0	-0.9	13.2	12.3
Total	-6	-4	8	-2	-1,510.8	-512.7	1,159.9	-863.6

4 Note:
 5 In 2012 dollars

6 *Regional Changes to Recreational Opportunities*

7 Changes in CVP and SWP water supplies and operations under Alternative 1 as
 8 compared to the No Action Alternative generally would result in higher reservoir
 9 elevations in reservoirs that store CVP and SWP water (up to 11 to 21 percent);
 10 and would result in increased recreational economic factors under Alternative 1 as
 11 compared to the No Action Alternative.

12 *Southern California Region*

13 *Regional Changes to Irrigated Agriculture*

14 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
 15 water supplies within the Southern California Region would not result in
 16 increases in long-term irrigated acreage or land use changes due to the use of
 17 other water supplies. However, there could be increased irrigated acreage in dry
 18 and critical dry years under Alternative 1 as compared to the No Action
 19 Alternative.

20 *Regional Changes to Municipal and Industrial Water Supplies*

21 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 22 and SWP water supplies would be higher under Alternative 1 as compared to the
 23 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
 24 described in Chapter 5, and determined the need for new water supplies, changes
 25 in water storage and groundwater pumping, water transfers, water shortage costs,
 26 and excess water savings. The factors and basis of the analysis is described in
 27 detail in Appendix 19A, CWEST Model. The analysis assumes that no new

1 supplies would be implemented until shortages were greater than 5 percent. The
 2 costs of these shortages are included in the analysis. It is assumed that
 3 communities do not have Alternative water supplies would utilize water transfers.
 4 The average annual water supply costs over the 81-year hydrologic period for
 5 M&I water supplies would decrease 14 percent, as presented in Table 19.82.

6 **Table 19.82 Changes in Municipal and Industrial Water Supply Costs for the**
 7 **Southern California Region under Alternative 1 as compared to the No Action**
 8 **Alternative**

Differences in Total	Alternative 1	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	2,394	1,932	461
Delivery Cost (\$1,000)	\$296,795	\$239,692	\$57,103
Assumed New Supply Deliveries (TAF)	11	47	-35
Annualized New Supply Costs (\$1,000)	\$4,032	\$12,688	-\$8,656
Water Storage Costs (\$1,000)	\$2,824	\$7,598	-\$4,774
Lost Water Sales Revenues (\$1,000)	\$1,119	\$14,614	-\$13,495
Transfer Costs (\$1,000)	\$3,705	\$11,484	-\$7,779
Shortage Costs (\$1,000)	\$353	\$17,319	-\$16,966
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$91,507	-\$57,474	-\$34,033
Excess Water Savings (\$1,000)	-\$10,573	-\$4,629	-\$5,944
Average Annual Changes in Water Supply Costs (\$1,000)	\$206,749	\$241,291	-\$34,542

9 Note:
 10 In 2012 dollars

11 The changes in M&I water supply costs would result in changes to employment
 12 and regional economic output, as summarized in Table 19.83.

Table 19.83 Changes in Municipal and Industrial Water Supply Related Employment and Regional Economic Output for the Southern California Region under Alternative 1 as compared to the No Action Alternative

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	-2	-1	0.0	12.5	-272.7	-260.2
Mining & Logging	0	1	-1	-1	0.0	164.2	-369.0	-204.8
Construction	0	43	-3	40	0.0	5,205.5	-395.5	4,810.0
Manufacturing	0	2	-10	-8	0.0	1,452.6	-6,814.5	-5,361.9
Transportation, Warehousing & Utilities	175	2	-12	166	43,673.4	592.0	-2,602.9	41,662.5
Wholesale Trade	0	1	-20	-19	0.0	275.3	-4,339.0	-4,063.8
Retail Trade	0	2	-58	-56	0.0	170.6	-5,106.3	-4,935.7
Information	0	1	-6	-5	0.0	637.5	-2,962.1	-2,324.6
Financial Activities	0	9	-52	-43	0.0	2,528.7	-17,797.9	-15,269.1
Services	0	46	-212	-166	0.0	5,542.2	-20,430.6	-14,888.4
Government	0	0	-3	-3	0.0	29.8	-587.3	-557.5
Total	175	108	-378	-95	43,673.4	16,611.0	-61,677.8	-1,393.5

Note:
In 2012 dollars

Regional Changes to Recreational Opportunities

Changes in CVP and SWP water supplies and operations under Alternative 1 as compared to the No Action Alternative generally would result in higher reservoir elevations in reservoirs that store CVP and SWP water (up to 11 to 21 percent); and would result in increased recreational economic factors under Alternative 1 as compared to the No Action Alternative.

19.4.3.2.2 Alternative 1 Compared to the Second Basis of Comparison

As described in Chapter 3, Description of Alternatives, Alternative 1 is identical to the Second Basis of Comparison.

19.4.3.3 Alternative 2

The CVP and SWP operations under Alternative 2 are identical to the CVP and SWP operations under the No Action Alternative, therefore, Alternative 2 is only compared to the Second Basis of Comparison.

19.4.3.3.1 Alternative 2 Compared to the Second Basis of Comparison

The CVP and SWP operations under Alternative 2 are identical to the CVP and SWP operations under the No Action Alternative. Therefore, changes to socioeconomic factors under Alternatives 2 as compared to the Second Basis of Comparison would be the same as the impacts described in Section 12.4.3.1, No Action Alternative.

1 **19.4.3.4 Alternative 3**

2 As described in Chapter 3, Description of Alternatives, CVP and SWP operations
3 under Alternative 3 are similar to the Second Basis of Comparison with modified
4 Old and Middle River flow criteria and New Melones Reservoir operations and
5 reductions in Striped Bass fishing opportunities. As described in Chapter 4,
6 Approach to Environmental Analysis, Alternative 3 is compared to the No Action
7 Alternative and the Second Basis of Comparison.

8 **19.4.3.4.1 Alternative 3 Compared to the No Action Alternative**

9 *Trinity River Region*

10 *Regional Changes to Irrigated Agriculture*

11 There are no agricultural lands irrigated with CVP and SWP water supplies in the
12 Trinity River Region. Therefore, there would be no changes in irrigated lands
13 under Alternative 3 as compared to the No Action Alternative.

14 *Regional Changes to Municipal and Industrial Water Supplies*

15 The CVP would continue to release water in Trinity River for downstream
16 beneficial uses, including water supplies under Alternative 3 as compared to the
17 No Action Alternative. There are no CVP or SWP water contractors in the
18 Trinity River Region.

19 *Regional Changes to Recreational Opportunities*

20 Recreational opportunities would be similar in the Trinity River Region under
21 Alternative 3 as compared to the No Action Alternative as described in
22 Chapter 15, Recreational Resources.

23 *Regional Changes to Salmon Fishing*

24 Trinity River flows would be similar under Alternative 3 as compared to the No
25 Action Alternative. This could result in similar salmon harvest conditions by the
26 Yurok and Hoopa Valley tribes.

27 *Central Valley Region*

28 *Regional Changes to Irrigated Agriculture*

29 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
30 and SWP water supplies would be greater under Alternative 3 as compared to the
31 No Action Alternative. It is anticipated that groundwater use would decrease in
32 response to increased CVP and SWP water supplies in 2030; and sustainable
33 groundwater management plans would not be fully implemented until the 2040s,
34 as discussed in Chapter 12, Agricultural Resources.

35 The agricultural production value under long-term average conditions would be
36 increased by less than 1 percent (\$1.2 million/year in the Sacramento Valley and
37 \$0.3 million/year in the San Joaquin Valley) primarily due to a decrease in
38 groundwater pumping of approximately 4 percent. The agricultural production
39 value under dry and critical dry conditions also would be increased by less than
40 1 percent (\$9.2 million/year in the Sacramento Valley and \$11.4 million/year in
41 the San Joaquin Valley), primarily due to a decrease in groundwater pumping.

1 The overall increase in agricultural production values are less than 0.05 percent
 2 under long-term conditions; and, changes in employment and regional economic
 3 output would be minimal. Therefore, the analysis of employment and regional
 4 economic output is focused on dry and critical dry years.

5 The direct changes in agricultural production would result in changes to
 6 employment and regional economic output in the Sacramento and San Joaquin
 7 valleys, as summarized in Tables 19.84 and 19.85, respectively.

8 **Table 19.84 Changes in Agricultural-Related Employment and Regional Economic**
 9 **Output for the Sacramento Valley under Alternative 3 as compared to the No**
 10 **Action Alternative in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	69	18	0	86	9.2	1.1	0.0	10.3
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	1	0	1	0.0	0.1	0.0	0.1
Manufacturing	0	0	0	0	0.0	0.1	0.0	0.1
Transportation, Warehousing & Utilities	0	1	0	1	0.0	0.3	0.1	0.4
Wholesale Trade	0	1	0	1	0.0	0.2	0.1	0.3
Retail Trade	0	0	3	3	0.0	0.0	0.3	0.3
Information	0	0	0	0	0.0	0.0	0.1	0.1
Financial Activities	0	5	2	7	0.0	1.3	0.7	2.0
Services	0	3	10	13	0.0	0.2	0.9	1.1
Government	0	0	0	0	0.0	0.1	0.0	0.1
Total	69	29	17	115	9.2	3.4	2.2	14.8

11 Note:
 12 In 2012 dollars

1 **Table 19.85 Changes in Agricultural-Related Employment and Regional Economic**
 2 **Output for the San Joaquin Valley under Alternative 3 as compared to the No**
 3 **Action Alternative in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	103	26	0	130	11.4	1.2	0.0	12.7
Mining & Logging	0	1	0	1	0.0	0.2	0.0	0.2
Construction	0	1	0	1	0.0	0.1	0.0	0.1
Manufacturing	0	1	0	1	0.0	1.2	0.1	1.3
Transportation, Warehousing & Utilities	0	2	0	2	0.0	0.5	0.1	0.6
Wholesale Trade	0	1	0	1	0.0	0.2	0.1	0.3
Retail Trade	0	0	3	3	0.0	0.0	0.3	0.3
Information	0	0	0	0	0.0	0.0	0.1	0.1
Financial Activities	0	8	1	10	0.0	1.8	0.6	2.5
Services	0	3	9	12	0.0	0.3	0.7	1.0
Government	0	0	0	1	0.0	0.1	0.0	0.1
Total	103	44	15	161	11.4	5.7	2.1	19.1

4 Note:
 5 In 2012 dollars

6 As described in Chapter 11, Geology and Soils Resources, increased groundwater
 7 pumping under the long-term average conditions may result in an additional
 8 increment of subsidence in those areas within the Central Valley. The additional
 9 amount of subsidence and the economic costs associated with it have not been
 10 quantified in this EIS. However, total subsidence-related costs have been shown
 11 to be substantial, as reported by Borchers et al. (2014) who estimated that the cost
 12 of subsidence in San Joaquin Valley between 1955 and 1972 was more than
 13 \$1.3 billion (in 2013 dollars). These estimates are based on the impacts to major
 14 infrastructure in the region including the San Joaquin River, Delta Mendota
 15 Canal, Friant-Kern Canal and San Luis Canal in addition to privately owned
 16 infrastructure. The incremental subsidence-related costs, expressed on an annual
 17 basis, could be an unknown fraction of that cumulative cost.

18 *Regional Changes to Municipal and Industrial Water Supplies*

19 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 20 and SWP water supplies would increase under Alternative 3 as compared to the
 21 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
 22 described in Chapter 5, and determined the need for new water supplies, changes
 23 in water storage and groundwater pumping, water transfers, water shortage costs,
 24 and excess water savings. The factors and basis of the analysis is described in
 25 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 26 supplies would be implemented until shortages were greater than 5 percent.

1 The costs of these shortages are included in the analysis. It is assumed that
2 communities do not have Alternative water supplies would utilize water transfers.

3 The average annual water supply costs over the 81-year hydrologic period for
4 M&I water supplies are presented in Tables 19.86 and 19.87 for the Sacramento
5 and San Joaquin Valley, respectively. Average annual water supply costs would
6 decrease by 6 percent in the Sacramento Valley and increase by 21 percent in the
7 San Joaquin Valley.

8 **Table 19.86 Changes in Municipal and Industrial Water Supply Costs for the**
9 **Sacramento Valley under Alternative 3 as compared to the No Action Alternative**

Differences in Total	Alternative 3	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	461	447	13
Delivery Cost (\$1,000)	\$8,285	\$8,031	\$255
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$243	\$213	\$30
Transfer Costs (\$1,000)	\$601	\$739	-\$138
Shortage Costs (\$1,000)	\$77	\$69	\$8
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$3,938	-\$3,858	-\$81
Excess Water Savings (\$1,000)	-\$2,517	-\$2,275	-\$241
Average Annual Changes in Water Supply Costs (\$1,000)	\$2,750	\$2,919	-\$169

10 Note:
11 In 2012 dollars

12 **Table 19.87 Changes in Municipal and Industrial Water Supply Costs for the**
13 **San Joaquin Valley under Alternative 3 as compared to the No Action Alternative**

Differences in Total	Alternative 3	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	241	214	27
Delivery Cost (\$1,000)	\$3,896	\$3,460	\$436
Assumed New Supply Deliveries (TAF)	0	2	-2
Annualized New Supply Costs (\$1,000)	\$13	\$429	-\$417
Water Storage Costs (\$1,000)	\$465	\$942	-\$477
Lost Water Sales Revenues (\$1,000)	\$284	\$361	-\$78
Transfer Costs (\$1,000)	\$2,104	\$2,673	-\$568
Shortage Costs (\$1,000)	\$89	\$115	-\$26
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$15,660	-\$15,377	-\$283
Excess Water Savings (\$1,000)	-\$1,378	-\$1,029	-\$349
Average Annual Changes in Water Supply Costs (\$1,000)	-\$10,187	-\$8,427	-\$1,761

14 Note:
15 In 2012 dollars

1 The changes in M&I water supply costs would result in changes to employment
 2 and regional economic output in the Sacramento and San Joaquin valleys, as
 3 summarized in Tables 19.88 and 19.89, respectively.

4 **Table 19.88 Changes in Municipal and Industrial Water Supply Related**
 5 **Employment and Regional Economic Output for the Sacramento Valley under**
 6 **Alternative 3 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.1	-1.2	-1.1
Mining & Logging	0	0	0	0	0.0	0.4	-0.2	0.2
Construction	0	0	0	0	0.0	25.8	-1.8	23.9
Manufacturing	0	0	0	0	0.0	2.8	-16.2	-13.5
Transportation, Warehousing & Utilities	1	0	0	1	254.4	2.5	-13.1	243.7
Wholesale Trade	0	0	0	0	0.0	0.9	-20.0	-19.1
Retail Trade	0	0	0	0	0.0	0.8	-33.8	-33.0
Information	0	0	0	0	0.0	3.0	-15.1	-12.1
Financial Activities	0	0	0	0	0.0	11.6	-107.7	-96.1
Services	0	0	-1	-1	0.0	27.4	-112.8	-85.4
Government	0	0	0	0	0.0	0.1	-2.8	-2.7
Total	1	1	-2	0	254.4	75.3	-324.8	4.9

7 Note:
 8 In 2012 dollars

9 **Table 19.89 Changes in Municipal and Industrial Water Supply Related**
 10 **Employment and Regional Economic Output for the San Joaquin Valley under**
 11 **Alternative 3 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.2	-8.9	-9.1
Mining & Logging	0	0	0	0	0.0	-1.2	-8.5	-9.7
Construction	0	0	0	0	0.0	-43.3	-7.4	-50.7
Manufacturing	0	0	0	0	0.0	-4.4	-62.0	-66.3
Transportation, Warehousing & Utilities	-2	0	0	-2	-457.3	-4.4	-59.6	-521.3
Wholesale Trade	0	0	0	0	0.0	-1.2	-51.6	-52.8
Retail Trade	0	0	-2	-2	0.0	-1.3	-130.7	-132.0
Information	0	0	0	0	0.0	-3.2	-36.0	-39.2
Financial Activities	0	0	-1	-1	0.0	-14.1	-352.2	-366.3
Services	0	0	-5	-5	0.0	-38.0	-391.1	-429.1
Government	0	0	0	0	0.0	-0.3	-17.2	-17.5
Total	-2	-1	-8	-11	-457.3	-111.6	-1,125.2	-1,694.1

12 Note:
 13 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Recreational opportunities would be similar at San Luis Reservoir under
3 Alternative 3 as compared to the No Action Alternative, as described in
4 Chapter 15, Recreation Resources. Recreational opportunities related to Striped
5 Bass fishing would decline due to predation control programs. Therefore, it is
6 anticipated that recreational economic factors would be reduced under
7 Alternative 3 as compared to the No Action Alternative.

