

14.1 Environmental Setting/Affected Environment

This section discusses the agricultural resources study area (the area in which impacts may occur) which consists of the Plan Area (the area covered by the BDCP); which is largely formed by the statutory borders of the Delta, along with areas in Suisun Marsh and the Yolo Bypass; and the Areas of Additional Analysis (see Chapter 3, *Description of Alternatives*, Section 3.3.1). Chapter 5, *Water Supply*, discusses potential additional changes to upstream areas. Effects to State Water Project (SWP) and Central Valley Project (CVP) Export Service Areas region are described in Chapter 30, *Growth Inducement and Other Indirect Effects*.

The agriculture industry is an economically important industry in California and one of the state's largest employers. California has fewer than 4% of the nation's total number of farms and ranches, yet produces 12.3% of the total United States agricultural production value. According to the California Department of Food and Agriculture (CDFA), the state exports agricultural products to more than 190 countries and the value of its export commodities reached \$12.4 billion in 2009 (California Department of Food and Agriculture 2010a, 2010b). California farmers produce nearly half the nation's fruits, nuts, and vegetables; generate more than \$30 billion in gross receipts annually; employ 1.1 million people; and create \$60 billion in personal income each year (when considering direct, indirect, and induced contributions). The CVP provides enough water to irrigate one-third of the state's farmlands (Bureau of Reclamation 2011). Central Valley farms produced 8% of the nation's agricultural output on 1% of the total farmland in the United States (California Farm Water Coalition 2008).

Of the top 20 agricultural products of California, at least 11 are grown in the Delta. Although the Delta represents less than 1% of California's land area, the land devoted to agriculture in the Delta represents approximately 2% of California's agricultural land. The Delta's agricultural industry represents approximately 2% of agricultural production in the state (California Department of Food and Agriculture 2010a).

Many topics related to agricultural resources in the Plan Area are also discussed in other chapters. Chapter 16, *Socioeconomics*, discusses the economic importance of agricultural production in the five Delta counties (Section 16.1.1.7); as mentioned above, Chapter 30, *Growth Inducement and Other Indirect Effects*, also discusses the potential of the BDCP to affect agricultural resources within the SWP/CVP Export Service Areas region. Chapter 9, *Geology and Seismicity* (Section 9.1.1), and Chapter 10, *Soils* (Section 10.1), delve into the characteristics and issues surrounding soils in the Plan Area, including subsidence. Additional effects related to agricultural water supplies and quality are discussed in Chapter 5, *Water Supply*; Chapter 6, *Surface Water*; Chapter 7, *Groundwater*; and Chapter 8, *Water Quality*. Conflicts with local land use regulations related to agricultural resources are discussed specifically below and in Chapter 13, *Land Use*. Effects related to agricultural wildlife habitat are discussed in Chapter 12, *Terrestrial Biological Resources*. Chapter 24, *Hazards and Hazardous Materials*, Section 24.1.2.2, provides information on pesticide leaching; Chapter 25, *Public Health*, Section 25.1.1, describes the effects of chemical contaminants on human health. Issues

1 surrounding agricultural infrastructure and labor are described in Chapter 16, *Socioeconomics* and
 2 Chapter 28, *Environmental Justice*.

3 **14.1.1 Potential Environmental Effects Area**

4 The study area for this chapter is comprised of the Plan Area and Areas of Additional Analysis, which
 5 encompass over 872,000 acres within Alameda, Contra Costa, Sacramento, San Joaquin, Solano,
 6 Sutter, and Yolo Counties.

7 Lands used for agricultural purposes according to Farmland Mapping and Monitoring Program
 8 (FMMP) classifications comprise more than 585,000 acres of the study area and are a substantial
 9 economic factor within the region (California Department of Conservation 2008–2010). The study
 10 area is described below to support later discussions of environmental consequences associated with
 11 potential agricultural land use changes resulting from the temporary and permanent footprints of
 12 disturbance associated with construction of project water conveyance and related facilities (CM1)
 13 and the other conservation measures (CM2–CM22), as well as other indirect effects on agricultural
 14 resources stemming from the long-term operations and existence of facilities and restored areas.

15 **14.1.1.1 Statutory Delta**

16 The Delta stretches generally from Sacramento in the north to Lathrop in the south, with its rivers
 17 and sloughs eventually emptying into Suisun Bay near Pittsburg. The Delta's specific boundaries are
 18 legally defined by Section 12220 of the California Water Code. Historically, the Delta has been
 19 characterized by the presence of rich sedimentary and organic soils that are highly productive and a
 20 unique climate influenced by the Central Valley and ocean and coastal conditions. This combination
 21 of highly productive soils, a climate conducive to agricultural production, and readily available good
 22 quality irrigation water supply results in a region that supports a broad range of crops that produce
 23 relatively higher value crops than those grown in other regions. The distribution of agricultural
 24 resources within the Delta, by agricultural crop classification, is shown in Figure 14-1. Six counties
 25 lie partially within the statutory Delta: Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and
 26 Yolo Counties. Each of these counties supports agricultural production in the Delta.

27 **14.1.1.2 Restoration Opportunity Areas (ROAs)**

28 BDCP Conservation Measures 4–11 were developed to restore, create, enhance, and manage
 29 physical habitat to expand the extent and quality of intertidal, floodplain, and other habitats across
 30 defined conservation zones (CZs) and Restoration Opportunity Areas (ROAs) (see Figure 3-1). The
 31 Plan Area is subdivided into 11 CZs within which conservation targets for natural communities and
 32 covered species' habitats have been established. The ROAs, including the Cache Slough,
 33 Cosumnes/Mokelumne, Suisun Marsh, West Delta, and South Delta, encompass those locations
 34 considered most appropriate for the restoration of tidal habitats and within which restoration goals
 35 for tidal and associated upland natural communities will be achieved. While the Yolo Bypass also
 36 represents an ROA, it is not being targeted specifically for tidal restoration activities but rather,
 37 those activities described individually by *CM2 Yolo Bypass Fisheries Enhancement*. Most of the other
 38 ROAs, described below, have a majority of their area within the statutory Delta. The majority of the
 39 Suisun Marsh ROA, however, is outside of the statutory Delta with only a portion of the marsh within
 40 the western area of the statutory Delta. Agricultural resources represent a portion of each of these
 41 ROAs that may be impacted from activities associated with these conservation measures, as shown
 42 in Table 14-1. Each ROA is discussed below and depicted in Figure 3-1. Detailed discussion of the

activities associated with conservation measures, as well as potential acreages to be restored within each ROA, is provided in the BDCP, Chapter 3, *Conservation Strategy*¹.

Table 14-1. Farmland Mapping and Monitoring Program Categories in Restoration Opportunity Areas

FMMP Category	Cache Slough ROA	Cosumnes-Mokelumne ROA	South Delta ROA	Suisun Marsh ROA	West Delta ROA	Total
Prime Farmland	12,930	6,854	34,240	577	2,189	56,791
Farmland of Statewide Importance	3,726	96	988	182	270	5,261
Unique Farmland	2,062	307	77	116	27	2,590
Farmland of Local Importance		40	134		1,070	1,244
Grazing Lands	15,279	1	108	17,755	533	33,676
Urban Built-up Land	15	16	17	869	368	1,285
Other Land	7,594	16		58,858	647	67,116
Rural Residential Land		53	11			64
Semi-Agricultural and Rural Commercial Land		15	244			259
Confined Animal Agriculture			27			27
Nonagricultural and Natural Vegetation			678			678
Water	7,558	2		4,610	654	12,824
Total	49,166	7,399	36,524	82,967	5,759	181,814

Note: For San Joaquin County, "Other Land" is divided into the four categories listed below it in the table (Rural Residential Land, Semi-Agricultural and Rural Commercial Land, Confined Animal Agriculture, and Nonagricultural and Natural Vegetation), as part of the Rural Land Mapping Project.

Cache Slough Restoration Opportunity Area

The Cache Slough ROA is located in the western region of the statutory Delta, west of the Sacramento Deep Water Ship Channel. It consists of approximately 49,000 acres, nearly 34,000 acres of which are used for agricultural purposes. Primary crops grown are alfalfa and pastureland, with substantial acreages of mixed agriculture and native classes (this refers to classes of native vegetation). The BDCP has set a general target of 5,000 acres of freshwater tidal habitat restoration in this area (BDCP Chapter 3, *Conservation Strategy*, CM4, Section 3.4.4.3.1). Details regarding the phased implementation of restoration activities are provided in BDCP Chapter 6, *Plan Implementation*.

Cosumnes/Mokelumne Restoration Opportunity Area

Agriculture within this ROA is primarily located in the western area, which produces some specialty crops. Within the eastern area of the ROA in the Grizzly Slough area, a project began in 1993 to

¹ As described in Chapter 1, *Introduction*, Section 1.1, the full Draft EIR/EIS should be understood to include not only the EIR/EIS itself and its appendices but also the proposed BDCP documentation including all appendices.

1 convert much of the slough area to floodplain habitat (California Department of Fish and Game
2 1995). Nearly all of this area's 7,400 acres are dedicated to agricultural production and the primary
3 crops grown are tomatoes, corn, and grapes. The BDCP has set a general target of 1,500 acres of
4 freshwater tidal habitat restoration in this area (BDCP Chapter 3, *Conservation Strategy*, CM4,
5 Section 3.4.4.3.1). Details regarding the phased implementation of restoration activities are
6 provided in BDCP Chapter 6, *Plan Implementation*.

7 **Suisun Marsh Restoration Opportunity Area**

8 The Suisun Marsh, located in Solano County, is primarily an estuary (with 6,300 acres of existing
9 tidal wetlands), but the area does support some vegetable and fruit crops (California Department of
10 Water Resources 2010). Of the area's 83,000 acres, agricultural activities occur on more than 18,000
11 acres and include production of turf and safflower with substantial acreage of native vegetation and
12 mixed agriculture. The Suisun Marsh Habitat Management, Preservation, and Restoration Plan
13 would restore between 2,000 and 9,000 acres of tidal habitat within the marsh while reducing the
14 acreage of managed wetlands currently subject to managed wetland activities from 52,000 acres to
15 between 42,000 and 48,000 acres (California Department of Fish and Game 2010). The BDCP has set
16 a general target of 7,000 acres of freshwater tidal habitat restoration in this area (BDCP Chapter 3,
17 *Conservation Strategy*, CM4, Section 3.4.4.3.1). It is anticipated that there will be some overlap
18 between the Suisun Marsh Habitat Management, Preservation, and Restoration Plan and BDCP.
19 Details regarding the phased implementation of restoration activities are provided in BDCP Chapter
20 6, *Plan Implementation*.

21 **West Delta Restoration Opportunity Area**

22 The West Delta ROA is along the western boundary of the Delta. Within the 6,000-acre West Delta
23 ROA, 4,000 acres are used for agricultural production. The primary crops grown are corn, grain, hay,
24 alfalfa, and pasture with significant amounts of native vegetation. The BDCP has set a general target
25 of 2,100 acres of freshwater tidal habitat restoration in this area (BDCP Chapter 3, *Conservation*
26 *Strategy*, CM4, Section 3.4.4.3.1). Details regarding the phased implementation of restoration
27 activities are provided in BDCP Chapter 6, *Plan Implementation*.

28 **South Delta Restoration Opportunity Area**

29 The South Delta ROA lies in the southern part of the Delta and is bordered by the San Joaquin River
30 to the east and the Old River to the south. Within this ROA, agricultural activities occur across more
31 than 35,500 acres of the 36,500-acre area. Leading crop types in the area include field truck,
32 nursery, and berry crops. Another large area of land is devoted to pasture. The BDCP has set a
33 general target of 5,000 acres of freshwater tidal habitat restoration in this area (BDCP Chapter 3,
34 *Conservation Strategy*, CM4, Section 3.4.4.3.1). Details regarding the phased implementation of
35 restoration activities are provided in BDCP Chapter 6, *Plan Implementation*.

36 **14.1.1.3 Study Area Climate and Soils**

37 Delta temperatures tend to be lower than the surrounding areas during the summer because of
38 periodic and diurnal cooling that is a result of its proximity to the Pacific Ocean and the San
39 Francisco Bay. Locally, the marine cooling influence is referred to as the "Delta breeze," which
40 creates unique growing conditions (National Weather Service 2003). These conditions are reflected
41 in the character of the wine grapes grown in the region and the suitability for certain crops (e.g.,

1 pears). The Delta breeze also influences the timing of harvest to increase the value and marketability
2 of crops by allowing growers to harvest their crops during market windows of relatively low
3 product availability elsewhere in the State and nation. This specialized harvest timing is practiced
4 for pears, cherries, apricots, peaches, and nectarines. Further, the Delta breeze influences the timing
5 of harvest to optimize the temporal distribution of food processing harvest volumes (e.g., processing
6 tomatoes). More detailed discussion of the climate in the study area is in Chapter 22, *Air Quality and*
7 *Greenhouse Gas Emissions*, Section 22.1.1.

8 Prior to agricultural development, much of the soil in the Delta was waterlogged as a result of
9 frequent flooding, which caused anaerobic (oxygen-poor) soil conditions that led to the formation of
10 peat soils (U.S. Geological Survey 2000a) (Chapter 10, *Soils*, Section 10.1.2). As the region developed
11 its agricultural industry, local growers and reclamation districts constructed levees to allow soils to
12 drain and become aerobic (oxygen-rich) and available for agricultural production. As the peat soils
13 became more aerobic, the rate of peat soil oxidation and volatilization increased. Continuous organic
14 decomposition has kept soils in the Delta nutrient-rich. However, this has also resulted in land
15 subsidence throughout the Delta (U.S. Geological Survey 2000b). The effects of subsidence—the
16 lowering of land-surface elevation due to decomposition of organic carbon in peat soil—on crops
17 and crop production is discussed below. In addition, the fine particles of peat soil can often be a
18 source of poor air quality as tillage operations for agricultural production cause these particles to be
19 disturbed and become airborne (for further discussion of Particulate Matter and its sources, see
20 Chapter 22, *Air Quality and Greenhouse Gas Emissions*, Section 22.1.2.4).

21 Peat soils comprise a substantial portion of soils in the study area. Their high nutrient and organic
22 content is beneficial for crops, and peat soils warm quickly because of their heat-absorbing dark
23 color. This characteristic is beneficial for crop management as planting can begin earlier if soils
24 warm earlier in the season. The water retention capability of peat soils is high. Subsurface irrigation
25 is a common means to irrigate crops in peat soils (Section 14.1.1.6, *General Crop Production Practices*
26 *and Characteristics, Irrigation and Drainage*). However, weeds are particularly problematic in peat
27 soils and measures must be commonly taken to reduce them. In drier conditions peat soils may dry
28 at the surface and cause adverse dusty conditions (Prichard 1979). The Storie Index Rating System
29 uses soil characteristics to determine the relative ranking and crop suitability of potential
30 agricultural land. Peat soils receive a high ranking in the Natural Resources Conservation Service
31 (NRCS) Soil Capability Classification System and the Storie Index Rating System. Further discussion
32 of the Storie Index Rating System, along with ratings for the soil types found in the study area, is
33 provided in Appendix 10C, *Soil Chemical and Physical Properties and Land Use Suitability*.

34 **Crop Production Interactions with Soil Subsidence**

35 Land in the Delta is subject to subsidence because organic carbon in peat soils is continually
36 decomposing (U.S. Geological Survey 2000a). While this is the principal cause of subsidence,
37 processes such as mechanical compaction, wind erosion, groundwater overdraft, and tectonic
38 movements have also been cited as significant factors in subsidence (Prokopovich 1985; U.S.
39 Geological Survey 2000b). Within the Delta, the primary influences of subsidence associated with
40 crop production are organic carbon decomposition and mechanical compaction and disturbance-
41 caused wind erosion created in part by crop tillage.

42 Organic carbon decomposition in peat soils began when the peat soils in the Delta were drained to
43 create agricultural land. During decomposition, most of the carbon lost is emitted as carbon dioxide
44 (CO₂) to the atmosphere (Deverel and Rojstaczer 1996). Carbon loss can also occur through crop

uptake of carbon in the soils. Agricultural production accelerates oxidation of peat soils when plants remove CO₂, water, and nutrients. This, in conjunction with mechanical compaction and wind erosion from agricultural machinery, accelerates subsidence of soils in the Delta. Land subsidence poses risks to the long-term sustainability of agriculture in the study area because it affects the levee system that protects the Delta from flooding. Subsidence increases the hydraulic gradient between agricultural land and channels, leading to more seepage through levees and the resultant need to continually deepen drainage ditches. Additionally, where adjacent lands lie below sea level, levees must be strengthened and maintained to successfully hold back water year-round. Potential sea level rise and seismic activity compound issues of subsidence. Some recent estimates, including those developed as part of the California Department of Water Resources' (DWR's) Delta Risk Management Strategy, predict that 3–4 feet of additional subsidence will occur in the central portion of the Delta by 2050 (California Department of Water Resources 2007). Chapter 6, *Surface Water*, Section 6.1.4.1, further discusses the relationship between subsidence and the levee system.

14.1.1.4 Study Area Crop Types and Distribution

Lands within and surrounding the Delta contain soil types that, along with the regional climate, allow the region to grow a wide variety of crops. Historical flooding of the Sacramento and San Joaquin Rivers and their tributaries resulted in high concentrations of peat soils and the deposition of large quantities of minerals. Both of these elements contribute to the nutrient-rich soils that make the region highly productive for agriculture. Over 30 types of crops are grown in the study area's approximately 585,000 acres of agricultural land. This estimate is not all cultivated land, but includes pasture, fallow, idle, and abandoned land as well as semi-agricultural land and land that is used for confined animal agriculture. Leading crops within the Delta include those grown for livestock feed, in addition to other field and row crops (Sumner and Rosen-Molina 2011). The top five Delta crops in terms of acreage are corn, alfalfa, processing tomatoes, wheat and wine grapes (Delta Protection Commission 2011). While corn and alfalfa cover the widest acreage in the Delta, the DPC's Economic Sustainability Plan for the Delta has identified tomatoes and wine grapes as those crops that create the most economic value through their sales and in their linkages to manufacturing in the area. This study also notes the important contributions of asparagus and pears and the presence of crops like pumpkins and blueberries, which reflect the diversity of crops grown in the area (Delta Protection Commission 2011). DWR's land use surveys (California Department of Water Resources 1994–2007) provide the most current acreage data for specific crops. Crops include: alfalfa, almonds, apples, apricots, asparagus, cherries, corn, cucurbits (squashes and melons), dry beans, grain and hay, wine grapes, miscellaneous truck crops (vegetable crops grown for commercial sale), olives, peaches, pears, rice, safflower, subtropical trees, Sudan grass, sunflowers, tomatoes, turf, walnuts, and uncommon crops (e.g., *Dichondra*). Crop acreages are also defined as deciduous crops (crops that lose their foliage during winter such as almonds), mixed-agriculture (more than one crop grown on specified acreage), or non-irrigated crops (crops that do not receive irrigation water). Each crop is also grouped by similar growing needs as either annual, perennial, or pasture. Annual crops are replanted each season, perennial crops provide produce for multiple seasons after planting, and pasture is made up of grasses for either harvest or cattle grazing.

Table 14-2 provides the acreages of crops grown in the Plan Area by county. To most appropriately show the agricultural acreages in the Plan Area, the class "mixed agriculture, urban and native classes" is included in the crop acreages. This class includes urban and agriculture acreage, urban and native classes acreage, and urban, agriculture, and native classes acreage. The acreages

1 presented in Table 14-2 are used as estimates because annual and semi-annual crop rotation and
 2 long-term crop change are based on a variety of outside influences including economic and climatic
 3 conditions.

4 **Table 14-2. Crop Acreages in the Plan Area**

Type	Crops	County						Total
		Alameda	Contra Costa	Sacramento	San Joaquin	Solano	Yolo	
Farmland and Row Crop								
Annual	Asparagus		1,480	990	21,590		5	24,064
Annual	Cucurbits (e.g., melons)		220	23	5,360	3	810	6,424
	Dairy		100	43	1,040			1,187
	Fallow and Idle		5,070	2,880	2,760	850	2,850	14,409
	Farmstead	20	720	690	1,650	630		3,710
Permanent	Feed Lot	3	14		62	16		95
Pasture	Grain and Hay	360	4,830	9,850	24,360	6,870	5,070	51,343
Annual	Miscellaneous Truck Crops	58	550	1,050	4,890	1	180	6,729
Permanent	Poultry Farm			1	76			77
Annual	Tomatoes		4,070	4,260	23,580	530	5,410	37,850
Field Crops								
Pasture	Alfalfa	370	3,870	3,570	42,800	13,530	5,730	69,868
Annual	Beans		380	470	8,960	250	85	10,140
Annual	Corn	200	8,690	27,260	60,860	4,250	12,830	114,108
Annual	Miscellaneous Field Crops			930	450	420	530	2,326
Annual	Safflower		2,860	4,840	17,650	6,650	18,160	50,157
Pasture	Sudan		420	310	930	1,250	1,850	4,753
Annual	Sunflowers				1,570	270	9	1,850
Orchards								
	Almonds		280		2,190			2,472
	Apples		1,470	490	240	100	140	2,435
	Apricots		990		1,060			2,041
	Cherries		430	240	34		30	739
	Miscellaneous Deciduous		660	20	180	21	47	929
Permanent	Mixed Deciduous Trees		14		98	19		131
	Peaches		160	45	98	9		309
	Pears		180	6,500	170	390	390	7,621
	Walnuts		1,130		3,980	8	54	5,170
	Grapes	44	690	7,270	7,100	1,470	5,530	22,095

Type	Crops	County						Total
		Alameda	Contra Costa	Sacramento	San Joaquin	Solano	Yolo	
	Mixed Agriculture		50	8	580	39		674
	Mixed Agriculture, Urban, and Native Classes	240	45,930	21,240	53,260	20,940	13,730	155,341
Uncommon Crops								
	Native and Mixed Native Classes	2,160	19,710	16,670	20,050	91,110	21,240	170,935
	Non-Irrigated Crops	1,110	300	97	51	2,070	1	3,633
Pasture	Pasture	68	7,010	6,290	4,190	20,380	4,930	42,863
Annual	Rice			580	13		6,710	7,298
Permanent	Subtropical Trees		4	24	50	3		81
Annual	Turf			140	1,110	310	65	1,630

Source: California Department of Water Resources 1994–2007 (dataset comprising county-specific land use survey data from 1994, 1995, 1996, 1997, 2000, 2006, and 2007).

Note: Crop acreages have been rounded to the nearest 10 acres for crops with more than 100 acres and the nearest 1 acre for crops with less than 100 acres.

1

2 Permanent Crops

3 Permanent crops account for a major proportion of the revenue generated by agriculture in the
4 Delta. They include almonds, apples, apricots, cherries, grapes, olives, peaches and nectarines, pears,
5 and walnuts, which account for approximately 7.3% of the agricultural land in the Delta. Northern
6 California, including the Delta, is well known for its vineyards and wine production. Between 2007
7 and 2009, wine had the second highest export value of all commodities grown in California
8 (California Department of Food and Agriculture 2010a). Figure 14-1 depicts the distribution of crop
9 classes throughout the study area. Wine appellations are located in Clarksburg and Lodi, which are
10 in the north and east Delta, respectively. Revenue generated by agricultural production in the Delta
11 is described in Chapter 16, *Socioeconomics*, Section 16.1.1.7.

12 Annual Crops

13 Annual crops in the Delta include corn, cucurbits, dry beans, grain and hay, rice, safflower, Sudan
14 grass, tomatoes, and turf. In addition to their economic value, agricultural lands provide resources
15 for a variety of biological resources. Chapter 12, *Terrestrial Biological Resources*, Section 12.1.1.2,
16 provides discussion of agricultural lands as habitat.

17 Uncommon Crops

18 Uncommon crops are those that are either not typically grown in large acreages or those that are
19 grown in the Delta because the area supports their unique production economics as well as market

1 timing. An example of an uncommon crop is Dichondra, a plant used for groundcover
2 (predominantly in southern Europe and Japan). Dichondra is grown in the Delta by two farmers and
3 fewer than 1,000 acres are devoted to Dichondra production nationwide. Other Delta-grown
4 uncommon crops include vegetables such as broccoli, cauliflower, cucumbers, peas and other seed
5 crops (seed onions and others), and nursery crops (ornamental trees and shrubs). Production of
6 seed crops in the Delta benefits from the geographic isolation from potential contamination from
7 varieties of the same crop (University of Wisconsin 2010).

8 **Pasture**

9 Agricultural lands are typically selected to produce pasture (as opposed to other crop choices)
10 because of lower productivity soils, such as hard pan, high water tables, poor drainage, or a
11 combination of these characteristics that limit the use of such lands for higher value agricultural
12 crops. Dairy cow pastures are often irrigated pasture, and the proximity to dairy facilities is another
13 factor that could determine the selection of pasture production. Cattle operations use Delta pastures
14 as seasonal range, which complements high Sierra Nevada grazing ranges. Pasture locations within
15 the Delta are depicted in Figure 14-1.

16 **Aquaculture**

17 Aquaculture, the cultivation of aquatic organisms for commercial gain, ranges from the production
18 of aquatic plants and invertebrates to fish production, which has become a profitable and popular
19 practice in many regions. Although aquaculture is practiced in California, no registered
20 aquaculturists are identified within the study area (California Department of Fish and Game 2011).
21 Therefore, no further discussion of potential effects on aquaculture is provided.

22 **Typical Crop Yields, Destinations, and Tonnages**

23 Crops grown in the study area, and agricultural products made from those crops are shipped
24 statewide, nationally, and internationally. Crop destinations and tonnages vary depending on crop
25 yield, quality, and market during the specific harvest season. Specific crop destinations likely would
26 not be affected by implementation of the BDCP, and therefore are not discussed in detail. However,
27 potential impacts on crop production could alter the economics of crop production in the Delta and
28 the subsequent crop selection by Delta growers. Table 14-3 shows the typical ranges of crop yield by
29 type for crops grown in the Delta.

1 **Table 14-3. Crop Yield by Type**

Crop	Yield (tons per acre)
Alfalfa	6.51
Almonds	0.80
Apples	13.98
Apricots	7.82
Asparagus	1.41
Cherries	2.10
Corn	4.62
Cucurbits ^a	14.76
Dry Beans	1.00
Grain and Hay ^b	2.29
Grapes	5.34
Miscellaneous Field Crops ^c	2.16
Miscellaneous Truck Crops ^d	80.54
Miscellaneous Deciduous ^e	1.58
Pasture	N/A
Peaches and Nectarines	20.32
Pears	18.34
Rice ^f	3.76
Safflower	1.18
Subtropical Trees ^g	13.75
Sudan	1.26
Sunflowers	0.21
Tomatoes	37.39
Turf ^h	N/A
Walnuts	1.58

Source: California Department of Food and Agriculture 2010c.

^a Pumpkins are used as the example crop in this category.

^b Wheat is used as the example crop in this category.

^c Grain sorghum is used as the example crop in this category.

^d Bell peppers are used as the example crop in this category.

^e Plums are used as the example crop in this category.

^f Medium grain rice is used as the example crop in this category.

^g Citrus price and yield from the San Joaquin Valley is used in this category.

^h Turf prices and values are not reported for Delta counties. The statewide average for all counties reporting both acreage and value is used.

2

3 **14.1.1.5 Important Farmland and Land Subject to Williamson Act** 4 **Contracts or in Farmland Security Zones**

5 The study area includes a large area of land uses designated for agricultural or specified compatible
6 open space uses under the provisions of the California Land Conservation Act of 1965, more
7 commonly known as the Williamson Act.

1 The study area encompasses more than 872,000 acres, of which nearly 432,000 acres are subject to
 2 Williamson Act contracts or in Farmland Security Zones, including land subject to contract non-
 3 renewal (California Department of Conservation 2007–2009).

4 These areas are identified in Figure 14-2 and further discussion of the Williamson Act can be found
 5 in Section 14.2.2.2.

6 A substantial portion of agricultural land in the study area is designated Important Farmland by the
 7 DOC's FMMP. Under this program, lands are categorized into one of eight categories. In the study
 8 area, there are more than 512,000 acres of Important Farmland, including approximately 395,000
 9 acres of Prime Farmland, 34,000 acres of Farmland of Statewide Importance, 40,000 acres of Unique
 10 Farmland, and 44,000 acres of Farmland of Local Importance. Additionally, there are more than
 11 77,000 acres of Grazing land, Semi-Agricultural and Rural Commercial Land, and Farmland of Local
 12 Potential, categories that are not included in estimates of Important Farmland (California
 13 Department of Conservation 2008–2010). These areas are identified in Figure 14-3. For further
 14 discussion of these agricultural designations and the FMMP, see Section 14.2.2.2.

15 **14.1.1.6 General Crop Production Practices and Characteristics**

16 The Delta's Mediterranean climate makes crop production possible year-round. In general, farmers
 17 cultivate and till during the winter and early spring, and harvest through the summer and early fall.
 18 However, crop production practices and timelines vary with each crop type, depending on soil,
 19 microclimate, irrigation practices, and other factors. Therefore, although many farms across the
 20 Delta may grow the same crops, each farm may have unique cultural practices and harvest timing
 21 that best suit the local conditions and the farmer's target market (e.g., fresh market tomatoes versus
 22 processing tomatoes, or apples for juice versus fresh market).

23 **Irrigation and Drainage**

24 Delta agricultural production relies heavily on irrigation because there is high rainfall during the
 25 winter and low rainfall during the majority of the growing season. Irrigation and drainage practices
 26 vary with each crop; methods include drip, sprinkler, furrow, flood, border strip, basin, sub-
 27 irrigation or a combination of these. Subsurface irrigation, or sub-irrigation, is a common irrigation
 28 method for peat soils. Peat soil sub-irrigation is conducted by applying water into a system of
 29 narrow and deep unlined ditches which raises the water table in the porous peat soils to be within
 30 several inches of the surface. After the water table drops again from crops drawing water, the
 31 ditches can be refilled to once again raise the water table and fill the root zone with water. Sub-
 32 irrigation is particularly dependent upon good water quality as this method does not push salts
 33 down below the root zone. Higher salinity irrigation water will tend to concentrate salts at the
 34 surface and in the root zone. This is particularly problematic for salt-sensitive crop growth stages
 35 such as germination and seedling. Annual row crops are often sprinkler-irrigated for crop
 36 germination and furrow-irrigated for the rest of the season. As noted above, many crops are also
 37 irrigated through sub-surface methods. Permanent crops are drip-, sprinkler-, furrow-, or flood-
 38 irrigated. Irrigated pasture and alfalfa are typically sprinkler- or flood-irrigated.

39 All applied irrigation water is subject to either being leached below the root zone, transpired by
 40 plant tissue, and/or to evaporation or runoff from the soil surface (Edinger-Marshall and Letey
 41 1997). Sprinkler and drip systems decrease leaching and runoff and offer greater control over the
 42 amount and distribution of water to the root zone in comparison to flood or furrow irrigation. This
 43 control translates to maximized yields and protection of groundwater. However, capital costs are

1 higher for drip irrigation systems. Flood and furrow irrigation have a higher incidence of water
2 evaporation or runoff from the soil surface. These methods increase the initial amount of water
3 needed for irrigation and can increase irrigation runoff. Since the advent of drip irrigation between
4 1969 and 1970 (Marsh 1977), drip, and sprinkler irrigation use have risen as the use of furrow or
5 flood irrigation has decreased across the state (Edinger-Marshall and Letey 1997).

6 Pre-irrigation (irrigation prior to crop planting) is not widely practiced in the Delta because winter
7 rains provide for full soil moisture profiles, and pre-irrigation leaching, which is typically used to
8 mobilize salts out of the crop root zone, is not needed because relatively high quality irrigation
9 water in the Delta results in low soil salt concentrations. Most crops produced in the Delta require
10 weekly or biweekly irrigation throughout the crop-growing season until a few weeks before
11 harvesting. In-season irrigation quantities depend on crop type, stage of crop growth, soil moisture
12 profile, management of plant pests and diseases, and weather conditions. Areas in the south Delta
13 may be the exception because, during some water year types and oftentimes late into the growing
14 season, irrigation water can become more saline, which may require modification to irrigation
15 practices to avoid crop salt burning (University of California Cooperative Extension 1986). Table 14-
16 4 provides water requirements for each crop. This data represents the combined practices of San
17 Joaquin and Sacramento Valleys and is representative of general requirements for the study area
18 (University of California Cooperative Extension 2008).

19 In general, irrigation water is diverted directly from Delta waterways and transported to
20 agricultural lands via irrigation and drainage canals. In some cases, however, water is pumped
21 directly into field furrows. Irrigation and drainage canals are operated and maintained in the Delta
22 by reclamation districts, irrigation districts, and water agencies. Because irrigation water is diverted
23 directly from surface water resources, little groundwater is pumped for surface irrigation purposes.
24 See Chapter 5, *Water Supply*, Section 5.1.2.6, for more information regarding irrigation water
25 diversion locations and Chapter 7, *Groundwater*, Section 7.1.1.2, for discussion of groundwater levels
26 in the Delta. Some of the agricultural surface water diversions are screened to protect fish, but many
27 are not (Chapter 11, *Fish and Aquatic Resources*, Section 11.1.5.1). Agricultural surface water
28 diversion operations depend on sufficient water surface levels to keep the intakes submerged.
29 Energy requirements for pumping, and therefore agricultural water costs in the Delta, also are
30 affected by surface water levels. Currently, temporary control structures are installed in the south
31 Delta to raise surface water elevations (Chapter 6, *Surface Water*, Section 6.1.2.3).

32 Agricultural runoff percolates into the water table or is discharged into Delta waterways. Within the
33 Delta, reclamation district canals and ditches function as both water supply and drainage
34 conveyance facilities. Canals and ditches are typically kept at low water levels during the drainage
35 season and are pumped out by the reclamation districts to remove drainage and stormwater. During
36 the crop irrigation season, water is diverted from tributaries into water supply ditches and
37 irrigation drainage water is captured in the canals and ditches and reused in subsequent irrigation.
38 The practice of reusing irrigation drainage water for subsequent irrigation is not currently
39 constrained because the quality of agricultural drainage and supply water is relatively good.
40 Discharge of agricultural runoff and drainage water is regulated and monitored (Chapter 8, *Water*
41 *Quality*, Section 8.2).

1 **Table 14-4. Applied Irrigation Requirements of Crops Grown in the Study Area by Acre**

Crop	Water Requirements (acre-inches) ^{a, b}	Typical Irrigation Methods
Alfalfa	42	Flood and Sprinkler
Almonds–Flood	51	Flood
Almonds–Micro Sprinkler	38–42	Micro-Sprinkler
Asparagus	30	Furrow and Flood
Common Dry Beans, Double Cropped and Lima Beans (large and baby)	28–36	Furrow
Cherries	30	Micro-Sprinkler
Cucurbits	30	Furrow
Field Corn	42	Flood
Wine Grapes	16–30	Drip
Raisins-Tray Dried	28	Drip
Cling Peaches	42	Furrow
Pecans	56	Flood
Rice	4–6 (continuously)	Flood
Safflower	6	Sprinkler
Sunflowers	29	Furrow
Tomatoes–Processing	42 (2–3 acre-inches by sprinkler, 36–40 acre-inches by furrow)	Sprinkler and Furrow
Walnuts	42	Micro-Sprinkler
Wheat	6	Furrow

Sources: University of California Cooperative Extension 2008; University of California, Davis 2008.

^a Values are for established crops on a per-acre basis.

^b No assumption is made for rainfall.

2

3 **General Fertilizer, Pesticide, and Herbicide Use**

4 Fertilizers, pesticides, and herbicides are commonly used for crop yield optimization and crop
5 quality protection. The term “pesticides” encompasses natural and chemically synthesized
6 insecticides, fungicides, herbicides, and fumigants used to stabilize the crop cultivation environment
7 against floral and faunal pests (U.S. Environmental Protection Agency 2009). More than 25 different
8 types of pesticides are commonly applied to crops in the study area. See Chapter 24, *Hazards and*
9 *Hazardous Materials*, Section 24.1.2.2, for more information about pesticide use in the area.

10 Fertilizers are used in agricultural production to replenish soil nutrients lost during the growing
11 season and to replace nutrients removed from the field by crop harvest. Fertilizers may be
12 composed of natural and/or synthetic materials with varying concentrations of plant nutrients. Soil
13 amendments are similar in make-up, although they are intended to supplement soils with nutrients
14 lost during the previous growing season. Generally, amendments are applied to soil prior to planting
15 and fertilizers are applied at the same time as planting and as needed throughout the growing
16 season. Fertilizer application practices, needs, and timing vary among crops. Pre-planting
17 application of pesticides is generally done in a broadcast application by applying the pesticide to the

1 entire area. After sprouting (post-emergent), fertilizer and pesticide applications can be done by
2 applying to the leaves or by adding to irrigation water. The application of fertilizers to irrigation
3 water can lead to fertilizers leaching to the groundwater or being discharged into agricultural
4 drainage water. Pesticides and herbicides are designed to naturally break down to innocuous
5 compounds; however, leaching of these chemical compounds into groundwater or surface water can
6 be problematic for wildlife and water quality.

7 Application methods of fertilizers, pesticides, and herbicides vary by crop and chemical type and
8 include: chemigation (application through the irrigation system), orchard spray rigs, spray booms,
9 brush brooms, broadcast spreaders, chemically coated seeds, and aerial applicators (crop dusters).
10 Best management practices (BMPs) such as integrated pest management; pesticide selection; timing
11 of application; weather conditions before, during, and after spraying; sprayer calibration; on-farm
12 runoff; sediment transport control; and spray buffers around open water and sensitive areas are
13 used within the agricultural industry to reduce the potential for contamination from chemical
14 applications. Application method and timing varies with crop type and materials being applied.
15 Environmental setting can affect the amount and type of pesticides applied. For instance, crops in
16 close proximity to standing water may be subject to more or a greater variety of pests. Also, crops
17 with inappropriate soil moisture could be more prone to root disease and would require an
18 increased amount of pesticides or fungicides. Fertilizers, pesticides, and herbicides contaminating
19 soils or ground or surface water become environmental stressors for humans, wildlife, aquatic
20 organisms, and fish. Chapter 24, *Hazards and Hazardous Materials*, Section 24.1.2.2, provides
21 information on pesticide leaching; Chapter 8, *Water Quality*, Section 8.1.3, describes the effects of
22 chemical contaminants on aquatic organisms and fish; Chapter 25, *Public Health*, Section 25.1.1,
23 describes the effects of chemical contaminants on human health.

24 Although pesticides are designed to break down after a period of time, spray drift and groundwater
25 contamination are potential causes of problems of applied pesticides. However, the application
26 requirements necessary for chemical registration are designed to minimize the mobilization of
27 chemicals with restrictions on wind speed, humidity, and proximity to open water during
28 application. Pesticide contamination of groundwater depends on the geological and hydrological
29 conditions in the area (Chapter 7, *Groundwater*, Section 7.1.1.2). Soil type plays an important role in
30 determining the extent to which pesticides leach into groundwater. Sandy soils increase the risk of
31 pesticide leaching because the absorption capacity of the soil is limited (U.S. Environmental
32 Protection Agency 2009).

33 To minimize the effects of spray drift, registration application condition requirements also specify
34 the distance from which pesticides can be applied to a water or riparian area, if necessary.

35 Pesticide, herbicide, and fertilizer usage is regulated by the U.S. Environmental Protection Agency
36 (EPA) and the California Department of Pesticide Regulation (CDPR) to ensure pesticide use does
37 not degrade environmental resources and to protect public health. Regulatory agencies and
38 enforcing regulations are discussed in Section 14.2, *Regulatory Setting*. Pesticides, herbicides, and
39 fertilizers are expected to continue to be applied in compliance with federal and state regulations.

40 **Crop Water Table Tolerances**

41 Delta groundwater levels vary seasonally and are highly influenced by seasonal precipitation,
42 drainage, soil texture, and profile, proximity to tributaries and open water, and surface water levels.
43 Surface water levels in the Delta are determined by Delta inflows, tides, diversions, and water

1 exports. High water tables and poor drainage can limit crop selection options, lead to crop loss or
 2 damage, contribute to pest infestations (e.g., fungus and mildews), and changes in soil conditions
 3 (anaerobic). Drain tiles to control groundwater depth and to move drain water are installed for most
 4 permanent crops and some open ground throughout the Delta so soils are not oversaturated. The
 5 interaction between crops and the water table depends on the type of crop and the water-holding
 6 capabilities of the soil. The water table elevation must be below the crop root zone to maximize
 7 growth and yield and minimize root rotting from oversaturation (University of California
 8 Cooperative Extension 1986). Table 14-5 illustrates root depth of crops in the Delta.

