Chapter 17
Socioeconomics

This chapter describes the socioeconomic conditions in the study area and analyzes changes that could result from construction, operation, and maintenance of the project and implementation of compensatory mitigation associated with other resources. Socioeconomics covers economic conditions, community character, and demographic characteristics of the study area that may be affected by construction or operation of water conveyance facilities. CEQA does not require a discussion of socioeconomic effects, except where they would result in reasonably foreseeable physical changes to the environment. Under CEQA, social or economic effects alone will not be treated as impacts on the physical environment. Public agencies are to consider economic, social, and housing effects together with technological and environmental factors in deciding if project changes are feasible to reduce or avoid significant effects (CEQA Guidelines §§ 15064(f), 15131). As discussed in Chapter 4, *Framework for the Environmental Analysis,* this CEQA document includes additional analyses normally reserved only for NEPA documents, including socioeconomics.

17.0 Summary Comparison of Alternatives

Table 17-0 provides a summary comparison of changes in socioeconomic conditions by alternative. This table provides information on the magnitude of the most pertinent and quantifiable changes in socioeconomic conditions that are expected to result from implementation of the alternatives. CEQA and CEQA Guidelines do not require an assessment of impacts and significance for purely socioeconomic effects. For consistency with other chapters, Table 17-0 simply summarizes the socioeconomic effects evaluated, although none of them would cause an impact as defined by CEQA. Important effects to consider include changes in regional employment and income, and changes in agricultural production value.

As shown in Table 17-0, each alternative could have effects on regional employment and income relative to the existing conditions as a result of increased jobs in construction and operations and maintenance of water conveyance facilities. During construction, Alternative 2a would result in the greatest increase in employment and income, peaking at 3,914 construction-related jobs, whereas Alternative 4b would result in the lowest increase in employment, with 1,990 construction-related jobs in its peak year. During operations and maintenance, Alternatives 2a and 5 would result in the greatest increase in employment with a total of 53 full-time equivalent (FTE) annual jobs. Alternative 2b would result in the lowest operation and maintenance employment, with 41 FTE jobs.

Each alternative would also result in a decrease in agricultural employment as a result of the conversion of agricultural lands necessary to construct water conveyance facilities. Additional conversion of land and associated employment changes would result from the Compensatory Mitigation Plan. These changes are also included in Table 17-0 with annual agricultural employment changes. Alternatives 2a and 4a would result in the largest estimated reduction in total agricultural employment, estimated at 69 FTE annual jobs, whereas Alternative 5 would result in smallest reduction, estimated at 49 jobs.

Each alternative would also result in a decrease in value of agricultural production as a result of farmland conversion for construction and compensatory mitigation activities. Alternative 4a would result in the largest loss of agricultural output, valued at $5.7 million per year. Alternative 2b would result in the smallest annual loss, $2.9 million.

Table ES-2 in the Executive Summary provides a summary of all effects disclosed in this chapter.

Table 17-0. Comparison of Effects on Socioeconomics by Alternative [a]

	Alternative								
Chapter 17 – Socioeconomics	1	2a	2b	2c	3	4a	4b	4c	5
ECON-1: Changes in Regional Employment and Income									
Changes in construction employment during construction phase during peak year [a]	3,321	3,914	2,492	3,060	2,861	3,647	1,990	2,597	3,086
Changes in operations and maintenance annual employment during O&M phase	50	53	41	47	49	52	42	46	53
Changes in annual agricultural employment	-62	-69	-52	-61	-62	-69	-51	-61	-49
ECON-6: Changes in Agricultural Economics in the Statutory Delta and Project Area (Change in total value of production in million $) [b]									
Changes in annual value of agricultural production	-4.4	-5.4	-2.9	-4.3	-4.6	-5.7	-3.1	-4.5	-4.5

[a] Peak construction occurs during either year 6 or 7 of the construction period across all project alternatives. Does not include construction employment associated with the Compensatory Mitigation Plan.

[b] Dollars are reported at 2020 levels.

17.1 Socioeconomic Conditions

This section describes current socioeconomic conditions in the study area. The description is both quantitative and qualitative and focuses on community character, social and economic characteristics, population, housing, employment, and income at regional levels.

The Delta is a maze of islands and channels at the confluence of the Sacramento and San Joaquin Rivers. The statutory Delta includes all or portions of the cities of Sacramento, Isleton, Elk Grove, West Sacramento, Rio Vista, Pittsburg, Antioch, Oakley, Brentwood, Stockton, Lathrop, Manteca, Tracy, and Lodi. Most of the population resides along the boundaries. The statutory Delta has a distinctive social, cultural, and natural heritage that reflects a long history of agricultural and recreational industries and water supply and flood control infrastructure including canals, sloughs, and pipelines conveying water from the Delta to the Central Valley, San Francisco Bay Area (Bay Area), and Southern California.

The socioeconomic conditions described in this chapter pertain to a larger area than the statutory Delta because it is anticipated that construction and operation of the project potentially affects not only the statutory Delta but also other areas of the counties in the Delta region. Additionally, data for some conditions, such as employment-by-industry information, are available only at the county level. As a result, discussion of the study area covers specific characteristics of the communities in the Delta region closest to the project area and a summary of information at the county level.

The California Department of Water Resources (DWR) *Economic Analysis Guidebook* (California Department of Water Resources 2008a) provides guidance regarding the economic assessments that should be conducted from project formulation through implementation, including effects on socioeconomic conditions. Additional information on individual racial/ethnic groups, low-income populations, and poverty levels is presented in Chapter 29, *Environmental Justice*, Section 29.2.1, *Identification of Environmental Justice Populations in the Study Area*.

17.1.1 Potential Socioeconomics Effects Area

This chapter summarizes potential socioeconomic effects in the study area with a focus on effects in the Delta region. Socioeconomic conditions in the Delta region related to population and housing, employment and labor force trends, prominent business and industry types, government, and finance are described in Sections 17.1.1.1, *Study Area*, through 17.1.1.7, *Economics of Agriculture in the Statutory Delta*. Additional discussions of the recreation and agriculture sectors based on their contributions to the Delta region's economy are also provided. Potential effects related to changes in SWP/CVP export service areas, who could experience improved water supply reliability as a result of the project, are also described at a general level. Information about export service areas is included in Sections 17.1.1.1, 17.1.1.2, *Population*, and 17.1.1.4, *Employment, Labor Force, and Industry in the Delta Region*.

17.1.1.1 Study Area

The study area for this chapter is the area in which socioeconomic effects of project construction and operation may occur. The socioeconomics study area includes communities and counties within or overlapping the statutory Delta and project area, because these areas would be most likely to

experience socioeconomic effects as a result of project construction and ongoing operation. The socioeconomics study area primarily consists of six counties—Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties—collectively referred to as the Delta region. Within the Delta region are the statutory Delta and project area. The boundary for the statutory Delta is shown in Figure 1-1 in Chapter 1. The project area primarily lies within the statutory Delta, although it extends further to the southeast for some alternatives, as described in Chapter 1, Section 1.4.4, *Project Area.*

The south-of-Delta State Water Project (SWP) and Central Valley Project (CVP) export service areas, which include areas that could realize improved water supply reliability as a result of the project, are also part of the socioeconomics study area. These areas could experience small long-term socioeconomic effects as a result of water delivery stabilization. The south-of-Delta SWP/CVP export service areas are broken into four groups: South Bay Area, San Joaquin Valley, Central Coast, and Southern California. Basic demographic information for counties in the south-of-Delta SWP/CVP export service areas is reported, including population (both recent and projected), employment, and income.

Although Alameda County is part of the export service area, for purposes of describing socioeconomic conditions Alameda County is instead included in the Delta region because it includes part of the project construction footprint and the statutory Delta. Alameda County is especially relevant when discussing the Bethany Reservoir alignment (Alternative 5), as Bethany Reservoir is in Alameda County. The land in Alameda County that overlaps with the statutory Delta and the project area is predominately agricultural and has no communities.

Delta Region Community Overview

Numerous communities with populations ranging from thousands (e.g., Pittsburg) to a few hundred (e.g., Clarksburg) are in the statutory Delta. Surrounding these communities are farms, ranches, orchards, and vineyards, most of which have residences associated with them that are not in a delineated community but are socially tied to a community through general proximity or public services (e.g., school district boundaries, public service delivery areas). The Delta Reform Act of 2009 designated several unincorporated legacy communities in the statutory Delta, including Bethel Island, Clarksburg, Courtland, Freeport, Hood, Isleton, Knightsen, Rio Vista, Ryde, Locke, and Walnut Grove. These communities exemplify the Delta's unique cultural history and contribute to the sense of the Delta as a place. This unique history led to the formation of the Sacramento–San Joaquin Delta National Heritage Area, the first such designation for any area in California, in 2019.

In addition to recognized cities and communities, the statutory Delta also includes numerous small, recreational areas (including campgrounds, marinas, recreational vehicle parks, and vacation homes) that are popular throughout the spring and summer months. Many Delta residents, whether full time or seasonal, are drawn to the area by the recreational opportunities afforded by the approximately 1,000 miles of waterways and multiple islands of the Delta. For many Delta residents, especially those arriving in more recent years, choosing to reside in the Delta is based on a desire to combine the urban lifestyles in nearby Sacramento and the Bay Area with a physical setting that provides relatively easy access to an extensive system of waterways.

The unique landscape, heritage, and recreational opportunities found in the Delta combine to create a distinctive environment that supports its own social and cultural character. The combination of the physical and biological environment with the social, economic, and cultural character of the Delta communities creates a unique regional framework.

Beyond the physical boundaries of the Delta, there are people connected to the Delta because of their business needs, recreation, and social activities. Even for people who reside outside the statutory Delta, there is a sense of being part of the Delta community because of the social interaction, common ties, and common appreciation of the Delta environment shared among residents and visitors. Different user groups may have a sense of being part of the larger Delta community because of shared values that are linked to the Delta landscape and resources.

Geographic Distribution and Characterization of Population in the Delta

The demographic composition of the Delta region varies greatly. It can be characterized by small towns and dispersed rural residences in the interior of the statutory Delta, and large urban areas on the periphery. In general, the population density of the inner Delta is very low. Most of the population resides in or near the peripheral urban areas. The highest concentration of people is in the urban centers of Sacramento to the north, Antioch and Pittsburg to the west, and Stockton and Tracy to the southeast. The small rural communities of Freeport, Isleton, and Thornton are in the interior of the Delta.

The population in the interior of the Delta mostly resides in several rural communities: Clarksburg, Courtland, Hood, Isleton, and Walnut Grove/Locke/Ryde (Delta Protection Commission 2012). These communities have experienced land use restrictions that inhibit urban development within the Primary Zone of the Delta, an area generally representing the inner Delta, defined by the Delta Protection Commission for the purposes of land use planning. Figure 14-1 in Chapter 14, *Land Use*, is a map of the Primary Zone of the Delta and the Secondary Zone, which lies outside of the Primary Zone and is another area identified for land use planning purposes. As a result of passage of the Delta Protection Act of 1992 and implementation of the Delta Protection Commission's *Land Use and Resource Management Plan for the Primary Zone of the Delta* in 1995, expansion of urban development in these communities is generally not allowed unless proponents can demonstrate that implementing their projects would not result in loss of wetlands or riparian habitat, degrade water quality, interfere with migratory birds or public access, harm agricultural operations, and degrade levees or expose the public to increased flood hazards (Public Res. Code § 29765). The Delta Protection Act requires the Delta Protection Commission to prepare, adopt, review, and maintain a comprehensive long-term resource management plan for land uses within the Primary Zone. The most recent *Land Use and Resource Management Plan* was adopted in 2010 (Delta Protection Commission 2010).

In addition to the communities in the Primary Zone, numerous residences are scattered throughout the Delta islands and are either associated with agricultural parcels or are estate-style residences used as vacation or leisure residences. Among the Delta islands in the interior of the Delta, Brannan-Andrus Island, Bethel Island, Byron Tract, New Hope Tract, and Sargent Barnhart Tract historically have had the highest populations (California Department of Water Resources 1995), although determining the populations of these individual islands is difficult because of seasonal changes in the recreation-associated residency and the presence of temporary agricultural workers on some islands, which can skew census tabulations. Some islands in the Delta are dedicated solely to agriculture or natural habitat, including McCormack-Williamson Tract, Kimball Island, and Coney Island.

The population of the statutory Delta is relatively diverse because of its unique cultural history, the presence of seasonal farm workers, and increasing development within the larger Delta communities. There are high proportions of minority residents in both urban and rural areas.

Historically, many of the agricultural areas in the interior of the Delta exhibit high proportions of minority residents, including Hispanics, Asians, and African Americans, because of a combination of historical and recent settlement trends. Chapter 29, *Environmental Justice*, Section 29.2.1.1 *Minority Populations*, further discusses the demographics of minority populations in the Delta region. Population estimates and growth trends for counties and communities of the Delta region are provided in Section 17.1.1.2, *Population*.

Economy

The economy of the interior of the Delta generally revolves around agriculture and tourism. This contrasts with the economies of the more urban and suburban communities on the periphery of the Delta that are generally tied to the more urban, diversified economies of Sacramento and the San Francisco Bay Area and are less dependent on tourism and agriculture.

The economy of the statutory Delta is rooted in agriculture (Visser et al. 2018). Agriculture became the primary economic driver because of the rich soil, ample water supply, and proximity of urban markets. Agriculture fostered a diverse population in terms of race and ethnicity. The waterways of the Delta have been used to transport agricultural products to urban centers, such as Stockton or Sacramento for processing, packing, and shipment.

Today, the agricultural sector is still important in the Delta region, but changes in mechanization and processing have resulted in a much smaller proportion of residents participating in agriculture than during the early part of the twentieth century. Viniculture is growing in economic importance for some communities in the statutory Delta. The Clarksburg Wine Growers & Vintners Association (CWGVA) consists of 46 growers and 12 wineries concentrated near Clarksburg in the statutory Delta (Clarksburg Wine Growers & Vintners Association 2020).

After agriculture, tourism and recreation are the next most important economic drivers in the statutory Delta (Visser et al. 2018). The Delta is a recreation destination for boating, fishing, waterskiing, and windsurfing. Because the communities in the interior of the Delta were established primarily for their easy access to the water, Delta communities are easily reached destinations for boaters and recreationists traveling through the area. As some areas have become key destinations for recreational users, the tourist activity supports additional services and businesses. Some of the recreation-oriented communities have restaurants, cafes, retail shops, and service providers near the local dock or marina.

The data in this chapter, including all dollar estimates, reflect conditions as of January 2020. An important short- and long-term consideration for the Delta regional economy is the effects of the COVID-19 pandemic. Businesses such as restaurants and bars have undoubtedly suffered major economic setbacks since March 2020 and are likely to need years to recover. This will be the case for many businesses all around the world. Potential effects of COVID-19 are discussed qualitatively where appropriate in this chapter.

Delta Region County Profiles

Key socioeconomic characteristics of each county and the main communities in the Delta region are described based on available data, as presented in the following sections.

Alameda County

A small part of the northeast corner of Alameda County lies within the statutory Delta and the project area. Alameda County lands within or near the statutory Delta are largely agricultural cropland and grazing land. The Bethany Reservoir and associated facilities are in the Alameda County portion of the project area.

Alameda County is the seventh most-populous county in California, with a total population of over 1.6 million in 2018. The county has 14 incorporated cities and several unincorporated communities, none of which overlap with the statutory Delta or project area. Cities include Oakland, Alameda, Berkeley, Hayward, Fremont, Pleasanton, and Livermore. Livermore is Alameda County's closest city or community to the project area, at about 20 miles away from the Bethany Reservoir facilities.

Alameda County's population is overwhelmingly concentrated in the cities, especially those along the east shore of the San Francisco Bay, and the demographic characteristics of the county reflect substantial diversity in culture, income, and ethnicity. Approximately 64% of the population is between the ages of 20 and 64. Alameda County is now one of the most ethnically diverse counties in the Bay Area and the nation, with a 68% minority population.

The per capita income in Alameda County is about $46,000, and the median household income is $96,100, with 10.6% of the population living below the poverty level. Both the per capita income and median household income of the county are higher than the state, and the percentage of persons living below the poverty level is lower than that of the state (U.S. Census Bureau 2018b).

From 2010 through 2019, the county's labor force has grown at a rate of 0.9%, with 844,400 residents in the labor force as of 2019. Of these, 819,700 are employed, resulting in an unemployment rate of 2.9%, which is lower than the statewide unemployment rate of 4% (California Employment Development Department 2020a). Alameda County's economy is diverse, including substantial manufacturing, retail, and services sectors. Business, professional, health, and educational services are the largest sectors of the economy, along with government and trade (California Employment Development Department 2020b). As of January 1, 2020, Alameda County has 0.6 million housing units, of which 319,000 are single-family and 285,000 are multifamily units. Alameda County's residential vacancy rate is 5.3% (California Department of Finance 2020b).

Contra Costa County

The southwestern portion of the statutory Delta lies in Contra Costa County, which extends from the Delta on its eastern and northeastern boundary to San Francisco Bay and San Pablo Bay on the west. Identified communities in Contra Costa County that are completely within the statutory Delta are Bay Point, Discovery Bay, and Knightsen. Communities in Contra Costa County that are partially in the statutory Delta include Antioch, Bethel Island, Brentwood, Byron, Oakley, and Pittsburg.

As of 2018, approximately 328,000 people, almost 29% of the county's population, reside in communities located partially or completely in the statutory Delta. Of these, Antioch has the largest population, at 110,730 residents, and Byron has the smallest, at 1,348 residents (U.S. Census Bureau 2018a).

Approximately 60% of the county's population is between the ages of 20 and 64. The county as a whole is 56% minority,[1] with communities that are partially located in the statutory Delta ranging from 25% (Knightsen) to 85% (Bay Point) minority composition (U.S. Census Bureau 2018a).

Approximately 20% of residents in the communities of Antioch, Bay Point, Brentwood, Discovery Bay, Oakley, and Pittsburg are in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. In contrast, Bethel Island, with an age-restricted development, is the only one of these communities with approximately 20% in the age range of 65 years and above (U.S. Census Bureau 2018a). Most residences in these communities are owner-occupied (U.S. Census Bureau 2018c).

The per capita income in Contra Costa County is $47,265, and the median household income is $97,296, with 9.1% of the population living below the poverty level.[2] The communities that are partially located in the statutory Delta are similar in income profile to the county as a whole and have from 7% to 19% of the population living below the poverty line. Both the per capita income and median household income of the county are higher than the state, and the percentage of persons living below the poverty level is lower than that of the state (U.S. Census Bureau 2018b).

From 2010 through 2019, the county's labor force grew at a rate of 0.8%, with 561,700 residents in the labor force as of 2019. Of these, 544,500 are employed, resulting in an unemployment rate of 3.1%, which is lower than the statewide unemployment rate of 4% (California Employment Development Department 2020a). Contra Costa County is home to a wide range of businesses. Various major corporations have their headquarters in the county, including Chevron and Bio-Rad Laboratories Inc (Infogroup 2020). Business, professional, health, educational, and government services are the largest sectors of the economy. The county also has a substantial heavy industrial and manufacturing sector (California Employment Development Department 2020b).

Sacramento County

Sacramento County extends from the low Delta lands between the Sacramento and San Joaquin Rivers north to about 10 miles beyond the State Capitol and east to the foothills of the Sierra Nevada. The Sacramento, Mokelumne, and San Joaquin Rivers form the southern border of Sacramento County in the statutory Delta.

The southwestern region of the county lies within the statutory Delta. Sacramento County communities completely within the statutory Delta include Courtland, Freeport, Hood, Isleton, Locke, and Walnut Grove. Additionally, the city of Sacramento lies partially within the statutory

[1] The Council on Environmental Quality (CEQ) defines the term *minority* as persons from any of the following U.S. Census Bureau categories for race: Black/African American, Asian, Native Hawaiian and Other Pacific Islander, and American Indian or Alaska Native. Additionally, for the purposes of this analysis, the term *minority* also includes all other nonwhite racial categories, such as "some other race" and "two or more races." The CEQ also concluded that persons identified by the U.S. Census Bureau as ethnically Hispanic, regardless of race, should be included in minority counts (Council on Environmental Quality 1997).

[2] The U.S. Census Bureau defines the term *poverty level* by using the Office of Management and Budget's Statistical Policy Directive 14. Income thresholds are used to determine who is in poverty. If a family's total income is less than a specified threshold, the family is considered to be in poverty. Poverty levels do not vary geographically (U.S. Census Bureau 2016).

Delta. As of 2018, 497,815 people, or 33% of Sacramento County's population, reside in communities lying at least partially within the statutory Delta. Most of the county population resides in Sacramento and its suburbs outside the statutory Delta. Of Sacramento County's eight communities that lie at least partially in the statutory Delta, Sacramento has the largest population, with 495,011 residents; however, most of this population does not live within the statutory Delta. Freeport and Hood have the smallest populations, each with fewer than 400 residents (U.S. Census Bureau 2018a).

Approximately 60% of the county's population is between the ages of 20 and 64. The total minority population in the county is about 55%; however, in the communities that are totally located in the Delta, the percentage of the population identified as minority ranges from 0% (Freeport) to 90% (Hood) (U.S. Census Bureau 2018a).

Approximately 15% of residents in the communities of Hood, Isleton, Sacramento, and Walnut Grove are in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. The community of Freeport is the only one of these communities with approximately 15% in the age range of 65 years and above (U.S. Census Bureau 2018a). In Freeport, Hood, and Sacramento, fewer than half of housing units are owner-occupied. In Courtland, Isleton, and Walnut Grove, most homes are owner-occupied units (U.S. Census Bureau 2018c).

The per capita income in Sacramento County is $32,509, and the median household income is $66,346, with 15.8% of the population living below the poverty line. The income figures are lower in Sacramento County than those for the state, and the level of poverty is higher than the state average percentage of persons living below the poverty line. The communities in the statutory Delta have a range in percentages of persons living below the poverty line: 0% to about 27% (U.S. Census Bureau 2018b).

From 2010 to 2019, the Sacramento County labor force annual growth rate was 0.5%, with 712,400 residents in the labor force as of 2019 with an unemployment rate of 3.7%, slightly lower than the state unemployment rate of 4% (California Employment Development Department 2020a). The top employers of Sacramento County include the California Department of Transportation (Caltrans) and Sutter Medical Center (Infogroup 2020).

San Joaquin County

Communities in San Joaquin County that are in the statutory Delta include Terminous and the cities of Lathrop, Stockton, and Tracy. As of 2018, the San Joaquin County population living in communities lying at least partially within the statutory Delta is 416,893, or about 57% of the county's total population. Of San Joaquin County's communities partially or entirely located in the statutory Delta, Stockton has the largest population at 306,283, followed by Tracy with 88,806 residents. Terminous is smallest, with a population of 411. The statutory Delta also includes the town of Mountain House, on the border with Alameda County near the Bethany Reservoir, with a population of 15,645 in 2018.

Approximately 57% of the county's population is between the ages of 20 and 64. The population of the county is about 68% minority. In communities that lie at least partially within the statutory Delta, the minority population ranges from 24% in Terminous to 79% in Stockton.

Approximately 20% of residents in the communities of Lathrop, Stockton, and Tracy are in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64. In the community of Mountain House, over 30% of the population is in the 5 to 19 years age range. In contrast, the

community of Terminous is the only one of these communities with approximately 20% in the age range of 65 years and above (U.S. Census Bureau 2018a). Of all these communities, only in Stockton are less than half of homes owner-occupied housing units (U.S. Census Bureau 2018c).

The per capita income in San Joaquin County is $27,145, and the median household income is $63,484, with 15.9% of the population living below poverty level. These income figures are lower than the California average and this poverty rate is higher than the state's. Of the communities that are in the statutory Delta, the percentage of persons living below the poverty line ranges from 5% in Mountain House to about 21% in Stockton (U.S. Census Bureau 2018b).

In 2019, 327,100 residents were in the county's labor force. Of these, 307,800 persons were employed, resulting in an unemployment rate of 5.9%. This unemployment rate is greater than the state's unemployment rate of 4% (California Employment Development Department 2020a). Major employment sectors in the county include educational and health services, private services, local government, and goods-production (California Employment Development Department 2020b).

Solano County

Located approximately 45 miles northeast of San Francisco and 45 miles southwest of Sacramento, Solano County supports a mix of agricultural and suburban areas. It covers 909 square miles, including 84 square miles of open water and 675 square miles of rural land (County of Solano 2009). The southeastern part of Solano County lies in the statutory Delta. Rio Vista is the only community in Solano County identified in this analysis as lying partially or completely within the statutory Delta, and it represents only about 2% of the county's population.

Approximately 61% of the county's population is between the ages of 20 and 64. The total minority population of the county is about 61%, whereas the minority population of Rio Vista is about 24%.

Fewer than 9% of residents in Rio Vista are in the age range of 5 to 19 years, with 46% between the ages of 20 and 64 and 44% aged 65 or older (U.S. Census Bureau 2018a). Approximately 80% of homes in Rio Vista are owner-occupied housing units (U.S. Census Bureau 2018c).

The county's per capita income is $34,989, and the median household income is $80,577. The percentage of persons living below the poverty level is 10.4%. Although the per capita income of Solano County is lower than the state average, the median household income surpasses that of the state and the poverty rate is lower that the statewide rate. The community of Rio Vista has 12% of residents living below the poverty line (U.S. Census Bureau 2018b).

In 2019, Solano County reported 209,500 residents in the labor force. Of these, 201,700 persons were employed, resulting in an unemployment rate of 3.8%, lower than the state unemployment rate of 4% (California Employment Development Department 2020a). Solano County restricts urban residential and commercial development outside cities, thus preserving approximately 80% of the land for open space or agricultural use. The top employers include Genentech Inc. and Solano County (Infogroup 2020).

Yolo County

The southeast portion of Yolo County lies in the statutory Delta. The communities in Yolo County that are in the statutory Delta include Clarksburg and West Sacramento. In 2018, the total population of these communities was approximately 53,000, accounting for about 25% of the county

population. Of Yolo County's two communities in the statutory Delta, West Sacramento has the larger population, with 52,826 residents, whereas Clarksburg has only 442 residents.

Approximately 61% of the county's population is between the ages of 20 and 64. The total minority population of the county is about 53%. In communities that lie at least partially within the statutory Delta, the minority population is 34% in Clarksburg and 54% in West Sacramento.

About 21% of residents in the communities of Clarksburg and West Sacramento are in the age range of 5 to 19 years, with larger proportions between the ages of 20 and 64 (U.S. Census Bureau 2018a). In Yolo County as a whole, as well as in the communities of Clarksburg and West Sacramento, approximately half of housing units are owner-occupied (U.S. Census Bureau 2018c).

Yolo County's per capita income is $33,845, and the median household income is $68,444. The percentage of persons living below the poverty level is 19.6%. The per capita income and median household income are both lower than state levels, and the poverty rate is higher than the statewide rate. Clarksburg has 0% of people living below the poverty line, whereas West Sacramento has just over 16% (U.S. Census Bureau 2018b).

In 2019, Yolo County reported 108,700 residents in the labor force. Of these, 104,200 persons were employed, resulting in an unemployment rate of 4.1%, close to the state unemployment rate of 4% (California Employment Development Department 2020a). Yolo County is home to the Port of West Sacramento, whose leading export is rice, a top agricultural product in the county. The leading import is cement (City of West Sacramento 2021). Government, as well as trade, transportation, and utilities are the leading sources of employment (California Employment Development Department 2020b).