8 *Effects Related to Cross Delta Water Transfers*

9 Potential effects to socioeconomic factors could be similar to those identified in a
10 recent environmental analysis conducted by Reclamation for long-term water
11 transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as
12 described above under the No Action Alternative compared to the Second Basis
13 of Comparison. For the purposes of this EIS, it is anticipated that similar
14 conditions would occur during implementation of cross Delta water transfers
15 under Alternative 3 and the No Action Alternative, and that impacts on
16 socioeconomic factors could be adverse in the seller's service area.

17 Under Alternative 3, water could be transferred throughout the year without an
18 annual volumetric limit. Under the No Action Alternative, the timing of cross
19 Delta water transfers would be limited to July through September and include
20 annual volumetric limits, in accordance with the 2008 USFWS BO and 2009
21 NMFS BO. Overall, the potential for cross Delta water transfers would be
22 increased under Alternative 3 as compared to the No Action Alternative.

23 *San Francisco Bay Area Region*

24 *Regional Changes to Irrigated Agriculture*

25 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
26 water supplies within the San Francisco Bay Area Region would not result in
27 changes in long-term irrigated acreage or land use changes due to the use of other
28 water supplies. However, there could be an increase in irrigated acreage in dry
29 and critical dry years under Alternative 3 as compared to the No Action
30 Alternative.

31 *Regional Changes to Municipal and Industrial Water Supplies*

32 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
33 and SWP water supplies would increase under Alternative 3 as compared to the
34 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
35 described in Chapter 5, and determined the need for new water supplies, changes
36 in water storage and groundwater pumping, water transfers, water shortage costs,
37 and excess water savings. The factors and basis of the analysis is described in
38 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
39 supplies would be implemented until shortages were greater than 5 percent. The
40 costs of these shortages are included in the analysis.

41 The average annual water supply costs over the 81-year hydrologic period for
42 M&I water supplies would decrease by 21 percent, as presented in Table 19.90.

1 **Table 19.90 Changes in Municipal and Industrial Water Supply Costs for the San**
 2 **Francisco Bay Area Region under Alternative 3 as compared to the No Action**
 3 **Alternative**

Differences in Total	Alternative 3	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	431	396	34
Delivery Cost (\$1,000)	\$12,096	\$11,044	\$1,052
Assumed New Supply Deliveries (TAF)	18	18	0
Annualized New Supply Costs (\$1,000)	\$575	\$599	-\$24
Water Storage Costs (\$1,000)	\$2,303	\$1,577	\$726
Lost Water Sales Revenues (\$1,000)	\$2,381	\$4,286	-\$1,905
Transfer Costs (\$1,000)	\$1,826	\$5,722	-\$3,896
Shortage Costs (\$1,000)	\$743	\$1,410	-\$667
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$726	-\$493	-\$232
Excess Water Savings (\$1,000)	-\$393	-\$225	-\$167
Average Annual Changes in Water Supply Costs (\$1,000)	\$18,806	\$23,919	-\$5,113

4 Note:
 5 In 2012 dollars

6 The changes in M&I water supply costs would result in changes to employment
 7 and regional economic output, as summarized in Table 19.91.

8 **Table 19.91 Changes in Municipal and Industrial Water Supply Related**
 9 **Employment and Regional Economic Output for the San Francisco Bay Area**
 10 **Region under Alternative 3 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.1	-6.0	-5.9
Mining & Logging	0	0	0	0	0.0	1.9	-3.8	-1.9
Construction	0	1	0	1	0.0	186.7	-28.2	158.6
Manufacturing	0	0	0	0	0.0	33.9	-363.5	-329.6
Transportation, Warehousing & Utilities	6	0	-1	5	1,754.5	13.2	-139.1	1,628.6
Wholesale Trade	0	0	-1	-1	0.0	5.8	-268.7	-262.9
Retail Trade	0	0	-5	-5	0.0	4.9	-428.6	-423.7
Information	0	0	0	0	0.0	19.8	-233.1	-213.4
Financial Activities	0	0	-3	-3	0.0	65.6	-1,320.3	-1,254.7
Services	0	1	-15	-14	0.0	157.2	-1,639.6	-1,482.4
Government	0	0	0	0	0.0	0.8	-41.8	-41.0
Total	6	3	-26	-17	1,754.5	489.9	-4,472.7	-2,228.3

11 Note:
 12 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Changes in CVP and SWP water supplies and operations under Alternative 3 as
3 compared to the No Action Alternative generally would result in higher reservoir
4 elevations in reservoirs that store CVP and SWP water (up to 9 to 17 percent);
5 and would result in increased recreational economic factors under Alternative 3 as
6 compared to the No Action Alternative.

7 *Regional Changes to Salmon Fishing*

8 Changes in commercial and sport ocean salmon fishing primarily would be
9 related to the presence of fall-run Chinook Salmon from Central Valley
10 hatcheries. It is assumed that the production of hatchery fish would be similar
11 under Alternative 3 and the No Action Alternative. However, survival of the fall-
12 run Chinook Salmon hatchery fish to the Pacific Ocean could be related to
13 changes in CVP and SWP operations. As described in Chapter 9, Fish and
14 Aquatic Resources, there would be little change in through-Delta survival by
15 emigrating natural juvenile fall-run Chinook Salmon under Alternative 3 and the
16 No Action Alternative. It is assumed that the survival of the hatchery juvenile
17 fall-run Chinook Salmon would be similar to the survival of the natural juvenile
18 fall-run Chinook Salmon. Therefore, the availability of fish for commercial and
19 sport ocean salmon fishing and the associated economic conditions for the fishing
20 industry would be similar under Alternative 3 and the No Action Alternative.

21 *Central Coast Region*

22 *Regional Changes to Irrigated Agriculture*

23 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
24 water supplies within the Central Coast Region would not result in increases in
25 long-term irrigated acreage or land use changes due to the use of other water
26 supplies. However, there could be increased irrigated acreage in dry and critical
27 dry years under Alternative 3 as compared to the No Action Alternative.

28 *Regional Changes to Municipal and Industrial Water Supplies*

29 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
30 and SWP water supplies would be higher under Alternative 3 as compared to the
31 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
32 described in Chapter 5, and determined the need for new water supplies, changes
33 in water storage and groundwater pumping, water transfers, water shortage costs,
34 and excess water savings. The factors and basis of the analysis is described in
35 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
36 supplies would be implemented until shortages were greater than 5 percent. The
37 costs of these shortages are included in the analysis. It is assumed that
38 communities do not have Alternative water supplies would utilize water transfers.

39 The average annual water supply costs over the 81-year hydrologic period for
40 M&I water supplies would be similar (within 5 percent change), as presented in
41 Table 19.92.

1 **Table 19.92 Changes in Municipal and Industrial Water Supply Costs for the**
 2 **Central Coast Region under Alternative 3 as compared to the No Action Alternative**

Differences in Total	Alternative 3	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	51	44	8
Delivery Cost (\$1,000)	\$7,814	\$6,663	\$1,151
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$0	\$0	\$0
Transfer Costs (\$1,000)	\$0	\$0	\$0
Shortage Costs (\$1,000)	\$0	\$0	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$8,333	-\$8,068	-\$265
Excess Water Savings (\$1,000)	-\$3,980	-\$2,970	-\$1,010
Average Annual Changes in Water Supply Costs (\$1,000)	-\$4,499	-\$4,374	-\$125

3 Note:
 4 In 2012 dollars

5 The changes in M&I water supply costs would result in changes to employment
 6 and regional economic output, as summarized in Table 19.93.

7 **Table 19.93 Changes in Municipal and Industrial Water Supply Related**
 8 **Employment and Regional Economic Output for the Central Coast Region under**
 9 **Alternative 3 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.4	-2.8	-2.4
Mining & Logging	0	0	0	0	0.0	4.9	-6.5	-1.7
Construction	0	1	0	1	0.0	153.8	-6.8	147.0
Manufacturing	0	0	0	0	0.0	20.4	-36.5	-16.0
Transportation, Warehousing & Utilities	5	0	0	5	1,150.6	13.0	-39.5	1,124.0
Wholesale Trade	0	0	0	0	0.0	3.7	-41.4	-37.8
Retail Trade	0	0	-1	-1	0.0	4.7	-83.0	-78.4
Information	0	0	0	0	0.0	9.1	-27.4	-18.3
Financial Activities	0	0	-1	0	0.0	52.5	-247.3	-194.8
Services	0	1	-3	-2	0.0	127.3	-314.2	-186.9
Government	0	0	0	0	0.0	0.7	-9.3	-8.6
Total	5	3	-6	2	1,150.6	390.4	-814.8	726.2

10 Note:
 11 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Changes in CVP and SWP water supplies and operations under Alternative 3 as
3 compared to the No Action Alternative generally would result in higher reservoir
4 elevations in reservoirs that store CVP and SWP water (up to 9 to 17 percent);
5 and would result in increased recreational economic factors under Alternative 3 as
6 compared to the No Action Alternative.

7 *Southern California Region*

8 *Regional Changes to Irrigated Agriculture*

9 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
10 water supplies within the Southern California Region would not result in
11 increases in long-term irrigated acreage or land use changes due to the use of
12 other water supplies. However, there could be increased irrigated acreage in dry
13 and critical dry years under Alternative 3 as compared to the No Action
14 Alternative.

15 *Regional Changes to Municipal and Industrial Water Supplies*

16 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
17 and SWP water supplies would be higher under Alternative 3 as compared to the
18 No Action Alternative. The analysis assumed CVP and SWP water deliveries, as
19 described in Chapter 5, and determined the need for new water supplies, changes
20 in water storage and groundwater pumping, water transfers, water shortage costs,
21 and excess water savings. The factors and basis of the analysis is described in
22 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
23 supplies would be implemented until shortages were greater than 5 percent. The
24 costs of these shortages are included in the analysis. It is assumed that
25 communities do not have Alternative water supplies would utilize water transfers.

26 The average annual water supply costs over the 81-year hydrologic period for
27 M&I water supplies would similar (within 5 percent change), as presented in
28 Table 19.94.

1 **Table 19.94 Changes in Municipal and Industrial Water Supply Costs for the**
 2 **Southern California Region under Alternative 3 as compared to the No Action**
 3 **Alternative**

Differences in Total	Alternative 3	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	2,241	1,932	308
Delivery Cost (\$1,000)	\$278,085	\$239,692	\$38,393
Assumed New Supply Deliveries (TAF)	40	47	-7
Annualized New Supply Costs (\$1,000)	\$10,584	\$12,688	-\$2,104
Water Storage Costs (\$1,000)	\$8,154	\$7,598	\$556
Lost Water Sales Revenues (\$1,000)	\$11,409	\$14,614	-\$3,205
Transfer Costs (\$1,000)	\$6,181	\$11,484	-\$5,303
Shortage Costs (\$1,000)	\$12,632	\$17,319	-\$4,687
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$81,693	-\$57,474	-\$24,218
Excess Water Savings (\$1,000)	-\$9,005	-\$4,629	-\$4,376
Average Annual Changes in Water Supply Costs (\$1,000)	\$236,347	\$241,291	-\$4,944

4 Note:
 5 In 2012 dollars

6 The changes in M&I water supply costs would result in changes to employment
 7 and regional economic output, as summarized in Table 19.95.

8 **Table 19.95 Changes in Municipal and Industrial Water Supply Related**
 9 **Employment and Regional Economic Output for the Southern California under**
 10 **Alternative 3 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	-1	-1	0.0	10.5	-146.4	-135.8
Mining & Logging	0	1	-1	0	0.0	138.6	-199.8	-61.2
Construction	0	37	-2	35	0.0	4,391.6	-211.9	4,179.8
Manufacturing	0	2	-6	-3	0.0	1,225.5	-3,662.5	-2,437.0
Transportation, Warehousing & Utilities	148	2	-6	143	36,845.0	499.5	-1,389.7	35,954.8
Wholesale Trade	0	1	-11	-10	0.0	232.2	-2,405.6	-2,173.3
Retail Trade	0	2	-31	-29	0.0	143.9	-2,688.1	-2,544.2
Information	0	1	-3	-2	0.0	537.8	-1,595.7	-1,057.9
Financial Activities	0	7	-28	-20	0.0	2,133.4	-9,496.1	-7,362.8
Services	0	39	-113	-74	0.0	4,675.7	-10,892.2	-6,216.5
Government	0	0	-2	-1	0.0	25.1	-314.7	-289.6
Total	148	91	-202	37	36,845.0	14,013.9	-33,002.7	17,856.2

11 Note:
 12 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Changes in CVP and SWP water supplies and operations under Alternative 3 as
3 compared to the No Action Alternative generally would result in higher reservoir
4 elevations in reservoirs that store CVP and SWP water (up to 9 to 17 percent);
5 and would result in increased recreational economic factors under Alternative 3 as
6 compared to the No Action Alternative.

7 **19.4.3.4.2 Alternative 3 Compared to the Second Basis of Comparison**

8 *Trinity River Region*

9 *Regional Changes to Irrigated Agriculture*

10 There are no agricultural lands irrigated with CVP and SWP water supplies in the
11 Trinity River Region. Therefore, there would be no changes in irrigated lands
12 under Alternative 3 as compared to the Second Basis of Comparison.

13 *Regional Changes to Municipal and Industrial Water Supplies*

14 The CVP would continue to release water in Trinity River for downstream
15 beneficial uses, including water supplies under Alternative 3 and the Second Basis
16 of Comparison. There are no CVP or SWP water contractors in the Trinity River
17 Region.

18 *Regional Changes to Recreational Opportunities*

19 Recreational opportunities would be similar in the Trinity River Region under
20 Alternative 3 as compared to the Second Basis of Comparison as described in
21 Chapter 15, Recreational Resources.

22 *Regional Changes to Salmon Fishing*

23 Trinity River flows would be similar under Alternative 3 as compared to the
24 Second Basis of Comparison. This could result in similar salmon harvest
25 conditions by the Yurok and Hoopa Valley tribes.

26 *Central Valley Region*

27 *Regional Changes to Irrigated Agriculture*

28 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
29 and SWP water supplies would be less under Alternative 3 than under the Second
30 Basis of Comparison. It is anticipated that groundwater use would increase in
31 response to reduced CVP and SWP water supplies in 2030 because sustainable
32 groundwater management plans would not be fully implemented until the 2040s,
33 as discussed in Chapter 12, Agricultural Resources.

34 The agricultural production value under long-term average conditions would be
35 reduced by less than 1 percent (\$0.3 million/year in the Sacramento Valley and
36 \$0.3 million/year in the San Joaquin Valley) primarily due to an increase in
37 groundwater pumping of approximately 2 percent. The agricultural production
38 value under dry and critical dry conditions also would be reduced by less than
39 1 percent (\$2.1 million/year in the Sacramento Valley and \$8.9 million/year in the
40 San Joaquin Valley) primarily due to an increase in groundwater pumping.

1 The overall reduction in agricultural production values are less than 0.05 percent
 2 under long-term conditions; and, changes in employment and regional economic
 3 output would be minimal. Therefore, the analysis of employment and regional
 4 economic output is focused on dry and critical dry years.

5 The direct changes in agricultural production would result in changes to
 6 employment and regional economic output in the Sacramento and San Joaquin
 7 valleys, as summarized in Tables 19.96 and 19.97, respectively.