9 **Table 14-5. Crop Type Root Depths (in feet)**

Crop Type	Lowlands	Uplands
Pasture	2.0	2.0
Alfalfa	4.0	6.0
Field	2.0	4.0
Grain	2.0	4.0
Rice	1.0	2.0
Truck	4.0	5.0
Tomatoes	4.0	5.0
Orchards	5.0	6.0
Vineyards	4.0	5.0
Safflower	4.0	5.0
Corn	3.0	4.0
Non-irrigated Pasture	2.0	2.0
Non-irrigated Vineyards	4.0	5.0
Non-irrigated Orchards	5.0	6.0
Dry Grass	2.0	2.0

Source: California Department of Water Resources 1995

Note: Assumptions developed for Delta Island Consumptive Use model.

11 **Crop Salinity Tolerances**

12 Crops have varying degrees of tolerance to changes in irrigation water salinity. Surface water and
 13 groundwater quality is determined by the natural, physical, and chemical properties of the land
 14 above or surrounding a water body (Chapter 7, *Groundwater*, Section 7.1.1.3, and Chapter 8, *Water*
 15 *Quality*, Section 8.1.1.4). Agricultural practices affect water quality as a result of the physical
 16 alterations to the land, as well as the chemical influences of agricultural production (e.g., pesticides,
 17 fertilizers, herbicides, and animal manure). In general, crops have varying degrees of tolerance to
 18 water salinity, which can vary by growth stage.

19 In addition to influencing surface and groundwater quality, application of irrigation water adds
 20 soluble salts such as sodium, calcium, magnesium, potassium, sulfate, and chloride that have
 21 dissolved from geologic materials. Evaporation and transpiration of irrigation water allow salts to
 22 concentrate in irrigation water and accumulate in soils unless adequate leaching and drainage are
 23 provided. Excessive soil salinity can affect soil structure, impede water and root penetrations, and
 24 result in seedling mortality, reduced plant growth rates, and reduced yields (Grattan 2002).

1 The concentration and composition of dissolved constituents in water determines whether the
2 water quality is suitable for irrigation. Electrical conductivity (EC) is measured in deciSiemens (dS)
3 and is used to indicate the total salt content or total dissolved salt content. The strength of the
4 electrical current depends on the water temperature, types of ions, and salt concentrations. Water
5 with a higher salt content is more conductive than water with lower salt content. For more
6 information on agricultural irrigation water quality suitability, see Chapter 8, *Water Quality*.

7 Irrigation can be used to control salt levels in the soil by over-irrigating, careful drainage, or
8 maintaining high moisture levels to dilute salt (Hagood 1977). Soil salinity is measured in EC_e , which
9 is the electrical conductivity of the soil in deciSiemens per meter (dS/m) at 25°C, and EC_w is the
10 electrical conductivity of water in dS/m. Crop tolerances for soil and water salinities vary. Some
11 crop varieties have the ability to withstand higher salt concentrations, such as sugar beets, which
12 tolerate 26 dS/m, and Sudan grass, which can tolerate 24 dS/m before crop yield loss occurs.

13 The effects of salts or salinity on agricultural production depend upon the texture of the soil, the
14 distribution of salt in the soil profile, the composition of the salt, irrigation practices, cultural
15 practices, soils moisture content management, the plant species, transpirational load, and the
16 growth stage of the plant (Ayers 1985). Salinity problems in irrigation water supply in the Delta are
17 uncommon, but areas of the south Delta (e.g., Old River) and west Delta can be affected depending
18 on water year type, time of year, and flow conditions. Areas of the south Delta that grow processing
19 tomatoes, which are particularly salt-sensitive in seedling and blooming growth stages, have been
20 documented to exhibit seedling mortality and bloom loss resulting from salt burning during
21 irrigation that have resulted in reduced yields and crop quality during certain years. Most salinity
22 problems in the Delta result from intrusion of saline drainage water from the San Joaquin Valley and
23 from intrusion of saline water from the San Francisco Bay, a situation likely to worsen with any
24 increases in sea level (Sumner and Rosen-Molina 2011).

25 Table 14-6 shows the crop tolerance and yield potential of certain crops grown in the Delta. The
26 table shows the EC_e and EC_w salinity content at which crops would have a 100, 75, 50, or 0% crop
27 yield. Additional discussion of water quality and, specifically salinity, is provided in Chapter 8, *Water*
28 *Quality*, Section 8.1.3.7.

29 **Agriculture-Related Infrastructure**

30 Agricultural production always requires supporting industry, related industry, and infrastructure.
31 Supporting industry, related industry, and infrastructure ranges from road access, irrigation and
32 drainage facilities, electrical power, fuel suppliers, agri-chemical and seed suppliers, equipment
33 supply and repair operations, and post-harvest facilities. Levees, irrigation facilities, and drainage
34 infrastructure are particularly important in supporting agriculture within the study area. After crops
35 are harvested they may be stored, processed, and shipped to other parts of the state, country, or
36 world, depending on the crop and market. Post-harvest infrastructure examples in the study area
37 include packing houses and cold storage plants for apples and pears, wineries for wine grapes,
38 packing sheds for vegetables and melons, and hay barns for alfalfa. The prevalence and distribution
39 of agricultural infrastructure directly and indirectly affects labor requirements, economics, and
40 environmental justice. These issues are discussed in Chapter 16, *Socioeconomics*, and Chapter 28,
41 *Environmental Justice*.

Table 14-6. Crop Tolerance and Yield Potential of Selected Crops as Influenced by Irrigation Water Salinity (EC_w) or Soil Salinity (EC_e)^{a, b}

Field Crops	100%	75%	50%	0% ^c	100%	75%	50%	0% ^c
	EC_e	EC_e	EC_e	EC_e	EC_w	EC_w	EC_w	EC_w
Alfalfa	2.0	5.4	8.8	16.0	1.3	3.6	5.9	10.0
Almond ^d	1.5	2.8	4.1	6.8	1.0	1.9	2.8	4.5
Apricot ^d	1.6	2.6	3.7	5.8	1.1	1.8	2.5	3.8
Bean	1.0	2.3	3.6	6.3	0.7	1.5	2.4	4.2
Corn (Maize)	1.7	3.8	5.9	10.0	1.1	2.5	3.9	6.7
Corn (Forage) (Maize)	1.8	5.2	8.6	15.0	1.2	3.5	5.7	10.0
Corn, Sweet (Maize)	1.7	3.8	5.9	10.0	1.1	2.5	3.9	6.7
Cucumber	2.5	4.4	6.3	10.0	1.7	2.9	4.2	6.8
Grape ^e	1.5	4.1	6.7	12.0	1.0	2.7	4.5	7.9
Peach	1.7	2.9	4.1	6.5	1.1	1.9	2.7	4.3
Rice (Paddy)	3.0	5.1	7.2	11.0	2.0	3.4	4.8	7.6
Squash, Zucchini (Courgette)	4.7	7.4	10.0	15.0	3.1	4.9	6.7	10.0
Squash, Scallop	3.2	4.8	6.3	9.4	2.1	3.2	4.2	6.3
Sudan Grass	2.8	8.6	14.0	26.0	1.9	5.7	9.6	17.0
Sugar Beet ^e	7.0	11.0	15.0	24.0	4.7	7.5	10.0	16.0
Tomato	2.5	5.0	7.6	13.0	1.7	3.4	5.0	8.4

Source: Ayers 1985.

^a Adapted from Maas and Hoffman (1977) and Maas (1984). These data should only serve as a guide to relative tolerances among crops. Absolute tolerances vary depending upon climate, soil conditions, and cultural practices. In soils with high concentrations of gypsum, plants will tolerate about 2 dS/m higher EC_e than indicated; however, the EC_w will remain the same as shown in this table.

^b EC_e means average root zone salinity as measured by EC of the saturation extract of the soil, reported in dS/m at 25°C. EC_w means EC of the irrigation water in dS/m. The relationship between soil salinity and water salinity ($EC_e = 1.5 EC_w$) assumes a 15–20% leaching fraction and a 40-30-20-10% water use pattern for the upper to lower quarters of the root zone. These assumptions were used in developing Table 14-6.

^c The zero yield potential or maximum EC_e indicates the theoretical EC_e at which crop growth ceases.

^d Tolerance evaluations are based on tree growth and not on yield.

^e Beets are more sensitive during germination; EC_e should not exceed 3 dS/m in the seeding area for garden beets and sugar beets.

14.2 Regulatory Setting

This section provides the regulatory setting for agriculture resources, including potentially relevant federal, state, and local requirements.

14.2.1 Federal Plans, Policies, and Regulations

14.2.1.1 Farmland Protection Policy Act

Under Federal law, the Farmland Protection Policy Act recognizes that the Nation's farmland is a unique natural resource and provides food and fiber necessary for the continued welfare of the people of the United States; that each year, a large amount of the Nation's farmland is irrevocably converted from actual or potential agricultural use to nonagricultural use; that the extensive use of farmland for nonagricultural purposes undermines the economic base of many rural areas; and that Federal actions, in many cases, result in the conversion of farmland to nonagricultural uses where alternatives actions would be preferred.

The Federal Farmland Protection Policy Act (FPPA) is subtitle I of Title XV, Section 1539-1549, Agriculture and Food Act of 1981 (Public Law 97-98). According to the NRCS,

...the FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency.

Assistance from a Federal agency includes:

- Acquiring or disposing of land.
- Providing financing or loans.
- Managing property.
- Providing technical assistance.

The rating process established under the FPPA was developed to help assess options for land use on an evaluation of productivity weighed against alternative proposed uses. Because the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) is a federal agency and is a National Environmental Policy Act (NEPA) co-lead agency for the EIR/EIS, it is required to coordinate with the NRCS to comply with the FPPA.

14.2.1.2 Other NRCS Programs

The Natural Resources Conservation Service manages a number of programs that assist producers in conserving natural resources while sustaining agricultural productivity. These programs include those that provide technical assistance to growers and those that share costs with farmers in exchange for the adoption of conservation practices on agricultural land. Other programs protect continued agricultural production through the purchase of easements. These programs are primarily geared toward individual landowners and are voluntary and incentive-based.

14.2.1.3 U.S. Environmental Protection Agency Pesticide Regulatory Program

Pesticide use is regulated by EPA in conjunction with each state's Department of Agriculture. Each pesticide is registered or licensed for usage and a tolerance level is set for each pesticide. This tolerance, or maximum residue limit, limits the amount of pesticide that can be present on produce grown in the United States. Tolerances are set after determining the toxicity of the pesticide and the products of its break-down, how much pesticide remains in or on food by its market time, and the amount and frequency of pesticide application. Testing and enforcement of these tolerance levels is conducted by EPA and the CDPR. Licensing and registration of pesticides is primarily to protect environmental assets while tolerance levels for produce are designed to ensure a safe food supply for public consumption.

14.2.1.4 Agriculture Marketing Service

The Agriculture Marketing Service (AMS) of the U.S. Department of Agriculture (USDA) oversees programs to provide standardization, grading, scientific support, and collaboration of resources for the United States agriculture industry. The commodity programs for dairy, fruit and vegetable, livestock and seed, poultry, and cotton and tobacco oversee standardization and grading services in addition to supplying market news. Federal laws, such as the Federal Seed Act and the Perishable Agricultural Commodities Act, are enforced under these programs. Also within the AMS is the National Organic Program, which implements the national standards for organic products, the Science and Technology Program which provides scientific support to AMS programs, and the Transportation and Marketing Program which coordinates the cooperation of specialists to improve agricultural transportation and market access for growers.

14.2.2 State Plans, Policies, and Regulations

14.2.2.1 California Department of Pesticide Regulation

The Department of Pesticide Regulation (DPR) regulates pesticides under a comprehensive program that encompasses enforcement of pesticide use in agricultural and urban environments. DPR oversees a multi-tiered enforcement infrastructure and, in addition to enforcing state pesticide laws, is vested by the U.S. Environmental Protection Agency with primary responsibility to enforce federal pesticide laws in California. DPR directs and oversees the County Agricultural Commissioners who carry out and enforce pesticide and related environmental laws and regulations locally.

Enacted in January 2008, the CDPR Strategic Plan is the 5-year plan to guide the CDPR in protecting human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management.

14.2.2.2 Farmland Mapping and Monitoring Program

The California Department of Conservation (DOC) established the FMMP in conjunction with the NRCS to establish categorical definitions of Important Farmland for land use inventory purposes. The definitions recognize the land's suitability for agricultural production rather than solely reflecting the physical and chemical characteristics of the soil. Land identified as Important Farmland is mapped into one of the following eight categories: prime farmland, farmland of

1 statewide importance, unique farmland, farmland of local importance, grazing land, urban and built-
2 up land, other land, and water (California Department of Conservation 2007).

3 **14.2.2.3 Delta Protection Act of 1992**

4 The Delta Protection Act of 1992 recognizes the agricultural resource value of the Delta and declares
5 that agricultural lands within the primary zone of the Delta should be “protected from the intrusion
6 of nonagricultural uses.” The bill created the Delta Protection Commission (DPC) and enabled it to
7 promote, facilitate, and administer the acquisition of agricultural conservation easements. In
8 addition, DPC was charged with protecting agricultural viability in the Delta while protecting the
9 region from development that would result in a significant loss of agricultural land. Pursuant to this
10 legislation, DPC created the *Land Use and Resource Management Plan for the Primary Zone of the*
11 *Delta*. This plan identifies nine general policies in support of Delta agriculture. These include
12 prioritizing low-value lands for conversion to nonagricultural uses, encouraging the acquisition of
13 agricultural conservation easements, managing agricultural lands to maximize wildlife habitat, and
14 supporting efforts to maintain a viable agricultural economy including educational programs,
15 agricultural tourism, and value-added production activities (Delta Protection Commission 1995)).
16 Under the 1992 legislation, counties with unincorporated land in the primary zone of the Delta must
17 incorporate the policies of the *Land Use and Resource Management Plan for the Primary Zone of the*
18 *Delta* into their General Plans. Where counties make land use decisions in the primary zone
19 allegedly inconsistent with the *Land Use and Resource Management Plan for the Primary Zone of the*
20 *Delta* and General Plan policies incorporating its contents, aggrieved parties can appeal such county
21 decisions to the DPC for ultimate determinations of consistency or inconsistency.

22 **14.2.2.4 Delta Reform Act and Delta Plan**

23 In November 2009, the California Legislature enacted SB 1 X7, also known as the Sacramento–San
24 Joaquin Delta Reform Act. The Act and related legislation on Delta activities contemplates that these
25 activities will involve the conversion of agricultural land to other uses and requires consideration of
26 the agricultural values of the Delta. Notably, in Public Resources Code section 29702, the Legislature
27 declared that the “coequal goals of providing a more reliable water supply for California and
28 protecting, restoring, and enhancing the Delta ecosystem ... shall be achieved in a manner that
29 protects and enhances the unique cultural, recreational, natural resource, and *agricultural* values of
30 the Delta as an evolving place.” (Emphasis added.)² Echoing this concern for Delta agriculture,
31 Public Resources Code section 32301[d] notes that “[t]he Delta contains more than 500,000 acres of
32 agricultural land, with unique soils, and farmers who are creative and utilize innovative agriculture,
33 such as carbon sequestration crops, subsidence reversal crops, wildlife-friendly crops, and crops
34 direct for marketing to the large urban populations nearby.”

35 The Delta bill created a new Delta Stewardship Council (DSC) and gave this body broad oversight of
36 Delta planning and resource management. The DSC is tasked with developing, adopting, and
37 commencing implementation of a long-term plan (the “Delta Plan”) which will be a legally
38 enforceable, comprehensive management plan The Delta Plan generally covers five topic areas and
39 goals: increased water supply reliability, restoration of the Delta ecosystem, improved water quality,
40 reduced risks of flooding in the Delta, and protection and enhancement of the Delta. The Delta
41 Stewardship Council does not propose constructing, owning, or operating any facilities related to
42 these five topic areas. Rather, the Delta Plan sets forth regulatory policies and recommendations

² Similar language is found in Water Code section 85020.

1 that seek to influence the actions, activities, and projects of cities and counties and state, federal,
2 regional, and local agencies toward meeting the goals in the five topic areas.

3 The DSC adopted the Proposed Final Delta Plan, as well as the Final Delta Plan Program EIR and the
4 Final Rulemaking Package, at its May 16, 2013 meeting. Once the State Office of Administrative Law
5 and California Secretary of State approve the plan, the proposed policies in the Delta Plan will
6 become enforceable regulations. The Proposed Final Delta Plan consists of 14 policies and 73
7 regulations (Delta Stewardship Council 2013).

8 **14.2.2.5 California Land Conservation Act of 1965 (Williamson Act)**

9 The California Land Conservation Act (Williamson Act) is an agricultural land protection program
10 enacted by the California Legislature in 1965 to help maintain the agricultural economy of the state
11 by preserving its agricultural land. The act discourages premature and unnecessary conversion of
12 agricultural land to urban uses. The legislation benefits landowners by allowing them to enter into
13 long-term contracts (10 or 20 years) with the state of California to keep agricultural land in
14 production. In return, the state reduces property taxes based on a complex calculation tied to
15 agricultural income.

16 The program is authorized both by statute and by California's Constitution (Article XIII, Sec. 8). The
17 Constitution provides that when land is "enforceably restricted" to certain enumerated uses,
18 including the "production of food or fiber," it is to be valued for property tax purposes "only on a
19 basis that is consistent with its restrictions and uses." Land in the Williamson Act program is
20 restricted, by means of a contract, to agricultural use and certain compatible uses.

21 The Williamson Act is implemented when a city or county creates an agricultural preserve. Once a
22 preserve is established, the landowner enters into a contract with a city or county. The landowner
23 and any successors-in-interest are obligated to adhere to the contract's enforceable restrictions,
24 unless the contract is rescinded or cancelled. The minimum Williamson Act contract term is ten
25 years and the contract is automatically renewed each year, adding an additional year to its term.

26 If a county agrees to establish a Farmland Security Zone (FSZ, or "Super-Williamson Act") program,
27 landowners may choose to enter into a 20-year contract to establish an FSZ or include the land
28 within an established FSZ. Except under limited circumstances, land subject to an FSZ contract
29 cannot be annexed into a city, or a special district that provides non-agricultural services, or
30 acquired by a school district for use as a public school. In return, FSZ contracts offer landowners
31 greater property tax reduction than under a 10-year Williamson Act contract.

32 These Williamson Act and FSZ contracts may be terminated by non-renewal or by cancellation. If a
33 10- or 20-year contract is terminated through non-renewal, a 9- or 19-year non-renewal period
34 must be initiated by either the landowner or the city or county, during which time the land is still
35 under contract, and the property taxes rise by a statutory formula during the last nine years of
36 either form of contract. If a contract is terminated through cancellation, a city or county must make
37 findings specific to each type of contract to justify cancellation.

38 It is the policy of the State to avoid, whenever practicable, the location of any federal, state, or local
39 public improvements and any improvements of public utilities, and the acquisition of land in
40 agricultural preserves. However, under several provisions of the Act, land under contract may be
41 removed from contract in order to convert land to a non-agricultural use. Land may be acquired
42 from a willing seller or by public acquisition for a public improvement project.

1 The Act requires that no public agency can locate a public improvement within an agricultural
 2 preserve unless it first finds that: (a) the location is not based primarily on a consideration of the
 3 lower cost of acquiring land in an agricultural preserve; and (b) there is no other land within or
 4 outside of the preserve on which it is reasonably feasible to locate the public improvement.
 5 However, the Act provides some exemptions and appears to exempt DWR from having to make
 6 these findings for a conveyance because the conveyance right-of-way would qualify as a “State
 7 Water Facility” as defined by §12934(d) (2) of the California Water Code. Applicable exemptions
 8 from these findings are identified in §51293 of the California Government Code and are listed below.

- 9 (d) The acquisition of either (1) temporary construction easements for public utility improvements,
 10 or (2) an interest in real property for underground public utility improvements. This subdivision
 11 shall apply only where the surface of the land subject to the acquisition is returned to the
 12 condition and use that immediately predated the construction of the public improvement, and
 13 when the construction of the public utility improvement will not significantly impair agricultural
 14 use of the affected contracted parcel or parcels.
- 15 (e) The location or construction of the following types of improvements, which are hereby
 16 determined to be compatible with or to enhance land within an agricultural preserve [not a
 17 contract]:
- 18 (1) Flood control works, including channel rectification and alteration.
 19 (2) Public works required for fish and wildlife enhancement and preservation.
 20 (3) Improvements for the primary benefit of the lands within the preserve.
- 21 (h) All facilities which are part of the State Water Facilities as described in subdivision (d) of Section
 22 12934 of the Water Code, except facilities under paragraph (6) of subdivision (d) of that section.
- 23 (j) The acquisition of a fee interest or conservation easement for a term of at least 10 years, in order
 24 to restrict the land to agricultural or open space uses as defined by subdivisions (b) and (o) of
 25 Section 51201.

26 In 2008, Assembly Bill 2921 was enacted, providing for a mechanism to rescind Williamson Act
 27 agricultural contracts in order to enter into either an open space contract under the Williamson Act,
 28 or an open space easement. Under the new provisions, the resulting agreement must be at least as
 29 restrictive as the contract it replaced, and the affected parcel large enough to provide open space
 30 benefits. This mechanism may be applicable to preservation or restoration activities associated with
 31 the implementation of BDCP conservation measures.

32 According to the *Williamson Act 2010 Status Report*, approximately 15 million acres were enrolled
 33 under the Williamson Act statewide as of January 1, 2009 (California Department of Conservation
 34 2010). This represents about half of California’s 30 million acres of farmland, which accounts for
 35 nearly one-third of the state’s privately owned land. In recent years, though, some counties have
 36 removed lands from Williamson Act contracts as a result of reductions to State subvention funds,
 37 which compensate counties for property tax revenue foregone through contracts. For fiscal year
 38 2009–2010, the subvention payments budget was cut to \$1,000 statewide; in 2010, Senate Bill 863
 39 restored funding to a statewide level of \$10 million for the 2010–2011 fiscal year. However, in 2011,
 40 Senate Bill 80 terminated this fund while Assembly Bill 1265 created a means by which participating
 41 counties receiving subvention aids less than half of the previous year’s foregone revenue may
 42 shorten the term of the active Williamson Act contracts in the county and recoup 10% of
 43 participating landowners’ property tax savings (California Department of Conservation 2011).

14.2.2.6 State Water Resources Control Board and Central Valley Regional Water Quality Control Board

The State Water Board allocates water rights, adjudicates water rights disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine Regional Boards located in the major watersheds of the state. The Regional Boards serve as the frontline for state and federal water pollution control efforts. The study area is almost exclusively within the boundaries of the Central Valley Regional Board. In 2003, the Central Valley Regional Board initiated the Irrigated Lands Regulatory Program with the adoption of Conditional Waiver of Waste Discharge Requirements. The 2003 Conditional Waiver expired in 2006, and a Revised Conditional Waiver was adopted and has been amended to continue until July 2013. The Irrigated Lands Regulatory Program is designed to restore and/or maintain the highest reasonable quality of state waters considering all the demands being placed on the water; minimize waste discharge from irrigated agricultural lands that could degrade the quality of state waters; maintain the economic viability of agriculture in California's Central Valley; and ensure that irrigated agricultural waste discharge to water designated as municipal/domestic supply is of sufficient quality to provide Central Valley communities a sustainable source of drinking water. As part of the Irrigated Lands Regulatory Program, farmers and ranchers are to join a coalition to manage and monitor water quality or obtain an individual discharge permit with a monitoring program. The monitoring programs support the use of alternative methods in farmer and rancher operations to prevent fertilizers and pesticides from reaching streams.

14.2.2.7 California Natural Resources Agency

In an October 27, 2004 memorandum, the Secretaries of the Resources Agency and the Department of Food and Agriculture stated that the two agencies were "committed to working together to ensure that the policies of each agency are, to the fullest extent possible, complementary, rather than conflicting." In a May 4, 2005 memorandum to Resources Agency departments, boards and commissions, the Secretary stated "in selecting and developing resource related projects, departments under Resources Agency should consider ways to reduce effects on productive agricultural lands" and encouraged departments to incorporate, where appropriate, the strategies identified in the CALFED EIR to reduce the impact of the CALFED Ecosystem Restoration Program on agricultural land and water use. The Secretary recommended several steps departments should take in cases involving agricultural lands. These included (1) projects should include both restoration and agricultural preservation efforts; (2) CEQA documents involving resource-related projects that involve agricultural land should include a separate section that describes the social and economic consequences of a conversion; and (3) the lead agency should analyze each situation on a case-by-case basis to determine whether a project will have a significant effect on the environment. Socioeconomic issues are discussed in Chapter 16, *Socioeconomics*.

14.2.2.8 California Department of Food and Agriculture

CDFA implements programs to support California agriculture and food production with improved quality assurance, animal safety programs, production, and on-farm safety management practices, and programs for processors of farm products. CDFA also conducts pest and disease prevention activities and programs to respond to emergencies that threaten California's food and agriculture. The CDFA relies on the County Agricultural Commissioners to carry many of its programs.

14.2.3 Regional and Local Plans, Policies, and Regulations

14.2.3.1 General Plans

The respective general plans for Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties include policies and mitigation requirements regarding the conversion of agricultural land use within the Delta. These documents set forth policies and implementation strategies to preserve agricultural and open space land uses through varying combinations of the following mechanisms: creation of urban growth boundaries, designation of agricultural overlay zones and other agricultural protection areas, identification of a minimum parcel size for agricultural uses, requirement of buffers between agricultural and other uses, enactment of mitigation fees for conversion of agricultural land associated with development, support for or required purchase of agricultural easements, establishment of transfer of development rights programs, and support for agricultural-related educational or tourism programs. City general plans may also have some provisions dealing with agriculture and open space. Generally state and federal agencies, as well as some local or regional agencies involved with the location or construction of facilities for the production, generation, storage, treatment, or transmission of water are not subject to local land use regulations and inconsistency with a specific local land use regulation is not by itself an adverse effect on the environment.³ However, this EIR/EIS, in assessing whether particular categories of environmental effects are adverse or beneficial (NEPA) or significant (CEQA), considers relevant local land use regulations that are adopted for the purpose of avoiding or mitigating an environmental impact. Provisions of these plans are discussed in more detail in Chapter 13, *Land Use*, Section 13.2.3.

14.2.3.2 County Right-to-Farm Ordinances

A right-to-farm ordinance is commonly adopted by counties with a prominent agricultural presence to protect agricultural operations from nuisance complaints and actions associated with adjacent residential uses. Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo Counties have adopted right-to-farm ordinances.

14.3 Environmental Consequences

This section describes the potential effects of the alternatives on agricultural resources within the study area. Effects are evaluated for severity and, where appropriate, mitigation measures are identified. This section describes potential direct and reasonably foreseeable indirect effects on agriculture that would result with implementation of each alternative. This analysis separates effects relating to Important Farmland and conversion of land subject to Williamson Act contracts or in Farmland Security Zones into two categories: one related to the physical and structural components of water conveyance facilities (CM1), which are project-level features, and one related to other conservation measures (CM2 through CM22), which are program-level features. For other potential effects, these components are treated together, along with effects stemming from BDCP operations, where such discussion is appropriate. Direct or indirect effects on agricultural resources in areas Upstream of the Delta are not anticipated; thus, agricultural resources in these areas are not

³ See, e.g., *Hall v. Taft* (1956), 47 Cal. 2d 177, 183; *Town of Atherton v. Superior Court* (1958) 159 Cal.App.2d 417 and *Lawler v. City of Redding* (1992) 7 Cal. App. 4th 778, 784.

1 discussed further in this section. Potential effects on upstream areas are discussed in Chapter 5,
 2 *Water Supply*. See Chapter 30, *Growth Inducement and Other Indirect Effects*, for a general discussion
 3 of potential effects on agricultural resources in the SWP/CVP Export Service Areas region.

4 Additionally, six of the proposed conservation measures related to supporting covered species and
 5 reducing effects from environmental stressors (listed below and described in Chapter 3, *Description*
 6 *of the Alternatives*, Section 3.6.3), which would be implemented under all action alternatives, are not
 7 anticipated to result in any meaningful effects on agricultural resources in the study area because
 8 the actions implemented under these conservation measures are not, for the most part, land-based
 9 or land-focused activities, nor would they be expected to result in any direct or indirect effects on
 10 agriculture in the study area. As such, these measures will not be addressed further in this analysis.

- 11 • Methylmercury Management (CM12)
- 12 • Stockton Deep Water Ship Channel Dissolved Oxygen Levels (CM14)⁴
- 13 • Illegal Harvest Reduction (CM17)
- 14 • Conservation Hatcheries (CM18)
- 15 • Urban Stormwater Treatment (CM19)
- 16 • Avoidance and Minimization Measures (CM22)

17 **14.3.1 Methods for Analysis**

18 Section 14.3.2, *Determination of Effects*, addresses the potential for effects associated with
 19 temporary construction activities, footprint of disturbance of new water conveyance facilities (CM1)
 20 and other conservation measures (CMs 2–11, 13, 15, 16, 20, 21), and operation of the BDCP
 21 alternatives within the study area. Relying on spatial data from the California Departments of
 22 Conservation and Water Resources, as well as project-specific data describing the location of project
 23 components, this section considers conversion of agricultural land designated as Important
 24 Farmland (Prime, Unique, Statewide Importance, and Local Importance) and subject to Williamson
 25 Act contracts or in Farmland Security Zones. Project-specific data also determined whether features
 26 would create footprint effects that would be temporary/short-term or permanent in nature. The
 27 section also describes potential changes to agricultural viability from the project as it relates to
 28 operational effects on water quality, groundwater elevation, and inundation frequency. Finally, the
 29 section considers several indirect consequences on agricultural resources that may result from
 30 implementation of the BDCP.

31 **14.3.1.1 Project- and Program-Level Components**

32 To evaluate effects stemming from the BDCP alternatives, this analysis uses a range of
 33 methodological approaches. First, geospatial data was used in a similar manner described above to
 34 quantify the number of acres of Important Farmland and land contracted under Williamson Act that
 35 would be affected by the footprint of all components of the proposed BDCP alternatives, including
 36 water conveyance facilities (CM1) and other conservation measures (CMs 2–11, 13, 15, 16, 20, 21).
 37 Because activities associated with these planned conservation measures are conceptual at this point,

⁴ Implementation of this conservation measure would modify the existing aeration facility as necessary and, if necessary, additional aerators and associated infrastructure would be added to optimize oxygen delivery to the river.

1 this analysis took a programmatic approach to addressing effects on crops using similar analytical
2 approaches and tools as for the placement of the water conveyance facilities. While these effects are
3 included in Section 14.3, *Environmental Consequences*, they will also be discussed in greater detail
4 and specificity in subsequent project-level environmental documentation once the specific locations
5 for these BDCP conservation measures are determined.

6 Chapter 7, *Groundwater*, evaluates changes in groundwater levels due to the construction of the
7 water conveyance facilities and the implementation of the other conservation measures, as well as
8 effects on agricultural drainage patterns. Changes to groundwater elevation are discussed in terms
9 of the interaction between crops and the water table. The water table elevation must be within the
10 crop root zone to maximize growth and yield and minimize root rotting from oversaturation. This
11 section assesses whether groundwater level changes due to new water conveyance facilities or the
12 other conservation measures would occur at a magnitude or time period that would affect crop root
13 zones, thereby affecting crop viability and/or irrigation practices. Because location-specific effects
14 cannot be identified, this evaluation is qualitative in nature. Where location-specific information
15 regarding changes to agricultural drainage patterns can be identified, these effects are discussed.
16 For instance, geospatial data was used to quantify the total length of irrigation or drainage facilities
17 that could be directly affected by the footprint of temporary or permanent features associated with
18 construction of water conveyance facilities (CM1) for each alternative.

19 Potential changes in water quality, which could alter irrigation practices or economically viable crop
20 choices (i.e., crop types or acreages), have been identified based on information from Chapter 8,
21 *Water Quality* and proposed operational guidelines with respect to existing salinity standards in the
22 study area. Modeling results were analyzed to identify and quantify, to the extent feasible, specific
23 areas that could be affected by these changes. Salinity, as measured by electrical conductivity, is a
24 primary indicator of water quality that could affect agricultural production in the study area. The
25 magnitude, duration, and frequency of a salinity change in irrigation water were evaluated by
26 analyzing the change in the number of days when electrical conductivity objectives for agricultural
27 beneficial uses would be exceeded or out of compliance. Specifically, exceedance of crop salinity
28 objectives was evaluated using DSM2 model output for eight representative nodes for agricultural
29 beneficial use in the study area: Sacramento River at Emmaton/Three Mile Slough near Sacramento
30 River (Emmaton for Existing Conditions and No Action Alternative and Three Mile Slough following
31 the change in compliance point under each action alternative) and San Joaquin River at Jersey Point
32 in the western Delta; South Fork Mokelumne River at Terminus and San Joaquin River at San
33 Andreas Landing in the interior Delta; and San Joaquin River at Vernalis, San Joaquin River at Brandt
34 Bridge, Old River near Middle River, and Old River at Tracy Bridge in the southern Delta. The
35 differences in irrigation water salinity are described in Chapter 8, *Water Quality*. However, these
36 events are discussed in relation to the water quality tolerances of agricultural crops grown in the
37 study area in Section 14.3.3, *Effects and Mitigation Approaches*.

38 A final qualitative discussion relates to potential changes to management practices or production
39 viability brought about by Conservation Measures 2–11 of the BDCP, including effects stemming
40 from proximity to new restoration areas. Again, in many cases the specific locations and guidelines
41 relating to these measures are forthcoming; thus, this document incorporates only programmatic
42 discussion of this issue. However, the potential for increased frequency of inundation events in the
43 Yolo Bypass differs from most other measures in its geographic certainty. Analysis of related effects
44 on agricultural resources relies on a comparison between a geographic estimate of the area that
45 would be more frequently inundated, along with data about the agricultural resources present in
46 this area.

14.3.1.2 Timing of Effects

The analysis that follows assesses the potential for temporary (four or fewer years) or short-term (between four and ten years) construction activities associated with the BDCP to directly or indirectly impede agricultural production and operations. This section relies upon geospatial information identifying temporary ground-disturbing activities necessary for project construction, as well as the current distribution of important agricultural resources, including Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones in the study area. Permanent effects (lasting more than ten years) resulting from the physical footprints of water conveyance facilities and conservation areas, as well as operational effects on agricultural resources, are described separately. The extent of agricultural land that would be disturbed by construction activities determines the severity of each effect.

14.3.2 Determination of Effects

As discussed in the regulatory discussion above, both California and federal law and policy recognize that farmland is a unique resource and that conversion of farmland to other uses may have adverse economic and environmental impacts. Farmland is unique under CEQA and NEPA in that it represents both a natural resource and an economic resource. In general, under both CEQA and NEPA it is not legally necessary to mitigate for purely economic impacts unless they lead to reasonably foreseeable secondary environmental impacts. However, because of the complex nature of farmland as a natural and economic resource, it may be difficult to determine when an impact is an economic impact and when it is an environmental impact. To the extent that agricultural land provides habitat for species and/or open space for the enjoyment of humans, such land represents an environmental resource. In addition, agricultural land, itself, has unique physical characteristics that distinguish it from other land types. These physical characteristics are integral to the determination of whether land is Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. High quality soils are complex bio-geo-chemical systems and some of California's most valuable natural resources. The higher the quality of a soil type, the greater and more diverse options it provides to potential users. To the extent that agricultural land produces commodities for sale, such land represents an economic resource, much like lands with significant mineral resources.

In the California Environmental Quality Act (CEQA), California Public Resources Code section 21060.1, subdivision (a), defines Agricultural Land as "prime farmland, farmland of statewide importance, or unique farmland, as defined by the United States Department of Agriculture land inventory and monitoring criteria as modified for California." These categories, and sometimes farmland of local importance, taken together, are commonly described as "Important Farmland." For purposes of this EIR/EIS, "Important Farmland" is defined as land designated under any of these four categories, and refers to land located in areas that can continue to be farmed economically and on a sustainable basis for an indefinite period of time absent a conversion to a different use under the BDCP.

The criteria used for determining the significance of an effect on agricultural resources are based on the above factors, Appendix G of the CEQA Guidelines (Environmental Checklist), and professional standards and practices. Effects on agricultural resources may be considered adverse for purposes of NEPA and significant for purposes of CEQA if an alternative would result in any one of the following conditions.

- 1 • Convert to nonagricultural use a substantial amount of Prime Farmland, Unique Farmland,
2 Farmland of Statewide Importance, or Farmland of Local Importance (collectively “Important
3 Farmland”), as shown on the most recent California Department of Conservation Important
4 Farmland maps for each of the affected counties.
- 5 • Convert a substantial amount of land subject to Williamson Act contracts or in Farmland
6 Security Zones to a non-agricultural use incompatible with contract restrictions or local
7 preserve rules or ordinances, or conflict with surrounding land uses or the terms of the
8 applicable Farmland Security Zone.
- 9 • Involve other changes in the existing environment, which, because of their location or nature,
10 would result in the conversion of substantial amounts of Important Farmland to nonagricultural
11 use.

12 For the purposes of assessing both the severity of impacts and the need for mitigation, this EIR/EIS
13 does not use a numerical approach. Rather, this document identifies different degrees of impacts
14 and different mitigation measures depending in part on the nature, duration, and permanence of the
15 impacts. Thus, where impacts are temporary or short-term in nature and the impacted land can be
16 restored to productive agricultural status after the completion of construction, impacts are
17 considered less severe than those that will be permanent in character, and mitigation obligations
18 would be diminished accordingly.

19 For program-level activities, some may have adverse environmental impacts, others may have
20 beneficial environmental impacts, and others may have no impacts at all. The extent of impacts and
21 any required mitigation shall be addressed on a case-by-case basis as the footprint and impact of
22 each activity is developed. At the time such program-level activities are proposed and subjected to
23 project-specific environmental review, the Lead Agencies shall assess whether a significant adverse
24 environmental impact would result from one or more such activities.

25 Where appropriate, BDCP proponents should work with local agencies and other State agencies,
26 (including the California Department of Conservation, the California Department of Food and
27 Agriculture, the U.S. Department of Food and Agriculture, including the Natural Resources
28 Conservation Service, and federal and state fishery and wildlife agencies) to identify design features
29 of the project that will benefit both agricultural and natural resources.

30 As noted above, effects related to incompatibilities with local agricultural policies and land use
31 designations are discussed in Chapter 13, *Land Use* (Impacts LU-1 and LU-4). Effects to individual
32 crop types were calculated and are presented in Appendix 14A, *Individual Crop Effects as a Result of*
33 *BDCP Water Conveyance Facility Construction*. However, their evaluation is incorporated in Chapter
34 16, *Socioeconomics* (Impacts ECON-6, ECON-12, and ECON-18), as changes in crop selection and crop
35 yield are considered primarily economic effects, rather than changes to the physical environment.

