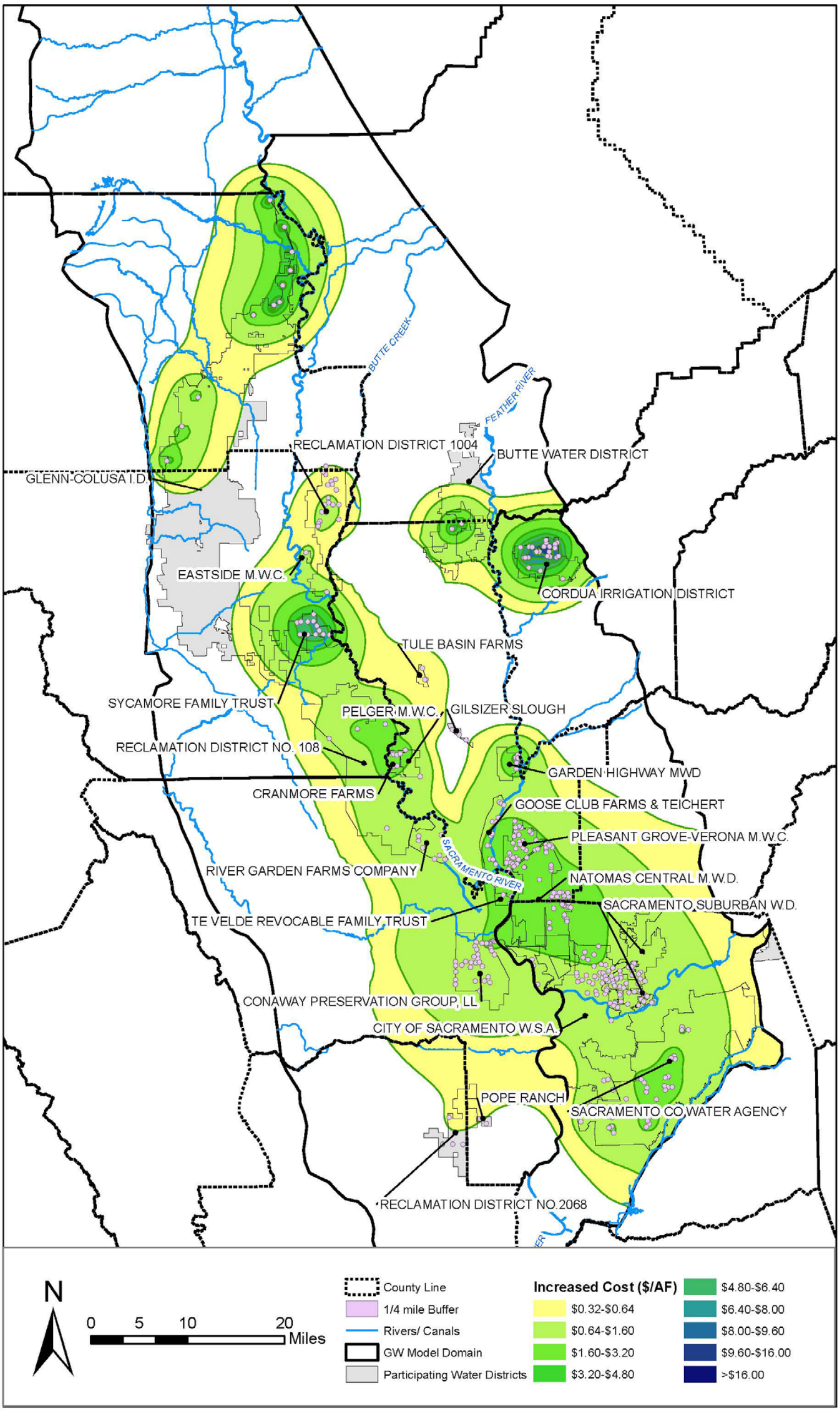

Figure 3.10-5. Potential Change in Groundwater Pumping Cost Related to Groundwater Level Declines (Aquifer Depth of Approximately 700 to 900 feet), September 1990

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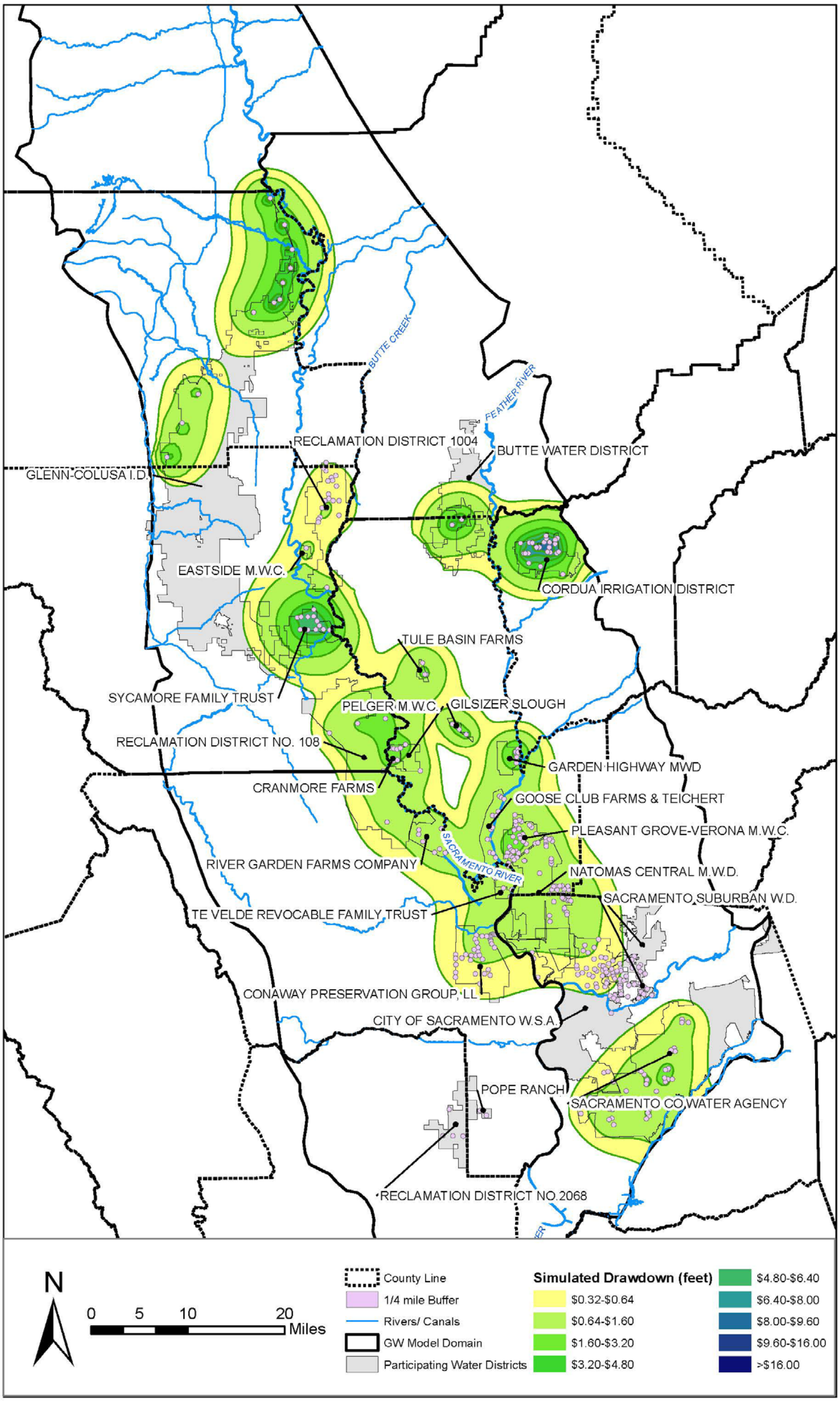

Figure 3.10-6. Potential Change in Groundwater Pumping Cost Related to Groundwater Level Declines (Aquifer Depth of Approximately 700 to 900 feet), September 1976

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3.10.2.3.2 Buyer Service Area

Use of Transfer Water
Water transfers would provide water for agricultural uses that could support revenues, economic output, and employment. Water transfers would provide water for irrigation in the Buyer Service Area that would help maintain crop production. Growers would likely continue to face water shortages and need to pump groundwater or idle fields, but water transfers would reduce water shortages and associated effects. Continuing crop production would support employment and incomes for farm workers and others employed by a farm. Growers would also continue to purchase inputs from suppliers, which would provide revenues to these businesses. Household spending in the region would also increase as farm workers, business owners, and other employees spend a portion of their incomes in the regional economy relative to the No Action/No Project Alternative. These would be positive regional economic effects in the agricultural areas of the Buyer Service Area.

Water transfers would provide water for M&I uses that could support revenues, economic output, and employment. Water transfers would also support M&I uses in the Buyer Service Area during dry and critical years. Supplementing a water supply during drought conditions could increase economic activity. Water supply provided by transfers would also help maintain the customers' quality of living relative to both indoor and outdoor water uses.

3.10.2.4 Alternative 3: No Cropland Modifications

3.10.2.4.1 Seller Service Area

Cropland Idling or Crop Shifting Transfers
Cropland idling and crop shifting transfers would not occur under Alternative 3; therefore, there would be no economic effects as a result of changes in agricultural production.

Local Government Finances and Economic Policies
Cropland idling transfers would not occur under Alternative 3; therefore, there would be no effects to tax revenues or operating costs of local governments. Other transfer methods would not likely affect local government activities or tax revenues.

Groundwater Substitution Transfers
Economic effects of groundwater substitution transfers would be the same as the Proposed Action.

Stored Reservoir Release and Conservation Transfers
Economic effects of stored reservoir release and conservation transfers would be the same as the Proposed Action.

3.10.2.4.2 Buyer Service Area

Use of Transfer Water
Economic effects in the Buyers Service Area would be the same as the Proposed Action.

3.10.2.5 Alternative 4: No Groundwater Substitution

3.10.2.5.1 Seller Service Area

Cropland Idling or Crop Shifting Transfers
Cropland idling transfers for Alternative 4 are the same acreages as the Proposed Action. Therefore, effects of cropland idling transfers would be the same as described for the Proposed Action.

Local Government Finances and Economic Policies
Economic effects would be the same to those described for the Proposed Action.

Groundwater Substitution Transfers
Groundwater substitution transfers would not occur under Alternative 4; therefore, there would be no economic effects as a result of increases in groundwater pumping costs.

Stored Reservoir Release and Conservation Transfers
Economic effects of stored reservoir release and conservation transfers would be the same as the Proposed Action.

3.10.2.5.2 Buyer Service Area

Use of Transfer Water
Economic effects in the Buyers Service Area would be the same as the Proposed Action.

3.10.3 Comparative Analysis of Alternatives

Table 3.10-~~33~~ 39 summarizes the potential economic effects of each of the action alternatives and the No Action/No Project Alternative.

Table 3.10-~~33~~39. Comparative Analysis of the Alternatives

Potential Effect	No Action/No Project	Proposed Action	Alternative 3: No Cropland Modifications	Alternative 4: No Groundwater Substitution
Seller Service Area				
Revenues from cropland idling water transfers could increase incomes for growers or landowners selling water.	Same as existing conditions	Beneficial	No Effect	Same as the Proposed Action
Cropland idling transfers in Glenn, Colusa, and Yolo counties could reduce employment, labor income, and economic output for businesses and households linked to agricultural activities.	Same as existing conditions	Employment: - 495 Labor Income: - $19.38 Million Output: - $90.43 Million	No Effect	Same as the Proposed Action
Cropland idling transfers in Sutter and Butte counties could reduce economic output, value added, and employment for businesses and households linked to agricultural activities.	Same as existing conditions	Employment: - 163 Labor Income: - $5.50 Million Output: - $26.76 Million	No Effect	Same as the Proposed Action
Cropland idling transfers in Solano County could reduce economic output, labor income, and employment for businesses and households linked to agricultural activities.	Same as existing conditions	Employment: - 32 Labor Income: - $1.13 Million Output: - $4.58 Million	No Effect	Same as the Proposed Action
Cropland idling transfers could have adverse local economic effects.	Same as existing conditions	Adverse	No Effect	Adverse
Water transfers from idling alfalfa could increase costs for dairy and other livestock feed.	Same as existing conditions	Adverse, but minimal	No Effect	Adverse, but minimal
Cropland idling transfers could decrease net revenues to tenant farmers whose landowners choose to participate in transfers.	Same as existing conditions	Adverse	No Effect	Adverse
Crop shifting transfers could change economic output, value added, and employment for businesses and households linked to agricultural activities.	Same as existing conditions	Adverse, but minimal	No Effect	Adverse, but minimal
Reductions in local sales associated with cropland idling transfer effects could reduce tax revenues and increase costs to county governments.	Same as existing conditions	Adverse, but minimal	No Effect	Adverse, but minimal
Economic effects associated with cropland idling could conflict with economic policies and objectives set forth in local plans.	Same as existing conditions	Adverse	No Effect	Adverse
Groundwater substitution transfers could increase groundwater pumping costs for water users in areas where groundwater levels decline as a result of the transfer.	Same as existing conditions	Adverse	Same as the Proposed Action	No Effect

Potential Effect	No Action/No Project	Proposed Action	Alternative 3: No Cropland Modifications	Alternative 4: No Groundwater Substitution
Revenues from groundwater substitution water transfers could increase incomes for growers or landowners selling water.	Same as existing conditions	Beneficial	Same as the Proposed Action	No Effect
Revenues received from stored reservoir and conservation transfers could increase operating incomes for sellers.	Same as existing conditions	Beneficial, but minimal	Same as the Proposed Action	Same as the Proposed Action
Buyer Service Area				
Water transfers would provide water for agricultural uses that could support revenues, economic output, and employment.	Same as existing conditions	Beneficial	Same as the Proposed Action	Same as the Proposed Action
Water transfers would provide water for M&I uses that could support revenues, economic output, and employment.	Same as existing conditions	Beneficial	Same as the Proposed Action	Same as the Proposed Action

3.10.3.1 No Action/No Project Alternative

Under the no Action/No Project Alternative, there would be no cropland idling or crop shifting transfers to CVP contractors, and therefore there would be no effects on the existing regional economy in the Seller Service Area, as well as no effect on local government finances. Additionally, groundwater pumping costs would not be affected by water transfers in the Seller Service Area to CVP contractors.

In the Buyer Service Area, growers would continue to take actions, such as cropland idling or groundwater pumping, in response to CVP water shortages. There would be no change from existing conditions.

3.10.3.2 Alternative 2: Full Range of Transfers (Proposed Action)

Under the Proposed Action, the full range of transfers including cropland idling and crop shifting transfers as well as groundwater substitution, stored reservoir release, and conservation transfers would be utilized. The revenues from cropland idling water transfers could potentially increase incomes for the farmer or landowners selling water. In Glenn, Colusa, Butte, Yolo, Sutter, and Solano counties, there would be reductions in employment, labor income, and economic output for business and households linked to agricultural activities. In Glenn, Colusa, Yolo, Sutter, Butte, and Solano counties, effects to employment, labor income, and output would result in a reduction of less than one percent relative to 2010 baseline economy.

Local government finances would be affected by the Proposed Action by reductions in local sales associated with cropland idling transfer effects. These effects could reduce tax revenues and increase costs to county governments primarily through the sales and use tax. Regional economic effects could

increase costs for local governments in the form of unemployment costs and other social services, however, such effects are expected to be minimal.

Groundwater substitution transfers would be utilized in the Proposed Action. These transfers could increase groundwater pumping costs for water users in areas where groundwater levels decline as a result of the transfer. Decreased groundwater levels would increase pumping costs to nearby well owners, which would be an adverse economic effect.

Revenues received from stored reservoir and conservation transfers could increase operating incomes from sellers, however, these effects are expected to be minor as water transfer revenues would not be a large or consistent income source.

In the Buyer Service Area, water transfers would provide water for agricultural uses that could support revenues, economic output, and employment. Transfers in this area would provide irrigation that would help maintain crop production. While growers would likely continue to face water shortages and need to pump groundwater or idle fields, water transfers would reduce these effects. Water transfers would also provide water for M&I uses that could support revenue, economic output, and employment.

3.10.3.3 Alternative 3: No Cropland Modification

Under Alternative 3, there would be no cropland modifications, however, groundwater substitution transfers and stored reservoir purchase and conservation transfers would be utilized. In the Seller Service Area, there would be no economic effects as a result of changes in agricultural production.

Groundwater substitution transfers and stored reservoir purchase and conservation transfers would be identical to the Proposed Action, and therefore economic effects would be the same as the Proposed Action.

In the Buyers Service Area economic effects would be the same as the Proposed Action.

3.10.3.4 Alternative 4: No Groundwater Substitution

Under Alternative 4, there would be no groundwater substitution.

Similar to the Proposed Action, cropland idling or crop shifting would occur from sellers in Glenn, Colusa, Yolo, Sutter, Butte, and Solano counties. While growers and landowners selling water for transfers could increase their incomes, regional economic effects would still be adverse to businesses and individuals who support farming activities. Since groundwater substitution transfers would not occur under Alternative 4 there would be no economic effects as a result of increases in groundwater pumping costs.

Economic effects of stored reservoir purchase and conservation transfers would be the same as the Proposed Action.

Additionally, economic effects in the Buyers Service Area would be the same for Alternative 4 as they are in the Proposed Action.

3.10.4 Cumulative Effects

The timeframe for the Long-Term Water Transfers cumulative analysis extends from 2015 through 2024, a ten year period. The cumulative effects analysis for regional economics considers State Water Project (SWP) water transfers and the CVP M&I Water Shortage Policy (WSP). Chapter 4 identifies potential SWP cropland idling transfers by seller and potential alternatives for the CVP M&I WSP. Reclamation is operating under an existing WSP and is evaluating the policy for revisions. Refer to Chapter 4 for further information. The cumulative analysis also considers land protection programs, general population growth and associated economic development in the Seller and Buyer Service Areas.

3.10.4.1 Alternative 2: Full Range of Transfers

3.10.4.1.1 Cropland Idling or Crop Shifting Transfers

Cropland idling and shifting transfers in combination with other cumulative projects could have regional economic effects in the Seller Service Area. Water management activities that could result in cumulative effects with long-term water transfers include the CVP M&I WSP and SWP water transfers. The CVP M&I WSP could limit water supplies to agricultural users and result in increased agricultural land idling in the Seller Service Area, which may result in fewer sellers participating in long-term water transfers. These changes, however, would likely be minor because the changes in water deliveries would likely represent a small amount of the overall water supply within the Seller Service Area. Therefore, the CVP M&I WSP would not contribute substantially to cumulative economic effects in the Seller Service Area.

Cropland idling implemented under the SWP transfers could result in a maximum of 26,342 acres of idled rice land in Butte and Sutter counties. Similar to cropland idling for CVP transfers, SWP cropland idling transfers would be a temporary effect and would not permanently affect employment, labor income, and output in the Seller Service Area.

Table 3.10-~~34~~ 40 summarizes cumulative economic effects to employment, labor income, and output in Butte and Sutter counties of idling of 10,769 acres of rice under the Proposed Action and up to 26,342 acres of rice for SWP transfers. The cumulative effects of transfers in Butte and Sutter counties would be less than one percent reduction in employment, labor income, and output in the regional economy.

Table 3.10-~~34~~40. Cumulative Regional Economic Effects in Butte and Sutter County from Rice Idling Transfer (2012 dollars)

Cumulative Acreage Idled	Employment (Jobs/1000 acres)	% change from Total Employment	Labor Income (Million $)	% change from Total Labor Income	Output (Million $)	% change from Total Output
37,111	456	0.31%	$15.71	0.28%	$79.98	0.46%

Figure 3.10-7 shows 2002 to 2013 unemployment rates in the cropland idling counties (Employment Development Department 2013). Glenn, Colusa, and Sutter counties have consistently had higher annual unemployment rates than the state average. During the 2009 to 2011 economic recession, cropland idling counties in the Seller Service Area experienced high levels of unemployment relative to previous years. Reductions in employment associated with cropland idling transfers would contribute to unemployment in the region. However, cropland idling effects are temporary and under the Proposed Action, cropland idling transfers would not occur each year over the 10-year period.

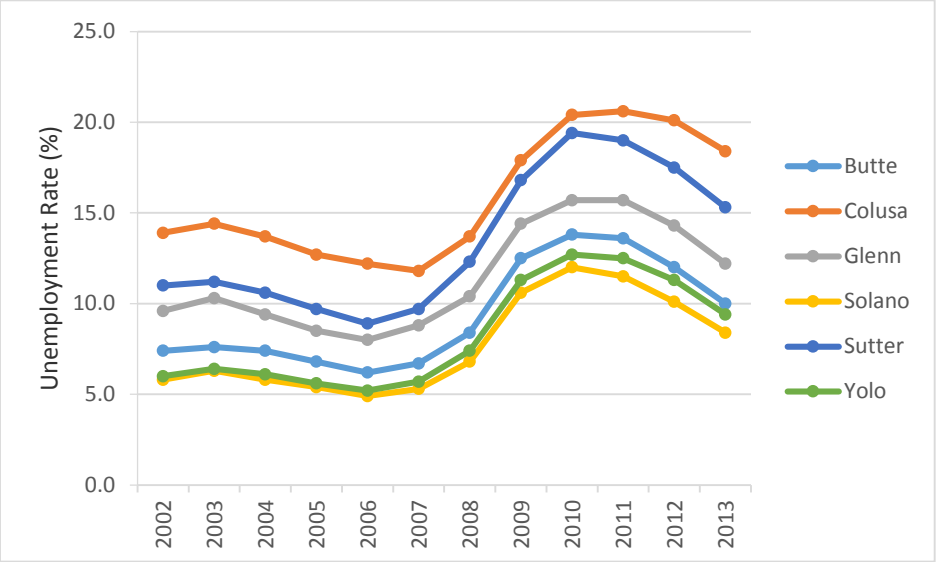

Figure 3.10-7. 2002 to 2013 Unemployment Rates in Seller Service Area

Populations are projected to increase in counties where cropland idling transfers could occur. Table 3.10-~~35~~41 shows projected population growth in Glenn, Colusa, Yolo, Sutter, Solano, and Butte counties. Population growth would increase the demand for housing and services, resulting in new construction and urban development. Urban development would include new businesses in the area, which would increase county revenues and provide employment opportunities. The counties might use new revenues to provide services, including programs to train unskilled workers. Overall, population growth and urban development would boost the regional economies under the cumulative condition.

Table 3.10-~~35~~41. Population Projections in the Seller Service Area Cropland Idling Counties

County	2015 Population	2030 Population	Total Growth Rate (%) 2015 to 2030
Glenn	28,871	33,552	16%
Colusa	22,417	29,023	29%
Yolo	209,198	250,414	20%
Sutter	98,833	133,010	35%
Solano	424,494	493,422	16%
Butte	224,955	284,082	26%

Source: California Department of Finance 2013

Section 3.9 discusses potential conversion of agricultural land to urban uses in the Seller Service Area. As described above, urban development would boost the regional economy; however, it would adversely affect the agricultural economy through loss of agricultural land. Agricultural to urban land conversions would affect incomes and employment for farm workers and agricultural businesses in the area as crop production decreased. However, crop yield increases might outpace agricultural land conversions, conversions to higher-value crops increase value of production, and some share of urban development will include agricultural service industries. Even with land conversion, agriculture is very likely to remain a dominant sector in the regional economy in the Sacramento Valley under the cumulative conditions.

There are also land protection programs in the Seller Service Area designed to preserve land in agriculture and open space. These programs, such as the California Land Conservation (Williamson) Act, provide financial assistance for growers who keep their land in private ownership and continue agricultural production. Under the cumulative condition, land protection programs would help maintain agricultural acreage, sales and employment for agricultural businesses.

Local Government Finances

Cropland idling and shifting transfers in combination with other cumulative projects could affect local government finances in the Seller Service Area. Many factors affect local government finances. Increasing urban development would increase construction activity. Construction can result in a temporary influx in spending in a county, which would increase sales tax revenues. Once constructed, development would likely increase property values and property tax revenues to local governments. Effects of construction and development would be a positive economic effect under the cumulative condition. CVP cropland idling transfers would reduce some spending in the region to support agriculture, which would reduce sales tax revenues to local governments. These reductions would be temporary and minor under the Proposed Action.

Groundwater Substitution Transfers
Section 3.3, Groundwater Resources, concludes that cumulative effects to groundwater levels would be significant. As a result, there would be adverse cumulative effects because of increased groundwater pumping costs.

Mitigation measure GW-1 (see Section 3.3, Groundwater Resources) establishes monitoring programs for groundwater substitution transfers. The programs would monitor groundwater level fluctuations within the local pumping area and if effects were reported or occurred, the participating selling agencies would implement appropriate mitigation, also described in mitigation measure GW-1. Mitigation measure GW-1 would reduce the effects of increased groundwater pumping costs for well owners in areas where groundwater levels decline as a result of transfers. This would reduce adverse cumulative economic effects of increased pumping costs of the Proposed Action.

Stored Reservoir Release and Conservation Transfers
Revenues received from stored reservoir release and conservation water transfers, in combination with other revenues and expenses, could increase operating incomes for sellers. Water districts often face increasing operation and maintenance costs and aging infrastructure and do not have new revenue sources to cover increasing costs. Increasing population growth in the Seller Service Area also requires water districts to develop urban water supplies under the cumulative condition. Water transfer revenues received by selling agencies could support financing of existing and planned activities to replace aging infrastructure and meet increasing demands. A portion of the revenues may go toward debt service, but another portion is likely to be spent in the regional economy on supplies and services, which would be a positive economic effect. Increased revenues would also support district employment and employee compensation.