8 **Table 19.96 Changes in Agricultural-Related Employment and Regional Economic**
 9 **Output for the Sacramento Valley under Alternative 3 as Compared to the Second**
 10 **Basis of Comparison in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-18	-4	0	-22	-2.1	-0.2	0.0	-2.3
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0	0	0.0	0.0	0.0	0.0
Manufacturing	0	0	0	0	0.0	0.0	0.0	0.0
Transportation, Warehousing & Utilities	0	0	0	0	0.0	-0.1	0.0	-0.1
Wholesale Trade	0	0	0	0	0.0	0.0	0.0	-0.1
Retail Trade	0	0	0	-1	0.0	0.0	0.0	0.0
Information	0	0	0	0	0.0	0.0	0.0	0.0
Financial Activities	0	-2	0	-2	0.0	-0.4	-0.1	-0.5
Services	0	-1	-1	-2	0.0	-0.1	-0.1	-0.2
Government	0	0	0	0	0.0	0.0	0.0	0.0
Total	-18	-7	-2	-27	-2.1	-0.9	-0.3	-3.3

11 Note:
 12 In 2012 dollars

1 **Table 19.97 Changes in Agricultural-Related Employment and Regional Economic**
 2 **Output for the San Joaquin Valley under Alternative 3 as Compared to the Second**
 3 **Basis of Comparison in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-36	-26	0	-63	-8.9	-1.1	0.0	-10.0
Mining & Logging	0	0	0	0	0.0	-0.1	0.0	-0.1
Construction	0	-1	0	-1	0.0	-0.1	0.0	-0.1
Manufacturing	0	0	0	-1	0.0	-0.7	-0.2	-0.8
Transportation, Warehousing & Utilities	0	-1	-1	-2	0.0	-0.3	-0.1	-0.5
Wholesale Trade	0	-1	-1	-1	0.0	-0.1	-0.1	-0.2
Retail Trade	0	0	-4	-4	0.0	0.0	-0.4	-0.4
Information	0	0	0	0	0.0	0.0	-0.1	-0.1
Financial Activities	0	-4	-2	-5	0.0	-0.8	-0.9	-1.7
Services	0	-2	-12	-14	0.0	-0.2	-1.0	-1.2
Government	0	0	0	0	0.0	-0.1	0.0	-0.1
Total	-36	-36	-20	-92	-8.9	-3.5	-2.8	-15.3

4 Note:
 5 In 2012 dollars

6 As described in Chapter 11, Geology and Soils Resources, increased groundwater
 7 pumping under the long-term average conditions may result in an additional
 8 increment of subsidence in those areas within the Central Valley. The additional
 9 amount of subsidence and the economic costs associated with it have not been
 10 quantified in this EIS. However, total subsidence-related costs have been shown
 11 to be substantial, as reported by Borchers et al. (2014) who estimated that the cost
 12 of subsidence in San Joaquin Valley between 1955 and 1972 was more than \$1.3
 13 billion (in 2013 dollars). These estimates are based on the impacts to major
 14 infrastructure in the region including the San Joaquin River, Delta Mendota
 15 Canal, Friant-Kern Canal and San Luis Canal in addition to privately owned
 16 infrastructure. The incremental subsidence-related costs, expressed on an annual
 17 basis, could be an unknown fraction of that cumulative cost.

18 *Regional Changes to Municipal and Industrial Water Supplies*

19 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 20 and SWP water supplies would be similar in the Sacramento Valley and greater in
 21 the San Joaquin Valley under Alternative 3 than under the Second Basis of
 22 Comparison. The analysis assumed CVP and SWP water deliveries, as described
 23 in Chapter 5, and determined the need for new water supplies, changes in water
 24 storage and groundwater pumping, water transfers, water shortage costs, and
 25 excess water savings. The factors and basis of the analysis is described in detail
 26 in Appendix 19A, CWEST Model. The analysis assumes that no new supplies
 27 would be implemented until shortages were greater than 5 percent. The costs of

1 these shortages are included in the analysis. It is assumed that communities do
 2 not have Alternative water supplies would utilize water transfers.
 3 The average annual water supply costs over the 81-year hydrologic period for
 4 M&I water supplies are presented in Tables 19.98 and 19.99 for the Sacramento
 5 and San Joaquin Valley, respectively. Average annual water supply costs would
 6 increase in the Sacramento and San Joaquin valleys by 5 and 6 percent,
 7 respectively.

8 **Table 19.98 Changes in Municipal and Industrial Water Supply Costs for the**
 9 **Sacramento Valley under Alternative 3 as Compared to the Second Basis of**
 10 **Comparison**

Differences in Total	Alternative 3	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	461	463	-2
Delivery Cost (\$1,000)	\$8,285	\$8,317	-\$32
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$243	\$207	\$35
Transfer Costs (\$1,000)	\$601	\$517	\$84
Shortage Costs (\$1,000)	\$77	\$68	\$9
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$3,938	-\$3,916	-\$23
Excess Water Savings (\$1,000)	-\$2,517	-\$2,563	\$46
Average Annual Changes in Water Supply Costs (\$1,000)	\$2,750	\$2,630	\$119

11 Note:
 12 In 2012 dollars

13 **Table 19.99 Changes in Municipal and Industrial Water Supply Costs for the San**
 14 **Joaquin Valley under Alternative 3 as Compared to the Second Basis of**
 15 **Comparison**

Differences in Total	Alternative 3	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	241	237	4
Delivery Cost (\$1,000)	\$3,896	\$3,854	\$42
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$13	\$15	-\$3
Water Storage Costs (\$1,000)	\$465	\$820	-\$355
Lost Water Sales Revenues (\$1,000)	\$284	\$322	-\$39
Transfer Costs (\$1,000)	\$2,104	\$2,623	-\$518
Shortage Costs (\$1,000)	\$89	\$102	-\$13
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$15,660	-\$16,011	\$351
Excess Water Savings (\$1,000)	-\$1,378	-\$1,318	-\$59
Average Annual Changes in Water Supply Costs (\$1,000)	-\$10,187	-\$9,593	-\$595

16 Note:
 17 In 2012 dollars

1 The changes in M&I water supply costs would result in changes to employment
 2 and regional economic output in the Sacramento and San Joaquin valleys, as
 3 summarized in Tables 19.100 and 19.101, respectively.

4 **Table 19.100 Changes in Municipal and Industrial Water Supply Related**
 5 **Employment and Regional Economic Output for the Sacramento Valley under**
 6 **Alternative 3 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	0.5	0.5
Mining & Logging	0	0	0	0	0.0	0.0	0.1	0.0
Construction	0	0	0	0	0.0	-3.5	0.7	-2.8
Manufacturing	0	0	0	0	0.0	-0.4	6.4	6.0
Transportation, Warehousing & Utilities	0	0	0	0	-34.6	-0.3	5.2	-29.7
Wholesale Trade	0	0	0	0	0.0	-0.1	7.7	7.6
Retail Trade	0	0	0	0	0.0	-0.1	13.6	13.5
Information	0	0	0	0	0.0	-0.4	6.0	5.5
Financial Activities	0	0	0	0	0.0	-1.6	42.9	41.3
Services	0	0	0	0	0.0	-3.7	45.0	41.2
Government	0	0	0	0	0.0	0.0	1.1	1.1
Total	0	0	1	1	-34.6	-10.2	129.2	84.4

7 Note:
 8 In 2012 dollars

9 **Table 19.101 Changes in Municipal and Industrial Water Supply Related**
 10 **Employment and Regional Economic Output for the San Joaquin Valley under**
 11 **Alternative 3 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.1	-2.3	-2.4
Mining & Logging	0	0	0	0	0.0	-0.8	-2.1	-3.0
Construction	0	0	0	0	0.0	-29.9	-1.9	-31.8
Manufacturing	0	0	0	0	0.0	-3.0	-15.5	-18.6
Transportation, Warehousing & Utilities	-1	0	0	-1	-315.8	-3.0	-14.9	-333.7
Wholesale Trade	0	0	0	0	0.0	-0.8	-12.7	-13.5
Retail Trade	0	0	0	0	0.0	-0.9	-33.4	-34.3
Information	0	0	0	0	0.0	-2.2	-9.0	-11.2
Financial Activities	0	0	0	0	0.0	-9.7	-88.6	-98.4
Services	0	0	-1	-1	0.0	-26.2	-99.0	-125.2
Government	0	0	0	0	0.0	-0.2	-4.3	-4.5
Total	-1	-1	-2	-4	-315.8	-77.0	-283.5	-676.3

12 Note:
 13 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Recreational opportunities would be similar at San Luis Reservoir under
3 Alternative 3 as compared to the Second Basis of Comparison, as described in
4 Chapter 15, Recreation Resources. Recreational opportunities related to Striped
5 Bass fishing would decline due to predation control programs. Therefore, it is
6 anticipated that recreational economic factors would be reduced under
7 Alternative 3 as compared to the Second Basis of Comparison.

8 *Effects Related to Cross Delta Water Transfers*

9 Potential effects to socioeconomic factors could be similar to those identified in a
10 recent environmental analysis conducted by Reclamation for long-term water
11 transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as
12 described above under the No Action Alternative compared to the Second Basis
13 of Comparison. For the purposes of this EIS, it is anticipated that similar
14 conditions would occur during implementation of cross Delta water transfers
15 under Alternative 3 and the Second Basis of Comparison, and that impacts on
16 socioeconomic factors could be adverse in the seller's service area.

17 Under Alternative 3 and Second Basis of Comparison, water could be transferred
18 throughout the year without an annual volumetric limit. Overall, the potential for
19 cross Delta water transfers would be similar under Alternative 3 as compared to
20 the Second Basis of Comparison.

21 *San Francisco Bay Area Region*

22 *Regional Changes to Irrigated Agriculture*

23 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
24 water supplies within the San Francisco Bay Area Region would not result in
25 reductions in long-term irrigated acreage or land use changes due to the use of
26 other water supplies. However, there could be a reduction in irrigated acreage in
27 dry and critical dry years under Alternative 3 as compared to the Second Basis of
28 Comparison.

29 *Regional Changes to Municipal and Industrial Water Supplies*

30 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
31 and SWP water supplies would be less under Alternative 3 than under the Second
32 Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as
33 described in Chapter 5, and determined the need for new water supplies, changes
34 in water storage and groundwater pumping, water transfers, water shortage costs,
35 and excess water savings. The factors and basis of the analysis is described in
36 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
37 supplies would be implemented until shortages were greater than 5 percent. The
38 costs of these shortages are included in the analysis.

39 The average annual water supply costs over the 81-year hydrologic period for
40 M&I water supplies would increase by 13 percent, as presented in Table 19.102.

1 **Table 19.102 Changes in Municipal and Industrial Water Supply Costs for the San**
 2 **Francisco Bay Area Region under Alternative 3 as Compared to the Second Basis**
 3 **of Comparison**

Differences in Total	Alternative 3	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	431	445	-14
Delivery Cost (\$1,000)	\$12,096	\$12,515	-\$419
Assumed New Supply Deliveries (TAF)	18	16	2
Annualized New Supply Costs (\$1,000)	\$575	\$234	\$342
Water Storage Costs (\$1,000)	\$2,303	\$1,963	\$340
Lost Water Sales Revenues (\$1,000)	\$2,381	\$1,595	\$786
Transfer Costs (\$1,000)	\$1,826	\$1,154	\$672
Shortage Costs (\$1,000)	\$743	\$523	\$221
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$726	-\$792	\$66
Excess Water Savings (\$1,000)	-\$393	-\$549	\$156
Average Annual Changes in Water Supply Costs (\$1,000)	\$18,806	\$16,643	\$2,163

4 Note:
 5 In 2012 dollars

6 The changes in M&I water supply costs would result in changes to employment
 7 and regional economic output, as summarized in Table 19.103.

8 **Table 19.103 Changes in Municipal and Industrial Water Supply Related**
 9 **Employment and Regional Economic Output for the San Francisco Bay Area**
 10 **Region under Alternative 3 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	1.9	1.9
Mining & Logging	0	0	0	0	0.0	0.3	1.2	1.5
Construction	0	0	0	0	0.0	28.0	9.0	36.9
Manufacturing	0	0	0	0	0.0	5.1	114.4	119.5
Transportation, Warehousing & Utilities	1	0	0	1	262.6	2.0	44.3	308.9
Wholesale Trade	0	0	0	0	0.0	0.9	81.9	82.8
Retail Trade	0	0	2	2	0.0	0.7	138.5	139.3
Information	0	0	0	0	0.0	3.0	73.5	76.4
Financial Activities	0	0	1	1	0.0	9.8	420.2	430.0
Services	0	0	5	5	0.0	23.5	523.1	546.7
Government	0	0	0	0	0.0	0.1	13.3	13.4
Total	1	0	8	10	262.6	73.3	1,421.3	1,757.2

11 Note:
 12 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Changes in CVP and SWP water supplies and operations under Alternative 3 as
3 compared to the Second Basis of Comparison generally would result in similar
4 reservoir elevations in reservoirs that store CVP and SWP water and similar
5 recreational economic factors under Alternative 3 as compared to the Second
6 Basis of Comparison.

7 *Regional Changes to Salmon Fishing*

8 Changes in commercial and sport ocean salmon fishing primarily would be
9 related to the presence of fall-run Chinook Salmon from Central Valley
10 hatcheries. It is assumed that the production of hatchery fish would be similar
11 under Alternative 3 and the Second Basis of Comparison. However, survival of
12 the fall-run Chinook Salmon hatchery fish to the Pacific Ocean could be related to
13 changes in CVP and SWP operations. As described in Chapter 9, Fish and
14 Aquatic Resources, there would be little change in through-Delta survival by
15 emigrating natural juvenile fall-run Chinook Salmon under Alternative 3 as
16 compared to the Second Basis of Comparison. It is assumed that the survival of
17 the hatchery juvenile fall-run Chinook Salmon would be similar to the survival of
18 the natural juvenile fall-run Chinook Salmon. Therefore, the availability of fish
19 for commercial and sport ocean salmon fishing and the associated economic
20 conditions for the fishing industry would be similar under Alternative 3 and the
21 Second Basis of Comparison.

22 *Central Coast Region*

23 *Regional Changes to Irrigated Agriculture*

24 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
25 water supplies within the Central Coast Region would not result in reductions in
26 long-term irrigated acreage or land use changes due to the use of other water
27 supplies. However, there could be a reduction in irrigated acreage in dry and
28 critical dry years under Alternative 3 as compared to the Second Basis of
29 Comparison.

30 *Regional Changes to Municipal and Industrial Water Supplies*

31 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
32 and SWP water supplies would be less under Alternative 3 than under the Second
33 Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as
34 described in Chapter 5, and determined the need for new water supplies, changes
35 in water storage and groundwater pumping, water transfers, water shortage costs,
36 and excess water savings. The factors and basis of the analysis is described in
37 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
38 supplies would be implemented until shortages were greater than 5 percent. The
39 costs of these shortages are included in the analysis. It is assumed that
40 communities do not have Alternative water supplies would utilize water transfers.
41 The average annual water supply costs over the 81-year hydrologic period for
42 M&I water supplies would similar (within 5 percent change), as presented in
43 Table 19.104.

1 **Table 19.104 Changes in Municipal and Industrial Water Supply Costs for the**
 2 **Central Coast Region under Alternative 3 as Compared to the Second Basis of**
 3 **Comparison**

Differences in Total	Alternative 3	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	51	54	-2
Delivery Cost (\$1,000)	\$7,814	\$8,174	-\$360
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$0	\$0	\$0
Transfer Costs (\$1,000)	\$0	\$0	\$0
Shortage Costs (\$1,000)	\$0	\$0	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$8,333	-\$8,643	\$310
Excess Water Savings (\$1,000)	-\$3,980	-\$4,176	\$196
Average Annual Changes in Water Supply Costs (\$1,000)	-\$4,499	-\$4,645	\$146

4 Note:
 5 In 2012 dollars

6 The changes in M&I water supply costs would result in changes to employment
 7 and regional economic output, as summarized in Table 19.105.

8 **Table 19.105 Changes in Municipal and Industrial Water Supply Related**
 9 **Employment and Regional Economic Output for the Central Coast Region under**
 10 **Alternative 3 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.1	1.2	1.0
Mining & Logging	0	0	0	0	0.0	-1.5	2.8	1.2
Construction	0	0	0	0	0.0	-48.1	2.9	-45.2
Manufacturing	0	0	0	0	0.0	-6.4	15.4	9.0
Transportation, Warehousing & Utilities	-2	0	0	-2	-359.9	-4.1	16.7	-347.2
Wholesale Trade	0	0	0	0	0.0	-1.2	17.2	16.1
Retail Trade	0	0	0	0	0.0	-1.5	35.5	34.1
Information	0	0	0	0	0.0	-2.9	11.6	8.8
Financial Activities	0	0	0	0	0.0	-16.4	104.9	88.5
Services	0	0	1	1	0.0	-39.8	133.4	93.6
Government	0	0	0	0	0.0	-0.2	3.9	3.7
Total	-2	-1	2	0	-359.9	-122.1	345.5	-136.5

11 Note:
 12 In 2012 dollars

13 *Regional Changes to Recreational Opportunities*

14 Changes in CVP and SWP water supplies and operations under Alternative 3 as
 15 compared to the Second Basis of Comparison generally would result in similar
 16 reservoir elevations in reservoirs that store CVP and SWP water and similar

1 recreational economic factors under Alternative 3 as compared to the Second
 2 Basis of Comparison.

3 *Southern California Region*

4 *Regional Changes to Irrigated Agriculture*

5 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
 6 water supplies within the Southern California Region would not result in
 7 reductions in long-term irrigated acreage or land use changes due to the use of
 8 other water supplies. However, there could be a reduction in irrigated acreage in
 9 dry and critical dry years under Alternative 3 as compared to the Second Basis of
 10 Comparison.