South-of-Delta SWP/CVP Export Service Area Profiles

South-of-Delta SWP/CVP export service areas are groups of counties with water agencies who may participate in and receive a stabilized water supply from the project. These are based on the areas displayed in Figure 1-3 in Chapter 1, *Introduction*, and the groupings used in Chapter 31, *Growth Inducement*. Below are descriptions of south-of-Delta SWP/CVP export service areas, including basic population and demographic information.

South Bay Area

The South Bay Area SWP/CVP export service area includes Alameda, Santa Clara, and San Benito Counties. A county profile for Alameda County is included above as part of the Delta region. The populations of Santa Clara and San Benito Counties as of 2019 are 1,961,000 and 62,800, respectively (California Department of Finance 2020a). The per capita income is $32,700 in San Benito County and $54,500 in Santa Clara County. These are below and above the state average, respectively. Median household income is $85,100 in San Benito County and $120,600 in Santa Clara County, both of which are higher than the state average. The percent of people living below the poverty level is 9% in San Benito County and 8% in Santa Clara County, both of which are lower than the state average. San Benito County's population is 65% minority and Santa Clara County's is 68%, which are both higher than the state average.

San Joaquin Valley

The San Joaquin Valley SWP/CVP export service area includes Stanislaus, Merced, Fresno, Tulare, Kings, and Kern Counties. The total population of this area in 2019 is 3,415,500, with the largest

population in Fresno County (1,022,000) and the smallest in Kings County (154,400) (California Department of Finance 2020a). The per capita income varies from $21,200 in Tulare County to $26,000 in Stanislaus County. The median household income varies from $49,300 in Tulare County to $59,600 in Stanislaus County. The percent of people living below the poverty level varies from 16% in Stanislaus County to 26% in Tulare County. Every county in this area has lower per capita and median household income than the state as a whole and a higher percent of people living in poverty. The percentage of the population who is minority varies from 57% in Stanislaus County to 72% in Merced County. All counties except Stanislaus County have a higher percentage minority population than the state average.

Central Coast

The Central Coast SWP export service area includes San Luis Obispo and Santa Barbara Counties. The populations of San Luis Obispo and Santa Barbara Counties as of 2019 are 278,900 and 454,500, respectively (California Department of Finance 2020a). The per capita income is $37,200 in San Luis Obispo County and $35,500 in Santa Barbara County. These are both higher than the state average. Median household income is $73,400 in San Luis Obispo County and $74,400 in Santa Barbara County, with a weighted average of $74,000. This is about equal to the state average. The percent of people living below the poverty level is 13% in San Luis Obispo County and 15% in Santa Barbara County, which are both close to the state average. San Luis Obispo County's population is 31% minority and Santa Barbara County's is 55%, which are both lower than the state average.

Southern California

The Southern California SWP export service area includes Ventura, Los Angeles, Orange, San Diego, San Bernardino, and Riverside Counties. The total population in this area as of 2019 is 22,333,500 people, dominated by Los Angeles County with a population of 10,260,200. The smallest county is Ventura County with a population of 853,700. The per capita income varies from $24,900 in San Bernardino County to $41,100 in Orange County, with an area average of $34,100. The per capita income for the area is slightly less than the state average. The median household income varies from $62,500 in San Bernardino County to $88,700 in Orange County, with a weighted average of $71,900. This weighted average is lower than the statewide median income. The percent of people living below the poverty level varies from 10% in Ventura County to 17% in San Bernardino County. The average for the area is 15%, which is slightly higher than the state average. The percentage of the population that is minority varies from 54% in San Diego County and Ventura County to 74% in Los Angeles County. Los Angeles, San Bernardino, and Riverside Counties all report a higher percentage of minority population than the state average, whereas the remaining counties are below.

17.1.1.2 Population

Population and Growth Trends

The Delta Protection Commission's *Economic Sustainability Plan for the Sacramento–San Joaquin Delta* reported a growth rate of about 54% within the statutory Delta between 1990 and 2010, as compared with a 25% growth rate statewide during the same period (Delta Protection Commission 2012). The report also indicated that population growth had occurred in the Secondary Zone of the Delta but stayed about the same in the Primary Zone (Figure 14-1), and that population in the central and south Delta areas had decreased since 2000.

Table 17-1 lists past, current, and projected population trends for the counties in the study area. As of 2019, the combined population of the Delta region is 5.3 million. Alameda County accounts for 29% of the population of the Delta region, and Sacramento County accounts for 27%. Yolo County had the smallest population (222,868 or 4%) of all the Delta region counties. The South Bay Area (Alameda County excluded), San Joaquin Valley, and Central Coast SWP/CVP export service areas each have a lower population than the Delta region, whereas Southern California has a much larger population of 21 million. The Southern California export service area counties collectively have the majority of the population of the state of California.

Table 17-1. Population by County and Area, 2010–2060

Area	2010 Population (millions)	2019 Population (millions)	2030 Projected Population (millions)	2035 Projected Population (millions)	2060 Projected Population (millions)
Delta Region	**5.30**	**5.82**	**6.37**	**6.61**	**7.43**
Alameda County	1.52	1.67	1.83	1.90	2.16
Contra Costa County	1.05	1.15	1.25	1.30	1.45
Sacramento County	1.42	1.55	1.70	1.75	1.94
San Joaquin County	0.69	0.77	0.88	0.92	1.09
Solano County	0.41	0.44	0.47	0.48	0.52
Yolo County	0.20	0.22	0.24	0.25	0.28
South Bay Area [a]	**1.85**	**2.02**	**2.17**	**2.25**	**2.51**
San Benito County	0.06	0.06	0.07	0.08	0.09
Santa Clara County	1.79	1.96	2.09	2.17	2.42
San Joaquin Valley	**3.14**	**3.42**	**3.77**	**3.92**	**4.46**
Stanislaus County	0.52	0.56	0.61	0.63	0.73
Merced County	0.26	0.28	0.33	0.35	0.46
Fresno County	0.93	1.02	1.12	1.16	1.29
Tulare County	0.44	0.48	0.52	0.53	0.56
Kings County	0.15	0.15	0.17	0.18	0.20
Kern County	0.84	0.92	1.02	1.06	1.21
Central Coast	**0.69**	**0.73**	**0.77**	**0.79**	**0.85**
San Luis Obispo County	0.27	0.28	0.28	0.29	0.29
Santa Barbara County	0.42	0.45	0.49	0.50	0.56
Southern California	**21.04**	**22.33**	**23.28**	**23.62**	**23.68**
Ventura County	0.83	0.85	0.86	0.86	0.78
Los Angeles County	9.85	10.26	10.38	10.39	9.61
Orange County	3.02	3.22	3.39	3.47	3.70
San Diego County	3.10	3.36	3.53	3.60	3.74
San Bernardino County	2.05	2.20	2.40	2.47	2.68
Riverside County	2.20	2.44	2.72	2.84	3.18
California	**37.37**	**39.96**	**42.26**	**43.20**	**45.30**

Source: California Department of Finance 2020a.

[a] The population estimates for the South Bay Area do not include Alameda County because this is included in the Delta region total.

For the 9-year period between 2010 and 2019, the population of the Delta region counties has increased at an average annual rate of 1.1% (9.8% in total), with the greatest rate of population growth occurring in San Joaquin County (1.3% per year). Population growth in Solano County during this 10-year period was the slowest (0.8% per year). The state showed a 0.8% annual growth rate in population during this period, slower than that of the Delta region. This is mainly influenced by the 0.7% annual growth rate in Southern California.

Growth projections through 2060 indicate that all counties in the Delta region are projected to grow at a faster rate than the state. Total population in the Delta region is projected to grow at an average annual rate of 1.1% through 2030 (California Department of Finance 2020a). Of the south-of-Delta SWP/CVP export service areas, Southern California shows the slowest growth through 2060. This is driven by Los Angeles and Ventura Counties, which are both projected to see decreased populations by 2060.

Table 17-2 presents more detailed information on populations of individual communities located (at least partially) in the statutory Delta. Growth rates from 2010 to 2018 were generally higher in the smaller communities than in larger cities such as Antioch and Sacramento. This is likely a result of these communities having lower property and housing prices, and their growth being less constrained by geography and adjacent communities.

Population density varies widely across the Delta region. Analysis done for the Delta Risk Management Strategy (California Department of Water Resources 2008b) indicated several Delta islands with fewer than 20 residents. In contrast, some cities are wholly or partly within the statutory Delta (e.g., Sacramento and Stockton) and have densities exceeding 4,000 residents per square mile. Smaller communities in the statutory Delta, such as Walnut Grove and Knightsen, have population densities lower than 200 residents per square mile (U.S. Census Bureau 2020).

Table 17-2. Statutory Delta Communities Population, 2010 and 2018

Community	2010	2018	Average Annual Growth Rate 2010–2018
Alameda County			
Incorporated Cities and Towns			
Livermore [a]	80,968	89,027	1.24%
Contra Costa County			
Incorporated Cities and Towns			
Antioch	102,372	110,730	1.02%
Brentwood	51,481	60,446	2.18%
Oakley	35,432	40,669	1.85%
Pittsburg	63,264	70,492	1.43%
Small or Unincorporated Communities			
Bay Point	21,349	25,165	2.23%
Bethel Island	2,137	2,010	-0.74%
Byron	1,277	1,348	0.69%
Discovery Bay	13,352	15,981	2.46%
Knightsen	1,568	1,500	-0.54%

Community	2010	2018	Average Annual Growth Rate 2010–2018
Sacramento County			
Incorporated Cities and Towns			
Isleton	804	583	-3.44%
Sacramento	466,488	495,011	0.76%
Small or Unincorporated Communities			
Courtland	355	537	6.41%
Freeport	38	81	14.14%
Hood	271	303	1.48%
Walnut Grove	1,542	1,300	-1.96%
San Joaquin County			
Incorporated Cities and Towns			
Lathrop	18,023	21,393	2.34%
Stockton	291,707	306,283	0.62%
Tracy	82,922	88,806	0.89%
Small or Unincorporated Communities			
Mountain House	9,675	15,645	7.71%
Terminous	381	411	0.98%
Solano County			
Incorporated Cities and Towns			
Rio Vista	7,360	8,618	2.14%
Yolo County			
Incorporated Cities and Towns			
West Sacramento	48,744	52,826	1.05%
Small or Unincorporated Communities			
Clarksburg	418	442	0.72%

Sources: U.S. Census Bureau 2011, 2018a.
[a] Livermore is not in the statutory Delta, but is included because it is the closest community in Alameda County.

Age Distribution

The *Economic Sustainability Plan for the Sacramento–San Joaquin Delta* describes a relatively young age class throughout the statutory Delta with a slightly older population within the Primary Zone (Delta Protection Commission 2012:B9). The report also indicated that there was a higher percentage of households with two or fewer residents in the Primary Zone than in the rest of the Delta or statewide.

More recent estimates for the Delta Primary and Secondary Zones show that about one-third of the population is under 19, whereas only about 5% is over 75. The Delta Secondary Zone specifically has a very young population (Visser et al. 2018). Age distribution in the Delta region is shown in Table 17-3. The age composition of people residing in the Delta region was generally similar to that of the state. The median ages in the Delta region counties ranged from 31 to 39, consistent with the state's median age of 36.3.

Most communities in the statutory Delta have an age distribution consistent with that of the counties and state. However, a few communities, such as Bethel Island, Terminous, and Rio Vista, had a greater percentage of the population at or near retirement age (U.S. Census Bureau 2018a).

Table 17-3. Delta Region Counties and California Age Distribution

Population Segment	Alameda County	Contra Costa County	Sacramento County	San Joaquin County	Solano County	Yolo County	Delta Region Counties	California
Total population	1,643,700	1,133,247	1,510,023	732,212	438,530	214,977	5,672,689	39,148,760
<5 years [a]	97,506	65,505	99,356	52,723	26,706	12,467	354,263	2,480,679
	5.9%	5.8%	6.6%	7.2%	6.1%	5.8%	6.3%	6.3%
5–19 years[a]	286,085	222,210	298,225	169,612	82,219	46,059	1,104,410	7,639,566
	17.4%	19.6%	19.7%	23.2%	18.7%	21.4%	19.5%	19.5%
20–64 years [a]	1,044,192	675,750	910,235	420,416	265,215	131,010	3,446,818	23,713,058
	63.5%	59.6%	60.3%	57.4%	60.5%	60.9%	60.8%	60.6%
65+ years [a]	215,917	169,782	202,207	89,461	64,390	25,441	767,198	5,315,457
	13.1%	15.0%	13.4%	12.2%	14.7%	11.8%	13.5%	13.6%
Median age	37.4	39.4	36.0	34.1	37.9	31.0	36.8	36.3

Source: U.S. Census Bureau 2018a.

[a] Percentages are of the total population by county. Percentages may not add to 100% because of independent rounding.

17.1.1.3 Housing in the Delta Region

Housing Unit Trends

Table 17-4 illustrates the distribution of housing units in the Delta region and in California as a whole. It also provides information on housing units for incorporated communities.

As of January 1, 2020, there are approximately 2 million housing units within the Delta region, representing 14.6% of the housing units in the state. Alameda County, with the largest population in the Delta region, also contains the most housing units. Yolo County, with the smallest population in the Delta region, has the fewest housing units. Recent annual growth rates in the number of housing units have been greatest in San Joaquin and Yolo Counties. Sacramento County registered the lowest increase in housing units.

From 2010 to 2020, the Delta region experienced a 0.5% average annual growth in the total number of housing units. This is about the same as the state growth rate (California Department of Finance 2020b).

Housing density varies greatly across the Delta region, corresponding to the variation in population density. Some Delta islands contain fewer than five housing units. As a result, substantial areas in the statutory Delta contain fewer than 20 housing units per square mile (California Department of Finance 2020b). In contrast, cities that are wholly or partly within the statutory Delta, such as Sacramento and Stockton, contain approximately 1,000 housing units per square mile. The housing density of small communities in the Delta region generally falls in between these extremes; Clarksburg, for example, contains about 86 housing units per square mile (U.S. Census Bureau 2020, 2018c).

Table 17-4. Housing Units in Delta Region Counties, Statutory Delta Communities, and California, 2010 and 2020

Area	2010	2020	Average Annual Growth Rate 2010–2020
Alameda County	**581,372**	**611,752**	**0.52%**
Livermore [a]	30,342	32,728	0.79%
Contra Costa County	**400,263**	**418,409**	**0.45%**
Antioch	34,849	36,149	0.37%
Brentwood	17,523	20,954	1.96%
Oakley	11,484	13,146	1.45%
Pittsburg	21,126	23,506	1.13%
Sacramento County	**555,932**	**579,115**	**0.42%**
Isleton	425	433	0.19%
Sacramento	190,911	198,971	0.42%
San Joaquin County	**233,755**	**249,058**	**0.65%**
Lathrop	5,261	7,284	3.85%
Stockton	99,637	101,235	0.16%
Tracy	25,963	27,843	0.72%

Area	2010	2020	Average Annual Growth Rate 2010–2020
Alameda County	**581,372**	**611,752**	**0.52%**
Livermore [a]	30,342	32,728	0.79%
Solano County	**152,698**	**160,614**	**0.52%**
Rio Vista	3,890	5,096	3.10%
Yolo County	**73,908**	**78,377**	**0.60%**
West Sacramento	18,681	20,241	0.84%
Delta Region Counties	**1,997,928**	**2,097,325**	**0.50%**
California	**13,670,304**	**14,329,863**	**0.48%**

Source: California Department of Finance 2020b.
Note: Data available for incorporated communities only.
[a] Livermore is not in the statutory Delta but included because it is the closest community in Alameda County.

Housing Type Trends

Housing type trends among the six counties and selected communities in the Delta region are given in Table 17-5.

For defining housing types, a multi-family home is a single building that is designed to accommodate more than one family living separately. It can range from a duplex, which has two dwellings within a single building, to apartment buildings with five or more units. Single-family attached homes are also included with multi-family housing in Table 17-5. Single-family residence means a detached structure maintained and used as a single dwelling unit. The vacancy rate is the percentage of all available housing units that are vacant or unoccupied. This is calculated as the difference between total and occupied housing units, divided by total housing units.

Of the Delta region counties, Sacramento County has the highest number of single-family homes and Alameda County has the highest number of multifamily homes. As of January 1, 2020, Sacramento County has 375,821 single-family homes and Alameda County has 284,540 multifamily homes. Yolo County has the fewest single-family and multifamily homes, with 46,671 single-family units and 28,150 multifamily units at the start of 2020. San Joaquin and Yolo Counties account for the greatest annual growth rate in single-family homes over the period with 0.7% and 0.6%, respectively. Alameda County accounts for the greatest annual growth rate for multifamily housing at 0.8%.

Table 17-5. Housing Type Trends, by County and Incorporated Communities, 2010–2020

	2010		2020		Average Annual Growth Rate 2010–2020	
Area	Single-Family	Multifamily	Single-Family	Multifamily	Single-Family	Multifamily
Alameda County	**309,306**	**264,235**	**319,353**	**284,540**	**0.32%**	**0.77%**
Livermore [a]	21,490	8,312	22,519	9,667	0.48%	1.63%
Contra Costa County	**266,693**	**126,196**	**278,918**	**132,209**	**0.46%**	**0.48%**
Antioch	26,884	7,563	28,100	7,647	0.45%	0.11%
Brentwood	15,219	1,950	18,513	2,087	2.16%	0.70%
Oakley	10,454	654	11,953	817	1.43%	2.49%
Pittsburg	14,914	5,465	16,547	6,212	1.09%	1.37%

Area	2010		2020		Average Annual Growth Rate 2010–2020	
	Single-Family	Multifamily	Single-Family	Multifamily	Single-Family	Multifamily
Sacramento County	**357,248**	**183,904**	**375,821**	**188,374**	**0.52%**	**0.24%**
Isleton	240	122	248	122	0.33%	0.00%
Sacramento	113,198	74,519	118,991	76,786	0.51%	0.30%
San Joaquin County	**169,118**	**56,064**	**181,649**	**58,620**	**0.74%**	**0.46%**
Lathrop	4,659	224	6,685	221	4.35%	-0.13%
Stockton	64,487	34,042	65,230	34,897	0.12%	0.25%
Tracy	21,125	4,371	22,407	4,967	0.61%	1.36%
Solano County	**109,059**	**39,057**	**115,476**	**40,511**	**0.59%**	**0.37%**
Rio Vista	3,492	219	4,548	369	3.02%	6.85%
Yolo County	**43,882**	**26,509**	**46,671**	**28,150**	**0.64%**	**0.62%**
West Sacramento	11,706	5,470	12,540	6,187	0.71%	1.31%
Delta Region	**1,255,306**	**695,965**	**1,317,888**	**732,404**	**0.50%**	**0.52%**
California	**7,959,078**	**5,153,579**	**8,231,436**	**5,537,610**	**0.34%**	**0.75%**

Source: California Department of Finance 2020b.
Notes: Excludes mobile homes. Single-Family includes single-family detached homes; multifamily includes single-family attached homes and multi-unit housing.
[a] Livermore is not in the statutory Delta but included because it is the closest community in Alameda County.

Housing Vacancy Rates

Housing vacancy rates among the six counties and selected communities in the Delta region are given in Table 17-6. Of these counties, San Joaquin County has the highest vacancy rate. As of January 1, 2020, San Joaquin County's vacancy rate is 5.7%. Yolo County has the lowest vacancy rate, with 3.8%. Sacramento and San Joaquin Counties experienced the greatest change in vacancy rate between 2010 and 2020 (-2.2% and -2.3%, respectively). The most recent data for vacancy rates in the Delta Primary and Secondary Zones (4.5% and 4.2%, respectively) are within the same range as those reported for the counties (Visser et al. 2018).

Table 17-6. Housing Vacancy Rates, by County and Incorporated Communities, 2010–2020

Area	Vacancy Rate 2010	Vacancy Rate 2020
Alameda County	**6.4%**	**5.3%**
Livermore [a]	4.0%	3.2%
Contra Costa County	**6.2%**	**5.0%**
Antioch	7.5%	5.7%
Brentwood	5.9%	4.2%
Oakley	6.6%	6.0%
Pittsburg	7.6%	6.1%
Sacramento County	**7.6%**	**5.4%**
Isleton	22.1%	23.6%
Sacramento	8.5%	6.5%
San Joaquin County	**8.0%**	**5.7%**
Lathrop	9.1%	5.4%

Area	Vacancy Rate 2010	Vacancy Rate 2020
Alameda County	**6.4%**	**5.3%**
Stockton	9.1%	6.1%
Tracy	6.3%	2.0%
Solano County	**7.2%**	**5.3%**
Rio Vista	11.2%	7.5%
Yolo County	**5.6%**	**3.8%**
West Sacramento	6.7%	4.7%
California	**8.1%**	**7.4%**

Source: California Department of Finance 2020b.
Note: Excludes mobile homes. Numbers for 2010 are as of April 1, 2010, and 2020 numbers are as of January 1, 2020.
[a] Livermore is not in the statutory Delta but included because it is the closest community in Alameda County.

17.1.1.4 Employment, Labor Force, and Industry in the Delta Region

Employment, labor force, and industry indicators provide useful insight into an area's economy. The following discussion describes recent employment trends, unemployment rates, labor force, and industry data. This section describes the employment and labor force characteristics in the Delta region based on data obtained from the California Employment Development Department (EDD) Labor Market Information Division (2020a). Employment and labor force data are only available at the county level; thus, a community-level discussion is not included.

Employment, labor, and industry trends are discussed at a broad level for the Delta region. As of 2019, the EDD reports a labor force of 2,763,800 people for the Delta region. This is compared with 19,408,300 people in California's labor force; thus, the Delta region makes up about 14% of the state's total labor force. Table 17-7 provides a breakdown of the labor force in each county in the Delta region. Alameda County is the largest contributor, with a labor force of 844,400. This is followed by Sacramento County (712,400) and Contra Costa County (561,700). San Joaquin County registers 327,100 people in the labor force, whereas Yolo and Solano Counties register 108,700 and 209,500, respectively. All counties' labor force numbers grew from 2017 to 2019, whereas unemployment rates went down. As of 2015, unemployment rates were higher in the Delta Secondary Zone than in the Primary Zone (Visser et al. 2018).

Table 17-7. Delta Region Counties and California Employment Trends, 2017–2019

Area	2017	2019	Average Annual Growth Rate (2017–2019)
Alameda County			
Labor force	840,200	844,400	0.2%
Employed	809,400	819,700	0.6%
Unemployment rate	3.7%	2.9%	N/A
Contra Costa County			
Labor force	559,200	561,700	0.2%
Employed	537,800	544,500	0.6%
Unemployment rate	3.8%	3.1%	N/A

Area	2017	2019	Average Annual Growth Rate (2017–2019)
Sacramento County			
Labor force	698,100	712,400	1.0%
Employed	665,600	686,300	1.6%
Unemployment rate	4.7%	3.7%	N/A
San Joaquin County			
Labor force	323,600	327,100	0.5%
Employed	301,100	307,800	1.1%
Unemployment rate	7.0%	5.9%	N/A
Solano County			
Labor force	208,400	209,500	0.3%
Employed	198,500	201,700	0.8%
Unemployment rate	4.8%	3.8%	N/A
Yolo County			
Labor force	106,800	108,700	0.9%
Employed	101,400	104,200	1.4%
Unemployment rate	5.1%	4.1%	N/A
Delta Region Counties			
Labor force	2,736,300	2,763,800	0.5%
Employed	2,613,800	2,664,200	1.0%
Unemployment rate	4.5%	3.6%	N/A
California			
Labor force	19,205,300	19,408,300	0.5%
Employed	18,285,500	18,623,900	0.9%
Unemployment rate	4.8%	4.0%	N/A

Source: California Employment Development Department 2020a.
Note: Unemployment rates are cyclical, so annual growth rates do not apply. Employment data are annual averages from 2017 and 2019.
N/A = not applicable.

Table 17-8 shows information on Delta region employment by industry, distribution of employment, and annual growth rates. The top industries in the Delta region as of 2019, based on the total number of employees across the six counties, are services, government, trade, and manufacturing/construction.

Table 17-8. Delta Region Counties Annual Employment and Shares by Major Industry, 2014–2019

Industry	2014	2015	2016	2017	2018	2019	Annual Growth Rate [a]
Agriculture	21,300 (1.0%)	22,300 (1.0%)	22,100 (1.0%)	21,300 (0.9%)	21,700 (0.9%)	20,900 (0.9%)	-0.3%
Manufacturing and construction [b]	253,500 (12.3%)	267,100 (12.5%)	284,900 (12.9%)	290,900 (12.9%)	312,800 (13.6%)	321,200 (13.7%)	4.5%
Transportation, utilities, and warehousing	73,500 (3.6%)	78,400 (3.7%)	84,500 (3.8%)	91,400 (4.1%)	97,600 (4.2%)	104,600 (4.5%)	7.1%
Trade	300,900 (14.5%)	306,300 (14.4%)	314,400 (14.2%)	317,700 (14.1%)	320,600 (13.9%)	315,200 (13.4%)	0.8%
Information	36,600 (1.8%)	38,200 (1.8%)	39,800 (1.8%)	40,000 (1.8%)	39,900 (1.7%)	39,600 (1.7%)	1.4%
Financial, insurance, and real estate services	99,300 (4.8%)	100,900 (4.7%)	103,300 (4.7%)	104,300 (4.6%)	104,400 (4.5%)	103,100 (4.4%)	0.6%
Services	689,400 (33.3%)	705,600 (33.1%)	737,100 (33.3%)	748,800 (33.3%)	768,900 (33.3%)	787,600 (33.6%)	2.4%
Leisure and hospitality	188,700 (9.1%)	196,100 (9.2%)	206,200 (9.3%)	211,900 (9.4%)	216,900 (9.4%)	225,300 (9.6%)	3.2%
Government	422,200 (20.4%)	431,900 (20.3%)	439,600 (19.9%)	444,100 (19.7%)	447,900 (19.4%)	450,500 (19.2%)	1.1%
Total for All Industries	2,068,700	2,129,000	2,211,600	2,250,000	2,307,900	2,344,100	2.2%

Source: California Employment Development Department 2020b.
Note: For every year, values are for January. Numbers in parentheses indicate the share as a percentage of the total employment. Percentages may not add to 100% because of independent rounding.
[a] Calculated as the total percent growth from 2014 to 2019, divided by 6.
[b] Includes natural resources and mining.

Table 17-9 shows per capita personal income, median household income, and poverty status for the Delta region and SWP/CVP export service area counties. The per capita personal incomes for the six Delta region counties range from a high of $47,265 in Contra Costa County (30% higher than the state per capita income of $36,360) to a low of $27,145 in San Joaquin County. Contra Costa County also has the highest median household income ($97,296), whereas San Joaquin County has the lowest median household income ($63,484) (U.S. Census Bureau 2018b). As of 2015, median household and per capita income both are higher in the Delta Secondary Zone compared to the Primary Zone (Visser et al. 2018).