36 **14.3.3 Effects and Mitigation Approaches**

37 **14.3.3.1 No Action Alternative**

38 Under the No Action Alternative, agricultural production would continue largely as it has under
39 Existing Conditions. This alternative includes continued implementation of SWP/CVP operations,
40 maintenance, enforcement, and protection programs by federal, state, and local agencies and non-
41 profit groups, as well as projects that are permitted or assumed to be constructed by 2060. This

1 includes implementation of the 2008 and 2009 Biological Opinions issued by NMFS and USFWS,
2 which establish certain RPAs requiring habitat restoration that may result in conversion of
3 agricultural land to nonagricultural uses (National Marine Fisheries Service 2009, U.S. Fish and
4 Wildlife Service 2008). The effects of climate change that would occur with or without the BDCP are
5 also part of the No Action Alternative. A complete list and description of programs, plans, and other
6 assumptions considered under the No Action Alternative is provided in Chapter 3, *Description of*
7 *Alternatives*, Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative,*
8 *and Cumulative Impact Conditions.*

9 **Temporary Conversion, Short-Term Conversion, and Permanent Conversion of** 10 **Important Farmland and of Land Subject to Williamson Act Contracts or in** 11 **Farmland Security Zones**

12 A selection of the programs, plans, and projects included under the No Action Alternative that are
13 relevant to the discussion of agricultural resources are summarized in Table 14-7, along with
14 anticipated effects on agricultural resources that have been identified. In total, the ongoing
15 programs and plans under the No Action Alternative would result in the permanent conversion of at
16 least 230 acres of farmland to nonagricultural uses and would temporarily affect approximately 500
17 acres of farmland. Of these total acres, at least 65 acres of Important Farmland (i.e., as Prime
18 Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance)
19 have been identified for conversion, along with temporary or short-term effects on 40 acres of
20 Important Farmland. At least 30 acres of land subject to Williamson Act contracts would be
21 converted and 415 acres would be temporarily affected. Habitat restoration activities, including
22 8,000 acres of restoration associated with the 2008 and 2009 Biological Opinions (BiOps) issued by
23 NMFS and USFWS, may require the conversion of additional acreage of Important Farmland or land
24 subject to Williamson Act contracts or in Farmland Security Zones. However, locations and the
25 resultant magnitude of effects of these programs are not yet known. Additionally, some of the
26 programs would also result in indirect effects on agriculture, as described in Table 14-7. Because the
27 amount of Important Farmland that could be converted to nonagricultural uses under the No Action
28 Alternative is substantial in the context of the study area, these plans, policies, and programs would
29 be deemed to have adverse effects upon agricultural resources. If species and habitat conservation
30 requires the conversion of farmland, it would necessitate its own environmental review process to
31 determine the potential for adverse effects on agriculture.

1 **Table 14-7. Effects on Agricultural Resources from Selected Plans, Policies, and Programs for the No**
 2 **Action Alternative based on Geography and Relevance to Resource Area**

Agency	Program/Project	Status	Description of Program/Project	Effects to Agricultural Resources
Contra Costa Water District	Contra Costa Canal Fish Screen Project (Rock Slough)	Under construction as of July 2011	Installation of a fish screen at Rock Slough Intake.	Contra Costa Water District provides water to 20 agricultural customers. Construction activities may affect intake operations.
Contra Costa Water District, Bureau of Reclamation, and California Department of Water Resources	Middle River Intake and Pump Station (previously known as the Alternative Intake Pump Station)	Completed in 2011	This project includes a potable water intake and pump station to improve drinking water quality for Contra Costa Water District customers.	Project resulted in permanent conversion to nonagricultural uses of 6–8 acres of Prime Farmland and Farmland of Statewide Importance in San Joaquin County, on Victoria Island, at the intake and pump stations. Additionally, temporary construction easement impacts included approximately 25–40 acres identified as Prime Farmland and Farmland of Statewide Importance.
California Department of Water Resources	Federal Energy Regulatory Commission (FERC) License Renewal for Oroville Project	Final EIR in 2008. FERC license will be issued in accordance with NMFS BO and final FERC license	The renewed federal license will allow the Oroville Facilities to continue providing hydroelectric power and regulatory compliance with water supply and flood control.	No effects on agricultural acreages are anticipated. A slight change in water temperatures, however, may affect rice production.
Freeport Regional Water Authority and Bureau of Reclamation	Freeport Regional Water Project	Project was completed late 2010.	Project includes an intake/pumping plant near Freeport on the Sacramento River and a conveyance structure to transport water through Sacramento County to the Folsom South Canal.	Project resulted in permanent conversion of approximately 50–70 acres of farmland to nonagricultural uses. Approximately 35–45 acres of farmland and 415 acres of land subject to Williamson Act contracts were temporarily affected.
City of Stockton	Delta Water Supply Project (Phase 1)	The project is currently under construction.	This project consists of a new intake structure and pumping station adjacent to the San Joaquin River; a water treatment plant along Lower Sacramento Road; and water pipelines along Eight Mile, Davis, and Lower Sacramento Roads.	This will result in permanent conversion of 56 acres of economically viable Prime (6 acres) and Farmland of Statewide Importance (50 acres) to nonagricultural uses.

Agency	Program/Project	Status	Description of Program/Project	Effects to Agricultural Resources
Bureau of Reclamation and State Water Resources Control Board	Battle Creek Salmon and Steelhead Restoration Project	Project is ongoing.	This project includes restoration of approximately 48 miles of habitat in Battle Creek and its tributaries to improve passage, growth, and recovery for anadromous fish populations.	This will result in a conversion of traditional farmland to aquaculture farming. Because the land will be used for agriculture, this would not constitute a conversion of farmland. However, the change would constrain crop selection, and change crop yields and production costs.
Tehama Colusa Canal Authority and Bureau of Reclamation	Red Bluff Diversion Dam Fish Passage Project	Completed in 2012	Proposed improvements include modifications made to upstream and downstream anadromous fish passage and water delivery to agricultural lands within CVP	Project provides beneficial effects on agricultural water deliveries within the CVP and increased pumping capacity during irrigation season. Therefore, no adverse effects on agriculture would occur.
Bureau of Reclamation, California Department of Fish and Wildlife, and Natomas Central Mutual Water Company	American Basin Fish Screen and Habitat Improvement Project	Completed in 2012	This three-phase project includes consolidation of diversion facilities; removal of decommissioned facilities; aquatic and riparian habitat restoration; and installing fish screens in the Sacramento River. Total project footprint encompasses about 124 acres east of the Yolo Bypass	The project will result in the permanent conversion of 70 acres of farmland (including 60 acres of rice) during Phases I and II
Yolo County	General Plan Update	General plan was adopted November 10, 2009	Anticipated implementation of policies and programs such as the Farmland Conversion Mitigation Program would minimize conversion of agricultural land to nonagricultural uses through mitigation	While buildout of the Yolo County General Plan would likely result in some conversion of farmland to nonagricultural uses, the Farmland Conversion Mitigation Program would minimize the occurrence of conversion and mitigate the effects
Zone 7 Water Agency and California Department of Water Resources	South Bay Aqueduct Improvement and Enlargement Project	Completed in 2012	The project includes construction of the Dyer Reservoir, Altamont Water Treatment Plant, and a pipeline to transport the water from the enlarged South Bay Aqueduct	During Stage 3 of the project, Brushy Creek and Dyer Reservoir will permanently convert 27 acres of grazing land and Williamson Act contract land

Agency	Program/Project	Status	Description of Program/Project	Effects to Agricultural Resources
National Marine Fisheries Service, U.S. Fish and Wildlife Service	2008 and 2009 Biological Opinions	Ongoing	The Biological Opinions issued by NMFS and USFWS establish certain RPAs and RPMs to be implemented. Some of the RPAs require habitat restoration which may require conversion of agricultural land to nonagricultural uses.	Habitat restoration actions required under the RPAs could result in up to 8,000 acres of agricultural land conversion. Agricultural land uses could also be periodically affected by changes in operation of the Yolo Bypass.

1

2 **Other Effects on Agriculture**

3 As described in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project*
4 *Alternative, and Cumulative Impact Conditions*, SWP/CVP operations identified as continuing actions
5 under the No Action Alternative include repair, maintenance, or protection of imperiled
6 infrastructure such as levees, and may also include actions for water quality management, habitat
7 and species protection, or flood management. While these continuing actions could result in indirect
8 effects on agriculture depending on the type of construction needed for repairs, or adjustments to
9 potential irrigation water and drainage needed for water quality and flood management, these
10 effects would be temporary in nature and would not be anticipated to result in the conversion of
11 Important Farmland, land subject to Williamson Act contracts or in Farmland Security Zones, or
12 otherwise substantially restrict agricultural uses.

13 **Water Quality Effects**

14 The potential effects of the No Action Alternative on agriculture due to changes in salinity were
15 evaluated by comparing the No Action water quality analysis for salinity to those for Existing
16 Conditions. Relative to Existing Conditions, the No Action Alternative would result in a fewer
17 number of days when Bay-Delta WQCP compliance locations in the western, interior, and southern
18 Delta would exceed EC objectives or be out of compliance with the EC objectives, with the exception
19 of the Sacramento River at Emmaton. Complete discussion of salinity under the No Action
20 Alternative is included in Chapter 8, *Water Quality*, Section 8.3.3.1.

21 **Future of Agriculture in the Delta**

22 The future of agricultural activities in the study area is uncertain. Over time, subsidence places
23 greater stress on levees, and it will continue to increase the already high costs of continued levee
24 maintenance and repair. Should the breach of a levee surrounding a Delta island devoted to
25 agriculture occur, it is possible that the island might be permanently lost to agricultural production.
26 Seismic risks and the effects of a changing climate also represent uncertainty with respect to the
27 future of agricultural production in the study area. The No Action Alternative assumes that levee
28 failures would be repaired under ongoing programs and does not include changes in land use to
29 accommodate climate change or adverse impacts associated with climate change. These issues are
30 discussed further in Appendix 3E, *Potential Seismic And Climate Change Risks to SWP/CVP Water*
31 *Supplies*, and Chapter 29, *Climate Change*.

1 Continuing activities related to operation of SWP and CVP facilities, changes in water quality, and
 2 other indirect effects are not changes in the existing environment that would result in the
 3 conversion of substantial amounts of Important Farmland to nonagricultural use. However, because
 4 Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones in
 5 the study area would be converted to nonagricultural uses under existing plans and programs, the
 6 No Action Alternative would have direct and adverse effects upon agricultural resources in the study
 7 area.

8 **CEQA Conclusion:** Continuing activities related to operation of SWP and CVP facilities, changes in
 9 water quality, and other indirect effects are not changes in the existing environment that would
 10 result in the conversion of substantial amounts of Important Farmland to nonagricultural use.
 11 However, because Important Farmland and land subject to Williamson Act contracts or in Farmland
 12 Security Zones would be converted to nonagricultural uses under existing plans and programs, the
 13 No Action Alternative would have significant impacts upon agricultural resources in the study area.
 14 In total, the ongoing programs and plans under the No Action Alternative would result in the
 15 permanent conversion of at least 230 acres of farmland to nonagricultural uses and would
 16 temporarily affect at least 500 acres of farmland. Of these total acres, at least 65 acres of Important
 17 Farmland (i.e., as Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or
 18 Farmland of Local Importance) would be permanently converted and 40 acres of Important
 19 Farmland would be temporarily affected. At least 30 acres of land subject to Williamson Act
 20 contracts would be converted and 415 acres would be temporarily affected. Habitat restoration
 21 activities, including 8,000 acres of restoration associated with the 2008 and 2009 BiOps issued by
 22 NMFS and USFWS, may require the conversion of additional acreage of Important Farmland or land
 23 subject to Williamson Act contracts or in Farmland Security Zones. Therefore, the effects of these
 24 programs and plans are considered significant.

25 **14.3.3.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and** 26 **Intakes 1–5 (15,000 cfs; Operational Scenario A)**

27 Alternative 1A would result in temporary effects on agricultural land in the study area associated
 28 with construction of five intakes and intake pumping plants, and other associated facilities; two
 29 forebays; conveyance pipelines; and tunnels. Nearby areas would be altered as work or staging
 30 areas, concrete batch plants, fuel stations, or be used for spoils storage areas. Transmission lines,
 31 access roads, and other incidental facilities would also be needed for operation of the project and
 32 construction of these structures would have temporary or short-term effects on agricultural lands.

33 Implementation of Alternative 1A would also result in permanent conversion of agricultural lands to
 34 nonagricultural uses associated with the five intakes and intake pumping plants and other
 35 associated facilities; an intermediate pumping plant; two forebays, and tunnel shafts. Other project
 36 features that would result in conversion of agricultural lands include soil borrow, spoil, and reusable
 37 tunnel material (RTM) storage areas, transmission line structures, and access roads.

1 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
3 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

4 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
5 ***water conveyance facility***

6 Temporary and short-term construction of water conveyance facilities associated with Alternative
7 1A would convert existing agricultural land to construction-related uses, directly precluding
8 agricultural use for the duration of construction. This alternative would convert approximately
9 1,329 acres of Important Farmland to other uses, including 1,126 acres of Prime Farmland, 13 acres
10 of Farmland of Statewide Importance, 48 acres of Unique Farmland, and 143 acres of Farmland of
11 Local Importance.

12 Of these acres of Important Farmland, intake work areas, adjacent to the proposed intakes and
13 pumping plants, would require the short-term conversion of approximately 500 acres near the east
14 bank of the Sacramento River between Freeport and Courtland. Work areas associated with the
15 construction of conveyance pipelines would require approximately 180 acres and would be located
16 primarily between Intakes 1 and 2 and between Intake 3 and the proposed intermediate forebay,
17 south of Hood and between the Sacramento River and Stone Lakes National Wildlife Refuge. Other
18 temporary work areas, including those necessary for the construction of tunnels and transmission
19 lines, would be located throughout the conveyance alignment. Mapbook Figure M14-1 shows all of
20 the construction features (including temporary work areas) associated with this proposed water
21 conveyance facility alignment along with Important Farmland. Note that not all of these structures
22 would be constructed under this alternative, since it displays all of the seven possible intakes that
23 would be constructed with this alignment; only Intakes 1-5 would be constructed under this
24 alternative. Table 14-8 displays a summary of temporary and short-term acreage and permanent
25 acreage of Important Farmland that could be converted to non-agricultural uses under
26 implementation of each alternative.

1 **Table 14-8. Estimated Conversion of Important Farmland as a Result of Construction of Water Conveyance Facilities, by Alternative (Acres)**
 2 **Alternative(s)**

	Permanent Surface Impacts					Temporary and Short-term Surface Impacts					Grand Total	Percent of Total in Study Area
	Farmland of Local Importance	Farmland of Statewide Importance	Prime Farmland	Unique Farmland	Subtotal	Farmland of Local Importance	Farmland of Statewide Importance	Prime Farmland	Unique Farmland	Subtotal		
Alternatives 1A and 6A	173	330	3,427	1,054	4,984	143	13	1,126	48	1,329	6,313	1.23%
Alternatives 1B and 6B	513	530	15,800	2,031	18,875	99	61	1,769	214	2,144	21,019	4.10%
Alternatives 1C and 6C	690	291	11,124	909	13,014	466	165	2,380	160	3,170	16,184	3.16%
Alternative 2A ^a	133	330	3,473	1,056	4,992	131	13	1,634	48	1,826	6,818	1.33%
Alternative 2B ^a	473	530	15,833	2,032	18,868	89	61	2,282	236	2,669	21,537	4.20%
Alternative 2C	690	291	11,127	912	13,019	466	165	2,380	160	3,170	16,189	3.16%
Alternative 3	124	330	3,331	1,053	4,838	59	11	863	20	953	5,791	1.13%
Alternative 4	197	158	4,281	339	4,975	237	70	955	53	1,315	6,290	1.23%
Alternative 5	124	330	3,267	1,049	4,770	59	11	747	17	833	5,603	1.09%
Alternatives 7 and 8	111	330	3,388	1,054	4,883	64	13	979	48	1,105	5,987	1.17%
Alternative 9	41	307	2,104	7	2,459	97	71	388	3	559	3,018	0.59%

^a Assumes Intakes 1-3, 6, and 7; otherwise, effects would be the same as Alternatives 1A and 1B, respectively.

1 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 2 ***conveyance facility***

3 Physical structures associated with construction of water conveyance facilities and borrow, spoils,
 4 and RTM areas would occupy agricultural lands designated as Important Farmland, directly
 5 precluding future agricultural use. The facilities associated with this alternative could convert
 6 approximately 4,984 acres of Important Farmland to project uses, including 3,427 acres of Prime
 7 Farmland, 330 acres of Farmland of Statewide Importance, 1,054 acres of Unique Farmland, and 173
 8 acres of Farmland of Local Importance.

9 Of these acres of Important Farmland, the forebays constructed under this alternative would,
 10 together, convert more than 1,600 acres to nonagricultural uses. The intermediate forebay would be
 11 located south of Hood, between the Sacramento River and South Stone Lake. The Byron Tract
 12 Forebay would be located adjacent to, and south of, Clifton Court Forebay. RTM areas would require
 13 more than 1,500 acres and would be located adjacent to main tunnel shafts and would be located
 14 just north of Scribner Road, east of the Sacramento River, on northern Brannan-Andrus Island, on
 15 southeastern Tyler Island, on eastern Bacon Island, and on northwestern Victoria Island. Activities
 16 associated with tunneling are likely to occur across multiple years at RTM storage areas. Additional
 17 time would then be required for dewatering, chemical characterization, and material storage.
 18 However, through implementation of an environmental commitment to reuse the material or
 19 dispose of it at appropriate facilities, as described in Appendix 3B, *Environmental Commitments*, it is
 20 anticipated that the material would be removed from these areas and applied, as appropriate, as
 21 bulking material for levee maintenance, as fill material for habitat restoration projects, or other
 22 beneficial means of reuse identified for the material. Following removal of material, stockpiled
 23 topsoil at RTM storage areas would be reapplied, and disturbed areas will be returned as near as
 24 feasible to preconstruction conditions by carefully grading to re-establish surface conditions and
 25 reconstructing features such as irrigation and drainage facilities. Over 1,000 acres would be
 26 converted to borrow or spoil areas. The largest of these areas would be adjacent to the forebays, and
 27 a third would be located between Intakes 1 and 2. Mapbook Figure M14-1 shows all of the
 28 construction features (including temporary work areas) associated with this proposed water
 29 conveyance facility alignment along with Important Farmland. Note that not all of these structures
 30 would be constructed under this alternative, since it displays all of the seven possible intakes that
 31 would be constructed with this alignment; only Intakes 1-5 would be constructed under this
 32 alternative. Table 14-8 displays a summary of temporary and short-term acreage and permanent
 33 acreage of Important Farmland that could be converted to non-agricultural uses under
 34 implementation of each alternative.

35 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
 36 ***Security Zones as a result of constructing the proposed water conveyance facility***

37 Temporary or short-term construction activities related to building the physical components of
 38 Alternative 1A would directly convert land subject to Williamson Act contracts or in Farmland
 39 Security Zones. This alternative could convert approximately 787 acres of land subject to
 40 Williamson Act contracts, including 77 acres in Farmland Security Zones. Much of the land subject to
 41 Williamson Act contracts or in Farmland Security Zones is also considered Important Farmland. For
 42 further discussion of potential incompatibilities with land use policies, see Chapter 13, *Land Use*,
 43 Impact LU-1.

1 Of this land subject to Williamson Act contracts or in Farmland Security Zones, intake work areas,
2 adjacent to the proposed intakes and pumping plants, would require the short-term conversion of
3 approximately 190 acres near the east bank of the Sacramento River between Freeport and
4 Courtland. Barge unloading facilities would require short-term conversion of approximately 100
5 acres and would be located on northern Upper Andrus Island, southern Tyler Island, southwest
6 Venice Island, northeast Bacon Island, southern Woodward Island, and northeast Victoria Island.
7 Other temporary work areas, including those necessary for the construction of tunnels and
8 transmission lines, would be located throughout the conveyance alignment. Mapbook Figure M14-2
9 shows all of the construction features (including temporary work areas) associated with this
10 proposed water conveyance facility alignment along with land subject to Williamson Act contracts
11 or in Farmland Security Zones. Note that not all of these structures would be constructed under this
12 alternative, since it displays all of the seven possible intakes that would be constructed with this
13 alignment; only Intakes 1-5 would be constructed under this alternative. Table 14-9 displays a
14 summary of temporary and short-term acreage and permanent acreage of land subject to
15 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
16 uses under implementation of each alternative.

17 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
18 ***result of constructing the proposed water conveyance facility***

19 Physical components of Alternative 1A would directly and permanently convert land subject to
20 Williamson Act contracts or in Farmland Security Zones to non-agricultural uses. This alternative
21 could convert approximately 2,857 acres of land subject to Williamson Act contracts, including 643
22 acres in Farmland Security Zones. For further discussion of potential incompatibilities with land use
23 policies, see Chapter 13, *Land Use*, Impact LU-1.

24 Of this land subject to Williamson Act contracts or in Farmland Security Zones, RTM areas would
25 require more than 1,500 acres and would be located adjacent to main tunnel shafts and would be
26 located just north of Scribner Road, east of the Sacramento River, on northern Brannan-Andrus
27 Island, on southeastern Tyler Island, on eastern Bacon Island, and on northwestern Victoria Island.
28 While these are considered permanent surface impacts for the purposes of impact analysis, it is
29 anticipated that the RTM would be removed from these areas and reused, as appropriate, as bulking
30 material for levee maintenance, as fill material for habitat restoration projects, or other beneficial
31 means of reuse identified for the material, as described above and in Appendix 3B, *Environmental*
32 *Commitments*. Over 500 acres would be converted to borrow or spoil areas. The largest of these
33 areas would be adjacent to the forebays, and a third would be located between Intakes 1 and 2. The
34 forebays constructed under this alternative would, together, convert approximately 280 acres to
35 nonagricultural uses. The intermediate forebay would be located south of Hood, between the
36 Sacramento River and South Stone Lake. The Byron Tract Forebay would be located adjacent to, and
37 south of, Clifton Court Forebay. Mapbook Figure M14-2 shows all of the construction features
38 (including temporary work areas) associated with this proposed water conveyance facility
39 alignment along with land subject to Williamson Act contracts or in Farmland Security Zones. Note
40 that not all of these structures would be constructed under this alternative, since it displays all of the
41 seven possible intakes that would be constructed with this alignment; only Intakes 1-5 would be
42 constructed under this alternative. Table 14-9 displays a summary of temporary and short-term
43 acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland Security
44 Zones that could be converted to non-agricultural uses under implementation of each alternative.

1 **Table 14-9. Estimated Conversion of Williamson Act and Farmland Security Zone Farmland as a Result**
 2 **of Construction of Water Conveyance Facilities (acres)**

Alternative(s)	Permanent Surface Impacts			Temporary and Short-term Surface Impacts			Grand Total	Percent of Total in Study Area
	Farmland Security Zone	Other Williamson Act	Subtotal	Farmland Security Zone	Other Williamson Act	Subtotal		
Alternatives 1A and 6A	643	2,215	2,857	77	710	787	3,645	0.84%
Alternatives 1B and 6B	3,788	10,292	14,080	233	1,093	1,326	15,406	3.57%
Alternatives 1C and 6C		7,647	7,647		1,243	1,243	8,890	2.06%
Alternative 2A ^a	643	2,267	2,910	77	1,195	1,272	4,182	0.97%
Alternative 2B ^a	3,788	10,337	14,125	233	1,644	1,877	16,003	3.71%
Alternative 2C		7,646	7,646		1,243	1,243	8,890	2.06%
Alternative 3	643	2,170	2,813	77	645	722	3,536	0.82%
Alternative 4	19	3,061	3,080	115	722	837	3,917	0.91%
Alternative 5	643	2,110	2,753	77	554	632	3,385	0.78%
Alternatives 7 and 8	643	2,204	2,847	77	667	744	3,592	0.83%
Alternative 9	919	1,428	2,347	132	659	790	3,137	0.73%

^a Assumes Intakes 1-3, 6, and 7; otherwise, effects would be similar to 1A and 1B, respectively.

3

4 **NEPA Effects:** The temporary and short-term and permanent conversion of Important Farmland and
 5 land subject to Williamson Act contracts or in Farmland Security Zones to non-agricultural uses, as
 6 discussed above, would constitute an adverse effect on the physical environment. Mitigation
 7 Measure AG-1 would be available to reduce these effects.

8 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
 9 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 10 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 11 construction. Temporary and short-term construction of facilities would convert approximately
 12 1,329 acres of Important Farmland and 787 acres of land subject to Williamson Act contracts or in
 13 Farmland Security Zones to other uses. Physical structures would also permanently convert
 14 approximately 4,984 acres of Important Farmland and 2,857 acres of land subject to Williamson Act
 15 contracts or in Farmland Security Zones to other uses. As described above and in Appendix 3B,
 16 *Environmental Commitments*, it is anticipated that the RTM would be removed from RTM storage
 17 areas (which represent a substantial portion of the permanent impact areas) and reused, as
 18 appropriate, as bulking material for levee maintenance, as fill material for habitat restoration
 19 projects, or other beneficial means of reuse identified for the material. Because these activities
 20 would convert a substantial amount of Important Farmland and land subject to Williamson Act
 21 contracts or in Farmland Security Zones to non-agricultural uses, however, they are considered
 22 significant impacts on the environment. Implementation of Mitigation Measure AG-1 would reduce
 23 these impacts by implementing activities such as siting project footprints to encourage continued
 24 agricultural production; relocating or replacing agricultural infrastructure in support of continued

1 agricultural activities; engaging counties, owners/operators, and other stakeholders in developing
 2 optional agricultural stewardship approaches; and/or preserving agricultural land through off-site
 3 easements or other agricultural land conservation interests. However, these impacts remain
 4 significant and unavoidable after implementation of this measure because (i) even after effects from
 5 the footprints of project facilities are minimized through design, they would continue to require the
 6 conversion of substantial amounts of Important Farmland and land subject to Williamson Act
 7 contracts or in Farmland Security Zones, (ii) conservation or preservation by means of acquiring
 8 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
 9 Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones and
 10 (iii) the proposed optional agricultural stewardship approach does not focus principally on physical
 11 effects, but rather, focuses on providing, at a minimum, a neutral agricultural economic effect on
 12 affected lands in the Delta as a result of the BDCP, taking into consideration the desire of individual
 13 Delta farmers to continue working on their land, the long-term viability of regional agricultural
 14 economies, the economic health of local governments and special districts, and the Delta as an
 15 evolving place. For further discussion of potential incompatibilities with land use designations, see
 16 Chapter 13, *Land Use*, Impact LU-1.

17 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 18 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 19 **Subject to Williamson Act Contracts or in Farmland Security Zones**

20 The BDCP proponents shall develop Agricultural Lands Stewardship Plans (ALSPs) (i) prior to
 21 the commencement of any construction activities or other physical activities associated with
 22 Conservation Measure 1 that would involve adverse effects (under NEPA) or significant effects
 23 (under CEQA) on Important Farmland or land subject to Williamson Act contracts or in
 24 Farmland Security Zones, and (ii) as part of the site-specific environmental review for all other
 25 conservation measures or other site-specific project activities that could involve adverse effects
 26 (under NEPA) or significant effects (under CEQA) on Important Farmland or land subject to
 27 Williamson Act contracts or in Farmland Security Zones. For each conservation measure or site-
 28 specific project activity other than Conservation Measure 1 that would cause such effects, a draft
 29 ALSP shall be included with any publicly circulated environmental document for the proposed
 30 conservation measure or project activity in order to obtain public input. The Plans shall contain
 31 the three elements identified below for this measure. If a programmatic ALSP is developed for
 32 the BDCP, parts of the BDCP, the Delta or parts of the Delta, BDCP proponents may rely on these
 33 plans to the extent that they include all the elements in this measure.

34 **Mitigation Measure AG-1a: Promote Agricultural Productivity of Important Farmland**

35 The BDCP proponents shall ensure that the following measures are implemented to reduce
 36 adverse effects and/or significant effects as described above if the measures are applicable and
 37 feasible. Not all measures listed below may be feasible or applicable to each conservation
 38 measure or to individual parts of each conservation measure. Rather, these measures serve as
 39 an overlying mitigation framework to be used for mitigation of impacts caused by the
 40 implementation of specific conservation measures. The applicability of measures listed below
 41 would vary based on the location, timing, nature, and feasibility of each measure.

- 1 ● Early Planning
- 2 ○ Describe the current land use in the project area and identify acreage of all land devoted
- 3 to agricultural use, including farmland of local importance, grazing land, and confined
- 4 animal agriculture.
- 5 ○ Describe the extent to which the project can be part of or complement existing or
- 6 planned land uses for the Delta. For BDCP, this means consulting with county
- 7 governments, the Delta Protection Commission, the Delta Conservancy and other
- 8 individuals and organizations that are considering plans or activities designed for
- 9 agricultural use; flood management; mitigation and enhancement relating to aquatic and
- 10 terrestrial habitat; recreation; and tourism. This consultation is particularly important
- 11 when there are multiple uses being considered for one specific area of land, but it is also
- 12 important to look at how the project affects or fits into other plans for the region or sub-
- 13 regions where the project is located.
- 14 ○ Project proponents should consult with farmers, local agencies and other State and
- 15 federal agencies, including the California Natural Resources Agency, the California
- 16 Department of Water Resources, the Central Valley Flood Protection Board, the
- 17 California Department of Conservation, the California Department of Food and
- 18 Agriculture, the California Department of Fish and Wildlife, the Delta Stewardship
- 19 Council, the California Delta Protection Commission, the Delta Conservancy, the United
- 20 States Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S.
- 21 Department of Agriculture, including the Natural Resources Conservation Service, to
- 22 identify design features of the project, if any, that will benefit flood management,
- 23 agricultural and natural resources.
- 24 ○ Consider whether the proposed land use is consistent with State, regional and local
- 25 plans. For the BDCP, this could include local General Plans, the Delta Protection
- 26 Commission's Land Use and Resource Management Plan and Economic Strategy, the
- 27 Delta Stewardship Council's Delta Plan, the California Water Plan Agriculture Strategy,
- 28 the Delta Conservancy Strategy, the California Department of Food and Agriculture's Ag
- 29 Vision; the California Natural Resources Agency's California Climate Adaptation Plan,
- 30 and the California Fish and Wildlife Strategic Vision;
- 31 ○ Consider whether agriculture and/or habitat management activities undertaken
- 32 pursuant to the proposed land use are consistent with State and local policies relating
- 33 to flood protection and whether they might provide additional protection because, for
- 34 example, they (i) provide flood management activities that provide additional
- 35 protection for agricultural activities or (ii) prevent or divert potential higher
- 36 groundwater levels that would thwart flood control efforts
- 37 ● Site Related Avoidance and Mitigation
- 38 ○ Site projects and project footprints to minimize the permanent conversion of Important
- 39 Farmland, to nonagricultural uses.
- 40 ○ When identifying and selecting project areas, give priority to public lands and existing
- 41 conservation lands.
- 42 ○ Where choices are possible among or between particular parcels or lands that are
- 43 available for a project, project proponents should look at the characteristics of the

1 different parcels or lands to determine whether one choice would be better from an
 2 agricultural resource perspective. If choices can be made regarding different locations
 3 for a project and still achieve the project purposes, it may be possible to avoid areas that
 4 may have more value from an agricultural resources perspective such as whether the
 5 property is (1) “high quality” farmland, (2) unique or has special values, (3) important
 6 to maintaining viability of agriculture in a certain area, (4) important to maintaining
 7 habitat lands in agriculture in a certain area.

- 8 ○ Manage project operations to minimize the introduction of invasive species or weeds
 9 that may affect agricultural production on adjacent agricultural land.

- 10 ● Mitigate on Site

- 11 ○ Design projects so as to optimize contiguous parcels of agricultural land of a size
 12 sufficient to support their efficient use for continued agricultural production.
- 13 ○ Where the construction or operation of a facility could limit access to ongoing
 14 agricultural operations, maintain a means of convenient access to these agricultural
 15 properties as part of project design, construction, and implementation.
- 16 ○ At borrow sites to be returned to agricultural production, remove and stockpile, at a
 17 minimum, the upper 2 feet of topsoil and replace the topsoil after project completion as
 18 part of borrow site reclamation.
- 19 ○ In areas permanently disturbed by project activities, and where topsoil is removed as
 20 part of project construction (e.g., stripping topsoil under a levee foundation) and not
 21 reused as part of the project, make the topsoil available to less productive agricultural
 22 lands that could benefit from the introduction of good-quality soil.
- 23 ○ Relocate and/or replace wells, pipelines, power lines, drainage systems, and other
 24 infrastructure that are needed for ongoing agricultural uses and would be adversely
 25 affected by project construction or operation.
- 26 ○ Minimize disturbance of Important Farmland and continuing agricultural operations
 27 during construction by (1) locating construction laydown and staging areas on sites that
 28 are fallow, already developed or disturbed, or are to be discontinued for use as
 29 agricultural land and (2) using existing roads to access construction areas.
- 30 ○ Consult with landowners and agricultural operators to develop appropriate
 31 construction practices to minimize construction-related impairment of agricultural
 32 productivity. Practices may include coordinating the movement of heavy equipment and
 33 implementing traffic control measures.
- 34 ○ Consult with landowners and agricultural operators with the goal of sustaining existing
 35 agricultural operations, at the landowners’ discretion, until the individual agricultural
 36 parcels are needed for project construction.
- 37 ● Consult with landowners and agricultural operators on what role they can take if they wish
 38 be involved in project development. Issues to consider include whether:
 - 39 ○ Owner(s) or operator(s) could carry out project activities on their land. To the extent
 40 that Important Farmland is part of the project, consideration should be given to
 41 providing flexibility to the farmer. To the extent that Important Farmland is part of the

- 1 project, consideration should also be given to developing working landscapes⁵ on
2 project lands
- 3 ○ Some or all of the ownership interests on any project land could remain in private hands
4 or in the hands of a private conservancy in order to keep the property in
5 nongovernmental ownership and thereby on the County tax base;
 - 6 ○ Owner(s) and/or operator(s) of land displaced by project facilities and activities could
7 maintain or obtain full or partial ownership of the land on which project activities will
8 be carried out or could be compensated to manage said land;
 - 9 ○ Existing agricultural operations on lands could be modified, through such things as crop
10 change, new integrated pest management strategies, altered water usage, or full or
11 partial conversion to habitat uses, in a manner that renders such operations consistent
12 with the goals and objectives of the project by enhancing environmental outcomes in a
13 manner beneficial to species covered by the project;
 - 14 ○ Limited agriculture could take place within areas identified for habitat restoration
15 under the project without undermining the achievement of the project goals and
16 objectives;
 - 17 ○ Subsidies to allow economically viable rice farming on particular lands could be justified
18 due to the environmental benefits of such rice farming such as the stabilization of
19 subsidizing areas or the creation of sinks for greenhouse gases and methylmercury;
 - 20 ○ Subsidies to assist the owner(s) and/or operator(s) to make a viable living managing
21 wetlands or other habitat areas could be justified due to the environmental benefits of
22 wetlands or habitat such as the stabilization of subsidizing areas or the safer
23 accumulation and isolation of greenhouse gases and methylmercury;
 - 24 ● Implementation
 - 25 ○ The plans should include a framework that encourages adaptive management with
26 regard to agricultural land management.
 - 27 ○ The plans should include reporting and monitoring actions necessary to show that the
28 actions agreed to were being carried out.

⁵ The Cal-Fed Working Landscapes Subcommittee of the Bay Delta Public Advisory Committee defined a working landscape as “a place where agriculture and other natural resource-based economic endeavors are conducted with the objective of maintaining the viability and integrity of its commercial and environmental values. On a working landscape, both private production, as well as public regulatory decisions account for the sustainability of families, businesses and communities, while protecting and enhancing the landscape’s ecological health. The working landscape is readily adaptable to change according to economic and ecosystem needs. With respect to CALFED, a working landscape is both an objective and a means to achieve it. A working landscape is efficiently managed largely by private agricultural landowners and managers who are supported and encouraged to manage their lands in ways that fulfill CALFED goals, allowing them to pursue ecological health goals while yielding economic returns on investments, and generating tax revenues that support their local governments” (California Bay-Delta Public Advisory Committee 2002).

1 **Mitigation Measure AG-1b: Minimize Impacts on Land Subject to Williamson Act Contracts**
 2 **or in Farmland Security Zones**

3 The BDCP proponents shall ensure that the following measures are implemented as applicable
 4 to reduce effects and preserve agricultural uses on land subject to Williamson Act contracts or in
 5 Farmland Security Zones.

- 6 ● The BDCP proponents shall comply with applicable provisions of California Government
 7 Code Sections 51290–51295 with regard to acquiring land subject to Williamson Act
 8 contracts. Sections 51290(a) and 51290(b) specify that State policy, consistent with the
 9 purpose of the Williamson Act to preserve and protect agricultural land, is to avoid locating
 10 public improvements and any public utilities improvements in agricultural preserves,
 11 whenever feasible. If it is infeasible to locate such improvements outside of a preserve, they
 12 shall be located on land that is not under contract, if feasible.
- 13 ● More specifically, the BDCP proponents shall comply with the following basic requirements
 14 stated in the California Government Code.
 - 15 ○ Whenever it appears that land within a preserve or under contract may be required for
 16 a public improvement, the DOC and the city or county responsible for administering the
 17 preserve must be notified (Section 51291(b)).
 - 18 ○ Within 30 days of being notified, DOC and the city or county must forward comments,
 19 which will be considered by the proponents of the public improvement (Section
 20 51291(b)).
 - 21 ○ A public improvement generally may not be located within an agricultural preserve
 22 unless the BDCP proponents make findings to the effect that (1) the location is not based
 23 primarily on the lower cost of acquiring land in an agricultural preserve and (2) for
 24 agricultural land covered under a contract for any public improvement, no other land
 25 exists within or outside the preserve where it is reasonably feasible to locate the public
 26 improvement (Sections 51921(a) and 51921(b)). Findings do not need be made if the
 27 action falls within one of the exemptions in Section 51293. The contract is normally
 28 terminated when land is acquired by eminent domain or in lieu of eminent domain
 29 (Section 51295).
 - 30 ○ DOC must be notified within 10 working days upon completion of the acquisition
 31 (Section 51291(c)).
 - 32 ○ DOC and the city or county must be notified before completion of any proposed work of
 33 any significant changes related to the public improvement (Section 51291(d)).
 - 34 ○ If, after acquisition, the acquiring public agency determines that the property would not
 35 be used for the proposed public improvement, DOC and the city or county administering
 36 the involved preserve must be notified before the land is returned to private ownership.
 37 The land will be reenrolled in a new contract or encumbered by an enforceable
 38 restriction at least as restrictive as that provided by the Williamson Act (Section 51295).
 - 39 ○ Work with the county where Williamson Act land is located to expand Williamson Act
 40 authorized uses to include open space/habitat lands in Williamson Act Preserves.

1 **Mitigation Measure AG-1c: Consideration of an Optional Agricultural Land Stewardship**
2 **Approach or Conventional Mitigation Approach**

3 Where project proponents have determined that compliance with Mitigation Measures AG-1a
4 and AG-1b is not sufficient to mitigate to a less than significant or adverse level the impacts from
5 the conversion of Important Farmland or of land subject to Williamson Act contracts or in
6 Farmland Security Zones, they shall undertake additional feasible mitigation pursuant to this
7 measure (AG-1c).

8 Exceptions to this requirement shall apply where the mitigation already being required for the
9 biological resource values for the land at issue (e.g., for its value as habitat for Swainson's hawk)
10 pursuant to the cultivated lands natural community strategy of Conservation Measure 3 already
11 requires the equivalent of 1:1 mitigation (based on the net area of land remaining in agriculture)
12 for impacts to Important Farmland or of land subject to Williamson Act contracts or in Farmland
13 Security Zones, provided that the easements for biological values also incorporate agricultural
14 preservation.

15 The BDCP proponents shall determine the nature and form of any necessary additional
16 mitigation after consultation with, at least, all of the following: (i) the County in which the
17 affected property is located; (ii) the owner(s) and/or operator(s) of said property; (iii) the
18 California Natural Resources Agency; (iv) the California Department of Water Resources; (v) the
19 Central Valley Flood Protection Board; (vi) the California Department of Conservation; (vii) the
20 California Department of Food and Agriculture; (viii) the California Department of Fish and
21 Wildlife; (ix) the Delta Stewardship Council; (x) the California Delta Protection Commission; and
22 (xi) the Delta Conservancy; (xii) the United States Fish and Wildlife Service; (xiii) the National
23 Marine Fisheries Service; and (xiv) the U.S. Department of Agriculture, including the Natural
24 Resources Conservation Service. After consulting with these agencies, entities, and/or
25 individuals, the BDCP proponents shall determine whether or not, under the circumstances
26 surrounding the conversion of particular agricultural lands, the best overall approach to the
27 additional required mitigation is the conventional use of agricultural land conservation property
28 interests (see discussion below on Conventional Mitigation Approach). In making this
29 determination, the BDCP proponents shall give considerable weight to the willingness of the
30 County in which the affected property is located and the owner(s) and/or operator(s) of said
31 property to participate in an Optional Agricultural Land Stewardship Approach, which would
32 seek opportunities to protect and enhance agriculture in the Delta as part of the project
33 landscape and focus on maintaining economic activity on agricultural lands instead or in
34 conjunction with the Conventional Mitigation Approach for purposes of CEQA/NEPA mitigation.
35 Where the County and the owner(s) and/or operator(s) have a preference for participating in an
36 Optional Agricultural Land Stewardship Approach, the BDCP proponents shall attempt to
37 develop a feasible Optional Agricultural Land Stewardship alternative mitigation program
38 acceptable not only to the County and the owner(s) and/or operator(s), but also to the California
39 Department of Fish and Wildlife, the United States Fish and Wildlife Service, and the National
40 Marine Fisheries Service. Where the BDCP proponents, despite a good faith effort, cannot
41 succeed in achieving the consensus necessary to carry out a feasible Optional Agricultural Land
42 Stewardship Approach, they shall undertake instead a Conventional Mitigation Approach, where
43 necessary and feasible, based on the use of agricultural conservation property interests or other
44 measures requiring the preservation or, enhancement of other land of similar agricultural
45 quality in areas that are threatened with encroaching urban development.