Buyer Service Area Use of Transfer Water
Water transfers in combination with other cumulative projects would provide water for agricultural uses that could support revenues, economic output, and employment. Under the cumulative condition, agricultural water users in Merced, San Benito, San Joaquin, Stanislaus, Fresno, and Kings counties face increasing limitations on water supplies and pressures from urban development. Water transfers would provide some water to supplement CVP supplies, but would not eliminate future water supply shortages under the cumulative condition.

Figure 3.10-8 shows 2002 to 2013 unemployment rates in the six counties (Employment Development Department 2013). All counties have consistently had higher annual unemployment rates than the state average. During the 2009 to 2011 economic recession, the counties experienced high levels of unemployment relative to previous years. Water transfers to agricultural uses would provide farm worker jobs and have positive employment, labor income,

and output effects in the regional economy. These effects would be temporary and only occur when transfers are implemented.

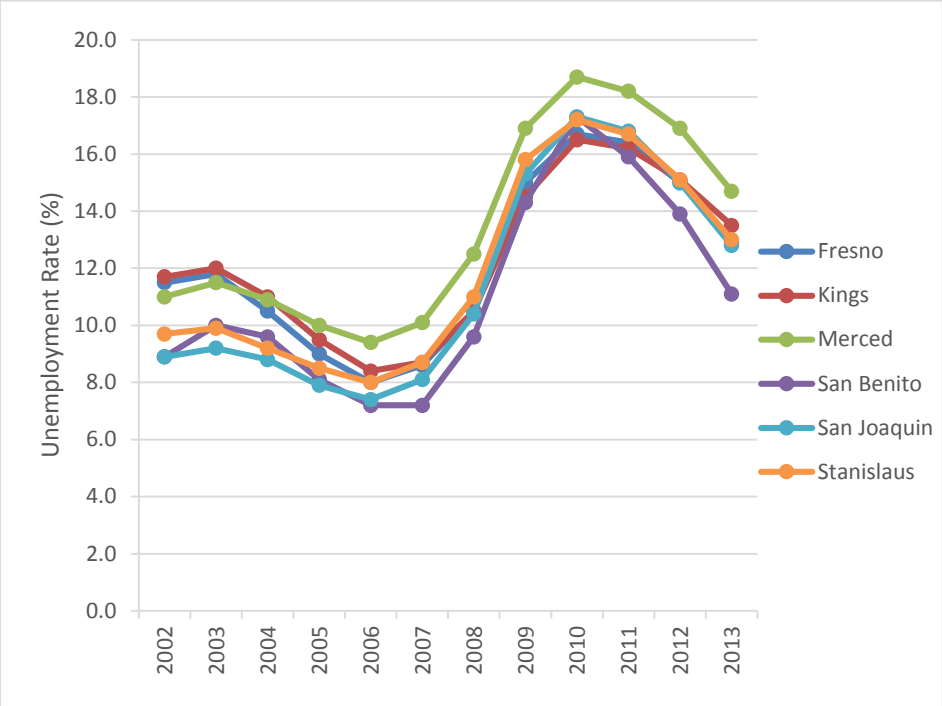

Figure 3.10-8. 2002-2013 Unemployment Rates in Buyer Service Area

Table 3.10-~~36~~ 42 shows projected population growth in Merced, San Benito, San Joaquin, Stanislaus, Fresno, and Kings counties. Population growth would increase the demand for housing and services, resulting in new construction and urban development. Urban development would include new businesses in the area, which would increase county revenues and provide employment opportunities. The counties could use new revenues to provide services, including programs to train unskilled workers. Overall, population growth and urban development would boost the regional economies under the cumulative condition.

Table 3.10-~~36~~42. Population Projections in the Merced, San Benito, San Joaquin, Stanislaus, Fresno and Kings Counties

County	2015 Population	2030 Population	Total Growth Rate (%) 2015 to 2030
Merced	273,156	366,352	34%
San Benito	57,512	69,215	20%
San Joaquin	725,884	1,004,147	38%
Stanislaus	540,853	674,859	25%
Fresno	988,970	1,241,773	26%
Kings	157,314	205,627	31%

Source: California Department of Finance 2013

Urban development would increase agricultural land conversions and permanently remove land from agricultural production. Section 3.9 discusses projected agricultural to urban land conversions in the counties. Water transfers under the Proposed Action would not be a permanent water source and would not likely change a landowners' decision to sell to developers in the long-term.

Refuge transfers could occur from sellers in the San Joaquin Valley near the Buyer Service Area. The single main seller of water supplies for refuge transfers is the San Joaquin River Exchange Contractors Water Authority. Water would be made available for refuges through cropland idling. Cropland idling in the sellers' areas would reduce agricultural employment and production. Refuge transfers would not affect agricultural employment or production in the Seller Service Area in the Sacramento Valley; therefore, refuge transfers in combination with the Proposed Action would not result in cumulative effects to regional economies in the Seller Service Area.

CVP water transfers in combination with other cumulative projects would provide water for M&I uses that could support economic activity and quality of living. The CVP M&I WSP and SWP transfers could increase M&I water supply to M&I contractors (East Bay MUD, Contra Costa WD, and Santa Clara Valley WD) during dry and critical years under the cumulative condition. The M&I contractors would also purchase water transfers during dry and critical years to supplement existing supplies. During the 10-year transfer period, a multi-year drought may require M&I contractors to implement water shortage contingency plans that require mandatory conservation measures and other drought relief actions. Supplementing a water supply during drought conditions could increase economic activity. Water supply provided by transfers would also help maintain the customers' quality of living relative to both indoor and outdoor water uses. Under the cumulative condition, the M&I WSP and water transfers would improve water supply reliability and support the regional economy.

Alameda, Contra Costa, and Santa Clara counties have projected population growth. Table 3.10-~~37~~ 43 shows population projections in the three counties.

Table 3.10-~~37~~43. Population Projections in the Alameda, Contra Costa, and Santa Clara Counties

County	2015 Population	2030 Population	Total Growth Rate (%) 2015 to 2030
Alameda	1,577,938	1,657,567	5%
Contra Costa	1,093,171	1,254,205	15%
Santa Clara	1,874,604	1,986,545	6%

Source: California Department of Finance 2013

Population growth would increase the demand for housing and services, resulting in new construction and urban development. Urban development

would be associated with new businesses in the area, which would increase county revenues and provide employment opportunities. This would result in positive economic effects under the cumulative condition.

3.10.4.2 Alternative 3: No Cropland Modification

Cumulative effects would be the same as described for the Proposed Action in the Seller and Buyer Service Areas.

3.10.4.3 Alternative 4: No Groundwater Substitution

Cumulative effects would be the same as described for the Proposed Action in the Seller and Buyer Service Areas.

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Section 3.11
Environmental Justice

This section discusses environmental justice within the area of analysis and evaluates potential effects to minority and/or low-income populations from the proposed alternatives. The concept of environmental justice embraces two principles: 1) fair treatment of all people regardless of race, color, nation of origin, or income, and 2) meaningful involvement of people in communities potentially affected by proposed actions.

The concept of environmental justice as applied here is that minority and low-income people should not be adversely and disproportionately affected by economic and quality of life effects from implementation of the Proposed Action. Proposed cropland idling and crop shifting transfers could affect farm labor employment by temporarily reducing the amount of agricultural land in production and the number of farmworkers needed to work on agricultural fields. Groundwater, stored reservoir release and conservation transfers would not result in environmental justice effects; therefore, these measures are not further discussed in this analysis.

3.11.1 Affected Environment/ Environmental Setting

This section describes the area of analysis and presents county demographic, economic, and agricultural data in regard to environmental justice issues.

3.11.1.1 Area of Analysis

The area of analysis for environmental justice includes counties where cropland idling and/or crop shifting transfers could occur and counties where transferred water would be used for agricultural purposes. Figure 3.11-1 shows the environmental justice area of analysis.

Figure 3.11-1. Environmental Justice Area of Analysis

3.11.1.2 Regulatory Setting

The following section describes the applicable laws and regulations pertaining to environmental justice.

3.11.1.2.1 Federal

Executive Order 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, issued* February 11, 1994, requires all federal agencies to conduct "programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin." Section 1-101 of the Order requires federal agencies to identify and address "disproportionately high and

adverse human health or environmental effects" of programs on minority and low-income populations (Executive Order 1994).

The Council on Environmental Quality (CEQ) (1997) states that environmental justice concerns may arise from effects on the natural or physical environment, such as human health or ecological effects on minority or low-income populations, or from related social or economic effects.

3.11.1.2.2 State

California law defines environmental justice as the "fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies," in Government Code Section 65040.12(e). Section 65040.12(a) designates the Governor's Office of Planning and Research (OPR) as the coordinating agency in State government for environmental justice programs and directs the agency to coordinate with Federal agencies regarding environmental justice information. OPR incorporated environmental justice into the *State of California 2003 General Plan Guidelines* (OPR 2003) and recommended that policies supportive of environmental justice be incorporated into all general plan elements.

3.11.1.3 Existing Conditions

This section presents the most current and available data relevant to identifying environmental justice conditions within the area of analysis.

3.11.1.3.1 Existing Regional Demographic and Economic Characteristics

This section presents the existing regional demographic and economic characteristic census data, from the 2012 American Community Survey Estimates by the U.S. Census Bureau for the area of analysis. Information for the State of California as a whole is presented for comparison purposes. See Section 3.11.2.1 below for definitions and assessment methodology on the identified thresholds to determine a minority or low-income affected area.

Seller Service Area

Table 3.11-1 presents the demographic characteristics of the Seller Service Area. This data shows that Colusa, Solano, Sutter, and Yolo counties all exhibit a total minority proportion exceeding 50 percent. All of these counties are considered minority affected areas within the Seller Service Area. Colusa County is the only county that has a Hispanic ethnic population that exceeds that of the State average, at 38.2 percent, suggesting that the high total minority percentage in this region is closely related to the proportion of Hispanic residents.

Table 3.11-3 presents the median household income, proportion of individuals living below the poverty threshold, and current unemployment rates for the Seller Service Area. The data shows that all counties within the Seller Service Area, for the exception of Solano County, have a median household income lower than the state; however, these counties do not fall below the U.S. Census Bureau's defined poverty thresholds for a family of four or an individual. Butte, Sutter and Yolo counties all have a higher proportion of low-income residents than compared to the State (12.9 percent); however, these counties do not surpass the identified 25.8 percent poverty level threshold. All counties within the Seller Service Area, for the exception of Yolo County, have an unemployment rate higher than the state. By definition, there are no low-income affected areas in the Seller Service Area.

Buyer Service Area

Table 3.11-2 presents the racial and ethnic composition of the Buyer Service Area. This data shows that all the counties within the Buyer Service Area, including Fresno, Kings, Merced, San Benito, San Joaquin and Stanislaus, exhibit a total minority proportion exceeding 50 percent. In addition all counties have Hispanic populations that exceed that of the state average, at 38.2 percent, suggesting that the high total minority percentage in the region is closely related to the proportion of Hispanic residents. All Buyer Service Area counties are considered minority affected areas.

Table 3.11-4 presents the median household income, proportion of individuals living below the poverty threshold and current unemployment rates for the Buyer Service Area. This data shows that all Buyer Service Area counties other than San Benito County has a median household income lower than the state average; however, none of the counties fall below the U.S. Census Bureau's defined poverty thresholds for a family of four or an individual. Also, these counties have a higher proportion of low-income residents compared to the state (12.9 percent); however, neither county surpasses the identified 25.8 percent poverty level threshold. All counties within the Buyer Service Area have an unemployment rate higher than the state. By definition, there are no low-income affected areas in the Buyer Service Area.

Table 3.11-1. Seller Service Area Demographic Characteristics, 2012

Geographic Area	Total Population	Race[1]							Hispanic Origin[2]		Total Minority[3]
		White	Black/ African American	American Indian and Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Some Other Race	Two or More Races	White Alone, Non-Hispanic	All Race, Hispanic	
Butte	**221,539 (100%)**	**188,102 (84.9%)**	**3,425 (1.5%)**	**1,892 (0.9%)**	**10,111 (4.6%)**	**153 (0.1%)**	**4,273 (1.9%)**	**13,583 (6.1%)**	**164,755 (74.4%)**	**32,875 (14.8%)**	**56,784 (25.6%)**
Colusa	**21,421 (100%)**	**16,733 (78.1%)**	**111 (0.5%)**	**250 (1.2%)**	**238 (1.1%)**	**4 (0.0%)**	**3,054 (14.3%)**	**1,031 (4.8%)**	**8,376 (39.1%)**	**11,976 (55.9%)**	**13,045 (60.8%)**
Glenn	28,090 (100%)	23,707 (84.4%)	244 (0.9%)	589 (2.1%)	734 (2.6%)	0 (0.0%)	1,854 (6.6%)	962 (3.4%)	17,381 (61.9%)	10,709 (38.1%)	13,709 (48.8%)
Solano	**420,757 (100%)**	**227,816 (54.1%)**	**55,648 (13.2%)**	**2,055 (0.5%)**	**64,570 (15.3%)**	**3,944 (0.9%)**	**36,095 (8.6%)**	**30,629 (7.3%)**	**169,048 (40.2%)**	**104,203 (24.8%)**	**251,709 (59.8%)**
Sutter	**95,022 (100%)**	**66,209 (69.7%)**	**1,412 (1.5%)**	**1,600 (1.7%)**	**13,962 (14.7%)**	**51 (0.1%)**	**6,248 (6.6%)**	**5,540 (5.8%)**	**46,358 (48.8%)**	**27,878 (29.3%)**	**48,664 (51.2%)**
Yolo	**204,118 (100%)**	**136,360 (66.8%)**	**5,129 (2.5%)**	**1,806 (0.9%)**	**28,186 (13.8%)**	**640 (0.3%)**	**20,778 (10.2%)**	**11,219 (5.5%)**	**99,667 (48.8%)**	**63,340 (31.0%)**	**104,451 (51.1%)**
California	**38,041,430 (100%)**	**23,628,545 (62.1%)**	**2,263,723 (6.0%)**	**285,342 (0.8%)**	**5,120,354 (13.5%)**	**146,712 (0.4%)**	**4,912,894 (12.9%)**	**1,683,860 (4.4%)**	**14,904,055 (39.2%)**	**14,537,661 (38.2%)**	**23,137,375 (60.8%)**

Source: U.S. Census Bureau 2012a.

Notes:

[1] A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic.

[2] The term "Hispanic" is an ethnic category and can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic residents for each geographic region are tabulated separately from the racial distribution by the U.S. Census Bureau.

[3] "Total Minority" is the aggregation of all non-white racial groups with the addition of all Hispanics, regardless of race with the total for "Not Hispanic or Latino: While Alone" subtracted from the total population.

Key:

Boldface denotes areas with meaningfully greater total minority proportion (more than 50 percent).

% = percent

Table 3.11-2. Buyer Service Area Demographic Characteristics, 2012

Geographic Area	Total Population	Race[1]							Hispanic Origin[2]		Total Minority[3]
		White	Black/ African American	American Indian and Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Some Other Race	Two or More Races	White Alone, Non-Hispanic	All Race, Hispanic	
Fresno	**940,493 (100%)**	**533,459 (56.7%)**	**47,433 (5.0%)**	**9,534 (1.0%)**	**90,960 (9.7%)**	**1,373 (0.1%)**	**218,696 (23.3%)**	**39,038 (4.2%)**	**302,405 (32.2%)**	**477,827 (50.8%)**	**638,088 (67.8%)**
Kings	**151,869 (100%)**	**112,399 (74.0%)**	**10,049 (6.6%)**	**1,704 (1.1%)**	**6,109 (4.0%)**	**301 (0.2%)**	**15,103 (9.9%)**	**6,204 (4.1%)**	**53,055 (34.9%)**	**78,299 (51.6%)**	**98,824 (65.0%)**
Merced	**262,305 (100%)**	**157,661 (60.1%)**	**9,337 (3.5%)**	**2,839 (1.0%)**	**20,014 (7.6%)**	**1,016 (0.3%)**	**60,222 (22.9%)**	**11,216 (4.2%)**	**79,926 (30.5%)**	**147,210 (56.1%)**	**182,379 (69.5%)**
San Benito	**56,210 (100%)**	**47,911 (85.2%)**	**616 (1.1%)**	**472 (0.8%)**	**1,095 (1.9%)**	**0 (0.0%)**	**4,020 (7.2%)**	**2,096 (3.7%)**	**21,206 (37.7%)**	**32,002 (56.9%)**	**35,004 (62.2%)**
San Joaquin	**702,612 (100%)**	**395,346 (56.2%)**	**50,103 (7.1%)**	**5,158 (0.7%)**	**100,563 (14.3%)**	**4,031 (0.5%)**	**91,540 (13.0%)**	**55,871 (7.9%)**	**244,786 (34.8%)**	**279,104 (39.7%)**	**457,826 (65.1%)**
Stanislaus	**521,726 (100%)**	**395,749 (75.8%)**	**14,118 (2.7%)**	**3,515 (0.6%)**	**27,678 (5.3%)**	**3,884 (0.7%)**	**54,101 (10.3%)**	**22,681 (4.3%)**	**237,445 (45.5%)**	**224,498 (43.0%)**	**284,281 (54.4%)**
California	**38,041,430 (100%)**	**23,628,545 (62.1%)**	**2,263,723 (6.0%)**	**285,342 (0.8%)**	**5,120,354 (13.5%)**	**146,712 (0.4%)**	**4,912,894 (12.9%)**	**1,683,860 (4.4%)**	**14,904,055 (39.2%)**	**14,537,661 (38.2%)**	**23,137,375 (60.8%)**

Source: U.S. Census Bureau 2012a.

Notes:

[1] A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic.

[2] The term "Hispanic" is an ethnic category and can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic residents for each geographic region are tabulated separately from the racial distribution by the U.S. Census Bureau.

[3] "Total Minority" is the aggregation of all non-white racial groups with the addition of all Hispanics, regardless of race with the total for "Not Hispanic or Latino: White Alone" subtracted from the total population.

Key:

Boldface denotes areas with meaningfully greater total minority proportion (more than 50 percent).

% = percent

Table 3.11-3. Seller Service Area Economic Characteristics, 2012

Geographic Area	Median Household Income[1, 2]	Percent Population Below Poverty Threshold[3]	Unemployment Rate
Butte	$40,960	13.6%	15.0%
Colusa	$51,016	12.1%	13.9%
Glenn	$38,920	12.0%	12.9%
Solano	$62,066	10.9%	13.6%
Sutter	$47,081	16.8%	12.9%
Yolo	$50,594	8.5%	10.9%
California	$58,328	12.9%	11.4%

Source: U.S. Census Bureau 2012a.

Notes:

[1] Household income is defined by the United States Census Bureau as "the sum of money income received in the calendar year by all household members 15 years old and over" (United States Census Bureau 2014).

[2] In 2012 inflation adjusted dollars.

[3] The census classifies families and persons as below poverty "if their total family income or unrelated individual income was less than the poverty threshold" as defined for all parts of the country by the federal government (United States Census Bureau 2012b). For 2012, the federal weighted average poverty level threshold for an individual was $11,720 and the 23,492 for a family of four (two adults and two children)

Key: % = percent

Table 3.11-4. Buyer Service Area Economic Characteristics, 2012

Geographic Area	Median Household Income[1, 2]	Percent Population Below Poverty Threshold[3]	Unemployment Rate
Fresno	$44,312	22%	15.7%
Kings	$47,112	17.8%	16.5%
Merced	$42,449	19.0%	16.9%
San Benito	$62,786	9.1%	15.2%
San Joaquin	$50,722	14.7%	16.0%
Stanislaus	$46,405	16.0%	17.2%
California	$58,328	12.9%	11.4%

Source: U.S. Census Bureau 2012a.

Notes:

[1] Household income is defined by the United States Census Bureau as "the sum of money income received in the calendar year by all household members 15 years old and over" (United States Census Bureau 2014).

[2] In 2012 inflation adjusted dollars.

[3] The census classifies families and persons as below poverty "if their total family income or unrelated individual income was less than the poverty threshold" as defined for all parts of the country by the federal government (United States Census Bureau 2012b). For 2012, the federal weighted average poverty level threshold for an individual was $11,720 and the 23,492 for a family of four (two adults and two children)

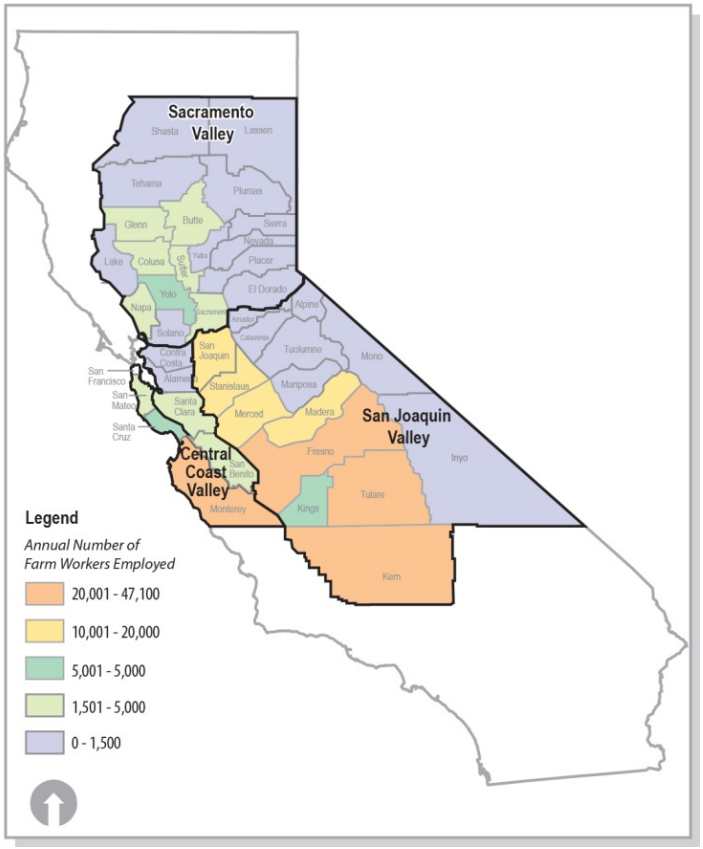
Key: % = percent

3.11.1.3.2 Agricultural Employment

Proposed cropland idling or shifting transfers could affect agricultural employment by changing the crops grown or decreasing the amount of agricultural production. This could potentially reduce the need for farm labor and the number of agricultural jobs available in the Seller Service Area. Water transferred to the Buyers Service Area for agricultural use could support agricultural employment. Figure 3.11-2 shows a detailed map of the distribution of agricultural employment in 2012 for the Sacramento, San Joaquin Valley and Central Coast Valley regions that encompass the seller and buyer serve areas.

Seller Service Area

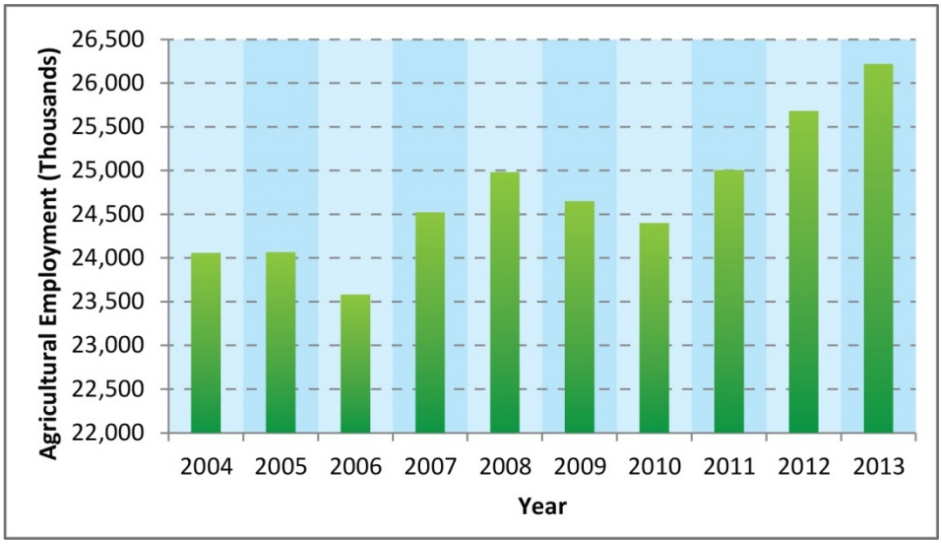
Counties within the Seller Service Area are located within the Sacramento Valley region. Figure 3.11-2 presents the State's agricultural employment for the year 2012. Based on this data, Yolo County employed the largest amount of agricultural employees in the region, employing between 5,001 and 10,000 people. The Sacramento Valley region comprised approximately 6.5 percent of the State's agricultural employment in 2012 (Employment Development Department [EDD] 2012a and EDD 2013).



Source: EDD 2012a

Figure 3.11-2. California Agricultural Employment by Region, 2012

Figure 3.11-3 shows historical agricultural employment between 2002 and 2012 for the Sacramento Valley region. In 2012, the Sacramento Valley region employed over 25,600 people in the agricultural labor market. In 2006, farm worker employment was the lowest for the region with approximately 23,500 jobs. The region has experienced a steady increase in agricultural jobs since 2010.