11 *Regional Changes to Municipal and Industrial Water Supplies*

12 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 13 and SWP water supplies would be less under Alternative 3 than under the Second
 14 Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as
 15 described in Chapter 5, and determined the need for new water supplies, changes
 16 in water storage and groundwater pumping, water transfers, water shortage costs,
 17 and excess water savings. The factors and basis of the analysis is described in
 18 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 19 supplies would be implemented until shortages were greater than 5 percent. The
 20 costs of these shortages are included in the analysis. It is assumed that
 21 communities do not have Alternative water supplies would utilize water transfers.

22 The average annual water supply costs over the 81-year hydrologic period for
 23 M&I water supplies would increase by 14 percent, as presented in Table 19.106.

24 **Table 19.106 Changes in Municipal and Industrial Water Supply Costs for the**
 25 **Southern California Region under Alternative 3 as Compared to the Second Basis**
 26 **of Comparison**

Differences in Total	Alternative 3	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	2,241	2,394	-153
Delivery Cost (\$1,000)	\$278,085	\$296,795	-\$18,710
Assumed New Supply Deliveries (TAF)	40	11	28
Annualized New Supply Costs (\$1,000)	\$10,584	\$4,032	\$6,552
Water Storage Costs (\$1,000)	\$8,154	\$2,824	\$5,330
Lost Water Sales Revenues (\$1,000)	\$11,409	\$1,119	\$10,289
Transfer Costs (\$1,000)	\$6,181	\$3,705	\$2,476
Shortage Costs (\$1,000)	\$12,632	\$353	\$12,279
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$81,693	-\$91,507	\$9,814
Excess Water Savings (\$1,000)	-\$9,005	-\$10,573	\$1,568
Average Annual Changes in Water Supply Costs (\$1,000)	\$236,347	\$206,749	\$29,598

27 Note:
 28 In 2012 dollars

29 The changes in M&I water supply costs would result in changes to employment
 30 and regional economic output, as summarized in Table 19.107.

Table 19.107 Changes in Municipal and Industrial Water Supply Related Employment and Regional Economic Output for the Southern California Region under Alternative 3 as Compared to the Second Basis of Comparison

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	1	1	0.0	-2.0	126.3	124.4
Mining & Logging	0	0	1	0	0.0	-25.7	169.2	143.5
Construction	0	-7	1	-5	0.0	-813.9	183.7	-630.2
Manufacturing	0	0	5	4	0.0	-227.1	3,152.0	2,924.9
Transportation, Warehousing & Utilities	-27	0	5	-22	-6,828.3	-92.6	1,213.1	-5,707.8
Wholesale Trade	0	0	9	9	0.0	-43.0	1,933.5	1,890.4
Retail Trade	0	0	27	27	0.0	-26.7	2,418.2	2,391.5
Information	0	0	3	3	0.0	-99.7	1,366.4	1,266.7
Financial Activities	0	-1	24	23	0.0	-395.4	8,301.7	7,906.3
Services	0	-7	99	92	0.0	-866.5	9,538.4	8,671.9
Government	0	0	1	1	0.0	-4.7	272.6	268.0
Total	-27	-17	177	132	-6,828.3	-2,597.1	28,675.1	19,249.7

Note:
In 2012 dollars

Regional Changes to Recreational Opportunities

Changes in CVP and SWP water supplies and operations under Alternative 3 as compared to the Second Basis of Comparison generally would result in similar reservoir elevations in reservoirs that store CVP and SWP water and similar recreational economic factors under Alternative 3 as compared to the Second Basis of Comparison.

19.4.3.5 Alternative 4

The CVP and SWP operations under Alternative 4 are identical to the CVP and SWP operations under the Second Basis of Comparison and Alternative 1, as described in Chapter 3, Description of Alternatives. In addition, Alternative 4 includes Striped Bass predation control which would reduce recreational opportunities. The non-recreational socioeconomic factors under Alternative 4 would be identical to the conditions under the Second Basis of Comparison. Alternative 4 is compared to the No Action Alternative and the Second Basis of Comparison.

19.4.3.5.1 Alternative 4 Compared to the No Action Alternative

The CVP and SWP operations under Alternative 4 are identical to the CVP and SWP operations under the Second Basis of Comparison and Alternative 1. Therefore, changes in non-recreational socioeconomic factors under Alternative 4 as compared to the No Action Alternative would be the similar to impacts described in Section 12.4.3.2.1, Alternative 1 Compared to the No Action

1 Alternative. However recreational economic opportunities related to Striped Bass
2 fishing would decline due to predation control programs.

3 **19.4.3.5.2 Alternative 4 Compared to the Second Basis of Comparison**

4 As described in Chapter 3, Description of Alternatives, socioeconomic factors
5 under Alternative 4 are the same as non-recreational socioeconomic factors under
6 the Second Basis of Comparison. However recreational economic opportunities
7 related to Striped Bass fishing would decline due to predation control programs.

8 **19.4.3.6 Alternative 5**

9 As described in Chapter 3, Description of Alternatives, CVP and SWP operations
10 under Alternative 5 are similar to the No Action Alternative with modified Old
11 and Middle River flow criteria and New Melones Reservoir operations. As
12 described in Chapter 4, Approach to Environmental Analysis, Alternative 5 is
13 compared to the No Action Alternative and the Second Basis of Comparison.

14 **19.4.3.6.1 Alternative 5 Compared to the No Action Alternative**

15 *Trinity River Region*

16 *Regional Changes to Irrigated Agriculture*

17 There are no agricultural lands irrigated with CVP and SWP water supplies in the
18 Trinity River Region. Therefore, there would be no changes in irrigated lands
19 under Alternative 5 as compared to the No Action Alternative.

20 *Regional Changes to Municipal and Industrial Water Supplies*

21 The CVP would continue to release water in Trinity River for downstream
22 beneficial uses, including water supplies under Alternative 5 as compared to the
23 No Action Alternative. There are no CVP or SWP water contractors in the
24 Trinity River Region.

25 *Regional Changes to Recreational Opportunities*

26 Recreational opportunities would be similar in the Trinity River Region under
27 Alternative 5 as compared to the No Action Alternative as described in
28 Chapter 15, Recreational Resources.

29 *Regional Changes to Salmon Fishing*

30 Trinity River flows would be similar under Alternative 5 as compared to the No
31 Action Alternative. This could result in similar salmon harvest conditions by the
32 Yurok and Hoopa Valley tribes.

33 *Central Valley Region*

34 *Regional Changes to Irrigated Agriculture*

35 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
36 and SWP water supplies would be similar under Alternative 5 and the No Action
37 Alternative. It is anticipated that groundwater use would be similar and
38 sustainable groundwater management plans would not be fully implemented until
39 the 2040s, as discussed in Chapter 12, Agricultural Resources.

1 The agricultural production value under long-term average conditions would be
 2 the same under Alternative 5 as the No Action Alternative. The agricultural
 3 production value under dry and critical dry conditions also would be reduced by
 4 less than 1 percent (\$0.8 million/year increase in the Sacramento Valley and \$2.7
 5 million/year decrease in the San Joaquin Valley), although groundwater pumping
 6 is not anticipated to change.

7 The overall decrease in agricultural production values are less than 0.05 percent
 8 under long-term conditions; and, changes in employment and regional economic
 9 output would be minimal. Therefore, the analysis of employment and regional
 10 economic output is focused on dry and critical dry years.

11 The direct changes in agricultural production would result in changes to
 12 employment and regional economic output in the Sacramento and San Joaquin
 13 valleys, as summarized in Tables 19.108 and 19.109, respectively.

14 **Table 19.108 Changes in Agricultural-Related Employment and Regional Economic**
 15 **Output for the Sacramento Valley under Alternative 5 as compared to the No**
 16 **Action Alternative in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	3	2	0	4	0.8	0.1	0.0	0.9
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0	0	0.0	0.0	0.0	0.0
Manufacturing	0	0	0	0	0.0	0.0	0.0	0.0
Transportation, Warehousing & Utilities	0	0	0	0	0.0	0.0	0.0	0.0
Wholesale Trade	0	0	0	0	0.0	0.0	0.0	0.0
Retail Trade	0	0	0	0	0.0	0.0	0.0	0.0
Information	0	0	0	0	0.0	0.0	0.0	0.0
Financial Activities	0	0	0	0	0.0	0.1	0.1	0.2
Services	0	0	1	2	0.0	0.0	0.1	0.1
Government	0	0	0	0	0.0	0.0	0.0	0.0
Total	3	2	2	7	0.8	0.2	0.3	1.3

17 Note:
 18 In 2012 dollars

1 **Table 19.109 Changes in Agricultural-Related Employment and Regional Economic**
 2 **Output for the San Joaquin Valley under Alternative 5 as compared to the No**
 3 **Action Alternative in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-5	-9	0	-14	-2.7	-0.4	0.0	-3.0
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0	0	0.0	0.0	0.0	0.0
Manufacturing	0	0	0	0	0.0	-0.2	-0.1	-0.2
Transportation, Warehousing & Utilities	0	0	0	-1	0.0	-0.1	0.0	-0.1
Wholesale Trade	0	0	0	0	0.0	0.0	0.0	-0.1
Retail Trade	0	0	-2	-2	0.0	0.0	-0.1	-0.1
Information	0	0	0	0	0.0	0.0	0.0	0.0
Financial Activities	0	-1	-1	-1	0.0	-0.2	-0.3	-0.5
Services	0	-1	-4	-5	0.0	-0.1	-0.4	-0.4
Government	0	0	0	0	0.0	0.0	0.0	0.0
Total	-5	-11	-7	-24	-2.7	-0.9	-1.0	-4.6

4 Note:
 5 In 2012 dollars

6 As described in Chapter 11, Geology and Soils Resources, increased groundwater
 7 pumping under the long-term average conditions may result in an additional
 8 increment of subsidence in those areas within the Central Valley. The additional
 9 amount of subsidence and the economic costs associated with it have not been
 10 quantified in this EIS. However, total subsidence-related costs have been shown
 11 to be substantial, as reported by Borchers et al. (2014) who estimated that the cost
 12 of subsidence in San Joaquin Valley between 1955 and 1972 was more than
 13 \$1.3 billion (in 2013 dollars). These estimates are based on the impacts to major
 14 infrastructure in the region including the San Joaquin River, Delta Mendota
 15 Canal, Friant-Kern Canal and San Luis Canal in addition to privately owned
 16 infrastructure. The incremental subsidence-related costs, expressed on an annual
 17 basis, could be an unknown fraction of that cumulative cost.

18 *Regional Changes to Municipal and Industrial Water Supplies*

19 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 20 and SWP water supplies would be similar in the Sacramento Valley and lower in
 21 the San Joaquin Valley under Alternative 5 and the No Action Alternative. The
 22 analysis assumed CVP and SWP water deliveries, as described in Chapter 5, and
 23 determined the need for new water supplies, changes in water storage and
 24 groundwater pumping, water transfers, water shortage costs, and excess water
 25 savings. The factors and basis of the analysis is described in detail in
 26 Appendix 19A, CWEST Model. The analysis assumes that no new supplies
 27 would be implemented until shortages were greater than 5 percent. The costs of

1 these shortages are included in the analysis. It is assumed that communities do
 2 not have Alternative water supplies would utilize water transfers.

3 The average annual water supply costs over the 81-year hydrologic period for
 4 M&I water supplies are presented in Tables 19.110 and 19.111 for the
 5 Sacramento and San Joaquin Valley, respectively. Average annual water supply
 6 costs would be similar (within 5 percent change) for the Sacramento and San
 7 Joaquin valleys.

8 **Table 19.110 Changes in Municipal and Industrial Water Supply Costs for the**
 9 **Sacramento Valley under Alternative 5 as compared to the No Action Alternative**

Differences in Total	Alternative 5	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	447	447	-1
Delivery Cost (\$1,000)	\$8,022	\$8,031	-\$8
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$204	\$213	-\$9
Transfer Costs (\$1,000)	\$752	\$739	\$12
Shortage Costs (\$1,000)	\$68	\$69	-\$2
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$3,856	-\$3,858	\$1
Excess Water Savings (\$1,000)	-\$2,266	-\$2,275	\$10
Average Annual Changes in Water Supply Costs (\$1,000)	\$2,924	\$2,919	\$5

10 Note:
 11 In 2012 dollars

12 **Table 19.111 Changes in Municipal and Industrial Water Supply Costs for the San**
 13 **Joaquin Valley under Alternative 5 as compared to the No Action Alternative**

Differences in Total	Alternative 5	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	211	214	-3
Delivery Cost (\$1,000)	\$3,411	\$3,460	-\$49
Assumed New Supply Deliveries (TAF)	2	2	1
Annualized New Supply Costs (\$1,000)	\$601	\$429	\$171
Water Storage Costs (\$1,000)	\$966	\$942	\$24
Lost Water Sales Revenues (\$1,000)	\$361	\$361	\$0
Transfer Costs (\$1,000)	\$2,661	\$2,673	-\$12
Shortage Costs (\$1,000)	\$115	\$115	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$15,329	-\$15,377	\$49
Excess Water Savings (\$1,000)	-\$996	-\$1,029	\$33
Average Annual Changes in Water Supply Costs (\$1,000)	-\$8,211	-\$8,427	\$215

14 Note:
 15 In 2012 dollars

1 The changes in M&I water supply costs would result in changes to employment
 2 and regional economic output in the Sacramento and San Joaquin valleys, as
 3 summarized in Tables 19.112 and 19.113, respectively.

4 **Table 19.112 Changes in Municipal and Industrial Water Supply Related**
 5 **Employment and Regional Economic Output for the Sacramento Valley under**
 6 **Alternative 5 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	0.0	0.0
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	0	0	0	0.0	-0.8	0.1	-0.7
Manufacturing	0	0	0	0	0.0	-0.1	0.6	0.5
Transportation, Warehousing & Utilities	0	0	0	0	-7.8	-0.1	0.5	-7.4
Wholesale Trade	0	0	0	0	0.0	0.0	0.7	0.7
Retail Trade	0	0	0	0	0.0	0.0	1.2	1.1
Information	0	0	0	0	0.0	-0.1	0.5	0.4
Financial Activities	0	0	0	0	0.0	-0.4	3.7	3.4
Services	0	0	0	0	0.0	-0.8	3.9	3.0
Government	0	0	0	0	0.0	0.0	0.1	0.1
Total	0	0	0	0	-7.8	-2.3	11.2	1.1

7 Note:
 8 In 2012 dollars

9 **Table 19.113 Changes in Municipal and Industrial Water Supply Related**
 10 **Employment and Regional Economic Output for the San Joaquin Valley under**
 11 **Alternative 5 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.1	0.7	0.8
Mining & Logging	0	0	0	0	0.0	0.4	0.7	1.0
Construction	0	0	0	0	0.0	13.9	0.6	14.5
Manufacturing	0	0	0	0	0.0	1.4	4.8	6.2
Transportation, Warehousing & Utilities	1	0	0	1	146.6	1.4	4.6	152.6
Wholesale Trade	0	0	0	0	0.0	0.4	3.9	4.3
Retail Trade	0	0	0	0	0.0	0.4	10.6	11.0
Information	0	0	0	0	0.0	1.0	2.8	3.8
Financial Activities	0	0	0	0	0.0	4.5	27.7	32.3
Services	0	0	0	0	0.0	12.2	31.1	43.3
Government	0	0	0	0	0.0	0.1	1.3	1.5
Total	1	0	1	1	146.6	35.8	88.8	271.2

12 Note:
 13 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Recreational opportunities at San Luis Reservoir would be similar under
3 Alternative 5 as compared to the No Action Alternative, as described in
4 Chapter 15, Recreation Resources. Therefore, it is anticipated that recreational
5 economic factors would be similar under Alternative 5 as compared to the No
6 Action Alternative.

7 *Effects Related to Cross Delta Water Transfers*

8 Potential effects to socioeconomic factors could be similar to those identified in a
9 recent environmental analysis conducted by Reclamation for long-term water
10 transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as
11 described above under the No Action Alternative compared to the Second Basis
12 of Comparison. For the purposes of this EIS, it is anticipated that similar
13 conditions would occur during implementation of cross Delta water transfers
14 under Alternative 5 and the No Action Alternative, and that impacts on
15 socioeconomic factors could be adverse in the seller's service area.