Table 17-9. Income and Poverty Levels

Area	Per Capita Income (2020 dollars)	Median Household Income (2020 dollars)	Persons Living below Poverty Level	Percentage of Population Living below Poverty Level
Delta Region [a]	**$38,930**	**$81,998**	**708,300**	**12.7%**
Alameda County	$45,977	$96,115	171,426	10.6%
Contra Costa County	$47,265	$97,296	102,271	9.1%
Sacramento County	$32,509	$66,346	235,353	15.8%
San Joaquin County	$27,145	$63,484	114,156	15.9%
Solano County	$34,989	$80,577	44,518	10.4%
Yolo County	$33,845	$68,444	40,577	19.6%
South Bay Area [b]	**$53,797**	**$119,546**	**145,104**	**7.9%**
San Benito County	$32,679	$85,112	5,437	9.2%
Santa Clara County	$54,457	$120,621	149,466	7.9%
San Joaquin Valley	**$23,632**	**$54,085**	**708,941**	**22.2%**
Stanislaus County	$26,061	$59,582	86,012	16.1%
Merced County	$22,461	$52,046	59,695	22.7%
Fresno County	$24,175	$53,222	231,799	24.1%
Tulare County	$21,202	$49,335	115,985	25.5%
Kings County	$21,996	$55,925	28,049	20.8%
Kern County	$23,416	$54,486	187,402	22.0%
Central Coast	**$36,178**	**$74,015**	**98,118**	**14.2%**
San Luis Obispo County	$37,202	$73,403	35,291	13.3%
Santa Barbara County	$35,538	$74,398	62,827	14.8%
Southern California	**$34,080**	**$71,892**	**3,138,362**	**14.6%**
Ventura County	$38,302	$87,230	80,303	9.6%
Los Angeles County	$33,711	$66,708	1,591,648	16.0%
Orange County	$41,104	$88,664	359,606	11.5%
San Diego County	$37,539	$77,718	402,687	12.5%
San Bernardino County	$24,872	$62,465	359,048	17.3%
California	**$35,021**	**$73,952**	**5,487,141**	**14.3%**

Source: U.S. Census Bureau 2018b.
Note: Dollars are converted to 2020 levels using the Gross Domestic Product Implicit Price Deflator data from the U.S. Bureau of Economic Analysis (2020).
[a] Per capita and median incomes in the Delta region (and other area summaries) are averages weighted by the county populations. Percent below poverty is the total persons below poverty in all counties of each region divided by total population of the region.
[b] The estimates for the South Bay Area do not include Alameda County because this is included in the Delta region.

The number of people living in poverty in the Delta region is largely consistent with the income data. Contra Costa County has the lowest percentage of the population living below the poverty level, at 9%. Yolo County, with a slightly higher per capita income and median household income than San Joaquin County, still registers the highest percentage of the population living below the poverty

level, at 20%. Sacramento and San Joaquin Counties follow at 16%. These percentages are higher than those of the state, which has 14% of the population living below the poverty level.

Chapter 29, *Environmental Justice*, Section 29.2.1.2 *Low-Income Populations*, provides greater detail regarding the distribution of low-income populations within the Delta region counties.

17.1.1.5 Government and Finance in the Delta Region

This section provides background information on local government finance for the six counties in the Delta region, including details on public revenues and expenditures.

Total revenues and expenditures vary among the six counties because of their size, population, level of commercial and industrial development, land uses, and the level and types of services provided. Revenue sources include tax receipts (primarily property taxes), rents, license and permit fees, expenditures of state and federal government funds, charges for services (e.g., water and sewer), and other sources. Revenue ranges from approximately $427 million in Yolo County for fiscal year (FY) 2018–2019 to nearly $3.7 billion in Contra Costa County (California State Controller's Office 2019). Table 17-10 presents the revenues and expenditures in the Delta region counties during FY 2018–2019.

The revenue generated varies by county depending on state and federal allocations, tax rates, property values, special assessments, and other special taxes. Revenue is generated from real property based on the assessed value of the property (allocated according to formulas set by state law) and by other taxes and assessments. Local agencies in each county are permitted to levy additional ad valorem tax rates for repayment of debt that is approved by voters, such as financing for facilities and services like hospitals and schools. As a result of the levy of additional voter-approved debt, tax rates may vary from area to area within any county, depending on the number and amount of debt. A city, county, or other public entity also can form a special assessment district and levy an assessment on real property to finance public improvements or services, infrastructure, or community services. The special district can finance those public improvements that confer a special, measurable, direct benefit to each parcel of the real property in the district.

Special assessment or service districts include benefit assessment districts (e.g., flood control, sewer, and water); abatement districts (e.g., mosquito and vector control); Mello-Roos community facilities districts; maintenance districts (e.g., levee, open space, park, and playground); reclamation districts; and community service districts (e.g., fire, police, lighting, and garbage). Special assessment districts may collect revenues on a one-time basis or on a continuous (usually annual) schedule, depending on the service. Special assessments are not based on property value. Instead, each assessment district includes a benefit formula and each parcel in the service area is assessed according to the specific benefit it receives from the services and improvements. All Delta region counties provide some government services but rely on the special districts to provide other services.

Expenditures by county governments range from approximately $429 million in Yolo County for FY 2018–2019 to approximately $3.5 billion per year in Contra Costa and Sacramento Counties (California State Controller's Office 2019). Table 17-10 presents the expenditures in Delta region counties during FY 2018–2019. Expenditures include payments made by jurisdictions to buy goods, pay employees, and provide services to residents. Many of the differences in the county-level expenditure per capita and the pattern of expenditures result from the counties' demographic composition. Also, the services provided by county-level governments versus city governments or

special districts vary from county to county. Note that education is a small part of the counties' budgets. Most local education spending is managed by school districts, not by the counties.

Table 17-10. Revenues and Expenditures by Delta Region Counties during Fiscal Year 2018–2019

Type of Revenue or Expenditure	Alameda County	Contra Costa County	Sacramento County	San Joaquin County	Solano County	Yolo County
Revenues (all values in millions of dollars)						
Property taxes	913.5	594.7	469.4	245.4	182.7	55.9
Other taxes	115.3	30.8	158.4	37.4	11.0	20.6
Licenses, permits, fines, forfeitures, etc.	11.7	40.9	105.5	19.7	18.2	23.0
Enterprise funds	0.0	1,557.6	401.3	462.0	2.0	19.8
Intergovernmental—federal, state, other	1,548.6	1,000.3	1,684.4	687.1	387.6	226.2
Miscellaneous revenue	89.7	24.3	133.3	14.3	16.0	2.6
Other financing sources	931.2	444.6	606.0	282.1	161.5	79.3
Total revenue	3,610.0	3,693.2	3,558.5	1,748.0	779.0	427.4
Expenditures (all values in millions of dollars)						
General government	160.9	106.6	190.2	54.2	61.2	33.5
Public protection	992.8	731.1	918.4	353.4	246.0	108.6
Education and recreation and cultural services	31.2	34.5	40.5	12.3	20.4	9.3
Public ways and facilities, health, and sanitation	879.4	366.3	832.2	216.5	187.5	69.3
Public assistance	775.4	504.9	675.9	387.1	157.2	105.2
Debt service and capital outlay	212.8	176.0	242.4	63.9	32.6	54.2
Enterprise funds	0.0	1,557.4	343.7	484.0	2.1	17.9
Internal service fund	286.5	65.4	286.2	141.7	47.1	31.0
Total expenditures	3,339.0	3,542.1	3,529.4	1,713.1	754.2	429.1

Source: California State Controller's Office 2019.
Note: Numbers may not sum to the totals because of rounding.

Alameda County

In FY 2018–2019, Alameda County received $3.6 billion in total revenue. The largest source of revenue was intergovernmental funds, which provided approximately $1.5 billion. Taxes represented approximately $1 billion in revenues. Other financing sources for Alameda County include charges for services, the internal service fund, and revenue from use of money and property.

Expenditures in FY 2018–2019 totaled approximately $3.3 billion. Table 17-10 displays the total expenditures for Alameda County in several categories. Public protection was the largest expenditure for the county ($993 million in FY 2018–2019). Public ways and facilities represented the second largest expenditure category ($879 million), followed by public assistance ($775 million).

Contra Costa County

In FY 2018–2019, Contra Costa County received nearly $3.7 billion in total revenue. The largest source of revenue was enterprise funds, which provided approximately $1.5 billion. Taxes represented approximately $625 million in revenues. Revenues generated by Contra Costa County are used for a range of governmental activities.

Expenditures in FY 2018–2019 totaled approximately $3.5 billion. Table 17-10 displays the total expenditures for Contra Costa County in several categories. Enterprise funds were the largest expenditures for Contra Costa County (approximately $1.5 billion in FY 2018–2019). Public protection represented the second largest expenditure category ($731 million), followed by public assistance ($505 million).

Sacramento County

Sacramento County's total revenues exceeded $3.5 billion in FY 2018–2019. Federal and state funding sources made up the largest revenue source, with nearly $1.7 billion directed to Sacramento County. Property taxes provided the second largest revenue source (approximately $469 million in FY 2018–2019).

As shown in Table 17-10, Sacramento County's budget expenditures also exceeded $3.5 billion in FY 2018–2019. The top two expenditures were for public protection ($918 million) and public ways/facilities, health, and sanitation ($832 million). A substantial portion of the budget also funded public assistance ($676 million).

San Joaquin County

San Joaquin County received approximately $1.7 billion in total revenues in FY 2018–2019. The largest source of revenue was federal and state funding of approximately $687 million. Enterprise funds represented the second largest revenue source for San Joaquin County at $462 million.

Expenditures in FY 2018–2019 also totaled approximately $1.7 billion. Enterprise funds were the largest expenditure at approximately $484 million. Public assistance represented the second largest expenditure category, with approximately $387 million spent in FY 2018–2019, followed by public protection at just over $353 million.

Solano County

Solano County revenues totaled $779 million in FY 2018–2019. Federal and state funding made up about half of Solano County's revenue, totaling approximately $387 million in FY 2018–2019. Property taxes provided another 23% of its revenue at approximately $182 million in FY 2018–2019.

Total expenditures totaled a little over $754 million in Solano County in FY 2018-2019. The top two expenditure categories in Solano County in FY 2018–2019 were public protection ($246 million) and public ways/facilities, health, and sanitation ($188 million).

Yolo County

Yolo County revenues were approximately $427 million in FY 2018–2019. The largest source of revenue was federal and state funding, which contributed approximately $226 million. Property

taxes represented the second largest revenue source for Yolo County in FY 2018–2019 (nearly $56 million dollars).

Expenditures in FY 2018-2019 totaled approximately $429 million. Public protection functions represented the largest expenditures for Yolo County (approximately $108 million in FY 2018–2019). Public assistance activities represented the second largest expenditure category, costing approximately $105 million in FY 2018–2019.

17.1.1.6 Economic Character of Recreation in the Statutory Delta

The recreation industry in the statutory Delta is composed primarily of boating, fishing, hunting, camping, and agritourism activities. Specific businesses directly support recreation in the statutory Delta, including marinas, boat rentals, guide services, and wineries. Other businesses, such as hotels, restaurants, specialty stores, and sporting goods retailers, provide general recreation and tourism goods and services to users in the Delta region, including Delta recreationists, among others.

The recreation-oriented focus of the statutory Delta leads to an interdependent relationship among the different businesses. Fishing guides and boaters depend on the marinas for supplies and fuel. Marinas without food services rely on local food markets or restaurants to serve visitors. Restaurants and wineries depend on hotels to provide accommodations for overnight or extended visits. All the businesses depend on visitors and tourists spending time and money in the statutory Delta.

An important consideration for recreation in the Delta is the short-term and potential long-term effects that the COVID-19 pandemic has had and will have on the industry. Businesses such as restaurants, wineries, and hotels suffered in 2020 because of restrictions on indoor dining and travel. Conversely, some outdoor recreational activities such as boating, fishing, and hunting were less affected. Potentially, some of these outdoor activities may have increased in the Delta in 2020, as outdoor activities that allow for proper social distancing became very popular considering restrictions on other recreational options. There is not enough data yet on the short-term effects of the pandemic on recreational spending in the statutory Delta, and it will take years to determine the long-term effects. Therefore, this section relies on historical information about the economic contributions of recreation in the statutory Delta prior to the onset of COVID-19.

Source of Contributions to the Delta Region Economy

Attendance at special events in the statutory Delta typically ranges from several hundred to several thousands of people. In 2015, the San Joaquin Asparagus Festival, one of the area's largest events, estimated that approximately 80,000 people attended over the 3-day event, and early in 2020, they were anticipating 65,000 people in attendance over the 3-day event (San Joaquin Asparagus Festival 2020). Other popular events include the Locke Asian Pacific Spring Festival, the Courtland Pear Fair, the Heart of Oakley Festival, and the Rio Vista Bass Derby & Festival. Results from a survey conducted by California State University, Sacramento, as part of a 2019 study on Delta recreation show events and festivals as the second most frequent recreational activity (after hiking and walking). Special events that bring out both visitors and locals also make direct economic contributions to the Delta regional economy. The 2018 Courtland Pear Fair was estimated to create an economic output of $301,592, and the 2018 Rio Vista Bass Derby & Festival contributed $1,440,698. This includes additional labor income of over $700,000 between the two events (Delta Protection Commission 2019a).

Heritage tourism in the statutory Delta occurs in small historic towns along the Sacramento River that developed as steamboat landings during the Gold Rush. Freeport, Clarksburg, Hood, Courtland, Locke, Walnut Grove, Ryde, Isleton, and Rio Vista are all considered legacy communities. The Sacramento–San Joaquin Delta National Heritage Area (California's first National Heritage Area) was established in March of 2019. The Delta Protection Commission manages this newly established National Heritage Area which "protects, enhances, and sustains the unique cultural values of the Delta through public education, historic preservation, tourism and recreation development, visitor amenities, and economic development activities" (Delta Protection Commission 2019b).

Consistent with Chapter 16, *Recreation*, the analysis of recreational economics focuses on the statutory Delta and other areas directly adjacent to it. There are 77 hotels in the statutory Delta with a total of 4,456 rooms. There are 1,559 food services and drinking places in the statutory Delta, an increase of 755 since 2008. However, within the Primary Zone, the number of food services and drinking places declined from 26 in 2008 to 15 in 2020 (Delta Protection Commission 2020a).

A total of 97 marinas are in the Delta, which is a decrease from 112 in 2008 (Delta Protection Commission 2020a). Historically, marinas are concentrated in Contra Costa, Sacramento, and San Joaquin Counties, with a few located in Solano and Yolo Counties. However, marinas in San Joaquin County are typically larger and have more berths on average (155) than marinas in other counties, and marinas in Contra Costa County have fewer berths on average (111). In addition to providing boat launching, berthing, fuel, and boat rentals, many marinas also provide ancillary amenities and services, such as picnic areas, trails, and camping facilities (AECOM 2011).

The statutory Delta received an estimated 12 million visitors for recreation in 2020. This indicates that annual visitation has not changed much in the last 30 years. This trend is expected to continue. The Delta is projected to continue to be a popular destination for recreational activities based on the reduction of opportunities in other areas and the growing population in cities and towns in and near the statutory Delta. However, there does appear to be a trend away from the most popular recreational activities in the Delta. Hunting, fishing, and wildlife viewing have all seen declines of 50 percent or more in the U.S. since 1991. Boat registration numbers have substantially declined both statewide and in the Delta since 2000. Non-motorized boating, such as kayaking and stand-up paddling, have increased in popularity since 2006 in California; however, these are also predicted to decline over the next 40 years. In addition to the declines in number of people participating in these activities, the number of days people participate in such activities are projected to decline as well (Delta Protection Commission 2020a).

Direct Economic Contributions from Recreation in the Delta Region

Table 17-11 summarizes estimated total annual recreation trip spending by activity. These are based on visitor day estimates and estimates of spending per day by activity. These spending estimates are calculated for Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties specifically. As Table 17-11 shows, the estimated total recreation trip spending in the statutory Delta is roughly $213 million for 2020. Food expenditures and spending on supplies (e.g., fuel) each account for about 33% of spending, with accommodation accounting for about 8% and other spending accounting for the remaining.

Table 17-11. Estimated 2020 Spending on Recreation in the Statutory Delta

Expenditure Type	Boating, Fishing, and Camping	Hunting	Driving for Pleasure and Tourism	Other Recreational Activities	Total
Accommodation	$11,437,000	$2,127,000	$1,695,000	$2,405,000	$17,664,000
Food	$48,160,000	$3,683,000	$13,555,000	$4,807,000	$70,204,000
Supplies	$50,635,000	$4,327,000	$12,372,000	$4,387,000	$71,720,000
Other	$45,250,000	$3,509,000	$2,509,000	$1,779,000	$53,047,000
Total	$155,482,000	$13,645,000	$30,131,000	$13,378,000	$212,636,000

Source: Delta Protection Commission 2020a:49–50.
Note: Spending is reported 2020 dollars. Estimates are for Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties.

In addition to trip related spending on recreation, non-trip related spending is estimated to be about $38 million per year. This includes spending on vehicles, parts, marinas, and other recreation-related industries. Trip and non-trip related spending in the statutory Delta totals about $251 million for 2020. This is a significant decrease from the estimated spending of $312 million in 2012 (Delta Protection Commission 2020a).

Recreation-Related Industry Employment

Table 17-12 summarizes the estimated employment and associated income for recreation-related industries for Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties. These estimates were calculated using an IMPLAN model based on the trip related spending totals summarized in Table 17-11 plus estimated non-trip related spending of $38 million per year. IMPLAN is a computer database and modeling system used to create input-output models for any combination of United States counties. The employment and income estimates from IMPLAN include direct, indirect, and induced effects. *Direct effects* are actual jobs created/supported in the industry. *Indirect effects* are based on activity created by business-to-business spending associated with a change in sector employment. *Induced effects* are based on activity created by changes in personal income created by the direct and indirect effects (Delta Protection Commission 2020a).

Table 17-12. Employment Supported by Spending on Recreation in the Delta Region

Regional Economic Effect	Trip Related Recreation and Tourism	Non-Trip Related Recreation and Tourism
Employment (FTE)		
Direct	1,360	320
Total [a]	1,850	420
Labor Income (million $)		
Direct	52.3	11.7
Total [a]	80.1	17.5

Source: Delta Protection Commission 2020a:52.
Note: Labor income is reported 2020 dollars. Estimates are for Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties.
FTE = full-time equivalent.
[a] Sum of direct, indirect, and induced effects; numbers may not sum to the total due to rounding.

17.1.1.7 Economics of Agriculture in the Statutory Delta

Agriculture is an important sector of the economy in the statutory Delta, particularly in the Primary Zone, where agriculture is the primary land use (Visser et al. 2018). Related information on agricultural land use, soils, and production practices is provided in Chapter 15, *Agricultural Resources*. The counties include cities such as Sacramento, Stockton, and Antioch. By their nature, cities are concentrations of non-rural economic activity. County-level data summaries (e.g., employment by sector figures in Table 17-8) that include large cities tend to diminish the important role of agriculture in more rural areas of the counties, such as the statutory Delta.

Commercial agriculture and the associated agricultural services, packing, processing, marketing, insuring, and transportation activities are critical components of the Delta region's economic and social character. Many products, such as wine grapes and processing tomatoes, also have significant processing and value added by local manufacturers. The economic production of agriculture in the statutory Delta is multiplied through the regional economy through these activities (Delta Protection Commission 2020b).

Irrigated Land

Consistent with Chapter 15, *Agricultural Resources,* the analysis of agricultural economics focuses on the statutory Delta and the project area. This chapter considers currently productive, irrigated agricultural land within the statutory Delta, and any parts of project area outside of it. Crop acreages are also described in Chapter 15, Table 15-1. The major crops, ranked by acreage, are pasture, corn, alfalfa, grain, grapes, wheat, tomatoes, and almonds.

In total, there are about 390,000 acres in irrigated cropland in the statutory Delta and project area as of 2018. This is a reduction from an estimated 416,000 acres in the statutory Delta in 2016 (Delta Protection Commission 2020b). Roughly 80,000 acres have been planted with perennial crops such as fruit trees and grapevines, which have a large, fixed investment in growing stock with an economic life of 20 years or more; and asparagus, which has a lower initial investment and produces for up to 10 years. Nearly half (48%) of the irrigated acreage in the statutory Delta and project area is in San Joaquin County; Sacramento County has the second largest share (17%), with the remainder split among Solano, Contra Costa, and Yolo Counties, along with a small portion in Alameda County. Chapter 15 provides additional information about crops grown within the statutory Delta and project area.

Yields, Prices, and Value of Production

Annual crop reports generated by the county agricultural commissioners are reported by the U.S. Department of Agriculture's National Agricultural Statistics Service (USDA NASS) each year. The counties report average crop yields and prices for the entire county, not specifically for the farming communities in the statutory Delta. However, crop markets are regional rather than specific to a subregion of a county, so the county-wide averages for crop prices are representative. Table 17-13 shows average yields, prices, and value of production per acre based on data from 2016–2018. Crop yield and price averages are weighted based on acres by crop type in each county. For crops that do not have prices and yields reported for any of the six counties, statewide averages are reported. The acreages reported in Table 17-13 include the entire project area, including some small areas not within the statutory Delta.

Most of the crop categories listed in Table 17-13 represent a specific crop, such as alfalfa hay. Some categories include more than one crop, so either a dominant crop or a crop that is considered representative within that category is used as a proxy crop for purposes of showing yield, price, and value per acre. For example, yields, prices, and values of cucumbers are reported for the melons, squash, and cucumbers category.

Table 17-13. Average Crop Yields, Prices, and Value per Acre in the Statutory Delta and Project Area, 2016–2018

Crop	Acreage	Yield (tons per acre)	Price ($ per ton)	Value per Acre ($)
Corn, Sorghum, and Sudan [a]	84,557	4.77	156	745
Mixed Pasture [b]	57,172	2.86	117	334
Alfalfa and Alfalfa Mixtures	46,329	6.07	186	1,127
Grapes [c]	40,981	7.31	747	5,458
Wheat	28,478	2.69	167	449
Tomatoes [d]	24,482	46.48	78	3,625
Almonds	20,136	1.05	5,065	5,333
Miscellaneous Grain and Hay	19,576	3.21	110	355
Safflower	11,762	1.14	426	486
Melons, Squash, and Cucumbers [e]	6,366	8.52	198	1,690
Miscellaneous Grasses [b]	5,722	2.86	117	334
Rice	5,692	4.19	351	1,469
Pears	5,456	18.03	475	8,564
Walnuts	5,125	2.00	2,075	4,145
Beans (Dry)	4,507	1.22	959	1,167
Young Perennials [f]	3,725	1.05	5,065	5,333
Potatoes and Sweet Potatoes	3,423	18.27	596	10,893
Cherries	2,706	1.92	3,834	7,359
Sunflowers	2,130	0.74	3,057	2,262
Miscellaneous Truck Crops [g]	1,911	2.51	3,807	9,568
Bush Berries [h]	1,699	4.84	4,561	22,074
Olives	1,536	4.45	852	3,795
Onions and Garlic [i]	1,457	31.80	222	7,049
Carrots	1,241	38.25	299	11,445
All Others [j]	3,889	N/A	N/A	N/A
Total Irrigated Crops	390,057			

Sources: Acreages are from Land IQ (2018); prices, yields, and values are from U.S. Department of Agriculture's National Agricultural Statistics Service 2018. Prices are converted to 2020 dollars (U.S. Bureau of Economic Analysis 2020).
Note: Does not include fallow or idle fields (31,911 acres).
N/A = not applicable.
[a] Corn for grain price and yield reported.
[b] Unspecified hay price and yield reported.
[c] Wine grapes price and yield reported.
[d] Processing tomatoes price and yield reported.
[e] Cucumber price and yield reported.
[f] Almond price and yield reported.
[g] Asparagus price and yield reported.
[h] Blueberry price and yield reported.

[i] Onion price and yield reported.
[j] Crops with less than 1,000 acres.

Total value of production is summarized in Table 17-14, with crop categories further aggregated into grains (including rice); field crops; forage crops (alfalfa and pasture); all vegetable, truck, and other specialty crops (including turf); and all orchards and vineyards. Percentage shares by acreage and by value of production are also shown below the totals. The value of production is based on the reported acreage and the per-acre values shown in Table 17-13. Therefore, the values are farm revenues expressed in the 2020 equivalent price level but using average prices and yields for 2016 through 2018.

Table 17-14. Total Value of Production for Crops in the Statutory Delta and Project Area

Crop Category	Acreage (percentage of total)	Value of Production in Million $ per Year (percentage of total)
Grains	54,634 (14.0%)	29.6 (3.4%)
Field Crops	103,594 (26.6%)	79.0 (9.1%)
Forage Crops	109,223 (28.0%)	73.2 (8.5%)
Vegetable, Truck, and Specialty Crops	41,045 (10.5%)	220.7 (25.5%)
Orchards and Vineyards	81,271 (20.9%)	463.5 (53.5%)
Total	390,057	866.0

Sources: Land IQ 2018; U.S. Department of Agriculture's National Agricultural Statistics Service 2018.
Note: Value of production is based on prices received by farmers, in 2020 dollars (U.S. Bureau of Economic Analysis 2020). Crops with less than 150 acres are not shown. Numbers and percentages may not sum to the totals because of rounding.

The estimated total value of irrigated crop production in the statutory Delta and project area is about $866 million per year. This is less than the estimate of $882 million in the statutory Delta for the 2016 season (Delta Protection Commission 2020b). The reduction can be attributed to the reduction in acres between 2016 and 2018. Two categories—vegetable, truck, and specialty crops and orchards and vineyards—account for $684 million per year, or 79% of total production value, whereas these crops are produced on only 31% of the total crop acreage.

Livestock production in the statutory Delta includes feed lots, dairies, and poultry farms. It is estimated that livestock production in the statutory Delta represented 13% of the total value of agricultural production over the period from 1998 to 2004 (Delta Protection Commission 2012). Based on 2016 data, this figure has dropped to about 9% (Delta Protection Commission 2020b). Assuming that the latter percentage is still reasonably accurate, livestock would provide an additional $78 million per year, for an annual total of $944 million in crop and livestock value.

Climate change poses a major threat to many crops grown in the Delta region. The Delta Protection Commission released the report *Climate Change Vulnerability in the Sacramento–San Joaquin Delta: Agriculture and Levee Impacts* in 2019 (Delta Protection Commission 2019c). This study focused on the effects of sea level rise and increasing temperature. Different crops are expected to change in different ways based on anticipated temperature changes. Perennial fruit and nut tree crops are at high risk for effects on yield and quality resulting from climate change, as are heat-sensitive annual crops, such as asparagus, beans, and corn. Some crops may benefit from increased temperatures, including many grains/grasses, alfalfa, and tomatoes. However, this is assuming the necessary quantity and quality of irrigation water is available (Delta Protection Commission 2019c).

Costs of Production and Labor Use for Selected Crops

Costs of irrigated crop production include labor, purchased inputs (e.g., seed, fertilizer, chemicals), custom services, investment in growing stock, other capital (including machinery and structures), and other overhead costs.

Croplands that may be affected by project activities have benefited from substantial investments in land, structures, and growing stock of perennial crops. Perennial crops such as orchards and vineyards may have useful lives of 25 years or more, and asparagus and multiyear forage crops also have years of production value. Investment in growing stock may be expressed as the accumulated costs incurred during the period when the crop is planted and brought to bearing age, called the establishment period. Establishment costs for some perennial crops can exceed $20,000 per acre (cash outlays plus noncash and allocated overhead costs). Table 17-15 provides typical establishment costs for some major perennial crops grown in the Delta region.

Table 17-15. Typical Establishment Costs for Example Perennial Crops in the Delta Region

Example Crop	Establishment Period (years)	Assumed Life of Stand (years)	Accumulated Total Cost during Establishment ($ per acre)	University of California Cooperative Extension Cost of Production Study
Alfalfa Hay	1	4	773	Sacramento Valley, 2020
Almonds	3	25	12,033	Sacramento Valley, 2019
Asparagus	2	10	2,266	San Joaquin County, 2013
Bartlett Pears	5	100	12,500	Sacramento County, 2018
Irrigated Pasture	1	20	439 [a]	Sacramento Valley, 2015
Walnuts	4	35	16,977	Sacramento Valley, 2018
Wine Grapes	3	25	22,572	Cabernet Sauvignon, San Joaquin Valley North, Delta Crush District 11, 2016

Source: University of California Cooperative Extension 2013, 2015b, 2016b, 2018a, 2018b, 2019, 2020.
Notes: Costs are converted to 2020-dollar equivalent values using the Gross Domestic Product Implicit Price Deflator (U.S. Bureau of Economic Analysis 2020). Assumed stand life is the financial life used for the cost and budget analysis. Individual growers may decide to keep stands in production longer or to remove them sooner.
[a] Assumes ground is tilled.