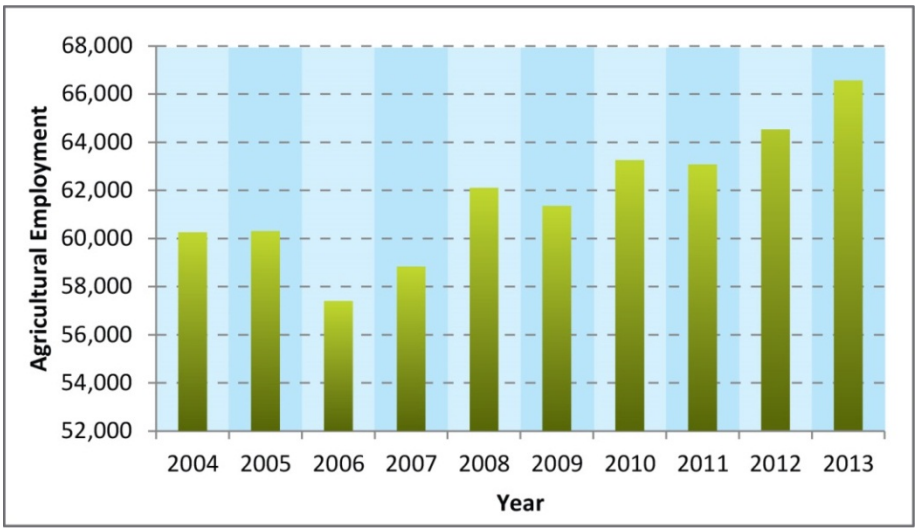
Source: EDD 2013.
Notes: 2013 Data includes only the months of January to October.

Figure 3.11-3. Sacramento Valley Region Historical Agricultural Employment

Buyer Service Area

Counties within the Buyer Service Area are divided into two agricultural geographical regions. San Benito County is within the Central Coast Agricultural Employment Region, and the other counties are within the San Joaquin Valley Agricultural Employment Region.

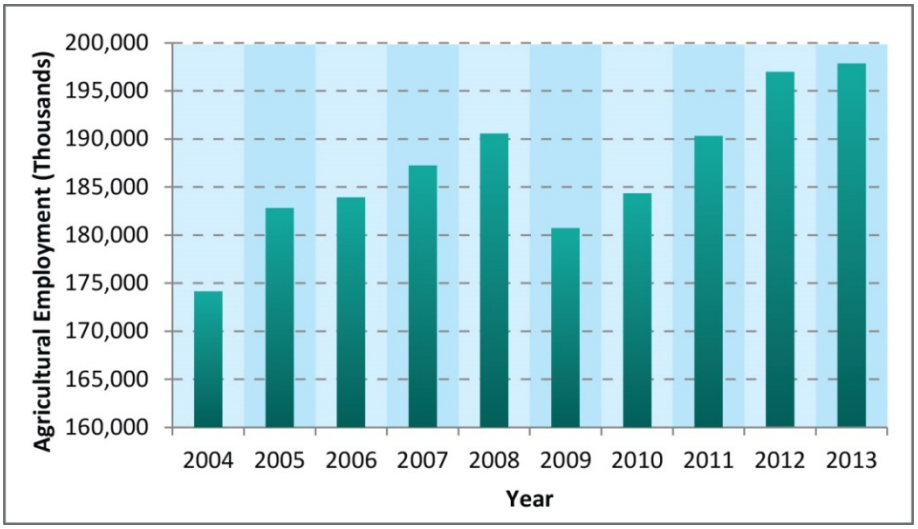
Figure 3.11-4 shows historical agricultural employment between 2002 and 2012 for the Central Coast Agricultural Region. The Central Coast region's agricultural employment has fluctuated over the past ten years with the least amount of agricultural employment occurring in the year 2006, with approximately 57,000 agricultural employed persons. San Benito County alone employed between 1,501 and 5,000 people in the agricultural industry in 2012. As a whole, the Central Coast region comprised approximately 16.2 percent of the State's agricultural employment in 2012 (EDD 2012a and EDD 2013).



Source: EDD 2013.
Notes: 2011 Data includes only the months of January to October.

Figure 3.11-4. Central Coast Region Historical Agricultural Employment

Figure 3.11-5 shows historical agricultural employment between 2002 and 2012 for the San Joaquin Valley region. For the past ten years, the San Joaquin Valley region has consistently employed over 174,000 people annually in the agricultural industry. The region experienced a decline in agricultural employment between the years 2008 and 2009, but has experience a steady increase in proceeding years. The San Joaquin Valley region comprised approximately 49.5 percent of the State's agricultural employment in 2012 (EDD 2012a and EDD 2013).



Source: EDD 2013.
Notes: 2011 Data includes only the months of January to October.

Figure 3.11-5. San Joaquin Valley Region Historical Agricultural Employment

According to EDD's 2008 Agricultural Report, Hispanics comprised 67.9 percent, or two-thirds of the State's agricultural employment in 2008. Fourteen percent of farmworkers reported unemployment and half reported an annual family income of less than $35,000. The majority of employed farmworkers earned $10 or less per hour. Based on these statistics, it is assumed that the majority of California farmworkers are minority and low-income, and could be affected by cropland idling or crop shifting transfers. Tables 3.11-5 through 3.11-10 below describe demographic and economic characteristic data from the U.S. Department of Agriculture (USDA) 2012 Census of Agriculture, U.S. Census Bureau's 2010 Census, and EDD's 2008 Agricultural Report. Information for the State of California as a whole is presented for comparison purposes.

Tables 3.11-5 and 3.11-6 present the racial and ethnic composition of farm operators in both the Seller and Buyer Service Areas. This data shows that the vast majority of farm operators in all counties are White, with the lowest percentage exhibited by Sutter County (71.4 percent), which has a large percentage of Asian operators (20.8 percent). For the exception of Butte and Sutter counties, Hispanic farm operators are higher than the state average (11.9 percent compared to 14 percent).

Tables 3.11-7 and 3.11-8 present the racial and ethnic composition of laborers and helpers in the Seller and Buyer Service Areas. Information for the State of California as a whole is presented for comparison purposes. The category "laborers and helpers" excludes construction personnel, as they are captured under a different category by the U.S. Census Bureau; however, the category is not necessarily exclusive to farm laborers and the data may include other manual labor sectors as part of the total. Regardless, the race and ethnic composition of this sector suggests that laborers and helpers, as an employment sector, are generally of minority status, with Hispanics comprising the largest proportion of laborers and helpers, in most cases exceeding that of the state (58.5 percent). This data suggest that impacts to the agricultural industry could be considered to disproportionately accrue to environmental justice populations. According to the CEQ guidance (1997), agencies may consider environmental justice communities either as a group of individuals living in geographic proximity to one other, or "a geographically dispersed/transient set of individuals (such as migrant workers or Native American[s]), where either type of group experiences common conditions of environmental exposure or effect."

Tables 3.11-9 and 3.11-10 present median annual wage information for farming occupations in Seller and Buyer Service Areas. While this data does not demonstrate as clearly as the U.S. Census data the proportion of residents living below the poverty threshold, the information presented in this table does suggest that median incomes in the farming industry are lower than the median income for all industries, with less skilled workers (graders and sorters, farmworkers) earning close to 50 percent of the median wage than that of the state. These data also suggest that impacts to the agricultural industry could be considered to disproportionately accrue to environmental justice populations.

Table 3.11-5. Farm Operators Demographic Characteristics in the Seller Service Area, 2012

Geographic Area	Total Farm Operators	White	Black/African American	American Indian and Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Two or More Races	All Races, Hispanic
Butte	3,230 (100%)	2,908 (90.0%)	4 (0.1%)	70 (2.1%)	141 (4.3%)	4 (0.1%)	28 (0.8%)	295 (9.1%)
Colusa	1,372 (100%)	1,246 (90.8%)	2 (0.1%)	10 (0.7%)	44 (3.2%)	8 (0.5%)	7 (0.5%)	151 (11.0%)
Glenn	2,122 (100%)	1,935 (91.1%)	11 (0.5%)	19 (0.8%)	64 (3.0%)	1 (0.0%)	19 (0.8%)	272 (12.8%)
Solano	1,395 (100%)	1,280 (91.7%)	20 (1.4%)	18 (1.2%)	40 (2.8%)	NA	10 (0.7%)	161 (11.5%)
Sutter	2,297 (100%)	1,641 (71.4%)	3 (0.1%)	41 (1.7%)	479 (20.8%)	13 (0.5%)	29 (1.2%)	179 (7.7%)
Yolo	1,759 (100%)	1,486 (84.4%)	15 (0.8%)	20 (1.1%)	113 (6.4%)	7 (0.3%)	12 (0.6%)	222 (12.6%)
California	126,099 (100%)	111,141 (88.1%)	526 (0.4%)	1,761 (1.3%)	7,474 (5.9%)	455 (0.3%)	1,030 (0.8%)	15,123 (11.9%)

Source: USDA 2012.

Notes:

"Total Minority" cannot be computed from the data provided by the USDA Agriculture Census, as a tabulation of "White Alone, Non-Hispanic" farm operators is not provided.

Key: % = percent

Table 3.11-6. Farm Operators Demographic Characteristics in the Buyer Service Area, 2012

Geographic Area	Total Farm Operators	White	Black/African American	American Indian and Alaska Native	Asian	Native Hawaiian/ Pacific Islander	Two or More Races	All Races, Hispanic
Fresno	9,000 (100%)	6,964 (77.3%)	52 (0.5%)	140 (1.5%)	1,499 (16.6%)	36 (0.4%)	71 (0.7%)	1,616 (17.9%)
Kings	1,941 (100%)	1,621 (83.5%)	13 (0.6%)	29 (1.4%)	74 (3.8%)	7 (0.3%)	8 (0.4%)	235 (12.1%)
Merced	4,170 (100%)	3,585 (85.9%)	14 (0.3%)	41 (0.9%)	323 (7.7%)	35 (0.8%)	14 (0.3%)	572 (13.7%)
San Benito	1,015 (100%)	939 (92.5%)	3 (0.2%)	18 (1.7%)	24 (2.3%)	NA	3 (0.2%)	179 (17.6%)
San Joaquin	5,685 (100%)	5,051 (88.8%)	21 (0.3%)	61 (1.0%)	341 (5.9%)	15 (0.2%)	40 (0.7%)	580 (10.2%)
Stanislaus	6,567 (100%)	6,089 (92.7%)	18 (0.2%)	106 (1.6%)	153 (2.3%)	31 (0.4%)	56 (0.8%)	762 (11.6%)
California	126,099 (100%)	111,141 (88.1%)	526 (0.4%)	1,761 (1.3%)	7,474 (5.9%)	455 (0.3%)	1,030 (0.8%)	15,123 (11.9%)

Source: USDA 2012.

Notes:

"Total Minority" cannot be computed from the data provided by the USDA Agriculture Census, as a tabulation of "White Alone, Non-Hispanic" farm operators is not provided.

Key: % = percent

Table 3.11-7. Laborers and Helpers Demographic Characteristics in the Seller Service Area, 2010

Geographic Area	Total Laborers and Helpers	Race[1]					Hispanic Origin[2]		Total Minority[3]
		White	Black/ African American	American Indian and Alaska Native	Asian	Native Hawaiian/ Pacific Islander	White Alone, Non-Hispanic	All Race, Hispanic	
Butte	**5,595 (100%)**	**3,445 (61.6%)**	**105 (1.9%)**	**15 (0.3%)**	**120 (2.1%)**	**15 (0.3%)**	**880 (15.7%)**	**690 (12.3%)**	**4,715 (84.2%)**
Colusa	**1,715 (100%)**	**245 (14.3%)**	**0 (0.0%)**	**10 (0.6%)**	**4 (0.2%)**	**0 (0.0%)**	**575 (33.5%)**	**875 (51.0%)**	**1,140 (66.4%)**
Glenn	**1,755 (100%)**	**650 (37.0%)**	**0 (0.0%)**	**25 (1.4%)**	**0 (0.0%)**	**0 (0.0%)**	**605 (34.5%)**	**475 (27.1%)**	**1,150 (65.5%)**
Solano	**7,815 (100%)**	**2,225 (28.5%)**	**850 (10.9%)**	**20 (0.3%)**	**525 (6.7%)**	**95 (1.2%)**	**1,835 (23.5%)**	**1,960 (25.1%)**	**5,980 (76.5%)**
Sutter	**4,360 (100%)**	**870 (20.0%)**	**25 (0.6%)**	**45 (1.0%)**	**620 (14.2%)**	**0 (0.0%)**	**1,545 (35.4%)**	**1,135 (26.0%)**	**2,815 (64.5%)**
Yolo	**5,210 (100%)**	**1,515 (29.1%)**	**30 (0.6%)**	**20 (0.4%)**	**170 (3.3%)**	**0 (0.0%)**	**1,935 (37.1%)**	**1,325 (25.4%)**	**3,275 (62.8%)**
California	**870,025 (100%)**	**167,320 (19.2%)**	**29,900 (3.4%)**	**3,085 (0.4%)**	**34,505 (4.0%)**	**3,205 (0.4%)**	**360,550 (41.4%)**	**259,710 (29.9%)**	**509,475 (58.5%)**

Source: U.S. Census Bureau 2010.

Notes:

[1] A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic.

[2] The term "Hispanic" is an ethnic category and can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic residents for each geographic region are tabulated separately from the racial distribution by the U.S. Census Bureau.

[3] "Total Minority" is the aggregation of all non-white racial groups with the addition of all Hispanics, regardless of race with the total for "Not Hispanic or Latino: While Alone" subtracted from the total population.

Key: Boldface denotes areas with meaningfully greater total minority proportion (more than 50 percent). % = percent

Table 3.11-8. Laborers and Helpers Demographic Characteristics in the Buyer Service Area, 2010

Geographic Area	Total Laborers and Helpers	Race[1]					Hispanic Origin[2]		Total Minority[3]
		White	Black/ African American	American Indian and Alaska Native	Asian	Native Hawaiian/ Pacific Islander	White Alone, Non-Hispanic	All Race, Hispanic	
Fresno	46,120 (100%)	4,085 (8.9%)	580 (1.3%)	130 (0.3%)	1,160 (2.5%)	0 (0.0%)	24,800 (53.8%)	14,910 (32.3%)	21,320 (46.2%)
Kings	9,520 (100%)	1,430 (15.0%)	55 (0.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	6,415 (67.4%)	1,615 (17.0%)	3,105 (32.6%)
Merced	**13,835 (100%)**	**6,175 (44.6%)**	**175 (1.3%)**	**0 (0.0%)**	**405 (2.9%)**	**35 (0.3%)**	**2,305 (16.7%)**	**4,625 (33.4%)**	**11,530 (83.3%)**
San Benito	**3,350 (100%)**	**345 (10.3%)**	**0 (0.0%)**	**0 (0.0%)**	**0 (0.0%)**	**0 (0.0%)**	**1,135 (33.9%)**	**1,840 (54.9%)**	**2,215 (66.1%)**
San Joaquin	**22,330 (100%)**	**4,110 (18.4%)**	**840 (3.8%)**	**85 (0.4%)**	**1,245 (5.6%)**	**105 (0.5%)**	**8,845 (39.6%)**	**6,855 (30.7%)**	**13,485 (60.3%)**
Stanislaus	16,835 (100%)	4,195 (24.9%)	160 (1.0%)	25 (0.1%)	410 (2.4%)	75 (0.4%)	8,530 (50.7%)	3,245 (19.3%)	8,305 (49.3%)
California	**870,025 (100%)**	**167,320 (19.2%)**	**29,900 (3.4%)**	**3,085 (0.4%)**	**34,505 (4.0%)**	**3,205 (0.4%)**	**360,550 (41.4%)**	**259,710 (29.9%)**	**509,475 (58.5%)**

Source: U.S. Census Bureau 2010.

Notes:

[1] A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic.

[2] The term "Hispanic" is an ethnic category and can apply to members of any race, including respondents who self-identified as "White." The total numbers of Hispanic residents for each geographic region are tabulated separately from the racial distribution by the U.S. Census Bureau.

[3] "Total Minority" is the aggregation of all non-white racial groups with the addition of all Hispanics, regardless of race with the total for "Not Hispanic or Latino: While Alone" subtracted from the total population.

Key: Boldface denotes areas with meaningfully greater total minority proportion (more than 50 percent).% = percent

Table 3.11-9. Agricultural Workers Median Annual Wages in the Seller Service Area, 2012

Geographic Area	Farming, Fishing, and Forestry Occupations – Overall	First-Line Supervisors	Agricultural Inspectors	Graders and Sorters	Equipment Operators	Farmworkers (Crop, Nursery, and Greenhouse)	Farmworkers (Farm and Ranch Animals)	Agricultural Workers, All Other	Median Wage All Industries
Butte	$24,419	$69,875	NA	NA	$22,266	$19,963	$21,223	$38,175	$42,460
Colusa and Glenn[1]	$22,045	$42,837	NA	$26,405	NA	$19,648	$21,108	NA	$40,334
Solano	$22,017	$52,593	NA	NA	NA	$19,276	NA	NA	$49,281
Sutter	$20,622	$38,876	NA	$21,827	NA	$19,431	NA	NA	$42,633
Yolo	$24,718	$71,783	NA	$19,292	$26,950	$19,658	$25,809	$58,120	$52,261
California	$20,994	$43,958	$47,283	$19,594	$24,150	$19,551	$25,672	$28,725	$52,630

Source: EDD 2012b.
Notes:
[1] The EDD Occupational Employment & Wage data combines the counties of Colusa and Glenn, in addition to Tehama County, as part of the North Valley Region.
Key: No = applicable data not available for this jurisdiction

Table 3.11-10. Agricultural Workers Median Annual Wages in the Buyer Service Area, 2012

Geographic Area	Farming, Fishing, and Forestry Occupations – Overall	First-Line Supervisors	Agricultural Inspectors	Graders and Sorters	Equipment Operators	Farmworkers (Crop, Nursery, and Greenhouse)	Farmworkers (Farm and Ranch Animals)	Agricultural Workers, All Other	Median Wage All Industries
Fresno	$19,504	$31,512	$41,275	$19,847	$19,836	$18,821	$21,368	$38,584	$41,852
Kings	$19,786	$40,077	NA	$18,262	$23,403	NA	NA	$23,225	$45,004
Merced	$20,369	$37,484	NA	$19,643	$20,787	$18,467	NA	$28,184	NA
San Benito	$23,247	$52,471	$43,889	NA	$30,441	$19,813	$27,080	NA	$70,820
San Joaquin	$19,682	$44,505	$51,376	$18,751	$21,898	$18,356	$21,898	$39,273	$43,467
Stanislaus	$20,047	$43,186	$52,099	$19,972	$25,883	$18,986	$28,265	NA	$42,883
California	$20,994	$43,958	$47,283	$19,594	$24,150	$19,551	$25,672	$28,725	$52,630

Source: EDD 2012b.

3.11.2 Environmental Consequences/Environmental Impacts

The National Environmental Policy Act (NEPA) requires an analysis of social, economic, and environmental justice effects; however, there is no standard set of criteria for evaluating environmental justice impacts. According to the California Environmental Quality Act (CEQA), economic and social impacts are not considered significant effects on the environment. Therefore, no significance determinations are made or mitigation measures required in the impact analyses. For purposes of this Environmental Impact Statement/Environmental Impact Report, the No Action/No Project Alternative is the basis of comparison, as required by NEPA.

The section presents assessment methods performed to analyze the environmental justice effects and presents the potential environmental justice effects of the proposed alternatives.

3.11.2.1 Assessment Methods

This section describes the assessment methods used to analyze potential environmental justice effects of the project alternatives, including the No Action/No Project Alternative.

The CEQ (1997) recommends that the following three factors be considered by the environmental justice analysis to determine whether disproportionately high and adverse impacts may accrue to minority or low-income populations. Impacts on Indian tribes are discussed in detail in Section 3.12, Indian Trust Assets.

- Whether there is or would be an impact on the natural or physical environment that significantly and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural environment.

- Whether the environmental effects are significant and are, or may be, having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.

- Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards.

The methodologies and thresholds used in this analysis are taken from the U.S. Environmental Protection Agency's (USEPA) final guidance on incorporating environmental justice concerns into NEPA analysis (USEPA 1998) and help define minority and low-income populations. The guidance states that a minority and/or low-income population may be present in an area if the proportion of the populations in the area of interest are "meaningfully greater" than that of the general population, or where the proportion exceeds 50 percent of the total population.

3.11.2.1.1 Minority

The CEQ (1997) defines the term "minority" as persons from any of the following U.S. Census categories for race: Black/African American, Asian, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native. Additionally, for the purposes of this analysis, "minority" also includes all other nonwhite racial categories, such as "some other race" and "two or more races." The CEQ also mandates that persons identified through the U.S. Census as ethnically Hispanic, regardless of race, should be included in minority counts (CEQ 1997). Hispanic origin is considered to be an ethnic category separate from race, according to the U.S. Census. For this analysis, regional populations for the Seller and Buyer Service Areas were compared to the State of California as a whole. Regional populations exceeding 50 percent were considered environmental justice populations.

Based on demographic characteristic data presented above Colusa, Solano, Sutter, and Yolo counties in the Seller Service Area and counties in the Buyer Service Area are considered minority affected areas.

3.11.2.1.2 Low-Income

Persons living with income below the poverty level are identified as "low-income," according to the annual statistical poverty thresholds established by the U.S. Census Bureau. The U.S. Census Bureau poverty threshold indicates that the poverty level in 2012 for an individual was $11,720 and for a family of four (two adults and two children $23,492. The CEQ guidance states that a demographic area exhibiting a proportion of people living in poverty two times higher than the State average of 12.9 percent (A total of 25.8 percent was considered to be meaningfully greater for this analysis) are considered environmental justice populations (CEQ 2007). This analysis also considered whether an area's median household incomes were substantially lower than that of the state average.

Based on economic characteristic data presented above no low-income affected areas exist within the environmental justice area of analysis.

Although by definition no low-income affect areas exist, historical agricultural data presented above, depicts farmworkers within these counties as both minority and low-income populations that could be adversely and disproportionately affected by transfers. Because low-income – farmworker populations exist in all of the Seller and Buyer Service Area counties, these

counties are evaluated further as low-income populations for the purpose of this analysis.

3.11.2.1.3 Cropland Idling and Crop Shifting Transfers

Cropland idling and crop shifting transfers could have adverse and disproportionate effects on minority and low-income populations identified above.

If transfers resulted in adverse and disproportionate effects on farmworker employment, there would be environmental justice effects to minority populations. This analysis uses full-time labor equivalents per 1,000 acres of idled cropland to estimate the changes in farmworker employment that could be caused by cropland idling transfers. Crops considered in this analysis include alfalfa, corn, rice and tomatoes, which are assumed to be representative of potential crops eligible for idling. Section 3.10, Regional Economics, discusses the use of representative crops for the cropland idling analysis and Chapter 2 Project Description, and identifies all the eligible crops for idling.

Table 3.11-11 presents the full-time labor equivalents for each representative crop. Labor requirements are based upon University of California Cooperative Extension (UCCE) cost and return studies for each representative crop. The average number of full-time workers per 1,000 acres includes both machine and non-machine labor (UCCE 2007, 2008a, 2008b, and 2008c). The UCCE studies do not distinguish between migrant and non-migrant workers and only include on-farm, hired labor. While some farmworkers work overtime, this analysis is based on a standard 40-hour work week.

Table 3.11-11. Full-Time Labor Equivalents

Representative Crop	Number of Full Time Workers/1,000 acres
Alfalfa	1.0
Corn	5.5
Rice	2.5~~6~~
Tomatoes	13.7

Source: UCCE ~~2007~~2012, 2008a, 2008b, and 2008c.
Note:
Full-time labor equivalents are based on a 2,000 hour per acre assumption

This analysis calculates the farmworker employment effects from cropland idling by estimating the total number of jobs per acre times the number of acres that could be idled under each alternative. The maximum idling actions would not likely occur in a single year; therefore, average annual effects would be less than those described in this section. To determine if an effect would be adverse and disproportionately high on minority populations, this analysis compares losses in farmworker employment as a result of transfers to total farmworker employment in the region. The change is compared to historical fluctuations in farm worker employment in the region.

Any job losses in either the Seller or Buyer Service Area counties could result in adverse and disproportionately high effects on low-income populations. Section 3.10, Regional Economics, uses the IMPLAN software to derive the total number of jobs affected by cropland idling transfers. Farmworkers are only one labor category of many that could be affected by transfers. Other types of employment influenced by transfers could include, but are not limited to, agricultural support services, wholesale trade, and trucking services. This analysis compares decreases in employment to total employment within the region to determine if an effect wou1d be adverse and disproportionately high on low-income populations. Environmental justice effects of crop shifting transfers are evaluated qualitatively.

3.11.2.2 Alternative 1: No Action/No Project

3.11.2.2.1 Seller Service Area

There would be no adverse and disproportionate effects to minority and low-income farm workers in the Seller Service Area. Under the No Action/No Project Alternative, sellers in the Seller Service Area would not transfer water; therefore, there would be no effect to low income and minority populations in the Seller Service Area and there would be no change from existing conditions.

3.11.2.2.2 Buyer Service Area

There would be no adverse and disproportionate effects to minority and low-income farm workers in the Buyer Service Area. Under existing conditions, farmers in the Buyer Service Area face potential shortages in Central Valley Project (CVP) water supplies. Farmers take various actions in response to potential shortages, including cropland idling, shifting to less water intensive crops. Cropland idling or some shifting actions cause reductions in agricultural employment and adversely and disproportionately affect minority and low-income populations in the Buyer Service Area. Under the No Action/No Project Alternative, these actions would continue in response to CVP shortages.

As mentioned above, all counties in the Buyer Service Area are all considered minority and low-income populations. Reductions in farm employment because of idling fields could result in adverse and disproportionately high effects to minority and low-income farm workers under existing conditions. These conditions would continue under the No Action/No Project Alternative.

3.11.2.3 Alternative 2: Full Range of Transfers (Proposed Action)

3.11.2.3.1 Seller Service Area

Cropland idling transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area. Cropland idling transfers could reduce farm worker jobs, by temporarily taking farmland out of production and decreasing demand for farm labor. Table 3.11-12 presents the estimated maximum annual cropland idling acreage and crop type under the Proposed Action. A maximum of 59,973 acres could be idled under the Proposed Action; however, because cropland idling transfers are the lowest

priority for buyers, the maximum acreage would not likely be idled in each transfer year. In some transfer years, buyers would not purchase any transfer water via cropland idling. Farm labor effects would occur only when cropland idling transfers took place.