16 Under Alternative 5 and the No Action Alternative, the timing of cross Delta
17 water transfers would be limited to July through September and include annual
18 volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO.
19 Overall, the potential for cross Delta water transfers would be similar under
20 Alternative 5 and the No Action Alternative.

21 *San Francisco Bay Area Region*

22 *Regional Changes to Irrigated Agriculture*

23 It is anticipated that as in the Central Valley Region, CVP and SWP water
24 supplies within the San Francisco Bay Area Region would be similar under
25 Alternative 5 and the No Action Alternative, and would not result in changes in
26 irrigated acreage or land use changes due to the use of other water supplies.

27 *Regional Changes to Municipal and Industrial Water Supplies*

28 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
29 and SWP water supplies would be lower under Alternative 5 and the No Action
30 Alternative. The analysis assumed CVP and SWP water deliveries, as described
31 in Chapter 5, and determined the need for new water supplies, changes in water
32 storage and groundwater pumping, water transfers, water shortage costs, and
33 excess water savings. The factors and basis of the analysis is described in detail
34 in Appendix 19A, CWEST Model. The analysis assumes that no new supplies
35 would be implemented until shortages were greater than 5 percent. The costs of
36 these shortages are included in the analysis.

37 The average annual water supply costs over the 81-year hydrologic period for
38 M&I water supplies would be similar, as presented in Table 19.114.

1 **Table 19.114 Changes in Municipal and Industrial Water Supply Costs for the San**
 2 **Francisco Bay Area Region under Alternative 5 as compared to the No Action**
 3 **Alternative**

Differences in Total	Alternative 5	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	394	396	-3
Delivery Cost (\$1,000)	\$10,962	\$11,044	-\$82
Assumed New Supply Deliveries (TAF)	18	18	0
Annualized New Supply Costs (\$1,000)	\$599	\$599	\$0
Water Storage Costs (\$1,000)	\$1,495	\$1,577	-\$81
Lost Water Sales Revenues (\$1,000)	\$4,360	\$4,286	\$74
Transfer Costs (\$1,000)	\$6,156	\$5,722	\$434
Shortage Costs (\$1,000)	\$1,450	\$1,410	\$40
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$470	-\$493	\$24
Excess Water Savings (\$1,000)	-\$225	-\$225	\$0
Average Annual Changes in Water Supply Costs (\$1,000)	\$24,328	\$23,919	\$409

4 Note:
 5 In 2012 dollars

6 The changes in M&I water supply costs would result in changes to employment
 7 and regional economic output, as summarized in Table 19.115.

8 **Table 19.115 Changes in Municipal and Industrial Water Supply Related**
 9 **Employment and Regional Economic Output for the San Francisco Bay Area**
 10 **Region under Alternative 5 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	0.5	0.5
Mining & Logging	0	0	0	0	0.0	-0.2	0.3	0.1
Construction	0	0	0	0	0.0	-17.4	2.4	-15.0
Manufacturing	0	0	0	0	0.0	-3.2	30.9	27.8
Transportation, Warehousing & Utilities	-1	0	0	-1	-163.1	-1.2	11.8	-152.5
Wholesale Trade	0	0	0	0	0.0	-0.5	22.9	22.4
Retail Trade	0	0	0	0	0.0	-0.5	36.4	35.9
Information	0	0	0	0	0.0	-1.8	19.8	18.0
Financial Activities	0	0	0	0	0.0	-6.1	112.3	106.2
Services	0	0	1	1	0.0	-14.6	139.4	124.8
Government	0	0	0	0	0.0	-0.1	3.6	3.5
Total	-1	0	2	1	-163.1	-45.5	380.3	171.7

11 Note:
 12 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*

2 Changes in CVP and SWP water supplies and operations under Alternative 5 as
3 compared to the No Action Alternative generally would result in similar reservoir
4 elevations in reservoirs that store CVP and SWP water and similar recreational
5 economic factors under Alternative 5 as compared o the No Action Alternative.

6 *Regional Changes to Salmon Fishing*

7 Changes in commercial and sport ocean salmon fishing primarily would be
8 related to the presence of fall-run Chinook Salmon from Central Valley
9 hatcheries. It is assumed that the production of hatchery fish would be similar
10 under Alternative 15 and the No Action Alternative. However, survival of the
11 fall-run Chinook Salmon hatchery fish to the Pacific Ocean could be related to
12 changes in CVP and SWP operations. As described in Chapter 9, Fish and
13 Aquatic Resources, there would be little change in through-Delta survival by
14 emigrating natural juvenile fall-run Chinook Salmon under Alternative 5 and the
15 No Action Alternative. It is assumed that the survival of the hatchery juvenile
16 fall-run Chinook Salmon would be similar to the survival of the natural juvenile
17 fall-run Chinook Salmon. Therefore, the availability of fish for commercial and
18 sport ocean salmon fishing and the associated economic conditions for the fishing
19 industry would be similar under Alternative 5 and the No Action Alternative.

20 *Central Coast Region*

21 *Regional Changes to Irrigated Agriculture*

22 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
23 water supplies within the Central Coast Region would be lower under
24 Alternative 5 and the No Action Alternative, and would not result in changes in
25 irrigated acreage or land use changes due to the use of other water supplies.

26 *Regional Changes to Municipal and Industrial Water Supplies*

27 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
28 and SWP water supplies would be similar under Alternative 5 and the No Action
29 Alternative. The analysis assumed CVP and SWP water deliveries, as described
30 in Chapter 5, and determined the need for new water supplies, changes in water
31 storage and groundwater pumping, water transfers, water shortage costs, and
32 excess water savings. The factors and basis of the analysis is described in detail
33 in Appendix 19A, CWEST Model. The analysis assumes that no new supplies
34 would be implemented until shortages were greater than 5 percent. The costs of
35 these shortages are included in the analysis. It is assumed that communities do
36 not have Alternative water supplies would utilize water transfers.

37 The average annual water supply costs over the 81-year hydrologic period for
38 M&I water supplies would be similar, as presented in Table 19.116.

1 **Table 19.116 Changes in Municipal and Industrial Water Supply Costs for the**
 2 **Central Coast Region under Alternative 5 as compared to the No Action Alternative**

Differences in Total	Alternative 5	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	43	44	-1
Delivery Cost (\$1,000)	\$6,567	\$6,663	-\$97
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$0	\$0	\$0
Transfer Costs (\$1,000)	\$0	\$0	\$0
Shortage Costs (\$1,000)	\$0	\$0	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$8,018	-\$8,068	\$50
Excess Water Savings (\$1,000)	-\$2,899	-\$2,970	\$70
Average Annual Changes in Water Supply Costs (\$1,000)	-\$4,350	-\$4,374	\$23

3 Note:
 4 In 2012 dollars

5 The changes in M&I water supply costs would result in changes to employment
 6 and regional economic output, as summarized in Table 19.117.

7 **Table 19.117 Changes in Municipal and Industrial Water Supply Related**
 8 **Employment and Regional Economic Output for the Central Coast Region under**
 9 **Alternative 5 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.0	0.3	0.2
Mining & Logging	0	0	0	0	0.0	-0.4	0.6	0.2
Construction	0	0	0	0	0.0	-13.0	0.7	-12.3
Manufacturing	0	0	0	0	0.0	-1.7	3.5	1.8
Transportation, Warehousing & Utilities	0	0	0	0	-97.1	-1.1	3.9	-94.3
Wholesale Trade	0	0	0	0	0.0	-0.3	4.0	3.7
Retail Trade	0	0	0	0	0.0	-0.4	8.1	7.8
Information	0	0	0	0	0.0	-0.8	2.7	1.9
Financial Activities	0	0	0	0	0.0	-4.4	24.1	19.7
Services	0	0	0	0	0.0	-10.7	30.7	19.9
Government	0	0	0	0	0.0	-0.1	0.9	0.8
Total	0	0	1	0	-97.1	-32.9	79.5	-50.5

10 Note:
 11 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*
 2 Changes in CVP and SWP water supplies and operations under Alternative 5 as
 3 compared to the No Action Alternative generally would result in similar reservoir
 4 elevations in reservoirs that store CVP and SWP water and similar recreational
 5 economic factors under Alternative 5 as compared to the No Action Alternative.

6 *Southern California Region*

7 *Regional Changes to Irrigated Agriculture*

8 It is anticipated that as in the Central Valley Region, increases in CVP and SWP
 9 water supplies within the Southern California Region would be similar under
 10 Alternative 5 and the No Action Alternative, and would not result in changes in
 11 irrigated acreage or land use changes due to the use of other water supplies.

12 *Regional Changes to Municipal and Industrial Water Supplies*

13 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 14 and SWP water supplies would be lower under Alternative 5 and the No Action
 15 Alternative. The analysis assumed CVP and SWP water deliveries, as described
 16 in Chapter 5, and determined the need for new water supplies, changes in water
 17 storage and groundwater pumping, water transfers, water shortage costs, and
 18 excess water savings. The factors and basis of the analysis is described in detail
 19 in Appendix 19A, CWEST Model. The analysis assumes that no new supplies
 20 would be implemented until shortages were greater than 5 percent. The costs of
 21 these shortages are included in the analysis. It is assumed that communities do
 22 not have Alternative water supplies would utilize water transfers.

23 The average annual water supply costs over the 81-year hydrologic period for
 24 M&I water supplies would be similar, as presented in Table 19.118.

25 **Table 19.118 Changes in Municipal and Industrial Water Supply Costs for the**
 26 **Southern California Region under Alternative 5 as compared to the No Action**
 27 **Alternative**

Differences in Total	Alternative 5	No Action Alternative	Changes
Average Annual CVP/SWP Deliveries (TAF)	1,912	1,932	-20
Delivery Cost (\$1,000)	\$237,118	\$239,692	-\$2,575
Assumed New Supply Deliveries (TAF)	81	47	34
Annualized New Supply Costs (\$1,000)	\$24,191	\$12,688	\$11,503
Water Storage Costs (\$1,000)	\$7,474	\$7,598	-\$124
Lost Water Sales Revenues (\$1,000)	\$14,206	\$14,614	-\$408
Transfer Costs (\$1,000)	\$10,505	\$11,484	-\$979
Shortage Costs (\$1,000)	\$16,662	\$17,319	-\$657
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$58,323	-\$57,474	-\$849
Excess Water Savings (\$1,000)	-\$4,588	-\$4,629	\$41
Average Annual Changes in Water Supply Costs (\$1,000)	\$247,243	\$241,291	\$5,952

28 Note:
 29 In 2012 dollars

1 The changes in M&I water supply costs would result in changes to employment
 2 and regional economic output, as summarized in Table 19.119.

3 **Table 19.119 Changes in Municipal and Industrial Water Supply Related**
 4 **Employment and Regional Economic Output for the Southern California under**
 5 **Alternative 5 as compared to the No Action Alternative**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	2.5	3.3	5.9
Mining & Logging	0	0	0	0	0.0	33.1	3.3	36.4
Construction	0	9	0	9	0.0	1,049.4	5.1	1,054.5
Manufacturing	0	0	0	1	0.0	292.8	80.2	373.0
Transportation, Warehousing & Utilities	35	0	0	36	8,804.2	119.3	37.0	8,960.5
Wholesale Trade	0	0	0	0	0.0	55.5	-0.2	55.3
Retail Trade	0	0	1	2	0.0	34.4	99.3	133.7
Information	0	0	0	0	0.0	128.5	32.2	160.8
Financial Activities	0	2	1	2	0.0	509.8	257.7	767.4
Services	0	9	3	13	0.0	1,117.3	301.8	1,419.1
Government	0	0	0	0	0.0	6.0	7.6	13.6
Total	35	22	6	63	8,804.2	3,348.6	827.3	12,980.1

6 Note:
 7 In 2012 dollars

8 *Regional Changes to Recreational Opportunities*

9 Changes in CVP and SWP water supplies and operations under Alternative 5 as
 10 compared to the No Action Alternative generally would result in similar reservoir
 11 elevations in reservoirs that store CVP and SWP water and similar recreational
 12 economic factors under Alternative 5 as compared to the No Action Alternative.

13 **19.4.3.6.2 Alternative 5 Compared to the Second Basis of Comparison**

14 *Trinity River Region*

15 *Regional Changes to Irrigated Agriculture*

16 There are no agricultural lands irrigated with CVP and SWP water supplies in the
 17 Trinity River Region. Therefore, there would be no changes in irrigated lands
 18 under Alternative 5 as compared to the Second Basis of Comparison.

19 *Regional Changes to Municipal and Industrial Water Supplies*

20 The CVP would continue to release water in Trinity River for downstream
 21 beneficial uses, including water supplies under Alternative 5 and the Second Basis
 22 of Comparison. There are no CVP or SWP water contractors in the Trinity River
 23 Region.

1 *Regional Changes to Recreational Opportunities*

2 Recreational opportunities would be similar in the Trinity River Region under
3 Alternative 5 as compared to the Second Basis of Comparison as described in
4 Chapter 15, Recreational Resources.

5 *Regional Changes to Salmon Fishing*

6 Trinity River flows would be similar under Alternative 5 as compared to the
7 Second Basis of Comparison. This could result in similar salmon harvest
8 conditions by the Yurok and Hoopa Valley tribes.

9 *Central Valley Region*

10 *Regional Changes to Irrigated Agriculture*

11 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
12 and SWP water supplies would be less under Alternative 5 than under the Second
13 Basis of Comparison. It is anticipated that groundwater use would increase in
14 response to reduced CVP and SWP water supplies in 2030 because sustainable
15 groundwater management plans would not be fully implemented until the 2040s,
16 as discussed in Chapter 12, Agricultural Resources.

17 The agricultural production value under long-term average conditions would be
18 reduced by less than 1 percent (\$1.5 million/year in the Sacramento Valley and
19 \$0.7 million/year in the San Joaquin Valley) primarily due to an increase in
20 groundwater pumping of approximately 6 percent. The agricultural production
21 value under dry and critical dry conditions also would be reduced by less than
22 1 percent (\$10.5 million/year in the Sacramento Valley and \$22.9 million/year in
23 the San Joaquin Valley) primarily due to an increase in groundwater pumping.

24 The overall reduction in agricultural production values are less than 0.05 percent
25 under long-term conditions; and, changes in employment and regional economic
26 output would be minimal. Therefore, the analysis of employment and regional
27 economic output is focused on dry and critical dry years.

28 The direct changes in agricultural production would result in changes to
29 employment and regional economic output in the Sacramento and San Joaquin
30 valleys, as summarized in Tables 19.120 and 19.121, respectively.

1 **Table 19.120 Changes in Agricultural-Related Employment and Regional Economic**
 2 **Output for the Sacramento Valley under Alternative 5 as Compared to the Second**
 3 **Basis of Comparison in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-84	-20	0	-104	-10.5	-1.2	0.0	-11.8
Mining & Logging	0	0	0	0	0.0	0.0	0.0	0.0
Construction	0	-1	0	-1	0.0	-0.1	0.0	-0.1
Manufacturing	0	0	0	0	0.0	-0.1	0.0	-0.1
Transportation, Warehousing & Utilities	0	-1	0	-2	0.0	-0.3	-0.1	-0.5
Wholesale Trade	0	-1	0	-1	0.0	-0.2	-0.1	-0.3
Retail Trade	0	0	-3	-4	0.0	0.0	-0.3	-0.3
Information	0	0	0	0	0.0	0.0	-0.1	-0.1
Financial Activities	0	-7	-2	-8	0.0	-1.6	-0.7	-2.3
Services	0	-3	-10	-13	0.0	-0.3	-0.9	-1.1
Government	0	0	0	0	0.0	-0.1	0.0	-0.1
Total	-84	-34	-17	-135	-10.5	-4.0	-2.2	-16.8

4 Note:
 5 In 2012 dollars

6 **Table 19.121 Changes in Agricultural-Related Employment and Regional Economic**
 7 **Output for the San Joaquin Valley under Alternative 5 as Compared to the Second**
 8 **Basis of Comparison in Dry and Critical Dry Years**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	-145	-61	0	-206	-22.9	-2.7	-0.1	-25.7
Mining & Logging	0	-1	0	-1	0.0	-0.3	0.0	-0.4
Construction	0	-2	0	-2	0.0	-0.2	0.0	-0.2
Manufacturing	0	-1	-1	-2	0.0	-2.0	-0.4	-2.4
Transportation, Warehousing & Utilities	0	-3	-1	-4	0.0	-0.9	-0.3	-1.2
Wholesale Trade	0	-2	-1	-3	0.0	-0.4	-0.2	-0.6
Retail Trade	0	0	-9	-9	0.0	0.0	-0.7	-0.8
Information	0	0	0	-1	0.0	-0.1	-0.2	-0.2
Financial Activities	0	-13	-4	-16	0.0	-2.8	-1.8	-4.6
Services	0	-6	-25	-31	0.0	-0.6	-2.1	-2.7
Government	0	-1	0	-1	0.0	-0.2	-0.1	-0.3
Total	-145	-90	-42	-277	-22.9	-10.2	-5.9	-39.0

9 Note:
 10 In 2012 dollars

11 As described in Chapter 11, Geology and Soils Resources, increased groundwater
 12 pumping under the long-term average conditions may result in an additional

1 increment of subsidence in those areas within the Central Valley. The additional
 2 amount of subsidence and the economic costs associated with it have not been
 3 quantified in this EIS. However, total subsidence-related costs have been shown
 4 to be substantial, as reported by Borchers et al. (2014) who estimated that the cost
 5 of subsidence in San Joaquin Valley between 1955 and 1972 was more than
 6 \$1.3 billion (in 2013 dollars). These estimates are based on the impacts to major
 7 infrastructure in the region including the San Joaquin River, Delta Mendota
 8 Canal, Friant-Kern Canal and San Luis Canal in addition to privately owned
 9 infrastructure. The incremental subsidence-related costs, expressed on an annual
 10 basis, could be an unknown fraction of that cumulative cost.