Farm expenditures are largely spent in the surrounding community in the form of input purchases, hired labor, rents paid to landlords, and custom services. Total labor in the agricultural production sector and associated input and processing sectors have been summarized, but crops vary substantially in the amount of labor hours and input purchases required, as shown in Table 17-16.

Table 17-16. Land Rent, Labor Hours, and Custom Services for Example Crops in the Delta Region

Example Crop	Typical Annual Land Costs ($ per acre)	Typical Annual Labor (hours per acre)	Custom Services Purchased ($ per acre)	University of California Cooperative Extension Cost of Production Study
Alfalfa Hay	300	14.8	12	Sacramento Valley, 2020
Almonds	1,200	20.8	1,096	Sacramento Valley, 2019
Asparagus	369	32.5[a]	2,288	San Joaquin County, 2013

Example Crop	Typical Annual Land Costs ($ per acre)	Typical Annual Labor (hours per acre)	Custom Services Purchased ($ per acre)	University of California Cooperative Extension Cost of Production Study
Bartlett Pears	990	32.0	3,557	Sacramento County, 2018
Corn, Grain	230	11.6	54	Sacramento Valley, 2015
Dry Beans	250	6.3	307	Sacramento Valley, 2014
Irrigated Pasture	180	0.0	183	Sacramento Valley, 2015
Safflower	73	2.7	3	Sacramento Valley, 2011
Walnuts	1,375	9.7	1,195	Sacramento Valley, 2018
Tomatoes, Processing	383	25.0	599	Sacramento Valley, 2017
Wheat	263	3.9	13	Sacramento Valley, 2016
Wine Grapes	938	74.8	536	Cabernet Sauvignon, San Joaquin Valley North, Delta Crush District 11, 2016

Source: University of California Cooperative Extension 2011, 2013, 2014, 2015a, 2015b, 2016a, 2016b, 2017, 2018a, 2018b, 2019, 2020.
Note: Costs are converted to 2020-dollar equivalent values using the Gross Domestic Product Implicit Price Deflator (U.S. Bureau of Economic Analysis 2020). Some labor hours may also be included in custom services payments.
[a] Does not include additional harvest costs.

In general, fruit, nut, and vegetable crops require the greatest amount of labor per acre, largely related to cultivation, harvest, and pruning efforts. Land rents may involve an actual cash payment or crop share payment, or they may be the imputed rental value of owned land. Custom services include hired services for pest control, land leveling, harvesting, and field packing. The typical labor hours shown are only those that have been itemized in the University of California Cooperative Extension cost of production studies. Additional labor is associated with the custom services provided.

All costs displayed in the tables are representative of well-run farming operations. Substantial variation exists among farming operations.

Farm Size, Revenue, and Government Payments

The U.S. Census of Agriculture is conducted every 5 years and collects information on farm numbers, sizes, costs and revenues, government payments, and owner characteristics. Average farm sizes and revenues for the counties in the Delta region are shown in Table 17-17. A small increase in average farm size during recent years has occurred in most of the Delta region counties, with an expected average value of production per farm increasing.

The values for San Joaquin and Contra Costa Counties are likely to be more representative of farms in the statutory Delta because greater proportions of those two counties' total farmland lie in the statutory Delta and project area. Government payments include payments for federally supported commodities, cost-sharing payments for soil and water conservation investments, and payments for participating in programs such as the Conservation Reserve. A portion of the commodity payments may be reflected directly or indirectly in market prices for government program commodities, as shown in Table 17-13. Important federally supported commodities in California include cotton, rice, small grains, corn, and oilseeds. On average, less than 10% of the value produced per farm in 2017 is attributable to government payments, for the portion of farms that receive government payments,

as shown in Table 17-17. Less than one-quarter of farms received direct government payments according to the 2017 U.S. Census of Agriculture.

Table 17-17. Average Farm Sizes and Revenues in Delta Region Counties, 2007 and 2017

Year	Average Farm Size [a] (acres)	Average Value of Production per Farm ($)	Average Value of Government Payments per Farm [b] ($)
Alameda County			
2007	390	118,623	15,046
2017	411	109,702	7,608
Contra Costa County			
2007	232	138,123	12,497
2017	339	192,179	19,039
Sacramento County			
2007	236	307,301	29,159
2017	224	392,950	18,439
San Joaquin County			
2007	204	533,839	17,786
2017	225	672,376	25,775
Solano County			
2007	403	339,460	18,264
2017	404	370,246	22,939
Yolo County			
2007	488	483,380	34,822
2017	484	638,313	16,596

Source: U.S. Department of Agriculture 2007, 2017.
Notes: All values are converted to 2020 dollars using the Gross Domestic Product Implicit Price Deflator (U.S. Bureau of Economic Analysis 2020). Alameda County is omitted because the farms in the Delta region are not representative of those in the whole county.
[a] Farm size in the Census definition includes all land, including farmsteads, rangeland, and idle land.
[b] Per farm that received government payments (less than one-quarter of farms received payments).

17.2 Applicable Laws, Regulations, and Programs

The applicable laws, regulations, and programs considered in the assessment of changes related to socioeconomic conditions are indicated in Section 17.3.1, *Methods for Analysis*, or the impact analysis, as appropriate. Applicable laws, regulations and programs associated with state and federal agencies that have a review or potential approval responsibility have also been considered in the development of CEQA impact thresholds or are otherwise considered in the assessment of environmental impacts. A listing of some of the agencies and their respective potential review and approval responsibilities, in addition to those under CEQA, is provided in Chapter 1, *Introduction*, Table 1-1. A listing of some of the federal agencies and their respective potential review, approval, and other responsibilities, in addition to those under NEPA, is provided in Chapter 1, Table 1-2.

17.3 Socioeconomic Analysis

This section describes potential direct and indirect socioeconomic effects that would result with implementation of each project alternative. As stated above, CEQA directs that purely economic or social effects of a project will not be treated as impacts on the environment unless they directly or indirectly result in physical changes to the environment (CEQA Guidelines § 15131). The assessment within the study area includes potential effects on community character and cohesion, population, housing, employment, income, and fiscal effects on local governments. In addition, particular focus is placed on economic effects of potential changes in agricultural production and recreational activity. Project alternatives are not anticipated to cause changes in water deliveries in areas upstream of the Delta. There could be some effects in the south-of-Delta SWP/CVP export service areas as a result of improvements in water delivery reliability occurring under each project alternative.

The analysis of socioeconomics separates effects between the construction phase and operations and maintenance phase for each of the project alternatives. The construction phase is assumed to include the effects associated with temporary construction and field investigation jobs and both the permanent and temporary construction footprint of each of the project alternatives. The operations and maintenance phase is assumed to include the effects associated with permanent operations and maintenance jobs, and the continued effects due to the construction footprint of the project occurring after completion of construction activities. This allows the analysis to distinguish between the long-term agricultural and operations and maintenance employment effects, and the short-term construction-related employment effects.

17.3.1 Methods for Analysis

Part of the socioeconomic analysis is based upon results of hydrologic and water quality analytical model simulations of the existing conditions, the No Project Alternative, and project alternatives. For this EIR, the No Project Alternative and operations of Alternatives 1, 2a, 2b, 2c, 3, 4a, 4b, 4c, and 5 were analyzed. This analysis compares conditions under implementation of the alternatives with the existing conditions.

For the purposes of the socioeconomic analysis, effects of project alternatives are divided into discussion of effects that could occur during the construction phase and/or because of construction activities (including preliminary field investigations) and effects that could occur during the operations and maintenance phase and/or as a result of operations and maintenance activities. Note that construction activities are anticipated to occur over a period of 12 to 14 years. Additionally, 2 years of preliminary field investigations would precede the construction period for all project alternatives. Details on the construction periods anticipated across the project alternatives are provided in Chapter 3, *Description of the Proposed Project and Alternatives.*

As established in Section 17.1, the Delta region includes Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties. Additionally, some effects are anticipated to occur in south-of-Delta SWP/CVP export service areas. The specific socioeconomic effects analyses in this chapter use different subsets of the study area depending on the subject and relevance to the region. These and other assumptions and limitations are described in more detail in the following sections.

17.3.1.1 Delta Regional Employment and Income

Analysis Metrics

The analysis of regional economic effects is presented quantitatively or qualitatively, as follows.

- Quantitative estimates of changes in annual regional construction and agricultural employment.
- Quantitative estimates of changes in annual regional construction and agricultural labor income.[3]
- Qualitative description of changes in employment and income in other industries.

Analytical Approach

Regional economic effects include changes in characteristics like regional employment and income. These are described in greater detail in Appendix 17A, *Regional Economic Effects of Water Conveyance Facility Construction*. The magnitudes of the economic effects within a region depend on the initial changes in economic activity within that region (such as construction employment or loss of production from existing economic activities), the interactions within the regional economy, and the "leakage" of economic activity from this regional economy to the larger, surrounding economy. Economic linkages create multiplier effects in a regional economy as money is circulated by trade. These linkages are often modeled using a large mathematical model called an input-output model.

IMPLAN is a computer database and modeling system used to create input-output models for any combination of United States counties. IMPLAN is the most widely used input-output model system in the United States. It provides users with the ability to define industries, economic relationships, and projects to be analyzed. It can be customized for any county, region, or state, and used to assess the "ripple effects" or "multiplier effects" caused by increasing or decreasing spending in various parts of the economy. The model describes the flows between producers, input suppliers, employment, and consumer spending using a series of economic multipliers. The model of county-level economic interactions is used to estimate, using the input-output multipliers, total regional economic activity based on a change in expenditures, employment, or another economic factor. The IMPLAN output used in the assessment includes the direct, indirect, and induced changes in employment and income.

IMPLAN includes (1) estimates of county-level final demands and final payments developed from government data; (2) a national average matrix of technical coefficients; (3) mathematical tools that help the user formulate a regional model; and (4) tools that allow the user to change data, conduct analyses, and generate reports. Economic data from 2019, the most recent version available from IMPLAN at the time of this analysis, was used to ensure that this analysis is based on the best available science. The 2019 data would also not be influenced by the effects on the economy in 2020 and beyond due to COVID-19 and subsequent supply chain problems.

Economic effects on the Delta regional economy can result from construction of facilities, changes in recreational uses, changes in agricultural production values, changes in operations and maintenance of existing natural gas wells, changes in water quality to municipal and industrial users, and changes

[3] IMPLAN's labor income includes "all forms of employment income, including Employee Compensation (wages and benefits) and Proprietor Income." These are estimates based on typical regional employment.

in other affected businesses. The direct effects of quantified changes (e.g., construction employment or change in agricultural production values) are input to the IMPLAN regional economic model. Based on construction labor estimates, total employment changes associated with construction of the project facilities are identified. These employment changes are used as inputs to IMPLAN to determine the regional employment and income changes associated with the construction of project facilities under all alternatives. The resulting output (employment and income) for each alternative model run is the change from the base model run (existing conditions are the same "base" IMPLAN model).

The employment and income estimates from IMPLAN include direct, indirect, and induced effects. Direct effects are based on estimated temporary jobs during each year of construction and field investigations, typical income for construction and power utility jobs in the region, annual estimated permanent jobs for operations and maintenance, and typical income for water system operations. Indirect effects are based on activity created by business-to-business spending associated with a change in sector employment. This includes typical spending on construction and power supplies. Induced effects are based on activity created by changes in personal income created by the direct and indirect effects. IMPLAN calculates induced effects assuming that some workers in the identified region would permanently reside and spend their income outside of the region (also known as *leakage*).

The regional IMPLAN analysis is also used to estimate the employment and income changes associated with changes in agricultural production. These are based on the temporary and permanent construction footprint of the project alternatives on agricultural acres in production, and the estimated value per acre for crops in the affected area. A separate IMPLAN analysis estimates the employment and income changes associated with agricultural production removed for the Compensatory Mitigation Plan. The methods for calculating changes in agricultural production values are discussed further in Section 17.3.1.5, *Agricultural Economics in the Statutory Delta and Project Area*.

For the purposes of the agricultural employment and labor income analysis, the temporary and permanent construction footprints are assumed to affect agriculture during both the construction phase and the operations and maintenance phase of the project. Neither a temporary nor permanent footprint would result directly from operations and maintenance activities; however, the analysis of project effects on agricultural employment and labor income conservatively assumes that the agricultural lands needed to support project construction and operation activities would be permanently converted to non-agricultural uses. Permanent and temporary effects on agricultural land are discussed further in Chapter 15, *Agricultural Resources*.

Changes in employment and income associated with changes in recreational expenditures are not estimated using IMPLAN because direct changes in recreational expenditures have not been quantified. The analysis of recreational economics is discussed further in Section 17.3.1.4, *Recreational Economics in the Statutory Delta and Project Area*. Similarly, changes in employment and income associated with potential abandonment of existing natural gas wells are not estimated using IMPLAN because no employment effects are anticipated. The direct effects of the implementation of general mitigation measures, best management practices, and environmental commitments are not quantified in this chapter. Although their effects on the regional economy are described in Section 17.3.3, *Socioeconomic Effects*, they are not analyzed using IMPLAN.

For analyzing effects on employment, the IMPLAN model includes five counties in the Delta region (Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties), whereas Alameda County is not included in the IMPLAN analysis. This is discussed further in *Assumptions and Limitations*.

An IMPLAN model of this region is used to estimate total changes in employment and income. The model follows county lines and incorporates, to the extent allowed by available data, the employment and income characteristics of the economic sectors in this region. Construction-related changes are modeled based on the expected year of employment changes. All other changes are assumed to be average annual changes. Estimates of direct construction and operations and maintenance employment are estimated based on equipment and materials estimates associated with the project alternatives. Agricultural employment effects are incorporated into the input-output models in dollar terms as changes in gross revenues from agricultural production.

Figure 17-1 provides an overview of the steps that were followed to quantify the potential effects on employment and income as a result of constructing and operating the water conveyance facilities. Quantified socioeconomic effects are measured as changes in employment and income. These changes in employment and income were estimated for three primary activities: temporary increases in construction employment, permanent losses in agricultural employment, and permanent increases in operations and maintenance employment.

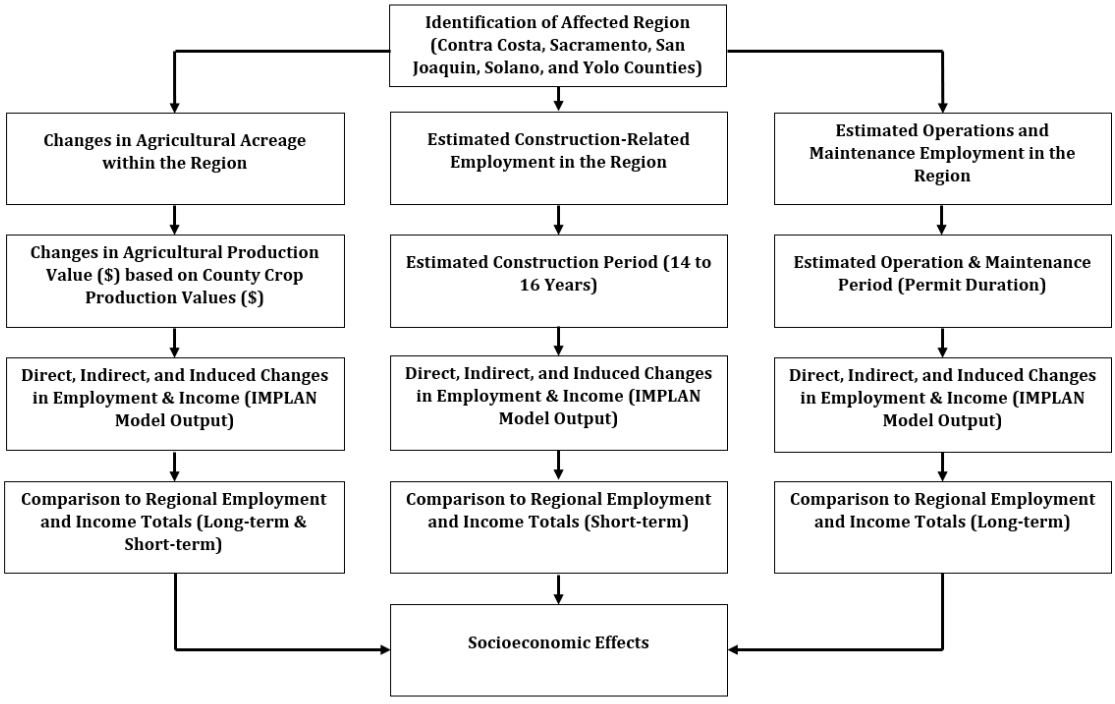

Figure 17-1. Steps in Analyzing Changes in Employment and Income as a Result of Constructing and Operating the Delta Conveyance Project

Assumptions and Limitations

The IMPLAN analysis uses a grouping of five counties, which includes a broader and more self-sufficient range of economic activities than using IMPLAN for each individual county. This region is

sufficiently large to capture most of the important secondary effects of direct changes in economic activity. A portion of direct project expenditures may occur outside of this region, and a portion of the secondary effects of within-region expenditures would also occur outside of the area. Although IMPLAN accounts for some spending to occur outside of the selected region (i.e., "leakage"), these effects are not included in the quantified results.

Any activities in the small portion of Alameda County overlapping the statutory Delta and project area are assumed to affect employment in the other five counties in the Delta region. Alameda County is the most populous county in the Delta region, as described in Section 17.1, but only a small area and very small part of the population is within the statutory Delta and the project area. Bethany Reservoir is in Alameda County and its facilities and operation are affected by Alternative 5. The communities closest to the Bethany Reservoir site are Mountain House (~6 miles) and Tracy (~13 miles), both in San Joaquin County.

The closest community in Alameda County to Bethany reservoir is Livermore, about 20 miles away over the Altamont pass. Therefore, inclusion of Bethany reservoir into the project area (Alternative 5) is unlikely to change the proportion of workers permanently residing outside of the Delta region with Alameda County omitted compared to the other project alternatives. In addition, the economy of Alameda County as a whole is very different from the largely agricultural areas affected in the project area. For example, in 2019 there were 12,600 farm jobs in San Joaquin County, or 5% of the county total, versus only 500 farm jobs in Alameda County, or less than 0.1% of its county total (California Employment Development Department 2020ab). Therefore, an IMPLAN analysis based on five counties within the Delta region (i.e., omitting Alameda) was judged to provide a better assessment of economic effects than one using all six counties.

The IMPLAN model accounts for the fact that not all workers employed in one region will spend all of their personal income there. This influences induced economic effects—that is, effects on spending on things like housing and childcare due to changes in personal income. Induced effects occur with changes in both direct and indirect employment and labor income. The IMPLAN estimate for the share of personal income earned in the region but "exported" outside of the region is 15%. This spending "leakage" is not included in the quantified indirect and induced effects on the Delta regional economy.

The analysis of agricultural employment effects, based on affected acres by crop type, includes any remnant acres on partially affected smaller parcels. That is, any parcel 20 acres or less in size that lies only partially within the construction footprint is assumed to be fully affected, with the area of the parcel not lying in the footprint included in the remnant acres. These acres are added to avoid underestimating the potential effects on smaller parcels that are less likely to be profitable to farm even if only partially affected. This analysis assumes that the crop mix of the remnant acres is the same as the crop mix of the acres within the construction footprint for all project alternatives.

IMPLAN does not allow for substitution among production inputs, and no economies of scale are possible. It also does not include price effects on materials, outputs, or labor that might be important to a region. None of these assumptions are expected to affect comparisons of results among alternatives.

Finally, the IMPLAN database is very large, incorporating up to 546 sectors. IMPLAN is periodically updated as more and better data become available, but it is not possible to check every number in its database for accuracy. However, some of the coefficients for key affected sectors were validated or revised to provide a better representation of secondary effects within the analysis.

Data Sources

IMPLAN uses a system of national accounts for the United States based on data collected by the U.S. Department of Commerce's Bureau of Economic Analysis, the U.S. Department of Labor's Bureau of Labor Statistics, and other federal and state government agencies. Data are collected for 546 distinct sectors of the national economy, corresponding to the North American Industry Classification System. Industry sectors are classified based on the primary commodity or service produced. Corresponding data sets are produced for each county in the United States, allowing analysis of individual counties, clusters of contiguous counties, individual states, or groups of states.

The model estimates regional economic changes in employment during construction, operation, and maintenance of the conveyance facilities, as well as employment changes related to compensatory mitigation. The direct employment data are estimated based on equipment and materials estimates associated with the project alternatives. Changes in agricultural acreage are developed using a construction and facilities footprint analysis and are described in Chapter 15*, Agricultural Resources*. The changes in agricultural output by sector resulting from the changes in acreages and production by crop type are used as input into the IMPLAN model to estimate the agricultural regional employment and income changes. Changes in agricultural output by sector are described further in Section 17.3.1.5, *Agricultural Economics in the Statutory Delta and Project Area.*

17.3.1.2 Delta Region Community

Analysis Metrics

The analyses of effects on Delta region communities' population, housing, and character are presented quantitatively or qualitatively, as follows.

- Quantitative estimates of changes in population.
- Quantitative estimates of housing supply and quantity demanded.
- Qualitative description of potential changes in community character.

Analytical Approach

Analysis of the Delta region community specifically addresses population, housing, and social and individual community effects.

Potential effects on housing and population include displacement of existing residences and changes in employment. Estimated construction employment was used as an input to the IMPLAN model, which applies multipliers to generate estimates of employment and income change for the region. The IMPLAN model is described in Section 17.3.1.1, *Delta Regional Employment and Income*. The population and housing effects focus on the same specific region as the analysis of employment and income. The justification for focusing on this specific region is described in Section 17.3.1.1, under *Assumptions and Limitations.*

Social and community effects are qualitatively evaluated with consideration of effects on established communities whose character could be most directly influenced by project activities based on total population, economic composition, proximity to project features, and the nature of project activities. This assessment focuses on communities in the statutory Delta and project area, where the direct effects of the project would occur and where social and community effects could be greatest. Social

and community effects elsewhere in the study area are anticipated to be minor because they would be spread over a large, heavily populated area and among many communities.

Population and Housing Effects

Estimates for potential population increase and housing demand during the construction and operations and maintenance phases of each alternative are calculated based on changes in employment. Data on employment changes are drawn from the analysis of Delta regional employment and income (see Section 17.3.1.1, *Delta Regional Employment and Income*, for a description of that methodology). A project alternative is expected to draw from the entire workforce in the region, not merely those workers who are available in the immediate area of construction or operation activity. It is expected that most of the construction workforce would consist of workers already living in the region who would not demand new housing.

However, the construction of conveyance facilities would require specialty occupations, such as tunnel boring machine operators, that require skills not always available in the local workforce. Thus, out-of-area contractors may bring their crews to the region. These workers may decide to relocate and demand additional housing. Because of the likelihood that specialized occupations and out-of-area contractors would enter the region, this analysis considers the scenario where all of the anticipated out-of-area construction workers demand housing. This analysis uses CA Department of Finance population data described in Section 17.1.1.2, *Population,* and EDD construction worker data described in Section 17.1.1.4, *Employment, Labor Force, and Industry in the Delta Region* to approximate the number of workers and their families who may decide to relocate to the region.

Changes in housing demand are estimated for the short-term construction phase and the longer-term operations and maintenance phase. Available housing is determined by estimating the number of vacant housing units using the total housing units and vacancy rates for each of the counties (California Department of Finance 2020b).

Total estimated changes in population because of implementing an alternative are calculated by multiplying the average number of persons per household, according to the California Department of Finance (2020b), and the number of workers who may relocate, by alternative. The changes in population resulting from construction and operation of a project alternative are then compared to the current population and projected population growth. In instances where population changes are anticipated to deviate from the projected population growth for the region (2019–2035), an effect is identified and discussed.

Social and Community Effects

The assessment of social and community effects is based on comparing each alternative to the existing conditions. The methodology specifically identifies how physical changes from the project alternatives could result in social and economic effects within communities.

As used in this analysis, community character describes the physical and social structure of a community that makes up its unique or distinctive attributes. Examples of statutory Delta community characteristics include location, small town feeling or rural setting, proximity to recreational opportunities, and cultural and natural heritage, all of which contribute to a sense of place. Community cohesion describes a shared sense of belonging and “common ground” among members of a community. Cohesion is supported by mobility and the ability to build and maintain relationships within a community and is often enhanced by the activities of community

organizations or community gathering places (such as schools, libraries, places of worship, and recreational facilities). Community character is further enhanced by the rich history of the Delta.

The physical effects of the alternatives, as addressed in other sections of this document, are used to determine the extent to which changes to the environment could affect individual communities and populations, and how they would potentially affect community character. Construction activities would occur over a multiyear period and could create sources of noise, air pollution, traffic, and other conditions that may affect the characteristics of some communities in the statutory Delta located near the project area. These activities, along with the long-term placement of the conveyance facilities, could also alter the character of these areas if they substantially reduce the extent of undeveloped land in proximity to communities and change the viability or desirability of important economic and social pursuits, including agricultural activities and water-based recreation.

Implementation of compensatory mitigation could have some similar effects during the construction period by introducing conditions that would alter and potentially detract from the rural characteristics of communities in the statutory Delta. These activities could also introduce sources of noise, air pollution, and traffic during earthwork and site preparation of compensatory mitigation areas. Following the completion of these activities, compensatory mitigation could affect rural qualities through enhancements to air quality and other resources. In the long term, these activities could also affect communities by converting agricultural land to other uses, which could change economic and social conditions within communities. These areas could also change the extent or nature of recreation in the statutory Delta, which could further alter the character of communities.

Aside from direct conflicts with existing structures requiring relocation (which are described in Chapter 14, *Land Use*), changes in regional economics, including employment and income, and changes to population and housing, may also result in indirect effects on the demographic composition of communities. For example, lower rates of unemployment could contribute to spillover effects like reduced numbers of vacant buildings, lower poverty and crime rates, and lessened need for social services. Effects on community character are anticipated to be substantially influenced by changes in the size and composition of population as well as changes in employment and, more generally, in the economic welfare of a particular community. Thus, the demographic effects of regional economic changes could inform anticipated changes to a community's character and stability.

Data Sources

Estimates of existing conditions for population and housing are obtained from the California Department of Finance and the U.S. Census Bureau, and are described in Section 17.1, *Socioeconomic Conditions*. The availability of housing is estimated using vacancy rate and number of dwellings by type from the California Department of Finance (2020b).

17.3.1.3 Local Delta Region Governments Fiscal Conditions

Analysis Metrics

The analysis of fiscal effects on local Delta region governments are presented qualitatively, as follows.

- Qualitative description of changes in tax revenue due to changes in employment and spending during construction and operations and maintenance phases.

- Qualitative description of potential changes due to forgone property tax revenue from lands affected during construction and operations and maintenance phases.

Analytical Approach

Fiscal effects on local governments would occur from changes to property tax, sales tax, or assessment revenue resulting from implementation of a project alternative. The analysis considers if there is loss of property tax revenue resulting from potential acquisition of existing privately held land as a result of an alternative. The analysis also considers potential changes in local tax revenue as a direct result of the estimated changes in employment, income, and agricultural production. Changes in government fiscal conditions can lead to changes in local public services as discussed in Chapter 21, *Public Services and Utilities.*

A project alternative would result in changes to existing land ownership and use that, in turn, could affect the property taxes on affected parcels. Acquisition by a public agency of fee-title interest, and surface and subsurface easement acquisition would have effects on local property tax. However, California law requires that, prior to initiation of construction, entities that contract to receive water from the SWP and CVP plan must pay for "full mitigation of property tax or assessments levied by local governments or special districts for land used in the construction, location, mitigation, or operation of new Delta conveyance facilities" (Wat. Code § 85089). Discussion of the potential effects of forgone property tax revenue is made considering this legal requirement.