Table 3.11-12. Maximum Proposed Acreage for Cropland Idling under the Proposed Action

Region	Rice	Alfalfa	Corn	Tomatoes	Total Acres Idled~~(Acre Feet)~~
Colusa, Glenn, and Yolo counties	40,704	1,400	400	400	42,904
Solano County	0	3,000	1,500	0	4,500
Sutter, Butte counties	10,769	600	800	400	12,569
				Total	**59,973**

Table 3.11-13 identifies the number of full-time farm workers whose jobs would be affected by maximum cropland idling in each region. This was calculated using the full-time labor equivalents in Table 3.11-11 and the proposed cropland idling acreages in Table 3.11-12. Table 3.11-13 compares the number of farm workers who would lose jobs through cropland idling transfers to the total farm worker employment.

Table 3.11-13. Farm Worker Effects from Proposed Cropland Idling in the Seller Service Area under the Proposed Action

Region/ County	Total County Farmworkers[1]	Farm Worker Jobs Affected by Proposed Action	Percent of Total Farm Worker Employment Affected	Maximum Annual Percent Change in Farm Worker Employment from 2003 to 2013[1]
Glenn/ Colusa/Yolo	9,940	-161	0.02%	15% (occurred 2001-2002)
Solano	1,600	-15	0.01%	15% (occurred 2006-2007)
Sutter/Butte	6,600	-54	0.01%	9% (occurred 2003-2004)
Total	**18,140**	**-230**	**0.01%**	**5% (occurred 2007-2008)**

Source: EDD 2013.

Notes:

[1] Based on 2010 Labor Market Statistics.

Farm worker job losses as a result of cropland idling transfers are within historic annual fluctuation in farm worker employment. In most transfer years, fewer acres would be idled than those described here and effects to farm worker employment would be less. All farm worker effects of the Proposed Action would be temporary. Cropland idling under the Proposed Action would not result in an adverse and disproportionately high effect to farm workers.

Crop shifting transfers could adversely and disproportionately affect minority and low-income populations in the Seller Service Area. For crop shifting transfers, farmers would switch from a higher water use crop to a lower water use crop, such as wheat, and sell the excess water for transfer. In general, crop shifting would have smaller labor effects relative to cropland idling, because the farmer continues to produce a crop and must hire farm labor. Farmers would also continue to purchase inputs and services for crop production, which would support additional jobs throughout the regional economy. Therefore, crop shifting in the Seller Service Area would have a beneficial effect on minority and low-income populations.

3.11.2.3.2 Buyer Service Area

Use of cropland modification transfers could adversely and disproportionately affect minority and low-income farm workers in the Buyer Service Area. Under the Proposed Action, potential buyers in the Buyer Service Area would receive transfer water to supplement water supplies during dry and critical years. Water would be used for existing agricultural uses, which would support farm worker and other employment in the counties. Minority and low-income populations within the Buyer Service Area would benefit from a supplemented water source; therefore, transfers would have a beneficial effect on minority and low-income populations in the Buyer Service Area.

3.11.2.4 Alternative 3: No Cropland Modifications

3.11.2.4.1 Seller Service Area

Use of cropland modification transfer could adversely and disproportionately affect minority or low-income populations in the Seller Service Area. Under the No Cropland Modifications Alternative, cropland modifications would not occur; therefore, there would be no effect to low income and minority populations in the Seller Service Area from implementation of cropland idling or shifting transfers.

3.11.2.4.2 Buyer Service Area

Use of cropland modification transfers could adversely and disproportionately affect minority and low-income farm workers in the Buyer Service Area. Under the No Cropland Modifications Alternative, cropland modifications would not occur; however, the Buyer Service Area would still receive transfers through other methods, i.e., groundwater substitution. Minority and low-income populations within the Buyer Service Area would benefit from a supplemented

water source; therefore, transfers would have a beneficial effect on minority and low-income populations in the Buyer Service Area.

3.11.2.5 Alternative 4: No Groundwater Substitution

3.11.2.5.1 Seller Service Area

Cropland idling transfers could disproportionately and adversely affect minority and low-income farm workers in the Seller Service Area. Under the No Groundwater Substitution Alternative, effects on farm workers from cropland idling would be the same as those under the Proposed Alternative. Farm worker job losses as a result of crop idling transfers are within historic annual fluctuation in farm worker employment. In most transfer years, fewer acres would be idled than those described here and effects to farm worker employment would be less. All farm worker effects of the No Groundwater Substitution Alternative would be temporary. Cropland idling under the No Groundwater Substitution Alternative would not result in an adverse and disproportionately high effect to farm workers.

Crop shifting transfers could adversely and disproportionately affect minority and low-income populations in the Seller Service Area. Under the No Groundwater Substitution Alternative, effects on farm workers from crop shifting would be the same as those under the Proposed Alternative. For crop shifting transfers, farmers would switch from a higher water use crop to a lower water use crop, such as wheat, and sell the excess water for transfer. In general, crop shifting would have smaller labor effects relative to crop idling, because the farmer continues to produce a crop and must hire farm labor. Therefore, crop shifting in the Seller Service Area would have a beneficial effect on minority and low-income populations.

3.11.2.5.2 Buyer Service Area

Use of cropland modification transfers could adversely and disproportionately affect minority and low-income farm workers in the Buyer Service Area. Under the No Groundwater Substitution Alternative, effects on minority or low-income populations in the Buyer Service Area would be the same as those under the Proposed Project. Minority and low-income populations within the Buyer Service Area would benefit from a supplemented water source; therefore, transfers would have a beneficial effect on minority and low-income populations in the Buyer Service Area.

3.11.3 Comparative Analysis of Alternatives

Table 3.11-14 summarizes the potential effects of each of the action alternatives and the No Action/No Project Alternative.

Table 3.11-14. Comparative Analysis of the Alternatives

Potential Effect	Alternative	Conclusion
Cropland idling transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area.	2, 3	No disproportionately high or adverse effect
Crop shifting transfers could adversely and disproportionately affect minority and low-income farm workers in the Seller Service Area.	2, 3	No disproportionately high or adverse effect
Use of cropland modification transfers could adversely and disproportionately affect minority and low-income farm workers in the Buyer Service Area.	2, 3, 4	Beneficial

3.11.3.1 No Action/No Project Alternative

There would be no changes to the existing environmental justice conditions in the Seller Service Area. In the Buyer Service Area, farmers would continue to face water shortages and in response, would continue to idle fields. These actions would affect farm worker employment similar to existing conditions.

3.11.3.2 Alternative 2: Full Range of Transfers (Proposed Action)

Cropland idling transfers under the Proposed Action could decrease farm labor demands in environmental justice affected areas; however, these effects would be temporary in nature and minimal compared to total farm labor. Effects to the Buyer Service Area would be beneficial; as proposed transfers would increase water supplies in environmental justice affected areas and support farm worker and other employment opportunities.

3.11.3.3 Alternative 3: No Cropland Modifications

Alternative 3 does not include cropland modification transfers. The potential effects on minority and low-income populations in the Seller Service Area from these actions as described under the Proposed Action would not occur.

Because other transfers would still occur, including groundwater pumping, effects to the Buyer Service Area would be the same as those described under the Proposed Action.

3.11.3.4 Alternative 4: No Groundwater Substitution

Alternative 4 would have the same effects in both the Seller and Buyer Service Areas as those described under the Proposed Action.

3.11.4 Cumulative Effects

The timeframe for the environmental justice cumulative effects analysis extends from 2015 through 2024, a ten year period. The relevant geographic study area for the cumulative effects analysis is the same area of analysis as shown in Figure 3.11-1. The following section analyzes the cumulative effects using both the project and the projection methods, which are further described in Chapter 4. Chapter 4 describes the projects included in the cumulative condition and growth and development trends in the area of analysis.

The cumulative analysis for environmental justice considers projects and conditions that could affect employment and income for minority and low-income populations in the area of analysis.

The following sections describe potential environmental justice effects for each of the proposed alternatives.

3.11.4.1 Alternative 2: Full Range of Transfers (Proposed Action)

Cropland idling and crop shifting transfers under the Proposed Action in combination with other projects could cumulatively adversely and disproportionately affect minority and low-income populations in the Seller Service Area. Under the Proposed Action, some sellers would implement crop idling and or shifting measures in order to transfer water to buyers south of the Delta.

Similar to the water transfers in the Proposed Action, State Water Project (SWP) contractors could also implement water transfers that include crop idling and shifting measures. The transfers would be voluntary and on a year-to-year basis. The majority of SWP transfers would occur from sellers within the Feather River region, mostly in Butte and Sutter counties.

Cropland idling transfers within Butte and Sutter counties could result in additional crops to be taken out of production, further decreasing available employment for farm workers in the area. Under the Proposed Action, Butte and Sutter counties crop idling transfers could result in the idling of a maximum 12,569 acres, including a maximum of 10,769 acres of rice lands. This would decrease 54 farm worker jobs during the transfer year, and approximately 0.01 percent of total farm employment in the region. Cumulative effects could add an additional 37,111 acres of rice to be idled, which could reduce employment by an additional 133 jobs. The total cumulative effects would be minor relative to the regional baseline. Employment effects would be temporary, and because of the temporary nature of effects and the relatively low percentage of farm worker losses relative to total agricultural employment, crop idling would not cause a cumulative adverse and disproportionately high effect to minority and low-income farm workers.

Repeated SWP crop idling transfers within a small geographic area could result in adverse and disproportionately high cumulative effects to low-income and minority populations. During these years, the buyers would focus CVP crop idling transfers in locations outside of Sutter and Butte County. Therefore, the Proposed Action would not contribute to cumulative effects to minority and low-income farm workers.

Changes in agricultural land conversion and land protection programs could also affect farm worker employment in the cumulative condition. Section 3.9, Agricultural Land Use, describes several programs aimed at protecting agricultural and open space lands. The 2008 Farm Bill provides financial incentives and technical assistance to keep land in agricultural production (USDA 2008). These programs would help farmers keep their land in private

ownership and continue agricultural production in the long-term under the cumulative condition, which would protect jobs for minority and low-income farm workers.

Additionally, counties proposing crop idling transfers include agricultural elements in their local general plans that outlay policies and guidelines to preserve and protect agricultural resources and limit urban development and agricultural land conversions. Examples of these policies and programs include tax and economic incentives, the continued existence of large, contiguous areas of agricultural zoning, Williamson Act and Farmland Security Zone Programs, Right-to-Farm ordinances, and buffer zone requirements. These programs would also protect farm worker employment under the cumulative condition.

Agricultural land is being converted in support of urban development in the Seller Service Area. Permanent land conversions could decrease farm worker employment in the cumulative condition. Population projections generally reflect future development conditions, which assume conversion of undeveloped lands in order to accommodate projected increases in population. Section 3.9.6.1 includes population and land use projections for municipal areas in the Sellers Service Area. Development that converts farm land to non-agricultural uses would affect minority farmworker employment; however, urban development would likely include low-income housing and develop new job opportunities for minority and low-income populations. The Proposed Action in combination with other cumulative actions that could remove farmland from production could have a cumulatively adverse and disproportionate effect on minority and low-income employment. The Proposed Action would only involve temporary crop idling; therefore, the Proposed Action's incremental contribution to these cumulative effects would not be cumulatively considerable.

Water transfers under the Proposed Action in combination with other projects could cumulatively adversely or disproportionately affect minority and low-income residents in the Buyer Service Area. The Proposed Action would increase water supplies for agricultural uses in the Buyer Service Area, which would support farm worker employment. Farm protection programs and local general plan policies would preserve land in agricultural production; however, water supplies may not be available for irrigation. If water is not available, farmers may choose to idle land, which would reduce demands for farm worker employment. Refuge transfers could purchase water from sellers in the San Joaquin Valley near the Buyers Service Area that make water available through cropland idling, but this would represent a very small change in land use.

The loss of farmland to expanding urban uses could affect minority and low-income employment under the cumulative condition. Figure 3.11-2 shows that in 2012, these counties combined employed between about 75,000 and 160,000 people in the agricultural labor market. These counties populations are also projected to grow at some of the fastest rates in the Buyer Service Area

(Department of Finance 2007). This could reduce demand for agricultural employment as land is converted to urban uses.

Although urban development can potentially reduce available agricultural land, it also has the potential to provide additional job and economic opportunities for minority and low-income populations. Under the cumulative condition, agricultural to urban land use conversions could result in an adverse or disproportionate effect on minority and low-income populations in the Buyer Service Area; however, urban development could also provide additional economic and job opportunities for minority and low-income populations.

3.11.4.2 Alternative 3: No Cropland Modifications

Cropland idling and crop shifting transfers under Alternative 3 in combination with other projects could cumulatively adversely and disproportionately affect minority and low-income populations in the Seller Service Area. Since there would be no cropland modifications under Alternative 3 there would be no cumulative effect to minority and low-income populations.

Water transfers under Alternative 3 in combination with other cumulative projects could adversely or disproportionately affect minority and low-income residents in the Buyer Service Area. Cumulative effects in the Buyer Service Area under Alternative 3 would be the same as those described under the Proposed Action.

3.11.4.3 Alternative 4: No Groundwater Substitution

Cropland idling and crop shifting transfers under Alternative 4 in combination with other projects could cumulatively adversely and disproportionately affect minority and low-income populations in the Seller Service Area. Cumulative cropland modification effects under Alternative 4 would have the same effects as those experienced under the Proposed Action.

Water transfers under Alternative 4 in combination with other projects could cumulatively adversely or disproportionately affect minority and low-income residents in the Buyer Service Area. Cumulative effects in the Buyer Service Area would be the same as those described under the Proposed Action.

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Section 3.12
Indian Trust Assets

This section presents the Indian Trust Assets (ITAs) within the area of analysis and discusses potential effects on ITAs from the proposed alternatives.

ITAs are defined as legal interests in property held in trust by the United States government for Indian tribes or individuals, or property protected under U.S. Law for Indian tribes or individuals. An Indian trust has three components: 1) the trustee, 2) the beneficiary, and 3) the trust asset. ITAs can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with a reservation or Rancheria. Beneficiaries of the Indian trust relationship are federally-recognized Indian tribes with trust land; the U.S. is the trustee. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the U.S. The characterization and application of the U.S. trust relationship have been defined by case law that supports Congressional acts, executive orders, and historic treaty provisions.

It is the general policy of the Department of the Interior (DOI), Bureau of Reclamation (Reclamation) to carry out activities in a manner that protects ITAs and avoids adverse effects whenever possible (Reclamation Indian Trust Asset Policy, July 2, 1993). In the event an effect is identified, consultation with affected federally recognized tribal governments proceeds through the Bureau of Indian Affairs (BIA), the Office of the Solicitor, and the Office of American Indian Trust (OAIT).

Groundwater substitution transfers could affect ITAs by increasing groundwater depth and increasing groundwater pumping costs, or stream depletion near ITA sites. Lower groundwater elevations and increased pumping costs could interfere with the exercise of federally-reserved Indian rights. An increase in groundwater pumping could cause an increase in stream flow temperatures which could affect fish which in turn could interfere with the exercise of federally-reserved Indian rights. Cropland idling, crop shifting, reservoir release and conservation transfers would not result in effects to ITAs; therefore, these measures are not further discussed in this analysis. Water purchase agreements are structured to recognize local leadership and work cooperatively with water associations, local government, and local interests, including tribes.

3.12.1 Affected Environment/Environmental Setting

This section describes the area of analysis, regulatory requirements, and environmental setting relevant to ITAs.

3.12.1.1 Area of Analysis

The area of analysis for ITAs includes the reservations or Rancherias that overlay the Sacramento Valley Groundwater Basin where groundwater substitution transfers could occur. In addition, the area of analysis includes reservations or Rancherias within the Buyer Service Area that could benefit from use of transfer water. Figure 3.12-1 shows the area of analysis.

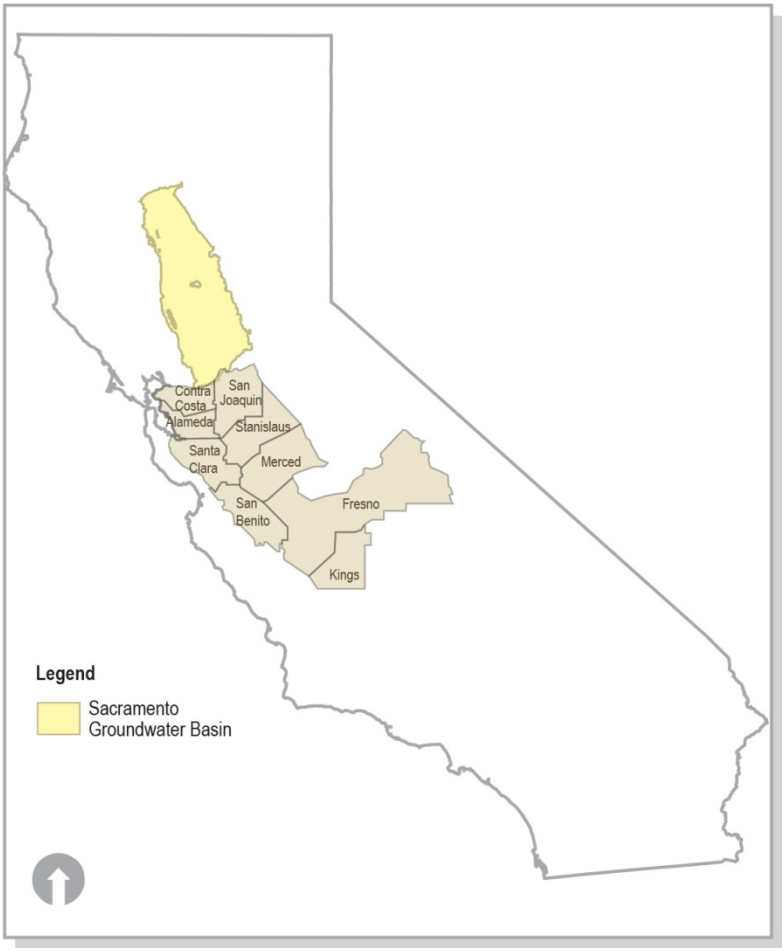


Figure 3.12-1. ITAs Area of Analysis

3.12.1.2 Regulatory Setting

This section describes the applicable laws and rules relating to ITAs. ITAs are regulated by the federal government; therefore, state and regional/local policies do not apply.

President William J. Clinton's 1994 memorandum, "Government-to-Government Relations with Native American Tribal Governments," directed the Bureau of Reclamation (Reclamation) to assess the effects of its programs on tribal trust resources and federally-recognized tribal governments. Reclamation is tasked with actively engaging federally-recognized tribal governments and consulting with such tribes on a government-to-government level (59 Federal Register 1994). Order number 3215, *Principles for the Discharge of the Secretary's Trust Responsibility*, assigns responsibility for ensuring protection of ITAs to the heads of bureaus and offices (Reclamation 2012). Reclamation is required to "protect and preserve Indian trust assets from loss, damage, unlawful alienation, waste, and depletion" (Reclamation 2012). Reclamation is responsible for assessing whether transfers would have the potential to affect ITAs.

It is the general policy of the DOI to perform its activities and programs in such a way as to protect ITAs and avoid adverse effects whenever possible (Reclamation 2012). Reclamation complies with procedures contained in Departmental Manual Part 512 (DOI 1995), which are guidelines that protect tribal resources and require Secretary of the Interior approval before sale of land, natural resources, water, or other assets. Federally-reserved water rights held in trust for tribes by the U.S. are ITAs that are restricted from being separated from tribes and individual Indians without the approval of the Secretary of the Interior.

3.12.1.3 Existing Conditions

The following section describes the existing ITAs within the area of analysis for both the Seller Service Area and Buyer Service Area.

3.12.1.3.1 Seller Service Area

The northernmost indigenous people in the Sacramento Valley region were the Achowami, Atsugewi, Ajumawi, Wintun, Pit River, and the Yana (San Diego State University 2002). Descendants of these tribes live on the Big Bend, Burney Tract, Montgomery Creek, Redding, and Roaring Creek Rancherias in Shasta County (San Diego State University 2002, Redding Rancheria 2000).

Maidu and Wintun people inhabited the area of the Colusa Basin (Camp Dresser & McKee Inc. 1995; Glenn-Colusa Irrigation District, California Department of Fish & Game, Reclamation, U.S. Army Corps of Engineers 1998). The Wintun Tribe comprises three divisions: Patwin, Nomlaki, and Wintu. Present-day descendants of the Wintun live on the Colusa and Cortina Rancherias in Colusa County and the Rumsey Rancheria in Yolo County. Wintun-Wailaki descendants in Glenn County live on the Grindstone Creek Rancheria (San Diego State University 2002). The Paskenta Band of Nomlaki Indians has a tract of trust land in Tehama County (U.S. Census Bureau 2010).

An integrated group of both Maidu and Miwok Indians, historically inhabited parts of the Sierra Nevada Foothills near the American River. Descendants of the tribe, now recognized as the United Auburn Indian Community, hold trust land in Placer County known as the Auburn Rancheria (United Auburn Indian Community, Auburn Rancheria N.D.).

The Shingle Springs Band of Miwok Indians, also descendants of the Miwok and Maidu Indians, in addition to the Nisenan Indians, inhabits parts of El Dorado County, just southwest of the Auburn Rancheria (Shingle Springs Band of Miwok Indians 2012). There are no reservations or Rancherias in Sacramento County (U.S. Census Bureau 2010).

Evidence indicates the Wintun and Maidu people inhabited areas near the Feather River for thousands of years, including portions of the Central Valley and western slopes of the Sierra Nevada to the north and northeast of the Sutter Buttes (City of Oroville 1995; Butte County 1998). Descendants of the Maidu live on the Mooretown and Berry Creek Rancherias in Butte County (San Diego State University 2002). The Enterprise Rancheria is currently a landless tribe of Maidu descendants, but has filed an application for a fee-to-trust transfer and casino and hotel project to be located in Yuba County (70 Federal Register 10138). The Mechoopda Indian Tribe of the Chico Rancheria recently acquired land in fee status in Butte County. There are no reservations or Rancherias in Sutter County (U.S. Census Bureau 2010).

3.12.1.3.2 Buyer Service Area

East Bay Municipal Utility District (MUD)
East Bay MUD provides water services to residents of Alameda and Contra Costa Counties. The Lytton Band of Pomo Indians holds trust land in the City of San Pablo, in Contra Costa County, where they own and operate the San Pablo Lytton Casino (San Pablo Lynton 2011, Rivera 2012). The tribe is serviced by East Bay MUD (Riveria 2012). Alameda County contains no reservations or Rancherias (U.S. Census Bureau 2010).

Contra Costa Water District (WD)
Contra Costa WD also provides water services to residents of Contra Costa County. Although, the Lytton Rancheria is located in Contra Costa County, it is served by the East Bay MUD. There are no other reservations or Rancherias within the Contra Costa WD service boundaries.

San Luis & Delta-Mendota Water Authority (SLDMWA)
No reservations or Rancherias exist in the SLDMWA service area (U.S. Census Bureau 2010).

3.12.2 Environmental Consequences/Environmental Impacts

This section presents assessment methods performed to analyze ITA effects and presents the potential ITA effects for the proposed alternatives.

3.12.2.1 Assessment Methods

Reclamation guidance states that, "Actions that could impact the value, use or enjoyment of the ITA should be analyzed as part of the ITA assessment. Such actions could include interference with the exercise of a reserved water right, degradation of water quality where there is a water right, impacts to fish or wildlife where there is a hunting or fishing right, [and] noise near a reservation when it adversely impacts uses of reservation lands" (Reclamation 2012).

Groundwater substitution is the only transfer method that could impact ITAs. To determine potentially affected reservations and Rancherias, the locations of reservations and Rancherias were overlaid with a map of the Sacramento Valley Groundwater Basin where groundwater substitution transfers could occur. Reservations and Rancherias were identified using a reservation boundary database (U.S. Census Bureau 2010). All identified ITAs within a groundwater substitution basin could be potentially affected by groundwater substitution transfers. ITAs found outside of the groundwater basin would not be affected by groundwater substitution and are not further analyzed in this section.

The following ITAs fall within the boundaries of the Sacramento Valley Groundwater Basin:

- Auburn Rancheria
- Chico Rancheria
- Colusa
- Cortina
- Paskenta
- Rumsey

After determining the tribes that fall within the groundwater basin, their location was compared to changes in groundwater levels from the groundwater model to determine if there would be any effects to ITAs.

Additionally, locations of the above identified tribes were further examined for their proximity to existing streambeds which could experience reductions in stream flow temperatures due to stream flow depletion associated with groundwater recharge from groundwater substitution transfers. Of the tribes identified in the Sacramento Valley Groundwater Basin, only the Chico Rancheria is located near a streambed, Butte Creek.

3.12.2.2 Alternative 1: No Action/No Project

3.12.2.2.1 Seller Service Area

There would be no effects to ITAs in the Seller Service Area. Groundwater substitution would not occur under the No Action/No Project Alternative; therefore, groundwater depth and pumping costs and stream flow temperatures in the Seller Service Area would continue to fluctuate similar to existing conditions. The No Action/No Project Alternative would have no change from existing conditions for ITAs in the Seller Service Area.