1 Specific strategies that could be used in formulating an Optional Agricultural Land Stewardship
 2 Approach are described in Appendix 14B, *Agricultural Land Stewardship Strategies*. In
 3 determining the potential nature and form of an Optional Agricultural Land Stewardship
 4 Approach, the BDCP proponents shall, at a minimum, consider the following, as applicable:

- 5 • whether there is Important Farmland in the Delta reasonably accessible to the BDCP
 6 proponents and/or to the owner(s) and/or operators for use for agriculture and/or habitat
 7 management in a manner consistent with the goals and objectives of the BDCP;
- 8 • whether there is Important Farmland that might not remain in agriculture if it was not
 9 protected by means of an agricultural conservation property interest because of threats of
 10 urban development (e.g. in the secondary zone in the Delta) or wind/solar and other non-
 11 renewable energy projects, or the productive value of which is so high, it should remain in
 12 agriculture instead of being used for restoration or other open-space projects because, for
 13 example, it is:
 - 14 ○ unique or has special values
 - 15 ○ important to maintaining viability of agriculture in the region
 - 16 ○ critical to prevent a “tipping” point that could lead to elimination of a crop in the region
 - 17 ○ important to maintaining habitat lands in agriculture in the region
- 18 • whether Agricultural Land Stewardship Strategies⁶ benefit agricultural lands by providing
 19 feasible CEQA/NEPA mitigation (or providing funding for such mitigation) for potential
 20 significant environmental agricultural impacts at both the farm and the regional level. In
 21 determining whether the funds necessary to make an Optional Agricultural Land
 22 Stewardship Approach feasible are available, the BDCP proponents shall be guided by the
 23 principle that funds that might otherwise be used for off-site preservation or another form
 24 of compensation may be made available instead to assist with making the Optional
 25 Agricultural Land Stewardship Approach work. Such strategies could include:
 - 26 ○ Potential strategies to help maintain farming in the Delta
 - 27 ▪ Improve flood protection (Strategy 1)
 - 28 ▪ Provide technical and financial assistance to help farmers maintain or improve
 29 agricultural production (Strategy 2)
 - 30 ▪ Provide technical and financial assistance to help farmers comply with regulatory
 31 requirements for water quality (Strategy 3)
 - 32 ▪ Control terrestrial weeds (Strategies 6a, 6b, and 6c)
 - 33 ▪ Reduce conflict between agriculture and nearby habitat lands by creating a “good
 34 neighbor” policy (Strategy 7)
 - 35 ▪ Work with other interests to explore the value of reinstating state funding of
 36 Williamson Act subventions (Strategy 8)

⁶ Strategies developed so far, and other materials relating to their development and implementation, can be found at <https://bdcpdf.water.ca.gov/home>. These are given as examples to consider at this time. It is expected that existing strategies will evolve and change over time and that additional strategies will be developed.

- 1 ▪ Work with counties to expand Williamson Act authorized uses to include open
- 2 space/habitat lands in Williamson Act Preserves (Strategy 9)
- 3 ▪ Investigate options for *in lieu* tax revenue for counties and payments for local
- 4 districts (Strategy 10)
- 5 ▪ Provide for Agricultural Conservation Easements (Strategy 11)
- 6 ○ Potential strategies that provide incentives for conservation on farmland
- 7 ▪ Partner with others to maintain and enhance environmental quality on farmland
- 8 (Strategy 12)
- 9 ▪ Compensate farmers to manage agricultural land as habitat for wildlife (Strategy 13)
- 10 ▪ Provide incentives for farmers to take part in a market-based conservation program
- 11 (Strategy 14)
- 12 ○ Potential strategies to manage land for purposes other than conventional crop
- 13 production
- 14 ▪ Provide technical and financial assistance to stabilize or reverse land subsidence on
- 15 Delta island (Strategy 15)
- 16 ▪ Assist landowners to produce and sell greenhouse gas offset credits in the AB 32
- 17 Cap-and-Trade program (Strategy 16)
- 18 ▪ Compensate farmers to manage habitat lands (Strategy 17)
- 19 ▪ Designate carbon sequestration and subsidence reversal crops as agricultural
- 20 production for regulatory and incentive programs (Strategy 18)
- 21 ○ Potential strategies that provide for economic development and other benefits
- 22 ▪ Provide technical and financial assistance to develop an economic study of
- 23 agricultural activity and related infrastructure (Strategy 19)
- 24 ▪ Provide technical and financial assistance for to promote economic development
- 25 (Strategy 20)
- 26 ▪ Provide technical and financial assistance to promote transportation infrastructure
- 27 improvements (Strategy 21)
- 28 ▪ Provide technical assistance to farmers to help in complying with the regulatory
- 29 framework present in the Delta (Strategy 22)
- 30 ▪ Provide technical, risk reduction, promotion, and financial assistance for farmers to
- 31 manage land to incorporate recreation and tourism (Strategy 23)
- 32 ▪ Work with others to better align the regulatory system to help farmers who engage
- 33 in ecological restoration and enhancement projects (Strategy 24)
- 34 ▪ Develop Agricultural Land Stewardship Plans (Strategy 25)
- 35 ● In addition, the BDCP proponents shall explore the following funding sources to implement
- 36 strategies that are in addition to those required under CEQA/NEPA in order to maintain
- 37 agriculture in the Delta. These strategies include those listed above for CEQA/NEPA
- 38 mitigation.

- 1 ○ Work with the California Air Resources Board (CARB) to establish a greenhouse gas
2 offset market using credits created through the development and restoration of
3 wetlands.
- 4 ○ Seek available funding from CARB's "Cap and Trade" program developed pursuant to
5 the Global Warming Act Solutions Act of 2006 (AB 32).
- 6 ○ Work with others to explore the value of reinstating state funding for Williamson Act
7 subventions from Cap and Trade Funding or other sources
- 8 ○ Consider recommending to the Governor and Legislature that funds for be included in
9 any bond measure(s) placed on the statewide ballot (e.g. the Delta Investment Fund
10 authorized by the Delta Reform Act).
- 11 ○ Work with other governmental and private entities to identify other funds that can be
12 used for the Optional Agricultural Land Stewardship Approach.

13 ***Strategy for implementing a Conventional Mitigation Approach.*** Where the BDCP
14 proponents, despite a good faith effort, cannot succeed in achieving the consensus necessary to
15 carry out a feasible Optional Agricultural Land Stewardship Approach, they shall undertake
16 instead, where necessary and feasible, a Conventional Mitigation Approach based on the
17 purchase of property interests in agricultural lands (e.g., conservation easements) or other
18 compensation arrangements (collectively referred to hereinafter as "agricultural conservation
19 property interests"), requiring the preservation and/or enhancement of other land of similar
20 agricultural quality. The standard ratio for purchase of agricultural conservation property
21 interests to mitigate for permanently converted Important Farmland not included, as discussed
22 above, as part of mitigation for biological resources, shall be at a ratio of 1:1 for similar types of
23 Important Farmland.

24 Where feasible, mitigation shall generally result in the purchase of agricultural conservation
25 property interests, such as easements on other agricultural lands of the same overall quality and
26 acreage either directly or indirectly. The two preferred forms of mitigation in this context shall
27 be (i) the inclusion of sufficient acreages within agricultural preserves within BDCP lands to
28 satisfy CEQA and NEPA agricultural resource mitigation in addition to meeting BDCP objectives
29 under the Endangered Species Act and California's Natural Community Conservation Planning
30 Act and (ii) reliance on the California Farmland Conservancy Program or on other established
31 programs in the Delta supported by the county where the project is located, the Delta
32 Stewardship Council, the Delta Planning Commission, or the Delta Conservancy. Where the
33 BDCP proponents choose to rely on the latter strategy, they shall confirm, prior to submitting
34 funds into any program both (a) that the program meets the standards under CEQA case law for
35 a "reasonable mitigation plan" and (b) that they can spend the funds at issue for the
36 preservation and, where appropriate, the enhancement, of land that is reasonably proximate to
37 the land being impacted and of a similar quality or extent. Where these two preferred options
38 are unavailable or infeasible, the BDCP proponents shall be responsible for purchasing
39 agricultural conservation property interests on their own.

40 Where feasible, agricultural land conservation interests should be acquired in the county in
41 which the conversion will take place, provided that any such land either would be at-risk for
42 conversion from agricultural uses in the absence of such long-term protection, unless such
43 purchases would undermine the overall BDCP conservation strategy by potentially putting off-
44 limits lands that may be needed for habitat purposes during the permit duration of the BDCP

1 (i.e., up until 2060), or is not necessary for other habitat conservation plans. Thus, acquisition of
 2 such agricultural land conservation interests cannot be located in areas targeted for habitat
 3 restoration if doing so would thwart implementation of the long-term habitat restoration
 4 objectives of the BDCP.

5 Where a property identified for purchase of an agricultural land conservation interest serves
 6 non-agricultural purposes such as providing wildlife habitat or flood control or flood
 7 management benefits, the terms of the agricultural land conservation interest shall require the
 8 farm operator to continue to use the property in a manner that preserves these benefits (e.g., by
 9 continuing to support certain crop types known to provide, or be consistent with, such benefits)
 10 unless similar benefits are provided through some other means. The value of the agricultural
 11 land conservation interest would need to take such limitations on agricultural practices into
 12 account.

13 Where Important Farmland of the same caliber as the Important Farmland being converted is
 14 not available within the county in which the conversion will take place, the agricultural land
 15 conservation interest may occur in another county, with a preference for counties within the
 16 greater Sacramento metropolitan area, as long as the property to be purchased or encumbered
 17 is at-risk for conversion from agricultural uses to developed uses from encroaching urban
 18 development in the absence of such long-term protection, and as long as such purchase does not
 19 undermine the overall BDCP conservation strategy by potentially putting off-limits lands that
 20 may be needed for habitat purposes during the permit duration of the BDCP (i.e., up until 2060).

21 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the** 22 **Proposed Water Conveyance Facility**

23 ***Effects on agriculture as a result of changes in groundwater elevation***

24 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 25 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 26 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. Localized effects related to
 27 dewatering activities in the vicinity of intake pump stations and the Byron Tract Forebay would
 28 temporarily lower groundwater levels by up to 10 feet and 20 feet, respectively. The pumping plants
 29 would be located just east of the Sacramento River, south of Freeport and north of Courtland. The
 30 Byron Tract Forebay would be adjacent and south of Clifton Court Forebay. Groundwater would
 31 return to pre-pumping levels over the course of several months. During long-term operations of the
 32 water conveyance, increases in the groundwater level of 10 feet or more could also occur in the
 33 vicinity of the intermediate and Byron Tract Forebays in the absence of design features to minimize
 34 seepage, due to groundwater recharge from these facilities (the intermediate forebay would be
 35 located south of Hood and west of South Stone Lake). However, the intermediate and Byron Tract
 36 Forebays would be constructed to comply with the requirements of the Division of Safety of Dams
 37 (DSD) which includes design provisions to minimize seepage. These design provisions would
 38 minimize seepage under the embankments and onto adjacent properties. Once constructed and
 39 placed in operation, the operation of the forebays would be monitored to ensure seepage does not
 40 exceed performance requirements. In the event seepage were to exceed these performance
 41 requirements, the BDCP proponents would modify the embankments or construct seepage
 42 collection systems that would ensure any seepage from the forebays would be collected and
 43 conveyed back to the forebay or other suitable disposal site. However, operation of Alternative 1A
 44 would result in local changes in groundwater flow patterns adjacent to the intermediate and Byron

1 Tract Forebays, where groundwater recharge from surface water would result in groundwater level
2 increases. If agricultural drainage systems adjacent to these forebays are not adequate to
3 accommodate the additional drainage requirements, operation of the forebays could interfere with
4 agricultural drainage. Areas in which crop roots are exposed to a surplus of water could result in
5 root rot, compromising the viability of certain crops, particularly those with deep roots (Refer to
6 Section 14.1, *Environmental Setting/Affected Environment*, for root depths by crop type). These
7 effects could prevent agricultural uses on land in these areas.

8 ***Effects on agriculture as a result of changes in salinity***

9 Under Alternative 1A, the operation of new physical facilities combined with hydrodynamic effects
10 of habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing
11 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
12 operation of the water conveyance facility would generally result in fewer days when water at
13 compliance locations relevant to agriculture would exceed or be out of compliance with electrical
14 conductivity objectives. In these areas, higher quality irrigation water could benefit agricultural
15 activities by reducing potential restrictions related to yields and crop selection. There are three
16 exceptions to this anticipated result. The percent of days the Emmaton EC objective would be
17 exceeded for the entire period modeled (1976–1991) would increase from 6% under Existing
18 Conditions to 27%. Further, the percent of days out of compliance at Emmaton would increase from
19 11% under Existing Conditions to 39% under Alternative 1A. The San Andreas Landing objective in
20 the interior Delta would increase from 1% to 2% of days in exceedance, and from 1% to 5% of days
21 out of compliance with the EC objective. At Brandt Bridge in the Southern Delta, the increase in the
22 percent of days of EC objective exceedance and days out of compliance would be less than 1%.
23 Average EC levels would decrease at western and southern Delta compliance locations, except at
24 Emmaton in the western Delta, and would increase at the two interior Delta compliance locations. At
25 Emmaton, average EC would increase 16% for both the entire period modeled and the drought
26 period modeled. Over the entire period modeled, the S. Fork Mokelumne River at Terminous
27 average EC would increase 4% and the San Joaquin River at San Andreas Landing average EC would
28 increase 12% to 0.444 dS/m. Modeling of drought years estimates EC reaching as high as 1.675
29 dS/m at the Emmaton compliance location. These results suggest that a number of crops using this
30 irrigation water may not be able to reach full yields, as reported in Table 14-6. However, it is
31 anticipated that agricultural activities could continue on lands using these sources. Complete water
32 quality modeling results are discussed in Chapter 8, *Water Quality*, Section 8.3.3.2, Impact WQ-11
33 and Appendix 8H, Tables EC-1 and EC-12.

34 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

35 Temporary construction activities and the permanent footprints associated with physical features
36 constructed as part of this alternative could create conflicts with existing irrigation and drainage
37 facilities throughout the study area. The conveyance alignment constructed under this alternative
38 would cross or interfere with approximately 38 miles of agricultural delivery canals and drainage
39 ditches, including approximately 7 miles on Victoria Island, 5 miles on Bacon Island, 4 miles on
40 Byron Tract, and 4 miles on Tyler Island. Construction activities requiring excavation or use of land
41 where irrigation canals are currently located could disrupt the delivery of water to crops, which
42 would compromise a key condition for the productive use of the land for agriculture. Similarly,
43 where construction or the long-term placement of conveyance facilities associated with this
44 alternative requires an existing agricultural drainage facility to be disconnected, high groundwater
45 levels could expose crops to soil conditions that would prevent the continuation of most agricultural

1 activities on the affected land. Thus, where irrigation or drainage infrastructure is disconnected
2 from the farmland it serves, continued agricultural use of the land could be jeopardized.

3 **NEPA Effects:** Considered together, construction and operation of the water conveyance facility
4 under this alternative could create indirect but adverse effects on agriculture by converting
5 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
6 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
7 related to water quality could be adverse or beneficial, depending on the location. Implementation
8 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
9 effects.

10 **CEQA Conclusion:** Water conveyance facility construction and operation could create a significant
11 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
12 uses through changes to groundwater elevation in localized areas and disruption of drainage and
13 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
14 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
15 will reduce the severity of these impacts by implementing activities such as siting project footprints
16 to encourage continued agricultural production; monitoring changes in groundwater levels during
17 construction; offsetting water supply losses attributable to construction dewatering activities;
18 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
19 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
20 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
21 developing optional agricultural stewardship approaches; and/or preserving agricultural land
22 through off-site easements or other agricultural land conservation interests. However, these impacts
23 remain significant and unavoidable after implementation of these measures because (i) replacement
24 water supplies associated with losses attributable to construction dewatering activities may not
25 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
26 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
27 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
28 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
29 stewardship approach does not focus principally on physical effects, but rather, focuses on
30 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
31 working on the land while maintaining the long-term viability of regional agricultural economies
32 and the economic health of local governments and special districts in the Delta.

33 In addition to and to supplement Mitigation Measure WQ-11, the BDCP proponents have
34 incorporated into the BDCP, as set forth in EIR/EIS Appendix 3B, *Environmental Commitments*, a
35 separate, non-environmental commitment to address the potential increased water treatment costs
36 that could result from electrical conductivity effects on agricultural water purveyor operations.
37 Potential options for making use of this financial commitment include funding or providing other
38 assistance towards acquiring alternative water supplies or towards modifying existing operations
39 when levels of electrical conductivity at a particular location reduce opportunities to operate
40 existing water supply diversion facilities. Please refer to Appendix 3B, *Environmental Commitments*,
41 for the full list of potential actions that could be taken pursuant to this commitment in order to
42 reduce the water quality treatment costs associated with water quality effects relating to chloride,
43 electrical conductivity, and bromide.

1 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 2 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 3 **Subject to Williamson Act Contracts or in Farmland Security Zones**

4 Please see Mitigation Measure AG-1 under Impact AG-1.

5 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 6 **Dewatering**

7 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 8 Chapter 7, *Groundwater*.

9 **Mitigation Measure GW-6: Agricultural Lands Seepage Minimization**

10 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 11 Chapter 7, *Groundwater*.

12 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 13 **Quality Conditions**

14 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 15 in Chapter 8, *Water Quality*.

16 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 17 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 18 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
 19 **and 21**

20 ***Conversion of Important Farmland as a result of implementing the proposed Conservation Measures 2-***
 21 ***11, 13, 15, 16, 20, and 21***

22 While locations have not been selected, implementation of conservation measures for habitat
 23 restoration and channel margin habitat enhancement would likely occupy existing state-recognized
 24 Important Farmland, directly precluding agricultural use. Construction activities for the
 25 conservation measures associated with this alternative may also result in temporary conversion of
 26 Important Farmland.

27 Alternative 1A would restore approximately 83,800 acres under conservation measures geared
 28 toward the restoration of tidal wetland habitat (CM4), seasonally-inundated floodplain (CM5),
 29 riparian habitat (CM7), grassland communities (CM8), vernal pool complex habitat (CM9), and
 30 nontidal marsh areas (CM10). Additionally, 20 linear miles of channel margin habitat would be
 31 enhanced (CM6). Under this measure, setback levees could potentially encroach upon Important
 32 Farmland. Additionally, earthwork activities associated with restoration activities could remove
 33 land from agricultural production. To maintain these areas, access roads and other facilities may
 34 also be necessary. Implementation of these restoration activities would occur in phases over the 50-
 35 year permit period, as summarized in Table 3-4 in Chapter 3, *Description of the Alternatives*.
 36 Additionally, in selecting sites for seasonally-inundated floodplain restoration under CM5,
 37 compatibility with ongoing agricultural uses would be considered and agricultural production could
 38 continue on acquired lands so long as agricultural practices are compatible with the primary goal of

1 restoring habitat for covered fish and wildlife species (see Chapter 3, Section 3.4.5.3.2 of the BDCP
2 for further detail).

3 Physical construction of facilities associated with other conservation measures may also occupy
4 small areas of Important Farmland. For instance, installation of non-physical fish barriers may
5 require an access road or storage facility on land under one of the Important Farmland designations.
6 However, the effects of these measures on Important Farmland are anticipated to be minor,
7 particularly when compared with the larger restoration actions described above.

8 Because locations have not been selected for these activities, the extent of this effect is unknown and
9 a definitive conclusion cannot be reached. However, based on the large proportion of the
10 Conservation Zones designated as Important Farmland, it is anticipated that a substantial area of
11 Important Farmland would be directly converted to habitat under this alternative.

12 ***Conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of***
13 ***implementing the proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

14 Conservation areas associated with the project would occupy land subject to Williamson Act
15 contracts or in Farmland Security Zones, leading to the potential cancellation of existing contracts
16 and the direct conversion of agricultural land to other uses.

17 As described above, Alternative 1A would restore approximately 83,800 acres under conservation
18 measures intended to restore various natural communities. Additionally, 20 linear miles of channel
19 margin habitat would be enhanced. Under *CM6 Channel Margin Enhancement*, setback levees could
20 potentially encroach on land subject to Williamson Act contracts or in Farmland Security Zones.
21 Associated earthwork activities could also conflict with lands subject to contracts. To maintain these
22 areas, access roads and other facilities may also be necessary.

23 Because locations have not been selected for these activities, the extent of this effect is unknown.
24 However, based on the large proportion of the land in Conservation Zones that is subject to
25 Williamson Act contracts or in Farmland Security Zones, it is anticipated that this alternative would
26 convert a substantial area of land subject to Williamson Act contracts or in Farmland Security Zones.

27 Physical construction of facilities associated with other conservation measures may also occupy
28 small areas of land subject to Williamson Act contracts or in Farmland Security Zones. For example,
29 construction or expansion of a conservation fish hatchery under CM18 could potentially conflict
30 with Williamson Act contracts. Similar effects may arise from conservation measures that would
31 install non-physical fish barriers. However, the effects of these measures on land subject to
32 Williamson Act contracts or in Farmland Security Zones are anticipated to be minor, particularly
33 when compared with the larger restoration actions described above.

34 ***NEPA Effects:*** Because locations have not been selected for these activities, the extent of this effect is
35 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
36 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
37 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
38 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
39 directly converted to habitat purposes under this alternative, resulting in an adverse effect on the
40 environment. While conflicts with or cancellation of Williamson Act contracts would not—by
41 itself—constitute an adverse effect on the quality of the human environment, the related conversion
42 of the underlying agricultural resource would result in such an effect. Mitigation Measure AG-1
43 would be available to lessen the severity of these potential effects. Also, under the provisions of

1 Government Code §51223, it may be feasible to rescind Williamson Act contracts for agricultural
 2 use, and enter into open space contracts under the Williamson Act, or open space easements
 3 pursuant to the Open Space Easement Act. To the extent this mechanism is used, it would eliminate
 4 the Williamson Act conflicts otherwise resulting from changes from agriculture to restoration and
 5 mitigation uses. For further discussion of potential incompatibilities with land use policies, see
 6 Chapter 13, *Land Use*, Impact LU-4.

7 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 8 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 9 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 10 other conservation measures could result in conversion of a substantial amount of Important
 11 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 12 resulting in a significant impact on agricultural resources in the study area. Further evaluation of
 13 these impacts would depend on additional information relating to the location of these activities and
 14 other detailed information. Implementation of Mitigation Measure AG-1 will reduce the severity of
 15 these impacts by implementing activities such as siting features to encourage continued agricultural
 16 production; relocating or replacing agricultural infrastructure in support of continued agricultural
 17 activities; engaging counties, owners/operators, and other stakeholders in developing optional
 18 agricultural stewardship approaches; and/or preserving agricultural land through off-site
 19 easements or other agricultural land conservation interests. However, these impacts remain
 20 significant and unavoidable after implementation of this measure because (i) even after effects from
 21 the footprints of conservation measures are minimized through design, they would continue to
 22 require the conversion of substantial amounts of Important Farmland and land subject to
 23 Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by means
 24 of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid a net
 25 loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security
 26 Zones and (iii) the proposed optional agricultural stewardship approach does not focus principally
 27 on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural economic
 28 effect on affected lands in the Delta as a result of the BDCP, taking into consideration the desire of
 29 individual Delta farmers to continue working on their land, the long-term viability of regional
 30 agricultural economies, the economic health of local governments and special districts, and the Delta
 31 as an evolving place.

32 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 33 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 34 **Subject to Williamson Act Contracts or in Farmland Security Zones**

35 Please see Mitigation Measure AG-1 under Impact AG-1.

36 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 37 **Conservation Measures 2-11, 13, 15, 16, 20, and 21**

38 ***Effects on agriculture as a result of changes in groundwater elevation***

39 Implementation of these conservation measures could indirectly affect agriculture by causing
 40 changes to the elevation of groundwater in the study area, as described under Chapter 7,
 41 *Groundwater*, Impact GW-6. Increased frequency of inundation associated with proposed tidal
 42 habitat, channel margin habitat, and seasonally inundated floodplain restoration would result in
 43 increased groundwater recharge, which could result in groundwater level rises and soil saturation

1 on adjacent lands. Areas in which crop roots are exposed to a surplus of water could result in root
2 rot, compromising the viability of certain crops, particularly those with deep roots (Refer to Section
3 14.1, *Environmental Setting/Affected Environment*, for root depths by crop type). Conversely, in
4 areas where the project results in a larger vertical distance between the water table and crop roots,
5 plants with shallow roots may not be able to extract enough water to maintain optimal growth
6 without modifying irrigation or drainage infrastructure. While the geographic incidence and
7 potential severity of these effects are unknown and would depend on existing localized groundwater
8 levels in the vicinity of sites chosen for restoration, they would be anticipated to create an adverse
9 effect on agricultural resources if they were to substantially restrict agricultural uses.

10 ***Effects on agriculture as a result of changes in salinity***

11 As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of these
12 conservation measures would not introduce new sources of electrical conductivity into the study
13 area. Therefore, as they relate to salinity of irrigation water, these measures would not be
14 anticipated to restrict agricultural uses within the study area.

15 Implementation of CM4 would increase the exchange of tidal water in restoration areas; however,
16 consideration of this measure and its potential effects on electrical conductivity in the Delta has
17 been incorporated in the assessment of CM1 under Impact AG-2.

18 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

19 Implementation of *CM21 Nonproject Diversions*, along with construction activities and the
20 permanent footprints associated with land acquired for habitat restoration, could directly or
21 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area. In
22 particular, CM21 would fund programs to modify, remove, or consolidate diversions that serve as
23 supplies of irrigation water within the study area. Where irrigation or drainage infrastructure is
24 disconnected from the farmland it serves, agricultural uses could be substantially restricted.
25 However, the location and severity of this effect would depend on site-specific conditions.

26 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

27 Restoration areas implemented under Alternative 1A would result in substantial changes in land use
28 patterns in parts of the study area, which could indirectly affect some farmlands by causing changes
29 to the microclimates surrounding sensitive agricultural crops. For example, large areas of tidal
30 habitat could create a localized climate that would be less supportive of yields of certain crops
31 adjacent to the areas. However, this effect is speculative and its potential severity would depend on
32 site-specific conditions.

33 ***Effects on agriculture as a result of increased frequency of inundation events***

34 Modified activities in the Yolo Bypass undertaken as part of Alternative 1A would indirectly affect
35 agricultural practices by increasing the frequency, duration, and magnitude of floodplain inundation.
36 *CM2 Yolo Bypass Fisheries Enhancement*, which this EIR/EIS addresses at a program level, will
37 require the preparation and implementation of a Yolo Bypass Fishery Enhancement Plan (YBFEP).
38 The YBFEP would propose a number of actions, which would include modifications to Fremont Weir
39 to manage timing, frequency, and duration of inundation of the Yolo Bypass. Modifications of
40 Fremont Weir would include installing and operating a gated channel to inundate the floodplain to
41 support covered fish species, primarily from mid-November through April. Opening these gates
42 would result in inundation of the Yolo Bypass. Target inundation footprints would be up to 10,000

1 acres between November 10 and November 30. Between December 1 and February 28, operations
2 would target up to 17,000 acres of inundation. Between March 1 and May 15, the target inundation
3 area would return to a range of 7,000–10,000 acres. These operations are expected to be typical of,
4 but not necessarily identical to, actual operational guidelines that would be developed in the course
5 of subsequent project-specific design, planning, and environmental documentation.

6 Although this area currently experiences periodic inundation within the same footprint, if
7 inundation continues later in the spring, this could result in a delay in ground preparation and
8 planting operations for crops within the Yolo Bypass. Table 14-10 shows typical crop production
9 practices in the Yolo Bypass. After the flow ceases, it may take as many as four weeks for the waters
10 to recede and for the land to dry sufficiently to start farming. While there is disagreement
11 surrounding the time periods necessary to prepare land and for the Bypass to dry out, for this
12 analysis, a four-week period is used as the amount of time required between the end of water
13 inundation and the point when ground preparation activities can begin. Based on the agricultural
14 practices outlined in Table 14-10, the anticipated dates at which inundation must end to allow
15 planting to be completed are also presented.

16 As shown in Table 14-10, if the duration of inundation events extends beyond March 1, March 15,
17 April 1, and April 15, the growing season for tomato; safflower; and corn and rice; and Sudan grass
18 could be delayed. This delay may reduce the growing season to the point of changing crop yield
19 and/or quality, or result in fallowing of agricultural land or the growing of less profitable crops on
20 impacted farmlands. Depending on the frequency and duration of inundation events, crop selection
21 may be constrained. However, short of substantially restricting agricultural use of land, these effects
22 would be considered economic, rather than environmental, in nature. Conservation easements or
23 fee-title acquisition would be required for all inundation on agricultural land.

24 The *Yolo Bypass Flood Date and Flow Volume Agricultural Impact Analysis*, a report created for Yolo
25 County (Howitt et al. 2012), assesses the agricultural and economic impacts from BDCP-proposed
26 flooding scenarios in the Yolo Bypass, including CM2. The CM2 scenario would only impose water
27 flows through an operable gate at Fremont Weir for an additional 30 days in years when there is
28 natural flooding (see Chapter 3, *Description of Alternatives*, Section 3.6.2, for further description of
29 CM2). Minimal loss of irrigated acres is expected in the CM2 scenario, but losses are anticipated to
30 occur in years when there is natural flooding. The largest losses would be anticipated during years
31 when natural overtopping occurs late into the season. CM2 proposes an additional 30 days of
32 flooding, through the middle of April, which is expected to result in crop yield losses and an increase
33 in fallow acres, as well as agricultural revenue losses.

34 As farmers delay planting, crop yields decline, which leads to lower revenues and land fallowing.
35 The report identified 9 major crop groups in areas affected by flooding in the Bypass: corn, irrigated
36 pasture, non-irrigated pasture, rice, wild rice, safflower, sunflower, processing tomatoes, and vines
37 (melons). Further discussion of socioeconomic effects of CM2 on agriculture can be found in Chapter
38 16, *Socioeconomics*, Impact ECON-16 and Impact ECON-18.

1 **Table 14-10. Typical Crop Production Practices in Yolo Bypass**

Crop	Ground Preparation	Planting	Harvest	Other	Plant By Date	End Inundation Date ^c
Corn ^a	March–April	April–May	Sept–Oct		June 1	April 1
Pasture ^a				Winter range feeding: Nov–Apr Summer Feeding: May–Oct Breeding: Dec–Feb		
Rice (wild/white) ^a	April–May	April–May	Sept–Nov		June 1	April 1
Safflower ^a	Aug–Oct (during year preceding planting)	Mar–May	Jul–Sept		May 15	March 15
Sudan Grass ^b	April–May	May–July	July–August		June 15	April 15
Tomato ^a	Mar–April	April–May	June–Sept		May 1	March 1

Sources: Crop production practices, all crops except Sudan grass: California Department of Fish and Game and Yolo Basin Foundation 2008.; Sudan grass production practices: U.C. Cooperative Extension 2009.

^a These data are based on the 2004 Crop Year, which was considered relatively normal year with regard to flooding in the Bypass. There was some mid-winter inundation which receded and did not dramatically impact production.

^b Data concerning Sudan grass is based on growing cultivation and cycles in South San Joaquin County. Growing conditions and crop cycles in the Yolo Bypass vary from these patterns. Different practices may result.

^c Table assumes 4 weeks for Bypass to dry out and 4 weeks for ground preparation.

2

3 The new inundation schedule could substantially prevent agricultural use of these lands. The
4 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
5 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
6 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
7 which would be completed under CM2. Mitigation Measure AG-1 is available to mitigate this effect.

8 Additionally, some benefits could result from an increased presence of water. An increase in
9 potential groundwater recharge could raise the groundwater table to within the root zone of some
10 crops (Section 14.1.1.6, *General Crop Production Practices and Characteristics*, discusses of the
11 relationship between crop viability and groundwater table levels). This could also be a beneficial
12 effect in parts of Yolo and Solano Counties that utilize groundwater from the aquifers underneath
13 the Yolo Bypass.

14 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
15 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

16 Under the cultivated lands natural community goal and objectives of BDCP *CM3 Natural*
17 *Communities Protection and Restoration*, the project proponents would acquire and protect
18 approximately 48,100 acres of nonrice cultivated lands and manage them for specific habitat values
19 corollary to agricultural use for species including Swainson's hawk, giant garter snake, greater

1 sandhill crane, white-tailed kite, and tricolored blackbird. Additionally, 3,500 acres of rice lands or
2 similarly functioning habitat would be maintained annually for giant garter snake in Conservation
3 Zones 4 and/or 5. Because crop selection is dynamic and predominantly influenced by economic
4 forces, the acquisition approach for these goals would allow for a combination of permanent
5 easements, agreements with other agencies, fee-title acquisition, and other methods, to ensure that
6 habitat target acreages are consistently satisfied across the Plan Area. Management activities would
7 maintain existing small patches of riparian woodland and scrub, wetlands, ponds, hedgerows, tree
8 rows, and isolated native or nonnative trees. While these conservation measures would protect
9 agricultural uses on the majority of these lands, specific management actions implemented under
10 *CM11 Natural Communities Enhancement and Management* could reduce crop yields, restrict crop
11 choices, and convert small portions of cultivated lands to nonagricultural uses. Where feasible,
12 tilling would be deferred or some lands left unharvested to increase the amount of forage available
13 to sandhill cranes. Shallow flooding of some lands during fall and winter months may also be
14 adopted to support cranes and other species. While implementation of CM3 would protect
15 agricultural uses on more than 48,000 acres of land, management actions under CM11 could directly
16 convert small portions of this land to nonagricultural uses such as grassland edges or woodlots.
17 Management techniques could also result in crop yield reductions following the minimization or
18 cessation of pesticide use on acquired lands, as many agricultural operators are currently able to
19 apply pesticides in a manner that causes such substances to “drift” onto neighboring properties.
20 However, the agricultural use of this land would be preserved and any further restrictions on the
21 continued agricultural use of the land are unlikely to be substantial.

22 Other conservation measures related to habitat restoration and enhancement could also indirectly
23 affect agricultural production or management practices. For example, restored habitat areas
24 adjacent to agricultural lands could increase crop predation by birds and could introduce invasive
25 species onto agricultural lands, reducing yields and associated production value. A related concern
26 is the introduction of a covered species into a new area, which may require adjustments to
27 agricultural management practices or the initiation of Safe Harbor Agreements. Finally, other
28 “important related actions” identified by the BDCP could further limit pesticide and herbicide
29 discharge in the Plan Area, possibly leading to other reductions in crop yield or increases in
30 operating costs. These effects would be considered primarily economic in nature.

31 Beneficial effects could result from efforts to control nonnative aquatic vegetation under *CM13*
32 *Invasive Aquatic Vegetation Control* and limit the spread of invasive species under *CM20 Recreational*
33 *Users Invasive Species Program*. If successful, these measures could limit the spread of weeds and
34 pests, while keeping irrigation infrastructure free from aquatic vegetation.

35 While these effects would convert small areas of land to nonagricultural use and could change
36 agricultural practices or yields across a large area, conservation measures would also support the
37 continued use of land for agricultural purposes, even though some neighboring operators might no
38 longer be able to conduct operations in a way that causes chemicals to drift onto adjacent
39 properties. Overall, these effects would not be anticipated to result in the substantial restriction of
40 agricultural uses.

41 **NEPA Effects:** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
42 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
43 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
44 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
45 evaluation of these effects would depend on additional information relating to the location of these

1 activities and other detailed information. However, implementation of Mitigation Measures AG-1
2 and GW-5 will reduce the severity of these adverse effects.

3 **CEQA Conclusion:** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
4 alternative could create a significant impact on agriculture by converting substantial amounts of
5 Important Farmland to other uses through changes to groundwater elevation and seepage,
6 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
7 effects would depend on additional information relating to the location of these activities and other
8 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
9 severity of these impacts by implementing activities such as siting features to encourage continued
10 agricultural production; monitoring seepage effects; relocating or replacing agricultural
11 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
12 and other stakeholders in developing optional agricultural stewardship approaches; and/or
13 preserving agricultural land through off-site easements or other agricultural land conservation
14 interests. However, these impacts remain significant and unavoidable after implementation of these
15 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
16 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
17 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
18 stewardship approach does not focus principally on physical effects, but rather, focuses on
19 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
20 working on the land while maintaining the long-term viability of regional agricultural economies
21 and the economic health of local governments and special districts in the Delta.

22 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
23 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
24 **Subject to Williamson Act Contracts or in Farmland Security Zones**

25 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

26 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

27 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
28 Chapter 7, *Groundwater*.

29 **14.3.3.3 Alternative 1B—Dual Conveyance with East Alignment and**
30 **Intakes 1–5 (15,000 cfs; Operational Scenario A)**

31 Alternative 1B would result in temporary and short-term effects on agricultural land in the study
32 area associated with construction of five intakes and intake pumping plants, one forebay, pipelines,
33 canals, tunnels, siphons, and an intermediate pumping plant and require development of
34 transmission lines, access roads, and other incidental structures that would result in temporary
35 conversion of agricultural lands to nonagricultural uses. This alternative would differ from
36 Alternative 1A primarily in that it would use a series of canals generally along the east section of the
37 Delta to convey water from north to south, rather than long segments of deep tunnel through the
38 central part of the Delta.

39 Implementation of Alternative 1B would also result in permanent conversion of agricultural lands
40 associated with the five intakes and intake pumping plants, one forebay, pipelines, canals, tunnels,
41 siphons, and an intermediate pumping plant; soils borrow, spoils, and RTM areas; and transmission
42 line corridors and access roads.

1 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 3 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

4 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 5 ***water conveyance facility***

6 Temporary and short-term construction of water conveyance facilities associated with Alternative
 7 1B would convert existing agricultural land to construction-related uses, directly precluding
 8 agricultural use for the duration of construction. This alternative would convert approximately
 9 2,144 acres of Important Farmland to other uses, including 1,769 acres of Prime Farmland, 61 acres
 10 of Farmland of Statewide Importance, 214 acres of Unique Farmland, and 99 acres of Farmland of
 11 Local Importance.

12 Of these acres of Important Farmland, siphon work areas would require the temporary or short-
 13 term conversion of more than 800 acres. These areas would be adjacent to proposed culvert siphons
 14 crossing Stone Lakes Drain, Beaver Slough, Hog Slough, Sycamore Slough, White Slough,
 15 Disappointment Slough, a BNSF railroad ROW near Holt, and Middle River. Intake work areas,
 16 adjacent to the proposed intakes and pumping plants, would require the short-term conversion of
 17 approximately 470 acres near the east bank of the Sacramento River between Freeport and
 18 Courtland. Work areas associated with the construction of conveyance pipelines would require
 19 approximately 110 acres and would be located primarily between Intake 5 and a canal segment
 20 west of South Stone Lake. Other temporary work areas, including those necessary for the
 21 construction of tunnel siphons, bridges, and transmission lines, would be located throughout the
 22 conveyance alignment. Mapbook Figure M14-3 shows all of the construction features (including
 23 temporary work areas) associated with this proposed water conveyance facility alignment along
 24 with Important Farmland. Note that not all of these structures would be constructed under this
 25 alternative, since it displays all of the seven possible intakes that would be constructed with this
 26 alignment; only Intakes 1-5 would be constructed under this alternative. Table 14-8 displays a
 27 summary of temporary and short-term acreage and permanent acreage of Important Farmland that
 28 could be converted to non-agricultural uses under implementation of each alternative.