Potential changes in employment and income would also lead to changes in local spending patterns, affecting revenue from local sales taxes. The IMPLAN analysis described in Section 17.3.1.1, *Delta Regional Employment and Income,* included secondary effects on spending by both businesses and consumers due to changes in employment. Potential effects on local sales tax revenue are expected to be correlated with these secondary effects.

17.3.1.4 Recreational Economics in the Statutory Delta and Project Area

Analysis Metrics

Recreational economics refers to spending, availability, and other market factors related to recreational activities. This includes direct spending on recreational activities (e.g., marina fees and spending on boat maintenance) and indirect local spending while enjoying recreational activities (e.g., hotels and restaurants). The analyses of recreational economics in the statutory Delta, and parts of the project area outside of the statutory Delta, provide a qualitative description of any potential changes in recreational economics during the construction and operations and maintenance phases. Additionally, this chapter analyzes potential effects on the quality of recreational opportunities in the statutory Delta and project area, and the extent to which these may affect recreational economics.

Analytical Approach

Chapter 16, *Recreation*, Section 16.3.3.2, *Impacts of the Project Alternatives on Recreation Resources*, assesses if there would be any physical changes to recreation resulting from facilities construction, operation, or compensatory mitigation. These changes, along with their anticipated economic effects, are discussed qualitatively in Section 17.3.3, *Socioeconomic Effects*. The area evaluated in Chapter 16 includes the statutory Delta and other areas directly adjacent to the statutory Delta in the project area. The analysis in this chapter focuses on the same geographical area.

The second part of the analysis of recreational economics in this chapter considers potential changes to recreational opportunities and their perceived quality. Although these are not physical changes under CEQA and, therefore not included in the analysis in Chapter 16, they are important socioeconomic factors because perceived quality may affect recreationists' spending patterns in and around the statutory Delta. All identified potential effects on recreational quality are disclosed in this chapter, and the extent to which they may affect recreational economics is discussed.

17.3.1.5 Agricultural Economics in the Statutory Delta and Project Area

Analysis Metrics

The following quantitative and qualitative comparisons are provided.

- Quantitative estimates of changes in values of agricultural production.
- Qualitative description of changes in production costs.
- Qualitative description of changes in values of agricultural facilities and investment.

Analytical Approach

The economic analysis of changes in agricultural production in the statutory Delta, and parts of the project area outside of the statutory Delta, uses project-specific geospatial data describing the location of project facilities for each alternative. Project-specific data also determines whether features would create footprints that would be temporary or permanent in nature. This chapter specifically identifies the overlap between the construction footprint of each project alternative, and the acreage by crop type identified in 17.1, *Socioeconomic Conditions.* The changes in total agricultural production values by crop are then estimated using the number of acres of each crop within the construction footprint for each alternative, multiplied by the average value per acre by crop summarized in Table 17-13. Data for individual crop types are then summarized by crop category and compared to the total production value by crop category under the existing conditions, summarized in Table 17-14. These changes in total value of production by crop category are also used as input into the IMPLAN model to estimate changes in agricultural employment and labor income, described in 17.3.1.1, *Delta Regional Employment and Income*.

The analyseis of both construction phase and operations and maintenance phase effects includes both the temporary and permanent construction footprint. Although no project footprint results directly from operations and maintenance activities, effects on agricultural production would continue into the operations and maintenance phase of the project. This analysis conservatively assumes that the agricultural lands needed to support project construction and operation activities would be permanently converted to non-agricultural uses. The long-term operations and phase includes effects of the full construction footprint because there is no guarantee that farmland in the temporary construction footprint could or would return to agricultural production following construction activities. To consider the full range of reasonable effects on agricultural economics, the whole construction footprint is assumed to occur during the short-term construction phase and continue into the long-term operations and maintenance phase. Permanent and temporary effects on agricultural land are discussed further in Chapter 15, *Agricultural Resources*.

The analysis of effects on agricultural production value, based on affected acres by crop type, includes any remnant acres on partially affected smaller parcels. That is, any parcel 20 acres or less in size that lies only partially within the construction footprint is assumed to be fully affected, with

the area of the parcel not lying in the footprint included in the remnant acres. These acres are added to avoid underestimating the potential effects on smaller parcels which are less likely to be economical profitable to farm even if only partially affected. For purposes of assessing the effect on agricultural employment, tThis analysis assumes that the crop mix of the remnant acres is similar tothe same as the crop mix of the acres within the construction footprint for all project alternatives.

Consistent with Chapter 15, *Agricultural Resources*, quantitative estimates are presented for the statutory Delta and project area for each of the project alternatives and for the Compensatory Mitigation Plan. The economic effects of productive agricultural land removed for compensatory mitigation are reported independently of the effects for theeach project alternatives. Areas specifically affected are identified in the geospatial analysis and described in Chapter 15. Also discussed are potential changes to production costs, value of facilities and investment, and related spending.

Other potential effects on agricultural production and costs that may be caused by the disruption of transportation and other infrastructure are described qualitatively. The potential effects of project facilities construction, operation, and maintenance on farm employment and related economic sectors are part of the regional economic analysis described in Section 17.3.1.1.

Data Sources

Acreage removed from production by crop category is based on a geospatial analysis of the project footprint and data on acreage by crop type in the statutory Delta and project area (Land IQ 2018). Yields and prices typical for agricultural products come from USDA NASS, and representative production cost data come from UCCE reports. These are presented in Section 17.1, *Socioeconomic Conditions*.

17.3.2 Determination of Effects

CEQA does not require a discussion of socioeconomic effects, except where they would result in reasonably foreseeable physical changes to the environment. Under CEQA, social or economic effects alone will not be treated as impacts. These effects may be used to determine the significance of physical changes to the environment. Public agencies are to consider economic, social, and housing effects together with technological and environmental factors in deciding if project changes are feasible to reduce or avoid significant effects (CEQA Guidelines §§ 15064(f), 15131). As discussed in Chapter 4, *Framework for the Environmental Analysis,* this CEQA document includes additional analyses normally reserved only for NEPA documents, including socioeconomics.

Socioeconomic conditions were considered affected if implementation of a project alternative would result in one of the following conditions.

- Changes related to regional employment. This effect could be either a reduction or increase in employment and/or labor income as a result of project activities.
- Changes related to population and housing. A concentrated change in population or new housing demand associated with project activities, substantial relative to current population growth estimates and available housing, would constitute a socioeconomic effect, as this could put added pressure on the local community and housing market. If a substantial change in population and/or new housing is identified, this also could lead to physical changes to the environment. Additionally, displacement of existing housing is a possible socioeconomic effect.

- Changes related to community character. Disruption of social and economic patterns within established communities as a result of project activities is classified as a socioeconomic effect. Support of social and economic patterns within established communities as a result of project activities is also a potential socioeconomic effect.
- Changes related to local government fiscal conditions. A socioeconomic effect could result from a project-related activity leading to either a reduction or increase in local government revenue. Reductions in local government revenue could lead to physical changes through foregone maintenance of local facilities and other decreases in investment.
- Changes related to recreational economics. A socioeconomic effect would occur if construction or operations and maintenance activities result in the loss of public access to or public use of established recreational facilities leading to decreases in recreational spending and employment. This could include reduced public use due to degradation of facilities as a result of increased use during loss of access to other recreational opportunities. Alternatively, a socioeconomic effect also could occur if construction or operations and maintenance activities result in improved quality of or access to existing recreational opportunities and/or create new recreational opportunities, leading to increased spending on recreation. In addition to loss of public access or use, changes to recreational quality are assessed in this chapter to demonstrate potential effects on recreation during construction activities. If any effects on the quality of recreational opportunities and experiences are identified to be extensive, long-term, or otherwise substantial, they could further affect recreational spending.
- Changes related to agricultural economics. A socioeconomic effect could result from a reduction or increase in agricultural production values as a result of project activities.

Socioeconomic effects are described at a project level for construction and operation of the conveyance facilities. Economic effects could only be considered potentially significant impacts if they lead to potentially significant and reasonably foreseeable physical changes. This chapter lists, where relevant, other chapters in the EIR which analyze physical effects relating to socioeconomics.

17.3.3 Socioeconomic Effects

17.3.3.1 No Project Alternative

As described in Chapter 3, *Description of the Proposed Project and Alternatives*, CEQA Guidelines Section 15126.6 directs that an EIR evaluate a "no project" alternative. The No Project Alternative in this Draft EIR represents the circumstances under which the project (or project alternative) does not proceed and considers predictable actions, such as projects, plans, and programs, that would be predicted to occur in the foreseeable future if the Delta Conveyance Project is not constructed and operated. This description of the environmental conditions under the No Project Alternative first considers how socioeconomics could change over time and then discusses how other predictable actions could affect socioeconomics.

Future Socioeconomic Conditions

Future socioeconomic conditions in the Delta region are not anticipated to substantially change under the No Project Alternative from current conditions and projections summarized in Section 17.1, *Socioeconomic Conditions*. Employment in the region would likely continue to reflect the percentages and growth trends by sector summarized in Table 17-8 and income would reflect

estimates summarized in Table 17-9. Population trends would be expected to continue to follow the estimates in Tables 17-1 and 17-2. Housing growth would likely follow trends summarized in Tables 17-4 and 17-5. Recreational spending would likely continue its current downward trend, leading to potential decreases in employment in recreation and related sectors. Recreational quality and participation may be further threatened by climate change effects, particularly sea level rise and seismic risks. Irrigated agricultural acreage would be expected to continue to decrease incrementally and, combined with increased mechanization, lead to a decrease in agricultural employment under the No Project Alternative. This also matches current agricultural employment trends for the region shown in Table 17-8. Climate change effects, particularly increased drought prevalence and severity, are likely to further lead to a gradual decline in agricultural acreage, output, and employment. Changes in community character may occur commensurate with changes in recreation and agriculture. Changes in local government fiscal conditions, compared to what is reported in Table 17-10, could occur with other changes to the local economy.

Future socioeconomic conditions in the south-of-Delta SWP/CVP export service areas are not expected to substantially change under the No Project Alternative from the current conditions and trends described in Section 17.1. Employment in the region would likely continue to follow current trends, and income would reflect estimates summarized in Table 17-9. Population trends would be expected to continue to follow the estimates in Table 17-1. Housing growth would follow current trends. Climate change effects, particularly increased drought prevalence and severity, are likely to threaten the reliability of annual surface water deliveries. Additionally, there are likely to be new limits on groundwater in many areas due to the Sustainable Groundwater Management Act. This would lead to decreases in water availability for agricultural, environmental, and urban uses. Some housing and population effects, therefore, could be affected by water availability. Reductions in agricultural output would also be expected due to decreased water availability under the No Project Alternative. Changes in community character may occur commensurate with changes to local agricultural economics. Changes in local government fiscal conditions could occur with other changes to local economies.

Predictable Actions by Others

A list and description of actions included as part of the No Project Alternative are provided in Appendix 3C, *Defining Existing Conditions, No Project Alternative, and Cumulative Impact Conditions*. As described in Chapter 4, *Framework for the Environmental Analysis,* the No Project Alternative analyses focus on identifying the additional water-supply-related actions public water agencies may opt to follow if the Delta Conveyance Project does not occur.

Public water agencies participating in the Delta Conveyance Project have been grouped into four geographic regions. The water agencies within each geographic region would likely pursue a similar suite of water supply projects under the No Project Alternative (Appendix 3C). Climate change, sea level rise, and earthquake risk could be expected to continue to affect SWP supplies, so water agencies would take other actions to continue to deliver water. Many of these projects, such as construction of desalination plants or water recycling facilities, would involve construction of facilities which could have socioeconomic effects.

Table 17-18 summarizes examples of potential socioeconomic effects that would result from these projects.

Table 17-18. Examples of Potential Socioeconomic Effects as a Result of Activities Occurring under the No Project Alternative

Project Type	Region	Potential Construction-Phase Effects	Potential Operations-Phase Effects
Increased/ Accelerated Desalination	Northern Coastal, Southern Coastal	Construction of new desalination facilities and conveyance would create increased construction-related employment, which in turn could lead to increased population and housing demand. Reduced quality of experience or displacement of recreational activities in the area could lead to effects on recreational economics. It is unlikely that these projects would affect agricultural economics. Effects on recreational economics, along with any disruption to community gathering places, could further lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.	Operations and maintenance of new desalination facilities and conveyance would create increased operations-related employment, which in turn could lead to increased population and housing demand. Unlikely that there would be effects on recreational or agricultural economics. If there are any disruptions to community gathering places, this could lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.
Groundwater Recovery (Brackish Water Desal)	Northern Inland, Southern Coastal, Southern Inland	Construction of new desalination facilities and conveyance would create increased construction-related employment, which in turn could lead to increased population and housing demand. Reduced quality of experience or displacement of recreational activities in the area could lead to effects on recreational economics. Conversion of farmland could lead to effects on agricultural economics. Effects on recreational and agricultural economics, along with any disruption to community gathering places, could further lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.	Operations and maintenance of new desalination facilities and conveyance would create increased operations-related employment, which in turn could lead to increased population and housing demand. There could be small effects on recreational economics through increased wildlife observation opportunities. Conversion of farmland could lead to effects on agricultural economics. Effects on agricultural economics, along with any disruption to community gathering places, could further lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.

Project Type	Region	Potential Construction-Phase Effects	Potential Operations-Phase Effects
Groundwater Management	Northern Coastal, Southern Coastal	Activities could create some construction-related employment, although they are not likely to create effects. Reduced quality of experience or displacement of recreational activities in the area could lead to effects on recreational economics. Conversion of farmland could lead to some effects on agricultural economics. Both recreational and agricultural economic effects, along with any disruption to community gathering places, could lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.	Activities could create some operations-related employment, although they are not likely to create effects. There could be small effects on recreational economics through increased wildlife observation opportunities. Conversion of farmland could lead to effects on agricultural economics. Effects on agricultural economics, along with any disruption to community gathering places, could further lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.
Water Recycling	Northern Coastal, Northern Inland, Southern Coastal, Southern Inland	Construction of new water treatment plants could create some construction-related employment. It is unlikely that these would lead to effects on population and housing. Reduced quality of experience or displacement of recreational activities in the area could lead to effects on recreational economics. Conversion of farmland could lead to effects on agricultural economics. Effects on recreational and agricultural economics, along with any disruption to community gathering places, could further lead to effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.	Operations and maintenance of new water treatment plants could create some operations-related employment. Effects on recreational economics are unlikely. Conversion of farmland could lead to effects on agricultural economics. Effects on recreational and agricultural economics, along with any disruption to community gathering places, could further lead to some effects on community character. Any major changes in local spending or land use could lead to effects on local government fiscal conditions.
Water Use Efficiency Measures	Northern Coastal, Southern Coastal, Southern Inland	Activities could create some construction-related employment, although they are not likely to create effects. Effects on recreational economics, agricultural economics, community character, and local government fiscal conditions are unlikely.	Activities could create some operations-related employment, although they are not likely to create effects. Effects on recreational economics, agricultural economics, community character, and local government fiscal conditions are unlikely.

Desalination projects would most likely be pursued in the northern and southern coastal regions. The southern coastal regions would likely require larger and more desalination projects than the northern coastal region to replace the water yield that otherwise would have been received through the Delta Conveyance Project. Groundwater recovery (brackish water desalination) could occur across the northern inland, southern coastal, and southern inland regions. Physical construction activities required for desalination and groundwater recovery projects would be similar and could include construction of pipelines, tanks, pumps, electrical equipment, and buildings. Both project types would similarly require long-term operations and maintenance.

Groundwater management projects would occur in the northern and southern coastal regions. Construction activities for each project could include site clearing; excavation and backfill; and construction of basins, conveyance canals, pipelines, diversions, and pump stations. Operational activities may include maintenance and repair of banks, berms, and concrete structures, and removal of debris, sediment, and vegetation.

Water recycling projects could be pursued in all four regions. The northern inland region would require the fewest number of wastewater treatment/water reclamation plants, followed by the northern coastal region, followed by the southern coastal region. The southern inland region would require the greatest number of water recycling projects to replace the anticipated water yield that it otherwise would have received through the Delta Conveyance Project. Water recycling projects would still require a continuous freshwater source for dilution.

Water efficiency projects could be pursued in all four regions and involve a wide variety of project types, such as flow measurement or automation in a local water delivery system, lining of canals, use of buried perforated pipes to water fields, and additional detection and repair of commercial and residential leaking pipes.

17.3.3.2 Effects of the Project Alternatives on Delta Regional Employment and Income

ECON-1: Changes in Regional Employment and Income

All Project Alternatives

Project Construction

This analysis first evaluates regional economic effects on employment and labor income during the project construction phase in the Delta region, less Alameda County (see *Assumptions and Limitations* in Section 17.3.1.1, *Delta Regional Employment and Income,* for further explanation of this omission). These effects include employment changes associated with both construction and preliminary field investigation activities. Changes are shown relative to existing conditions in Table 17-19. The table shows both the direct and total (i.e., the sum of direct, indirect, and induced) changes that would result from changes in employment. Direct employment changes include a range of activities, such as earthwork, truck driving, tunnel construction, and concrete placement, among others. Indirect employment effects are based on activity created by business-to-business spending associated with the change in direct employment. This includes, for example, jobs supported by spending on construction supplies. Induced employment effects are based on activity created by changes in personal income created by the direct and indirect effects. This includes, for example, jobs supported by household purchases.

Table 17-19. Temporary Regional Economic Effects on Construction-Related Employment and Labor Income during the Construction Phase

Regional Economic Effect [a]	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Alternative 1																
Employment (FTE)																
Direct	535	848	817	1,116	2,405	2,763	3,321	2,689	2,281	1,767	962	102	29	21	6	N/A
Total [b]	1,146	1,661	1,530	1,854	3,989	4,583	5,508	4,460	3,783	2,931	1,596	169	48	35	10	N/A
Labor Income (million $)																
Direct	62.6	89.3	81.6	96.4	207.3	238.2	286.3	231.8	196.6	152.3	82.9	8.8	2.5	1.8	0.5	N/A
Total [b]	114.5	153.4	135.2	142.0	305.0	350.4	421.1	341.0	289.2	224.1	122.0	12.9	3.7	2.7	0.8	N/A
Alternative 2a																
Employment (FTE)																
Direct	538	860	882	1,236	2,679	3,352	3,914	3,302	2,651	1,840	1,277	350	61	23	21	4
Total [b]	1,151	1,681	1,638	2,050	4,443	5,560	6,492	5,477	4,397	3,052	2,118	581	101	38	35	7
Labor Income (million $)																
Direct	62.9	90.3	87.2	106.5	230.9	288.9	337.4	284.6	228.5	158.6	110.1	30.2	5.3	2.0	1.8	0.3
Total [b]	114.9	154.9	143.5	156.7	339.7	425.1	496.3	418.7	336.2	233.3	161.9	44.4	7.7	2.9	2.7	0.5
Alternative 2b																
Employment (FTE)																
Direct	436	981	923	1,544	2,257	2,492	2,478	2,239	1,814	1,255	224	79	21	6	N/A	N/A
Total [b]	979	1,882	1,706	2,561	3,744	4,133	4,110	3,714	3,009	2,082	372	131	35	10	N/A	N/A
Labor Income (million $)																
Direct	53.9	100.8	90.7	133.1	194.6	214.8	213.6	193.0	156.4	108.2	19.3	6.8	1.8	0.5	N/A	N/A
Total [b]	101.4	170.3	148.7	195.8	286.2	316.0	314.2	283.9	230.0	159.1	28.4	10.0	2.7	0.8	N/A	N/A
Alternative 2c																
Employment (FTE)																
Direct	539	854	795	1,088	2,385	2,822	3,060	2,531	2,065	1,529	700	53	26	21	3	N/A
Total [b]	1,151	1,671	1,494	1,807	3,956	4,681	5,075	4,198	3,425	2,536	1,161	88	43	35	5	N/A
Labor Income (million $)																
Direct	62.9	89.8	79.7	94.0	205.6	243.3	263.8	218.2	178.0	131.8	60.3	4.6	2.2	1.8	0.3	N/A
Total [b]	114.7	154.2	132.4	138.5	302.4	357.8	388.0	320.9	261.9	193.9	88.8	6.7	3.3	2.7	0.4	N/A

Regional Economic Effect [a]	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Alternative 3																
Employment (FTE)																
Direct	436	772	758	1,016	2,209	2,515	2,861	2,228	1,786	1,304	773	59	33	22	17	N/A
Total [b]	979	1,535	1,433	1,685	3,664	4,171	4,171	3,695	2,962	2,163	1,282	98	55	36	28	N/A
Labor Income (million $)																
Direct	53.9	82.8	76.5	87.6	190.4	216.8	216.8	192.1	154.0	112.4	66.6	5.1	2.8	1.9	1.5	N/A
Total [b]	101.4	143.8	127.7	128.8	280.1	318.9	318.9	282.5	226.5	165.4	98.0	7.5	4.2	2.8	2.2	N/A
Alternative 4a																
Employment (FTE)																
Direct	440	774	807	1,115	2,452	3,142	3,647	3,060	2,321	1,412	955	338	72	25	21	15
Total [b]	991	1,538	1,514	1,849	4,067	5,211	6,049	5,075	3,850	2,342	1,584	561	119	41	35	25
Labor Income (million $)																
Direct	54.6	82.9	80.7	96.1	211.4	270.8	314.4	263.8	200.1	121.7	82.3	29.1	6.2	2.2	1.8	1.3
Total [b]	102.9	144.0	133.9	141.4	310.9	398.4	462.5	388.0	294.3	179.1	121.1	42.9	9.1	3.2	2.7	1.9
Alternative 4b																
Employment (FTE)																
Direct	436	908	770	1,272	1,889	1,990	1,922	1,693	1,259	821	83	44	21	6	N/A	N/A
Total [b]	979	1,760	1,452	2,110	3,133	3,301	3,188	2,808	2,088	1,362	138	73	35	10	N/A	N/A
Labor Income (million $)																
Direct	53.9	94.5	77.6	109.6	162.8	171.5	165.7	145.9	108.5	70.8	7.2	3.8	1.8	0.5	N/A	N/A
Total [b]	101.4	161.0	129.3	161.3	239.5	252.3	243.7	214.7	159.6	104.1	10.5	5.6	2.7	0.8	N/A	N/A
Alternative 4c																
Employment (FTE)																
Direct	439	772	729	1,002	2,217	2,530	2,597	2,107	1,616	1,114	579	55	30	21	9	N/A
Total [b]	988	1,535	1,384	1,662	3,677	4,196	4,307	3,495	2,680	1,848	960	91	50	35	15	N/A
Labor Income (million $)																
Direct	54.4	82.8	74.0	86.4	191.1	218.1	223.9	181.6	139.3	96.0	49.9	4.7	2.6	1.8	0.8	N/A
Total [b]	102.6	143.8	124.1	127.1	281.1	320.8	329.3	267.2	204.9	141.3	73.4	7.0	3.8	2.7	1.1	N/A

Regional Economic Effect [a]	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16
Alternative 5																
Employment (FTE)																
Direct	665	561	538	1,326	2,212	2,692	3,086	3,056	2,543	1,803	921	307	92	25	12	N/A
Total [b]	1,355	1,191	1,068	2,199	3,669	4,465	5,119	5,069	4,218	2,990	1,528	509	153	41	20	N/A
Labor Income (million $)																
Direct	73.4	64.9	57.6	114.3	190.7	232.1	266.0	263.4	219.2	155.4	79.4	26.5	7.9	2.2	1.0	N/A
Total [b]	129.7	118.0	99.8	168.1	280.5	341.4	391.3	387.5	322.5	228.6	116.8	38.9	11.7	3.2	1.5	N/A

Source: IMPLAN Group, LLC. IMPLAN 2020. Note: Labor income is based on IMPLAN sector data for this region and reported 2020 dollars (IMPLAN 2020).
FTE = full-time equivalent.
[a] IMPLAN results are changes relative to existing conditions.
[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding. Detailed estimates are presented in Appendix 17A, *Regional Economic Effects of Water Conveyance Facility Construction*.

The footprint of conveyance structures and related facilities such as roads and utilities would remove some existing agricultural land from production, resulting in decreases in agricultural employment and income. This includes effects due to both the permanent and temporary construction footprints. Permanent and temporary effects on agricultural land are discussed further in Chapter 15, *Agricultural Resources*. These also result in effects on the value of agricultural production, discussed in Impact ECON-6: *Changes in Agricultural Economics*. The regional economic effects on employment and income from changes in the value of agricultural production are reported in Table 17-20.

Table 17-20. Regional Economic Effects on Agricultural Employment and Labor Income Due to the Project Construction Footprint

Regional Economic Effect [a]	Alt 1	Alt 2a	Alt 2b	Alt 2c	Alt 3	Alt 4a	Alt 4b	Alt 4c	Alt 5
Employment (FTE)									
Direct	-51	-57	-41	-49	-50	-58	-39	-49	-38
Total [b]	-68	-79	-52	-66	-68	-80	-51	-66	-55
Labor Income (million $)									
Direct	-1.2	-1.4	-0.8	-1.1	-1.2	-1.5	-0.8	-1.2	-1.2
Total [b]	-2.1	-2.6	-1.4	-2.0	-2.2	-2.7	-1.5	-2.1	-2.1

Source: IMPLAN Group, LLC. IMPLAN 2020.
Note: Labor income is reported 2020 dollars.
Alt = alternative; FTE = full-time equivalent.
[a] IMPLAN results are changes relative to existing conditions.
[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding.

Based on the crop production value changes described in ECON-6, the direct agricultural job losses would more likely be concentrated in the orchards and vineyards sectors, which are relatively labor intensive, as well as in the forage crops sector, which is less labor intensive. Job losses would be less concentrated in the grain and field crop sectors, where more of the field operations are mechanized, and in the vegetable and truck crop sector, which is most labor intensive. There is a bit of variation in affected sector depending on the specific project alternative. Note that direct agricultural job losses could be higher than the full-time equivalent (FTE) jobs shown in Table 17-20 because many agricultural jobs are seasonal rather than year-round jobs, meaning that more than one seasonal agricultural job could be lost per every FTE job lost as a result of conveyance facilities construction.

None of the project alternatives are expected to affect natural gas wells. The topic of natural gas wells is discussed in Chapter 27, *Mineral Resources,* Impact MIN-1: *Loss of Availability of Locally Important Natural Gas Wells as a Result of the Project* and Impact MIN-2: *Loss of Availability of Extraction Potential from Natural Gas Fields as a Result of the Project*. As a result, there would be no anticipated employment or labor income effects associated with natural gas well abandonment during construction.

Impact ECON-5: *Changes in Recreational Economics in the Statutory Delta and Project Area* discusses effects on recreational economics and finds that the effects would be minimal. Therefore, there are no anticipated effects on employment and labor income related to recreation.

Operations and Maintenance

Ongoing operations and maintenance of project facilities would result in increased employment. Changes in employment are shown relative to existing conditions in Table 17-21. Additional jobs are expected to be created through the indirect and induced effects of direct employment from operations and maintenance activities. Table 17-21 shows the direct and total (i.e., sum of direct, indirect, and induced) changes that would result from expected operations and maintenance employment.