3.12.2.2.2 Buyer Service Area

Limited water supplies could cause adverse effects on ITAs in the Buyer Service Area. The only ITAs present in the Buyer Service Area include the Lytton Band of Pomo Indians, serviced by the East Bay MUD. Under the No Action/No Project Alternative, Central Valley Project (CVP) shortages could reduce water supplies to East Bay MUD in dry and critical years. Depending on the shortage, East Bay MUD may need to implement water shortage contingency measures, such as mandatory conservation. The Lytton Band of Pomo Indians would likely be subject to these measures as an East Bay MUD customer. These reductions in deliveries would be the same as currently experienced and represent no change from existing conditions.

3.12.2.3 Alternative 2: Full Range of Transfers (Proposed Action)

3.12.2.3.1 Seller Service Area

Groundwater substitution transfers could adversely affect ITAs by decreasing groundwater levels, which would potentially interfere with the exercise of a federally-reserved water right use, occupancy, and or character. Under the Proposed Action, groundwater substitution transfers would increase depth to groundwater and could increase groundwater pumping costs.

Auburn Rancheria, Cortina, and Rumsey lie on the border of the basin; therefore, effects from groundwater substitution would be less than those experienced by Chico Rancheria, Colusa and Paskenta, since they are more centrally located in the basin.

Figure 3.12-2 shows the potential groundwater level drawdown under the Proposed Action and the potential ITAs within the Sacramento Basin. The groundwater level changes would be very small near these sites, and would likely not be noticeable. Section 3.3, Groundwater Resources provides detailed information on the simulation used to develop the groundwater level information.

Because groundwater substitution would have negligible effect to groundwater near ITAs, the Proposed Action would not affect the ITAs' federally-reserved water rights.

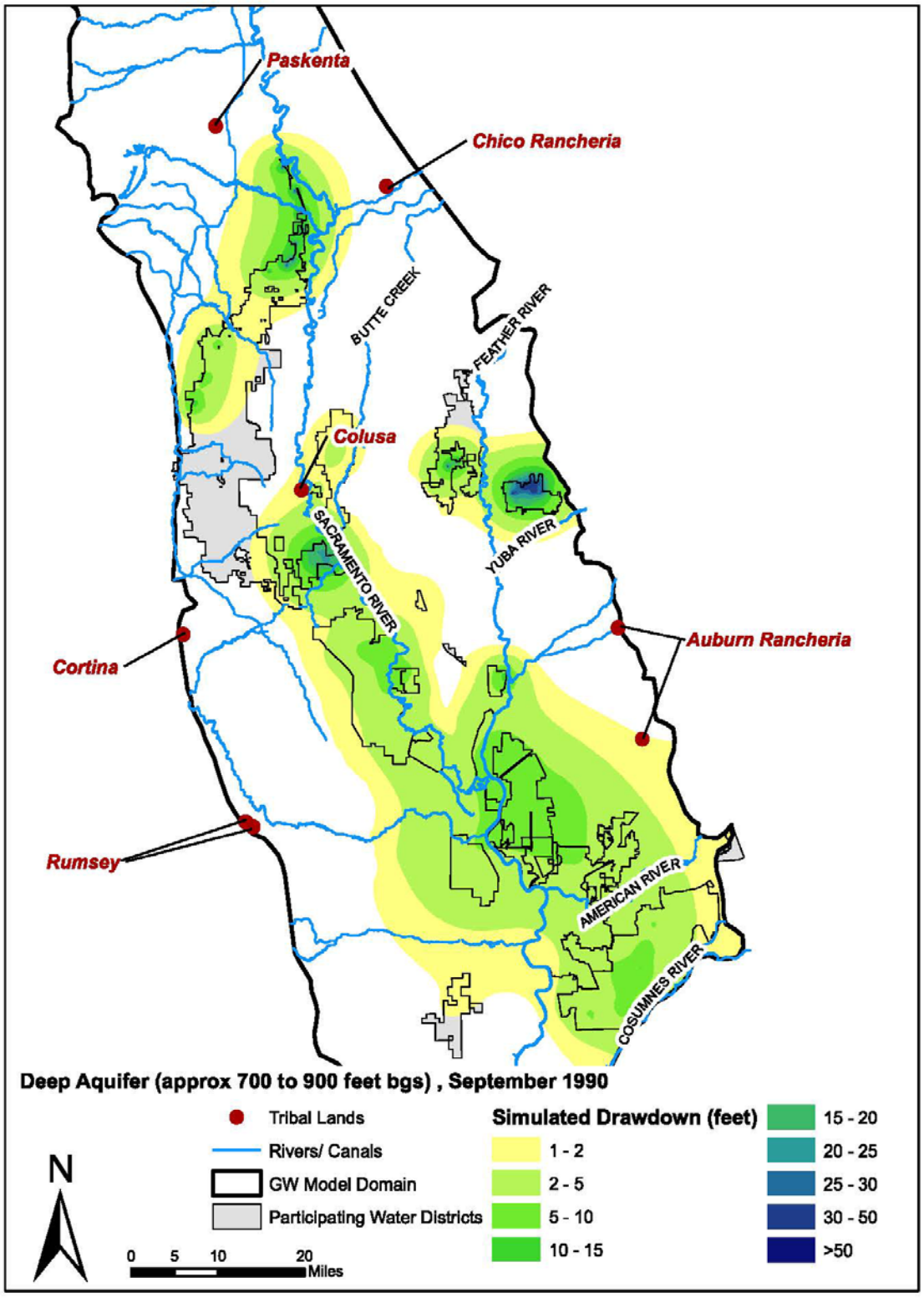
Groundwater substitution transfers could adversely affect ITAs by reducing the health of tribal members by decreasing water supplies. Under the Proposed Action, groundwater substitution in the Sacramento Valley Groundwater Basin would not reduce groundwater table elevations near project ITA sites; therefore, groundwater substitution would also not decrease water supplies or affect the health of tribal members under the Proposed Action. Because the changes in groundwater levels would be negligible near ITA sites, the Proposed Action would not decrease water supplies to ITAs, thereby reducing the health of tribal members.

Groundwater substitution transfers could affect ITAs by affecting fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right. Under the Proposed Action, groundwater substitution in the Sacramento Valley Groundwater Basin would result in very small changes to groundwater table elevations near ITA sites; therefore, groundwater substitution would not affect fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right. For more information on groundwater substitution effects on aquatic and terrestrial resources in other project areas, see Section 3.7, Fisheries and Section 3.8, Vegetation and Wildlife. Because groundwater substitution would not measurably reduce groundwater elevations near project ITAs, the Proposed Action would not affect fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right.

Groundwater substitution transfers could adversely affect ITAs by causing changes in stream flow temperatures or stream depletion, which would potentially interfere with the exercise of a federally-reserved Indian right. Under the Proposed Action, groundwater substitution transfers in the Sacramento Valley Groundwater Basin could result in an increase in groundwater recharge in the Seller Service Area which could cause small reductions in local base flows in nearby streams.

Chico Rancheria lies near Butte Creek along the border of the Sacramento Valley Groundwater Basin; thus, effects from groundwater substitution, including changes in steam flow temperatures would be less than if the ITAs were located more centrally in the basin. Figure 3.12-2 shows the potential groundwater level drawdown under the Proposed Action and the potential ITAs within the Sacramento Basin. The groundwater level changes would be very small, and would likely not noticeably increase groundwater recharge effects. Section 3.3, Groundwater Resources provides detailed information on the simulation used to develop the groundwater level information.

Because groundwater substitution would have negligible effects, the effects of groundwater recharge on streams near ITAs would also be negligible. The Proposed Action would not affect ITAs' federally-reserved water rights.



Source: Department of Water Resources 2012 and U.S. Census Bureau 2010.

Figure 3.12-2. ITAs and Groundwater Basins

3.12.2.3.2 Buyer Service Area

Use of groundwater substitution transfers could affect ITAs. The Lytton Band of Pomo Indians is the only tribe with federal trust land in the Buyer Service Area and receives water services from Easy Bay MUD, a potential buyer. Under the Proposed Action, East Bay MUD would receive water transfers from willing sellers in the Seller Service Area. Transfers would help East Bay MUD supplement its water supply during dry years, in order to serve its customers, including the Lytton Rancheria. The tribe would benefit from a supplemented water source; therefore, the Proposed Action would have a beneficial effect on ITAs in the Buyer Service Area.

3.12.2.4 Alternative 3: No Cropland Modifications

3.12.2.4.1 Seller Service Area

Effects to ITAs in the Seller Service Area would be the same as under the Proposed Action.

3.12.2.4.2 Buyer Service Area

Effects to ITAs in the Buyer Service Area would be the same as under the Proposed Action.

3.12.2.5 Alternative 4: No Groundwater Substitution

3.12.2.5.1 Seller Service Area

The No Groundwater Substitution Alternative does not include groundwater substitution transfers. Because groundwater substitution would not occur, the No Groundwater Substitution Alternative would have no effect on ITAs.

3.12.2.5.2 Buyer Service Area

Effects to ITAs in the Buyer Service Area would be the same as under the Proposed Action.

3.12.3 Comparative Analysis of Alternatives

Table 3.12-1 lists the potential effects to ITAs of each of the action alternatives. The following text supplements the table by describing the magnitude of the effects under the action alternatives and No Action/No Project Alternative.

Table 3.12-1. Comparative Analysis of Alternatives

Potential Impact	Alternative(s)	Significance	Proposed Mitigation	Significance after Mitigation
CVP shortages could adversely affect ITAs in the Buyer Service Area.	1	No effect	None	No effect
Groundwater substitution transfers could adversely affect ITAs by decreasing groundwater levels, which would potentially interfere with the exercise of a federally-reserved water right use, occupancy, and or character	2, 3	No effect	None	No effect
Groundwater substitution transfers could adversely affect ITAs by reducing the health of tribal members by decreasing water supplies	2, 3	No effect	None	No effect
Groundwater substitution transfers could affect ITAs by affecting fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right.	2, 3	No effect	None	No effect
Groundwater substitution transfers could adversely affect ITAs by causing changes in stream flow temperatures or stream depletion, which would potentially interfere with the exercise of a federally-reserved Indian right	2, 3	No effect	None	No effect
Use of groundwater substitution transfers could affect reservations or Rancherias in the Buyer Service Area to reduce CVP shortages.	2, 3, 4	Beneficial	None	Beneficial

3.12.3.1 No Action/No Project Alternative

Under the No Action/No Project Alternative, there would be no impacts to ITAs in the Seller Service Area. CVP water shortages could reduce East Bay MUD supplies in dry and critical years, but the shortages would be the same as those that occur under existing conditions

3.12.3.2 Alternative 2: Full Range of Transfers (Proposed Action)

The Proposed Action includes increased groundwater pumping in the Seller Service Area. Groundwater levels underlying reservations and Rancherias in the area of analysis would be negligible and would not affect ITAs. Water transfers would provide water to East Bay MUD during dry and critical years, which would increase water supplies available for the Lytton Band of Pomo Indians in the East Bay MUD service area.

3.12.3.3 Alternative 3: No Cropland Modifications

Impacts to ITAs under the No Cropland Modification Alternative would be the same as the Proposed Action.

3.12.3.4 Alternative 4: No Groundwater Substitution

There would be no impacts in the Seller Service Area as a result of Alternative 4. Effects in the Buyer Service Area would be the same as the Proposed Action.

3.12.4 Environmental Commitments/Mitigation Measures

Reclamation's policy is to protect and avoid adverse impacts to ITAs whenever possible. The analysis has not identified any potential impacts to ITAs; therefore, no specific mitigation measures are included. However, if any unanticipated impacts arise during project implementation, Reclamation shall initiate government-to-government consultation to determine interests, concerns, effects, and appropriate mitigation measures. Reclamation will take the lead on consultation with the tribes. Potentially affected tribes and the BIA, OAIT, Regional Solicitor's Office, Reclamation's Native American Affairs Office, and or Regional Native American Affairs coordinator may be involved in identifying ITAs (Reclamation 2012). The agencies will discuss appropriate avoidance and/or minimization strategies on a government-to-government basis. Separate measures may be required for different types of trust assets, including federally-reserved water, land, minerals, fishing, and gathering rights.

Measures necessary to reduce effects will be developed in consultation with the affected federally recognized tribe(s) before implementation. Other measures will be used as determined appropriate through tribal consultation. Consultation and minimization measures would reduce any potential adverse effects on ITAs.

3.12.5 Potentially Significant Unavoidable Impacts

There are no expected significant and unavoidable impacts to ITAs.

3.12.6 Cumulative Effects

The ITAs cumulative analysis focuses only on those programs that potentially affect groundwater in the Seller Service Area and the Buyer Service Area.

3.12.6.1 Alternative 2: Full Range of Transfers (Proposed Action)

3.12.6.1.1 Seller Service Area

Groundwater substitution transfers in combination with other cumulative projects could adversely affect ITAs in the Seller Service Area. Proposed groundwater substitution transfers in combination with existing and foreseeable future groundwater substitution programs and projects could affect ITAs if wells were to be over pumped and dried out on tribal lands, or increase pumping costs. This could interfere with the exercise of a federally-reserved water right, reduce the health of tribal members by decreasing water supplies, and or effect

fish and wildlife where there is a federally-reserved hunting, gathering, or fishing right.

State Water Project transfers could also acquire water through groundwater substitution, but these transfers would only be about 6,800 AF. Section 3.3.6.1.1 in the Groundwater Resources analysis describes other existing and foreseeable projects that could affect groundwater resources in the Seller Service Area. The groundwater substitution elements of these programs in conjunction with proposed groundwater substitution transfers could reduce groundwater levels and increase pumping costs in the Seller Service Area. If continuous groundwater substitution from multiple projects and programs were to cause over pumping or increased pumping costs near ITAs located in the Sacramento Valley Groundwater Basin, it could result in an adverse cumulative effect.

If potential impacts to ITAs are identified, tribal consultation will then precede any formal groundwater transfer in the vicinity of the identified tribes. Government-to-government consultation shall take place to determine interests, concerns, effects, and appropriate mitigation measures. Consultation may involve the BIA, the regional Solicitor's Office, and Department of Water Resources. Since government-to-government consultations with potentially affected tribes and the development of appropriate minimization measures would be completed prior to the implementation of groundwater substitution transfers, the Proposed Action's contribution to potential cumulative effects on ITAs in the Seller Service Area would be minimized.

3.12.6.1.2 Buyer Service Area

Groundwater substitution transfers in combination with other cumulative projects could adversely affect ITAs in the Buyer Service Area. Groundwater substitution transfers would provide water to East Bay MUD that could be used to serve the Lytton Band of Pomo Indians. In the future, East Bay MUD would likely experience increased demands as populations increase; however, East Bay MUD has planned for the increased demands so they would not likely adversely affect deliveries to the Lytton Band of Pomo Indians.

3.12.6.2 Alternative 3: No Cropland Modifications

The cumulative impacts of Alternative 3 would be the same as those for the Proposed Action.

3.12.6.3 Alternative 4: No Groundwater Substitution

3.12.6.3.1 Seller Service Area

Alternative 4 does not include groundwater substitution transfers; therefore, there are no actions that could contribute to the cumulative condition in the Seller Service Area.

3.12.2.6.2 Buyer Service Area

The cumulative impacts of Alternative 4 in the Buyer Service Area would be the same as those for the Proposed Action.

3.12.7 References

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Section 3.13
Cultural Resources

This section discusses cultural resources within the area of analysis. It describes the affected environment, potential environmental impacts that may result from implementation of alternatives, and proposes mitigation measures to offset the effects of those alternatives.

3.13.1 Affected Environment/Environmental Setting

This section provides an overview of the area of analysis, the regulatory setting associated with cultural resources, and the existing conditions within the area of analysis. The existing conditions consist of archaeological, ethnographic, and historic background and a summary of the potential cultural resource types within the area of analysis that may be affected by the action alternatives.

3.13.1.1 Area of Analysis

The area of analysis for cultural resources includes all reservoirs in the Seller Service Area and San Luis Reservoir. In order to better describe the area of analysis for cultural resources, however, it is more meaningful to define the area of analysis according to culturally distinguishable geographic regions. Those regions include the following:

- The Sacramento Valley (from Shasta Reservoir to the Delta, including some western Sierra foothills)
- The San Joaquin Valley (Kings County to the Delta, including some western Sierra foothills).

The two regions were defined on the basis of their prehistoric, ethnographic, and historic period culture history. In certain instances, the culture histories of these regions overlapped, and they were therefore discussed collectively as the Central Valley. Figure 3.13-1 illustrates the area of analysis for cultural resources.

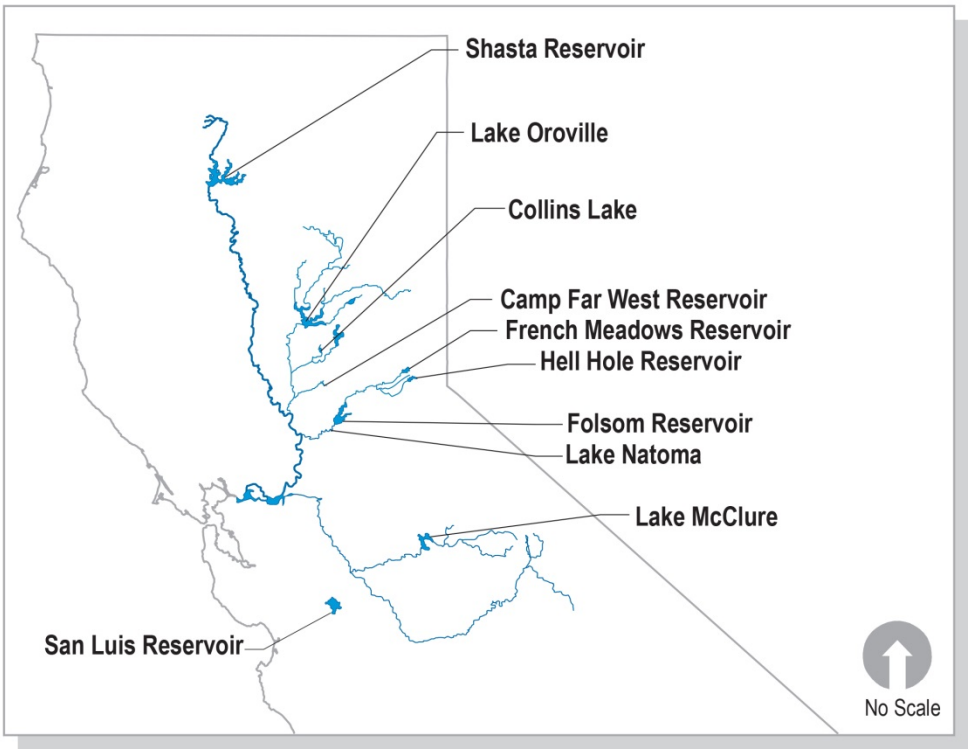

Figure 3.13-1. Cultural Resources Area of Analysis

3.13.1.2 Regulatory Setting

3.13.1.2.1 Federal

Federal laws and regulations for cultural resources include but are not limited to:

- National Historic Preservation Act (NHPA) of 1966, as amended: requires Federal agencies to consider the effects of their actions on historic properties.
- Archaeological Resources Protection Act of 1979 (ARPA): requires permitting for the excavation of cultural resources and identifies criminal and civil penalties for collecting and destruction of cultural resources on Federal land.
- Native American Graves Protection and Repatriation Act (NAGPRA): addresses the rights on lineal descendants, Indian Tribes, and Native Hawaiian organizations to Native American cultural items, including human remains, funerary objects, sacred objects, and objects of cultural patrimony.
- Executive Order 13007: requires Federal agencies responsible for the management of Federal lands to accommodate access to and

ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.

Because the proposed water transfers would use existing facilities and land uses would remain the same (within historic ranges of use), there are no obligations under Section 106 of the NHPA as the undertaking does not have the potential to effect historic properties, pursuant to 36 Code of Federal Regulations 800.3(a)(1).

3.13.1.2.2 State

The California Environmental Quality Act (CEQA) requires lead agencies to determine if a proposed project would have a significant effect on archaeological resources.

The California Register of Historical Resources (CRHR) is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code [PRC] Section 5024.1[a]). Criteria for eligibility to the CRHR are based on National Register of Historic Places (NRHP) criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California CRHR, including California properties formally determined eligible for, or listed in, the NRHP.

3.13.1.2.3 Regional/Local

Relevant regional or local cultural resources regulations include but are not limited to those adopted by the counties in the area of analysis. Each county has established its own goals, objectives policies, actions, implementation programs, and ordinances that are presented in county general plans and in some cases in county ordinance codes.

3.13.1.3 Existing Conditions

This section describes existing conditions for cultural resources within the area of analysis. All data regarding existing conditions were collected through an examination of archival and current literature pertinent to the area of analysis. Because action alternatives associated with the project do not involve physical construction-related impacts to cultural resources, no project specific cultural resource studies were conducted in preparation of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

3.13.1.3.1 Archaeological Background

A wide range of prehistoric and historic period cultural resources may be present in the area of analysis. Prehistoric cultural resources in the Central Valley and Delta may include archaeological site types ranging from small lithic or midden scatters to large, mounded village sites. Although many smaller, discrete archaeological sites have remained undisturbed, historic period

and modern landscape development have destroyed most known examples of larger prehistoric village sites (Rosenthal et al. 2007:147).

Historic period cultural resources in the Central Valley may include those associated with early Spanish expeditions, Spanish settlements (Missions, Pueblos, military), or Mexican Ranchos. Resources related to California's Gold Rush, such as mining machinery, sluices, tailings, cabins, and mills are also common in the region. Other historic period sites may include those pertaining to cattle ranching, agricultural production, early transportation, water development, and townsite development.

Central Valley

Due to the alternating periods of erosion and deposition that have characterized California's Central Valley and Delta regions, many of the Pleistocene landscapes that might hold evidence relating to the earliest human occupation of the region have been eroded away or subsumed by more recent alluvial deposits. Archaeological data about early human occupation of the region have come largely from isolated finds on remnant landforms; such finds have included artifacts found in the southernmost extent of San Joaquin Valley thought to date to the Paleo-Indian Period (11,550–8550 Before Christ [BC]). Evidence for the Lower Archaic Period (8850–5550 BC) in the Central Valley and Delta is also sparse, although shells from the Pacific Coast and obsidian from the Sierra Nevada found at sites dating to this period suggest that regional interaction spheres were established early in the region's prehistory (Rosenthal et al. 2007:151–152).

Archaeological sites dating to the Middle Archaic Period (5550-550 BC) have provided some of the oldest evidence for well-defined cultural traditions in the region. Evidence for increased residential stability, logistical organization, riverine adaptations, and far ranging regional exchange during the Middle Archaic has been recovered (Rosenthal et al. 2007:153-155). The Windmiller Pattern (1850-750 BC), which shows a widespread uniformity of burial practices, is characteristic of the period. The Upper Archaic (550 BC- Anno Domini [AD] 1100) was marked by cultural, economic, and technological diversity. This period also saw the development of large mounded villages in the Delta and lower Sacramento Valley (Rosenthal et al. 2007:156).

During the Emergent Period (AD 1100 to the historic period), native peoples living in the Central Valley and Delta developed the cultural traditions noted at the time of contact with Euro-Americans. These included technological advances such as the bow and arrow and the fish weir. Indigenous trade networks also appear to have changed in the Emergent Period, as shell beads assumed the role of currency throughout much of the region. The population of the Central Valley and Delta regions, which had been growing steadily since the Middle Archaic, continued to climb in the Emergent Period; this growth correlated with an intensification of hunting, gathering, and fishing, as well as increased socio-political complexity (Rosenthal et al. 2007:257-259).

Sierra Nevada

Sierra Nevada prehistoric archaeological deposits were first found during the Gold Rush era. Deposits consisting of mortars, charmstones, pestles, and human remains were among the cultural resources discovered in the 1850s and 1860s (Moratto 1984). In the mid-nineteenth century, mining led to the discovery of many prehistoric sites. In the later nineteenth and twentieth centuries, dam construction within the Sierra Nevada also led to the discovery of numerous archaeological sites.

In 1952, a total of 26 Northern Sierra sites were recorded by University of California Berkeley archaeologists T. Bolt, A.B. Elsasser, and R.F. Heizer. Two archaeological cultures were identified from this survey: the Martis Complex (centered in the Martis Valley) and the Kings Beach Complex (centered in the Lake Tahoe area). The Martis Complex was unusual for its use of basalt rather than obsidian in tool making. Dates from the tools suggest that the complex dated from 4000-2000 BC to AD 500 (Moratto 1984). The Kings Beach Complex (AD 500-1800) was distinguished by flaked obsidian and silicate implements, small projectiles points, the bow and arrow, and occasional scrapers and bedrock mortars (Moratto 1984).

In 1970, Ritter compared various Lake Oroville area sites to the Martis Valley and Kings Beach sites to help develop a chronology for the Lake Oroville area. As so derived, the Lake Oroville chronology spans a period of about 3,000 years and consists of the Mesilla, Bidwell, Sweetwater, and Oroville Complexes, as well as the ethnographic Maidu era (Moratto 1984).

The Mesilla Complex was identified as a sporadic occupation of the foothills. People associated with this complex hunted with atlatls and processed their food in mortar bowls and on millingstones. Shell beads, charmstones, and bone pins show a close relationship between the Mesilla Complex and the Sacramento Valley cultures between 1000 BC and AD 1 (Moratto 1984).

After the Mesilla Complex, the cultural sequence continued with the Bidwell Complex from AD 1-800. The Bidwell Complex people lived in permanent villages, hunted deer and smaller game with slate and basalt projectile points, fished, ground acorns on millingstones, and collected fresh water mussels. A new cultural element for this complex was the manufacture of steatite cooking vessels (Moratto 1984).

The Sweetwater Complex (AD 800-1500) was defined by new cultural items and forms, which included particular shell ornament types; wider use of steatite for cups, bowls and smoking pipes; and, small, lighter projectile points that indicated the use of bows and arrows for hunting (Moratto 1984).