11 *Regional Changes to Municipal and Industrial Water Supplies*

12 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 13 and SWP water supplies would be less under Alternative 5 than under the Second
 14 Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as
 15 described in Chapter 5, and determined the need for new water supplies, changes
 16 in water storage and groundwater pumping, water transfers, water shortage costs,
 17 and excess water savings. The factors and basis of the analysis is described in
 18 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 19 supplies would be implemented until shortages were greater than 5 percent. The
 20 costs of these shortages are included in the analysis. It is assumed that
 21 communities do not have Alternative water supplies would utilize water transfers.

22 The average annual water supply costs over the 81-year hydrologic period for
 23 M&I water supplies are presented in Tables 19.122 and 19.123 for the
 24 Sacramento and San Joaquin Valley, respectively. Average annual water supply
 25 costs would increase by 11 percent in the Sacramento Valley and decrease by
 26 14 percent in the San Joaquin Valley.

27 **Table 19.122 Changes in Municipal and Industrial Water Supply Costs for the**
 28 **Sacramento Valley under Alternative 5 as Compared to the Second Basis of**
 29 **Comparison**

Differences in Total	Alternative 5	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	447	463	-16
Delivery Cost (\$1,000)	\$8,022	\$8,317	-\$295
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$204	\$207	-\$3
Transfer Costs (\$1,000)	\$752	\$517	\$235
Shortage Costs (\$1,000)	\$68	\$68	-\$1
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$3,856	-\$3,916	\$60
Excess Water Savings (\$1,000)	-\$2,266	-\$2,563	\$298
Average Annual Changes in Water Supply Costs (\$1,000)	\$2,924	\$2,630	\$293

30 Note:
 31 In 2012 dollars

1 **Table 19.123 Changes in Municipal and Industrial Water Supply Costs for the San**
 2 **Joaquin Valley under Alternative 5 as Compared to the Second Basis of**
 3 **Comparison**

Differences in Total	Alternative 5	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	211	237	-26
Delivery Cost (\$1,000)	\$3,411	\$3,854	-\$443
Assumed New Supply Deliveries (TAF)	2	0	2
Annualized New Supply Costs (\$1,000)	\$601	\$15	\$585
Water Storage Costs (\$1,000)	\$966	\$820	\$146
Lost Water Sales Revenues (\$1,000)	\$361	\$322	\$39
Transfer Costs (\$1,000)	\$2,661	\$2,623	\$38
Shortage Costs (\$1,000)	\$115	\$102	\$13
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$15,329	-\$16,011	\$683
Excess Water Savings (\$1,000)	-\$996	-\$1,318	\$322
Average Annual Changes in Water Supply Costs (\$1,000)	-\$8,211	-\$9,593	\$1,381

4 Note:
 5 In 2012 dollars

6 The changes in M&I water supply costs would result in changes to employment
 7 and regional economic output in the Sacramento and San Joaquin valleys, as
 8 summarized in Tables 19.124 and 19.125, respectively.

9 **Table 19.124 Changes in Municipal and Industrial Water Supply Related**
 10 **Employment and Regional Economic Output for the Sacramento Valley under**
 11 **Alternative 5 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.1	1.7	1.6
Mining & Logging	0	0	0	0	0.0	-0.4	0.3	-0.1
Construction	0	0	0	0	0.0	-29.9	2.6	-27.3
Manufacturing	0	0	0	0	0.0	-3.2	22.7	19.5
Transportation, Warehousing & Utilities	-1	0	0	-1	-295.2	-2.9	18.4	-279.6
Wholesale Trade	0	0	0	0	0.0	-1.0	27.8	26.8
Retail Trade	0	0	1	1	0.0	-0.9	47.7	46.8
Information	0	0	0	0	0.0	-3.5	21.1	17.6
Financial Activities	0	0	0	0	0.0	-13.4	151.3	137.9
Services	0	0	2	1	0.0	-31.8	158.5	126.8
Government	0	0	0	0	0.0	-0.2	3.9	3.8
Total	-1	-1	3	1	-295.2	-87.3	456.1	73.6

12 Note:
 13 In 2012 dollars

Table 19.125 Changes in Municipal and Industrial Water Supply Related Employment and Regional Economic Output for the San Joaquin Valley under Alternative 5 as Compared to the Second Basis of Comparison

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	0.1	7.4	7.5
Mining & Logging	0	0	0	0	0.0	0.8	7.1	7.8
Construction	0	0	0	0	0.0	27.2	6.1	33.4
Manufacturing	0	0	0	0	0.0	2.8	51.3	54.1
Transportation, Warehousing & Utilities	1	0	0	1	287.4	2.8	49.4	339.5
Wholesale Trade	0	0	0	0	0.0	0.7	42.9	43.6
Retail Trade	0	0	1	1	0.0	0.8	107.9	108.7
Information	0	0	0	0	0.0	2.0	29.8	31.8
Financial Activities	0	0	1	1	0.0	8.9	291.4	300.3
Services	0	0	4	4	0.0	23.9	323.4	347.2
Government	0	0	0	0	0.0	0.2	14.2	14.5
Total	1	1	6	8	287.4	70.1	930.8	1,288.4

Note:
In 2012 dollars

Regional Changes to Recreational Opportunities

Recreational opportunities would decrease by 6 to 9 percent under Alternative 5 as compared to the Second Basis of Comparison, depending upon water year type, as described in Chapter 15, Recreation Resources. Therefore, it is anticipated that recreational economic factors would be reduced under Alternative 5 as compared to the Second Basis of Comparison.

Effects Related to Cross Delta Water Transfers

Potential effects to socioeconomic factors could be similar to those identified in a recent environmental analysis conducted by Reclamation for long-term water transfers from the Sacramento to San Joaquin valleys (Reclamation 2014c) as described above under the No Action Alternative compared to the Second Basis of Comparison. For the purposes of this EIS, it is anticipated that similar conditions would occur during implementation of cross Delta water transfers under Alternative 5 and the Second Basis of Comparison, and that impacts on socioeconomic factors could be adverse in the seller's service area.

Under Alternative 5, the timing of cross Delta water transfers would be limited to July through September and include annual volumetric limits, in accordance with the 2008 USFWS BO and 2009 NMFS BO. Under Second Basis of Comparison, water could be transferred throughout the year without an annual volumetric limit. Overall, the potential for cross Delta water transfers would be decreased under Alternative 5 as compared to the Second Basis of Comparison.

1 *San Francisco Bay Area Region*

2 *Regional Changes to Irrigated Agriculture*

3 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
 4 water supplies within the San Francisco Bay Area Region would not result in
 5 reductions in long-term irrigated acreage or land use changes due to the use of
 6 other water supplies. However, there could be a reduction in irrigated acreage in
 7 dry and critical dry years under Alternative 5 as compared to the Second Basis of
 8 Comparison.

9 *Regional Changes to Municipal and Industrial Water Supplies*

10 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 11 and SWP water supplies would be less under Alternative 5 than under the Second
 12 Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as
 13 described in Chapter 5, and determined the need for new water supplies, changes
 14 in water storage and groundwater pumping, water transfers, water shortage costs,
 15 and excess water savings. The factors and basis of the analysis is described in
 16 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 17 supplies would be implemented until shortages were greater than 5 percent. The
 18 costs of these shortages are included in the analysis.

19 The average annual water supply costs over the 81-year hydrologic period for
 20 M&I water supplies would increase by 46 percent, as presented in Table 19.126.

21 **Table 19.126 Changes in Municipal and Industrial Water Supply Costs for the San**
 22 **Francisco Bay Area Region under Alternative 5 as Compared to the Second Basis**
 23 **of Comparison**

Differences in Total	Alternative 5	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	394	445	-51
Delivery Cost (\$1,000)	\$10,962	\$12,515	-\$1,553
Assumed New Supply Deliveries (TAF)	18	16	2
Annualized New Supply Costs (\$1,000)	\$599	\$234	\$365
Water Storage Costs (\$1,000)	\$1,495	\$1,963	-\$467
Lost Water Sales Revenues (\$1,000)	\$4,360	\$1,595	\$2,765
Transfer Costs (\$1,000)	\$6,156	\$1,154	\$5,002
Shortage Costs (\$1,000)	\$1,450	\$523	\$927
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$470	-\$792	\$322
Excess Water Savings (\$1,000)	-\$225	-\$549	\$324
Average Annual Changes in Water Supply Costs (\$1,000)	\$24,328	\$16,643	\$7,686

24 Note:
 25 In 2012 dollars

26 The changes in M&I water supply costs would result in changes to employment
 27 and regional economic output, as summarized in Table 19.127.

1 **Table 19.127 Changes in Municipal and Industrial Water Supply Related**
 2 **Employment and Regional Economic Output for the San Francisco Bay Area**
 3 **Region under Alternative 5 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.1	8.4	8.3
Mining & Logging	0	0	0	0	0.0	-1.7	5.3	3.5
Construction	0	-1	0	-1	0.0	-176.1	39.5	-136.6
Manufacturing	0	0	1	0	0.0	-32.0	509.0	477.0
Transportation, Warehousing & Utilities	-6	0	1	-5	-1,654.5	-12.4	195.3	-1,471.6
Wholesale Trade	0	0	2	1	0.0	-5.5	373.6	368.1
Retail Trade	0	0	7	7	0.0	-4.7	603.7	599.0
Information	0	0	1	1	0.0	-18.6	326.5	307.9
Financial Activities	0	0	5	5	0.0	-61.9	1,853.1	1,791.2
Services	0	-1	22	20	0.0	-148.2	2,302.6	2,154.4
Government	0	0	0	0	0.0	-0.7	58.7	57.9
Total	-6	-3	37	29	-1,654.5	-462.0	6,275.6	4,159.1

4 Note:
 5 In 2012 dollars

6 *Regional Changes to Recreational Opportunities*

7 Changes in CVP and SWP water supplies and operations under Alternative 5 as
 8 compared to the Second Basis of Comparison generally would result in lower
 9 reservoir elevations in reservoirs that store CVP and SWP water (up to 10 to
 10 18 percent); and would result in decreased recreational economic factors under
 11 Alternative 5 as compared to the Second Basis of Comparison.

12 *Regional Changes to Salmon Fishing*

13 Changes in commercial and sport ocean salmon fishing primarily would be
 14 related to the presence of fall-run Chinook Salmon from Central Valley
 15 hatcheries. It is assumed that the production of hatchery fish would be similar
 16 under Alternative 5 and the Second Basis of Comparison. However, survival of
 17 the fall-run Chinook Salmon hatchery fish to the Pacific Ocean could be related to
 18 changes in CVP and SWP operations. As described in Chapter 9, Fish and
 19 Aquatic Resources, there would be little change in through-Delta survival by
 20 emigrating natural juvenile fall-run Chinook Salmon under Alternative 5 as
 21 compared to the Second Basis of Comparison. It is assumed that the survival of
 22 the hatchery juvenile fall-run Chinook Salmon would be similar to the survival of
 23 the natural juvenile fall-run Chinook Salmon. Therefore, the availability of fish
 24 for commercial and sport ocean salmon fishing and the associated economic
 25 conditions for the fishing industry would be similar under Alternative 5 and the
 26 Second Basis of Comparison.

1 *Central Coast Region*

2 *Regional Changes to Irrigated Agriculture*

3 It is anticipated that as in the Central Valley Region, reductions in CVP and SWP
 4 water supplies within the Central Coast Region would not result in reductions in
 5 long-term irrigated acreage or land use changes due to the use of other water
 6 supplies. However, there could be a reduction in irrigated acreage in dry and
 7 critical dry years under Alternative 5 as compared to the Second Basis of
 8 Comparison.

9 *Regional Changes to Municipal and Industrial Water Supplies*

10 As described in Chapter 5, Surface Water Resources and Water Supplies, CVP
 11 and SWP water supplies would be less under Alternative 5 than under the Second
 12 Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as
 13 described in Chapter 5, and determined the need for new water supplies, changes
 14 in water storage and groundwater pumping, water transfers, water shortage costs,
 15 and excess water savings. The factors and basis of the analysis is described in
 16 detail in Appendix 19A, CWEST Model. The analysis assumes that no new
 17 supplies would be implemented until shortages were greater than 5 percent. The
 18 costs of these shortages are included in the analysis. It is assumed that
 19 communities do not have Alternative water supplies would utilize water transfers.

20 The average annual water supply costs over the 81-year hydrologic period for
 21 M&I water supplies would decrease by 6 percent, as presented in Table 19.128.

22 **Table 19.128 Changes in Municipal and Industrial Water Supply Costs for the**
 23 **Central Coast Region under Alternative 5 as Compared to the Second Basis of**
 24 **Comparison**

Differences in Total	Alternative 5	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	43	54	-11
Delivery Cost (\$1,000)	\$6,567	\$8,174	-\$1,607
Assumed New Supply Deliveries (TAF)	0	0	0
Annualized New Supply Costs (\$1,000)	\$0	\$0	\$0
Water Storage Costs (\$1,000)	\$0	\$0	\$0
Lost Water Sales Revenues (\$1,000)	\$0	\$0	\$0
Transfer Costs (\$1,000)	\$0	\$0	\$0
Shortage Costs (\$1,000)	\$0	\$0	\$0
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$8,018	-\$8,643	\$625
Excess Water Savings (\$1,000)	-\$2,899	-\$4,176	\$1,277
Average Annual Changes in Water Supply Costs (\$1,000)	-\$4,350	-\$4,645	\$295

25 Note:
 26 In 2012 dollars

27 The changes in M&I water supply costs would result in changes to employment
 28 and regional economic output, as summarized in Table 19.129.

Table 19.129 Changes in Municipal and Industrial Water Supply Related Employment and Regional Economic Output for the Central Coast Region under Alternative 5 as Compared to the Second Basis of Comparison

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	0	0	0.0	-0.6	4.3	3.7
Mining & Logging	0	0	0	0	0.0	-6.8	9.9	3.1
Construction	0	-2	0	-2	0.0	-214.8	10.4	-204.4
Manufacturing	0	0	0	0	0.0	-28.6	55.4	26.8
Transportation, Warehousing & Utilities	-7	0	0	-7	-1,606.9	-18.1	60.1	-1,565.0
Wholesale Trade	0	0	0	0	0.0	-5.1	62.7	57.5
Retail Trade	0	0	1	1	0.0	-6.5	126.7	120.2
Information	0	0	0	0	0.0	-12.8	41.7	29.0
Financial Activities	0	0	1	1	0.0	-73.3	376.2	303.0
Services	0	-2	5	3	0.0	-177.8	478.2	300.4
Government	0	0	0	0	0.0	-1.0	14.1	13.1
Total	-7	-4	9	-2	-1,606.9	-545.3	1,239.6	-912.6

Note:
In 2012 dollars

Regional Changes to Recreational Opportunities

Changes in CVP and SWP water supplies and operations under Alternative 5 as compared to the Second Basis of Comparison generally would result in lower reservoir elevations in reservoirs that store CVP and SWP water (up to 10 to 18 percent); and would result in decreased recreational economic factors under Alternative 5 as compared to the Second Basis of Comparison.

Southern California Region

Regional Changes to Irrigated Agriculture

It is anticipated that as in the Central Valley Region, reductions in CVP and SWP water supplies within the Southern California Region would not result in reductions in long-term irrigated acreage or land use changes due to the use of other water supplies. However, there could be a reduction in irrigated acreage in dry and critical dry years under Alternative 5 as compared to the Second Basis of Comparison.