Table 17-21. Regional Economic Effects on Operations-Related Employment and Labor Income during Operations and Maintenance

Regional Economic Effect [a]	Alt 1	Alt 2a	Alt 2b	Alt 2c	Alt 3	Alt 4a	Alt 4b	Alt 4c	Alt 5
Employment (FTE)									
Direct	50	53	41	47	49	52	42	46	53
Total [b]	116	123	95	109	113	120	97	106	123
Labor Income (million $)									
Direct	5.9	6.3	4.9	5.6	5.8	6.2	5.0	5.5	6.3
Total [b]	10.2	10.8	8.4	9.6	10.0	10.6	8.6	9.4	10.8

Source: IMPLAN Group, LLC. IMPLAN 2020. Note: Labor income is reported 2020 dollars.
Alt = alternative; FTE = full-time equivalent.
[a] IMPLAN results are changes relative to existing conditions.
[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding.

Operations and maintenance activities would not directly result in effects on agricultural employment and income. However, effects of the construction footprint on productive agricultural land would continue during the operations and maintenance phase following construction activities, continuing to cause effects on agricultural employment and labor income relative to the existing conditions. It is possible that agricultural land removed due to the temporary construction footprint would return to agriculture. However, the parcels that would be returned to agricultural use are not yet known. Land used for farming could be reclaimed for and returned to agriculture, but also could shift to habitat restoration and/or other uses. This process is discussed further in Chapter 3, *Description of the Proposed Project and Alternatives*, Section 3.4.14, *Land Reclamation.*

Permanent and temporary effects on agricultural land are discussed further in Chapter 15, *Agricultural Resources*. Chapter 15 concludes that 200 or fewer acres would be temporarily affected for each project alternative, or less than 10% of affected farmland for each alternative. The analysis of project effects on agricultural employment and labor income conservatively assumes that the agricultural lands needed to support project construction and operation activities would be permanently converted to non-agricultural uses. Therefore, the agricultural employment and income effects summarized in Table 17-20 would also pertain to the long-term operations and maintenance phase of the project.

Operations and maintenance of conveyance facilities are not expected to have effects on recreational spending; therefore, they would not lead to any effects on employment and labor income. ECON-5 discusses effects on recreational economics further.

Effects Conclusion—All Project Alternatives

Project construction activities would create socioeconomic effects through creation of new temporary construction jobs in the region and support of related industries. Long-term effects on agricultural employment and labor income would result from the loss of productive agricultural land in the project construction footprint. The annual agricultural employment losses would be much less than the temporary jobs created during the project construction period; however, the effects on agricultural employment and labor income would continue during the operations and maintenance phase.

The project alternatives would also create effects through new permanent jobs related to the operation and maintenance of the new water conveyance facilities. Agricultural employment and labor income losses during the operations and maintenance phase of the project, attributed to farmland lost as part of the project footprint, would continue to create socioeconomic effects.

Effects on employment and labor income are not in and of themselves impacts under CEQA. Employment and income effects are socioeconomic effects and would be considered impacts under CEQA if they were to lead to physical changes to the environment. The potential for these employment and labor income changes to lead to physical changes are discussed further in Impact ECON-2: *Changes in Regional Population and Housing* and Impact ECON-3: *Changes in Community Character in the Statutory Delta*. Changes in agricultural employment and labor income result from conversion of farmland, which is addressed in Chapter 15.

Compensatory Mitigation Effects

This section summarizes potential employment and labor income effects associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could be anticipated based on available information and concludes that such effects will not result in reasonably foreseeable physical changes.

Compensatory Mitigation

Compensatory mitigation activities to mitigate the project's potential effects on terrestrial and aquatic resources would have effects on employment and labor income. Appendix 3F, *Compensatory Mitigation Plan for Special Status-Species and Aquatic Resources*, describes these activities.

The Compensatory Mitigation Plan for Bouldin Island and I-5 Ponds 6, 7, and 8 would require construction activities such as earth moving, access improvements, and construction of water control structures. Tables 3F-8 and 3F-15 in Appendix 3F summarize the equipment working days required for Bouldin Island and the I-5 ponds, respectively. These are used to estimate potential effects on employment and labor income, as summarized in Table 17-22. To estimate direct employment effects, this analysis assumes one construction employee per equipment working day, and 250 working days per employee per year. This estimate is conservative because more than one employee may be required to run some equipment and other activities, such as weed control and planting, may not be included. Construction activities would be completed over a 2-year period on Bouldin Island and over a 3-year period for I-5 Ponds 6, 7, 8. The FTE estimates presented in Table 17-22 are based on annual averages over these periods.

Table 17-22. Temporary Regional Economic Effects on Construction-Related Employment and Labor Income Due to Compensatory Mitigation

Regional Economic Effect [a]	Bouldin Island (per year for 2 years)	I-5 Ponds 6, 7, & 8 (per year for 3 year)
Employment (FTE)		
Direct	4.3	12.9
Total [b]	7.2	21.4
Labor Income (million $)		
Direct	0.4	1.1
Total [b]	0.5	1.6

Source: IMPLAN Group, LLC. IMPLAN 2020. Note: Labor income is reported 2020 dollars.
FTE = full-time equivalent.
[a] IMPLAN results are changes relative to existing conditions.
[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding.

Other parts of the Compensatory Mitigation Plan described in Appendix 3F require construction activities within the North Delta Arc that may lead to small, temporary increases in construction-related employment and labor income beyond those identified in Table 17-22. Channel margin habitat restoration requires operation of trackhoes, bulldozers, and other equipment to make levee modifications and other improvements. Tidal wetland habitat mitigation construction activities include grading and infrastructure modifications. The working days associated with these activities have not been quantified. These additional construction activities could lead to a small increase in employment and labor income in the region, but the increase would be minor relative to those summarized in Table 17-22 and relative to other employment effects disclosed in this chapter.

In addition to construction activities, some long-term maintenance activities are part of the Compensatory Mitigation Plan. This would include repairs, vegetation control, and wildlife management. The working days associated with these activities have not been quantified. Maintenance activities could lead to a small, long-term increase in employment and labor income in the region, but this increase would be minor relative to other long-term employment effects disclosed in this chapter.

Compensatory Mitigation Plan activities, specifically those to be undertaken on Bouldin Island, are also expected to take irrigated farmland out of production, resulting in a reduction in agricultural jobs and labor income beyond those identified in Table 17-20. Chapter 15, *Agricultural Resources*, Impact AG-1: *Convert a Substantial Amount of Prime Farmland, Unique Farmland, Farmland of Local Importance, or Farmland of Statewide Importance as a Result of Construction of Water Conveyance Infrastructure Facilities* discusses effects of the Compensatory Mitigation Plan on agriculture further. Table 17-23 summarizes the estimated changes in employment and labor income due to agricultural production lost at the Bouldin Island mitigation site relative to current conditions. Other parts of the Compensatory Mitigation Plan, including I-5 Ponds 6, 7, and 8, are not expected to displace any currently irrigated productive farmland nor affect agricultural employment and labor income.

Table 17-23. Permanent Regional Economic Effects on Agricultural Employment and Labor Income Due to Compensatory Mitigation

Regional Economic Effect [a]	Bouldin Island Compensatory Mitigation
Employment (FTE)	
Direct	-12
Total [b]	-14
Labor Income (million $)	
Direct	-0.2
Total [b]	-0.4

Source IMPLAN Group, LLC. IMPLAN 2020.
Note: Labor income is reported 2020 dollars.
FTE = full-time equivalent.
[a] IMPLAN results are changes relative to existing conditions.
[b] Includes direct, indirect, and induced effects; numbers may not sum to the total due to rounding.

There are no anticipated effects on recreation or natural gas well employment and labor income resulting from the Compensatory Mitigation Plan. Therefore, the project alternatives combined with compensatory mitigation would not change the overall effect.

Other Mitigation Measures

No other mitigation measures are expected to lead to measurable changes in employment and labor income.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with the project, will lead to some effects on employment and labor income; however, socioeconomic effects on employment and labor income are not in and of themselves impacts under CEQA. Employment and income effects only would be considered potentially significant impacts if they were to lead to potentially significant physical changes to the environment. The potential for these employment and labor income changes to lead to physical changes are discussed further in ECON-2 and ECON-3. Changes in agricultural employment and labor income result from conversion of farmland, which is addressed in Chapter 15, *Agricultural Resources*.

17.3.3.3 Socioeconomic Analysis of Delta Region Communities

This section discusses the potential effects associated with changes in population and housing stemming from changes in regional employment and income analyzed in Section 17.3.3.2, *Effects of the Project Alternatives on Delta Regional Employment and Income*. Additionally, this section discusses potential effects on community character in the statutory Delta.

ECON-2: Changes in Regional Population and Housing

All Project Alternatives

Project Construction

Table 17-24 shows the estimated workforce during peak construction, as well as the year peak construction will take place for each project alternative.

Table 17-24. Estimated Workforce during Peak Construction

Project Alternative	Construction Workers	Year of Peak Construction
1	3,321	7
2a	3,914	7
2b	2,492	6
2c	3,060	7
3	2,861	7
4a	3,647	7
4b	1,990	6
4c	2,597	7
5	3,086	7

Source: Delta Conveyance Design and Construction Authority 2022a and Delta Conveyance Design and Construction Authority 2022b.

Population

Peak construction employment occurs either in year 6 or 7 of the project alternatives, as shown in Table 17-24. It is anticipated that the majority of these new jobs would be filled from within the existing labor force in the region analyzed. Appendix 3G, *Community Benefits Program Framework*, discusses targeted hiring programs which would seek socially or economically disadvantaged workers in the area as part of the CBP. However, construction of the tunnels and other features is likely to require workers with specialized skills potentially not readily available in the local labor pool. As a result, some specialized workers may be recruited from outside of this region.

The effect of project construction and operations on population and housing depends on where project workers reside. The region has a large existing labor pool of construction workers. EDD data reported in Table 17-8 in Section 17.1.1.4, *Employment, Labor Force, and Industry in the Delta Region*, show over 300,000 workers in construction, manufacturing, and related industries in the Delta region, with a 3.6% unemployment rate. If omitting Alameda County, this figure drops to about 190,000 workers, although the difference is driven primarily by manufacturing jobs. Therefore, the local labor pool can support a large majority of workers needed for the project. Chapter 20, *Transportation*, uses these same data to conclude that project workers would live within the Delta region rather than commute daily. However, some workers, including those with special skills for the proposed project, could be needed from outside the region. These workers are assumed to relocate into the region on a long-term or permanent basis.

This analysis estimates that 15% represents a reasonable estimate of the percent of workers that would relocate into the region and affect long-term population and housing demand. At the peak workforce of 3,914 under Alternative 2a, the number of workers moving into the region would be approximately 587. Using the regional average household size of 2.89 (California Department of Finance 2020b), this would result in a potential population increase of 1,696 during peak construction.

This additional population would constitute a very small increase in the total 2019 population in the Delta region (less Alameda County) of 4.1 million. It is also minor relative to the projected regional population growth of about 0.5 million between 2019 and 2035 (California Department of Finance 2020a). Any project-related effects on population are anticipated to be distributed throughout the

region. Changes in demand for public services resulting from any increase in population are addressed in Chapter 21, *Public Services and Utilities.*

Employment created through the indirect and induced economic effects of project construction described in Impact ECON-1: *Changes in Regional Employment and Income* is unlikely to require additional specialty workers from outside the region. The sectors included in indirect and induced employment effects are summarized in Appendix 17A, *Regional Economic Effects of Water Conveyance Facility Construction*, for each alternative. In contrast to direct employment estimates, indirect and induced employment changes would be spread out across a variety of sectors in the local economy. Based on industry employment by sector and unemployment rates by county, both summarized in Section 17.1, *Socioeconomic Conditions*, there would be a sufficient number of available workers within the region to fill the indirect and induced employment created for each of the alternatives. Therefore, there would not be any additional population effects due to the indirect and induced effects of construction employment.

Housing

Changes in housing availability are based on changes in supply resulting from displacement during facilities construction and changes in housing demand resulting from employment associated with construction of conveyance facilities. As described in Chapter 14, *Land Use,* Section 14.3.3.2, *Impacts of the Project Alternatives on Land Use*, Impact LU-1: *Displacement of Existing Structures and Residences and Effects on Population and Housing,* construction of the project alternatives would conflict with 13 to 27 residential structures. The owners and residents of these structures would be compensated for temporary or permanent loss of access to their residences.

As discussed previously in *Population*, the construction workforce would largely already reside in the region and commute daily to the work sites; however, if needed, an estimated 79,000 vacant housing units are available to accommodate workers from outside the region who may choose to commute on a workweek basis or who may choose to relocate temporarily or permanently (California Department of Finance 2020b). This is enough to accommodate the estimated peak of 587 workers and their families who may decide to relocate to the region temporarily or permanently. In addition to the available housing units, the region has recreational vehicle and mobile home parks and numerous hotels and motels to accommodate construction workers. As a result, construction of the proposed conveyance facilities is not expected to increase the demand for housing.

Operations and Maintenance

Population

Operations and maintenance of conveyance facilities would create up to 53 new full-time employment positions, depending on the project alternative. Given the nature of those operations and maintenance jobs, the existing water conveyance facilities already in the region, the large regional workforce, and the large water agencies with headquarters in the region, it is anticipated that all of these new jobs would be filled from within the labor force in the region.

Housing

It is anticipated that the operational workforce would be drawn from within the region. Consequently, operation of the conveyance facilities would not result in effects on housing.

Effects Conclusion —All Project Alternatives

The additional employment created by project construction activities, as described in ECON-1, could lead to a very small increase in the local population. However, this increase is minor relative to the current population of the region and regional population growth estimates. This population increase could additionally lead to an increase in housing demand; however, this would be much lower than the estimated vacant housing in the region. Therefore, no effects on population and housing demand growth are expected due to increases in construction employment for any of the project alternatives. Accordingly, the housing and population effects of the project alternatives are not expected to cause any physical changes to the environment. Operations and maintenance of water conveyance facilities are expected to have no effects on population and housing demand and, as such, no physical changes to the environment are anticipated from these activities.

Mitigation Effects

This section summarizes potential population and housing effects associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could be anticipated based on available information. These effects would only be considered effects under CEQA if they lead to physical changes to the environment.

Compensatory Mitigation

Compensatory mitigation, which is described in Appendix 3F, *Compensatory Mitigation Plan for Special-Status Species and Aquatic Resources*, would create temporary increases in construction-related employment and permanent decreases in agricultural employment, as discussed in ECON-1. However, this change in jobs would be small relative to the changes in employment during construction of conveyance facilities. Therefore, the project alternatives combined with compensatory mitigation would also not lead to effects on population or housing.

Other Mitigation Measures

None of the other mitigation measures proposed would result in changes in population and housing; therefore, the no effect conclusion remains.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with the project, is not expected to create any physical changes in population or housing demand.

ECON-3: Changes in Community Character in the Statutory Delta

All Project Alternatives

Project Construction

Construction-related employment would expand as a result of the construction of the project alternatives, as discussed in Impact ECON-1. Agricultural contributions to the character and culture of the statutory Delta would be likely to decline commensurate with the projected decline in agricultural-related acreage, employment, and production, discussed in Impact ECON-1 and Impact ECON-6: *Changes in Agricultural Economics*. This could result in the closure of agriculture-dependent businesses or those catering to agricultural workers, particularly in areas where conversion of

agricultural land would be most concentrated. Although some areas would experience losses in agricultural area, the overall estimated reduction in agricultural acreage in the statutory Delta is less than 1% for all project alternatives. Effects on community character could also result from potential changes to recreation, discussed in ECON-5. However, these effects are projected to be minimal. Social influences associated with the construction industry would grow during the multiyear construction period for water conveyance facilities under each of the project alternatives.

To the extent that this anticipated economic shift away from agriculture and toward construction results in demographic changes in population, employment level, income, age, gender, or ethnic origin, the communities in the statutory Delta could be expected to see changes to its character. This is expected particularly in those communities most affected by demographic changes based on their size, ability to accommodate growth, or proximity to project activities. In comparing the existing demographic composition of agricultural workers and construction laborers within the Delta region (less Alameda County), men make up a large portion of both occupations: 71% of workers in the farming sector were male, compared with 96% of construction laborers. Additionally, 87% of farming sector workers within the region report Hispanic origin, whereas 54% of construction laborers claim Hispanic origin (U.S. Census Bureau 2018d). Although this implies a potential demographic shift due to regional employment changes from agriculture to construction, the extent of this shift is expected to be minimal relative to the population of the region.

In addition to potential changes in the demographic composition of communities in the statutory Delta, construction of water conveyance facilities under each project alternative could also affect the size of the communities. Based upon the projections provided in ECON-1 and ECON-2, the employment base of the Delta region would expand during water conveyance facility construction. This expansion could provide economic opportunities during this period, which could support community stability by increasing investment. However, predicting the specific location of such investments would be speculative.

Legacy communities in the statutory Delta, which are those identified as containing distinct historical and cultural character, include Locke, Bethel Island, Clarksburg, Courtland, Freeport, Hood, Isleton, Knightsen, Rio Vista, Ryde, and Walnut Grove. These communities provide support services and limited workforce housing for the area's agricultural industry. Some housing is also provided to retirees and workers commuting to nearby urban areas including Sacramento. Construction activities associated with project facilities could result in some changes to the rural qualities of these communities during the construction period; however, these effects would be minor. Rural qualities are characterized by relatively low population densities, predominantly agricultural land uses, and low levels of associated noise and vehicular traffic. The importance of historic rural landscapes in the statutory Delta is discussed further in Chapter 19, *Cultural Resources*. As discussed in ECON-2, changes in population are expected to be spread across the whole region, not just communities closest to project activities. As discussed in ECON-6, although some reduction in agricultural production is expected, this would represent less than 1% of total production in the statutory Delta. Chapter 19 discusses potential effects to historic rural sites and landscape.

Chapter 19, Section 19.3.3.2, *Impacts of the Project Build Alternatives on Cultural Resources*, identifies potential effects of the project alternatives on identified and unidentified historic built-environment resources. Built-environment historical resources include sites that are listed in, or are eligible to be listed in, the national and/or state registry for historic places and represent preservation of community character. Impact CUL-1: *Impacts on Eligible Built-Environment Historical Resources Resulting from Construction and Operation of the Project* identifies a total of 31 built-environment

resources which may require either physical alteration or experience changes in setting due to construction of the project alternatives. Mitigation Measure CUL-1: *Prepare and Implement a Built-Environment Treatment Plan in Consultation with Interested Parties* could help reduce the effects on historic built-environment resources through treatment plans prepared by an architectural historian. Impact CUL-2: *Impacts on Unidentified and Unevaluated Built-Environment Historical Resources Resulting from Construction and Operation* identifies additional alteration or potential demolition that may occur due to construction of the project alternatives on historic built-environment resources which have not yet been identified or recorded. Mitigation Measure CUL-2: *Conduct a Survey of Inaccessible Properties to Assess Eligibility, Determine If These Properties Will Be Adversely Affected by the Project, and Develop Treatment to Resolve or Mitigate Adverse Impacts* would help reduce these effects by further assessing currently inaccessible properties.

Implementation of mitigation measures related to noise, visual effects, and transportation would help to limit potential effects on communities. Mitigation Measure NOI-1: *Develop and Implement Noise Abatement Plan Including Site-Specific Measures* in Chapter 24, *Noise and Vibration*, would reduce noise levels during construction. Mitigation Measure TRANS-1: *Implement Site-Specific Construction Transportation Demand Management Plan and Transportation Management Plan* in Chapter 20, *Transportation*, would create a transportation demand management plan that would minimize the number of project-related vehicle miles traveled. This would help to avoid effects on mobility and access to community gathering places by avoiding unnecessary traffic and congestion. Mitigation Measure AES-1a: *Install Visual Barriers between Construction Work Areas and Sensitive Receptors* in Chapter 18, *Aesthetics and Visual Resources*, would help avoid or limit visual effects on communities near construction sites.

Effects associated with construction activities could also result in changes to community cohesion if they were to restrict mobility, reduce opportunities for maintaining face-to-face relationships, or disrupt the functions of community organizations or community gathering places (such as schools, libraries, places of worship, and recreational facilities). The effect on community gathering places would depend not only on proximity to construction sites, but also on peak days and time of use, the flow of commuters to gathering places, and potential short- and long-term effects associated with COVID-19. Due to these various factors, effects on community gathering places were not analyzed quantitatively. Access to community gathering places is not likely to be affected because the project alternatives are designed to avoid road effects or closures (as described in Chapter 20, *Transportation*). Additionally, construction activities are planned to take place mostly during the day on weekdays, whereas community gathering places generally hold events on weeknights or during the weekend.

Under each project alternative, additional regional employment and income could create effects on the character of statutory Delta communities by way of increased investments in some communities. In contrast, property values may decline in other communities if they become less desirable to live, work, shop, or participate in recreational activities in. Although project construction could result in some effects that enhance the economic welfare of a community, other social effects could arise as a result of declining economic stability in other communities, although these are expected to be minimal. ECON-5 discusses recreational economics and finds there to be no effects during the construction phase. ECON-6 discusses agricultural economics and finds that, although some effects may occur, the overall effects on agricultural acreage and production during the construction phase would be reductions of less than 1% of current totals in the statutory Delta.

Operations and Maintenance

Population is not expected to change as a result of continued operations and maintenance of the water conveyance facilities. Agricultural contributions to the character and culture of the statutory Delta may decline commensurate with the projected decline in agricultural-related employment and production. As discussed in ECON-1 and ECON-6, during the operations and maintenance phase of the project, agricultural land in both the permanent and temporary construction footprint is assumed to remain out of agricultural production. This would result in the continued closure of agriculture-dependent businesses or those catering to agricultural employees (although operations and maintenance activities would not directly lead to any new closures). Although some areas would continue to experience losses in agriculture, the overall estimated reduction in agricultural acreage in the statutory Delta is less than 1% for all project alternatives. Compensation to the farming sector for displaced infrastructure and farmland taken out of production due to water supply effects is discussed in Chapter 15, *Agricultural Resources.* Acreage, employment, and business operations in agriculture are expected to be lower during the operations and maintenance phase of the project relative to the existing conditions.

The effects on recreational activities are expected to be minimal, as discussed in Chapter 16, *Recreation*, and ECON-5. Community influences associated with those hired to operate, repair, and maintain water conveyance facilities would grow. To the extent that this anticipated economic shift away from agriculture results in demographic changes in population, employment level, income, age, gender, or race, the region would be expected to see changes to its character. However, the extent of this shift is expected to be minimal relative to the total population of the region.

Although some of the rural qualities of statutory Delta communities, including relatively low noise and traffic levels, would return to near preconstruction conditions during the project operations phase, other effects would be lasting. For instance, the visual appearance of intakes and other permanent features of all project alternatives could compromise the predominantly undeveloped and agricultural nature of communities like Hood, which would be near the permanent water conveyance features. Mitigation Measure AES-1b: *Apply Aesthetic Design Treatments to All Structures* in Chapter 18, *Aesthetics and Visual Resources*, would minimize the effects of visual intrusion on communities. Access to community gathering places is not likely to be affected because the project alternatives are designed to avoid road effects or closures (as described in Chapter 20 *Transportation*).

Although operations could result in effects relating to increased economic welfare of some communities, undesirable social effects could linger in communities closest to potential character-changing effects and in those most heavily influenced by agricultural and recreational activities. However, these effects would be minimal. ECON-5 discusses recreational economics and finds that there would not be effects during the operations and maintenance phase. ECON-6 discusses agricultural economics and finds that, although there would be effects on the industry, the overall effects on agricultural acreage and production during the operations phase would be reductions of less than 1% of current totals in the statutory Delta.

Implementation of mitigation measures and environmental commitments related to noise, visual effects, and transportation could reduce effects (Chapters 18, 20, and 24, *Noise*). Specifically, these measures include, but are not limited to, Mitigation Measure TRANS-1: *Implement Site-Specific Construction Transportation Demand Management Plan and Transportation Management Plan* in Chapter 20, which would minimize the number of project-related vehicle miles traveled. This would

help to avoid effects on mobility and access to community gathering places by avoiding unnecessary traffic and congestion in and near the project area. Mitigation Measure AES-1b: *Apply Aesthetic Design Treatments to All Structures* in Chapter 18 would minimize the effects of visual intrusion on communities. NOI-1, would help reduce noise levels and minimize or avoid potential effects of equipment noise on communities during construction of project features.

Effects Conclusion—All Project Alternatives

Although some effects on historic sites and community cohesion are possible during the construction and operations of conveyance facilities, mitigation measures would reduce these effects, if not avoid them altogether. Changes to community character as a result of reductions in agricultural acreage and production are also possible; however, these effects are anticipated to be minimal given that this reduction would represent less than 1% of agriculture in the statutory Delta. Therefore, the effects of the project alternatives on community character are expected to be minor and would not lead to any physical changes to the environment.

Mitigation Effects

This section summarizes potential community character effects associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could be anticipated based on available information. These effects could only be considered potentially significant impacts under CEQA if they lead to potentially significant physical changes to the environment.

Compensatory Mitigation

Loss of agriculture would result from the Compensatory Mitigation Plan, described in Appendix 3F, *Compensatory Mitigation Plan for Special-Status Species and Aquatic Resources*. This loss may also lead to effects on communities linked to agriculture. However, overall losses in agricultural acreage and production would be minimal relative to the statutory Delta (less than 0.5%). Effects on agricultural labor are summarized in ECON-1 and effects on overall production in ECON-6. Wildlife viewing opportunities may increase as a result of these projects, as discussed in Chapter 16, *Recreation,* Impact REC-2: *Include Recreational Facilities or Require the Construction or Expansion of Recreational Facilities That Might Have an Adverse Physical Effect on the Environment*. This could increase spending and create small economic effects for communities linked to wildlife and outdoor recreation; however, these economic effects would be small. Therefore, the project alternatives combined with compensatory mitigation are expected to be minor and would not lead to any physical changes.

Other Mitigation Measures

Other mitigation measures, besides those identified in the effects analyses and Compensatory Mitigation Plan, are not expected to affect community character in the statutory Delta.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with the project, would not have effects on community character in the statutory Delta to the extent that physical changes to the environment would occur.

17.3.3.4 Effects of the Project Alternatives on Local Delta Region Governments Fiscal Conditions

ECON-4: Changes in Local Government Fiscal Conditions in the Delta Region

All Project Alternatives

Project Construction

Some of the land on which publicly owned water conveyance facilities would be constructed is currently held by private owners. Any losses in property tax revenues as a result of the state's acquisition of private lands required to construct the project alternatives would be offset. California law requires "full mitigation of property tax or assessments levied by local governments or special districts for land used in the construction, location, mitigation, or operation of new Delta conveyance facilities" (Wat. Code § 85089). Therefore, there would be no effects on local government fiscal conditions resulting from lost property tax revenue during construction of any of the project alternatives.

As described in ECON-1, the changes in employment would have secondary effects on the regional economy. These secondary effects would include sales tax revenue changes correlated with changes in income and spending. The findings in ECON-1 are that overall increases in employment and labor income are expected during the construction phase for all project alternatives. A commensurate increase in local sales tax revenue is expected as well, which would create some effects on local government fiscal conditions. Changes in government fiscal conditions can lead to changes in local public services as discussed in Chapter 21, *Public Services and Utilities.*

Operations and Maintenance

As described for construction effects, any losses in property tax revenues would be offset, so the alternatives would not affect local government fiscal conditions through changes in property tax revenues. As described in ECON-1, the changes in employment would have secondary effects on the regional economy. These secondary effects would include sales tax revenue changes correlated with changes in income and spending. The findings in ECON-1 are that only small changes in employment and labor income are expected during the operations and maintenance phase of all project alternatives. Therefore, only small effects on local government fiscal conditions during the operations and maintenance phase are anticipated.