29 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 30 ***conveyance facility***

31 Physical structures associated with construction of water conveyance facilities and borrow, spoils,
 32 and RTM areas would occupy agricultural lands designated as Important Farmland, directly
 33 precluding future agricultural use. The facilities associated with this alternative could convert
 34 approximately 18,875 acres of Important Farmland to project uses, including 15,800 acres of Prime
 35 Farmland, 530 acres of Farmland of Statewide Importance, 2,031 acres of Unique Farmland, and 513
 36 acres of Farmland of Local Importance.

37 Of these acres of Important Farmland, areas dedicated to borrow, spoils, or a combination would
 38 convert more than 10,500 acres under this alternative. These areas would be located throughout the
 39 conveyance alignment, with some of the largest areas identified on Union Island West, Drexler Tract,
 40 Rindge Tract, and west of the canal segment immediately south of Intake 5. Nearly 6,500 acres
 41 would also be converted to nonagricultural uses to accommodate the canal, which would run south
 42 from Intake 1, generally parallel to and two or fewer miles west of Interstate 5 until reaching its
 43 southern extent, when it would convey water southwest to the proposed Byron Tract Forebay. The
 44 forebay would convert about 650 acres to nonagricultural uses. Areas dedicated to RTM storage

(from tunnel siphons), bridges over the canal, intake pumping plant facilities, and culvert siphons would also require conversion to nonagricultural uses. While RTM storage areas are considered permanent surface impacts for the purposes of impact analysis, it is anticipated that the RTM would be removed from these areas and reused, as appropriate, as bulking material for levee maintenance, as fill material for habitat restoration projects, or other beneficial means of reuse identified for the material, as described in Appendix 3B, *Environmental Commitments*. Mapbook Figure M14-3 shows all of the construction features (including temporary work areas) associated with this proposed water conveyance facility alignment along with Important Farmland. Note that not all of these structures would be constructed under this alternative, since it displays all of the seven possible intakes that would be constructed with this alignment; only Intakes 1-5 would be constructed under this alternative. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility

Temporary or short-term construction activities related to building the physical components of Alternative 1B would directly convert land subject to Williamson Act contracts or in Farmland Security Zones. This alternative could convert approximately 1,326 acres of land subject to Williamson Act contracts, including 233 acres in Farmland Security Zones. For further discussion of potential incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-1.

Of this land subject to Williamson Act contracts or in Farmland Security Zones, siphon work areas would require the temporary or short-term conversion of nearly 600 acres. These areas would be adjacent to proposed culvert siphons crossing Stone Lakes Drain, Beaver Slough, Hog Slough, Sycamore Slough, White Slough, Disappointment Slough, a BNSF railroad ROW near Holt, and Middle River. Intake work areas, adjacent to the proposed intakes and pumping plants, would require the short-term conversion of approximately 160 acres near the east bank of the Sacramento River between Freeport and Courtland. Work areas associated with the construction of bridges over proposed canal segments would require approximately 170 acres and would be located adjacent to proposed bridges over Scribner Road, Lambert Road, Dierssen Road, Twin Cities Road, West Barber Road, West Walnut Grove Road, West Peltier Road, West Woodbridge Road, State Route 12, North Guard Road, West 8 Mile Road, West McDonald Road, State Route 4, West Bacon Island Road, South Tracy Boulevard, Calpack Road, and Clifton Court Road. Approximately 120 acres would be converted during construction of tunnel siphons crossing Lost Slough/Mokelumne River, San Joaquin River, and Old River. Other temporary work areas, including those necessary for the construction of transmission lines, would be located throughout the conveyance alignment. Mapbook Figure M14-4 shows all of the construction features (including temporary work areas) associated with this proposed water conveyance facility alignment along with land subject to Williamson Act contracts or in Farmland Security Zones. Note that not all of these structures would be constructed under this alternative, since it displays all of the seven possible intakes that would be constructed with this alignment; only Intakes 1-5 would be constructed under this alternative. Table 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural uses under implementation of each alternative.

1 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
 2 ***result of constructing the proposed water conveyance facility***

3 Physical components of Alternative 1B would directly and permanently convert land subject to
 4 Williamson Act contracts or in Farmland Security Zones to non-agricultural uses. This alternative
 5 could convert approximately 14,080 acres of land subject to Williamson Act contracts, including
 6 3,788 acres in Farmland Security Zones. For further discussion of potential incompatibilities with
 7 land use policies, see Chapter 13, *Land Use*, Impact LU-1.

8 Of this land subject to Williamson Act contracts or in Farmland Security Zones, areas dedicated to
 9 borrow, spoils, or a combination would convert more than 8,400 acres under this alternative. These
 10 areas would be located throughout the conveyance alignment, with some of the largest areas
 11 identified on Union Island West, Drexler Tract, Rindge Tract, and west of the canal segment
 12 immediately south of Intake 5. Nearly 5,000 acres would also be converted to nonagricultural uses
 13 to accommodate the canal, which would run south from Intake 1, generally parallel to and two or
 14 fewer miles west of Interstate 5 until reaching its southern extent, when it would convey water
 15 southwest to the proposed Byron Tract Forebay. Areas dedicated to RTM storage (from tunnel
 16 siphons), bridges over the canal, intake pumping plant facilities, and culvert siphons would also
 17 require conversion to nonagricultural uses. While RTM storage areas are considered permanent
 18 surface impacts for the purposes of impact analysis, it is anticipated that the RTM would be removed
 19 from these areas and reused, as appropriate, as bulking material for levee maintenance, as fill
 20 material for habitat restoration projects, or other beneficial means of reuse identified for the
 21 material, as described in Appendix 3B, *Environmental Commitments*. Mapbook Figure M14-4 shows
 22 all of the construction features (including temporary work areas) associated with this proposed
 23 water conveyance facility alignment along with land subject to Williamson Act contracts or in
 24 Farmland Security Zones. Note that not all of these structures would be constructed under this
 25 alternative, since it displays all of the seven possible intakes that would be constructed with this
 26 alignment; only Intakes 1-5 would be constructed under this alternative. Table 14-9 displays a
 27 summary of temporary and short-term acreage and permanent acreage of land subject to
 28 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
 29 uses under implementation of each alternative.

30 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
 31 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
 32 agricultural uses, as discussed above, would constitute an adverse effect on the physical
 33 environment. Mitigation Measure AG-1 would be available to reduce these effects.

34 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
 35 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 36 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 37 construction. Temporary and short-term construction of facilities would convert approximately
 38 2,144 acres of Important Farmland and 1,326 acres of land subject to Williamson Act contracts to
 39 other uses. Physical structures would also permanently convert approximately 18,875 acres of
 40 Important Farmland and 14,080 acres of land subject to Williamson Act contracts or in Farmland
 41 Security Zones to other uses. As described above and in Appendix 3B, *Environmental Commitments*,
 42 it is anticipated that the RTM would be removed from RTM storage areas and reused, as
 43 appropriate, as bulking material for levee maintenance, as fill material for habitat restoration
 44 projects, or other beneficial means of reuse identified for the material. However, the overall effects
 45 are considered significant impacts on the environment. Implementation of Mitigation Measure AG-1

1 would reduce these impacts by implementing activities such as siting project footprints to
 2 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
 3 support of continued agricultural activities; engaging counties, owners/operators, and other
 4 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 5 agricultural land through off-site easements or other agricultural land conservation interests.
 6 However, these impacts remain significant and unavoidable after implementation of this measure
 7 because (i) even after effects from the footprints of project facilities are minimized through design,
 8 they would continue to require the conversion of substantial amounts of Important Farmland and
 9 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 10 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 11 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 12 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 13 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 14 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 15 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 16 viability of regional agricultural economies, the economic health of local governments and special
 17 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 18 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

19 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 20 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 21 **Subject to Williamson Act Contracts or in Farmland Security Zones**

22 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

23 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 24 **Proposed Water Conveyance Facility**

25 ***Effects on agriculture as a result of changes in groundwater elevation***

26 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 27 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 28 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. Localized effects related to
 29 dewatering activities in the vicinity of intake pump stations, canal excavations, siphons, and the
 30 Byron Tract Forebay could temporarily lower groundwater levels by up to 20 feet (in the case of
 31 intakes and the forebay). The pumping plants would be located just east of the Sacramento River,
 32 south of Freeport and north of Courtland. The canal would run south from Intake 1, generally
 33 parallel to and two or fewer miles west of Interstate 5 until reaching its southern extent, when it
 34 would convey water southwest to the proposed Byron Tract Forebay. Culvert siphons would cross
 35 Stone Lakes Drain, Beaver Slough, Hog Slough, Sycamore Slough, White Slough, Disappointment
 36 Slough, a BNSF railroad ROW near Holt, and Middle River. The Byron Tract Forebay would be
 37 adjacent and south of Clifton Court Forebay. During long-term operations of the water conveyance
 38 proposed under this alternative, increases and decreases in the groundwater level could occur in the
 39 vicinity of an unlined canal, due to groundwater recharge from this facility. In the northern portion
 40 of the canal between the intakes and the Mokelumne River, the rise in groundwater is predicted to
 41 be less than 5 feet. Between the Mokelumne River and the San Joaquin River, groundwater is
 42 forecasted to discharge into the canal, resulting in declines up to 10 feet. In the southern portion of
 43 the canal, groundwater recharge from the canal would be expected to result in a rise in the
 44 groundwater level up to 10 feet. In the southern portion of this alignment, recharge could result in

1 near-surface groundwater levels, which could compromise the viability of agricultural uses on land
2 in these areas. While these facilities would not alter the regional drainage flow patterns, an unlined
3 canal could benefit localized agricultural drainage in the segment of the canal projected to gain
4 groundwater from both east and west sides. If a lined canal were constructed, canal-related seepage
5 would be minimal. Local changes in groundwater flow patterns adjacent to the Byron Tract Forebay
6 might occur due to groundwater recharge from surface water impoundment and would result in
7 groundwater level increases. If agricultural drainage systems adjacent to this forebay are not
8 adequate to accommodate the additional drainage requirements, operation of the forebay could
9 interfere with agricultural drainage.

10 ***Effects on agriculture as a result of changes in salinity***

11 Under this alternative, the operation of new physical facilities combined with hydrodynamic effects
12 of habitat restoration activities under CM2 and CM4 would be similar to those described under
13 Alternative 1A. BDCP operations could indirectly affect agriculture by causing changes to the quality
14 of irrigation water in parts of the study area. Relative to Existing Conditions, the frequency of
15 exceedance and non-compliance with EC objectives would increase or decrease, depending upon the
16 individual compliance point. Similarly, the average EC could increase or decrease, depending on
17 location within the study area. Where salinity levels decrease, higher quality irrigation water could
18 benefit agricultural activities by reducing potential restrictions related to yields and crop selection.
19 However, increased salinity levels suggest that a number of crops using this irrigation water may
20 not be able to reach full yields. In general, agricultural activities would be anticipated to continue on
21 lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
22 *Water Quality*, Section 8.3.3.2, Impact WQ-11 and Appendix 8H, Tables EC-1 and EC-12.

23 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

24 Temporary construction activities and the permanent footprints associated with physical features
25 constructed as part of this alternative could create conflicts with existing irrigation and drainage
26 facilities throughout the study area. The conveyance alignment constructed under this alternative
27 would cross or interfere with approximately 136 miles of agricultural delivery canals and drainage
28 ditches, including approximately 32 miles on Roberts Island, 28 miles on Union Island, 13 miles on
29 New Hope Tract, 11 miles on Terminous Tract, and 10 miles on Rindge Tract. Construction activities
30 requiring excavation or use of land where irrigation canals are currently located could disrupt the
31 delivery of water to crops, which would compromise a key condition for the productive use of the
32 land for agriculture. Similarly, where construction or the long-term placement of conveyance
33 facilities associated with this alternative requires an existing agricultural drainage facility to be
34 disconnected, high groundwater levels could expose crops to soil conditions that would prevent the
35 continuation of most agricultural activities on the affected land. Where irrigation or drainage
36 infrastructure is disconnected from the farmland it serves, continued agricultural use of the land
37 could be jeopardized.

38 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
39 under this alternative could create indirect but adverse effects on agriculture by converting
40 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
41 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
42 related to water quality could be adverse or beneficial, depending on the location. Implementation
43 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
44 effects.

1 **CEQA Conclusion:** Water conveyance facility construction and operation could create a significant
 2 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
 3 uses through changes to groundwater elevation in localized areas and disruption of drainage and
 4 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
 5 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
 6 will reduce the severity of these impacts by implementing activities such as siting project footprints
 7 to encourage continued agricultural production; monitoring changes in groundwater levels during
 8 construction; offsetting water supply losses attributable to construction dewatering activities;
 9 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
 10 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 11 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 12 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 13 through off-site easements or other agricultural land conservation interests. However, these impacts
 14 remain significant and unavoidable after implementation of these measures because (i) replacement
 15 water supplies associated with losses attributable to construction dewatering activities may not
 16 meet the preexisting demands or planned land use demands of the affected party, (ii) seepage
 17 minimization may be infeasible in some instances, (iii) the feasibility and effectiveness of phased
 18 actions to reduce EC levels is uncertain, (iv) conservation or preservation by means of acquiring
 19 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
 20 Important Farmland and (v) the proposed optional agricultural stewardship approach does not
 21 focus principally on physical effects, but rather, focuses on supporting the Delta as an evolving place
 22 by encouraging existing owners and operators to continue working on the land while maintaining
 23 the long-term viability of regional agricultural economies and the economic health of local
 24 governments and special districts in the Delta.

25 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 26 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 27 environmental commitment to address the potential increased water treatment costs that could
 28 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 29 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 30 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 31 water quality effects relating to chloride, electrical conductivity, and bromide.

32 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 33 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 34 **Subject to Williamson Act Contracts or in Farmland Security Zones**

35 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

36 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 37 **Dewatering**

38 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 39 Chapter 7, *Groundwater*.

40 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

41 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 42 Chapter 7, *Groundwater*.

1 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 2 **Quality Conditions**

3 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 4 in Chapter 8, *Water Quality*.

5 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 6 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 7 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
 8 **and 21**

9 Effects of Alternative 1B related to the conversion of Important Farmland and land subject to
 10 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 11 measures would be similar to those described for Alternative 1A. Potential variations could result
 12 from areas in which physical features associated with this alternative conflict with potential
 13 restoration areas thereby necessitating implementation elsewhere. Alternative 1B would restore
 14 approximately 83,800 acres under conservation measures geared toward the restoration of various
 15 natural communities.

16 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 17 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 18 the conservation zones designated as Important Farmland and/or subject to Williamson Act
 19 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
 20 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 21 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 22 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 23 quality of the human environment, the related conversion of the underlying agricultural resource
 24 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 25 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 26 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 27 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 28 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 29 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 30 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

31 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 32 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 33 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 34 other conservation measures could result in conversion of a substantial amount of Important
 35 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 36 resulting in a significant impact on agricultural resources in the study area.

37 Further evaluation of these impacts would depend on additional information relating to the location
 38 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 39 reduce the severity of these impacts by implementing activities such as siting features to encourage
 40 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 41 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 42 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 43 through off-site easements or other agricultural land conservation interests. However, these impacts
 44 remain significant and unavoidable after implementation of this measure because (i) even after

1 effects from the footprints of conservation measures are minimized through design, they would
 2 continue to require the conversion of substantial amounts of Important Farmland and land subject
 3 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 4 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 5 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 6 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 7 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 8 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 9 desire of individual Delta farmers to continue working on their land, the long-term viability of
 10 regional agricultural economies, the economic health of local governments and special districts, and
 11 the Delta as an evolving place.

12 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 13 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 14 **Subject to Williamson Act Contracts or in Farmland Security Zones**

15 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

16 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 17 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

18 ***Effects on agriculture as a result of changes in groundwater elevation***

19 Implementation of these conservation measures could indirectly affect agriculture by causing
 20 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 21 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 22 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 23 restoration would result in increased groundwater recharge, which could result in groundwater
 24 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 25 severity of these effects are unknown and would depend on existing localized groundwater levels in
 26 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

27 ***Effects on agriculture as a result of changes in salinity***

28 Effects related to salinity under Alternative 1B would be similar to those described for Alternative
 29 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 30 these conservation measures would not introduce new sources of electrical conductivity into the
 31 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 32 anticipated to restrict agricultural uses in the study area.

33 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

34 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 35 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
 36 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
 37 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
 38 However, this effect is speculative and its potential severity would depend on site-specific
 39 conditions.

1 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

2 Effects related to disruption of infrastructure would be similar to those described under Alternative
 3 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 4 and the permanent footprints associated with land acquired for habitat restoration, could directly or
 5 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 6 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
 7 uses could be substantially restricted. However, the location and severity of this effect would
 8 depend on site-specific conditions.

9 ***Effects on agriculture as a result of increased frequency of inundation events***

10 Modified activities in the Yolo Bypass under Alternative 1B would be identical to those described in
 11 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
 12 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
 13 continues later in the spring, this could result in a delay in ground preparation and planting
 14 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
 15 longer duration could result in a change to crop yields and production, due to a variety of factors
 16 beyond delay in planting operations.

17 The new inundation schedule could substantially prevent agricultural use of these lands. The
 18 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
 19 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
 20 effects are unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
 21 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
 22 mitigate this effect.

23 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 24 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

25 Effects related to changes in agricultural practices and protection levels under Alternative 1B would
 26 be similar to those described for Alternative 1A. Potential changes could result from areas chosen
 27 for protection based on the physical alignment of facilities under this alternative. The cultivated
 28 lands natural community strategy under CM3 would acquire agricultural land and manage it for
 29 specific habitat values corollary to agricultural use for covered species. While these effects would
 30 convert small areas of land to nonagricultural use and could change agricultural practices or yields
 31 across a large area, conservation measures would also support the continued use of land for
 32 agricultural purposes. Overall, this effect would not be anticipated to substantially restrict
 33 agricultural use.

34 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 35 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 36 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 37 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 38 evaluation of these effects would depend on additional information relating to the location of these
 39 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 40 and GW-5 will reduce the severity of these adverse effects.

41 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 42 alternative could create a significant impact on agriculture by converting substantial amounts of
 43 Important Farmland to other uses through changes to groundwater elevation and seepage,

1 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 2 effects would depend on additional information relating to the location of these activities and other
 3 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 4 severity of these impacts by implementing activities such as siting features to encourage continued
 5 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 6 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 7 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 8 preserving agricultural land through off-site easements or other agricultural land conservation
 9 interests. However, these impacts remain significant and unavoidable after implementation of these
 10 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 11 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 12 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 13 stewardship approach does not focus principally on physical effects, but rather, focuses on
 14 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 15 working on the land while maintaining the long-term viability of regional agricultural economies
 16 and the economic health of local governments and special districts in the Delta.

17 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 18 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 19 **Subject to Williamson Act Contracts or in Farmland Security Zones**

20 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

21 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

22 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 23 Chapter 7, *Groundwater*.

24 **14.3.3.4 Alternative 1C—Dual Conveyance with West Alignment and**
 25 **Intakes W1–W5 (15,000 cfs; Operational Scenario A)**

26 Alternative 1C would result in temporary and short-term effects on agricultural land in the study
 27 area associated with construction of five intakes and intake pumping plants, one forebay,
 28 conveyance pipelines, canals, a tunnel, culvert siphons, and an intermediate pumping plant.
 29 Transmission lines, access roads, and other incidental facilities would also be needed for operation
 30 of the project and construction of these structures would have temporary effects on agricultural
 31 lands.

32 Implementation of Alternative 1C would also result in permanent conversion of agricultural lands to
 33 nonagricultural uses associated with the five intakes and intake pumping plants, one forebay,
 34 pipelines, canals, a tunnel, culvert siphons, and an intermediate pumping plant. Other project
 35 features that would result in conversion of agricultural lands include soil borrow, spoil, and RTM
 36 storage areas; transmission line structures; and access roads.

1 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 3 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

4 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 5 ***water conveyance facility***

6 Temporary and short-term construction of water conveyance facilities associated with Alternative
 7 1C would convert existing agricultural land to construction-related uses, directly precluding
 8 agricultural use for the duration of construction. This alternative would convert approximately
 9 3,170 acres of Important Farmland to other uses, including 2,380 acres of Prime Farmland, 165
 10 acres of Farmland of Statewide Importance, 160 acres of Unique Farmland, and 466 acres of
 11 Farmland of Local Importance.

12 Of these acres of Important Farmland, siphon work areas would require the temporary or short-
 13 term conversion of more than 900 acres. These areas would be adjacent to proposed culvert siphons
 14 crossing Elk Slough, Duck Slough, Miner Slough, Rock Slough, a BNSF railroad ROW northwest of
 15 Discovery Bay, Main Canal, Kellogg Creek, Kendall Creek Overflow, and Italian Slough. Intake work
 16 areas, adjacent to the proposed intakes and pumping plants, would require the short-term
 17 conversion of nearly 500 acres near the west bank of the Sacramento River between Freeport and
 18 Courtland (but on the opposite bank). Work areas associated with the construction of conveyance
 19 pipelines would require nearly 400 acres and would be located primarily between Intake 1 and the
 20 beginning of the canal near Intake 2, north and west of Clarksburg. Other temporary work areas,
 21 including those necessary for the construction of tunnels, bridges, and transmission lines, would be
 22 located throughout the conveyance alignment. Mapbook Figure M14-5 shows all of the construction
 23 features (including temporary work areas) associated with this proposed water conveyance facility
 24 alignment along with Important Farmland. Table 14-8 displays a summary of temporary and short-
 25 term acreage and permanent acreage of Important Farmland that could be converted to non-
 26 agricultural uses under implementation of each alternative.

27 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 28 ***conveyance facility***

29 Physical structures associated with construction of water conveyance facilities and borrow, spoils,
 30 and RTM areas would occupy agricultural lands designated as Important Farmland, directly
 31 precluding future agricultural use. The facilities associated with this alternative would convert
 32 approximately 13,014 acres of Important Farmland to project uses, including 11,124 acres of Prime
 33 Farmland, 291 acres of Farmland of Statewide Importance, 909 acres of Unique Farmland, and 690
 34 acres of Farmland of Local Importance.

35 Of these acres of Important Farmland, areas dedicated to borrow or spoils would convert
 36 approximately 6,500 acres under this alternative. These areas would be located throughout the
 37 conveyance alignment, with some of the largest areas identified between Intakes 2 and 3 west of the
 38 Sacramento River, adjacent to the proposed canal segment between Elk Slough and Duck Slough, on
 39 north Ryer Island, and north and west of the proposed Byron Tract Forebay, northwest of Clifton
 40 Court Forebay. Approximately 4,200 acres would also be converted to nonagricultural uses to
 41 accommodate canal segments. The northern segment of canal would run south from Intake 2 south
 42 of Clarksburg, then west along Courtland Road to the Sacramento Deep Water Ship Channel, where
 43 the canal would again turn south and run generally parallel to the Sacramento Deep Water Ship
 44 Channel to a point near the Channel's confluence with Miner Slough. Another canal segment would

1 start north of the Contra Costa Canal northeast of Knightsen and would be constructed to the south,
 2 passing to the west of Discovery Bay, until reaching the proposed Byron Tract Forebay northwest of
 3 Clifton Court Forebay. This proposed forebay would convert about 770 acres to nonagricultural
 4 uses. Areas dedicated to RTM storage would convert nearly 890 acres to nonagricultural uses. While
 5 RTM storage areas are considered permanent surface impacts for the purposes of impact analysis, it
 6 is anticipated that the RTM would be removed from these areas and reused, as appropriate, as
 7 bulking material for levee maintenance, as fill material for habitat restoration projects, or other
 8 beneficial means of reuse identified for the material, as described in Appendix 3B, *Environmental*
 9 *Commitments*. Bridges over the canal, intake pumping plant facilities, tunnel shafts, and culvert
 10 siphons would also require conversion of lands to nonagricultural uses. Mapbook Figure M14-5
 11 shows all of the construction features (including temporary work areas) associated with this
 12 proposed water conveyance facility alignment along with Important Farmland. Table 14-8 displays a
 13 summary of temporary and short-term acreage and permanent acreage of Important Farmland that
 14 could be converted to non-agricultural uses under implementation of each alternative.

15 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
 16 ***Security Zones as a result of constructing the proposed water conveyance facility***

17 Temporary or short-term construction activities related to building the physical components of
 18 Alternative 1C would directly convert land subject to Williamson Act contracts. This alternative
 19 would convert approximately 1,243 acres of land subject to Williamson Act contracts. For further
 20 discussion of potential incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact
 21 LU-1.

22 Of this land subject to Williamson Act contracts, siphon work areas would require the temporary or
 23 short-term conversion of more than 280 acres. These areas would be adjacent to proposed culvert
 24 siphons crossing Elk Slough, Duck Slough, and Miner Slough. Intake work areas, adjacent to
 25 proposed Intakes 1, 3, and 5, would require the short-term conversion of more than 150 acres near
 26 the west bank of the Sacramento River between Freeport and Courtland (but on the opposite bank).
 27 Work areas associated with the construction of conveyance pipelines would require approximately
 28 200 acres and would be located primarily between Intake 1 and the beginning of the canal near
 29 Intake 2, north and west of Clarksburg. Nearly 130 acres west of Elkhorn Slough on Ryer Island
 30 would be converted to nonagricultural uses during construction of the proposed intermediate
 31 pumping plant. Other temporary work areas, including those necessary for the construction of
 32 tunnels, bridges, and transmission lines, would be located throughout the conveyance alignment.
 33 Mapbook Figure M14-6 shows all of the construction features (including temporary work areas)
 34 associated with this proposed water conveyance facility alignment along with land subject to
 35 Williamson Act contracts. Table 14-9 displays a summary of temporary and short-term acreage and
 36 permanent acreage land subject to Williamson Act contracts or in Farmland Security Zones that
 37 could be converted to non-agricultural uses under implementation of each alternative.

38 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
 39 ***result of constructing the proposed water conveyance facility***

40 Physical components of Alternative 1C would directly and permanently convert land subject to
 41 Williamson Act contracts to non-agricultural uses. This alternative would convert approximately
 42 7,647 acres of land subject to Williamson Act contracts. For further discussion of potential
 43 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-1.

1 Of this land subject to Williamson Act contracts, areas dedicated to borrow or spoils would convert
2 approximately 4,400 acres under this alternative. These areas would be located throughout the
3 conveyance alignment, with some of the largest impact areas identified north of the proposed
4 conveyance pipeline north of the Winchester Lake, adjacent to the proposed canal segment between
5 Elk Slough and the Sacramento Deep Water Ship Channel, and on north Ryer Island. Approximately
6 2,500 acres would also be converted to nonagricultural uses to accommodate canal segments. The
7 proposed canal would primarily cross land subject to Williamson Act contracts from Intake 3 south
8 of Clarksburg, then west along Courtland Road to the Sacramento Deep Water Ship Channel, where
9 the canal would again turn south and run generally parallel to the Sacramento Deep Water Ship
10 Channel to a point near the Channel's confluence with Miner Slough. Areas dedicated to RTM storage
11 on south Ryer Island, north Brannan-Andrus Island, and northeast of Knightsen would convert
12 approximately 510 acres to nonagricultural uses. While RTM storage areas are considered
13 permanent surface impacts for the purposes of impact analysis, it is anticipated that the RTM would
14 be removed from these areas and reused, as appropriate, as bulking material for levee maintenance,
15 as fill material for habitat restoration projects, or other beneficial means of reuse identified for the
16 material, as described in Appendix 3B, *Environmental Commitments*. Bridges over the canal, intake
17 pumping plant facilities, tunnel shafts, and culvert siphons would also require conversion of lands to
18 nonagricultural uses. Mapbook Figure M14-6 shows all of the construction features (including
19 temporary work areas) associated with this proposed water conveyance facility alignment along
20 with land subject to Williamson Act contracts. Table 14-9 displays a summary of temporary and
21 short-term acreage and permanent acreage of land subject to Williamson Act contracts or in
22 Farmland Security Zones that could be converted to non-agricultural uses under implementation of
23 each alternative.

24 **NEPA Effects:** The temporary and short-term conversion and permanent conversion of Important
25 Farmland and land subject to Williamson Act contracts to non-agricultural uses, as discussed above,
26 would constitute an adverse effect on the physical environment. Mitigation Measure AG-1 would be
27 available to reduce these effects.

28 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
29 proposed under this alternative would occupy Important Farmland and land subject to Williamson
30 Act contracts, directly precluding agricultural use for the duration of construction. Temporary and
31 short-term construction of facilities could convert approximately 3,170 acres of Important Farmland
32 and 1,243 acres of land subject to Williamson Act contracts to other uses. Physical structures would
33 also permanently convert approximately 13,014 acres of Important Farmland and 7,647 acres of
34 land subject to Williamson Act contracts to other uses. As described above and in Appendix 3B,
35 *Environmental Commitments*, it is anticipated that the RTM would be removed from RTM storage
36 areas and reused, as appropriate, as bulking material for levee maintenance, as fill material for
37 habitat restoration projects, or other beneficial means of reuse identified for the material. However,
38 the overall effects are considered significant impacts on the environment. Implementation of
39 Mitigation Measure AG-1 would reduce these impacts by implementing activities such as siting
40 project footprints to encourage continued agricultural production; relocating or replacing
41 agricultural infrastructure in support of continued agricultural activities; engaging counties,
42 owners/operators, and other stakeholders in developing optional agricultural stewardship
43 approaches; and/or preserving agricultural land through off-site easements or other agricultural
44 land conservation interests. However, these impacts remain significant and unavoidable after
45 implementation of this measure because (i) even after effects from the footprints of project facilities
46 are minimized through design, they would continue to require the conversion of substantial

1 amounts of Important Farmland and land subject to Williamson Act contracts or in Farmland
 2 Security Zones, (ii) conservation or preservation by means of acquiring agricultural land
 3 conservation interests, even at one-to-one ratio, may not avoid a net loss of Important Farmland and
 4 land subject to Williamson Act contracts or in Farmland Security Zones and (iii) the proposed
 5 optional agricultural stewardship approach does not focus principally on physical effects, but rather,
 6 focuses on providing, at a minimum, a neutral agricultural economic effect on affected lands in the
 7 Delta as a result of the BDCP, taking into consideration the desire of individual Delta farmers to
 8 continue working on their land, the long-term viability of regional agricultural economies, the
 9 economic health of local governments and special districts, and the Delta as an evolving place. For
 10 further discussion of potential incompatibilities with land use designations, see Chapter 13, *Land*
 11 *Use*, Impact LU-1.

12 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 13 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 14 **Subject to Williamson Act Contracts or in Farmland Security Zones**

15 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

16 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 17 **Proposed Water Conveyance Facility**

18 ***Effects on agriculture as a result of changes in groundwater elevation***

19 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 20 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 21 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. Localized effects related to
 22 dewatering activities in the vicinity of intake pump stations, canal excavations, siphons, and the
 23 Byron Tract Forebay could temporarily lower groundwater levels by up to 20 feet (in the case of
 24 intakes and the forebay). The pumping plants would be located just west of the Sacramento River,
 25 south of Freeport and north of Courtland. The northern segment of canal would run south from
 26 Intake 2 south of Clarksburg, then west along Courtland Road to the Sacramento Deep Water Ship
 27 Channel, where the canal would again turn south and run generally parallel to the Sacramento Deep
 28 Water Ship Channel to a point near the Channel's confluence with Miner Slough. Another canal
 29 segment would start north of the Contra Costa Canal northeast of Knightsen and would be
 30 constructed to the south, passing to the west of Discovery Bay, until reaching the proposed Byron
 31 Tract Forebay northwest of Clifton Court Forebay. Culvert siphons would cross Elk Slough, Duck
 32 Slough, Miner Slough, Rock Slough, a BNSF railroad ROW northwest of Discovery Bay, Main Canal,
 33 Kellogg Creek, Kendall Creek Overflow, and Italian Slough. During long-term operations of the water
 34 conveyance proposed under this alternative, increases and decreases in the groundwater level could
 35 occur in the vicinity of an unlined canal, due to groundwater recharge from this facility. In the
 36 northern portion of the canal between the intakes and the tunnel, a rise in groundwater is predicted
 37 to be up to 10 feet. In the southern portion of the canal, increases and decreases in the groundwater
 38 level would range up to 5 feet in either direction. Particularly in the northern portion of the unlined
 39 canal, agricultural drainage would be affected, which could compromise the viability of agricultural
 40 uses on land in these areas. If a lined canal were constructed, canal-related seepage would be
 41 minimal. Local changes in groundwater flow patterns adjacent to the Byron Tract Forebay might
 42 occur due to groundwater recharge from surface water impoundment and would result in
 43 groundwater level increases. If agricultural drainage systems adjacent to this forebay are not

1 adequate to accommodate the additional drainage requirements, operation of the forebay could
2 interfere with agricultural drainage.

3 ***Effects on agriculture as a result of changes in salinity***

4 Under this alternative, the operation of new physical facilities combined with hydrodynamic effects
5 of habitat restoration activities under CM2 and CM4 would be similar to those described under
6 Alternative 1A. BDCP operations could indirectly affect agriculture by causing changes to the quality
7 of irrigation water in parts of the study area. Relative to Existing Conditions, the frequency of
8 exceedance and non-compliance with EC objectives would increase or decrease, depending upon the
9 individual compliance point. Similarly, the average EC could increase or decrease, depending on
10 location within the study area. Where salinity levels decrease, higher quality irrigation water could
11 benefit agricultural activities by reducing potential restrictions related to yields and crop selection.
12 However, increased salinity levels suggest that a number of crops using this irrigation water may
13 not be able to reach full yields. In general, agricultural activities would be anticipated to continue on
14 lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
15 *Water Quality*, Section 8.3.3.2, Impact WQ-11 and Appendix 8H, Tables EC-1 and EC-12.

16 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

17 Temporary construction activities and the permanent footprints associated with physical features
18 constructed as part of this alternative could create conflicts with existing irrigation and drainage
19 facilities throughout the study area. The conveyance alignment constructed under this alternative
20 would cross or interfere with approximately 124 miles of agricultural delivery canals and drainage
21 ditches, including approximately 45 miles on Ryer Island, 37 miles on the Netherlands (north of
22 Ryer Island), 20 miles on Byron Tract, and 12 miles on Merritt Island. Construction activities
23 requiring excavation or use of land where irrigation canals are currently located could disrupt the
24 delivery of water to crops, which would compromise a key condition for the productive use of the
25 land for agriculture. Similarly, where construction or the long-term placement of conveyance
26 facilities associated with this alternative requires an existing agricultural drainage facility to be
27 disconnected, high groundwater levels could expose crops to soil conditions that would prevent the
28 continuation of most agricultural activities on the affected land. Where irrigation or drainage
29 infrastructure is disconnected from the farmland it serves, continued agricultural use of the land
30 could be jeopardized.

31 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
32 under this alternative could create indirect but adverse effects on agriculture by converting
33 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
34 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
35 related to water quality could be adverse or beneficial, depending on the location. Implementation
36 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
37 effects.

38 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
39 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
40 uses through changes to groundwater elevation in localized areas and disruption of drainage and
41 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
42 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
43 will reduce the severity of these impacts by implementing activities such as siting project footprints
44 to encourage continued agricultural production; monitoring changes in groundwater levels during

1 construction; offsetting water supply losses attributable to construction dewatering activities;
 2 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
 3 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 4 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 5 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 6 through off-site easements or other agricultural land conservation interests. However, these impacts
 7 remain significant and unavoidable after implementation of these measures because (i) replacement
 8 water supplies associated with losses attributable to construction dewatering activities may not
 9 meet the preexisting demands or planned land use demands of the affected party, (ii) seepage
 10 minimization may be infeasible in some instances, (iii) the feasibility and effectiveness of phased
 11 actions to reduce EC levels is uncertain, (iv) conservation or preservation, even at one-to-one ratio,
 12 may not avoid a net loss of Important Farmland and (v) the proposed optional agricultural
 13 stewardship approach does not focus principally on physical effects, but rather, focuses on
 14 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 15 working on the land while maintaining the long-term viability of regional agricultural economies
 16 and the economic health of local governments and special districts in the Delta.

17 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 18 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 19 environmental commitment to address the potential increased water treatment costs that could
 20 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 21 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 22 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 23 water quality effects relating to chloride, electrical conductivity, and bromide.

24 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 25 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 26 **Subject to Williamson Act Contracts or in Farmland Security Zones**

27 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

28 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 29 **Dewatering**

30 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 31 Chapter 7, *Groundwater*.

32 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

33 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 34 Chapter 7, *Groundwater*.

35 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 36 **Quality Conditions**

37 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 38 in Chapter 8, *Water Quality*.

39 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 40 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**

1 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
2 **and 21**

3 Effects of Alternative 1C related to the conversion of Important Farmland and land subject to
4 Williamson Act contracts or in Farmland Security Zones associated with these conservation
5 measures would be similar to those described for Alternative 1A. Potential variations could result
6 from areas in which physical features associated with this alternative conflict with potential
7 restoration areas thereby necessitating implementation elsewhere. Alternative 1C would restore
8 approximately 83,800 acres under conservation measures geared toward the restoration of various
9 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

10 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
11 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
12 the conservation zones designated as Important Farmland and/or subject to Williamson Act
13 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
14 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
15 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
16 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
17 quality of the human environment, the related conversion of the underlying agricultural resource
18 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
19 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
20 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
21 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
22 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
23 changes from agriculture to restoration and mitigation uses. For further discussion of potential
24 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

25 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
26 measures geared toward the restoration of various natural communities. Additionally, 20 linear
27 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
28 other conservation measures could result in conversion of a substantial amount of Important
29 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
30 resulting in a significant impact on agricultural resources in the study area.

31 Further evaluation of these impacts would depend on additional information relating to the location
32 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
33 reduce the severity of these impacts by implementing activities such as siting features to encourage
34 continued agricultural production; relocating or replacing agricultural infrastructure in support of
35 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
36 developing optional agricultural stewardship approaches; and/or preserving agricultural land
37 through off-site easements or other agricultural land conservation interests. However, these impacts
38 remain significant and unavoidable after implementation of this measure because (i) even after
39 effects from the footprints of conservation measures are minimized through design, they would
40 continue to require the conversion of substantial amounts of Important Farmland and land subject
41 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
42 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
43 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
44 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
45 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural

1 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 2 desire of individual Delta farmers to continue working on their land, the long-term viability of
 3 regional agricultural economies, the economic health of local governments and special districts, and
 4 the Delta as an evolving place.

5 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 6 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 7 **Subject to Williamson Act Contracts or in Farmland Security Zones**

8 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

9 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 10 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

11 ***Effects on agriculture as a result of changes in groundwater elevation***

12 Implementation of these conservation measures could indirectly affect agriculture by causing
 13 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 14 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 15 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 16 restoration would result in increased groundwater recharge, which could result in groundwater
 17 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 18 severity of these effects are unknown and would depend on existing localized groundwater levels in
 19 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

20 ***Effects on agriculture as a result of changes in salinity***

21 Effects related to salinity under Alternative 1C would be similar to those described for Alternative
 22 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 23 these conservation measures would not introduce new sources of electrical conductivity into the
 24 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 25 anticipated to restrict agricultural uses in the study area.

26 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

27 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 28 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
 29 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
 30 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
 31 However, this effect is speculative and its potential severity would depend on site-specific
 32 conditions.

33 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

34 Effects related to disruption of infrastructure would be similar to those described under Alternative
 35 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 36 and the permanent footprints associated with land acquired for habitat restoration, could directly or
 37 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 38 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
 39 uses could be substantially restricted. However, the location and severity of this effect would
 40 depend on site-specific conditions.

1 ***Effects on agriculture as a result of increased frequency of inundation events***

2 Modified activities in the Yolo Bypass under Alternative 1C would be identical to those described in
3 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
4 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
5 continues later in the spring, this could result in a delay in ground preparation and planting
6 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
7 longer duration could result in a change to crop yields and production, due to a variety of factors
8 beyond delay in planting operations.

9 The new inundation schedule could substantially prevent agricultural use of these lands. The
10 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
11 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
12 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
13 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
14 mitigate this effect.

15 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
16 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

17 Effects related to changes in agricultural practices and protection levels under Alternative 1C would
18 be similar to those described for Alternative 1A. Potential changes could result from areas chosen
19 for protection based on the physical alignment of facilities under this alternative. The cultivated
20 lands natural community strategy under CM3 would acquire agricultural land and manage it for
21 specific habitat values corollary to agricultural use for covered species. While these effects would
22 convert small areas of land to nonagricultural use and could change agricultural practices or yields
23 across a large area, conservation measures would also support the continued use of land for
24 agricultural purposes. Overall, this effect would not be anticipated to substantially restrict
25 agricultural use.