Regional Changes to Municipal and Industrial Water Supplies

As described in Chapter 5, Surface Water Resources and Water Supplies, CVP and SWP water supplies would be less under Alternative 5 than under the Second Basis of Comparison. The analysis assumed CVP and SWP water deliveries, as described in Chapter 5, and determined the need for new water supplies, changes in water storage and groundwater pumping, water transfers, water shortage costs, and excess water savings. The factors and basis of the analysis is described in detail in Appendix 19A, CWEST Model. The analysis assumes that no new supplies would be implemented until shortages were greater than 5 percent. The

1 costs of these shortages are included in the analysis. It is assumed that
 2 communities do not have Alternative water supplies would utilize water transfers.
 3 The average annual water supply costs over the 81-year hydrologic period for
 4 M&I water supplies would increase by 20 percent, as presented in Table 19.130.

5 **Table 19.130 Changes in Municipal and Industrial Water Supply Costs for the**
 6 **Southern California Region under Alternative 5 as Compared to the Second Basis**
 7 **of Comparison**

Differences in Total	Alternative 5	Second Basis of Comparison	Changes
Average Annual CVP/SWP Deliveries (TAF)	1,912	2,394	-482
Delivery Cost (\$1,000)	\$237,118	\$296,795	-\$59,677
Assumed New Supply Deliveries (TAF)	81	11	70
Annualized New Supply Costs (\$1,000)	\$24,191	\$4,032	\$20,159
Water Storage Costs (\$1,000)	\$7,474	\$2,824	\$4,649
Lost Water Sales Revenues (\$1,000)	\$14,206	\$1,119	\$13,087
Transfer Costs (\$1,000)	\$10,505	\$3,705	\$6,800
Shortage Costs (\$1,000)	\$16,662	\$353	\$16,309
Groundwater Pumping Savings (due to reductions in Groundwater Pumping) (\$1,000)	-\$58,323	-\$91,507	\$33,183
Excess Water Savings (\$1,000)	-\$4,588	-\$10,573	\$5,985
Average Annual Changes in Water Supply Costs (\$1,000)	\$247,243	\$206,749	\$40,495

8 Note:
 9 In 2012 dollars

10 The changes in M&I water supply costs would result in changes to employment
 11 and regional economic output, as summarized in Table 19.131.

12 **Table 19.131 Changes in Municipal and Industrial Water Supply Related**
 13 **Employment and Regional Economic Output for the Southern California Region**
 14 **under Alternative 5 as Compared to the Second Basis of Comparison**

Economic Sectors	Employment				Economic Output (\$ thousands)			
	Direct	Indirect	Induced	Total	Direct	Indirect	Induced	Total
Agriculture	0	0	2	1	0.0	-10.0	276.1	266.1
Mining & Logging	0	0	1	1	0.0	-131.1	372.3	241.2
Construction	0	-35	3	-32	0.0	-4,156.1	400.7	-3,755.4
Manufacturing	0	-2	10	9	0.0	-1,159.8	6,894.7	5,734.9
Transportation, Warehousing & Utilities	-140	-2	12	-130	-34,869.2	-472.7	2,639.9	-32,702.0
Wholesale Trade	0	-1	20	19	0.0	-219.8	4,338.8	4,119.1
Retail Trade	0	-2	59	58	0.0	-136.2	5,205.5	5,069.3
Information	0	-1	7	6	0.0	-509.0	2,994.4	2,485.4
Financial Activities	0	-7	52	45	0.0	-2,019.0	18,055.5	16,036.5
Services	0	-37	215	178	0.0	-4,424.9	20,732.4	16,307.5
Government	0	0	3	3	0.0	-23.8	594.9	571.1
Total	-140	-86	384	158	-34,869.2	-13,262.4	62,505.2	14,373.6

15 Note:
 16 In 2012 dollars

1 *Regional Changes to Recreational Opportunities*
 2 Changes in CVP and SWP water supplies and operations under Alternative 5 as
 3 compared to the Second Basis of Comparison generally would result in lower
 4 reservoir elevations in reservoirs that store CVP and SWP water (up to 10 to
 5 18 percent); and would result in decreased recreational economic factors under
 6 Alternative 5 as compared to the Second Basis of Comparison.

7 **19.4.3.7 Summary of Environmental Consequences**

8 The results of the environmental consequences of implementation of Alternatives
 9 1 through 5 as compared to the No Action Alternative and the Second Basis of
 10 Comparison are presented in Tables 19.132 and 19.133.

11 **Table 19.132 Comparison of Alternatives 1 through 5 to No Action Alternative**

Alternative	Potential Change	Consideration for Mitigation Measures
Alternative 1	<p>Trinity River Region Similar conditions.</p> <p>Central Valley Region Agricultural and M&I water-related employment would be similar (within 5 percent of existing values). M&I water supply costs would decrease by 10 percent in the Sacramento Valley and increase by 14 percent in the San Joaquin Valley. Recreational economic factors would increase related to use of San Luis Reservoir.</p> <p>San Francisco Region M&I water-related employment would be similar. M&I water supply costs would decrease by 30 percent. Recreational economic factors would increase related to use of reservoirs that store CVP and SWP water.</p> <p>Central Coast Region M&I water-related employment would be similar. M&I water supply costs would increase by 6 percent. Recreational economic factors would increase related to use of reservoirs that store SWP water.</p> <p>Southern California Region M&I water-related employment would be similar. M&I water supply costs would decrease by 14 percent. Recreational economic factors would increase related to use of reservoirs that store SWP water.</p>	None available to reduce increased M&I water supply costs in the Central Valley and Central Coast regions.
Alternative 2	No effects on socioeconomic factors.	None needed

Alternative	Potential Change	Consideration for Mitigation Measures
Alternative 3	<p>Trinity River Region Similar conditions.</p> <p>Central Valley Region Agricultural and M&I water-related employment would be similar. M&I water supply costs would increase by 6 percent in the Sacramento Valley and by 21 percent in the San Joaquin Valley. Recreational economic factors related to Striped Bass would be reduced.</p> <p>San Francisco Region M&I water-related employment would be similar. M&I water supply costs would decrease by 21 percent. Recreational economic factors would increase related to use of reservoirs that store CVP and SWP water.</p> <p>Central Coast Region M&I water-related employment would be similar. M&I water supply costs would be similar. Recreational economic factors would increase related to use of reservoirs that store SWP water.</p> <p>Southern California Region M&I water-related employment would be similar. M&I water supply costs would decrease by 14 percent. Recreational economic factors would be similar.</p>	None available to reduce increased M&I water supply costs in the Central Valley Region
Alternative 4	<p>Same effects as described for Alternative 1 compared to the No Action Alternative for non-recreational economic factors. Reduced recreational economic factors related to Striped Bass fishing.</p>	None needed
Alternative 5	<p>Trinity River Region Similar conditions.</p> <p>Central Valley Region Agricultural and M&I water-related employment would be similar. M&I water supply costs would be similar in the Sacramento and San Joaquin valleys. Recreational economic factors would be similar.</p> <p>San Francisco Region M&I water-related employment would be similar. M&I water supply costs would be similar. Recreational economic factors would be similar.</p> <p>Central Coast Region M&I water-related employment would be similar. M&I water supply costs would be similar. Recreational economic factors would be similar.</p> <p>Southern California Region M&I water-related employment would be similar. M&I water supply costs would be similar. Recreational economic factors would be similar.</p>	None needed

1 **Table 19.133 Comparison of No Action Alternative and Alternatives 1 through 5 to**
 2 **Second Basis of Comparison**

Alternative	Potential Change	Consideration for Mitigation Measures
No Action Alternative	<p>Trinity River Region Similar conditions.</p> <p>Central Valley Region Agricultural and M&I water-related employment would be similar. M&I water supply costs would increase by 11 percent in the Sacramento Valley and decrease by 12 percent in the San Joaquin Valley. Recreational economic factors would decrease related to use of San Luis Reservoir.</p> <p>San Francisco Region M&I water-related employment would be similar. M&I water supply costs would increase by 44 percent. Recreational economic factors would decrease related to use of reservoirs that store CVP and SWP water.</p> <p>Central Coast Region M&I water-related employment would be similar. M&I water supply costs would decrease by 6 percent. Recreational economic factors would decrease related to use of reservoirs that store SWP water.</p> <p>Southern California Region M&I water-related employment would be similar. M&I water supply costs would increase by 17 percent. Recreational economic factors would decrease related to use of reservoirs that store SWP water.</p>	Not considered for this comparison.
Alternative 1	No effects on socioeconomic factors.	Not considered for this comparison.
Alternative 2	Same effects as described for No Action Alternative as compared to the Second Basis of Comparison.	Not considered for this comparison.
Alternative 3	<p>Trinity River Region Similar conditions.</p> <p>Central Valley Region Agricultural and M&I water-related employment would be similar. M&I water supply costs would be similar in the Sacramento Valley and by 6 percent in the San Joaquin Valley. Recreational economic factors related to Striped Bass would be reduced.</p> <p>San Francisco Region M&I water-related employment would be similar. M&I water supply costs would increase by 13 percent. Recreational economic factors would be similar.</p> <p>Central Coast Region M&I water-related employment would be similar. M&I water supply costs would be similar. Recreational economic factors would be similar.</p>	Not considered for this comparison.

Alternative	Potential Change	Consideration for Mitigation Measures
	<p>Southern California Region M&I water-related employment would be similar. M&I water supply costs would increase by 14 percent. Recreational economic factors would be similar.</p>	
Alternative 4	<p>No effects on non-recreational socioeconomic factors. Reduced recreational economic factors related to Striped Bass fishing.</p>	Not considered for this comparison.
Alternative 5	<p>Trinity River Region Similar conditions.</p> <p>Central Valley Region Agricultural and M&I water-related employment would be similar. M&I water supply costs would increase by 11 percent in the Sacramento Valley and decrease by 14 percent in the San Joaquin Valley. Recreational economic factors would decrease related to use of San Luis Reservoir.</p> <p>San Francisco Region M&I water-related employment would be similar. M&I water supply costs would increase by 46 percent. Recreational economic factors would decrease related to use of reservoirs that store CVP and SWP water.</p> <p>Central Coast Region M&I water-related employment would be similar. M&I water supply costs would decrease by 6 percent. Recreational economic factors would decrease related to use of reservoirs that store SWP water.</p> <p>Southern California Region M&I water-related employment would be similar. M&I water supply costs would increase by 20 percent. Recreational economic factors would decrease related to use of reservoirs that store SWP water.</p>	Not considered for this comparison.

1 **19.4.3.8 Potential Mitigation Measures**

2 Changes in CVP and SWP operations under Alternatives 1 through 5 as compared
 3 to the No Action Alternative would result in adverse changes in socioeconomic
 4 factors related to the average annual M&I water supply costs as compared to the
 5 No Action Alternative. These adverse impacts would occur in the Central Valley
 6 and Central Coast regions under Alternative 1 and the Central Valley region under
 7 Alternative 3 as compared to the No Action Alternative.

1 **19.4.3.9 Cumulative Effects Analysis**

2 As described in Chapter 3, the cumulative effects analysis considers projects,
3 programs, and policies that are not speculative; and are based upon known or
4 reasonably foreseeable long-range plans, regulations, operating agreements, or
5 other information that establishes them as reasonably foreseeable.

6 The No Action Alternative, Alternatives 1 through 5, and Second Basis of
7 Comparison include climate change and sea level rise, implementation of general
8 plans, and completion of ongoing projects and programs (see Chapter 3,
9 Description of Alternatives). The effects of these items were analyzed
10 quantitatively and qualitatively, as described in the Impact Analysis of this
11 chapter. The discussion below focuses on the qualitative effects of the
12 alternatives and other past, present, and reasonably foreseeable future projects
13 identified for consideration of cumulative effects (see Chapter 3, Description of
14 Alternatives).

15 **19.4.3.9.1 No Action Alternative and Alternatives 1 through 5**

16 Continued coordinated long-term operation of the CVP and SWP under the No
17 Action Alternative would result in reduced CVP and SWP water supply
18 availability as compared to recent conditions due to climate change and sea level
19 rise by 2030. These conditions are included in the analysis presented above.

20 Future water resource management projects considered in cumulative effects
21 analysis could increase water supply availability, as described in Chapter 5,
22 Surface Water Resources and Water Supplies; and reduce economic impacts in
23 the San Francisco Bay Area, Central Coast, and Southern California regions by
24 providing additional water supplies that could be stored in existing reservoirs.

25 There also are several ongoing programs that could result in reductions in CVP
26 and SWP water supply availability due to changes in flow patterns in the
27 Sacramento and San Joaquin rivers watersheds and the Delta that could reduce
28 availability of CVP and SWP water deliveries as well as local and regional water
29 supplies, as described in Chapter 5, Surface Water Resources and Water Supplies.
30 Reduction in available surface water supplies as compared to projected water
31 supplies under the No Action Alternative and Alternatives 1 through 5 could
32 result in reduced water supplies, and further increase the cost of future water
33 supplies.

34 There were be adverse economic impacts associated related to the cost of M&I
35 water supplies in the Central Valley and Central Coast regions under
36 Alternatives 1 and 3 as compared to the No Action Alternative. Therefore,
37 Alternatives 1 and 3 would contribute cumulative impacts to economics factors
38 associated with the cost of M&I water.

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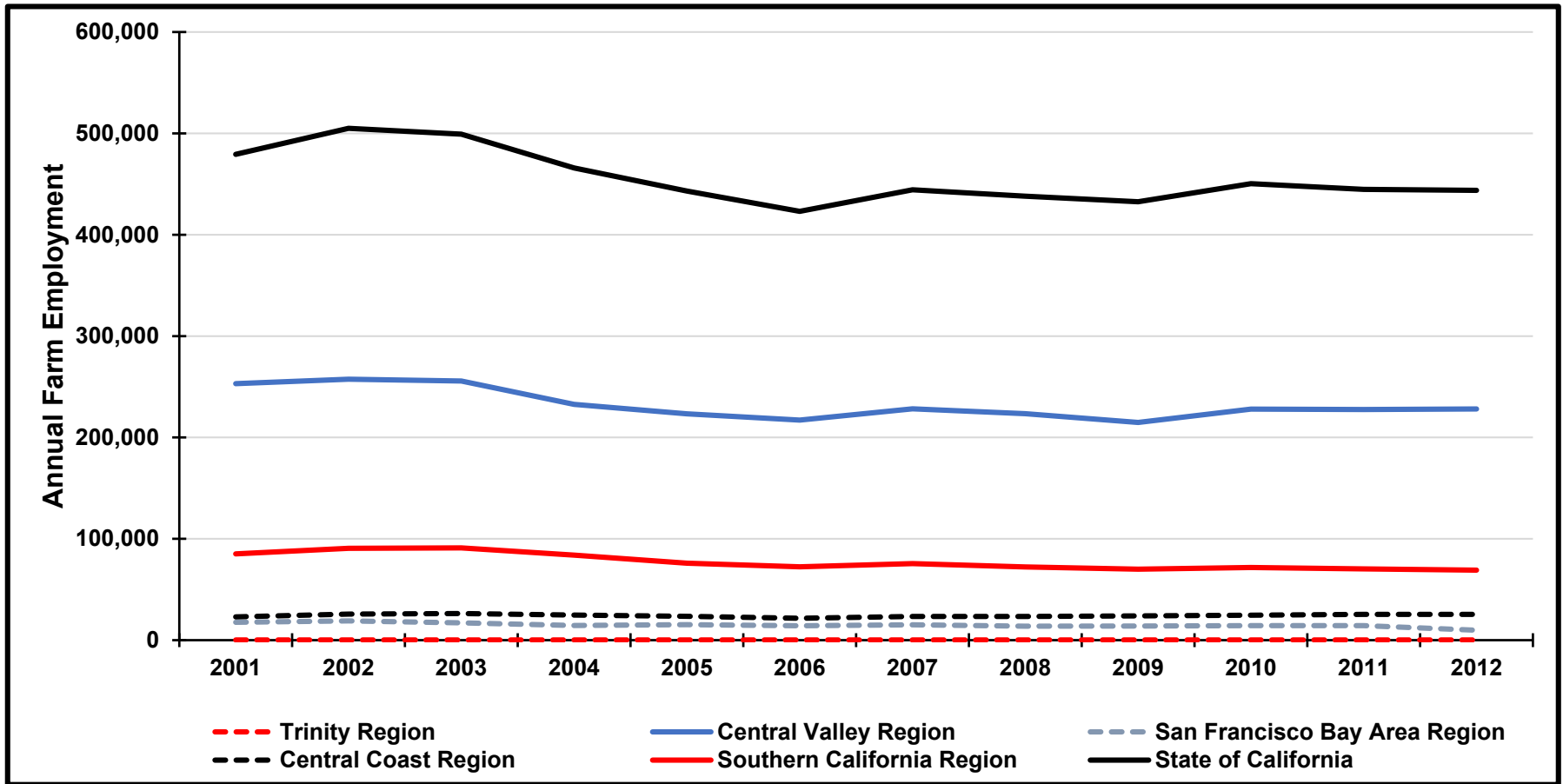