Effects Conclusion—All Project Alternatives

Based on the increases in employment, labor income, and secondary spending discussed in ECON-1, some effects on local government fiscal conditions could result from project construction activities. As the net effect on local government would be a potential small increase in revenue, there should not be any physical changes to the environment as a result of changes to local government fiscal conditions.

Mitigation Effects

This section summarizes potential local government fiscal effects associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could

be anticipated based on available information. These effects would only be considered potentially significant impacts under CEQA if they lead to potentially significant physical changes to the environment.

Compensatory Mitigation

Compensatory mitigation described in Appendix 3F, *Compensatory Mitigation Plan for Special Status-Species and Aquatic Resources*, would only have a small effect on local Delta region government fiscal conditions. California law requires "full mitigation of property tax or assessments levied by local governments or special districts for land used in the construction, location, mitigation, or operation of new Delta conveyance facilities" (Wat. Code § 85089). Therefore, there would be no effects on local government fiscal conditions resulting from lost property tax revenue due to the Compensatory Mitigation Plan. As discussed in ECON-1, some changes in employment, labor income, and corresponding spending are anticipated to occur as a result of the Compensatory Mitigation Plan; however, the overall changes are minor relative to those due to construction. Therefore, the project alternatives combined with compensatory mitigation are expected to result in only small effects on local sales tax revenue due to compensatory mitigation.

Other Mitigation Measures

The other mitigation measures are not anticipated to affect employment and labor income; therefore, they would not have secondary effects on the regional economy. Therefore, there would not be any additional local fiscal effects related to tax revenue.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with project activities, could lead to some small effects on local government fiscal conditions in the Delta region, but these effects would not lead to any physical changes to the environment.

17.3.3.5 Effects of the Project Alternatives on Recreational Economics in the Statutory Delta and Project Area

ECON-5: Changes in Recreational Economics in the Statutory Delta and Project Area

All Project Alternatives

This analysis summarizes any potential changes to recreational economics that could stem from changes to recreational facilities or opportunities. The analysis uses the analyses in Chapter 16, *Recreation*, to determine if and what potential physical changes to recreational facilities or opportunities exist. Additionally, although not part of the CEQA Guidelines Appendix G environmental factors, a further assessment of how the project might affect quality of recreation was undertaken for this chapter. The assessment of recreational quality looked at whether any of the project alternatives resulted in short- or long-term reduction of recreational opportunities and experiences and is presented below. If any effects on the quality of recreational opportunities and experiences are identified to be extensive, long-term, or otherwise substantial, they could further affect recreational spending. Potential connections between changes in recreational quality and changes in recreational economics are discussed below where relevant.

Project Construction

Impact REC-1: *Increase the Use of Existing Neighborhood and Regional Parks or Other Recreational Facilities Such That Substantial Physical Deterioration of the Facility Would Occur or Be Accelerated,* discusses potential increases in use of parks and other regional recreational facilities further from construction sites. Some recreationists could avoid certain active construction areas and participate in similar or different recreational activities in other nearby recreation areas or waterways. This impact is determined in Chapter 16 to be less than significant. Therefore, it would not lead to any identified effects on recreational economics.

Impact REC-2 identifies potential changes to or modifications of recreational facilities. These changes were determined to be less than significant with implementation of mitigation measures. For example, Mitigation Measures AES-1a: *Install Visual Barriers between Construction Work Areas and Sensitive Receptors,* AES-1b: *Apply Aesthetic Design Treatments to All Structures,* and AES-1c: *Implement Best Management Practices to Implement Project Landscaping Plan*, would partially reduce effects by installing visual barriers between construction work areas and sensitive receptors at Lower Roberts Island, Bethany Reservoir SRA, and most constructed facilities. With the implementation of these measures, Chapter 16 determines that these impacts on recreation would be less than significant. Therefore, they would not lead to any identified effects on recreational economics.

Recreational Experience

In terms of recreational experience, some temporary displacement or changes to use patterns of recreationists may occur during construction and in a few limited areas depending on alternative (Table 17-25). Effects could include auditory, access, and visual intrusions on the landscape during construction. Overall, project construction would have minimal effects on recreational areas. Although the loss of recreational access to riverbank areas at intake locations would be permanent, this loss would be minimal when compared to the total amount of available riverbank access within the Delta. Boaters, anglers, and other recreationists would have ample choices for accessing fishing sites and boating in the vicinity of the proposed intakes. In addition, construction may result in short term effects on recreational events, festivals and tourism in the study area through localized changes to traffic, noise, and air quality. However, these effects would be temporary. Because construction activities would not generally occur on weekends, and because most recreation and tourism activities also occur on weekends, effects to recreation and tourism would be minimal. In Chapter 16, *Recreation,* Table 16-5 Annual Community-Based Delta Recreation Events, provides a list of recreational events and festivals in the study area. These activities were considered as part of the assessment of the effects on tourism.

Table 17-25 summarizes recreational resources that could be the affected by construction of conveyance facilities due to their proximity to project features. These affected areas and activities are further discussed in the sections that follow.

Table 17-25. Dispersed and Developed Recreational Resources with Activities that Could Experience Disruptions or Quality Losses during Construction

Recreation Resource	Activities that Could Experience Disruptions or Quality Losses during Construction	Project Component(s)	Alternatives
Clarksburg Public Boat Launch	Boating, angling, other day use	Intake B	1, 2a, 2c, 3, 4a, 4c, 5
Clarksburg town public use areas	Picnicking, other shoreline day use	Intake A	2a, 4a
Stone Lakes National Wildlife Refuge	Wildlife viewing, Interpretation	Intakes A, and/or B, and/or C	All
Blossom Vineyards Winery	Agritourism	New Hope Tract Maintenance Shaft (eastern alignments)	3, 4a, 4b, 4c, 5
Tower Park Marina	Boating, other day uses, camping	Bouldin Island Launch/Reception Shaft, levee improvements	1, 2a, 2b, 2c
Windmill Cove and Tiki Lagoon Marinas	Boating, camping	Lower Roberts Island Launch/Reception Shaft, RTM Storage yard and levee improvements	3, 4a,4b, 4c, 5
Clifton Court Forebay Trails	Angling, walking/exercise	Southern Complex	1, 2a, 2b, 2c, 3, 4a, 4b, 4c
Lazy M Marina and Italian Slough, Widows, and Eucalyptus Island waterways	Boating, angling, other day uses,	Southern Complex	1, 2a, 2b, 2c, 3, 4a, 4b, 4c
Bethany Reservoir SRA	Boating, angling, bicycling, other day uses	Bethany Complex	5

SRA = State Recreation Area.

INTAKES

The Sacramento River channel and bank would be affected by construction of the north Delta intake facilities (Intakes A, B, and C) (Figure 3.3-2). Construction of each intake would occur primarily Monday through Friday for up to 24 hours per day under a few special circumstances such as large pours of concrete for foundations. The intakes would require that State Route (SR) 160 be temporarily realigned within the construction footprint to accommodate construction of the intake structure.

Construction of one to three intake structures and associated facilities would introduce considerable heavy equipment—excavators, pile drivers, cranes, graders, dozers, sheepsfoot rollers, dump trucks, and end loaders, in addition to support pickups and water trucks—into the views of roadway travelers on SR 160 including recreationists. Depending on the alternative, work areas ranging from approximately 161 to 234 acres would be located adjacent to each intake site and would be used for staging, temporary field offices, work equipment and delivery parking, equipment and materials laydown and storage, and would support other construction-related needs. Along the Sacramento

River, depending on alternative, each intake structure could require up to 1,400 feet of shoreline that would be cordoned off from recreational use. Although farm equipment is common in this area, the presence of long-term and large-scale construction is not common and would potentially but temporarily disrupt experiences by bicyclists and recreationists passing through by motor vehicle. These users along with recreational boaters on the Sacramento River would be inconvenienced by the construction activities, particularly from any temporary detours in the channel, noise, and dust (also see Chapter 23, *Air Quality and Greenhouse Gases*, Section 23.3, *Environmental Impacts*). No construction traffic would be allowed on SR 160 between SR 12 and Cosumnes River Boulevard except for realignment of this highway at the intake locations or for individuals traveling from homes or trucks traveling from businesses. Those changes could very temporarily detract from the quality of recreation experience in this area; however, major road improvements, such as a new intake haul road to avoid construction related use of SR 160 and the widening of the existing bridge at Hood-Franklin Road, were incorporated into the project to reduce congestion and delays.

Construction of conveyance pipelines and tunnels and transmission and supervisory control and data acquisition (SCADA) lines would only be visible or otherwise interfere with recreation resources during some construction; most of these facilities are not near recreation use areas such as waterways and shorelines, and the effects would be temporary and generally minor.

As set forth in Chapter 23, DWR identified several environmental commitments (Appendix 3B, *Environmental Commitments and Best Management Practices*) to reduce emissions of construction-related criteria pollutants, including basic and enhanced fugitive dust control measures and measures for entrained road dust that would help reduce the creation of dust clouds that could negatively affect the experience of recreationists passing through the area. As set forth in Chapter 20, *Transportation*, Mitigation Measure TRANS-1: *Implement Site-Specific Construction Transportation Demand Management Plan* would minimize traffic effects, including providing notifications to commercial and leisure boating community of any proposed barge operations in the waterways, including posting notices at Delta marinas and public launch ramps. This information will provide details regarding construction site locations, construction schedules, and identification of no-wake zones, speed restricted zones, and detours, where applicable. Implementing this measure will help to ease traffic congestion during construction that could otherwise impede travel times and experiences of recreationists using public roadways and waterways affected by construction and operations of the project.

Under all alternatives except Alternatives 2b and 4b, the Intake B facility would be constructed directly across the river from the Clarksburg Boat Launch facility. Although the Sacramento River in that section is more than 400 feet wide, that distance would not provide much of a buffer from the construction noise and changes in the visual setting as viewed from Clarksburg Boat Launch. During the construction period of up to 7 years duration for varying stages, construction would result in a lower quality of experience for recreationists visiting the boat launch facilities. However, the construction period for the cofferdams and intake structures would be in the later 4 years of the 7- to 10-year period. During these periods, boating speeds in short stretches of the Sacramento River (less than a mile) could be reduced, particularly for areas near the eastern shoreline of the Sacramento River. This would represent a slight inconvenience for pass-through boaters and would likely remove the chance for water skiing or high-speed adventure cruising in these areas.

The construction activities in the first 5 years, with installation of the temporary levee and SR 160 realignment, would not hinder vehicular passage, but could affect views. After the first 5 years, most

construction activity on the intakes would take place behind the levee and road area and therefore would be less noticeable to passing recreationists.

Additionally, some nearshore area occupied by the large intake structures would not be available for angling or boating; however, these shoreline areas of up to 1,400 feet are very small compared to the total riverine and nearshore areas found alongside the Sacramento River main channel and the total shoreline areas found throughout the Delta, and therefore would result in only a very minor loss to potential angling or boating areas. Bank fishing opportunities are provided on both sides of the Sacramento River in the study area and throughout the Delta. Furthermore, there is no indication from readily available sources or from a reconnaissance trip through the area, that these areas are well used, or even lightly used for bank fishing or other shoreline recreation other than some occasional fishing by boat.

The construction and permanent use of the haul road for the intakes leading north from Lambert Road would be constructed on lands just outside the Stone Lakes National Wildlife Refuge, but directly on its western perimeter. The areas are used for wildlife viewing periodically, but effects would be minimal because there is a 12 to 20-foot-high embankment between the refuge and the work areas and haul routes.

Launch, Reception, and Maintenance Shafts

Construction activities associated with the launch, reception, and maintenance shafts for the tunnels under all alternatives would also bring undesirable noise and dust and equipment emissions along with changes in the visual environment that could, in limited locations, adversely affect the quality of experiences boaters, anglers, sightseeing public and wildlife viewing enthusiasts currently find in and around the Delta waterways. The quality of bird watching activities on Staten Island and a few other locations could be reduced if birding activities and other wildlife observation activities are close to launch or maintenance shafts. Increased traffic on roads can also hinder or slow access for recreationists to Delta destinations or periodic events. Construction is planned to take place for 10 hours a day, Monday through Friday, for most of the construction period. Construction on weekdays would be during a period when fewer people are recreating; however, some particularly sensitive uses (including daytime noise for boaters who often are in stationary anchorages for extended periods during overnight moorages in waterways such as Potato and Little Potato Slough, or Sycamore Slough) could experience unwelcomed noise from nearby construction activities.

As described in Chapter 24, *Noise and Vibration*, Mitigation Measure NOI-1: *Develop and Implement Noise Control Plan* would help to reduce noise effects from construction of all project components, including launch and maintenance shafts.

Some Delta roadways, such as West Walnut Grove Road, would experience additional truck traffic. This public road would be used to support construction of New Hope Tract and Staten Island shafts. Recreationists also use this road to access New Hope Landing and Wimpy's Marina facilities by land. Some recreationists who travel to these marinas could experience some slight delays. Similarly, construction of the Mandeville Island maintenance shaft facilities would involve construction and use of a new haul road coming from West Lower Jones Road. This new road would be within 1 mile of Bullfrog Marina on the Middle River. Marina recreationists might see, or hear noise from, construction trucks passing through the area, Monday through Friday. However, noise from the construction may not be greater than marina users experience with nearby agricultural equipment operations, just more frequent.

Levee Improvements

To address flood risk, the project proposes to undertake targeted repairs and improvements to existing levees on Bouldin Island (Alternatives 1, 2a, 2b, and 2c) or Lower Roberts Island (Alternatives 3, 4a, 4b, 4c, and 5) to reduce potential problems in constructing and operating the project from high-water events. On Bouldin Island for these same alternatives, targeted repairs would primarily involve levee widening and crown raising for over 9 miles of shorelines. Construction of the Bouldin Island launch/reception shaft and levee improvements would increase traffic passing through Terminous on SR 12. This additional construction traffic would contribute to road noise near campers at the Tower Park Marina and potential to those at Westgate Landing Regional Park. On Lower Roberts Island, similar levee modifications would occur along the Turner Cut eastern levee adjacent to West Neugebauer Road. All of the modifications at either island would occur on the landside of the levees. Temporary levee modification access roads would be constructed along the landside toe of the existing levee at the current grade.

The levee modifications on Bouldin Island or Lower Roberts Island would not directly affect recreation use areas but construction would create noise that would reduce the quality of daytime boating experiences for boaters on the South Mokelumne River, Potato Slough, and Little Potato Slough (for Bouldin Island) or boaters in Turner Cut and at Tiki Lagoon Marina for Lower Roberts Island. Further at Lower Roberts Island, the levee improvements would directly affect storage areas at Tiki Lagoon Marina as discussed above; although these storage areas are not used by recreationists for recreation purposes, the construction activities could impede marina owners' use of their storage yards, and would likely be an inconvenience for the operation of that private marina facility and lead to inconveniences for recreationists.

Southern Complex

The Southern Forebay emergency spillway would discharge flow into Italian Slough, which flows into Old River. The emergency spillway would extend from the Southern Forebay embankment to the levee along Italian Slough to meet DWR Division of Safety of Dams (DSOD) emergency overflow protection. This outlet structure would be constructed in years 9 through 11 of the overall project construction period under the central and eastern alignment alternatives. During construction, recreational boat passage would be somewhat impeded in a short stretch (less than 1,000 feet stretch of waterway), for short daytime periods over approximately 8 months. Therefore, the quality of boating experience in this waterway would be degraded slightly and temporarily, and limited to that particular small stretch of Italian Slough. The disruption of boating traffic in Italian Slough due to construction the emergency spillway would likely require partial channel closures and use of equipment within the waterways. However, the channel will be open to boating throughout the construction period. All such construction would have temporary in-water construction zone speed restrictions where high-speed recreation boating activities would be eliminated. In-water construction activities would constrict boat passage and degrade the attractiveness of the waterway in this area on a temporary (during construction) and long-term basis (permanent features in and along the waterway shoreline). The construction activities in Italian Slough could impede recreation opportunities and create negative visual perceptions of these facilities, which would reduce the recreational experience because of the facilities' industrial nature. However, this channel and area of the channel is typically used for passage to other waterways in the main Delta because it is on the southernmost extent of Delta waterways, and is adjacent to an industrial facility. Additionally, as set forth in Appendix 3B, Environmental Commitment EC-16: *Provide Notification of Construction and*

Maintenance Activities in Waterways would provide notification of construction and maintenance activities in waterways at nearby affected Delta marinas and public launch ramps.

Recreationists at The Lazy M Marina would experience potential disruptions in boat and vehicle access because of construction activities and also experience periodic noise from large equipment operations and potentially windblown dust from construction of the Southern Complex facilities. The facility itself could experience disruptions to business, including food and tackle sales, if boaters choose to use a different facility to avoid construction.

Clifton Court Forebay offers public fishing and walking access from Byron Highway on the west side of the facility. Some visitors walk or ride a bike around the forebay. Access to the Clifton Court Forebay would be maintained during construction, and it is unlikely users would be displaced because the facility would remain open.

Bethany Complex

As described in REC-1, under Alternative 5, an area of the Bethany Reservoir SRA shoreline approximately 1,000 feet long would be taken out of recreation use during the 6-year construction period for the discharge structure. Of this, in the long-term, about 200 feet of shoreline would be committed to water conveyance facilities that would be off-limits to public access, except for the relocated California Aqueduct Bikeway. The area would be cordoned off with boater exclusion zones along the nearshore area where the discharge facility operates. Because the reservoir offers a large area for recreation that is not heavily used, degradation to other areas of the recreation area would not be anticipated if users change use patterns because of the new facility's presence. The new facility would be similar to the existing discharge structure from the Harvey O. Banks Pumping Plant at the northwest corner of the reservoir.

This removal or conversion of shoreline could affect areas that boaters, bicyclists, and other day users, such as anglers. The California Aqueduct Bikeway would continue across the top of the Bethany Reservoir Discharge Structure, and boaters would still be able to use this portion of the reservoir, except for close to the discharge facility where an exclusion buoy barrier would be erected for public safety.

Park-and-Ride Lots

Park-and-ride lots would introduce up to five new parking areas throughout the project area. The park-and-ride lots would be established near major commute routes, where workers could park and ride shuttle buses or vans to construction sites. These lots would include asphalt-paved parking areas with striped parking spaces, lights, and electric vehicle charging stations. Construction or the presence of new park-and-ride lots would not likely affect recreation resources but workers' use of them during construction would help limit the potential number of vehicles trips on Delta roadways, thereby helping to minimize additional congestion on the roadways which recreationists use.

Field Investigations

Field investigations that would occur under all of the alternatives would involve activities such as geotechnical and hydrogeologic sampling and other construction test projects supporting geotechnical analysis. These investigations would be used to more specifically identify appropriate construction methodologies given existing site conditions and guide the development of any geological and groundwater monitoring programs for the project. Field investigations for project

construction would occur within the construction footprints and in portions of the underground tunnel alignments of the individual alternatives. The use of heavy equipment, such as excavators and boring drills, and work vehicles could add some temporary congestion and disruptions at certain times, to vehicular and bicycle travel in the area which active recreationists use. This could be most pronounced in waterways and roads around the Southern Complex and the intake locations. Use of heavy equipment, such as excavators, boring drills, and work vehicles over a period of several months during exploration would create additional noise for a few recreationists, such as nearby boaters who might pass through the area or moor for a temporary or overnight period. This could temporarily reduce the quality of their recreation experience.

As set forth in Environmental Commitment EC-16: *Provide Notification of Construction and Maintenance Activities in Waterways*, notification of construction and maintenance activities in waterways will be undertaken for all construction and field investigation activities. This notification measure will apply to Clarksburg Public Boat Launch and other marinas and boat ramps and would help to ensure information about construction site locations, construction schedules, and identification of no-wake zones and/or detours is readily available to the boating public.

Operations and Maintenance

Impact REC-1 in Chapter 16, *Recreation*, concludes that maintenance of new water conveyance facilities is not likely to generate more interest or demand for recreational activities elsewhere, and therefore the impact is less than significant. Accordingly, it would not lead to effects on recreational economics. Impact REC-2 identifies that maintenance of the conveyance facilities (i.e., intakes, tunnels, and transmission lines) would be required periodically and could be visible from the water or land by recreationists in proximity to these features. However, this impact is also determined to be less than significant in Chapter 16. Therefore, it also would not lead to effects on recreational economics.

Recreational Experience

Maintenance of the conveyance facilities (i.e., intakes, tunnels, and transmission lines) would be required periodically and would involve, cleaning, and repairing structures; annual dredging at sedimentation basin and drying lagoons; road maintenance; vegetation removal and care along embankments; tunnel inspection; and vegetation removal within transmission line rights-of-way. These activities could be visible from the water or land by recreationists near these features. These activities, however, would likely represent only very minor changes to current agricultural and transportation activities along and near Delta waterways. Near the intakes, however, boating speeds on the Sacramento River might be reduced near the facilities and bank fishing along in those locations will not be possible with the facilities operating in place.

In the long term, in limited locations compared to the vast landscape, the presence of large utility features in a rural landscape in the immediate area of the aboveground facilities would reduce the attractiveness of those particular settings to which recreationists might be accustomed to in the Delta region. Under any of the project alternatives it is likely that recreationists in some areas (such as in specific portions of waterways or on shorelines or stretches of roads [Chapter 18]) will be able to have near and/or middle ground views of new project structures and associated facilities. These intrusions on the landscape will diminish the quality of the rural setting and attractiveness of the area for recreation.

To implement Mitigation Measure AES-1b: *Apply Aesthetic Design Treatments to All Structures to the Extent Feasible*, DWR will use aesthetic design treatments, where and to the extent feasible, to minimize the effect on existing visual quality and character in communities within the statutory Delta associated with the introduction of water conveyance structures.

During operation of the project, changes in flows where considered. In terms of flow levels in the lower Sacramento River connecting with other waterways in the Delta region, the result of hydrologic model runs summarized in Chapter 5, *Surface Water*, analyzed the periods of flow during lower flow conditions and found that they are nearly identical for the May through October time period under project alternatives, relative to existing conditions. The greatest decreases in flows from implementation of project alternatives would occur in July and August. The average flow decrease for the full simulation period in July and August would be 2% lower than for existing conditions. This range of reduction in flows would not be noticeable to recreation boaters or shoreline anglers and result in no effect on the quality of recreation experience in the Delta waterways.

On a monthly basis, as a result of operating the project, the differences of the long-term average of monthly flows in the Sacramento, Feather, and American Rivers between project alternatives and existing conditions are within ±3% of anticipated flow conditions in the future. Furthermore, over the long term, the average water storage for Trinity, Shasta, and Folsom Lakes and Lake Oroville, that were simulated under all project alternatives would be similar (i.e., <1% change) to existing conditions as noted in Chapter 5, *Surface Water*, and as such have no effect on recreation occurring at those facilities. Seasonal flow patterns in the Delta waterways would be slightly different that current conditions, depending on throughputs in dry or wet years, but these changes as described in Chapter 5 would be within the range of variability boaters in the Delta waterways experience currently and are not expected to affect recreationists' enjoyment in the various boating recreational opportunities.

As noted in Chapter 9, *Water Quality*, operation of the project under the project alternatives would not result in substantial changes in water quality parameters such as Total Suspended Solids (TSS) concentrations or turbidity levels in Delta waters. The project alternatives would not affect Delta water temperatures, nutrients, or water clarity (and thus irradiance) at levels that would substantially affect, or affect at all, cyanobacteria harmful algal blooms (CHAB) frequency or magnitude in the Delta. Because TSS concentrations and turbidity levels are not expected to change substantially, no long-term water quality degradation is expected to occur, thus, there would be no noticeable changes or effects on recreationists in the Delta and adjoining waterways.

TSS concentrations and turbidity levels in the Sacramento River entering the Delta wound not differ from existing conditions under the alternatives, because the concentrations in the river would not change when a portion of the water is entrained. Any minor settling of sediment that may occur downstream of the north Delta diversions under lower flows would be resuspended on the tidal cycle or when overall river flows are increased. Further, the water diversions during project operations would not substantially affect flows associated with storm events or the "first flush" events important for sediment transport to the Delta or the TSS concentrations or turbidity levels in those flows. Finally, erosion and deposition processes that are driven by tidal flow velocity changes would continue under the project alternatives and would be similar to existing conditions and thus boating channels and the forces that change and shape them, would be expected to be similar to existing conditions (see Chapter 9, *Water Quality*, for further details).

Effects Conclusion—All Project Alternatives

Based on the recreation information provided above, the effects of the project alternatives on recreational economics are not expected to be substantial and would not lead to physical changes to the environment. As described in Section 17.1, *Socioeconomic Conditions*, recreational spending patterns in the statutory Delta are currently trending downward for several reasons. Furthermore, spending patterns have changed and will continue to change due to the ongoing effects of COVID-19. Therefore, it would be speculative to conclude that any changes in recreational economics would be associated with project construction and/or operations and maintenance activities.

Field investigations, which would consist of some overwater geotechnical investigations and pile testing, would take less than 2 years, and holes would be backfilled and seeded so that disturbed areas would be restored to existing conditions to which recreationists are accustomed. Therefore, effects on recreation quality during this phase of construction would be temporary, and there would not be effects on recreational economics.

The only waterway effects on areas used for recreational boating in the study area would be limited to the intake and discharge facility locations associated with construction of the intakes on the Sacramento River, the Southern Forebay Emergency Spillway, which would be constructed in Italian Slough for Alternatives 1, 2a, 2b, 2c, 3, 4a, 4b, and 4c, and at Bethany Reservoir under Alternative 5. These effects would be slightly more during construction but would also occur during operations in and around the intakes and Bethany Reservoir Discharge Structure, and could hinder any currently occurring recreation activities only in the immediate areas of the facilities. Minor effects may occur on boat passage including some speed restriction, and noise is likely from construction of the intake facilities on the Sacramento River. However, the construction of intake facilities would generally take place during weekdays, so weekend boaters would experience less disruption from noise and active construction equipment. Most spending on recreation happens during weekends and evenings, so any effects on recreational economics due to this temporary effect on recreation quality would be minor.

Construction of all project alternatives would involve a variety of activities such as excavation, driving large equipment on local roadways, and using large machinery and temporary manufacturing plants. The posting of signage with periodic updates over the course of construction would inform recreationists of ongoing and upcoming construction activities and provide safety information about potential hazards in the areas of the intakes (Clarksburg Public Boat Launch) and Bethany Reservoir Discharge Structure (Alternative 5, Bethany Reservoir SRA, REC 1a). Such notifications would promote safety and allow recreationists the opportunity to avoid areas of noise or other factors that could diminish the quality of their recreation experiences. Signage will help to avoid minor effects on recreational economics due to any perceived decreases in quality.

Potential short-term construction-related effects on recreational events and festivals that draw tourism to the region would be minimal because most events occur on weekends when there would be little or no construction. Potential effects would be further reduced through implementation of environmental commitments, EC-11: *Fugitive Dust Control*, EC-18: *Minimize Construction-Related Disturbances to Delta Community Events and Festivals*, and mitigation measures, MM AES-1a: *Install Visual Barriers between Construction Work Areas and Sensitive Receptors*, MM TRANS-1: *Implement Site-Specific Construction Transportation Demand Management Plan and Transportation Management Plan*, and MM NOI-1: *Develop and Implement Noise Abatement Plan Including Site-Specific Measures.*

Once operational, flows and water quality conditions would be within the range of current seasonal and yearly conditions now experienced by boaters and other recreationists and no noticeable effects on the quality of recreationists' experience are expected as a result of the project.