The Oroville Complex is significant because it represents the protohistoric Nisenan (AD 1500 to 1833) (Moratto 1984). The Nisenan culture was characterized by bedrock mortars for acorn processing, dance halls, and burials

placed in tightly flexed positions on their sides marked with stone cairns. The Lake Oroville Chronology sequence ended with the historic era and abandonment of traditional settlements in the nineteenth century (Moratto 1984).

3.13.1.3.2 Ethnography

When European colonization of California began, the Central Valley and Sierra foothills were home to an estimated 100,000 people who spoke at least eight different indigenous languages, including Wintu, Yana, Nomlaki, Konkow, River Patwin, and Nisenan in the Sacramento Valley and adjacent Sierra foothills, and Miwok and Yokuts in the San Joaquin Valley and adjacent Sierra foothills. Groups speaking these languages shared many common cultural practices associated with technology, subsistence, ceremonial life, and social organization. Downstream from the Delta, the Costanoans—or Ohlone, as their descendants prefer to be called—inhabited the eastern shores of San Francisco Bay, as well as the San Francisco peninsula and the coastal areas south to Point Sur (for detailed information on particular ethnolinguistic groups see entries in Heizer 1978).

The principal form of social organization among the native groups of the Central Valley was the tribelet, which often included a primary village associated with several outlying hamlets. Most settlements consisted of houses and granaries made of locally available materials (typically bark or tule), as well as semi-subterranean ceremonial structures. Many villages were occupied year-round, except during the fall acorn harvest. Among the Nomlaki and some Yokuts groups, however, people spent most of the year in dispersed family camps in order to utilize diverse ecological zones, coming together only during the winter when they shared surpluses and performed important ceremonies (Lightfoot et al. 2009: 303).

Native Californians living in the Central Valley used a wide variety of resources. Acorns were an important food crop throughout much of prehistory, and oak stands were often owned on the individual, family, or tribelet level. Tule, or bulrush, was another principal plant and was used to make clothing, thatch houses, and construct watercraft. For basketry, which was one of the most important items of material culture in the region, native people used tule, ferns, and grasses. The native people ate the small seeds of a number of plants, as well as berries and greens. As elsewhere in California, native people in the Central Valley relied on prescribed burning to maintain a diverse landscape and to encourage the growth of desired species. Communal hunts of deer, rabbit, and squirrels were also common in the region. The diets for people living along Central Valley rivers and sloughs also included waterfowl and diverse fish species (Lightfoot et al. 2009: 303-338).

Sacramento Valley and Sierra Foothills

The area of analysis lies within the ethnographic territories of the Nisenan, Plains and Southern Sierra Miwok, Northern Yokuts, and Konkow.

The Nisenan, often referred to as the Southern Maidu in anthropological literature, were classified as the southern linguistic group of the Maidu tribe; together with the Maidu and Konkow, they formed a subgroup of the California Penutian linguistic family (Wilson and Towne 1978). The Nisenan linguistic group has been further subdivided based on dialect into Northern Hill Nisenan, spoken in the Yuba River drainage; Southern Hill Nisenan, spoken along the American River; and Valley Nisenan, dominant along a portion of the Sacramento River Valley between the American and Feather Rivers (Beals 1933; Kroeber 1925, 1929).

Prior to Euro-American contact, Nisenan territory extended west into the Sacramento Valley to encompass the lower Feather River drainage; north to include the Yuba River watershed; south to include the whole of the Bear and American River drainages and the upper reaches of the Cosumnes River; and east to the crest of the Sierra Nevada (Wilson and Towne 1978).

The Konkow, also known as Northwestern Maidu, occupied territory below the high Sierra in the foothills where the south, middle, north, and west branches of the Feather River converge. Konkow territory included the upper Butte and Chico creeks and part of the Sacramento Valley along the lower courses of the same drainages (Kroeber 1925).

Plains Miwok belong to the Eastern Miwok division of the Miwokan subgroup of the Utian language family (Levy 1978a:398). The Plains Miwok occupied the lower portion of the Cosumnes and Mokelumne rivers and both banks of the Sacramento River between the modern towns of Rio Vista and Freeport (Levy 1978a:398).

San Joaquin Valley

The Northern Valley Yokuts occupied the northern San Joaquin Valley and possessed a territory that extended from the point where the San Joaquin River turns north up the Central Valley to a point between the Calaveras and Mokelumne rivers (Wallace 1978:462); from east to west their territory spanned from the Sierra foothills to the crest of the Diablo Range (Wallace 1978:462). The northern territorial boundary between the Northern Valley Yokuts and the Plains Miwok is contested and remains less clearly defined (Wallace 1978:462).

The Southern Sierra Miwok belong to the Eastern Miwok division of the Miwokan subgroup of the Utian language family (Levy 1978a:398). The Southern Sierra Miwok occupied the upper Merced and Chowchilla river drainages (Levy 1978a398).

3.13.1.3.3 History

Although the Central Valley was not settled by the Spanish as part of the mission system or the associated presidio and pueblo establishments, the Spanish did explore portions of the San Joaquin and Sacramento Valleys. Expeditions to the Delta region began in the 1770s, and large portions of the

Central Valley were explored further in the early nineteenth century as the Spanish sought to convert the native inhabitants and to punish native raiding parties. After winning its independence from Spain, the Mexican government divided much of its territory in California into individual land grants. Although these ranchos, as they came to be known, were located primarily near the coast, several ranchos were also granted along the banks of the Sacramento and San Joaquin rivers. During the Mexican period, Anglo-American trappers made their way into the Central Valley. Jedediah Smith, one of the most notable early explorers, traversed the San Joaquin and Sacramento valleys in the 1820s (Beck and Haase 1974; Hoover et al. 1990).

In the 1840s, increasing numbers of Anglo-Americans began arriving in California, and many of their major trails crossed the Central Valley. After 1848, the Gold Rush era population explosion transformed the region. Cities along the San Joaquin and Sacramento rivers grew quickly to serve as supply centers and transportation links between San Francisco and the goldfields along the eastern tributaries. By 1849, the placer mines of the foothills were thick with miners; most were men, who hailed from many occupations and ethnicities. Over time, however, many Chinese and Hispanic miners left the goldfields and sought work in other industries such as agriculture and ranching (Hoover et al. 1990; Rawls and Bean 1998:91–103). The Central Valley was also the site of important early developments in oil and gas drilling.

By the late nineteenth century, the Central Valley's role as a great agricultural producer was already established. The demand for water for gold mining and agriculture led to the development of numerous water conveyance systems in the Central Valley. Early, privately financed systems were dwarfed by the early twentieth century systems created by municipalities, such as the Hetch Hetchy Aqueduct, as well as those developed by the Federal government, including the Central Valley Project (CVP) (Beck and Haase 1974).

Sacramento Valley

Constituting the northern portion of the Central Valley, the Sacramento Valley was the site of early Euro-American settlement. In 1839, John Sutter constructed a fort at the mouth of the American River and the east bank of the Sacramento River. There he engaged in a host of enterprises including raising grain and livestock, irrigation, and flour milling (Hoover et al. 1990). His property's strategic location made it a natural destination from the Sierra trails, and he did more to open California to American immigration than any other individual (Hoover et al. 1990:286–287; Lewis Publishing 1891:192–197).

In 1848, James Marshall, Sutter's foreman, discovered gold while constructing a mill at the South Fork of the American River. The gold seekers who began pouring into California as word of Marshall's discovery spread, created a tent city on Sutter's property around his fort. By the Fall of 1849, the nascent city housed 2,000 residents and had become a central stopover point; Sacramento was a point of embarkation to not only the American River mines, but to those

on the Feather, Yuba, and Bear rivers, and a natural place for miners to outfit themselves (Hoover et al. 1990:291).

Miners began working the sand bars upstream from Marysville on both the Feather and Yuba Rivers as early as 1848, and scores of mining camps sprang up along the American River in Sacramento, Placer, and El Dorado counties. Many briefly became important towns in the early 1850s only to dwindle or disappear with the surface gold deposits. Gold Rush speculators formed Marysville, the Yuba County seat, in 1850 on land purchased from Sutter. Strategically located at the confluence of the Feather and Yuba rivers, and at the head of navigation for the Feather River, Marysville was also close to the mines. With its accessibility from emerging urban centers and the mines, the town grew rapidly in its first decades and became an important regional commercial center (Hoover et al. 1990:495, 493; Delay 1924:133–137). Oroville, originally Ophir City (est.1849), was the most important of these towns; it became the Butte County seat in 1856 (Lewis Publishing 1891:117–118). Another significant camp was Mormon Island, which today lies under Folsom Reservoir. The Town of Folsom was established in 1855 at the location of Negro Bar, which was originally prospected by African Americans in 1849. Folsom's prosperity peaked in the 1860s when it served as the northern terminus of California's first passenger railroad, as well as the western terminus of the Pony Express (Hoover et al. 1990:289).

Early river mining involved diverting streams from their natural channels by utilizing dams, ditches, and flumes. These structures required miners to begin working together in large numbers, often forming joint stock companies in which each miner invested his labor for a share in potential profits.

After the ditch systems were no longer needed for mining, they were frequently repurposed for agricultural irrigation, and were an invaluable resource for early developers of hydro-electric power in the Sierras (JRP Historical 2000:33, 62).

Some of the most notable river diversions for mining took place on the Feather River above Oroville (Hittell 1861:79) and along the American River. Among the structures that resulted from these efforts were the Big Bend Tunnel on the Feather River, the Natoma Ditch on the American River, the Excelsior Canal Company ditch system on the Yuba River, the Iowa Hill Ditch on the North Fork of the American River, and the El Dorado Canal on the South Fork of the American River (JRP 2000; Brown 1868; Meade 1901). In addition to the ditch systems, mining companies created dozens of reservoirs on the Upper Yuba River for dry season water storage, which by the turn of the century had an aggregate water storage capacity of over a billion cubic feet (Brown 1868; Meade 1901).

The Sawyer decision in 1884 all but ended hydraulic mining in California. As in other Gold Country locales, the Depression brought a limited revival of placer mining to the American River. Mechanized dredging took the place of

hydraulic mining on the Feather and Yuba rivers in the early twentieth century, profitably extracting gold from the old tailings, while during the Depression the unemployed once again panned for gold (Hoover et al. 1990:540–541; Hittell 1898:83, 269; Delay 1924:256).

The Gold Rush population boom stimulated agricultural production throughout the Sacramento Valley. Sacramento Valley areas were initially exploited for cattle and wheat production. Citrus groves, rice, hops, and a variety of other crops became common as the area was settled more densely, and the area has remained an agricultural powerhouse. Though the higher-elevation drainages of the American River are somewhat better suited to agriculture, pioneers planted vegetable patches near Coloma as early as 1849. As mining declined, agricultural activities increased, with many mining ditches were actually repurposed for irrigation. In 1855, agricultural crops were being cultivated in Placer, Yuba, Sutter, and El Dorado counties. ~~Lumber extraction, first practiced in conjunction with mining, replaced mining as the leading local industry in areas above 3,000 feet (Department of Water Resources [DWR] 1964:9–10).~~

In addition to its strategic position along navigable rivers, Sacramento played an important role in the development of regional and national railroad networks. The Sacramento Valley Railroad (SVRR) was the first commercial railroad in California. Completed in 1856, the SVRR ran between Sacramento and Folsom; original plans to extend it as far as Marysville were never realized. In 1860, Theodore Judah, an American railroad engineer, began looking for financial backers for what would become the Central Pacific Railroad (CPRR); he found them in Sacramento Governor Leland Stanford, Charles Crocker, Mark Hopkins, and C.P. Huntington. The CPRR ultimately formed the western leg of the first transcontinental railroad in the United States. The project was authorized by Congress in 1862 and completed in 1869, with Sacramento serving as the CPRR's western terminus (Burg 2007:18–19; Willis 1913:184).

Water development in the Sacramento Valley continued to evolve in tandem with population expansion and expanding transportation networks. That development took the form of irrigation, hydroelectric, and reclamation projects. These projects often began as private ventures, but due to the scale of many of these ventures, they were ultimately taken over by government agencies or eclipsed by government projects. Many water development projects were closely aligned with townsite and regional development. For instance, Horatio Livermore constructed the first dam at Folsom in 1867 in an effort to create an industrial town there. Livermore's multi-purpose system included canals to carry logs to local mills and to provide crop irrigation. The Folsom Power Plant became operational in 1895; it was the first hydroelectric power plant in the Central Valley, and it operated continuously from 1895 to 1952 (Hughes 1983:269–270; JRP Historical 2000:58; Hoover et al. 1990:290).

The California State Legislature authorized the State Water Project (SWP), (then known as the Feather River Project), in 1951. Devastating flooding in the

Sacramento Valley in 1955, which was particularly severe in Marysville and Yuba City, contributed to popular support of the idea that damming the Feather River would prevent future flooding. Oroville Dam was built in response as a multi-purpose project intended to generate power, conserve water, control flooding, and create recreational opportunities (JRP Historical 2000:49, 82; DWR 1974:65– 67).

San Joaquin Valley

Exploration from the central coast into the San Joaquin Valley began with the Gabriel Moraga expeditions of 1806, 1808, and 1810, which brought the Spanish to the Merced and San Joaquin rivers and likely through Pacheco Pass (Hoover et al. 1990:198). By the beginning of the nineteenth century, the Spanish had established an interior north-south road called El Camino Viejo. The route ran from the Los Angeles coast north along the western edge of the San Joaquin Valley to the Patterson Pass (near the modern City of Tracy) and then west to San Antonio (currently East Oakland) (Hoover et al. 1990:85).

Following independence from Spain, Mexican activities in the San Joaquin Valley consisted largely of retaliatory expeditions meant to answer raids by Miwok and Yokut tribes on Mexican colonists. In the 1840s, the Mexican government began issuing land grants in the San Joaquin Valley. Land Grants the vicinity of the project area included Thompson's Rancho, Rancheria del Rio Estanislao, El Pescador, Orestimba Rancho, Rancho del Puerto, and Sanjon de Santa Rita (granted to Francisco Soberanes in 1841) (Beck and Haase 1974).

Gold mining in the Southern Sierra mining region of the Sierra foothills began with the Gold Rush in 1848. As in other parts of the Sierras, the Gold Rush brought a flood of miners to the western Sierra foothills. By the 1850s, the fever of the Gold Rush had died down and many people relocated to the growing cities in the San Joaquin Valley and other parts of the state. Mining in the foothills and the Sierras transitioned from an emphasis on individual placer mining to small and large scale operations including dredging on the Merced and Tuolumne rivers, hydraulic mining, and lode mining for gold and other ores during the nineteenth and early twentieth century (California Department of Transportation [Caltrans] 2008). Hydraulic mining led to the development of ditches and canals, which later were repurposed for irrigation and hydroelectric systems (JRP and Caltrans 2000:38–50).

Early settlement in San Joaquin Valley occurred along streams and rivers. The early town of Dover was located on the San Joaquin River, five miles north of the mouth of the Merced River. Dover was established in 1844 when Jose Castro attempted to build a fort there, which was later occupied by Americans in 1866 (Hoover et al. 1990: 203). It was later abandoned in favor of Hills Ferry, which was established on the confluence of the Merced River and the San Joaquin River in 1860. Hills Ferry was a crossing point on the San Joaquin River. The coming of the railroad changed the settlement patterns in the San

Joaquin Valley, drawing people away from the waterways to the rails (Hoover et al. 1990:200).

As the gold mining industry in California declined in the 1860s, agriculture and ranching expanded to become important industries for the state economy. Farming in the San Joaquin Valley was characterized by cattle and sheep ranching, grain farming, and irrigation agriculture. Cattle ranching was especially important in the San Joaquin Valley, and companies such as Miller & Lux and the Kern County Land Company controlled millions of acres of rangeland (Hoover et al. 1990:200). With the completion of the transcontinental railway in 1869, farmers in the Central Valley began to export their fruit, nut, and vegetable crops to the rest of the nation.

The demand for water for gold mining and agriculture led to the development of numerous water conveyance systems in the Central Valley. In the San Joaquin Valley, large private land holders drove the movement to irrigate their land which led to the formation of private water companies. Water for irrigation in Madera, Merced, Fresno, and Stanislaus counties came from the Merced and Tuolumne rivers, which facilitated the construction of the San Joaquin and Kings River Canal from Mendota. This canal was the largest single irrigation system in the state in the 1880s (Beck and Haase 1974:76). Although private water companies still exist, privately financed systems have since been dwarfed by the municipal and federal systems and projects that began in earnest in the early twentieth century—including the CVP (Beck and Haase 1974).

3.13.1.3.4 Summary of Potential Cultural Resource Types

A wide range of prehistoric and historic period cultural resources may be present in the Seller or Buyer Service Areas analyzed in this EIS/EIR. Cultural resources may comprise landscapes, districts, sites, buildings, structures, objects, or isolated finds relating to American history, prehistory, architecture, archaeology, engineering, or culture.

Archaeological resources include prehistoric (pre-contact) and historic period (post-contact) cultural resources. Prehistoric resources are the physical remains that result from human activities that predate European contact with native peoples in America. Prehistoric archaeological sites may include villages, campsites, lithic or artifact scatters, fishing sites, roasting pits/hearths, milling features, rock art (petroglyphs/pictographs, intaglios), rock features (circles, blinds, etc.), and/or burials. Historic period archaeological sites are the physical remains of human activity during the historic period (post-contact to 50 years before present). Historic period sites may include the remnants of structures (foundations, cellars, privies), built objects, refuse deposits, subsurface hollow-filled features, landscape modifications, and/or complexes consisting of multiple feature types. Historic archaeological sites may include townsites, homesteads, agricultural or ranching features, mining-related features, refuse concentrations, and/or refuse scatters.

Ethnographic resources include sites, areas, and materials important in Native American or religious, spiritual, or traditional uses. These resources can encompass the sacred character of physical locations (mountain peaks, springs, and burial sites) or particular native plants, animals, or minerals that are gathered for use in traditional ritual activities. These resources are identified by Native American stakeholders and can be classified as a Traditional Cultural Property, which can be evaluated for eligibility for the NRHP.

Prehistoric cultural resources in the Central Valley include various types of archaeological sites ranging from small lithic scatters to large mounded village sites, although in the case of the latter, historic period and modern landscape modifications have destroyed most known examples (Rosenthal et al. 2007:147). Cultural resources that relate to ethnographically documented villages or personages, or sites that represent Traditional Cultural Properties, may also exist. Historic period cultural resources in the Central Valley may include those associated with early Spanish expeditions, Spanish settlements (missions, pueblos, or military presidios) or Mexican ranchos. Resources related to California's Gold Rush, such as mining machinery, sluices, tailings, cabins, and mills are common in the region. Other historic period sites include those pertaining to ranching, agriculture, early transportation, water development, and townsite development.

In the Sacramento River Division, about 2,300 historic sites have been recorded. Between the Sacramento/Sutter County boundary and Freeport along the Sacramento River, there are three historic sites and at least 42 historic structures along this segment of the Sacramento River. The town of Freeport has the potential to be determined an important historical resource. There are 13 historic and one multi-component sites on the American River between Folsom Dam and the Sacramento River.

3.13.2 Environmental Consequences/Environmental Impacts

These sections describe the environmental consequences/environmental impacts on cultural resources associated with each alternative.

3.13.2.1 Assessment Methods

The criteria for determining the historical significance of cultural resources are the CRHR eligibility criteria as defined at Section 5024.1 of the California PRC.

An impact is considered significant if a project would have an effect that may change the historical significance of the resource (PRC Section 21084.1). Demolition, replacement, substantial alteration, and relocation of historic properties are actions that would change the historical significance of a property eligible for listing or listed on the CRHR.

To evaluate if a potential impact to cultural resources could occur, the Transfer Operations Model output for the three action alternatives were used. Changes in elevations of any reservoirs that could be affected by the alternatives were compared to elevation changes that would occur under the No Action/No Project Alternative.

3.13.2.2 Significance Criteria

Because the proposed water transfers would use existing facilities and land uses would remain the same (within historic ranges of use), there are no obligations under Section 106 of the NHPA as the undertaking does not have the potential to effect historic properties, pursuant to 36 Code of Federal Regulations 800.3(a)(1).

Cultural resource significance is evaluated in terms of eligibility for listing on the NRHP. CEQA defines a significant historical resource as "a resource listed or eligible for listing on the [CRHR]" (PRC Section 5024.1).

Reservoir fluctuations that exceed historical elevations were used as the primary tool used to determine project effects. Reservoir processes, specifically the human, mechanical and biochemical impacts identified by Ware (1989), can positively or negatively impact the preservation of cultural resources and individual artifact classes. Erosion, flood events, and reservoir processes can cause the transport and redeposition of certain classes of cultural materials, thereby altering the nature of archaeological sites.

Significant impacts would be determined when operations expose previously submerged resources, increasing their vulnerability to vandalism and other factors; and expose resources to increased cycles of inundation (erosion) and drawdown.

3.13.2.3 Alternative 1: No Action/No Project Alternative

Surface water facilities would operate in the same manner as existing conditions and no impacts to cultural resources would occur. Under the No Action/No Project Alternative, surface water facilities would continue to operate in the same manner as under existing operations. Individual agencies would continue to manage cultural resources in a manner consistent with State and Federal laws.

Effects that are currently underway (i.e., disturbance to cultural resources by looters, vehicles, wave action erosion, sedimentation, changing water levels, redistribution of cultural materials, etc.) would continue. Water and irrigation districts would continue to operate their systems as they do under the existing conditions, moving water frequently between facilities. Cultural resources would be subject to currently existing effects, and the No Action/No Project Alternative would reflect the system as it is presently operating.

3.13.2.4 Alternative 2: Full Range of Transfers (Proposed Action)

Transfers that draw down reservoir surface elevations at CVP and SWP reservoirs beyond historically low levels could affect cultural resources. The Proposed Action would slightly affect reservoir elevation in CVP and SWP reservoirs and reservoirs participating in stored reservoir water transfers. Water transfers have the potential to affect cultural resources, if transfers result in changing operations beyond the No Action/No Project Alternative. Reservoir surface water elevation changes could expose previously inundated cultural resources to vandalism and/or increased wave action and erosion.

Table 3.13-1 presents changes in elevation under the Proposed Action relative to the No Action/No Project Alternative. Water could be made available for transfer during the irrigation season of April through September. The model results indicate that elevations would be very similar to those under the No Action/No Project Alternative under all hydrologic conditions. The reservoir surface elevation changes under the Proposed Action for these reservoirs would be within the normal operations and would not be expected to expose previously inundated cultural resources to vandalism or increased wave action and wind erosion. Impacts to cultural resources at Shasta, Oroville and Folsom reservoirs would be less than significant.

Table 3.13-1. Changes in CVP and SWP Reservoir Elevations between the No Action/No Project Alternative and the Proposed Action (in feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta Reservoir												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
D	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.6	1.8	1.4	-0.2	-0.2
C	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	1.2	3.7	0.4	-0.5	-0.5
Lake Oroville												
W	-0.5	-0.5	-0.3	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
AN	-2.2	-2.2	-2.1	-1.4	-1.1	0.1	0.0	0.0	0.0	-0.4	-0.3	-0.3
BN	-0.3	-0.4	-0.6	-0.5	-0.5	-0.3	-0.3	-0.3	-0.4	-0.6	-0.7	-0.8
D	-0.7	-0.7	-0.6	-0.6	-0.6	-0.4	-0.4	0.5	0.6	0.0	-1.2	-0.7
C	-1.7	-2.2	-2.3	-2.3	-2.1	-1.8	-1.9	-1.7	-1.4	-0.9	-2.9	-3.0
Folsom Reservoir												
W	0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
AN	-0.5	-0.6	-0.5	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.5
BN	-0.3	-0.4	-0.6	-0.5	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2
D	0.3	0.2	-0.1	-0.2	-0.3	-0.1	-0.1	0.8	1.4	1.4	1.6	1.8
C	1.1	0.8	0.6	0.5	0.6	-0.1	0.0	0.5	1.5	1.5	1.0	1.4

Note: Negative numbers indicate that the Proposed Action would decrease reservoir elevations compared to the No Action/No Project Alternative; positive numbers indicate that the Proposed Action would increase reservoir elevations.

Key: W = wet; AN = above normal; BN = below normal; D = dry; C = critical

Stored reservoir release transfers that draw down reservoir surface elevations at local reservoirs beyond historically low levels could affect cultural resources. Under the Proposed Action, stored reservoir release transfers could affect elevations at participating reservoirs, which could affect the cultural resources of the reservoir. The surface elevation changes under the Proposed Action for these reservoirs could expose previously inundated cultural resources to vandalism, increased wave action, and wind erosion. The reservoirs, however, would not drop below the conservation pool at any of the facilities and expose cultural resources existing below the conservation pool. Changes in water levels are expected to be in line with normal operations and impacts would be less than significant.

3.13.2.5 Alternative 3: No Cropland Modifications

Transfers that draw down reservoir surface elevations at CVP and SWP reservoirs beyond historically low levels could affect cultural resources. Table 3.13-2 presents changes in elevation under Alternative 3 relative to the No Action/No Project Alternative. Water could be made available for transfer during the irrigation season of April through September. The model results indicate that elevations would be very similar to those under the No Action/No Project Alternative under all hydrologic conditions. The reservoir surface elevation changes under Alternative 3 for these reservoirs would be within the normal operations and would not be expected to expose previously inundated cultural resources to vandalism or increased wave action and wind erosion. Impacts to cultural resources at Shasta, Oroville and Folsom reservoirs would be less than significant.