26 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
27 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
28 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
29 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
30 evaluation of these effects would depend on additional information relating to the location of these
31 activities and other detailed information. However, implementation of Mitigation Measures AG-1
32 and GW-5 will reduce the severity of these adverse effects.

33 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
34 alternative could create a significant impact on agriculture by converting substantial amounts of
35 Important Farmland to other uses through changes to groundwater elevation and seepage,
36 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
37 effects would depend on additional information relating to the location of these activities and other
38 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
39 severity of these impacts by implementing activities such as siting features to encourage continued
40 agricultural production; monitoring seepage effects; relocating or replacing agricultural
41 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
42 and other stakeholders in developing optional agricultural stewardship approaches; and/or
43 preserving agricultural land through off-site easements or other agricultural land conservation
44 interests. However, these impacts remain significant and unavoidable after implementation of these

1 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 2 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 3 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 4 stewardship approach does not focus principally on physical effects, but rather, focuses on
 5 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 6 working on the land while maintaining the long-term viability of regional agricultural economies
 7 and the economic health of local governments and special districts in the Delta.

8 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 9 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 10 **Subject to Williamson Act Contracts or in Farmland Security Zones**

11 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

12 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

13 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 14 Chapter 7, *Groundwater*.

15 **14.3.3.5 Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five**
 16 **Intakes (15,000 cfs; Operational Scenario B)**

17 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 18 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 19 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

20 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 21 ***water conveyance facility***

22 Temporary and short-term effects on Important Farmland associated with construction of
 23 structures under Alternative 2A would be similar to those described for Alternative 1A, with the
 24 addition of an operable barrier at the head of Old River. If Intakes 6 and 7 were chosen instead of
 25 Intakes 4 and 5, however, construction of facilities under this alternative would necessitate
 26 temporary or short-term conversion of approximately 1,826 acres of Important Farmland to other
 27 uses, including 1,634 acres of Prime Farmland, 13 acres of Farmland of Statewide Importance, 48
 28 acres of Unique Farmland, and 131 acres of Farmland of Local Importance. Table 14-8 displays a
 29 summary of temporary and short-term acreage and permanent acreage of Important Farmland that
 30 could be converted to non-agricultural uses under implementation of each alternative.

31 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 32 ***conveyance facility***

33 Permanent effects on Important Farmland associated with construction of structures under
 34 Alternative 2A would be similar to those described for Alternative 1A, with the addition of an
 35 operable barrier at the head of Old River. If Intakes 6 and 7 were chosen instead of Intakes 4 and 5,
 36 however, construction of facilities under this alternative would necessitate conversion of
 37 approximately 4,992 acres of Important Farmland to other uses, including 3,473 acres of Prime
 38 Farmland, 330 acres of Farmland of Statewide Importance, 1,056 acres of Unique Farmland, and 133
 39 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term

1 acreage and permanent acreage of Important Farmland that could be converted to non-agricultural
2 uses under implementation of each alternative.

3 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
4 ***Security Zones as a result of constructing the proposed water conveyance facility***

5 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
6 Security Zones associated with construction of structures under Alternative 2A would be similar to
7 those described for Alternative 1A, with the addition of an operable barrier at the head of Old River.
8 If Intakes 6 and 7 were chosen instead of Intakes 4 and 5, however, construction of facilities under
9 this alternative would necessitate temporary or short-term conversion of approximately 1,272 acres
10 of land subject to Williamson Act contracts, including 77 acres in Farmland Security Zones. For
11 further discussion of potential incompatibilities with land use policies, see Chapter 13, *Land Use*,
12 Impact LU-1. Table 14-9 displays a summary of temporary and short-term acreage and permanent
13 acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be
14 converted to non-agricultural uses under implementation of each alternative.

15 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
16 ***result of constructing the proposed water conveyance facility***

17 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
18 associated with construction of structures under Alternative 2A would be similar to those described
19 for Alternative 1A, with the addition of an operable barrier at the head of Old River. If Intakes 6 and
20 7 were chosen instead of Intakes 4 and 5, however, construction of facilities under this alternative
21 would necessitate conversion of approximately 2,910 acres of land subject to Williamson Act
22 contracts, including 643 acres in Farmland Security Zones. For further discussion of potential
23 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-1. Table 14-9 displays a
24 summary of temporary and short-term acreage and permanent acreage of land subject to
25 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
26 uses under implementation of each alternative.

27 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
28 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
29 agricultural uses, as discussed above, would constitute an adverse effect on the physical
30 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
31 along with Mitigation Measure AG-1, would be available to reduce these effects.

32 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
33 proposed under this alternative would occupy Important Farmland and land subject to Williamson
34 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
35 construction. Temporary and short-term construction of facilities would convert approximately
36 1,826 acres of Important Farmland and 1,272 acres of land subject to Williamson Act contracts or in
37 Farmland Security Zones to other uses. Physical structures would also permanently convert
38 approximately 4,992 acres of Important Farmland and 2,910 acres of land subject to Williamson Act
39 contracts or in Farmland Security Zones to other uses. These are considered significant impacts on
40 the environment. However, implementation of Mitigation Measure AG-1 along with an
41 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
42 would reduce these impacts by implementing activities such as siting project footprints to
43 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
44 support of continued agricultural activities; engaging counties, owners/operators, and other

1 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 2 agricultural land through off-site easements or other agricultural land conservation interests.
 3 However, these impacts remain significant and unavoidable after implementation of this measure
 4 because (i) even after effects from the footprints of project facilities are minimized through design,
 5 they would continue to require the conversion of substantial amounts of Important Farmland and
 6 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 7 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 8 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 9 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 10 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 11 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 12 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 13 viability of regional agricultural economies, the economic health of local governments and special
 14 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 15 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

16 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 17 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 18 **Subject to Williamson Act Contracts or in Farmland Security Zones**

19 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A

20 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 21 **Proposed Water Conveyance Facility**

22 ***Effects on agriculture as a result of changes in groundwater elevation***

23 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 24 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 25 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 26 those identified under Alternative 1A, Impact AG-2. Over the short term, lower groundwater levels
 27 related to dewatering for pumping plant construction would apply to different locations if Intakes 6
 28 and 7 were chosen. These effects could restrict or prevent agricultural uses on land in these areas.

29 ***Effects on agriculture as a result of changes in salinity***

30 Under Alternative 2A, the operation of new physical facilities combined with hydrodynamic effects
 31 of habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing
 32 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
 33 operation of the water conveyance facility would result in an increase in the number of days when
 34 electrical conductivity objectives would be exceeded or out of compliance at certain locations.
 35 Locations where these frequencies would increase include Sacramento River at Emmaton, San
 36 Joaquin River at San Andreas Landing and Old River near Middle River and at Tracy Bridge. The
 37 percent of days the Emmaton EC objective would be exceeded for the entire period modeled (1976–
 38 1991) would increase from 6% under Existing Conditions to 23%, and the percent of days out of
 39 compliance would increase from 11% under Existing Conditions to 35% under Alternative 2A. The
 40 San Andreas Landing EC objective would be exceeded on 4% of days, compared with 1% under
 41 Existing Conditions. The frequency at which this location would be out of compliance with the EC
 42 objective would increase from 1% of days to 6%. The increase in the frequency at which Old River

1 locations would exceed the EC objectives and be out of compliance would be 2% of days at Tracy
2 Bridge and less than 1% at Middle River.

3 Average EC levels would decrease at western and southern Delta compliance locations, except at
4 Emmaton in the western Delta, and would increase at the two interior Delta compliance locations.
5 Where salinity levels decrease, higher quality irrigation water could benefit agricultural activities by
6 reducing potential restrictions related to yields and crop selection. Over the entire period modeled,
7 the S. Fork Mokelumne River at Terminous average EC would increase 5% and the San Joaquin River
8 at San Andreas Landing average EC would increase 1%. At Emmaton, average EC would increase 9%
9 over drought period modeled. Modeling of drought years estimates EC reaching levels as high as
10 1.578 dS/m at the Emmaton compliance location. Increased salinity levels suggest that a number of
11 crops using this irrigation water may not be able to reach full yields, as reported in Table 14-6. In
12 general, agricultural activities would be anticipated to continue on lands using these sources.
13 Complete water quality modeling results are discussed in Chapter 8, *Water Quality*, Section 8.3.3.5,
14 Impact WQ-11 and Appendix 8H, Tables EC-2 and EC-13.

15 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

16 Conflicts with existing irrigation and drainage facilities as a result of constructing the water
17 conveyance facility would be similar to those described under Alternative 1A. The conveyance
18 alignment constructed under this alternative would cross or interfere with approximately 41 miles
19 of agricultural delivery canals and drainage ditches, including approximately 7 miles on Victoria
20 Island, 5 miles on Bacon Island, 4 miles on Byron Tract, and 4 miles on Tyler Island. Construction
21 activities requiring excavation or use of land where irrigation canals are currently located could
22 disrupt the delivery of water to crops, which would compromise a key condition for the productive
23 use of the land for agriculture. Similarly, where construction or the long-term placement of
24 conveyance facilities associated with this alternative requires an existing agricultural drainage
25 facility to be disconnected, high groundwater levels could expose crops to soil conditions that would
26 prevent the continuation of most agricultural activities on the affected land. Where irrigation or
27 drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
28 the land could be jeopardized.

29 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
30 under this alternative could create indirect but adverse effects on agriculture by converting
31 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
32 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
33 related to water quality could be adverse or beneficial, depending on the location. Implementation
34 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
35 effects.

36 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
37 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
38 uses through changes to groundwater elevation in localized areas, increased levels of salinity, and
39 disruption of drainage and irrigation facilities. In other areas, effects of this alternative related to
40 water quality could be beneficial. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and
41 WQ-11 will reduce the severity of these impacts by implementing activities such as siting project
42 footprints to encourage continued agricultural production; monitoring changes in groundwater
43 levels during construction; offsetting water supply losses attributable to construction dewatering
44 activities; monitoring seepage effects; relocating or replacing agricultural infrastructure in support

1 of continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 2 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 3 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 4 through off-site easements or other agricultural land conservation interests. However, these impacts
 5 remain significant and unavoidable after implementation of these measures because (i) replacement
 6 water supplies associated with losses attributable to construction dewatering activities may not
 7 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
 8 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
 9 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 10 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
 11 stewardship approach does not focus principally on physical effects, but rather, focuses on
 12 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 13 working on the land while maintaining the long-term viability of regional agricultural economies
 14 and the economic health of local governments and special districts in the Delta.

15 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 16 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 17 environmental commitment to address the potential increased water treatment costs that could
 18 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 19 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 20 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 21 water quality effects relating to chloride, electrical conductivity, and bromide.

22 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 23 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 24 **Subject to Williamson Act Contracts or in Farmland Security Zones**

25 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

26 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 27 **Dewatering**

28 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 29 Chapter 7, *Groundwater*.

30 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

31 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 32 Chapter 7, *Groundwater*.

33 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 34 **Quality Conditions**

35 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 36 in Chapter 8, *Water Quality*.

1 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 3 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
 4 **and 21**

5 Effects of Alternative 2A related to the conversion of Important Farmland and land subject to
 6 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 7 measures would be similar to those described for Alternative 1A. Alternative 2A would restore
 8 approximately 83,800 acres under conservation measures geared toward the restoration of various
 9 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

10 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 11 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 12 the conservation zones designated as Important Farmland and/or subject to Williamson Act
 13 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
 14 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 15 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 16 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 17 quality of the human environment, the related conversion of the underlying agricultural resource
 18 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 19 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 20 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 21 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 22 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 23 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 24 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

25 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 26 measures geared toward the restoration of tidal habitat, seasonally-inundated floodplain, grassland
 27 communities, vernal pool complex habitat, and nontidal marsh areas. Additionally, 20 linear miles of
 28 channel margin habitat would be enhanced. Implementation of restoration activities and other
 29 conservation measures could result in conversion of a substantial amount of Important Farmland
 30 and conflict with land subject to Williamson Act contracts or in Farmland Security Zones, resulting
 31 in a significant impact on agricultural resources in the study area.

32 Further evaluation of these impacts would depend on additional information relating to the location
 33 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 34 reduce the severity of these impacts by implementing activities such as siting features to encourage
 35 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 36 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 37 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 38 through off-site easements or other agricultural land conservation interests. However, these impacts
 39 remain significant and unavoidable after implementation of this measure because (i) even after
 40 effects from the footprints of conservation measures are minimized through design, they would
 41 continue to require the conversion of substantial amounts of Important Farmland and land subject
 42 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 43 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 44 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 45 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus

1 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 2 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 3 desire of individual Delta farmers to continue working on their land, the long-term viability of
 4 regional agricultural economies, the economic health of local governments and special districts, and
 5 the Delta as an evolving place.

6 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 7 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 8 **Subject to Williamson Act Contracts or in Farmland Security Zones**

9 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

10 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 11 **Conservation Measures 2-11, 13, 15, 16, 20, and 21**

12 ***Effects on agriculture as a result of changes in groundwater elevation***

13 Implementation of these conservation measures could indirectly affect agriculture by causing
 14 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 15 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 16 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 17 restoration would result in increased groundwater recharge, which could result in groundwater
 18 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 19 severity of these effects are unknown and would depend on existing localized groundwater levels in
 20 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

21 ***Effects on agriculture as a result of changes in salinity***

22 Effects related to salinity under Alternative 2A would be similar to those described for Alternative
 23 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 24 these conservation measures would not introduce new sources of electrical conductivity into the
 25 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 26 anticipated to restrict agricultural uses in the study area.

27 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

28 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 29 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
 30 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
 31 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
 32 However, this effect is speculative and its potential severity would depend on site-specific
 33 conditions.

34 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

35 Effects related to disruption of infrastructure would be similar to those described under Alternative
 36 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 37 and the permanent footprints associated with land acquired for habitat restoration, could directly or
 38 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 39 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural

1 uses could be substantially restricted. However, the location and severity of this effect would
2 depend on site-specific conditions.

3 ***Effects on agriculture as a result of increased frequency of inundation events***

4 Modified activities in the Yolo Bypass under Alternative 2A would be identical to those described in
5 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
6 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
7 continues later in the spring, this could result in a delay in ground preparation and planting
8 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
9 longer duration could result in a change to crop yields and production, due to a variety of factors
10 beyond delay in planting operations.

11 The new inundation schedule could substantially prevent agricultural use of these lands. The
12 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
13 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
14 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
15 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
16 mitigate this effect.

17 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
18 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

19 Effects related to changes in agricultural practices and protection levels under Alternative 2A would
20 be similar to those described for Alternative 1A. The cultivated lands natural community strategy
21 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
22 agricultural use for covered species. While these effects would convert small areas of land to
23 nonagricultural use and could change agricultural practices or yields across a large area,
24 conservation measures would also support the continued use of land for agricultural purposes.
25 Overall, this effect would not be anticipated to substantially restrict agricultural use.

26 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
27 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
28 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
29 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
30 evaluation of these effects would depend on additional information relating to the location of these
31 activities and other detailed information. However, implementation of Mitigation Measures AG-1
32 and GW-5 will reduce the severity of these adverse effects.

33 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
34 alternative could create a significant impact on agriculture by converting substantial amounts of
35 Important Farmland to other uses through changes to groundwater elevation and seepage,
36 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
37 effects would depend on additional information relating to the location of these activities and other
38 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
39 severity of these impacts by implementing activities such as siting features to encourage continued
40 agricultural production; monitoring seepage effects; relocating or replacing agricultural
41 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
42 and other stakeholders in developing optional agricultural stewardship approaches; and/or
43 preserving agricultural land through off-site easements or other agricultural land conservation

1 interests. However, these impacts remain significant and unavoidable after implementation of these
 2 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 3 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 4 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 5 stewardship approach does not focus principally on physical effects, but rather, focuses on
 6 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 7 working on the land while maintaining the long-term viability of regional agricultural economies
 8 and the economic health of local governments and special districts in the Delta.

9 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 10 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 11 **Subject to Williamson Act Contracts or in Farmland Security Zones**

12 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

13 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

14 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 15 Chapter 7, *Groundwater*.

16 **14.3.3.6 Alternative 2B—Dual Conveyance with East Alignment and Five**
 17 **Intakes (15,000 cfs; Operational Scenario B)**

18 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 19 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 20 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

21 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 22 ***water conveyance facility***

23 Temporary and short-term effects on Important Farmland associated with construction of
 24 structures under Alternative 2B would be similar to those described for Alternative 1B, with the
 25 addition of an operable barrier at the head of Old River. If Intakes 6 and 7 were chosen instead of
 26 Intakes 4 and 5, however, construction of facilities under this alternative would necessitate
 27 temporary or short-term conversion of approximately 2,669 acres of Important Farmland to other
 28 uses, including 2,282 acres of Prime Farmland, 61 acres of Farmland of Statewide Importance, 236
 29 acres of Unique Farmland, and 89 acres of Farmland of Local Importance. Table 14-8 displays a
 30 summary of temporary and short-term acreage and permanent acreage of Important Farmland that
 31 could be converted to non-agricultural uses under implementation of each alternative.

32 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 33 ***conveyance facility***

34 Permanent effects on Important Farmland associated with construction of structures under
 35 Alternative 2B would be similar to those described for Alternative 1B, with the addition of an
 36 operable barrier at the head of Old River. If Intakes 6 and 7 were chosen instead of Intakes 4 and 5,
 37 however, construction of facilities under this alternative would necessitate conversion of
 38 approximately 18,868 acres of Important Farmland to other uses, including 15,833 acres of Prime
 39 Farmland, 530 acres of Farmland of Statewide Importance, 2,032 acres of Unique Farmland, and 473
 40 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term

1 acreage and permanent acreage of Important Farmland that could be converted to non-agricultural
2 uses under implementation of each alternative.

3 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
4 ***Security Zones as a result of constructing the proposed water conveyance facility***

5 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
6 Security Zones associated with construction of structures under Alternative 2B would be similar to
7 those described for Alternative 1B, with the addition of an operable barrier at the head of Old River.
8 If Intakes 6 and 7 were chosen instead of Intakes 4 and 5, however, construction of facilities under
9 this alternative would necessitate temporary or short-term conversion of approximately 1,877 acres
10 of land subject to Williamson Act contracts, including 233 acres in Farmland Security Zones. For
11 further discussion of potential incompatibilities with land use policies, see Chapter 13, *Land Use*,
12 Impact LU-1. Table 14-9 displays a summary of temporary and short-term acreage and permanent
13 acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be
14 converted to non-agricultural uses under implementation of each alternative.

15 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
16 ***result of constructing the proposed water conveyance facility***

17 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
18 associated with construction of structures under Alternative 2B would be similar to those described
19 for Alternative 1B, with the addition of an operable barrier at the head of Old River. If Intakes 6 and
20 7 were chosen instead of Intakes 4 and 5, however, construction of facilities under this alternative
21 would necessitate conversion of approximately 14,125 acres of land subject to Williamson Act
22 contracts, including 3,788 acres in Farmland Security Zones. For further discussion of potential
23 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-1. Table 14-9 displays a
24 summary of temporary and short-term acreage and permanent acreage of land subject to
25 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
26 uses under implementation of each alternative.

27 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
28 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
29 agricultural uses, as discussed above, would constitute an adverse effect on the physical
30 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
31 along with Mitigation Measure AG-1, would be available to reduce these effects.

32 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
33 proposed under this alternative would occupy Important Farmland and land subject to Williamson
34 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
35 construction. Temporary and short-term construction of facilities would convert approximately
36 2,669 acres of Important Farmland and 1,877 acres of land subject to Williamson Act contracts or in
37 Farmland Security Zones to other uses. Physical structures would also permanently convert
38 approximately 18,868 acres of Important Farmland and 14,125 acres of land subject to Williamson
39 Act contracts or in Farmland Security Zones to other uses. These are considered significant impacts
40 on the environment. However, implementation of Mitigation Measure AG-1 along with an
41 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
42 would reduce these impacts by implementing activities such as siting project footprints to
43 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
44 support of continued agricultural activities; engaging counties, owners/operators, and other

1 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 2 agricultural land through off-site easements or other agricultural land conservation interests.
 3 However, these impacts remain significant and unavoidable after implementation of this measure
 4 because (i) even after effects from the footprints of project facilities are minimized through design,
 5 they would continue to require the conversion of substantial amounts of Important Farmland and
 6 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 7 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 8 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 9 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 10 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 11 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 12 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 13 viability of regional agricultural economies, the economic health of local governments and special
 14 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 15 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

16 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 17 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 18 **Subject to Williamson Act Contracts or in Farmland Security Zones**

19 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

20 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 21 **Proposed Water Conveyance Facility**

22 ***Effects on agriculture as a result of changes in groundwater elevation***

23 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 24 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 25 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 26 those identified under Alternative 1B. Over the short term, lower groundwater levels related to
 27 dewatering for pumping plant construction would apply to different locations if Intakes 6 and 7
 28 were chosen. During long-term operations of the water conveyance proposed under this alternative,
 29 increases and decreases in the groundwater level could occur in the vicinity of an unlined canal, due
 30 to groundwater recharge from this facility. In the southern portion of this alignment, recharge could
 31 result in near-surface groundwater levels, which could compromise the viability of agricultural uses
 32 on land in these areas. If a lined canal were constructed, canal-related seepage would be minimal.

33 ***Effects on agriculture as a result of changes in salinity***

34 Under this alternative, the operation of new physical facilities combined with hydrodynamic effects
 35 of habitat restoration activities under CM2 and CM4 would be similar to those described under
 36 Alternative 2A. BDCP operations could indirectly affect agriculture by causing changes to the quality
 37 of irrigation water in parts of the study area. Relative to Existing Conditions, the frequency of
 38 exceedance and non-compliance with EC objectives would generally increase, including those
 39 compliance points at Sacramento River at Emmaton, San Joaquin River at San Andreas Landing, and
 40 Old River near Middle River and at Tracy Bridge. The average EC could increase or decrease
 41 depending on location within the study area. Where salinity levels decrease, higher quality irrigation
 42 water could benefit agricultural activities by reducing potential restrictions related to yields and

1 crop selection. However, increased salinity levels suggest that a number of crops using this
2 irrigation water may not be able to reach full yields. In general, agricultural activities would be
3 anticipated to continue on lands using these sources. Complete water quality modeling results are
4 discussed in Chapter 8, *Water Quality*, Section 8.3.3.5, Impact WQ-11 and Appendix 8H, Tables EC-2
5 and EC-13.

6 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

7 Conflicts with existing irrigation and drainage facilities would be similar to those described under
8 Alternative 1B. Temporary construction activities and the permanent footprints associated with
9 physical features constructed as part of this alternative could create conflicts with existing irrigation
10 and drainage facilities throughout the study area. The conveyance alignment constructed under this
11 alternative would cross or interfere with approximately 138 miles of agricultural delivery canals
12 and drainage ditches, including approximately 32 miles on Roberts Island, 28 miles on Union Island,
13 13 miles on New Hope Tract, 11 miles on Terminous Tract, and 10 miles on Rindge Tract. Where
14 irrigation or drainage infrastructure is disconnected from the farmland it serves, continued
15 agricultural use of the land could be jeopardized.

16 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
17 under this alternative could create indirect but adverse effects on agriculture by converting
18 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
19 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
20 related to water quality could be adverse or beneficial, depending on the location. Implementation
21 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
22 effects.

23 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
24 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
25 uses through changes to groundwater elevation in localized areas and disruption of drainage and
26 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
27 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
28 will reduce the severity of these impacts by implementing activities such as siting project footprints
29 to encourage continued agricultural production; monitoring changes in groundwater levels during
30 construction; offsetting water supply losses attributable to construction dewatering activities;
31 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
32 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
33 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
34 developing optional agricultural stewardship approaches; and/or preserving agricultural land
35 through off-site easements or other agricultural land conservation interests. However, these impacts
36 remain significant and unavoidable after implementation of these measures because (i) replacement
37 water supplies associated with losses attributable to construction dewatering activities may not
38 meet the preexisting demands or planned land use demands of the affected party, (ii) seepage
39 minimization may be infeasible in some instances, (iii) the feasibility and effectiveness of phased
40 actions to reduce EC levels is uncertain, (iv) conservation or preservation by means of acquiring
41 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
42 Important Farmland and (v) the proposed optional agricultural stewardship approach does not
43 focus principally on physical effects, but rather, focuses on supporting the Delta as an evolving place
44 by encouraging existing owners and operators to continue working on the land while maintaining

1 the long-term viability of regional agricultural economies and the economic health of local
2 governments and special districts in the Delta.

3 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
4 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
5 environmental commitment to address the potential increased water treatment costs that could
6 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
7 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
8 pursuant to this commitment in order to reduce the water quality treatment costs associated with
9 water quality effects relating to chloride, electrical conductivity, and bromide.

10 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
11 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
12 **Subject to Williamson Act Contracts or in Farmland Security Zones**

13 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

14 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
15 **Dewatering**

16 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
17 Chapter 7, *Groundwater*.

18 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

19 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
20 Chapter 7, *Groundwater*.

21 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
22 **Quality Conditions**

23 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
24 in Chapter 8, *Water Quality*.

25 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
26 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
27 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
28 **and 21**

29 Effects of Alternative 2B related to the conversion of Important Farmland and land subject to
30 Williamson Act contracts or in Farmland Security Zones associated with these conservation
31 measures would be similar to those described for Alternative 1B. Alternative 2B would restore
32 approximately 83,800 acres under conservation measures geared toward the restoration of various
33 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

34 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
35 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
36 the conservation zones designated as Important Farmland and/or subject to Williamson Act
37 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
38 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
39 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or

1 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 2 quality of the human environment, the related conversion of the underlying agricultural resource
 3 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 4 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 5 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 6 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 7 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 8 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 9 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

10 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 11 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 12 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 13 other conservation measures could result in conversion of a substantial amount of Important
 14 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 15 resulting in a significant impact on agricultural resources in the study area.

16 Further evaluation of these impacts would depend on additional information relating to the location
 17 of these activities and other detailed information. Implementation of Mitigation Measures AG-1 will
 18 reduce the severity of these impacts by implementing activities such as siting features to encourage
 19 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 20 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 21 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 22 through off-site easements or other agricultural land conservation interests. However, these impacts
 23 remain significant and unavoidable after implementation of this measure because (i) even after
 24 effects from the footprints of conservation measures are minimized through design, they would
 25 continue to require the conversion of substantial amounts of Important Farmland and land subject
 26 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 27 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 28 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 29 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 30 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 31 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 32 desire of individual Delta farmers to continue working on their land, the long-term viability of
 33 regional agricultural economies, the economic health of local governments and special districts, and
 34 the Delta as an evolving place.

35 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 36 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 37 **Subject to Williamson Act Contracts or in Farmland Security Zones**

38 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

39 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 40 **Conservation Measures 2-11, 13, 15, 16, 20, and 21**

41 ***Effects on agriculture as a result of changes in groundwater elevation***

42 Implementation of these conservation measures could indirectly affect agriculture by causing
 43 changes to the elevation of groundwater in the study area, as described under Alternative 1A,

1 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
2 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
3 restoration would result in increased groundwater recharge, which could result in groundwater
4 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
5 severity of these effects are unknown and would depend on existing localized groundwater levels in
6 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

7 ***Effects on agriculture as a result of changes in salinity***

8 Effects related to salinity under Alternative 2B would be similar to those described for Alternative
9 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
10 these conservation measures would not introduce new sources of electrical conductivity into the
11 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
12 anticipated to restrict agricultural uses in the study area.

13 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

14 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
15 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
16 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
17 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
18 However, this effect is speculative and its potential severity would depend on site-specific
19 conditions.

20 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

21 Effects related to disruption of infrastructure would be similar to those described under Alternative
22 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
23 and the permanent footprints associated with land acquired for habitat restoration, could directly or
24 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
25 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
26 uses could be substantially restricted. However, the location and severity of this effect would
27 depend on site-specific conditions.

28 ***Effects on agriculture as a result of increased frequency of inundation events***

29 Modified activities in the Yolo Bypass under Alternative 2B would be identical to those described in
30 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
31 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
32 continues later in the spring, this could result in a delay in ground preparation and planting
33 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
34 longer duration could result in a change to crop yields and production, due to a variety of factors
35 beyond delay in planting operations.

36 The new inundation schedule could substantially prevent agricultural use of these lands. The
37 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
38 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
39 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
40 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
41 mitigate this effect.

1 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 2 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

3 Effects related to changes in agricultural practices and protection levels under Alternative 2B would
 4 be similar to those described for Alternative 1B. The cultivated lands natural community strategy
 5 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 6 agricultural use for covered species. While these effects would convert small areas of land to
 7 nonagricultural use and could change agricultural practices or yields across a large area,
 8 conservation measures would also support the continued use of land for agricultural purposes.
 9 Overall, this effect would not be anticipated to substantially restrict agricultural use.

10 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 11 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 12 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 13 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 14 evaluation of these effects would depend on additional information relating to the location of these
 15 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 16 and GW-5 will reduce the severity of these adverse effects.

17 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 18 alternative could create a significant impact on agriculture by converting substantial amounts of
 19 Important Farmland to other uses through changes to groundwater elevation and seepage,
 20 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 21 effects would depend on additional information relating to the location of these activities and other
 22 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 23 severity of these impacts by implementing activities such as siting features to encourage continued
 24 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 25 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 26 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 27 preserving agricultural land through off-site easements or other agricultural land conservation
 28 interests. However, these impacts remain significant and unavoidable after implementation of these
 29 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 30 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 31 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 32 stewardship approach does not focus principally on physical effects, but rather, focuses on
 33 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 34 working on the land while maintaining the long-term viability of regional agricultural economies
 35 and the economic health of local governments and special districts in the Delta.

36 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 37 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 38 **Subject to Williamson Act Contracts or in Farmland Security Zones**

39 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

40 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

41 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 42 Chapter 7, *Groundwater*.

14.3.3.7 Alternative 2C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario B)

Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security Zones as a Result of Constructing the Proposed Water Conveyance Facility

Temporary and short-term conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Temporary and short-term effects on Important Farmland associated with construction of structures under Alternative 2C would be similar to those described for Alternative 1C, with the addition of an operable barrier at the head of Old River. This alternative would convert approximately 3,170 acres of Important Farmland to other uses, including 2,380 acres of Prime Farmland, 165 acres of Farmland of Statewide Importance, 160 acres of Unique Farmland, and 466 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Permanent conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Permanent effects on Important Farmland associated with construction of structures under Alternative 2C would be similar to those described for Alternative 1C, with the addition of an operable barrier at the head of Old River. The facilities associated with this alternative would convert approximately 13,019 acres of Important Farmland to project uses, including 11,127 acres of Prime Farmland, 291 acres of Farmland of Statewide Importance, 912 acres of Unique Farmland, and 690 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility

Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland Security Zones associated with construction of structures under Alternative 2C would be similar to those described for Alternative 1C, with the addition of an operable barrier at the head of Old River. This alternative would convert approximately 1,243 acres of land subject to Williamson Act contracts. Table 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural uses under implementation of each alternative.

Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility

Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones associated with construction of structures under Alternative 2C would be similar to those described for Alternative 1C, with the addition of an operable barrier at the head of Old River. This alternative would convert approximately 7,647 acres of land subject to Williamson Act contracts. Table 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land subject to

1 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
2 uses under implementation of each alternative.

3 **NEPA Effects:** The temporary and short-term conversion and permanent conversion of Important
4 Farmland and land subject to Williamson Act contracts to non-agricultural uses, as discussed above,
5 would constitute an adverse effect on the physical environment. Disposal and reuse of RTM
6 (described in Appendix 3B, *Environmental Commitments*), along with Mitigation Measure AG-1,
7 would be available to reduce these effects.

8 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
9 proposed under this alternative would occupy Important Farmland and lands subject to Williamson
10 Act contracts, directly precluding agricultural use for the duration of construction. Temporary and
11 short-term construction of facilities could convert approximately 3,170 acres of Important Farmland
12 and 1,243 acres of land subject to Williamson Act contracts to other uses. Physical structures would
13 also permanently convert approximately 13,019 acres of Important Farmland and 7,647 acres of
14 land subject to Williamson Act contracts to other uses. These are considered significant impacts on
15 the environment. However, implementation of Mitigation Measure AG-1 along with an
16 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
17 would reduce these impacts by implementing activities such as siting project footprints to
18 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
19 support of continued agricultural activities; engaging counties, owners/operators, and other
20 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
21 agricultural land through off-site easements or other agricultural land conservation interests.
22 However, these impacts remain significant and unavoidable after implementation of this measure
23 because (i) even after effects from the footprints of project facilities are minimized through design,
24 they would continue to require the conversion of substantial amounts of Important Farmland and
25 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
26 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
27 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
28 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
29 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
30 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
31 consideration the desire of individual Delta farmers to continue working on their land, the long-term
32 viability of regional agricultural economies, the economic health of local governments and special
33 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
34 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

35 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
36 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
37 **Subject to Williamson Act Contracts or in Farmland Security Zones**

38 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

39 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
40 **Proposed Water Conveyance Facility**

41 ***Effects on agriculture as a result of changes in groundwater elevation***

42 Construction and operation of water conveyance facilities would indirectly affect agriculture by
43 causing seepage or changes in the elevation of groundwater within the study area, as discussed in

1 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
2 those identified under Alternative 1C. During long-term operations of the water conveyance
3 proposed under this alternative, increases and decreases in the groundwater level could occur in the
4 vicinity of an unlined canal due to groundwater recharge from this facility. Particularly in the
5 northern portion of the unlined canal, agricultural drainage would be affected, which could
6 compromise the viability of agricultural uses on land in these areas. If a lined canal were
7 constructed, canal-related seepage would be minimal.

8 ***Effects on agriculture as a result of changes in salinity***

9 Under this alternative, the operation of new physical facilities combined with hydrodynamic effects
10 of habitat restoration activities under CM2 and CM4 would be similar to those described under
11 Alternative 2A. BDCP operations could indirectly affect agriculture by causing changes to the quality
12 of irrigation water in parts of the study area. Relative to Existing Conditions, the frequency of
13 exceedance and non-compliance with EC objectives would generally increase, including those
14 compliance points at Sacramento River at Emmaton, San Joaquin River at San Andreas Landing, and
15 Old River near Middle River and at Tracy Bridge. The average EC could increase or decrease
16 depending on location within the study area. Where salinity levels decrease, higher quality irrigation
17 water could benefit agricultural activities by reducing potential restrictions related to yields and
18 crop selection. However, increased salinity levels suggest that a number of crops using this
19 irrigation water may not be able to reach full yields. However, agricultural activities would be
20 anticipated to continue on lands using these sources. Complete water quality modeling results are
21 discussed in Chapter 8, *Water Quality*, Section 8.3.3.5, Impact WQ-11 and Appendix 8H, Tables EC-2
22 and EC-13.

23 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

24 Conflicts with existing irrigation and drainage facilities would be similar to those described under
25 Alternative 1C. Temporary construction activities and the permanent footprints associated with
26 physical features constructed as part of this alternative could create conflicts with existing irrigation
27 and drainage facilities throughout the study area. The conveyance alignment constructed under this
28 alternative would cross or interfere with approximately 124 miles of agricultural delivery canals
29 and drainage ditches, including approximately 45 miles on Ryer Island, 37 miles on the Netherlands
30 (north of Ryer Island), 20 miles on Byron Tract, and 12 miles on Merritt Island. Where irrigation or
31 drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
32 the land could be jeopardized.

33 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
34 under this alternative could create indirect but adverse effects on agriculture by converting
35 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
36 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
37 related to water quality could be adverse or beneficial, depending on the location. Implementation
38 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
39 effects.

40 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
41 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
42 uses through changes to groundwater elevation in localized areas and disruption of drainage and
43 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
44 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11

1 will reduce the severity of these impacts by implementing activities such as siting project footprints
 2 to encourage continued agricultural production; monitoring changes in groundwater levels during
 3 construction; offsetting water supply losses attributable to construction dewatering activities;
 4 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
 5 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 6 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 7 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 8 through off-site easements or other agricultural land conservation interests. However, these impacts
 9 remain significant and unavoidable after implementation of these measures because (i) replacement
 10 water supplies associated with losses attributable to construction dewatering activities may not
 11 meet the preexisting demands or planned land use demands of the affected party, (ii) seepage
 12 minimization may be infeasible in some instances, (iii) the feasibility and effectiveness of phased
 13 actions to reduce EC levels is uncertain, (iv) conservation or preservation by means of acquiring
 14 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
 15 Important Farmland and (v) the proposed optional agricultural stewardship approach does not
 16 focus principally on physical effects, but rather, focuses on supporting the Delta as an evolving place
 17 by encouraging existing owners and operators to continue working on the land while maintaining
 18 the long-term viability of regional agricultural economies and the economic health of local
 19 governments and special districts in the Delta.

20 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 21 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 22 environmental commitment to address the potential increased water treatment costs that could
 23 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 24 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 25 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 26 water quality effects relating to chloride, electrical conductivity, and bromide.

27 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 28 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 29 **Subject to Williamson Act Contracts or in Farmland Security Zones**

30 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

31 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 32 **Dewatering**

33 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 34 Chapter 7, *Groundwater*.

35 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

36 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 37 Chapter 7, *Groundwater*.

38 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 39 **Quality Conditions**

40 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 41 in Chapter 8, *Water Quality*.

1 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 3 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
 4 **and 21**

5 Effects of Alternative 2C related to the conversion of Important Farmland and land subject to
 6 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 7 measures would be similar to those described for Alternative 1C. Alternative 2C would restore
 8 approximately 83,800 acres under conservation measures geared toward the restoration of various
 9 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

10 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 11 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 12 the land in conservation zones designated as Important Farmland and/or subject to Williamson Act
 13 contracts or in a Farmland Security Zones, it is anticipated that a substantial area of Important
 14 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 15 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 16 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 17 quality of the human environment, the related conversion of the underlying agricultural resource
 18 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 19 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 20 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 21 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 22 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 23 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 24 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

25 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 26 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 27 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 28 other conservation measures could result in conversion of a substantial amount of Important
 29 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 30 resulting in a significant impact on agricultural resources in the study area.

31 Further evaluation of these impacts would depend on additional information relating to the location
 32 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 33 reduce the severity of these impacts by implementing activities such as siting features to encourage
 34 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 35 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 36 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 37 through off-site easements or other agricultural land conservation interests. However, these impacts
 38 remain significant and unavoidable after implementation of this measure because (i) even after
 39 effects from the footprints of conservation measures are minimized through design, they would
 40 continue to require the conversion of substantial amounts of Important Farmland and land subject
 41 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 42 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 43 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 44 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 45 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural

1 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 2 desire of individual Delta farmers to continue working on their land, the long-term viability of
 3 regional agricultural economies, the economic health of local governments and special districts, and
 4 the Delta as an evolving place.

5 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 6 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 7 **Subject to Williamson Act Contracts or in Farmland Security Zones**

8 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

9 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 10 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

11 ***Effects on agriculture as a result of changes in groundwater elevation***

12 Implementation of these conservation measures could indirectly affect agriculture by causing
 13 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 14 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 15 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 16 restoration would result in increased groundwater recharge, which could result in groundwater
 17 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 18 severity of these effects are unknown and would depend on existing localized groundwater levels in
 19 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

20 ***Effects on agriculture as a result of changes in salinity***

21 Effects related to salinity under Alternative 2C would be similar to those described for Alternative
 22 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 23 these conservation measures would not introduce new sources of electrical conductivity into the
 24 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 25 anticipated to restrict agricultural uses in the study area.

26 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

27 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 28 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
 29 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
 30 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
 31 However, this effect is speculative and its potential severity would depend on site-specific
 32 conditions.

33 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

34 Effects related to disruption of infrastructure would be similar to those described under Alternative
 35 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 36 and the permanent footprints associated with land acquired for habitat restoration, could directly or
 37 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 38 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
 39 uses could be substantially restricted. However, the location and severity of this effect would
 40 depend on site-specific conditions.

1 ***Effects on agriculture as a result of increased frequency of inundation events***

2 Modified activities in the Yolo Bypass under Alternative 2C would be identical to those described in
 3 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
 4 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
 5 continues later in the spring, this could result in a delay in ground preparation and planting
 6 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
 7 longer duration could result in a change to crop yields and production, due to a variety of factors
 8 beyond delay in planting operations.