Figure 19.1 Farm Employment in Counties within the Study Area

Source: BEA 2014a

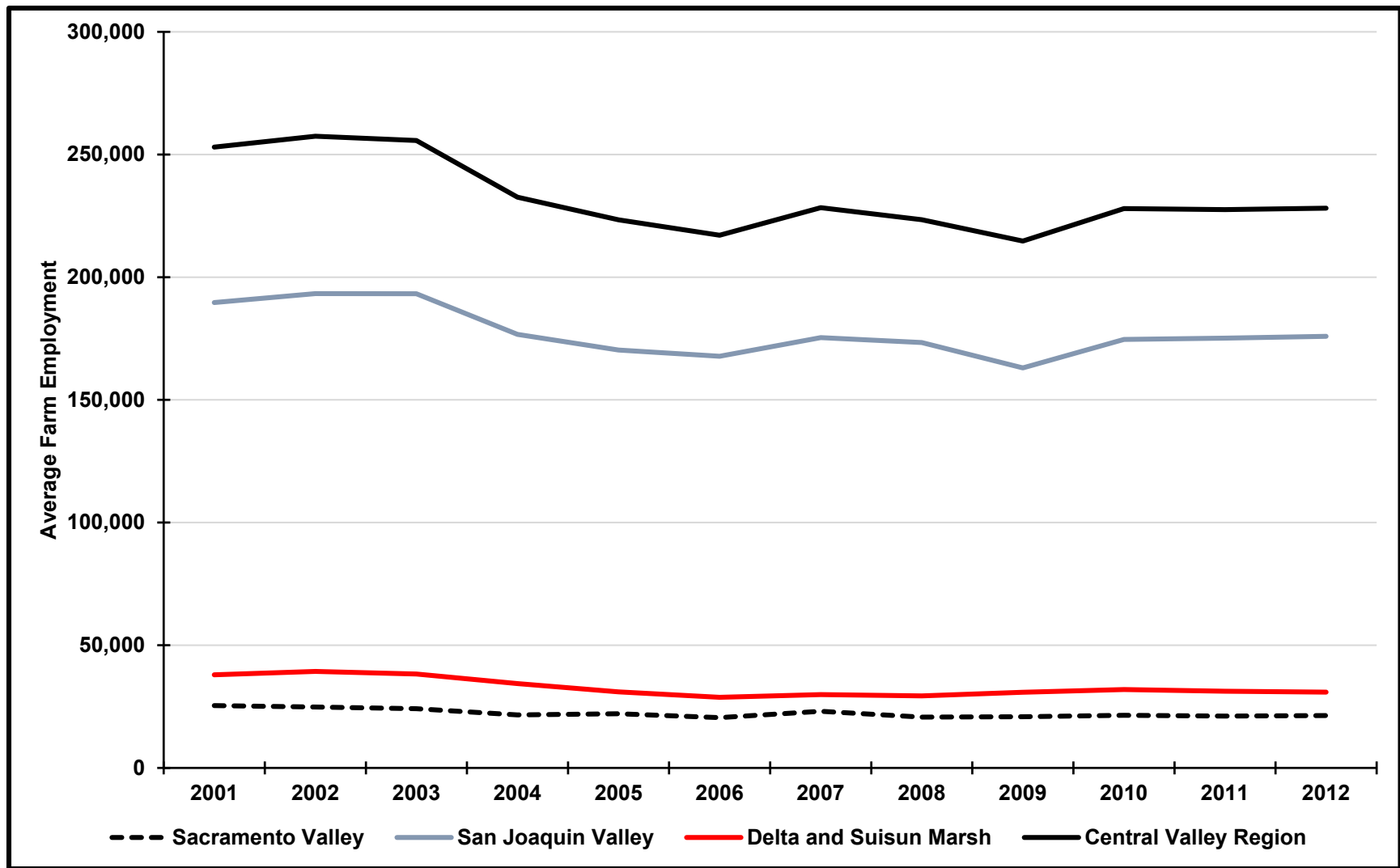


Figure 19.2 Farm Employment in Counties within the Central Valley Region

Source: BEA 2014a

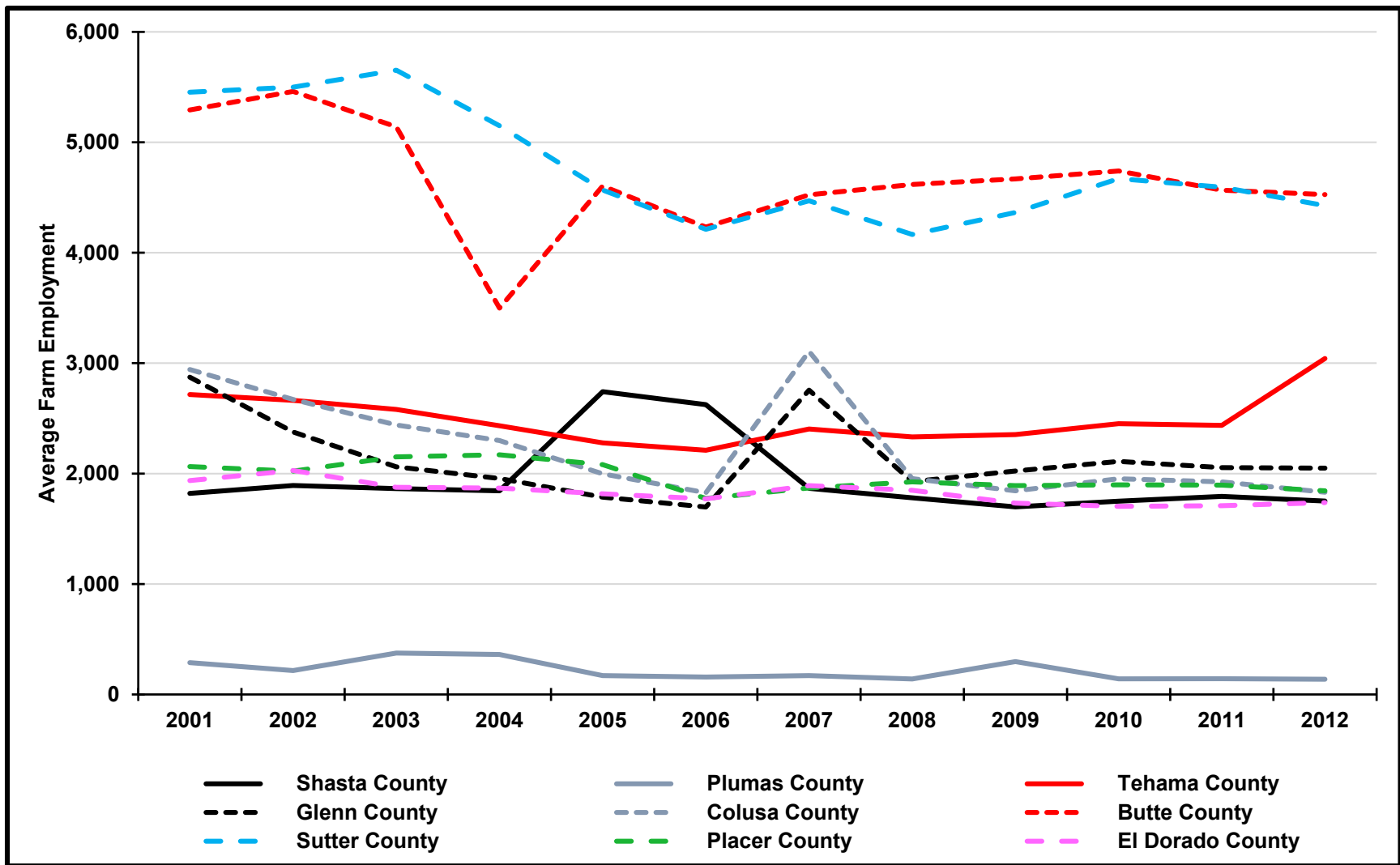


Figure 19.3 Farm Employment in Counties within the Sacramento Valley Portion of the Central Valley Region

Source: BEA 2014a

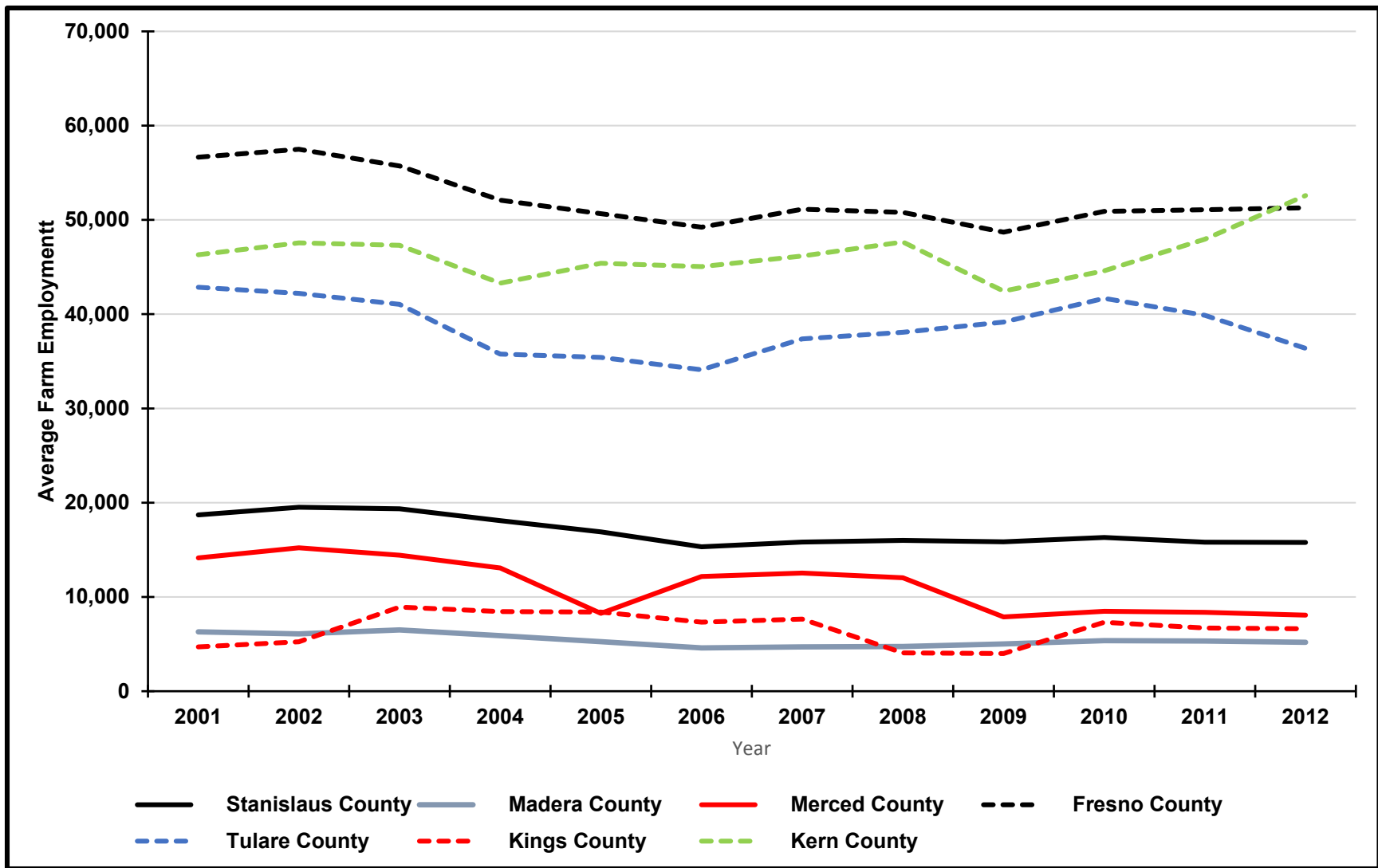


Figure 19.4 Farm Employment in Counties within the San Joaquin Valley Portion of the Central Valley Region

Source: BEA 2014a

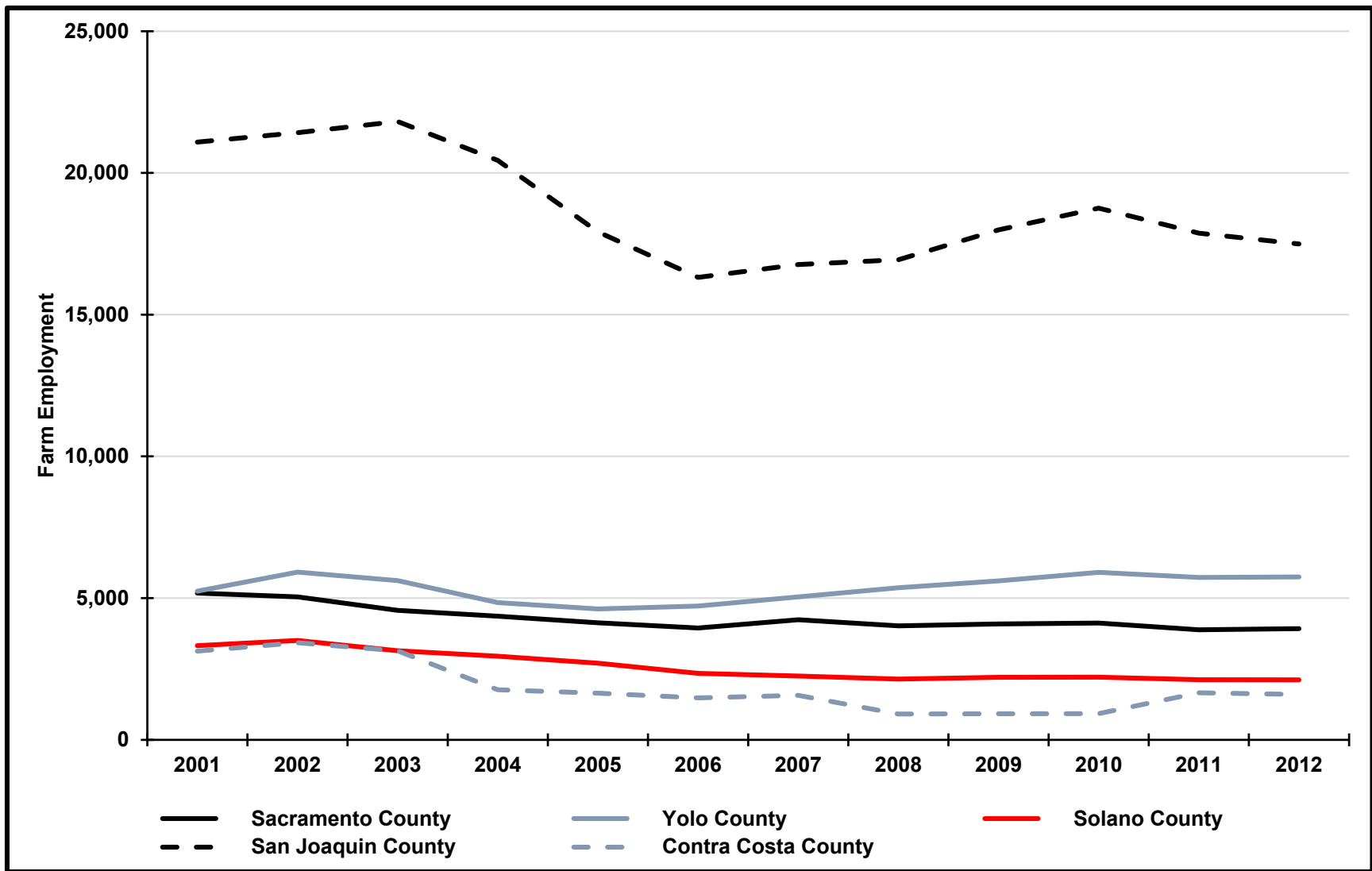


Figure 19.5 Farm Employment in Counties within the Delta and Suisun Marsh Portion of the Central Valley Region

Source: BEA 2014a

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