Table 3.13-2. Changes in CVP and SWP Reservoir Elevations between the No Action/No Project Alternative and Alternative 3 (in feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta Reservoir												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
D	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.4	1.3	0.9	-0.2	-0.2
C	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	0.5	1.8	-0.2	-0.5	-0.5
Lake Oroville												
W	-0.5	-0.5	-0.3	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
AN	-2.2	-2.2	-2.1	-1.4	-1.1	-0.1	-0.1	-0.1	0.0	-0.4	-0.3	-0.3
BN	-0.3	-0.4	-0.6	-0.5	-0.5	-0.3	-0.3	-0.3	-0.4	-0.6	-0.7	-0.8
D	-0.7	-0.7	-0.6	-0.6	-0.6	-0.4	-0.4	-0.4	0.5	0.0	-1.2	-0.7
C	-1.7	-2.2	-2.3	-2.3	-2.1	-1.8	-1.9	-1.8	-1.5	-1.8	-2.9	-3.0

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Folsom Reservoir												
W	0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
AN	-0.5	-0.6	-0.5	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.5
BN	-0.3	-0.4	-0.6	-0.5	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2
D	0.3	0.2	-0.1	-0.2	-0.3	-0.1	-0.1	0.8	1.4	1.4	1.6	1.8
C	1.1	0.8	0.6	0.5	0.6	-0.1	0.0	0.5	1.5	1.5	1.0	1.4

Note: Negative numbers indicate that Alternative 3 would decrease reservoir elevations compared to the No Action/No Project Alternative; positive numbers indicate that Alternative 3 would increase reservoir elevations.

Key: W = wet; AN = above normal; BN = below normal; D = dry; C = critical

Stored reservoir release transfers that draw down reservoir surface elevations at local reservoirs beyond historically low levels could affect cultural resources. Water transfers with stored reservoir water would be the same as the Proposed Action. Changes in water levels are expected to be in line with normal operations and impacts would be less than significant.

3.13.2.6 Alternative 4: No Groundwater Substitution

Transfers that draw down reservoir surface elevations at CVP and SWP reservoirs beyond historically low levels could affect cultural resources. Table 3.13-3 presents changes in elevation under the Proposed Action relative to the No Action/No Project Alternative. Water could be made available for transfer during the irrigation season of April through September. The model results indicate that elevations would be very similar to those under the No Action/No Project Alternative under all hydrologic conditions. The reservoir surface elevation changes under Alternative 4 for these reservoirs would be within the normal operations and would not be expected to expose previously inundated cultural resources to vandalism or increased wave action and wind erosion. Impacts to cultural resources at Shasta, Oroville and Folsom reservoirs would be less than significant.

Table 3.13-3. Changes in CVP and SWP Reservoir Elevations between the No Action/No Project Alternative and Alternative 4 (in feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta Reservoir												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.4	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.4	0.4	0.0	0.0
Lake Oroville												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.9	-0.5	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.8	0.0	0.0

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Folsom Reservoir												
W	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	-0.2	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.6	0.5	0.0	0.0	-0.1	0.0	0.0	0.6	1.0	1.3	1.7	2.0
C	1.4	1.2	1.1	1.0	1.1	0.4	0.1	0.5	1.1	1.0	1.4	1.9

Note: Negative numbers indicate that Alternative 4 would decrease reservoir elevations compared to the No Action/No Project Alternative; positive numbers indicate that Alternative 4 would increase reservoir elevations.

Key: W = wet; AN = above normal; BN = below normal; D = dry; C = critical

Stored reservoir release transfers that draw down reservoir surface elevations at local reservoirs beyond historically low levels could affect cultural resources. Water transfers with stored reservoir water would be the same as the Proposed Action. Changes in water levels are expected to be in line with normal operations and impacts would be less than significant.

3.13.3 Comparative Analysis of Alternatives

Table 3.13-4 summarizes the effects of each of the action alternatives. The following text supplements the table by describing the magnitude of the effects under the action alternatives and No Action/No Project Alternative.

Table 3.13-4. Comparison of Alternatives

Potential Impact	Alternatives	Significance	Proposed Mitigation	Significance After Mitigation
Surface water facilities would operate in the same manner as existing conditions and no impacts to cultural resources would occur.	1	NCFEC	None	NCFEC
Transfers that draw down reservoir surface elevations beyond historically low levels could affect cultural resources.	2, 3, 4	LTS	None	LTS
Stored reservoir release transfers that draw down reservoir surface elevations at local reservoirs beyond historically low levels could affect cultural resources.	2, 3, 4	LTS	None	LTS

Key:

LTS = less than significant.

NCFEC = no change from existing conditions

3.13.3.1 No Action/No Project Alternative

Surface water facilities would operate in the same manner as existing conditions and no impacts to cultural resources would occur.

3.13.3.2 Alternative 2: Full Range of Transfers (Proposed Action)

Reservoir surface water elevation changes as a result of reservoir draw down could expose previously inundated cultural resources to vandalism and/or increased wave action and erosion. No impacts would occur at CVP, SWP and local reservoirs. Impacts would be less than significant.

3.13.3.3 Alternative 3: No Cropland Modification

Similar to the Proposed Action, no impacts would occur at CVP, SWP, and local reservoirs. Impacts would be less than significant.

3.13.3.4 Alternative 4: No Groundwater Substitution

Similar to the Proposed Action, no impacts would occur at CVP, SWP, and local reservoirs. Impacts would be less than significant.

3.13.4 Environmental Commitments/Mitigation Measures

There would be no significant impacts to cultural resources from implementation of the No Action/No Project Alternative or the action alternatives. Therefore, no environmental commitments/mitigation measures are proposed.

3.13.5 Potentially Significant Unavoidable Impacts

None of the action alternatives would result in potentially significant and unavoidable impacts on cultural resources.

3.13.6 Cumulative Effects

This cumulative effects assessment considers other programs or projects that could impact cultural resources within the same timeframe as the action alternatives considered in this EIS/EIR. Although cultural resources typically manifest as discrete archaeological sites, structures, or objects, the combination of programs or projects within a region can result in the cumulative loss of these resources and their data potential for archaeological research. Similarly, for historic landscapes, districts, and other geographically expansive areas, the combined effects of numerous programs or projects in disparate locations can result in a loss of integrity that diminishes the quality of the individual resources.

3.13.6.1 Alternative 2: Full Range of Transfers (Proposed Action)

Transfers, in combination with other cumulative projects, could draw down CVP and SWP reservoir surface elevations beyond historically low levels and affect cultural resources. Proposed transfers in combination with other cumulative projects could affect cultural resources in CVP and SWP reservoirs if multiple projects occurred in the same year, exacerbating the effects on reservoir elevation. Water operations in response to drought conditions could also result in lower reservoir elevations. The CVP and SWP reservoirs levels fluctuate frequently in response to normal water supply operations and hydrologic year types. Cultural resources within the operating zones are typically exposed to fluctuating water levels. All changes to reservoirs and rivers from the cumulative projects would remain within established water flow, water quality, and reservoir level standards. Therefore, the Proposed Action in combination with other cumulative actions would not result in a cumulative significant impact related to cultural resources in CVP and SWP reservoirs.

Transfers, in combination with other cumulative projects, could draw down local reservoir surface elevations beyond historically low levels and affect cultural resources. Reservoir elevations in local reservoirs fluctuate frequently due to water supply operations. Water transfers could further reduce water levels and expose cultural resources, but any fluctuations are expected to be within the operating zones of the reservoirs. Therefore, the Proposed Action in combination with other cumulative actions would not result in a cumulative significant impact related to cultural resources in non-Project reservoirs.

3.13.6.2 Alternative 3: No Cropland Modifications

The cultural resource impacts under Alternative 3 would be very similar to the Proposed Action. As under the Proposed Action, the cumulative impacts to cultural resources would be less than significant.

3.13.6.3 Alternative 4: No Groundwater Substitution

The cultural resource impacts under Alternative 4 would be very similar to the Proposed Action. As under the Proposed Action, the cumulative impacts to cultural resources would be less than significant.

3.13.7 References

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Section 3.14
Visual Resources

This section describes the existing aesthetic and visual resources within the area of analysis and discusses potential effects on visual resources from the proposed alternatives.

3.14.1 Affected Environment/Environmental Setting

3.14.1.1 Area of Analysis

The area of analysis for visual resources includes areas where cropland idling and crop shifting, groundwater substitution, reservoir release, and conservation transfers could occur in the Seller Service Area and areas that could receive water for agricultural uses in the Buyer Service Area. The counties included in the visual resources area of analysis are shown in Figure 3.14-1.

In addition to the counties, the area of analysis in the Seller Service Area includes: Sacramento, Feather, Bear, Yuba, American, Merced, and San Joaquin rivers, and Shasta, Oroville, Natoma, McClure, Camp Far West, Collins Lake, French Meadows, Hell Hole, Folsom, and New Bullards Bar reservoirs. The area of analysis in the Buyer Service Area includes: San Luis Reservoir.

3.14.1.2 Regulatory Setting

3.14.1.2.1 Federal

National Wild and Scenic Rivers Act (NWSRA) (16 U.S. Code [USC] 1271 et seq.)
Created by Congress in 1968, the NWSRA protects selected rivers which "possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values" for generational enjoyment. Rivers or river segment protected by the Act are classified by the system as wild, scenic, or recreational depending on impoundments, condition of shorelines, and accessibility. Federal management of selected rivers is provided by the U.S. Bureau of Land Management, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service and the National Park Service. While designation helps conserve the special character these rivers possess, it does not necessarily limit all types of developments and users. Management is encouraged to

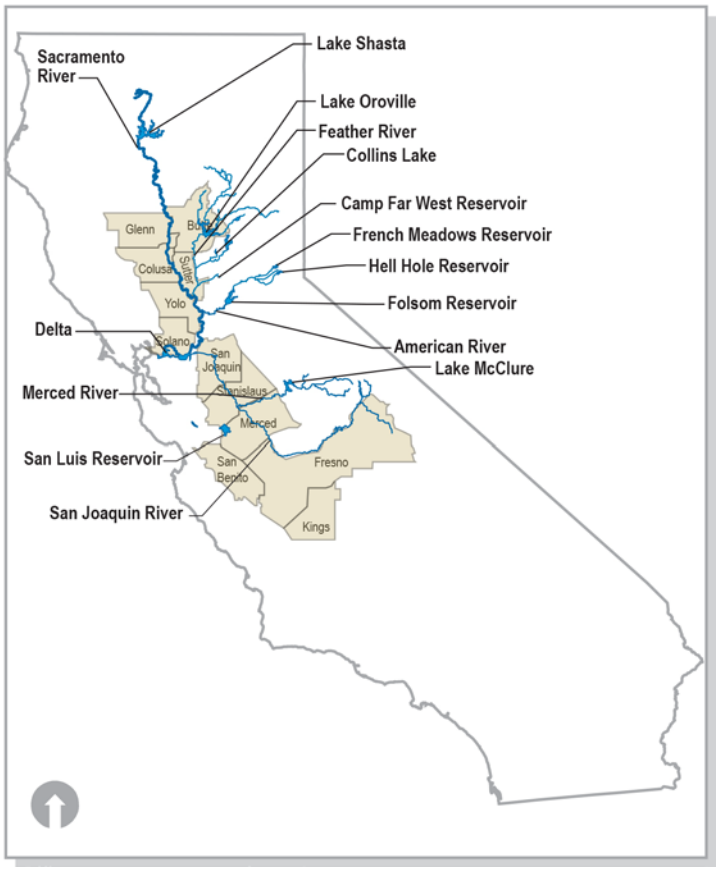

Figure 3.14-1. Visual Resource Area of Analysis

involve landowners, river users, and the general public when developing goals for river protection (National Wild and Scenic Rivers System [NWSRS] 2012). Portions of the American River, Feather River and Merced rivers, each included in this analysis, are designated as part of the NWSRS.

3.14.1.2.2 State

California Wild and Scenic Rivers Act (CWSRA) (Public Resources Code 5093.50-5093.70)

The goal of the CWSRA is to protect selected rivers "which possess extraordinary scenic, recreational, fishery, or wildlife values shall be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state." Rivers or river segment protected under the CWSRA are categorized in similar fashion as the NWSRA. A management plan is developed for the river segment and adjacent land according to its categorization. The CWSRA is administrated by the California Natural Resources Agency. Portions of the American River, included in this analysis, are designated as a California Wild and Scenic River System.

State Scenic Highways

The goal of the California Scenic Highway Program is to preserve and enhance the state's natural scenic resources. The laws governing the program establishes the State's responsibility to protect and enhance the states scenic resources by identifying portions of the State highway system and adjacent scenic corridors which require special conservation treatment. California Department of Transportation (Caltrans) manages the Scenic Highway Program but responsibility for developments along scenic corridors lies with local governmental agencies (Caltrans 2012). These state regulations are applicable to visual resources throughout the project area as seen from state scenic highways. State Scenic Highways included within this area of analysis include:

- A three mile stretch of State Route (SR) 151 from Shasta Dam to near Summit City
- Pacheco Pass (SR 152) (along San Luis Reservoir)

3.14.1.3 Existing Conditions

The following section describes the existing visual resources within the area of analysis. The presentation of information in this section is organized by service area, then by river region, which discusses both the river and reservoirs.

3.14.1.3.1 Seller Service Area

The Seller Service Area is bordered on the east by the Sierra Nevada, on the northwest by the Coast Ranges, and on the south by the Sacramento-San Joaquin Delta. Agriculture in the Sacramento Valley, forests in the upper watersheds, and grasslands and woodlands in the foothills characterize the region visually. Other low-elevation characteristics include occasional wetlands, vernal pools, and riparian areas. Much of the upper watershed on the east side of the Central Valley is forested, which limits views for motorists traveling through the area. Reservoirs in the region increase the level of scenic attractiveness at their maximum operating levels.

The following section describes visually sensitive areas, the landscape character, and scenic attractiveness of water bodies and adjacent scenic routes in the Seller Service Area.

Sacramento River Region

The Sacramento River originates above Shasta Reservoir in the north and flows through the Sacramento Valley to the Delta. Agriculture, a Class C visual resource (See Section 3.14.2.1.1 for a description of scenic attractiveness classifications), dominates the land uses near the river along the valley floor, while the upper watershed has retained its oak woodland, grasslands, forests, and rural character. Rice is one of the prominent crops grown in the Sacramento Valley and is noticeable along Interstate 5 (I-5) corridor. The Sacramento Valley also has many acres of field crops and orchards. An

example of scenery surrounding the Sacramento River is shown in Figure 3.14-2.

Figure 3.14-2. Sacramento River

Shasta Reservoir is in the Shasta-Trinity National Forest in Shasta County and is the largest manmade reservoir in California. Lands adjacent to Shasta Reservoir consist primarily of steep slopes, upland vegetation, and coniferous forests (Class A and B visual resources). The shorelines of Shasta Reservoir vary from steep and rocky banks to coves of wooded flats. Figure 3.14-3 provides a view of the scenery surrounding Shasta Reservoir.

Figure 3.14-3. Shasta Dam and Shasta Reservoir

A three mile stretch of SR 151 from Shasta Dam to near Summit City is designated as a state scenic highway. This portion of road provides views of the Sacramento River, Shasta Reservoir, and distant hills.

In Sacramento County, a portion of SR 160 from the Contra Costa County line to the southern city limit of Sacramento is designated as a state scenic route. This road offers a glimpse of historic Delta agricultural areas and small towns along the Sacramento River (California Scenic Highway Mapping System [CSHMS] 2012). Views along this portion of roadway are considered Class A and B visual resources.

Feather River Region

Oroville Dam and Reservoir offer dramatic visual scenery surrounded by the Sierra Nevada foothills. Lake Oroville State Recreation Area (SRA) visitor center includes a 47-foot-high observation tower with two high-powered telescopes designed to give panoramic views of the dam and lake. Area views are also seen from developed facilities around the lake such as campgrounds, picnic areas, marinas, and boat launch areas (California Department of Parks and Recreation [CDPR] 2012). The recreational areas have Class A and B visual resources as does the reservoir. Figure 3.14-4 provides a view of the Lake Oroville area.

The lower Feather River terrain is generally flat. Riparian vegetation lines the river, with grassland and croplands in the adjacent agricultural areas. The southern portion of the Feather River, near Marysville, is adjacent to large areas of rice fields, as well as other field crops, which are considered Class C visual resources.

Figure 3.14-4. Lake Oroville

Yuba River Region

The Yuba River flows into the Feather River near Marysville. In this area agricultural lands are a dominant feature as well as grasslands and barren land, Class C visual resources. Collins Lake is in Yuba County in the foothills between Marysville and Grass Valley. The reservoir has 12 miles of shoreline with many varieties of trees and shrubs, as well as wildflowers. The reservoir and surrounding area are considered Class A and B visual resources.

American River Region

The American River originates in the Sierra Nevada and flows southwest to Folsom Reservoir and then into the Sacramento River near the City of Sacramento. Main tributaries include the North, Middle, and South Fork. These tributaries are known for their deep canyons, trails, and white water rafting are considered Class A and B high visual quality resources. Figure 3.14-5 provides a view of the Upper American River Region.

French Meadow Reservoir is along the Middle Fork of the American River in Placer County. The reservoir has a shoreline consisting of many varieties of trees and shrubs, as well as wildflowers. The vegetation provides suitable habitat for many wildlife species, and has opportunities for wildlife viewing. The reservoir and surrounding area are considered Class A and B visual resources.

Figure 3.14-5. Upper American River

Hell Hole Reservoir is located in El Dorado County on the Rubicon River, which flows to the Middle Fork of the American River. The reservoir has a 15-mile shoreline of rugged canyon walls. The reservoir's clear water adds to its

visual character of the landscape and the shoreline is suitable for wildlife and bird viewing. The reservoir and surrounding area are considered Class A and B visual resources. Figure 3.14-6 provides a view of the visual resources surrounding Hell Hole Reservoir.

Figure 3.14-6. Hell Hole Reservoir

The North, Middle, and South Fork tributaries drain towards Folsom Reservoir. Folsom Reservoir is surrounded by rolling grasslands and wooded foothills. Figure 3.14-7 provides a view of Folsom Reservoir.

Figure 3.14-7. Folsom Reservoir

Folsom Reservoir SRA and Folsom Powerhouse State Historic Park offer multiple recreational opportunities and views of the reservoir. Folsom

Reservoir contrasts sharply with the nearby rolling grassland and wooded foothill landscapes. About seven miles downstream of Folsom Dam on the American River is Lake Natoma formed by Nimbus Dam. Lake Natoma regulates the releases from Folsom Dam made for power generation. The shoreline contains gravel banks, large boulders, and riparian vegetation. Both Lake Natoma and Folsom Reservoir are considered Class A and B visual resources.

The lower American River provides a variety of visual experiences, including steep bluffs, terraces, islands, backwater areas, and riparian vegetation. Figure 3.14-8 provides an aerial view of the lower American River. The water surface, gravel banks, natural grasses, smaller plants, and variety of trees along the river create a natural setting designated as a "protected area" in the American River Parkway Plan by Sacramento County for native plant restoration and habitat protection (Sacramento County 2008). The American River reach through Sacramento is a federally designated Wild and Scenic River. While the river flows through an urban area, the river is buffered by the American River Parkway. Sacramento County's American River Parkway Plan helps preserve the open spaces and natural resources along the American River that "provide Parkway users with a highly-valued natural setting and feeling of serenity, in the midst of a developed urban area" (Sacramento County 2008). The lower American River is considered a Class A visual resource.

Figure 3.14-8. Lower American River

Merced River Region

Lake McClure is a reservoir in the Sierra Nevada foothills on the Merced River. The lake has 80 miles of shoreline and is surrounded by pine and oak woodlands. The reservoir and facilities offer Class A and B visual resources.

The lower Merced River generally flows southwest from Lake McClure out of the foothills to the San Joaquin River. The land upstream from the San Joaquin River is generally flat and primarily used for agricultural purposes such as field crops and livestock, a Class C visual resource.

3.14.1.3.2 Buyer Service Area

Visual resources that could be affected in the Buyer Service Area include San Luis Reservoir and agricultural areas of San Luis & Delta-Mendota Water Authority participating member agencies.

San Luis Reservoir lies in the western San Joaquin Valley, along historic Pacheco Pass (SR 152), a state scenic highway. The reservoir lies within the San Luis Reservoir SRA, which is surrounded by undeveloped open spaces, and has views of distant rolling hills and the Diablo Range (CDPR 2012). Within the San Luis Reservoir SRA a visitor center at the Romero Overlook offers information on the reservoir and provides telescopes for viewing the area around the reservoir. In the spring, the reservoir area offers wildflower-viewing opportunities (CDPR 2012). The reservoir and facilities offer Class A and B visual resources. Figure 3.14-9 provides an aerial view of the region surrounding San Luis Reservoir.

Figure 3.14-9. San Luis Reservoir and O'Neill Forebay

The majority of the Buyer Service Area is primarily designated for agriculture uses, including tree and row crops, typically a Class C visual resource. The agricultural lands of the Buyer Service Area include tree and row crops, grain, hay, and pasture. Short-term fallow fields also make up a large portion of the Buyer Service Area in any given season.

3.14.2 Environmental Consequences/Environmental Impacts

The following sections describe the environmental consequences/environmental impacts associated with each alternative.

3.14.2.1 Assessment Methods

This section presents the assessment methods applied to evaluate visual resources. Visual resource analysis tends to be subjective and generally expressed qualitatively. In order to analyze the importance of an impact on a visual resource, it is necessary to first classify the value of that visual resource.

3.14.2.1.1 Scenery Management System (SMS)

Assessment methods relied on the SMS developed by the U.S. Department of Agriculture (USDA), USFS in 1995 and outlined in *Landscape Aesthetics: A Handbook for Scenery Management, Agriculture Handbook Number 701*. The SMS helps determine landscapes and landscape character that are important for scenic attractiveness, based on commonly held perceptions of the beauty of landform, vegetation pattern, composition, surface water characteristics, and land use patterns.

The SMS is applied to the alternatives using the following steps:

- **Identify visually sensitive areas.** Sensitivity is considered highest for views seen by people driving to or from recreational activities, or along routes designated as scenic corridors. Views from relatively moderate to high-use recreation areas are also considered sensitive. For this analysis, rivers and reservoirs are considered visually sensitive areas. The analysis also evaluates effects to views of productive agricultural lands.

- **Define the landscape character.** Landscape character gives an area it's visual and cultural image, and consists of the combination of physical, biological, and cultural attributes that make each landscape identifiable or unique. Landscape character refers to images of the landscape that can be defined with a list of scenic attributes.

  The USDA defines these as the following:

  – Landform Patterns and Features: Includes characteristic landforms, rock features, and their juxtaposition to one another.

  – Surface Water Characteristics: The relative occurrence and distinguishing characteristics of rivers, streams, lakes, and wetlands. Includes features such as waterfalls and coastal areas.

  - Vegetation Patterns: Relative occurrence and distinguishing characteristics of potential vegetative communities and the patterns formed by them.

  - Land Use Patterns and Cultural Features: Visible elements of historic and present land use which contribute to the image and sense of place. Agriculture in the Central Valley contributes to the landscape character of the region.

- **Classify scenic attractiveness.** Scenic attractiveness classifications are a key component of the SMS and are used to classify visual features into the following categories:

  - **Class A, Distinctive** – Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

  - **Class B, Typical** – Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide ordinary or common scenic quality. These landscapes have generally positive, yet common, attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance. Normally they would form the basic matrix within the ecological unit.

  - **Class C, Indistinctive** – Areas where landform, vegetation patterns, water characteristics, and cultural land use have low scenic quality. Often water and rockform of any consequence are missing in class C landscapes. These landscapes have weak of missing attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance.

Class A and B visual resources typically include state or federal parks, recreation, or wilderness areas. Rivers and reservoirs are typically considered Class A or B visual resources. Class C resources generally include areas that have low scenic quality and contain more common landscapes, such as agricultural lands. This analysis evaluates the effects to landscape character from cropland idling but does not evaluate the effects on scenic attractiveness from cropland idling transfers because agricultural is considered a Class C resource.

3.14.2.1.2 Transfers Operation Model

To determine visual effects on rivers and reservoirs, changes in reservoir elevations and river flows under the alternatives are compared to the No Action/No Project Alternative. This analysis uses hydrologic operations

modeling to provide estimated changes in reservoir elevation, reservoir storage, and river flows. Appendix B describes the operations modeling methods and assumptions.

As stated above, reservoirs are generally Class A or B visual resources when their water surface elevations are near to or at their maximum. An adverse visual effect to reservoirs would occur if surface water elevation levels decreased to a level such that shoreline riparian vegetation were reduced or the "bathtub" ring was substantially larger than under the existing conditions or the No Action/No Project Alternative. As drawdown occurs during the summer and fall, an increasing area of shoreline devoid of vegetation appears in the area between the normal high water mark and the actual lake level. The exposed rock and soil of the drawdown zone contrasts with the vegetated areas above the high water level and with the lake's surface. See Figure 3.14-10 for a visual of Shasta Reservoir experiencing a bathtub ring effect; notice the exposed rock beneath the high water mark. As a consequence of reservoir operations, the level of scenic attractiveness tends to decline in July and August with increasing drawdown.

Source: Department of Water Resources (DWR) 2012

Figure 3.14-10. The "Bathtub Ring" Effect at Shasta Reservoir

A river would be adversely affected visually if the decrease in flow resulted in exposure of the riverbed, reduction of riparian vegetation along the banks, or changes to any important visual features of the river. Seasonal variations in flow levels of the rivers within this region provide for a wide range of aesthetic opportunities. Most of the rivers in this region have low flow regulations in place. Flow requirements for the various rivers and streams may be found in State Water Resources Control Board water right permits or licenses, Federal Energy Regulatory Commission hydropower licenses, and interagency agreements. Because minimum flow requirements exist and the flows are

managed, riparian vegetation along the rivers reflects the results of current management practices. These practices include the use of levees for flood control, managed floodplains and overflow bypasses, and controlled releases from reservoirs. These practices may result in a narrow riparian corridor. Nonetheless, riparian vegetation remains an important visual aspect to all streams and river corridors. Water, shade, and dense cover distinguish the riparian areas from the surrounding land. Increased river flows typically improve visual resources by creating a fuller river, and improving riparian habitat along the river's banks. Reductions in river flows could result in substantial exposure of the river bed, reduction of riparian vegetation along the banks or changes to important visual features of the river.