9 The new inundation schedule could substantially prevent agricultural use of these lands. The
 10 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
 11 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
 12 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
 13 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
 14 mitigate this effect.

15 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 16 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

17 Effects related to changes in agricultural practices and protection levels under Alternative 2C would
 18 be similar to those described for Alternative 1C. The cultivated lands natural community strategy
 19 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 20 agricultural use for covered species. While these effects would convert small areas of land to
 21 nonagricultural use and could change agricultural practices or yields across a large area,
 22 conservation measures would also support the continued use of land for agricultural purposes.
 23 Overall, this effect would not be anticipated to substantially restrict agricultural use.

24 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 25 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 26 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 27 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 28 evaluation of these effects would depend on additional information relating to the location of these
 29 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 30 and GW-5 will reduce the severity of these adverse effects.

31 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 32 alternative could create a significant impact on agriculture by converting substantial amounts of
 33 Important Farmland to other uses through changes to groundwater elevation and seepage,
 34 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 35 effects would depend on additional information relating to the location of these activities and other
 36 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 37 severity of these impacts by implementing activities such as siting features to encourage continued
 38 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 39 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 40 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 41 preserving agricultural land through off-site easements or other agricultural land conservation
 42 interests. However, these impacts remain significant and unavoidable after implementation of these
 43 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 44 preservation by means of acquiring agricultural land conservation interests, even at one-to-one

1 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 2 stewardship approach does not focus principally on physical effects, but rather, focuses on
 3 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 4 working on the land while maintaining the long-term viability of regional agricultural economies
 5 and the economic health of local governments and special districts in the Delta.

6 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 7 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 8 **Subject to Williamson Act Contracts or in Farmland Security Zones**

9 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

10 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

11 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 12 Chapter 7, *Groundwater*.

13 **14.3.3.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and**
 14 **Intakes 1 and 2 (6,000 cfs; Operational Scenario A)**

15 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 16 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 17 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

18 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 19 ***water conveyance facility***

20 Temporary and short-term effects on Important Farmland associated with construction of
 21 structures under Alternative 3 would be similar to those described for Alternative 1A except that
 22 Intakes 3, 4, and 5 would not be built. Construction of facilities under this alternative would
 23 necessitate temporary or short-term conversion of approximately 953 acres of Important Farmland
 24 to other uses, including 863 acres of Prime Farmland, 11 acres of Farmland of Statewide
 25 Importance, 20 acres of Unique Farmland, and 59 acres of Farmland of Local Importance. Table 14-8
 26 displays a summary of temporary and short-term acreage and permanent acreage of Important
 27 Farmland that could be converted to non-agricultural uses under implementation of each
 28 alternative.

29 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 30 ***conveyance facility***

31 Permanent effects on Important Farmland associated with construction of structures under
 32 Alternative 3 would be similar to those described for Alternative 1A except that Intakes 3, 4, and 5
 33 would not be built. Construction of facilities under this alternative would necessitate conversion of
 34 approximately 4,838 acres of Important Farmland to other uses, including 3,331 acres of Prime
 35 Farmland, 330 acres of Farmland of Statewide Importance, 1,053 acres of Unique Farmland, and 124
 36 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term
 37 acreage and permanent acreage of Important Farmland that could be converted to non-agricultural
 38 uses under implementation of each alternative.

1 **Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland**
 2 **Security Zones as a result of constructing the proposed water conveyance facility**

3 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
 4 Security Zones associated with construction of structures under Alternative 3 would be similar to
 5 those described for Alternative 1A except that Intakes 3, 4, and 5 would not be built. Construction of
 6 facilities under this alternative would necessitate temporary or short-term conversion of
 7 approximately 722 acres of land subject to Williamson Act contracts, including 77 acres in Farmland
 8 Security Zones. Table 14-9 displays a summary of temporary and short-term acreage and permanent
 9 acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be
 10 converted to non-agricultural uses under implementation of each alternative.

11 **Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a**
 12 **result of constructing the proposed water conveyance facility**

13 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
 14 associated with construction of structures under Alternative 3 would be similar to those described
 15 for Alternative 1A except that Intakes 3, 4, and 5 would not be built. Construction of facilities under
 16 this alternative would necessitate conversion of approximately 2,813 acres of land subject to
 17 Williamson Act contracts, including 643 acres in Farmland Security Zones. Table 14-9 displays a
 18 summary of temporary and short-term acreage and permanent acreage of land subject to
 19 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
 20 uses under implementation of each alternative.

21 **NEPA Effects:** The temporary and short-term conversion and permanent conversion of Important
 22 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
 23 agricultural uses, as discussed above, would constitute an adverse effect on the physical
 24 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
 25 along with Mitigation Measure AG-1, would be available to reduce these effects.

26 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
 27 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 28 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 29 construction. Temporary and short-term construction of facilities would convert approximately 953
 30 acres of Important Farmland and 722 acres of land subject to Williamson Act contracts or in
 31 Farmland Security Zones to other uses. Physical structures would also permanently convert
 32 approximately 4,838 acres of Important Farmland and 2,813 acres of land subject to Williamson Act
 33 contracts or in Farmland Security Zones to other uses. These are considered significant impacts on
 34 the environment. However, implementation of Mitigation Measure AG-1 along with an
 35 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
 36 would reduce these impacts by implementing activities such as siting project footprints to
 37 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
 38 support of continued agricultural activities; engaging counties, owners/operators, and other
 39 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 40 agricultural land through off-site easements or other agricultural land conservation interests.
 41 However, these impacts remain significant and unavoidable after implementation of this measure
 42 because (i) even after effects from the footprints of project facilities are minimized through design,
 43 they would continue to require the conversion of substantial amounts of Important Farmland and
 44 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 45 preservation by means of acquiring agricultural land conservation interests, even at one-to-one

1 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 2 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 3 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 4 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 5 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 6 viability of regional agricultural economies, the economic health of local governments and special
 7 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 8 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

9 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 10 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 11 **Subject to Williamson Act Contracts or in Farmland Security Zones**

12 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

13 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 14 **Proposed Water Conveyance Facility**

15 ***Effects on agriculture as a result of changes in groundwater elevation***

16 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 17 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 18 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 19 those identified under Alternative 1A, Impact AG-2. However, temporarily lower groundwater levels
 20 related to dewatering for pumping plant construction associated with Intakes 3, 4, and 5 would not
 21 apply to this alternative. These effects could restrict or prevent agricultural uses on land in these
 22 areas.

23 ***Effects on agriculture as a result of changes in salinity***

24 Under Alternative 3, the operation of new physical facilities combined with hydrodynamic effects of
 25 habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing
 26 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
 27 operation of the water conveyance facility would generally result in a fewer number of days when
 28 water at compliance locations relevant to agriculture would exceed or be out of compliance with
 29 electrical conductivity objectives. Where salinity levels decrease, higher quality irrigation water
 30 could benefit agricultural activities by reducing potential restrictions related to yields and crop
 31 selection. However, the compliance point on the Sacramento River at Emmaton in the western Delta
 32 and San Joaquin River at San Andreas Landing in the interior Delta are two exceptions. The percent
 33 of days the Emmaton EC objective would be exceeded for the entire period modeled (1976–1991)
 34 would increase from 6% under Existing Conditions to 27% under Alternative 3, and the days out of
 35 compliance with the EC objective would increase from 11% to 39%. The San Andreas Landing
 36 objective would increase from 1% to 2% of days in exceedance, and from 1% to 4% of days out of
 37 compliance with the EC objective. Average EC levels would decrease at western and southern Delta
 38 compliance locations, except at Emmaton in the western Delta, and would increase at the two
 39 interior Delta compliance locations. At Emmaton, average EC would increase by 14% for the entire
 40 period modeled and 12% for the drought period modeled. Over the entire period modeled, the S.
 41 Fork Mokelumne River at Terminous average EC would increase 4% and the San Joaquin River at
 42 San Andreas Landing average EC would increase 12% to 0.444 dS/m. Modeling of drought years

1 estimates EC reaching as high as 1.621 dS/m at the Emmaton compliance location. Increased salinity
2 levels suggest that a number of crops using this irrigation water may not be able to reach full yields,
3 as reported in Table 14-6. In general, agricultural activities would be anticipated to continue on
4 lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
5 *Water Quality*, Section 8.3.3.8, Impact WQ-11 and Appendix 8H, Tables EC-3 and EC-14.

6 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

7 Conflicts with existing irrigation and drainage facilities as a result of constructing the water
8 conveyance facility would be similar to those described under Alternative 1A. The conveyance
9 alignment constructed under this alternative would cross or interfere with approximately 37 miles
10 of agricultural delivery canals and drainage ditches, including approximately 7 miles on Victoria
11 Island, 5 miles on Bacon Island, 4 miles on Byron Tract, and 4 miles on Tyler Island. Where irrigation
12 or drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
13 the land could be jeopardized.

14 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
15 under this alternative could create indirect but adverse effects on agriculture by converting
16 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
17 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
18 related to water quality could be adverse or beneficial, depending on the location. Implementation
19 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
20 effects.

21 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
22 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
23 uses through changes to groundwater elevation in localized areas and disruption of drainage and
24 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
25 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
26 will reduce the severity of these impacts by implementing activities such as siting project footprints
27 to encourage continued agricultural production; monitoring changes in groundwater levels during
28 construction; offsetting water supply losses attributable to construction dewatering activities;
29 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
30 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
31 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
32 developing optional agricultural stewardship approaches; and/or preserving agricultural land
33 through off-site easements or other agricultural land conservation interests. However, these impacts
34 remain significant and unavoidable after implementation of these measures because (i) replacement
35 water supplies associated with losses attributable to construction dewatering activities may not
36 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
37 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
38 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
39 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
40 stewardship approach does not focus principally on physical effects, but rather, focuses on
41 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
42 working on the land while maintaining the long-term viability of regional agricultural economies
43 and the economic health of local governments and special districts in the Delta.

1 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 2 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 3 environmental commitment to address the potential increased water treatment costs that could
 4 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 5 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 6 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 7 water quality effects relating to chloride, electrical conductivity, and bromide.

8 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 9 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 10 **Subject to Williamson Act Contracts or in Farmland Security Zones**

11 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

12 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 13 **Dewatering**

14 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 15 Chapter 7, *Groundwater*.

16 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

17 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 18 Chapter 7, *Groundwater*.

19 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 20 **Quality Conditions**

21 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 22 in Chapter 8, *Water Quality*.

23 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 24 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 25 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
 26 **and 21**

27 Effects of Alternative 3 related to the conversion of Important Farmland and land subject to
 28 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 29 measures would be similar to those described for Alternative 1A. Alternative 3 would restore
 30 approximately 83,800 acres under conservation measures geared toward the restoration of various
 31 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

32 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 33 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 34 the land in conservation zones designated as Important Farmland and/or subject to Williamson Act
 35 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
 36 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 37 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 38 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 39 quality of the human environment, the related conversion of the underlying agricultural resource

1 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 2 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 3 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 4 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 5 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 6 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 7 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

8 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 9 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 10 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 11 other conservation measures could result in conversion of a substantial amount of Important
 12 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 13 resulting in a significant impact on agricultural resources in the study area.

14 Further evaluation of these impacts would depend on additional information relating to the location
 15 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 16 reduce the severity of these impacts by implementing activities such as siting features to encourage
 17 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 18 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 19 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 20 through off-site easements or other agricultural land conservation interests. However, these impacts
 21 remain significant and unavoidable after implementation of this measure because (i) even after
 22 effects from the footprints of conservation measures are minimized through design, they would
 23 continue to require the conversion of substantial amounts of Important Farmland and land subject
 24 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 25 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 26 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 27 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 28 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 29 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 30 desire of individual Delta farmers to continue working on their land, the long-term viability of
 31 regional agricultural economies, the economic health of local governments and special districts, and
 32 the Delta as an evolving place.

33 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 34 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 35 **Subject to Williamson Act Contracts or in Farmland Security Zones**

36 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

37 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 38 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

39 ***Effects on agriculture as a result of changes in groundwater elevation***

40 Implementation of these conservation measures could indirectly affect agriculture by causing
 41 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 42 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 43 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain

1 restoration would result in increased groundwater recharge, which could result in groundwater
2 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
3 severity of these effects are unknown and would depend on existing localized groundwater levels in
4 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

5 ***Effects on agriculture as a result of changes in salinity***

6 Effects related to salinity under Alternative 3 would be similar to those described for Alternative 1A,
7 Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
8 these conservation measures would not introduce new sources of electrical conductivity into the
9 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
10 anticipated to restrict agricultural uses in the study area.

11 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

12 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
13 conservation measures would be similar to those described under Alternative 3, Impact AG-4. Under
14 this alternative, the restoration of large areas of tidal habitat could create a localized climate that
15 would be less supportive of crop yields adjacent to areas chosen for habitat restoration. However,
16 this effect is speculative and its potential severity would depend on site-specific conditions.

17 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

18 Effects related to disruption of infrastructure would be similar to those described under Alternative
19 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
20 and the permanent footprints associated with land acquired for habitat restoration, could directly or
21 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
22 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
23 uses could be substantially restricted. However, the location and severity of this effect would
24 depend on site-specific conditions.

25 ***Effects on agriculture as a result of increased frequency of inundation events***

26 Modified activities in the Yolo Bypass under Alternative 3 would be identical to those described in
27 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
28 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
29 continues later in the spring, this could result in a delay in ground preparation and planting
30 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
31 longer duration could result in a change to crop yields and production, due to a variety of factors
32 beyond delay in planting operations.

33 The new inundation schedule could substantially prevent agricultural use of these lands. The
34 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
35 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
36 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
37 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
38 mitigate this effect.

1 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 2 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

3 Effects related to changes in agricultural practices and protection levels under Alternative 3 would
 4 be similar to those described for Alternative 1A. The cultivated lands natural community strategy
 5 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 6 agricultural use for covered species. While these effects would convert small areas of land to
 7 nonagricultural use and could change agricultural practices or yields across a large area,
 8 conservation measures would also support the continued use of land for agricultural purposes.
 9 Overall, this effect would not be anticipated to substantially restrict agricultural use.

10 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 11 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 12 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 13 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 14 evaluation of these effects would depend on additional information relating to the location of these
 15 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 16 and GW-5 will reduce the severity of these adverse effects.

17 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 18 alternative could create a significant impact on agriculture by converting substantial amounts of
 19 Important Farmland to other uses through changes to groundwater elevation and seepage,
 20 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 21 effects would depend on additional information relating to the location of these activities and other
 22 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 23 severity of these impacts by implementing activities such as siting features to encourage continued
 24 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 25 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 26 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 27 preserving agricultural land through off-site easements or other agricultural land conservation
 28 interests. However, these impacts remain significant and unavoidable after implementation of these
 29 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 30 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 31 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 32 stewardship approach does not focus principally on physical effects, but rather, focuses on
 33 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 34 working on the land while maintaining the long-term viability of regional agricultural economies
 35 and the economic health of local governments and special districts in the Delta.

36 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 37 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 38 **Subject to Williamson Act Contracts or in Farmland Security Zones**

39 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

40 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

41 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 42 Chapter 7, *Groundwater*.

14.3.3.9 Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H)

Alternative 4 would result in temporary effects on agricultural land in the study area associated with construction of three intakes and intake pumping plants, and other associated facilities; two forebays; conveyance pipelines; and tunnels. Nearby areas would be altered as work or staging areas, concrete batch plants, fuel stations, or be used for spoils storage areas. Transmission lines, access roads, and other incidental facilities would also be needed for operation of the project and construction of these structures would have temporary or short-term effects on agricultural lands.

Implementation of Alternative 4 would also result in permanent conversion of agricultural lands to nonagricultural uses associated with the three intakes and intake pumping plants and other associated facilities; two forebays; and tunnel shafts. Other project features that would result in conversion of agricultural lands include soil borrow, spoil, dredged material, and RTM storage areas; power transmission structures; and access roads. Temporary and permanent features associated

Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security Zones as a Result of Constructing the Proposed Water Conveyance Facility

Temporary and short-term conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Temporary and short-term construction of water conveyance facilities associated with Alternative 4 would convert existing agricultural land to construction-related uses, directly precluding agricultural use for the duration of construction. This alternative would result in the temporary or short-term conversion of approximately 1,315 acres of Important Farmland to other uses, including 955 acres of Prime Farmland, 70 acres of Farmland of Statewide Importance, 53 acres of Unique Farmland, and 237 acres of Farmland of Local Importance.

Of these acres of Important Farmland, intake work areas, adjacent to the proposed intakes and pumping plants, would require the short-term conversion of approximately 410 acres near the east bank of the Sacramento River between Freeport and Courtland. Other temporary work areas, including those necessary for the construction of tunnels and transmission lines, would be located throughout the conveyance alignment. Mapbook Figure M14-7 shows all of the construction features (including temporary work areas) associated with this proposed water conveyance facility alignment along with Important Farmland. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Permanent conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Physical structures associated with construction of water conveyance facilities and borrow, spoils, and RTM areas would occupy agricultural lands designated as Important Farmland, directly precluding future agricultural use. The facilities associated with this alternative could convert approximately 4,975 acres of Important Farmland to project uses, including 4,281 acres of Prime Farmland, 158 acres of Farmland of Statewide Importance, 339 acres of Unique Farmland, and 197 acres of Farmland of Local Importance.

1 Of these acres of Important Farmland, the forebays constructed under this alternative would,
2 together, convert more than 860 acres to nonagricultural uses. The intermediate forebay would be
3 located north of Twin Cities Road, between the Sacramento River and Interstate 5. The Clifton Court
4 Forebay would be expanded to the south of the existing water surface area. RTM areas would
5 require nearly 3,160 acres and would be located adjacent to tunnel shafts including sites just north
6 of Intake 2, several parcels west of Interstate 5 near the intermediate forebay, on northern Staten
7 Island, on southern Staten Island, on southwestern Bouldin Island, and on Byron Tract west of
8 Clifton Court Forebay. The site west of Clifton Court Forebay would also act as a storage area for
9 dredged material. Activities associated with tunneling are likely to occur across multiple years at
10 RTM storage areas. Additional time would then be required for dewatering, chemical
11 characterization, and material storage. However, through implementation of an environmental
12 commitment to reuse RTM and dredged material or dispose of it at appropriate facilities, as
13 described in Appendix 3B, *Environmental Commitments*, it is anticipated that the material would be
14 removed from these areas and applied, as appropriate, as bulking material for levee maintenance, as
15 fill material for habitat restoration projects, or other beneficial means of reuse identified for the
16 material. Following removal of material, stockpiled topsoil at RTM storage areas would be reapplied,
17 and disturbed areas will be returned as near as feasible to preconstruction conditions by carefully
18 grading to re-establish surface conditions and reconstructing features such as irrigation and
19 drainage facilities. Approximately 240 acres would be required for the intake pumping plant sites
20 and about 200 acres would be converted to a borrow or spoil area north of Intake 2. Mapbook
21 Figure M14-7 shows all of the construction features (including temporary work areas) associated
22 with this proposed water conveyance facility alignment along with Important Farmland. Table 14-8
23 displays a summary of temporary and short-term acreage and permanent acreage of Important
24 Farmland that could be converted to non-agricultural uses under implementation of each
25 alternative.

26 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
27 ***Security Zones as a result of constructing the proposed water conveyance facility***

28 Temporary or short-term construction activities related to building the physical components of
29 Alternative 4 would directly convert land subject to Williamson Act contracts or in Farmland
30 Security Zones. The facilities associated with this alternative could convert approximately 837 acres
31 of land subject to Williamson Act contracts, including 115 acres in Farmland Security Zones. For
32 further discussion of potential incompatibilities with land use policies, see Chapter 13, *Land Use*,
33 Impact LU-1.

34 Of this land subject to Williamson Act contracts or in Farmland Security Zones, intake work areas,
35 adjacent to the proposed intakes and pumping plants, would require the short-term conversion of
36 approximately 150 acres near the east bank of the Sacramento River between Freeport and
37 Courtland. Barge unloading facilities would require short-term conversion of approximately 20
38 acres and would be located on eastern Byron Tract on Italian Slough, northwestern Victoria Island
39 on Old River, northern Bacon Island on Connection Slough, southwestern Bouldin Island on San
40 Joaquin River, and southern Staten Island on South Mokelumne River. Other temporary work areas,
41 including those necessary for the construction of tunnels, conveyance of RTM, and transmission
42 lines, would be located throughout the conveyance alignment. Mapbook Figure M14-8 shows all of
43 the construction features (including temporary work areas) associated with this proposed water
44 conveyance facility alignment along with land subject to Williamson Act contracts or in Farmland
45 Security Zones. Table 14-9 displays a summary of temporary and short-term acreage and permanent

1 acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be
2 converted to non-agricultural uses under implementation of each alternative.

3 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
4 ***result of constructing the proposed water conveyance facility***

5 Physical components of Alternative 4 would directly and permanently convert land subject to
6 Williamson Act contracts or in Farmland Security Zones to non-agricultural uses. The facilities
7 associated with this alternative could convert approximately 3,080 acres of land subject to
8 Williamson Act contracts, including 19 acres in Farmland Security Zones. For further discussion of
9 potential incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-1.

10 Of this land subject to Williamson Act contracts or in Farmland Security Zones, RTM areas would
11 require more than 2,200 acres and would be located adjacent to tunnel shafts including sites just
12 north of Intake 2, several parcels west of Interstate 5 near the intermediate forebay, on northern
13 Staten Island, on southern Staten Island, on southwestern Bouldin Island, and on Byron Tract west
14 of Clifton Court Forebay. While these are considered permanent surface impacts for the purposes of
15 impact analysis, it is anticipated that the RTM would be removed from these areas and reused, as
16 appropriate, as bulking material for levee maintenance, as fill material for habitat restoration
17 projects, or other beneficial means of reuse identified for the material, as described above and in
18 Appendix 3B, *Environmental Commitments*. Approximately 150 acres would be converted to a
19 borrow or spoil area north of Intake 2. The intermediate forebay and associated spillway area
20 constructed under this alternative would, together, convert approximately 240 acres to
21 nonagricultural uses. The intermediate forebay would be located north of Twin Cities Road, between
22 the Sacramento River and Interstate 5. Mapbook Figure M14-8 shows all of the construction features
23 (including temporary work areas) associated with this proposed water conveyance facility
24 alignment along with land subject to Williamson Act contracts or in Farmland Security Zones. Table
25 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land
26 subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-
27 agricultural uses under implementation of each alternative.

28 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
29 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
30 agricultural uses, as discussed above, would constitute an adverse effect on the physical
31 environment. Disposal and reuse of RTM and dredged material (described in Appendix 3B,
32 *Environmental Commitments*), along with Mitigation Measure AG-1, would be available to reduce
33 these effects.

34 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
35 proposed under this alternative would occupy Important Farmland and land subject to Williamson
36 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
37 construction. Temporary and short-term construction of facilities would convert approximately
38 1,315 acres of Important Farmland and 837 acres of land subject to Williamson Act contracts or in
39 Farmland Security Zones to other uses. Physical structures would also permanently convert
40 approximately 4,975 acres of Important Farmland and 3,080 acres of land subject to Williamson Act
41 contracts or in Farmland Security Zones to other uses. As described above and in Appendix 3B,
42 *Environmental Commitments*, it is anticipated that the RTM and dredged material would be removed
43 from RTM storage areas (which represent a substantial portion of the permanent impact areas) and
44 reused, as appropriate, as bulking material for levee maintenance, as fill material for habitat

1 restoration projects, or other beneficial means of reuse identified for the material. Because these
 2 activities would convert a substantial amount of Important Farmland and land subject to Williamson
 3 Act contracts or in Farmland Security Zones to non-agricultural uses, however, they are considered
 4 significant impacts on the environment. Implementation of Mitigation Measure AG-1 would reduce
 5 these impacts by implementing activities such as siting project footprints to encourage continued
 6 agricultural production; relocating or replacing agricultural infrastructure in support of continued
 7 agricultural activities; engaging counties, owners/operators, and other stakeholders in developing
 8 optional agricultural stewardship approaches; and/or preserving agricultural land through off-site
 9 easements or other agricultural land conservation interests. However, these impacts remain
 10 significant and unavoidable after implementation of this measure because (i) even after effects from
 11 the footprints of project facilities are minimized through design, they would continue to require the
 12 conversion of substantial amounts of Important Farmland and land subject to Williamson Act
 13 contracts or in Farmland Security Zones, (ii) conservation or preservation by means of acquiring
 14 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
 15 Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones and
 16 (iii) the proposed optional agricultural stewardship approach does not focus principally on physical
 17 effects, but rather, focuses on supporting the Delta as an evolving place by encouraging existing
 18 owners and operators to continue working on the land while maintaining the long-term viability of
 19 regional agricultural economies and the economic health of local governments and special districts
 20 in the Delta. For further discussion of potential incompatibilities with land use designations, see
 21 Chapter 13, *Land Use*, Impact LU-1.

22 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 23 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 24 **Subject to Williamson Act Contracts or in Farmland Security Zones**

25 The BDCP proponents shall develop ALSPs (i) prior to the commencement of any construction
 26 activities or other physical activities associated with Conservation Measure 1 that would involve
 27 adverse effects (under NEPA) or significant effects (under CEQA) on Important Farmland or
 28 land subject to Williamson Act contracts or in Farmland Security Zones, and (ii) as part of the
 29 site-specific environmental review for all other conservation measures or other site-specific
 30 project activities that could involve adverse effects (under NEPA) or significant effects (under
 31 CEQA) on Important Farmland or land subject to Williamson Act contracts or in Farmland
 32 Security Zones. For each conservation measure or site-specific project activity other than
 33 Conservation Measure 1 that would cause such effects, a draft ALSP shall be included with any
 34 publicly circulated environmental document for the proposed conservation measure or project
 35 activity in order to obtain public input. The Plans shall contain the three elements identified
 36 below for this measure. If a programmatic ALSP is developed for the BDCP, parts of the BDCP,
 37 the Delta or parts of the Delta, BDCP proponents may rely on these plans to the extent that they
 38 include all the elements in this measure.

39 **Mitigation Measure AG-1a: Promote Agricultural Productivity of Important Farmland**

40 The BDCP proponents shall ensure that the following measures are implemented to reduce
 41 adverse effects and/or significant effects as described above if the measures are applicable and
 42 feasible. Not all measures listed below may be feasible or applicable to each conservation
 43 measure or to individual parts of each conservation measure. Rather, these measures serve as
 44 an overlying mitigation framework to be used for mitigation of impacts caused by the

1 implementation of specific conservation measures. The applicability of measures listed below
 2 would vary based on the location, timing, nature, and feasibility of each measure.

3 ● Early Planning

- 4 ○ Describe the current land use in the project area and identify acreage of all land devoted
 5 to agricultural use, including farmland of local importance, grazing land, and confined
 6 animal agriculture.
- 7 ○ Describe the extent to which the project can be part of or complement existing or
 8 planned land uses for the Delta. For BDCP, this means consulting with county
 9 governments, the Delta Protection Commission, the Delta Conservancy and other
 10 individuals and organizations that are considering plans or activities designed for
 11 agricultural use; flood management; mitigation and enhancement relating to aquatic and
 12 terrestrial habitat; recreation; and tourism. This consultation is particularly important
 13 when there are multiple uses being considered for one specific area of land, but it is also
 14 important to look at how the project affects or fits into other plans for the region or sub-
 15 regions where the project is located.
- 16 ○ Project proponents should consult with farmers, local agencies and other State and
 17 federal agencies, including the California Natural Resources Agency, the California
 18 Department of Water Resources, the Central Valley Flood Protection Board, the
 19 California Department of Conservation, the California Department of Food and
 20 Agriculture, the California Department of Fish and Wildlife, the Delta Stewardship
 21 Council, the California Delta Protection Commission, the Delta Conservancy, the United
 22 States Fish and Wildlife Service, the National Marine Fisheries Service, and the U.S.
 23 Department of Agriculture, including the Natural Resources Conservation Service, to
 24 identify design features of the project, if any, that will benefit flood management,
 25 agricultural and natural resources.
- 26 ○ Consider whether the proposed land use is consistent with State, regional and local
 27 plans. For the BDCP, this could include local General Plans, the Delta Protection
 28 Commission's Land Use and Resource Management Plan and Economic Strategy, the
 29 Delta Stewardship Council's Delta Plan, the California Water Plan Agriculture Strategy,
 30 the Delta Conservancy Strategy, the California Department of Food and Agriculture's Ag
 31 Vision; the California Natural Resources Agency's California Climate Adaptation Plan,
 32 and the California Fish and Wildlife Strategic Vision;
- 33 ○ Consider whether agriculture and/or habitat management activities undertaken
 34 pursuant to the proposed land use are consistent with State and local policies relating
 35 to flood protection and whether they might provide additional protection because, for
 36 example, they (i) provide flood management activities that provide additional
 37 protection for agricultural activities or (ii) prevent or divert potential higher
 38 groundwater levels that would thwart flood control efforts

39 ● Site Related Avoidance and Mitigation

- 40 ○ Site projects and project footprints to minimize the permanent conversion of Important
 41 Farmland, to nonagricultural uses.
- 42 ○ When identifying and selecting project areas, give priority to public lands and existing
 43 conservation lands.

- 1 ○ Where choices are possible among or between particular parcels or lands that are
2 available for a project, project proponents should look at the characteristics of the
3 different parcels or lands to determine whether one choice would be better from an
4 agricultural resource perspective. If choices can be made regarding different locations
5 for a project and still achieve the project purposes, it may be possible to avoid areas that
6 may have more value from an agricultural resources perspective such as whether the
7 property is (1) “high quality” farmland, (2) unique or has special values, (3) important
8 to maintaining viability of agriculture in a certain area, (4) important to maintaining
9 habitat lands in agriculture in a certain area.
- 10 ○ Manage project operations to minimize the introduction of invasive species or weeds
11 that may affect agricultural production on adjacent agricultural land.
- 12 ● Mitigate on Site
- 13 ○ Design projects so as to optimize contiguous parcels of agricultural land of a size
14 sufficient to support their efficient use for continued agricultural production.
- 15 ○ Where the construction or operation of a facility could limit access to ongoing
16 agricultural operations, maintain a means of convenient access to these agricultural
17 properties as part of project design, construction, and implementation.
- 18 ○ At borrow sites to be returned to agricultural production, remove and stockpile, at a
19 minimum, the upper 2 feet of topsoil and replace the topsoil after project completion as
20 part of borrow site reclamation.
- 21 ○ In areas permanently disturbed by project activities, and where topsoil is removed as
22 part of project construction (e.g., stripping topsoil under a levee foundation) and not
23 reused as part of the project, make the topsoil available to less productive agricultural
24 lands that could benefit from the introduction of good-quality soil.
- 25 ○ Relocate and/or replace wells, pipelines, power lines, drainage systems, and other
26 infrastructure that are needed for ongoing agricultural uses and would be adversely
27 affected by project construction or operation.
- 28 ○ Minimize disturbance of Important Farmland and continuing agricultural operations
29 during construction by (1) locating construction laydown and staging areas on sites that
30 are fallow, already developed or disturbed, or are to be discontinued for use as
31 agricultural land and (2) using existing roads to access construction areas.
- 32 ○ Consult with landowners and agricultural operators to develop appropriate
33 construction practices to minimize construction-related impairment of agricultural
34 productivity. Practices may include coordinating the movement of heavy equipment and
35 implementing traffic control measures.
- 36 ○ Consult with landowners and agricultural operators with the goal of sustaining existing
37 agricultural operations, at the landowners’ discretion, until the individual agricultural
38 parcels are needed for project construction.
- 39 ● Consult with landowners and agricultural operators on what role they can take if they wish
40 be involved in project development. Issues to consider include whether:
- 41 ○ Owner(s) or operator(s) could carry out project activities on their land. To the extent
42 that Important Farmland is part of the project, consideration should be given to

- 1 providing flexibility to the farmer. To the extent that Important Farmland is part of the
 2 project, consideration should also be given to developing working landscapes⁷ on
 3 project lands
- 4 ○ Some or all of the ownership interests on any project land could remain in private hands
 5 or in the hands of a private conservancy in order to keep the property in
 6 nongovernmental ownership and thereby on the County tax base;
 - 7 ○ Owner(s) and/or operator(s) of land displaced by project facilities and activities could
 8 maintain or obtain full or partial ownership of the land on which project activities will
 9 be carried out or could be compensated to manage said land;
 - 10 ○ Existing agricultural operations on lands could be modified, through such things as crop
 11 change, new integrated pest management strategies, altered water usage, or full or
 12 partial conversion to habitat uses, in a manner that renders such operations consistent
 13 with the goals and objectives of the project by enhancing environmental outcomes in a
 14 manner beneficial to species covered by the project;
 - 15 ○ Limited agriculture could take place within areas identified for habitat restoration
 16 under the project without undermining the achievement of the project goals and
 17 objectives;
 - 18 ○ Subsidies to allow economically viable rice farming on particular lands could be justified
 19 due to the environmental benefits of such rice farming such as the stabilization of
 20 subsiding areas or the creation of sinks for greenhouse gases and methylmercury;
 - 21 ○ Subsidies to assist the owner(s) and/or operator(s) to make a viable living managing
 22 wetlands or other habitat areas could be justified due to the environmental benefits of
 23 wetlands or habitat such as the stabilization of subsiding areas or the safer
 24 accumulation and isolation of greenhouse gases and methylmercury;
 - 25 ● Implementation
 - 26 ○ The plans should include a framework that encourages adaptive management with
 27 regard to agricultural land management.
 - 28 ○ The plans should include reporting and monitoring actions necessary to show that the
 29 actions agreed to were being carried out.

⁷ The Cal-Fed Working Landscapes Subcommittee of the Bay Delta Public Advisory Committee defined a working landscape as “a place where agriculture and other natural resource-based economic endeavors are conducted with the objective of maintaining the viability and integrity of its commercial and environmental values. On a working landscape, both private production, as well as public regulatory decisions account for the sustainability of families, businesses and communities, while protecting and enhancing the landscape’s ecological health. The working landscape is readily adaptable to change according to economic and ecosystem needs. With respect to CALFED, a working landscape is both an objective and a means to achieve it. A working landscape is efficiently managed largely by private agricultural landowners and managers who are supported and encouraged to manage their lands in ways that fulfill CALFED goals, allowing them to pursue ecological health goals while yielding economic returns on investments, and generating tax revenues that support their local governments” (California Bay-Delta Public Advisory Committee 2002).

1 **Mitigation Measure AG-1b: Minimize Impacts on Land Subject to Williamson Act Contracts**
 2 **or in Farmland Security Zones**

3 The BDCP proponents shall ensure that the following measures are implemented as applicable
 4 to reduce effects and preserve agricultural uses on land subject to Williamson Act contracts or in
 5 Farmland Security Zones:

- 6 ● The BDCP proponents shall comply with applicable provisions of California Government
 7 Code Sections 51290–51295 with regard to acquiring land subject to Williamson Act
 8 contracts. Sections 51290(a) and 51290(b) specify that State policy, consistent with the
 9 purpose of the Williamson Act to preserve and protect agricultural land, is to avoid locating
 10 public improvements and any public utilities improvements in agricultural preserves,
 11 whenever feasible. If it is infeasible to locate such improvements outside of a preserve, they
 12 shall be located on land that is not under contract, if feasible.
- 13 ● More specifically, the BDCP proponents shall comply with the following basic requirements
 14 stated in the California Government Code:
 - 15 ○ Whenever it appears that land within a preserve or under contract may be required for
 16 a public improvement, the DOC and the city or county responsible for administering the
 17 preserve must be notified (Section 51291(b)).
 - 18 ○ Within 30 days of being notified, DOC and the city or county must forward comments,
 19 which will be considered by the proponents of the public improvement (Section
 20 51291(b)).
 - 21 ○ A public improvement generally may not be located within an agricultural preserve
 22 unless the BDCP proponents make findings to the effect that (1) the location is not based
 23 primarily on the lower cost of acquiring land in an agricultural preserve and (2) for
 24 agricultural land covered under a contract for any public improvement, no other land
 25 exists within or outside the preserve where it is reasonably feasible to locate the public
 26 improvement (Sections 51921(a) and 51921(b)). Findings do not need be made if the
 27 action falls within one of the exemptions in Section 51293. The contract is normally
 28 terminated when land is acquired by eminent domain or in lieu of eminent domain
 29 (Section 51295).
 - 30 ○ DOC must be notified within 10 working days upon completion of the acquisition
 31 (Section 51291(c)).
 - 32 ○ DOC and the city or county must be notified before completion of any proposed work of
 33 any significant changes related to the public improvement (Section 51291(d)).
 - 34 ○ If, after acquisition, the acquiring public agency determines that the property would not
 35 be used for the proposed public improvement, DOC and the city or county administering
 36 the involved preserve must be notified before the land is returned to private ownership.
 37 The land will be reenrolled in a new contract or encumbered by an enforceable
 38 restriction at least as restrictive as that provided by the Williamson Act (Section 51295).
 - 39 ○ Work with the county where Williamson Act land is located to expand Williamson Act
 40 authorized uses to include open space/habitat lands in Williamson Act Preserves.

1 **Mitigation Measure AG-1c: Consideration of an Optional Agricultural Land Stewardship**
2 **Approach or Conventional Mitigation Approach**

3 Where project proponents have determined that compliance with Mitigation Measures AG-1a
4 and AG-1b is not sufficient to mitigate to a less than significant or adverse level the impacts from
5 the conversion of Important Farmland or of land subject to Williamson Act contracts or in
6 Farmland Security Zones, they shall undertake additional feasible mitigation pursuant to this
7 measure (AG-1c).

8 Exceptions to this requirement shall apply where the mitigation already being required for the
9 biological resource values for the land at issue (e.g., for its value as habitat for Swainson's hawk)
10 pursuant to the cultivated lands natural community strategy of Conservation Measure 3 already
11 requires the equivalent of 1:1 mitigation (based on the net area of land remaining in agriculture)
12 for impacts to Important Farmland or of land subject to Williamson Act contracts or in Farmland
13 Security Zones, provided that the easements for biological values also incorporate agricultural
14 preservation.

15 The BDCP proponents shall determine the nature and form of any necessary additional
16 mitigation after consultation with, at least, all of the following: (i) the County in which the
17 affected property is located; (ii) the owner(s) and/or operator(s) of said property; (iii) the
18 California Natural Resources Agency; (iv) the California Department of Water Resources; (v) the
19 Central Valley Flood Protection Board; (vi) the California Department of Conservation; (vii) the
20 California Department of Food and Agriculture; (viii) the California Department of Fish and
21 Wildlife; (ix) the Delta Stewardship Council; (x) the California Delta Protection Commission; (xi)
22 the Delta Conservancy; (xii) the United States Fish and Wildlife Service; (xiii) the National
23 Marine Fisheries Service; and (xiv) the U.S. Department of Agriculture, including the Natural
24 Resources Conservation Service. After consulting with these agencies, entities, and/or
25 individuals, the BDCP proponents shall determine whether or not, under the circumstances
26 surrounding the conversion of particular agricultural lands, the best overall approach to the
27 additional required mitigation is the conventional use of agricultural land conservation property
28 interests (see discussion below on Conventional Mitigation Approach). In making this
29 determination, the BDCP proponents shall give considerable weight to the willingness of the
30 County in which the affected property is located and the owner(s) and/or operator(s) of said
31 property to participate in an Optional Agricultural Land Stewardship Approach, which would
32 seek opportunities to protect and enhance agriculture in the Delta as part of the project
33 landscape and focus on maintaining economic activity on agricultural lands instead or in
34 conjunction with the Conventional Mitigation Approach for purposes of CEQA/NEPA mitigation.
35 Where the County and the owner(s) and/or operator(s) have a preference for participating in an
36 Optional Agricultural Land Stewardship Approach, the BDCP proponents shall attempt to
37 develop a feasible Optional Agricultural Land Stewardship alternative mitigation program
38 acceptable not only to the County and the owner(s) and/or operator(s), but also to the California
39 Department of Fish and Wildlife, the United States Fish and Wildlife Service, and the National
40 Marine Fisheries Service. Where the BDCP proponents, despite a good faith effort, cannot
41 succeed in achieving the consensus necessary to carry out a feasible Optional Agricultural Land
42 Stewardship Approach, they shall undertake instead a Conventional Mitigation Approach, where
43 necessary and feasible, based on the use of agricultural conservation property interests or other
44 measures requiring the preservation or, enhancement of other land of similar agricultural
45 quality in areas that are threatened with encroaching urban development.