As set forth in Chapter 23, *Air Quality and Greenhouse Gases*, DWR has identified several environmental commitments (Appendix 3B, *Environmental Commitments Best Management Practices*) to reduce emissions of construction-related criteria pollutants, including basic and enhanced fugitive dust control measures and measures for entrained road dust that would help reduce the creation of dust clouds that would affect short-range views (refer to Environmental Commitments EC-7: *Off-Road Heavy-Duty Engines* and EC-11: *Fugitive Dust Control*).

Implementation of Mitigation Measures AES-1a: *Install Visual Barriers between Construction Work Areas and Sensitive Receptors* through AES-1c: *Implement Best Management Practices to Implement Project Landscaping Plan* found in Chapter 18, *Aesthetics and Visual Resources*, would also partially reduce effects on the presence of both construction activities and long-term presence of new water conveyance infrastructure on the landscape by installing visual barriers between construction work areas and sensitive receptors, applying aesthetic design treatments to all structures to the extent feasible, and using best management practices to implement a project landscaping plan.

Environmental Commitment EC-16: *Provide Notification of Construction and Maintenance Activities in Waterways* would reduce effects on marine navigation, including recreation boating, by implementing measures to notify boaters in advance on such encounters on the waterways.

Mitigation Measure NOI-1: *Develop and Implement Noise Abatement Plan* would provide a noise abatement plan to help reduce construction and operations and maintenance activity noise.

During operations and maintenance of the constructed facilities, visible maintenance activities would be temporary, intermittent, and short-term effects on the existing visual quality and character of the affected areas during operation and would be considered minor.

All of these measures taken together would further reduce potential effects from construction on recreational quality and spending of all project components, including launch and maintenance shafts.

Mitigation Effects

This section summarizes potential effects on recreational economics and quality associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could be anticipated based on available information. These effects would only be considered potentially significant impacts under CEQA if they lead to potentially significant physical changes to the environment.

Compensatory Mitigation

Compensatory mitigation described in Appendix 3F, *Compensatory Mitigation Plan for Special Status-Species and Aquatic Resources*, could create enhanced wildlife viewing opportunities. This is discussed further in Impact REC-2 in Chapter 16, *Recreation.* This could lead to a small increase in recreational spending.

Although the Compensatory Mitigation Plan described in Appendix 3F does not act as mitigation for effects on this resource from project construction or operations, its implementation could result in effects on the recreational experience.

Compensatory mitigation would be placed on Bouldin Island and three of the I-5 Ponds. Construction activities would involve site inundation, some excavation to allow water entry, or grading for appropriate water levels. Construction activities could lead to increased noise and dust affecting the quality of experience for recreational boaters around Bouldin Island.

For the three I-5 Ponds, improvements would include a new gravel-surfaced access road on the west boundary of the Ponds 7 and 8 and it is envisioned that a boat ramp may be installed for future water access for maintenance. Cattle exclusion fencing would be installed as needed if future land uses of the site include grazing. These changes will change the upland recreationists' views from more rural and agricultural uses to more natural setting and could improve wildlife viewing opportunities.

At Bouldin Island, three mitigation sites are proposed. The wetland mitigation site will be located at the northwestern portion of the island. Two other sites located near the center of the island will be constructed and enhanced to create a valley/foothill riparian habitat and open water (lake/pond depression) as well as creation of one area of perennial grassland habitat. Overall construction activities associated with these improvements will not likely disturb recreation uses in the area because they are more in line with typical agricultural activities or perhaps slightly more intense. After construction as the habitat features are established, the island could offer more wildlife viewing activities, such as bird watching. On the waterward side, there would be no long-term effects on boaters.

Other mitigation could involve projects attempting to enhance channel margin habitat along the Sacramento River between Freeport and Georgiana Slough to enhance juvenile salmonid habitats. Enhanced channel margin in the vicinity of the proposed north Delta intakes (upstream, between the intakes, and downstream) would provide resting spots and refuge for fish moving through this reach. Tidal restoration within the North Delta Arc could also offer resting spots and refuge for fish, as well as additional wildlife viewing opportunities. These actions are not likely to adversely affect recreationists and could improve the natural appeal of shorelines for passing boaters.

Overall, the project alternatives combined with compensatory mitigation is not expected to affect recreational opportunities or quality to the extent that there would be substantial effects on recreational economics. For more information regarding the Compensatory Mitigation Plan, see Appendix 3F, *Compensatory Mitigation Plan for Special-Status Species and Aquatic Resources*.

Other Mitigation Measures

Other mitigation measures, besides those identified in the effects analyses and Compensatory Mitigation Plan, would not result in a change in recreation opportunities and therefore, would not affect regional economic activity linked to recreation occurring within the statutory Delta and project area.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with project activities, would lead to some small effects on recreational economics and quality of recreational experiences in the project area, but these effects would not lead to any physical changes to the environment.

17.3.3.6 Effects of the Project Alternatives on Agricultural Economics in the Statutory Delta and Project Area

ECON-6: Changes in Agricultural Economics in the Statutory Delta and Project Area

All Project Alternatives

Project Construction

Construction activities would convert land from existing agricultural uses to uses for water conveyance facilities, construction staging areas, borrow/spoils areas, reusable tunnel material storage, temporary and permanent roads, and utilities. Agricultural land could also be affected by changes in water quality (if significant changes in water quality are determined). These direct effects on agricultural land are described in Chapter 15, *Agricultural Resources*, Section 15.3.3.2 *Impacts of the Project Alternatives on Agricultural Resources*, in Impact AG-1*,* Impact AG-2: *Convert a Substantial Amount of Land Subject to Williamson Act Contracts or in Farmland Security Zones to a Nonagricultural Use as a Result of Construction of Water Conveyance Facilities*, and Impact AG-3: *Other Impacts on Agriculture as a Result of Constructing and Operating the Water Conveyance Facilities Prompting Conversion of Prime Farmland, Unique Farmland, Farmland of Local Importance, or Farmland of Statewide Importance*.

Changes in productive irrigated acreage were used to describe the associated changes in economic values. This analysis uses the temporary and permanent construction footprint to estimate the potential reduction in productive irrigated acreage by crop type. Unit prices, yields, and crop production and investment costs are presented in Section 17.1, *Socioeconomic Conditions*. Table 17-26 summarizes the estimated total acreage and value of agricultural production in the statutory Delta, and parts of the project area outside of the statutory Delta, under each project alternative. The table also includes a summary of changes in acreage and production value relative to the existing conditions by aggregate crop category for each alternative.

Depending on the project alternative, total value of irrigated crop production in the statutory Delta and project area would decline by between $2.4 to $5.1 million per year during the construction period relative to existing conditions. Total irrigated crop acreage in production would decline by between 2,000 and 3,300 acres, depending on the project alternative. Both the declines in crop production and acreage are less than 1% relative to existing conditions in the statutory Delta (and surrounding parts of the project area) for all project alternatives. These estimates are not dependent on water year type.

Construction of conveyance facilities could also affect production costs on lands even if gross revenues are largely unaffected; however, these costs are not anticipated to be substantial. Operational constraints and longer travel times resulting from construction should be minimal. Construction designs have provided for such costs in two ways. In most cases, affected lands would be within the facilities footprint, and are included in the agricultural acreage and value of production changes described elsewhere in this chapter and in Chapter 15, Section 15.3.3.2, *Impacts of the Project Alternatives on Agricultural Resources*. Travel associated with project construction activities is required to stay on major freeways and away from local roads used by agricultural workers, as discussed in Chapter 20, *Transportation.*

Loss of investments in production facilities and standing orchards and vineyards would occur as a result of project construction. The value of structures and equipment potentially affected would vary widely across parcels. Much of the equipment is portable (e.g., machinery, tools, portable sprinkler pipe), and could be sold or used on other lands. Shop and storage buildings and permanent irrigation and drainage equipment may have little or no salvage value. The negotiated acquisition of lands for the conveyance and associated facilities would compensate for some, but perhaps not all of that value. According to Cooperative Extension cost of production studies (University of California Cooperative Extension 2011, 2013, 2014, 2015a, 2015b, 2016a, 2016b, 2017, 2018a, 2018b, 2019, 2020), permanent structures, irrigation systems, and drainage systems can represent a wide range of investment, from less than $100 per acre for field and vegetable crops to thousands of dollars per acre for some orchards. Most of these investments would not be new, so their depreciated values would be substantially lower.

Table 17-26. Effects on Crop Acres and Value of Agricultural Production in the Statutory Delta and Project Area Due to the Project Construction Footprint

	Alternative 1		Alternative 2a		Alternative 2b		Alternative 2c		Alternative 3		Alternative 4a		Alternative 4b		Alternative 4c		Alternative 5	
Analysis Metric	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change	Total	Change
Total Crop Acreage (thousand acres)	**386.8**	**-2.9**	**386.5**	**-3.3**	**387.2**	**-2.5**	**386.9**	**-2.8**	**386.9**	**-2.9**	**386.5**	**-3.2**	**387.3**	**-2.4**	**387.0**	**-2.8**	**387.8**	**-2.0**
Grains	54.4	-0.3	54.3	-0.3	54.4	-0.2	54.4	-0.2	54.4	-0.2	54.3	-0.3	54.4	-0.2	54.4	-0.2	54.4	-0.2
Field crops	102.9	-0.7	102.9	-0.7	103.0	-0.6	102.9	-0.7	103.1	-0.5	103.0	-0.6	103.1	-0.5	103.1	-0.5	103.3	-0.3
Forage crops	107.5	-1.7	107.5	-1.8	107.6	-1.6	107.6	-1.7	107.5	-1.7	107.4	-1.8	107.6	-1.6	107.6	-1.7	108.4	-0.9
Vegetable, truck, and specialty crops	41.0	0.0	40.9	-0.1	41.0	0.0	41.0	0.0	41.0	0.0	40.9	-0.1	41.0	0.0	41.0	0.0	41.0	0.0
Orchards and vineyards	81.0	-0.3	80.9	-0.3	81.2	-0.1	81.0	-0.3	80.9	-0.3	80.9	-0.4	81.1	-0.1	81.0	-0.3	80.8	-0.5
Total Value of Production (million $)	**862.2**	**-3.8**	**861.2**	**-4.8**	**863.7**	**-2.4**	**862.3**	**-3.7**	**862.0**	**-4.0**	**860.9**	**-5.1**	**863.4**	**-2.6**	**862.1**	**-3.9**	**862.0**	**-4.0**
Grains	29.5	-0.1	29.4	-0.1	29.5	-0.1	29.5	-0.1	29.5	-0.1	29.4	-0.1	29.5	-0.1	29.5	-0.1	29.5	-0.1
Field crops	78.5	-0.5	78.4	-0.5	78.5	-0.5	78.5	-0.5	78.6	-0.4	78.6	-0.4	78.6	-0.4	78.6	-0.4	78.7	-0.2
Forage crops	71.9	-1.3	71.9	-1.3	72.0	-1.3	72.0	-1.3	71.9	-1.3	71.8	-1.4	72.0	-1.2	71.9	-1.3	72.6	-0.6
Vegetable, truck, and specialty crops	220.6	-0.1	220.2	-0.5	220.6	-0.1	220.6	-0.1	220.6	-0.1	220.2	-0.5	220.6	-0.1	220.6	-0.1	220.6	-0.1
Orchards and vineyards	461.7	-1.8	461.2	-2.4	463.1	-0.5	461.8	-1.7	461.5	-2.0	460.9	-2.6	462.8	-0.7	461.5	-2.0	460.6	-2.9

Note: Value of production is based on prices received by farmers, converted to 2020 levels using the Gross Domestic Product Implicit Price Deflator data from the U.S. Bureau of Economic Analysis (2020). Numbers may not sum to totals due to rounding.

Investment in standing orchards and vineyards would also be considered during negotiations for land acquisitions. Standing orchards and vineyards represent long-term investment in a property beyond the value of the land and buildings. Typical investments required to bring permanent crops into production are shown in Section 17.1, *Socioeconomic Conditions*. For example, the establishment of wine grapes require an estimated investment of over $22,000 per acre. Forage crops such as irrigated pasture and alfalfa may require an establishment cost of about $400 to $800 per acre. The depreciated values of the growing stock could be substantially below these establishment costs, depending on the ages of the stands that would be affected.

Only minor changes in the quality of agricultural water supply in the statutory Delta and project area are expected during construction. Chapter 9, *Water Quality,* identifies temporary elevations in turbidity and total suspended solids near construction sites. However, the direct effects of this on local agriculture would be minor.

Operations and Maintenance

Operations and maintenance activities would not directly result in effects on productive irrigated agricultural acreage and production values. However, effects of the construction footprint on productive agricultural land would continue during the operations and maintenance phase following construction activities, continuing to cause effects on productive irrigated acreage and value of production relative to the existing conditions. It is possible that agricultural land removed due to the temporary construction footprint would return to agriculture. However, the parcels that would be returned to agricultural use are not yet known. Land previously used for farming could be reclaimed for and return to agriculture, but also could shift to habitat or other uses. The process for land acquisition for the project is discussed further in Chapter 3, *Description of the Proposed Project and Alternatives*, Section 3.4.14, *Land Reclamation*.

Permanent and temporary effects on agricultural land are discussed further in Chapter 15, *Agricultural Resources*, which concludes that 200 or less acres would be temporarily affected for each project alternative, or less than 10% of affected farmland for each alternative. The analysis of project effects on agricultural economics conservatively assumes that the agricultural lands needed to support project construction and operation activities would be permanently converted to non-agricultural uses. Table 17-26 therefore also summarizes the operations and maintenance phase effects on productive irrigated crop acreage and value of agricultural production by project alternative relative to the existing conditions.

Agricultural land could also be affected by changes in water quality (to the extent that changes in water quality are expected to be significant). These direct effects on agricultural land are described in Chapter 15, Impacts AG-1 and AG-2. Crop yields and crop selection on lands in the statutory Delta and project area affected by changes in salinity of agricultural water supply during operations and maintenance activities are described in Chapter 15, Impact AG-3. The modeled changes to salinity levels would remain in compliance with water quality standards and would not affect conversion of farmland. Therefore, this is not expected to affect agricultural production values.

Effects Conclusion—All Project Alternatives

The permanent and temporary construction footprints created by the project alternatives would lead to effects on the value of agricultural production. However, these effects are not expected to be substantial as the losses in production and acreage would represent less than 1% of total in the statutory Delta (and surrounding parts of the project area) across all project alternatives. How

changes in agricultural economics would further affect employment and labor income is discussed in Impact ECON-1. How changes in agricultural economics would further affect community character is discussed in Impact ECON-3. Although these effects on the agricultural economy in the statutory Delta and project area stem from physical changes to the environment, they do not themselves lead to further physical effects and, therefore, are not impacts under CEQA.

Mitigation Effects

This section summarizes potential effects on agricultural economics associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could be anticipated based on available information. Socioeconomic effects alone are not effects under CEQA.

Compensatory Mitigation

Compensatory mitigation described in Appendix 3F would create effects on agricultural economics because farmland would come out of production for these mitigation areas, specifically on Bouldin Island. Effects of compensatory mitigation on farmland is also discussed in Chapter 15, Impact AG-1.

Changes in acreage by crop type were used to estimate the associated changes in economic values. Unit prices, yields, and crop production and investment costs are presented in Section 17.1, *Socioeconomic Conditions*. Table 17-27 summarizes the changes in acreage and value of agricultural production that would result from the Compensatory Mitigation Plan on Bouldin Island. Changes are shown relative to existing conditions by aggregate crop category.

Table 17-27. Changes in Crop Acres and Value of Agricultural Production in the Statutory Delta and Project Area Due to Compensatory Mitigation

Analysis Metric	Compensatory Mitigation on Bouldin Island Change
Total Crop Acreage (thousand acres)	**-0.8**
Grains	0.0
Field crops	-0.8
Forage crops	0.0
Vegetable, truck, and specialty crops	0.0
Orchards and vineyards	0.0
Total Value of Production (million $)	**-0.6**
Grains	0.0
Field crops	-0.6
Forage crops	0.0
Vegetable, truck, and specialty crops	0.0
Orchards and vineyards	0.0

Tidal wetland and channel margin restorations within the North Delta Arc are not expected to require conversion of farmland currently in production and would not lead to any effects on agricultural economics. Therefore, the project alternatives combined with compensatory mitigation would not change the overall effect.

Other Mitigation Measures

No other mitigation measures are expected to require conversion of farmland currently in production, and therefore would not lead to any effects on agricultural economics.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with project activities, would lead to some effects on agricultural economics in the statutory Delta and project area, but these effects would not lead to any physical changes to the environment.

17.3.3.7 Effects in the South-of-Delta SWP/CVP Export Service Areas

ECON-7: Socioeconomic Effects in the South-of-Delta SWP/CVP Export Service Areas

All Project Alternatives

As described in Chapter 31, *Growth Inducement*, Section 31.2.3, *Impacts and Mitigation Approaches*, construction and operation of the project alternatives could result in a number of effects in SWP (and potentially CVP) export service areas receiving water deliveries by increasing the reliability of water deliveries. This can also reduce costs to water providers and users in these regions if they are able to use the SWP (and potentially CVP) supply to avoid more costly supplies.

According to the water supply changes summarized in Chapter 6, *Water Supply*, Table 6-2, south-of-Delta public water agencies would receive the large majority of water supply reliability improvements from project alternatives. Reliability improvements would be to both urban (municipal and industrial) and agricultural SWP and, potentially, CVP contractors, though the exact splits have not been finalized. The project objective is to stabilize SWP, and potentially CVP, water supplies into the future when faced with multiple challenges. These improvements would help avoid future SWP supplies from degrading if no action is taken. Future reliability would likely be more similar to existing conditions (but still better than a future baseline that has degraded). See Appendix 6A, *Water Supply 2040 Analysis*, for more information.

South-of-Delta SWP/CVP export service areas are summarized in Section 17.1, *Socioeconomic Conditions.* Counties in the SWP export service areas would realize some effects as a result of the project alternatives relative to the existing socioeconomic conditions, namely through stabilization of annual water deliveries. Counties that are in the CVP (but not SWP) export service areas would potentially realize some effects depending on their level of participation. These include Stanislaus, Merced, Fresno, and Tulare Counties in the primarily agricultural San Joaquin Valley.

Increased reliability of deliveries to agricultural uses would support more stable (and potentially larger) agricultural acreage, enable broader crop selection, and reduce cost and risk associated with uncertain water deliveries. During dry and critical water conditions, additional supply can reduce land idling and reduce the cost of replacement supply. More reliable agricultural water supply would also benefit the local farm economy, including seasonal and permanent on-farm employment and employment in industries closely associated with agricultural production such as food processing, agricultural inputs, and transportation.

The community character of rural regions receiving SWP or CVP water supply is closely tied to agriculture, so improvements in water supply reliability could support the current social activities and character. The range of agricultural water supply likely provided by the project alternatives would not induce new agricultural production, but the improved reliability would contribute to and

reinforce existing economic and social patterns and institutions. Greater stability of the local economy would also benefit local government fiscal conditions.

Increased amount and reliability of urban water supply is expected to be used to accommodate population and economic growth that the urban regions are already planning for and to offset other, more costly supplies that would otherwise be used or developed. Chapter 31, Section 31.2.3.3, *Indirect Growth Inducement Effects Associated with Stabilized Water Deliveries*, describes how the water deliveries will accommodate existing or already planned uses.

Effects Conclusion—All Project Alternatives

Compared to existing conditions, all project alternatives would increase water supply reliability to all SWP export service areas, and potentially CVP export service areas. The changes in delivery reliability by project alternative are given in Chapter 6, *Water Supply,* Table 6-2.

As discussed in Chapter 31, *Growth Inducement*, long-term water supply reliability is an important component in supporting the economy and local community and in accommodating planned growth. Improved agricultural water supply and reliability can keep land in production, support the local economy and community, and reduce overall water supply cost and risk. However, these socioeconomic effects of increased water supply reliability would be spread out over a large area, and not lead to any physical changes.

Mitigation Effects

This section summarizes potential effects on socioeconomic conditions in the south-of-Delta SWP/CVP export service areas associated with compensatory mitigation and other mitigation measures. Many details associated with implementing these mitigation measures are not known at this time. This analysis discloses potential effects that could be anticipated based on available information. These effects would only be considered potentially significant impacts under CEQA if they lead to potentially significant physical changes to the environment.

Compensatory Mitigation

The Compensatory Mitigation Plan described in Appendix 3F, *Compensatory Mitigation Plan for Special Status-Species and Aquatic Resources*, is not expected to affect socioeconomic conditions in the south-of-Delta SWP/CVP export service areas.

Other Mitigation Measures

None of the other mitigation measures proposed would result in socioeconomic effects in the south-of-Delta SWP/CVP export service area and as such would not result in changes to socioeconomic conditions in the service areas.

Overall, implementation of the Compensatory Mitigation Plan and other mitigation measures, combined with project activities, would not create any effects on socioeconomic conditions in the south-of-Delta SWP/CVP export service areas to the extent that there would be physical changes to the environment.

17.3.4 Cumulative Analysis

The cumulative effects analysis for socioeconomics considers past, present, and reasonably foreseeable future projects and programs in combination with the effects of the No Project Alternative and project alternatives. Specific plans, policies, and programs that are either ongoing or proposed for future implementation that could affect cumulative socioeconomic conditions are listed in Table 17-28. Cumulative socioeconomic effects are not impacts under CEQA.

Table 17-28. Cumulative Effects on Socioeconomics from Plans, Policies, and Programs

Program/ Project	Agency	Status	Description of Program/ Project	Potential Effects on Socioeconomics
Delta Plan	Delta Stewardship Council	Began in 2009, ongoing.	The Delta Reform Act, created by SB X7-1, established the co-equal goals for the Delta of "providing a more reliable water supply for California and protecting, restoring, and enhancing the delta ecosystem." (Pub. Resources Code § 29702; Wat. Code § 85054). These coequal goals are to be achieved "in a manner that protects and enhances the unique cultural, recreational, natural resources, and agricultural values of the Delta as an evolving place." (Wat. Code § 85054). The Delta Reform Act also established the DSC. The DSC is tasked with furthering the state's coequal goals for the Delta through development of the Delta Plan, a comprehensive, long-term, resource management plan for the Delta, containing both regulatory policies and recommendations aimed at furthering the coequal goals and promoting a healthy Delta ecosystem. The Delta Plan provides for a distinct regulatory process for activities that qualify as Covered Actions under Water Code Section 85057.5. State and local agencies proposing Covered Actions, prior to initiating implementation of that action, must prepare a written certification of consistency with detailed findings regarding consistency with applicable Delta Plan policies and submit that certification to the DSC.	Effects on community character.

Program/ Project	Agency	Status	Description of Program/ Project	Potential Effects on Socioeconomics
Sacramento County General Plan of 2005–2030	Sacramento County	Adopted in 2011.	The updated plan provides a sustainable growth management program for the unincorporated territory through 2030.	Effects on population, housing, and community character.
San Joaquin County General Plan	San Joaquin County	Updated in 2015.	This plan guides all future land use, development, preservation, and resource conservation decisions for the county through 2035.	Effects on community character. Could reduce effects on agricultural economics.
Solano County General Plan	Solano County	Adopted in 2008 (Housing and Public Health and Safety Elements updated in 2015).	This policy document guides both land development and conservation of agricultural and natural resources in the unincorporated portions of the county through the year 2030.	Effects on population, housing, and community character. Could reduce effects on agricultural economics.
2030 Countywide General Plan	Yolo County	Adopted in 2009.	Key purposes are to identify the County's land use, circulation, environmental, economic, and social goals, and policies as they relate to land use.	Effects on community character.
Sustainable Groundwater Management Act	California Department of Water Resources	Passed in 2014. Plans ongoing.	Requires groundwater basins in California to reach a sustainable yield by 2042.	Could create effects on agricultural economics and regional employment (Hanak et al. 2019)
Central Valley Vision	California State Parks	Draft Implementation Plan with 20-year outlook released in 2008.	The plan provides a 20-year road map for State Park actions to focus on increasing service to Central Valley residents and visitors.	Effects on recreational economics and community character.
Water Supply Contract Extension Program	California Department of Water Resources	Most contracts expiring in 2035.	The program mission is to extend the term and amend the SWP contracts by conducting negotiations between DWR contractors and public water agencies.	Could reduce some effects on agricultural economics.
Los Vaqueros Reservoir Expansion	Bureau of Reclamation, California Department of Water Resources, and Contra Costa Water District	Final feasibility report released in August 2020.	Project consists of enlarging the existing Los Vaqueros Reservoir and constructing related reservoir system facilities to develop water supplies for environmental water management that supports fish protection, habitat management, and other environmental needs, and Bay Area urban water users.	Effects on regional employment, and recreational economics. Also benefits the San Francisco Bay Area export service area.

Program/ Project	Agency	Status	Description of Program/ Project	Potential Effects on Socioeconomics
Irrigated Lands Regulatory Program	Central Valley Regional Water Quality Control Board	Ongoing.	This program regulates discharges from irrigated agricultural lands. Its purpose is to prevent agricultural discharges from impairing the waters that receive the discharges.	Effects on Delta water quality and agricultural economics.
Delta Protection Commission Land Use and Resource Management Plan Update	Delta Protection Commission	Currently being updated (last update was in 2010).	The plan outlines the long-term land use requirements for the Sacramento–San Joaquin Delta and sets out findings, policies, and recommendations in the areas of environment, utilities and infrastructure, land use, agriculture, water, recreation and access, levees, and marine patrol/boater education/safety programs.	Effects on regional employment, population, housing, community character, agricultural economics, and recreational economics.
Recreation Proposal for the Sacramento–San Joaquin Delta and Suisun Marsh	California Department of Parks and Recreation	Proposal developed in 2011.	The proposal recommends that communities on the edge of the Delta or Suisun Marsh with access to major transportation routes be developed as "gateways" to provide supplies and information to visitors about recreation opportunities available in an area.	Effects on recreational economics and community character.
Sites Reservoir/ North of the Delta Offstream Storage	Sites Reservoir Authority	Under development.	By operating in conjunction with other California reservoirs, Sites Reservoir substantially increases water supply flexibility, reliability, and resiliency in drier years.	Effects on regional employment, agricultural economics, and recreational economics. Also benefits north-of-Delta and south-of-Delta regions.
Envision Stockton 2040 General Plan	City of Stockton	Adopted December 2018.	The General Plan is the principal policy document that guides future conservation and development in Stockton.	Effects on regional employment, population, housing, and community character.
California Aquatic Invasive Species Management Plan	California Department of Fish and Wildlife	Released January 2008.	The plan's overall goal is to identify the steps that need to be taken to minimize the harmful ecological, economic, and human health effects of aquatic invasive species in California.	Effects on recreational economics and community character.

Program/ Project	Agency	Status	Description of Program/ Project	Potential Effects on Socioeconomics
Yolo Bypass Wildlife Area Land Management Plan	California Department of Fish and Wildlife	Ongoing.	The Yolo Bypass Wildlife Area comprises approximately 16,770 acres of managed wildlife habitat and agricultural land within the Yolo Bypass. The bypass conveys seasonal high flows from the Sacramento River to help control river stage and protect the cities of Sacramento, West Sacramento, and Davis and other local communities, farms, and lands from flooding.	Effects on regional employment, community character, recreational economics, and agricultural economics.
FloodSAFE California	California Department of Water Resources	Ongoing (initiated in 2006).	The FloodSAFE vision is a sustainable integrated flood management and emergency response system throughout California that improves public safety, protects and enhances environmental and cultural resources, and supports economic growth by reducing the probability of destructive floods.	Effects on regional employment, community character, recreational economics, and agricultural economics.