3.14.2.2 Significance Criteria

Impacts on visual resources would be considered potentially significant if transfers would:

- Substantially degrade the existing landscape character and scenic attractiveness of Class A and B visual resources.

3.14.2.3 Alternative 1: No Action/No Project

3.14.2.3.1 Seller Service Area

There would be no impacts to existing landscape character or scenic attractiveness of Class A and B visual resources in the Seller Service Area. Under the No Action/No Project Alternative, water transfers would not be implemented. Any effects on visual resources in the Seller Service Area relating to lowered reservoir levels and decreased river flows would be the same as existing project operations. Therefore, the No Action/No Project Alternative reflects that of the affected environment and there would be no change from existing conditions on visual resources in the Seller Service Area.

3.14.2.3.2 Buyer Service Area

There would be no impacts to existing landscape character or scenic attractiveness of Class A and B visual resources in the Buyer Service Area. During dry years, the No Action/No Project Alternative could experience increased amounts of cropland idling because of decreased water supplies. Agricultural land is generally considered a Class C visual resource and by definition would not have an impact on Class A and B visual resources. There would be no change in visual resources compared to existing conditions under the No Action/No Project Alternative.

3.14.2.4 Alternative 2: Full Range of Transfers (Proposed Action)

3.14.2.4.1 Seller Service Area

Water transfers could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at Central Valley Project (CVP) and State Water Project (SWP) reservoirs. Under the Proposed Action,

water supply operations related to water transfers could affect reservoir elevations in Shasta, Oroville, and Folsom reservoirs. Decreased reservoir elevations could affect the landscape character and scenic attractiveness of the reservoir. Table 3.14-1 shows the changes in reservoir elevations at these three reservoirs. The changes from the No Action/No Project Alternative would be minor, and the visual effect of the increased bathtub ring would not be noticeable. The impact to visual resources would be less than significant.

Table 3.14-1. Changes in CVP and SWP Reservoir Elevations between the No Action/No Project Alternative and the Proposed Action (in feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta Reservoir												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
D	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.6	1.8	1.4	-0.2	-0.2
C	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	1.2	3.7	0.4	-0.5	-0.5
Lake Oroville												
W	-0.5	-0.5	-0.3	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
AN	-2.2	-2.2	-2.1	-1.4	-1.1	0.1	0.0	0.0	0.0	-0.4	-0.3	-0.3
BN	-0.3	-0.4	-0.6	-0.5	-0.5	-0.3	-0.3	-0.3	-0.4	-0.6	-0.7	-0.8
D	-0.7	-0.7	-0.6	-0.6	-0.6	-0.4	-0.4	0.5	0.6	0.0	-1.2	-0.7
C	-1.7	-2.2	-2.3	-2.3	-2.1	-1.8	-1.9	-1.7	-1.4	-0.9	-2.9	-3.0
Folsom Reservoir												
W	0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
AN	-0.5	-0.6	-0.5	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.5
BN	-0.3	-0.4	-0.6	-0.5	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2
D	0.3	0.2	-0.1	-0.2	-0.3	-0.1	-0.1	0.8	1.4	1.4	1.6	1.8
C	1.1	0.8	0.6	0.5	0.6	-0.1	0.0	0.5	1.5	1.5	1.0	1.4

Note: Negative numbers indicate that the Proposed Action would decrease reservoir elevations compared to the No Action/No Project Alternative; positive numbers indicate that the Proposed Action would increase reservoir elevations.

Key: Sac Yr Type = year type, W = wet, AN = above normal, BN = below normal, D = dry, C = critical

Water transfers could degrade the existing landscape character or scenic quality of Class A and B visual resources along surface water bodies. Decreased river flows could affect the visual quality of these rivers. Table 3.14-2 shows changes in river flows on the Sacramento, Feather, American, and Merced rivers. As described above, reservoir operators would need to continue releases to meet downstream flow and water quality standards; these required releases would prevent any changes from substantially changing the visual quality of the channel.

Changes in river flows under the Proposed Action would be within normal river flow fluctuation and would not result in a notable difference in the landscape character of the river. The Proposed Action would have a less-than-significant impact on the landscape character and scenic attractiveness of existing visual resources along the Sacramento, Feather, American, and Merced rivers.

Table 3.14-2. Changes in River Flows between the No Action/No Project Alternative and the Proposed Action (in cfs)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Sacramento River at Wilkins Slough												
W	-8.9	-5.1	-8.0	-10.7	-6.3	-5.3	-5.0	-3.2	-1.9	-2.4	-1.4	-1.3
AN	-8.3	-8.2	-27.2	-19.6	-18.2	-7.9	-8.2	-44.3	-2.6	7.2	7.2	7.8
BN	-4.5	-3.7	-3.5	-3.5	-3.5	-3.3	-4.3	0.0	0.0	-3.3	0.0	-3.0
D	-11.0	-14.1	-10.1	-11.0	-7.9	-7.6	-53.1	-33.5	-252.6	465.6	758.9	162.0
C	-21.5	-15.8	-15.2	-14.1	-5.2	-15.1	-0.2	-114.5	-274.4	1,517.7	838.4	356.1
All	-11.5	-9.3	-13.0	-12.6	-8.3	-8.1	-13.0	-38.5	-102.2	394.8	307.3	102.6
Lower Feather River												
W	0.2	-13.8	-32.1	-25.8	-52.4	-16.4	-10.4	-9.1	-3.5	-1.1	7.1	6.4
AN	16.3	-11.7	-9.9	-55.2	-55.8	-196.8	-15.5	-58.8	-22.0	86.1	-39.3	-31.2
BN	5.3	5.4	13.4	-5.0	-7.5	-9.6	-9.2	-7.2	0.0	0.7	10.7	4.0
D	-1.9	-10.0	-8.2	-13.3	-25.2	-35.2	-7.9	-109.4	-16.0	120.1	240.8	-35.7
C	-11.0	-8.5	-0.3	-18.5	-56.0	-21.1	-0.6	-0.5	-31.3	113.9	318.3	49.2
All	0.7	-10.5	-14.8	-26.1	-46.3	-52.1	-8.8	-33.7	-14.5	59.4	104.4	1.0
American River at H Street												
W	16.4	38.7	-39.7	-56.2	-22.4	-2.7	-1.3	8.3	-13.7	4.1	-1.6	3.5
AN	21.2	12.1	0.9	-173.0	-235.7	-34.9	-1.3	-1.3	1.8	32.7	36.5	41.0
BN	12.1	11.9	21.5	-0.4	-79.4	-0.5	-0.4	-0.5	12.3	13.6	-0.3	8.2
D	25.4	8.9	43.7	-53.1	-22.0	-73.9	-114.5	-63.7	-0.9	130.5	80.0	56.9
C	51.5	40.0	30.3	16.9	17.0	25.8	-23.3	19.4	-45.9	195.1	141.3	82.4
All	25.8	27.4	0.2	-57.9	-55.2	-14.9	-25.7	-4.3	-13.8	71.4	49.0	36.1
River at San Joaquin River												
W	0.0	0.0	0.0	0.0	-41.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	-81.3	0.0	0.0	-84.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	127.5	71.4	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	85.0	47.6	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	36.4	20.4	0.0	0.0	0.0	0.0
All	0.0	0.0	0.0	0.0	-15.9	-14.4	30.0	16.8	-14.8	0.0	0.0	0.0

Note: Negative numbers indicate that the Proposed Action would decrease river flows compared to the No Action/No Project Alternative; positive numbers indicate that the Proposed Action would increase river flows.

Key: Sac Yr Type = year type, W = wet, AN = above normal, BN = below normal, D = dry, C = critical

Stored reservoir release transfers could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at participating reservoirs. Under the Proposed Action, stored reservoir release transfers could affect elevations at participating reservoirs, which could affect the visual quality of the reservoir. The reservoirs, however, would not drop below the conservation pool at any of the facilities (which defines the bottom of the bathtub ring).

Under the Proposed Action, elevation changes would be of an insufficient magnitude to result in perceptible changes to the visual quality of the reservoirs. Under the Proposed Action, reservoir release would have a less-than-significant

impact on the landscape character and scenic attractiveness of existing visual resources at participating reservoirs.

Cropland idling transfers could substantially degrade the existing landscape character and scenic attractiveness of Class A and B visual resources. Agricultural lands are typically considered a Class C visual resource and by definition would not have an impact on Class A and B visual resources. Under the Proposed Action, crop idling would have a less-than-significant impact on the landscape character and scenic attractiveness of existing visual resources in the Sacramento River Region.

3.14.2.4.2 Buyer Service Area

Water transfers could substantially degrade the existing landscape character and quality in the Buyer's Service Area. The conveyance of transfer water through existing conveyance channels in the Buyers Service Area could be visible from adjacent land, vantage points, and roadways. Flows would be similar to what is normally flowing in these channels but would occur for a longer period of time, and could potentially extend into the summer months during years when transfer water is available. Because the conveyance channels are generally located within and near agricultural areas, they are considered Class C resources. Any changes in flow in conveyance channels would not affect Class A or B resources. The effects of increased flows in export conveyance channels would have a less-than-significant impact on visual resources in the Buyers Service Area.

3.14.2.5 Alternative 3: No Cropland Modifications

This section describes the potential visual resources effects of the No Cropland Modifications Alternative.

3.14.2.5.1 Seller Service Area

Water transfers could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at CVP and SWP reservoirs. Under Alternative 3, water supply operations related to water transfers could affect reservoir elevations in Shasta, Oroville, and Folsom reservoirs (similar to the Proposed Action). Decreased reservoir elevations could affect the landscape character and scenic attractiveness of the reservoir. Table 3.14-3 shows the changes in reservoir elevations at these three reservoirs. The changes from the No Action/No Project Alternative would be minor, and the visual effect of the increased bathtub ring would not be noticeable. The impact to visual resources would be less than significant.

Table 3.14-3. Changes in CVP and SWP Reservoir Elevations between the No Action/No Project Alternative and Alternative 3 (in feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta Reservoir												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	-0.4	-0.4	-0.3	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
D	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.2	0.4	1.3	0.9	-0.2	-0.2
C	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	0.5	1.8	-0.2	-0.5	-0.5
Lake Oroville												
W	-0.5	-0.5	-0.3	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2
AN	-2.2	-2.2	-2.1	-1.4	-1.1	-0.1	-0.1	-0.1	0.0	-0.4	-0.3	-0.3
BN	-0.3	-0.4	-0.6	-0.5	-0.5	-0.3	-0.3	-0.3	-0.4	-0.6	-0.7	-0.8
D	-0.7	-0.7	-0.6	-0.6	-0.6	-0.4	-0.4	-0.4	0.5	0.0	-1.2	-0.7
C	-1.7	-2.2	-2.3	-2.3	-2.1	-1.8	-1.9	-1.8	-1.5	-1.8	-2.9	-3.0
Folsom Reservoir												
W	0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
AN	-0.5	-0.6	-0.5	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.5
BN	-0.3	-0.4	-0.6	-0.5	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2
D	0.3	0.2	-0.1	-0.2	-0.3	-0.1	-0.1	0.8	1.4	1.4	1.6	1.8
C	1.1	0.8	0.6	0.5	0.6	-0.1	0.0	0.5	1.5	1.5	1.0	1.4

Note: Negative numbers indicate that Alternative 3 would decrease reservoir elevations compared to the No Action/No Project Alternative; positive numbers indicate that Alternative 3 would increase reservoir elevations.

Key: Sac Yr Type = year type, W = wet, AN = above normal, BN = below normal, D = dry, C = critical

Water transfers could degrade the existing landscape character or scenic quality of Class A and B visual resources along surface water bodies. Under Alternative 3, decreased river flows could affect the visual quality of these rivers. Table 3.14-4 shows changes in river flows on the Sacramento, Feather, American, and Merced rivers. Changes in river flows under Alternative 3 would be within normal river flow fluctuation and would not result in a notable difference in the landscape character of the river. Alternative 3 would have a less-than-significant impact on the landscape character and scenic attractiveness of existing visual resources along the Sacramento, Feather, American, and Merced rivers.

Table 3.14-4. Changes in River Flows between the No Action/No Project Alternative and Alternative 3 (in cfs)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Sacramento River at Wilkins Slough												
W	-8.9	-5.1	-8.0	-10.7	-6.3	-5.3	-5.0	-3.2	-1.9	-2.4	-1.4	-1.3
AN	-8.3	-8.2	-27.2	-19.6	-18.2	-7.9	-8.2	-44.3	-2.6	7.2	7.2	7.8
BN	-4.5	-3.7	-3.5	-3.5	-3.5	-3.3	-4.3	0.0	0.0	-3.3	0.0	-3.0
D	-11.0	-14.1	-10.1	-11.0	-7.9	-7.6	-53.1	-33.5	-248.9	294.9	452.1	75.6
C	-21.5	-15.8	-15.2	-14.1	-5.2	-15.1	-0.2	-119.3	-273.7	715.3	251.9	102.1
All	-11.5	-9.3	-13.0	-12.6	-8.3	-8.1	-13.0	-39.5	-101.5	199.5	132.4	35.1
Lower Feather River												
W	0.2	-13.8	-32.1	-25.8	-52.4	-16.4	-10.4	-9.1	-3.5	-1.1	7.1	6.4
AN	16.3	-11.7	-9.9	-55.2	-55.8	-196.8	-15.5	-58.8	-22.0	86.1	-39.3	-31.2
BN	5.3	5.4	13.4	-5.0	-7.5	-9.6	-9.2	-7.2	0.0	0.7	10.7	4.0
D	-1.9	-10.0	-8.2	-13.3	-25.2	-35.2	-7.9	-106.9	-16.0	102.1	228.7	-40.7
C	-11.0	-8.5	-0.3	-18.5	-56.0	-21.1	-0.6	-0.5	-29.5	185.5	197.5	40.6
All	0.7	-10.5	-14.8	-26.1	-46.3	-52.1	-8.8	-33.3	-14.1	71.0	77.4	-1.6
American River at H Street												
W	16.4	38.7	-39.7	-56.2	-22.4	-2.7	-1.3	8.3	-13.7	4.1	-1.6	3.5
AN	21.2	12.1	0.9	-173.0	-235.7	-34.9	-1.3	-1.3	1.8	32.7	36.5	41.0
BN	12.1	11.9	21.5	-0.4	-79.4	-0.5	-0.4	-0.5	12.3	13.6	-0.3	8.2
D	25.4	8.9	43.7	-53.1	-22.0	-73.9	-114.5	-63.7	-0.9	130.5	80.0	56.9
C	51.5	40.0	30.3	16.9	17.0	25.8	-23.3	20.5	-44.3	191.3	142.5	82.4
All	25.8	27.4	0.2	-57.9	-55.2	-14.9	-25.7	-4.1	-13.5	70.6	49.3	36.1
Merced River at San Joaquin River												
W	0.0	0.0	0.0	0.0	-41.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	-81.3	0.0	0.0	-84.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	127.5	71.4	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	85.0	47.6	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	36.4	20.4	0.0	0.0	0.0	0.0
All	0.0	0.0	0.0	0.0	-15.9	-14.4	30.0	16.8	-14.8	0.0	0.0	0.0

Note: Negative numbers indicate that Alternative 3 would decrease river flows compared to the No Action/No Project Alternative; positive numbers indicate that Alternative 3 would increase river flows.

Key: Sac Yr Type = year type, W = wet, AN = above normal, BN = below normal, D = dry, C = critical

Stored reservoir release transfers could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources participating reservoirs. The impacts to visual resources at reservoirs participating in stored reservoir water transfers would be the same under Alternative 3 as the Proposed Action; these impacts would be less than significant.

3.14.2.5.2 Buyer Service Area

Water transfers could substantially degrade the existing landscape character and quality in the Buyer's Service Area. The impacts to visual resources in the

Buyer Service Area would be the same under Alternative 3 as the Proposed Action; these impacts would be less than significant.

3.14.2.6 Alternative 4: No Groundwater Substitution

This section describes the potential visual resources effects of the No Groundwater Substitution Alternative.

3.14.2.6.1 Seller Service Area

Water transfers could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at CVP and SWP reservoirs. Under Alternative 4, water supply operations related to water transfers could affect reservoir elevations in Shasta, Oroville, and Folsom reservoirs (similar to the Proposed Action). Decreased reservoir elevations could affect the landscape character and scenic attractiveness of the reservoir. Table 3.14-5 shows the changes in reservoir elevations at these three reservoirs. The changes from the No Action/No Project Alternative would be minor, and the visual effect of the increased bathtub ring would not be noticeable. The impact to visual resources would be less than significant.

Table 3.14-5. Changes in CVP and SWP Reservoir Elevations between the No Action/No Project Alternative and Alternative 4 (in feet)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta Reservoir												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	0.4	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	2.4	0.4	0.0	0.0
Lake Oroville												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	-0.1	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.4	0.9	-0.5	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.8	0.0	0.0
Folsom Reservoir												
W	0.6	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	-0.2	-0.3	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.6	0.5	0.0	0.0	-0.1	0.0	0.0	0.6	1.0	1.3	1.7	2.0
C	1.4	1.2	1.1	1.0	1.1	0.4	0.1	0.5	1.1	1.0	1.4	1.9

Note: Negative numbers indicate that Alternative 4 would decrease reservoir elevations compared to the No Action/No Project Alternative; positive numbers indicate that Alternative 4 would increase reservoir elevations.

Key: Sac Yr Type = year type, W = wet, AN = above normal, BN = below normal, D = dry, C = critical

Water transfers could degrade the existing landscape character or scenic quality of Class A and B visual resources along surface water bodies. Under Alternative 4, decreased river flows could affect the visual quality of these rivers. Table 3.14-6 shows changes in river flows on the Sacramento, Feather, American, and Merced rivers. Changes in river flows under Alternative 4

would be within normal river flow fluctuation and would not result in a notable difference in the landscape character of the river. Alternative 4 would have a less-than-significant impact on the landscape character and scenic attractiveness of existing visual resources along the Sacramento, Feather, American, and Merced rivers.

Table 3.14-6. Changes in River Flows between the No Action/No Project Alternative and Alternative 4 (in cfs)

Sac Yr Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Sacramento River at Wilkins Slough												
W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-73.8	279.9	279.9	89.1
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-31.7	-108.3	1,024.0	516.0	255.9
All	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-6.5	-35.3	260.2	155.6	68.4
Lower Feather River												
W	0.0	0.0	-6.3	-6.3	0.0	-3.9	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	-40.7	0.0	-16.8	0.0	-33.6	0.0	54.2	-40.7	-14.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	-12.0	-19.5	0.0	-24.3	0.0	-2.1	237.2	-66.0
C	0.0	0.0	0.0	0.0	-44.6	-5.8	0.0	0.0	-13.2	62.2	127.2	12.4
All	0.0	0.0	-2.4	-9.6	-11.3	-9.1	0.0	-10.2	-2.7	22.0	60.9	-11.6
American River at H Street												
W	9.7	36.2	-28.6	-18.6	-20.7	-1.1	0.0	9.6	-13.5	-0.5	-0.8	0.0
AN	10.4	4.4	1.7	-132.1	-233.9	-33.2	0.3	0.1	0.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	20.8	11.7	57.6	-52.2	-21.2	-72.2	-113.6	-24.3	0.0	55.6	33.9	32.2
C	36.5	28.6	31.5	18.2	18.3	26.8	26.8	38.6	-6.8	97.4	59.6	55.8
All	16.7	22.6	6.0	-35.9	-48.8	-13.5	-14.5	7.3	-6.6	29.7	17.9	17.2
Merced River at San Joaquin River												
W	0.0	0.0	0.0	0.0	-41.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-84.0	0.0	0.0	0.0
BN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	162.6	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.7	0.0	0.0
All	0.0	0.0	0.0	0.0	-15.9	0.0	0.0	0.0	-14.8	43.1	0.0	0.0

Note: Negative numbers indicate that Alternative 4 would decrease river flows compared to the No Action/No Project Alternative; positive numbers indicate that Alternative 4 would increase river flows.

Key: Sac Yr Type = year type, W = wet, AN = above normal, BN = below normal, D = dry, C = critical

Stored reservoir release transfers could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources participating reservoirs. The impacts to visual resources at reservoirs participating in stored reservoir water transfers would be the same under Alternative 4 as the Proposed Action; these impacts would be less than significant.

Cropland idling transfers could substantially degrade the existing landscape character and scenic attractiveness of Class A and B visual resources. The impacts to visual resources at from cropland idling transfers would be the same under Alternative 4 as the Proposed Action; these impacts would be less than significant.

3.14.2.6.2 Buyer Service Area

Water transfers could substantially degrade the existing landscape character and quality in the Buyer's Service Area. The impacts to visual resources in the Buyer Service Area would be the same under Alternative 4 as the Proposed Action; these impacts would be less than significant.

3.14.3 Comparative Analysis of Alternatives

Table 3.14-7 summarizes the effects of each of the action alternatives. The following text supplements the table by describing the magnitude of the effects under the action alternatives and No Action/No Project Alternative.

Table 3.14-7. Comparative Analysis of Alternatives

Potential Impacts	Alternative(s)	Significance	Proposed Mitigation	Significance after Mitigation
There would be no impacts to existing landscape character or scenic attractiveness of Class A and B visual resources in the Seller Service Area	1	NCFEC	None	NCFEC
There would be no impacts to existing landscape character or scenic attractiveness of Class A and B visual resources in the Buyer Service Area	1	NCFEC	None	NCFEC
Water transfers could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources at CVP and SWP reservoirs	2, 3, 4	LTS	None	LTS
Water transfers could degrade the existing landscape character or scenic quality of Class A and B visual resources along surface water bodies	2, 3, 4	LTS	None	LTS
Stored reservoir release transfers could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources participating reservoirs	2, 3, 4	LTS	None	LTS
Cropland idling transfers could substantially degrade the existing landscape character and scenic attractiveness of Class A and B visual resources	2, 4	LTS	None	LTS
Water transfers could substantially degrade the existing landscape character and quality in the Buyer's Service Area	2, 3, 4	LTS	None	LTS

Key: LTS = less than significant, None = no mitigation

3.14.3.1 No Action/No Project Alternative

There would be no impacts on visual resources.

3.14.3.2 Alternative 2: Full Range of Transfers (Proposed Action)

Water transfers under the Proposed Action could affect reservoir elevations and river flows in the area of analysis; however, reported changes in elevation and flow would generally be within normal seasonal fluctuations and would not be expected to result in substantial changes to visual resources.

3.14.3.3 Alternative 3: No Cropland Modifications

Alternative 3 would not include cropland idling, so the minor visual effects associated with idle fields would not occur. The remaining potential effects to visual resources would be the same as the Proposed Action.

3.14.3.4 Alternative 4: No Groundwater Substitution

Effects to visual resources would be the same under Alternative 4 as the Proposed Action.

3.14.4 Environmental Commitments/Mitigation Measures

There are no significant visual resource impacts; therefore no mitigation measures are required.

3.14.5 Potentially Significant Unavoidable Impacts

There are no expected significant and unavoidable impacts to visual resources.

3.14.6 Cumulative Effects

The timeline for the visual resources cumulative effects analysis extends from 2015 through 2024, a ten year period. The relevant geographic study area for the cumulative effects analysis is the same area of analysis as shown in Figure 3.14-1. The following section analyzes the cumulative effects using the project method, which is further described in Chapter 4. Chapter 4 describes the projects included in the cumulative condition.

The cumulative analysis for visual resources considers projects and conditions that could affect landscape character or scenic attractiveness of existing visual resources within the area of analysis.

3.14.6.1 Alternative 2: Full Range of Transfers (Proposed Action)

3.14.6.1.1 Seller Service Area

Water transfers, in combination with other cumulative projects, could degrade the existing landscape character or scenic attractiveness of Class A and B visual resources. Proposed cropland modifications and groundwater substitution transfers in combination with other cumulative projects could affect visual resources if multiple transfers occurred in the same year, elevating the effects on reservoir elevation and river flows. This could substantially degrade the existing landscape character or scenic attractiveness of Class A and B visual resources in the Sacramento River Region.

Existing and foreseeable water acquisition programs with potential to affect reservoir elevation and river flows in the Seller Service Area include the SWP Transfers, which are described in Chapter 4. The proposed additional transfers could contribute to the additional fluctuation of reservoir elevation and river flows, if transfers occurred within the same year. Increased elevation and river flows typically improve visual resources by creating a fuller reservoir or river, and improving riparian habitat along shorelines. Reductions in elevation and river flows could result in substantial exposure of a reservoir's bathtub ring, or the riverbed, reduction in riparian vegetation along the shore or change important visual features a part of the reservoir or river. All changes to reservoirs and rivers from the cumulative projects would remain within established water flow, water quality, and reservoir level standards. Therefore, the Proposed Action in combination with other cumulative actions would not result in a cumulative significant impact related to visual resources.

3.14.6.2 Alternative 3: No Cropland Modifications

The visual impacts under Alternative 3 would be very similar to the Proposed Action. As under the Proposed Action, the cumulative impacts to visual resources would be less than significant.

3.14.6.3 Alternative 4: No Groundwater Substitution

The visual impacts under Alternative 4 would be very similar to the Proposed Action. As under the Proposed Action, the cumulative impacts to visual resources would be less than significant.

3.14.7 References

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