1 Specific strategies that could be used in formulating an Optional Agricultural Land Stewardship
 2 Approach are described in Appendix 14B, *Agricultural Stewardship Strategies*. In determining
 3 the potential nature and form of an Optional Agricultural Land Stewardship Approach, the BDCP
 4 proponents shall, at a minimum, consider the following, as applicable:

- 5 ● whether there is Important Farmland in the Delta reasonably accessible to the BDCP
 6 proponents and/or to the owner(s) and/or operators for use for agriculture and/or habitat
 7 management in a manner consistent with the goals and objectives of the BDCP;
- 8 ● whether there is Important Farmland that might not remain in agriculture if it was not
 9 protected by means of an agricultural conservation property interest because of threats of
 10 urban development (e.g. in the secondary zone in the Delta) or wind/solar and other non-
 11 renewable energy projects, or the productive value of which is so high, it should remain in
 12 agriculture instead of being used for restoration or other open-space projects because, for
 13 example, it is:
 - 14 ○ unique or has special values
 - 15 ○ important to maintaining viability of agriculture in the region
 - 16 ○ critical to prevent a “tipping” point that could lead to elimination of a crop in the region
 - 17 ○ important to maintaining habitat lands in agriculture in the region
- 18 ● whether Agricultural Land Stewardship Strategies⁸ benefit agricultural lands by providing
 19 feasible CEQA/NEPA mitigation (or providing funding for such mitigation) for potential
 20 significant environmental agricultural impacts at both the farm and the regional level. In
 21 determining whether the funds necessary to make an Optional Agricultural Land
 22 Stewardship Approach feasible are available, the BDCP proponents shall be guided by the
 23 principle that funds that might otherwise be used for off-site preservation or another form
 24 of compensation may be made available instead to assist with making the Optional
 25 Agricultural Land Stewardship Approach work. Such strategies could include:
 - 26 ○ Potential strategies to help maintain farming in the Delta
 - 27 ■ Improve flood protection (Strategy 1)
 - 28 ■ Provide technical and financial assistance to help farmers maintain or improve
 29 agricultural production (Strategy 2)
 - 30 ■ Provide technical and financial assistance to help farmers comply with regulatory
 31 requirements for water quality (Strategy 3)
 - 32 ■ Control terrestrial weeds (Strategies 6a, 6b, and 6c)
 - 33 ■ Reduce conflict between agriculture and nearby habitat lands by creating a “good
 34 neighbor” policy (Strategy 7)
 - 35 ■ Work with other interests to explore the value of reinstating state funding of
 36 Williamson Act subventions (Strategy 8)

⁸ Strategies developed so far, and other materials relating to their development and implementation, can be found at <https://bdcpdf.water.ca.gov/home>. These are given as examples to consider at this time. It is expected that existing strategies will evolve and change over time and that additional strategies will be developed.

- 1 ▪ Work with counties to expand Williamson Act authorized uses to include open
- 2 space/habitat lands in Williamson Act Preserves (Strategy 9)
- 3 ▪ Investigate options for in lieu tax revenue for counties and payments for local
- 4 districts (Strategy 10)
- 5 ▪ Provide for Agricultural Conservation Easements (Strategy 11)
- 6 ○ Potential strategies that provide incentives for conservation on farmland
- 7 ▪ Partner with others to maintain and enhance environmental quality on farmland
- 8 (Strategy 12)
- 9 ▪ Compensate farmers to manage agricultural land as habitat for wildlife (Strategy 13)
- 10 ▪ Provide incentives for farmers to take part in a market-based conservation program
- 11 (Strategy 14)
- 12 ○ Potential strategies to manage land for purposes other than conventional crop
- 13 production
- 14 ▪ Provide technical and financial assistance to stabilize or reverse land subsidence on
- 15 Delta island (Strategy 15)
- 16 ▪ Assist landowners to produce and sell greenhouse gas offset credits in the AB 32
- 17 Cap-and-Trade program (Strategy 16)
- 18 ▪ Compensate farmers to manage habitat lands (Strategy 17)
- 19 ▪ Designate carbon sequestration and subsidence reversal crops as agricultural
- 20 production for regulatory and incentive programs (Strategy 18)
- 21 ○ Potential strategies that provide for economic development and other benefits
- 22 ▪ Provide technical and financial assistance to develop an economic study of
- 23 agricultural activity and related infrastructure (Strategy 19)
- 24 ▪ Provide technical and financial assistance for to promote economic development
- 25 (Strategy 20)
- 26 ▪ Provide technical and financial assistance to promote transportation infrastructure
- 27 improvements (Strategy 21)
- 28 ▪ Provide technical assistance to farmers to help in complying with the regulatory
- 29 framework present in the Delta (Strategy 22)
- 30 ▪ Provide technical, risk reduction, promotion, and financial assistance for farmers to
- 31 manage land to incorporate recreation and tourism (Strategy 23)
- 32 ▪ Work with others to better align the regulatory system to help farmers who engage
- 33 in ecological restoration and enhancement projects (Strategy 24)
- 34 ▪ Develop Agricultural Land Stewardship Plans (Strategy 25)
- 35 ● In addition, the BDCP proponents shall explore the following funding sources to implement
- 36 strategies that are in addition to those required under CEQA/NEPA in order to maintain
- 37 agriculture in the Delta. These strategies include those listed above for CEQA/NEPA
- 38 mitigation.

- 1 ○ Work with the California Air Resources Board (CARB) to establish a greenhouse gas
2 offset market using credits created through the development and restoration of
3 wetlands.
- 4 ○ Seek available funding from CARB's "Cap and Trade" program developed pursuant to
5 the Global Warming Act Solutions Act of 2006 (AB 32).
- 6 ○ Work with others to explore the value of reinstating state funding for Williamson Act
7 subventions from Cap and Trade Funding or other sources
- 8 ○ Consider recommending to the Governor and Legislature that funds for be included in
9 any bond measure(s) placed on the statewide ballot (e.g. the Delta Investment Fund
10 authorized by the Delta Reform Act).
- 11 ○ Work with other governmental and private entities to identify other funds that can be
12 used for the Optional Agricultural Land Stewardship Approach.

13 ***Strategy for implementing a Conventional Mitigation Approach.*** Where the BDCP
14 proponents, despite a good faith effort, cannot succeed in achieving the consensus necessary to
15 carry out a feasible Optional Agricultural Land Stewardship Approach, they shall undertake
16 instead, where necessary and feasible, a Conventional Mitigation Approach based on the
17 purchase of property interests in agricultural lands (e.g., conservation easements) or other
18 compensation arrangements (collectively referred to as "agricultural conservation property
19 interests"), requiring the preservation and/or enhancement of other land of similar agricultural
20 quality. The standard ratio for purchase of agricultural conservation property interests to
21 mitigate for permanently converted Important Farmland not included, as discussed above, as
22 part of mitigation for biological resources, shall be at a ratio of 1:1 for similar types of Important
23 Farmland.

24 Where feasible, mitigation shall generally result in the purchase of agricultural conservation
25 property interests, such as easements on other agricultural lands of the same overall quality and
26 acreage either directly or indirectly. The two preferred forms of mitigation in this context shall
27 be (i) the inclusion of sufficient acreages within agricultural preserves within BDCP lands to
28 satisfy CEQA and NEPA agricultural resource mitigation in addition to meeting BDCP objectives
29 under the Endangered Species Act and California's Natural Community Conservation Planning
30 Act and (ii) reliance on the California Farmland Conservancy Program or on other established
31 programs in the Delta supported by the county where the project is located, the Delta
32 Stewardship Council, the Delta Planning Commission, or the Delta Conservancy. Where the
33 BDCP proponents choose to rely on the latter strategy, they shall confirm, prior to submitting
34 funds into any program both (a) that the program meets the standards under CEQA case law for
35 a "reasonable mitigation plan" and (b) that they can spend the funds at issue for the
36 preservation and, where appropriate, the enhancement, of land that is reasonably proximate to
37 the land being impacted and of a similar quality or extent. Where these two preferred options
38 are unavailable or infeasible, the BDCP proponents shall be responsible for purchasing
39 agricultural conservation property interests on their own.

40 Where feasible, agricultural land conservation interests should be acquired in the county in
41 which the conversion will take place, provided that any such land either would be at-risk for
42 conversion from agricultural uses in the absence of such long-term protection, unless such
43 purchases would undermine the overall BDCP conservation strategy by potentially putting off-
44 limits lands that may be needed for habitat purposes during the permit duration of the BDCP

1 (i.e., up until 2060), or is not necessary for other habitat conservation plans. Thus, acquisition of
 2 such agricultural land conservation interests cannot be located in areas targeted for habitat
 3 restoration if doing so would thwart implementation of the long-term habitat restoration
 4 objectives of the BDCP.

5 Where a property identified for purchase of an agricultural land conservation interest serves
 6 non-agricultural purposes such as providing wildlife habitat or flood control or flood
 7 management benefits, the terms of the agricultural land conservation interest shall require the
 8 farm operator to continue to use the property in a manner that preserves these benefits (e.g., by
 9 continuing to support certain crop types known to provide, or be consistent with, such benefits)
 10 unless similar benefits are provided through some other means. The value of the agricultural
 11 land conservation interest would need to take such limitations on agricultural practices into
 12 account.

13 Where Important Farmland of the same caliber as the Important Farmland being converted is
 14 not available within the county in which the conversion will take place, the agricultural land
 15 conservation interest may occur in another county, with a preference for counties within the
 16 greater Sacramento metropolitan area, as long as the property to be purchased or encumbered
 17 is at-risk for conversion from agricultural uses to developed uses from encroaching urban
 18 development in the absence of such long-term protection, and as long as such purchase does not
 19 undermine the overall BDCP conservation strategy by potentially putting off-limits lands that
 20 may be needed for habitat purposes during the permit duration of the BDCP (i.e., up until 2060).

21 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the** 22 **Proposed Water Conveyance Facility**

23 ***Effects on agriculture as a result of changes in groundwater elevation***

24 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 25 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 26 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. Localized effects related to
 27 dewatering activities in the vicinity of intake pump stations and the expanded Clifton Court Forebay
 28 would temporarily lower groundwater levels by up to 10 feet and 20 feet, respectively. The pumping
 29 plants would be located just east of the Sacramento River, south of Freeport and north of Courtland.
 30 The area of expansion for the Clifton Court Forebay would be adjacent and south of the existing
 31 forebay. Groundwater would return to pre-pumping levels over the course of several months.
 32 During long-term operations of the water conveyance, increases in the groundwater level of 10 feet
 33 or more could also occur in the vicinity of the intermediate forebay and expanded area of the Clifton
 34 Court Forebay in the absence of design features to minimize seepage, due to groundwater recharge
 35 from these facilities (the intermediate forebay would be located on Glannvale Tract near Twin Cities
 36 Road). However, the forebays would be constructed to comply with the requirements of the DSD
 37 which includes design provisions to minimize seepage. These design provisions would minimize
 38 seepage under the embankments and onto adjacent properties. Once constructed and placed in
 39 operation, the operation of the forebays would be monitored to ensure seepage does not exceed
 40 performance requirements. In the event seepage were to exceed these performance requirements,
 41 the BDCP proponents would modify the embankments or construct seepage collection systems that
 42 would ensure any seepage from the forebays would be collected and conveyed back to the forebay
 43 or other suitable disposal site. However, operation of Alternative 4 would result in local changes in
 44 shallow groundwater flow patterns adjacent to the expanded Clifton Court Forebay, where

1 groundwater recharge from surface water would result in groundwater level increases. If existing
 2 agricultural drainage systems adjacent to the forebay are not adequate to accommodate the
 3 additional drainage requirements, operation of the forebay could interfere with agricultural
 4 drainage. Areas in which crop roots are exposed to a surplus of water could result in root rot,
 5 compromising the viability of certain crops, particularly those with deep roots (Refer to Section
 6 14.1, *Environmental Setting/Affected Environment*, for root depths by crop type). These effects could
 7 prevent agricultural uses on land in these areas.

8 ***Effects on agriculture as a result of changes in salinity***

9 Under Alternative 4, Scenarios H1-H4, the operation of new physical facilities combined with
 10 hydrodynamic effects of habitat restoration activities under CM2 and CM4, could indirectly affect
 11 agriculture by causing changes to the quality of irrigation water in parts of the study area. Relative
 12 to the No Action Alternative, operation of the water conveyance facility would result in an increase
 13 in the number of days when electrical conductivity objectives would be exceeded or out of
 14 compliance in some locations. Locations where these frequencies would increase include
 15 Sacramento River at Emmaton, San Joaquin River at San Andreas Landing, San Joaquin River at
 16 Jersey Point, Old River near Middle River, and Old River at Tracy Bridge.

17 The Sacramento River at Emmaton EC objective would be exceeded on 23–25% of days, compared
 18 with 12% under the No Action Alternative. The frequency at which this location would be out of
 19 compliance with the EC objective would increase from 22% of days (under the No Action
 20 Alternative) to 35–38% of days, depending on which operational scenario is implemented. The San
 21 Andreas Landing EC objective would be exceeded on 3–4% of days, compared with 1% under the No
 22 Action Alternative. The frequency at which this location would be out of compliance with the EC
 23 objective would increase from 1% of days (under the No Action Alternative) to 5–7% of days,
 24 depending on which operational scenario is implemented. The Old River at Tracy Bridge objective
 25 would be exceeded on 5–6% of days, compared with 4% of days under the No Action Alternative.
 26 The frequency at which this location would be out of compliance with the EC objective would
 27 increase from 8% of days (under the No Action Alternative) to 11–12% of days, depending on which
 28 operational scenario is implemented. The Old River near Middle River objective would be exceeded
 29 on 3% of days, the same as under the No Action Alternative (though there would be an increase in
 30 the total number of days in exceedance). The frequency at which this location would be out of
 31 compliance with the EC objective would increase from 7% of days (under the No Action Alternative)
 32 to 8% of days. Compared to the No Action Alternative, Scenarios H1–H3 would also result in an
 33 increase in the frequency of days out of compliance with the EC objective for San Joaquin River at
 34 Jersey Point. Scenario H4 would result in a small increase in days in which this objective would be
 35 exceeded but a decrease in the days in which it would be out of compliance.

36 Following implementation of Scenarios H1–H4, there would be a decrease in the number of days in
 37 which the EC objective at Sacramento River at Emmaton/Three Mile Slough near Sacramento River
 38 would be exceeded or out of compliance. There would be a decrease or no change in the frequency
 39 of days in exceedance or out of compliance at three other locations: S. Fork Mokelumne River at
 40 Terminous, San Joaquin River at Vernalis, and San Joaquin River at Brandt Bridge.

41 Average EC levels would decrease at western Delta compliance locations, except Emmaton under
 42 Scenarios H1 and H2, and would increase at the two interior Delta compliance locations and some
 43 south Delta compliance locations. Where salinity levels decrease, higher quality irrigation water
 44 could benefit agricultural activities by reducing potential restrictions related to yields and crop

1 selection. For the entire period modeled and the drought period modeled, average EC levels would
2 increase at Emmaton in the western Delta (Scenarios H1 and H2 only). For the entire period
3 modeled, average EC levels would also increase at interior and southern Delta locations; the average
4 EC increase would be 5-15% at interior Delta locations and 2% or less at southern Delta locations,
5 depending on the operations scenario (Chapter 8, *Water Quality*, Appendix 8H, Tables EC-15A
6 through EC-15D). During the drought period modeled, average EC would increase at interior and
7 southern Delta locations. The greatest average EC increase during the drought period modeled
8 would occur in the interior Delta in the San Joaquin River at San Andreas Landing (7–13%
9 depending on the operations scenario); the increase at the other locations would be <1–9%
10 (Chapter 8, *Water Quality*, Appendix 8H, Tables EC-15A through EC-15D). Modeling of drought years
11 estimates EC reaching levels as high as 1.644 dS/m at the Emmaton compliance location under
12 Scenario H1. The comparison to the No Action Alternative reflects changes in EC due only to the
13 different operational components of Scenarios H1-H4 of Alternative 4. Increased salinity levels
14 suggest that a number of crops using this irrigation water may not be able to reach full yields, as
15 reported in Table 14-6. In general, agricultural activities would be anticipated to continue on lands
16 using these sources. Complete water quality modeling results are discussed in Chapter 8, *Water*
17 *Quality*, Section 8.3.3.9, Impact WQ-11 and Appendix 8H, Tables EC-4 and EC-15A through EC-15D.

18 Relative to Existing Conditions, operation of the water conveyance facility would result in an
19 increase in the number of days when electrical conductivity objectives would be exceeded or out of
20 compliance in the Sacramento River at Emmaton, San Joaquin River at San Andreas Landing, Old
21 River near Middle River, and Old River at Tracy Bridge.

22 The percent of days the Emmaton EC objective would be exceeded for the entire period modeled
23 (1976–1991) would increase from 6% under Existing Conditions to 23–25%, depending on the
24 operational scenario, and the percent of days out of compliance would increase from 11% under
25 Existing Conditions to 35–38%, depending on the operational scenario. The San Andreas Landing EC
26 objective would be exceeded on 3–4% of days, compared with 1% under Existing Conditions. The
27 frequency at which this location would be out of compliance with the EC objective would increase
28 from 1% of days (under Existing Conditions) to 5–7% of days, depending on which operational
29 scenario is implemented. The Old River at Tracy Bridge objective would be exceeded on 5–6% of
30 days, compared with 4% of days under Existing Conditions. The frequency at which this location
31 would be out of compliance with the EC objective would increase from 10% of days (under Existing
32 Conditions) to 11–12% of days, depending on which operational scenario is implemented. The Old
33 River near Middle River objective would be exceeded on 3% of days, the same as under Existing
34 Conditions (though there would be an increase in the total number of days in exceedance). The
35 frequency at which this location would be out of compliance with the EC objective would not change
36 compared to Existing Conditions (8% of days out of compliance).

37 Compared to both Existing Conditions, there would be a decrease in the number of days in which the
38 EC objective in Sacramento River at Emmaton/Three Mile Slough near Sacramento River and the
39 objective in San Joaquin River at Jersey Point would be exceeded or out of compliance following
40 implementation of Scenarios H1–H4. There would be a decrease or no change in the frequency of
41 days in exceedance or out of compliance at three other locations: S. Fork Mokelumne River at
42 Terminous, San Joaquin River at Vernalis, and San Joaquin River at Brandt Bridge.

43 Average EC levels at the western and southern Delta compliance locations would decrease (except at
44 Emmaton) from 1–36% for the entire period modeled and 2–33% during the drought period
45 modeled (1987–1991) (Chapter 8, *Water Quality*, Appendix 8H, Tables EC-15A through EC-15D).

1 Where salinity levels decrease, higher quality irrigation water could benefit agricultural activities by
2 reducing potential restrictions related to yields and crop selection. At Emmaton, there would be an
3 increase in average EC under all operational scenarios, though the increase would be less for
4 scenarios H3 and H4 (0% for entire period; 8% for drought period) than for scenarios H1 and H2
5 (13–14% for entire period; 12–13% for drought period). There would be increases in average EC at
6 two interior Delta locations under all operational scenarios: the S. Fork Mokelumne River at
7 Terminous average EC would increase 5% for the entire period modeled and 4% during the drought
8 period modeled; and San Joaquin River at San Andreas Landing average EC would increase 0–9% for
9 the entire period modeled and 7–13% during the drought period modeled. On average, EC would
10 increase at San Andreas Landing from March through September under all operations scenarios;
11 Scenarios H1, H2, and H4 also would increase EC at this location in February and Scenarios H1 and
12 H2 would increase EC in October. Average EC in the S. Fork Mokelumne River at Terminous would
13 increase during all months (Chapter 8, *Water Quality*, Appendix 8H, Tables EC-15A through EC-15D).
14 Modeling of drought years estimates EC reaching levels as high as 1.644 dS/m at the Emmaton
15 compliance location. The comparison to Existing Conditions reflects changes in EC due to both
16 Alternative 4 operations (including north Delta intake capacity of 9,000 cfs and numerous other
17 operational components of Scenarios H1–H4) and climate change/sea level rise. Increased salinity
18 levels suggest that a number of crops using this irrigation water may not be able to reach full yields,
19 as reported in Table 14-6. In general, agricultural activities would be anticipated to continue on
20 lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
21 *Water Quality*, Section 8.3.3.9, Impact WQ-11 and Appendix 8H, Tables EC-4 and EC-15A through EC-
22 15D.

23 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

24 Temporary construction activities and the permanent footprints associated with physical features
25 constructed as part of this alternative could create conflicts with existing irrigation and drainage
26 facilities throughout the study area. The conveyance alignment constructed under this alternative
27 would cross or interfere with approximately 46 miles of agricultural delivery canals and drainage
28 ditches, including approximately 19 miles on Staten Island, 11 miles on Byron Tract, and 6 miles on
29 Bouldin Island. Construction activities requiring excavation or use of land where irrigation canals
30 are currently located could disrupt the delivery of water to crops, which would compromise a key
31 condition for the productive use of the land for agriculture. Similarly, where construction or the
32 long-term placement of conveyance facilities associated with this alternative requires an existing
33 agricultural drainage facility to be disconnected, high groundwater levels could expose crops to soil
34 conditions that would prevent the continuation of most agricultural activities on the affected land.
35 Thus, where irrigation or drainage infrastructure is disconnected from the farmland it serves,
36 continued agricultural use of the land could be jeopardized.

37 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
38 under this alternative could create indirect but adverse effects on agriculture by converting
39 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
40 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
41 related to water quality could be adverse or beneficial, depending on the location. Implementation
42 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
43 effects.

44 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
45 adverse impact on agriculture by converting substantial amounts of Important Farmland to other

1 uses through changes to groundwater elevation in localized areas and disruption of drainage and
2 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
3 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
4 will reduce the severity of these impacts by implementing activities such as siting project footprints
5 to encourage continued agricultural production; monitoring changes in groundwater levels during
6 construction; offsetting water supply losses attributable to construction dewatering activities;
7 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
8 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
9 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
10 developing optional agricultural stewardship approaches; and/or preserving agricultural land
11 through off-site easements or other agricultural land conservation interests. However, these impacts
12 remain significant and unavoidable after implementation of these measures because (i) replacement
13 water supplies associated with losses attributable to construction dewatering activities may not
14 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
15 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
16 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
17 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
18 stewardship approach does not focus principally on physical effects, but rather, focuses on
19 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
20 working on the land while maintaining the long-term viability of regional agricultural economies
21 and the economic health of local governments and special districts in the Delta.

22 In addition to and to supplement Mitigation Measure WQ-11, the BDCP proponents have
23 incorporated into the BDCP, as set forth in EIR/EIS Appendix 3B, *Environmental Commitments*, a
24 separate, non-environmental commitment to address the potential increased water treatment costs
25 that could result from electrical conductivity effects on agricultural water purveyor operations.
26 Potential options for making use of this financial commitment include funding or providing other
27 assistance towards acquiring alternative water supplies or towards modifying existing operations
28 when levels of electrical conductivity at a particular location reduce opportunities to operate
29 existing water supply diversion facilities. Please refer to Appendix 3B, *Environmental Commitments*,
30 for the full list of potential actions that could be taken pursuant to this commitment in order to
31 reduce the water quality treatment costs associated with water quality effects relating to chloride,
32 electrical conductivity, and bromide.

33 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
34 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
35 **Subject to Williamson Act Contracts or in Farmland Security Zones**

36 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 4.

37 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
38 **Dewatering**

39 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
40 Chapter 7, *Groundwater*.

1 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

2 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
3 Chapter 7, *Groundwater*.

4 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water
5 Quality Conditions**

6 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
7 in Chapter 8, *Water Quality*.

8 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of
9 Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security
10 Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,
11 and 21**

12 ***Conversion of Important Farmland as a result of implementing the proposed Conservation Measures 2-
13 11, 13, 15, 16, 20, and 21***

14 While locations have not been selected, implementation of conservation measures for habitat
15 restoration and channel margin habitat enhancement would likely occupy existing state-recognized
16 Important Farmland, directly precluding agricultural use. Construction activities for the
17 conservation measures associated with this alternative may also result in temporary conversion of
18 Important Farmland.

19 Alternative 4 would restore approximately 83,800 acres under conservation measures geared
20 toward the restoration of tidal wetland habitat (CM4), seasonally-inundated floodplain (CM5),
21 riparian habitat (CM7), grassland communities (CM8), vernal pool complex habitat (CM9), and
22 nontidal marsh areas (CM10). Additionally, 20 linear miles of channel margin habitat would be
23 enhanced. Under this measure, setback levees could potentially encroach upon Important Farmland.
24 Additionally, earthwork activities associated with restoration activities could remove land from
25 agricultural production. To maintain these areas, access roads and other facilities may also be
26 necessary. Implementation of these restoration activities would occur in phases over the 50-year
27 permit period, as summarized in Table 3-4 in Chapter 3, *Description of the Alternatives*. Additionally,
28 in selecting sites for seasonally inundated floodplain restoration under CM5, compatibility with
29 ongoing agricultural uses would be considered and agricultural production could continue on
30 acquired lands so long as agricultural practices are compatible with the primary goal of restoring
31 habitat for covered fish and wildlife species (see Chapter 3, Section 3.4.5.3.2 of the BDCP for further
32 detail).

33 Physical construction of facilities associated with other conservation measures may also occupy
34 small areas of Important Farmland. For instance, installation of nonphysical fish barriers may
35 require an access road or storage facility on land under one of the Important Farmland designations.
36 However, the effects of these measures on Important Farmland are anticipated to be minor,
37 particularly when compared with the larger restoration actions described above.

38 Because locations have not been selected for these activities, the extent of this effect is unknown and
39 a definitive conclusion cannot be reached. However, based on the large proportion of the
40 Conservation Zones designated as Important Farmland, it is anticipated that a substantial area of
41 Important Farmland would be directly converted to habitat under this alternative.

1 **Conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of**
2 **implementing the proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21**

3 Conservation areas associated with the project would occupy land subject to Williamson Act
4 contracts or in Farmland Security Zones, leading to the potential cancellation of existing contracts
5 and the direct conversion of agricultural land to other uses.

6 As described above, Alternative 4 would restore approximately 83,800 acres under conservation
7 measures intended to restore various natural communities. Additionally, 20 linear miles of channel
8 margin habitat would be enhanced. Under *CM6 Channel Margin Enhancement*, setback levees could
9 potentially encroach on land subject to Williamson Act contracts or in Farmland Security Zones.
10 Associated earthwork activities could also conflict with contract lands. To maintain these areas,
11 access roads and other facilities may also be necessary.

12 Because locations have not been selected for these activities, the extent of this effect is unknown.
13 However, based on the large proportion of the Conservation Zones that represent land subject to
14 Williamson Act contracts or in Farmland Security Zones, it is anticipated that this alternative would
15 convert a substantial area of land subject to Williamson Act contracts or in Farmland Security Zones.

16 Construction of physical facilities associated with other conservation measures may also occupy
17 small areas of land subject to Williamson Act contracts or in Farmland Security Zones. For example,
18 construction or expansion of a conservation fish hatchery under CM18 could potentially conflict
19 with Williamson Act contracts. Similar effects may arise from conservation measures that would
20 install non-physical fish barriers. However, the effects of these measures on land subject to
21 Williamson Act contracts or in Farmland Security Zones are anticipated to be minor, particularly
22 when compared with the larger restoration actions described above.

23 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
24 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
25 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
26 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
27 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
28 directly converted to habitat purposes under this alternative, resulting in an adverse effect on the
29 environment. While conflicts with or cancellation of Williamson Act contracts would not—by
30 itself—constitute an adverse effect on the quality of the human environment, the related conversion
31 of the underlying agricultural resource would result in such an effect. Mitigation Measure AG-1
32 would be available to lessen the severity of these potential effects. Also, under the provisions of
33 Government Code §51223, it may be feasible to rescind Williamson Act contracts for agricultural
34 use, and enter into open space contracts under the Williamson Act, or open space easements
35 pursuant to the Open Space Easement Act. To the extent this mechanism is used, it would eliminate
36 the Williamson Act conflicts otherwise resulting from changes from agriculture to restoration and
37 mitigation uses. For further discussion of potential incompatibilities with land use policies, see
38 Chapter 13, *Land Use*, Impact LU-4.

39 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
40 measures geared toward the restoration of various natural communities. Additionally, 20 linear
41 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
42 other conservation measures could result in conversion of a substantial amount of Important
43 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
44 resulting in a significant impact on agricultural resources in the study area. Further evaluation of

1 these impacts would depend on additional information relating to the location of these activities and
 2 other detailed information. Implementation of Mitigation Measure AG-1 will reduce the severity of
 3 these impacts by implementing activities such as siting features to encourage continued agricultural
 4 production; relocating or replacing agricultural infrastructure in support of continued agricultural
 5 activities; engaging counties, owners/operators, and other stakeholders in developing optional
 6 agricultural stewardship approaches; and/or preserving agricultural land through off-site
 7 easements or other agricultural land conservation interests. However, these impacts remain
 8 significant and unavoidable after implementation of this measure because (i) even after effects from
 9 the footprints of conservation measures are minimized through design, they would continue to
 10 require the conversion of substantial amounts of Important Farmland and land subject to
 11 Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by means
 12 of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid a net
 13 loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security
 14 Zones and (iii) the proposed optional agricultural stewardship approach does not focus principally
 15 on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural economic
 16 effect on affected lands in the Delta as a result of the BDCP, taking into consideration the desire of
 17 individual Delta farmers to continue working on their land, the long-term viability of regional
 18 agricultural economies, the economic health of local governments and special districts, and the Delta
 19 as an evolving place.

20 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 21 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 22 **Subject to Williamson Act Contracts or in Farmland Security Zones**

23 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 4.

24 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 25 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

26 ***Effects on agriculture as a result of changes in groundwater elevation***

27 Implementation of these conservation measures could indirectly affect agriculture by causing
 28 changes to the elevation of groundwater in the study area, as described under Chapter 7,
 29 *Groundwater*, Impact GW-6. Increased frequency of inundation associated with proposed tidal
 30 habitat, channel margin habitat, and seasonally inundated floodplain restoration would result in
 31 increased groundwater recharge, which could result in groundwater level rises and soil saturation
 32 on adjacent lands. Areas in which crop roots are exposed to a surplus of water could result in root
 33 rot, compromising the viability of certain crops, particularly those with deep roots (Refer to Section
 34 14.1, *Environmental Setting/Affected Environment*, for root depths by crop type). Conversely, in
 35 areas where the project results in a larger vertical distance between the water table and crop roots,
 36 plants with shallow roots may not be able to extract enough water to maintain optimal growth
 37 without modifying irrigation or drainage infrastructure. While the geographic incidence and
 38 potential severity of these effects are unknown and would depend on existing localized groundwater
 39 levels in the vicinity of sites chosen for restoration, they would be anticipated to create an adverse
 40 effect on agricultural resources if they were to substantially restrict agricultural uses.

1 *Effects on agriculture as a result of changes in salinity*

2 As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of these
3 conservation measures would not introduce new sources of electrical conductivity into the study
4 area. Therefore, as they relate to salinity of irrigation water, these measures would not be
5 anticipated to restrict agricultural uses within the study area.

6 Implementation of CM4 would increase the exchange of tidal water in restoration areas; however,
7 consideration of this measure and its potential effects on electrical conductivity in the Delta has
8 been incorporated in the assessment of CM1 under Impact AG-2.

9 *Effects on agriculture as a result of disruptions to agricultural infrastructure*

10 Implementation of *CM21 Nonproject Diversions*, along with construction activities and the
11 permanent footprints associated with land acquired for habitat restoration, could directly or
12 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area. In
13 particular, CM21 would fund programs to modify, remove, or consolidate diversions that serve as
14 supplies of irrigation water within the study area. Where irrigation or drainage infrastructure is
15 disconnected from the farmland it serves, agricultural uses could be substantially restricted.
16 However, the location and severity of this effect would depend on site-specific conditions.

17 *Effects on agriculture as a result of changes in microclimates and localized growing conditions*

18 Restoration areas implemented under Alternative 4 would result in substantial changes in land use
19 patterns in parts of the study area, which could indirectly affect some farmlands by causing changes
20 to the microclimates surrounding sensitive agricultural crops. For example, large areas of tidal
21 habitat could create a localized climate that would be less supportive of yields of certain crops
22 adjacent to the areas. However, this effect is speculative and its potential severity would depend on
23 site-specific conditions.

24 *Effects on agriculture as a result of increased frequency of inundation events*

25 Modified activities in the Yolo Bypass undertaken as part of Alternative 4 would indirectly affect
26 agricultural practices by increasing the frequency, duration, and magnitude of floodplain inundation.
27 *CM2 Yolo Bypass Fisheries Enhancement*, which this EIR/EIS addresses at a program level, will
28 require the preparation and implementation of a YBFEP. The YBFEP would propose a number of
29 actions, which would include modifications to Fremont Weir to manage timing, frequency, and
30 duration of inundation of the Yolo Bypass. Modifications of Fremont Weir would include installing
31 and operating a gated channel to inundate the floodplain to support covered fish species, primarily
32 from mid-November through April. Opening these gates would result in inundation of the Yolo
33 Bypass. Target inundation footprints would be up to 10,000 acres between November 10 and
34 November 30. Between December 1 and February 28, operations would target up to 17,000 acres of
35 inundation. Between March 1 and May 15, the target inundation area would return to a range of
36 7,000–10,000 acres. These operations are expected to be typical of, but not necessarily identical to,
37 actual operational guidelines that would be developed in the course of subsequent project-specific
38 design, planning, and environmental documentation.

39 Although this area currently experiences periodic inundation within the same footprint, if
40 inundation continues later in the spring, this could result in a delay in ground preparation and
41 planting operations for crops within the Yolo Bypass. Table 14-11 shows typical crop production
42 practices in the Yolo Bypass. After the flow ceases, it may take as many as four weeks for the waters

1 to recede and for the land to dry sufficiently to start farming. While there is disagreement
2 surrounding the time periods necessary to prepare land and for the Bypass to dry out, for this
3 analysis, a four-week period is used as the amount of time required between the end of water
4 inundation and the point when ground preparation activities can begin. Based on the agricultural
5 practices outlined in Table 14-11, the anticipated dates at which inundation must end to allow
6 planting to be completed are also presented.

7 As shown in Table 14-11, if the duration of inundation events extends beyond March 1, March 15,
8 April 1, and April 15, the growing season for tomato; safflower; and corn and rice; and Sudan grass
9 could be delayed. This delay may reduce the growing season to the point of changing crop yield
10 and/or quality, or result in fallowing of agricultural land or the growing of less profitable crops on
11 impacted farmlands. Depending on the frequency and duration of inundation events, crop selection
12 may be constrained. However, short of substantially restricting agricultural use of land, these effects
13 would be considered economic, rather than environmental, in nature. Conservation easements or
14 fee-title acquisition would be required for all inundation on agricultural land.

15 The *Yolo Bypass Flood Date and Flow Volume Agricultural Impact Analysis*, a report created for Yolo
16 County, assesses the agricultural and economic impacts from BDCP-proposed flooding scenarios in
17 the Yolo Bypass, including CM2. The CM2 scenario would only impose water flows through an
18 operable gate at Fremont Weir for an additional 30 days in years when there is natural flooding (see
19 Chapter 3, *Description of Alternatives*, Section 3.6.2, for further description of CM2). Minimal loss of
20 irrigated acres is expected in the CM2 scenario, but losses are anticipated to occur in years when
21 there is natural flooding. The largest losses would be anticipated during years when natural
22 overtopping occurs late into the season. CM2 proposes an additional 30 days of flooding, through
23 the middle of April, which is expected to result in crop yield losses and an increase in fallow acres, as
24 well as agricultural revenue losses.

25 As farmers delay planting, crop yields decline, which leads to lower revenues and land fallowing.
26 The report identified 9 major crop groups in areas affected by flooding in the Bypass: corn, irrigated
27 pasture, non-irrigated pasture, rice, wild rice, safflower, sunflower, processing tomatoes, and vines
28 (melons). Further discussion of socioeconomic effects of CM2 on agriculture can be found in Chapter
29 16, *Socioeconomics*, Impact ECON-16 and Impact ECON-18.

1 **Table 14-11. Typical Crop Production Practices in Yolo Bypass**

Crop	Ground Preparation	Planting	Harvest	Other	Plant By Date	End Inundation Date ^c
Corn ^a	March–April	April–May	Sept–Oct		June 1	April 1
Pasture ^a				Winter range feeding: Nov-Apr Summer Feeding: May–Oct Breeding: Dec-Feb		
Rice (wild/white) ^a	April–May	April–May	Sept–Nov		June 1	April 1
Safflower ^a	Aug–Oct (during year preceding planting)	Mar–May	Jul–Sept		May 15	March 15
Sudan Grass ^b	April–May	May–July	July–August		June 15	April 15
Tomato ^a	Mar–April	April–May	June–Sept		May 1	March 1

Sources: Crop production practices, all crops except Sudan grass: California Department of Fish and Game and Yolo Basin Foundation 2008.; Sudan grass production practices: U.C. Cooperative Extension 2009.

^a These data are based on the 2004 Crop Year, which was considered relatively normal year with regard to flooding in the Bypass. There was some mid-winter inundation which receded and did not dramatically impact production.

^b Data concerning Sudan grass is based on growing cultivation and cycles in South San Joaquin County. Growing conditions and crop cycles in the Yolo Bypass vary from these patterns. Different practices may result.

^c Table assumes 4 weeks for Bypass to dry out and 4 weeks for ground preparation.

2

3 The new inundation schedule could substantially prevent agricultural use of these lands. The
4 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
5 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
6 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
7 which would be completed under CM2. Mitigation Measure AG-1 is available to mitigate this effect.

8 Additionally, some benefits could result from an increased presence of water. An increase in
9 potential groundwater recharge could raise the groundwater table to within the root zone of some
10 crops (Section 14.1.1.6, *General Crop Production Practices and Characteristics*, discusses of the
11 relationship between crop viability and groundwater table levels). This could also be a beneficial
12 effect in parts of Yolo and Solano Counties that utilize groundwater from the aquifers underneath
13 the Yolo Bypass.

14 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
15 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

16 Under the cultivated lands natural community goal and objectives of BDCP *CM3 Natural*
17 *Communities Protection and Restoration*, the BDCP proponents would acquire and protect
18 approximately 48,100 acres of nonrice cultivated lands and manage them for specific habitat values
19 corollary to agricultural use for species including Swainson's hawk, giant garter snake, greater

1 sandhill crane, white-tailed kite, and tricolored blackbird. Additionally, 3,500 acres of rice lands or
2 similarly functioning habitat would be maintained annually for giant garter snake in Conservation
3 Zones 4 and/or 5. Because crop selection is dynamic and predominantly influenced by economic
4 forces, the acquisition approach for these goals would allow for a combination of permanent
5 easements, agreements with other agencies, fee-title acquisition, and other methods, to ensure that
6 habitat target acreages are consistently satisfied across the Plan Area. Management activities would
7 maintain existing small patches of riparian woodland and scrub, wetlands, ponds, hedgerows, tree
8 rows, and isolated native or nonnative trees. While these conservation measures would protect
9 agricultural uses on the majority of these lands, specific management actions implemented under
10 *CM11 Natural Communities Enhancement and Management* could reduce crop yields, restrict crop
11 choices, and convert small portions of cultivated lands to nonagricultural uses. Where feasible,
12 tilling would be deferred or some lands left unharvested to increase the amount of forage available
13 to sandhill cranes. Shallow flooding of some lands during fall and winter months may also be
14 adopted to support cranes and other species. While implementation of CM3 would protect
15 agricultural uses on over 48,000 acres of land, management actions under CM11 could directly
16 convert small portions of this land to nonagricultural uses such as grassland edges or woodlots.
17 Management techniques could also result in crop yield reductions following the minimization or
18 cessation of pesticide use on acquired lands, as many agricultural operators are currently able to
19 apply pesticides in a manner that causes such substances to “drift” onto neighboring properties.
20 However, the agricultural use of this land would be preserved and any further restrictions on the
21 continued agricultural use of the land are unlikely to be substantial.

22 Other conservation measures related to habitat restoration and enhancement could also indirectly
23 affect agricultural production or management practices. For example, restored habitat areas
24 adjacent to agricultural lands could increase crop predation by birds and could introduce invasive
25 species onto agricultural lands, reducing yields and associated production value. A related concern
26 is the introduction of a covered species into a new area, which may require adjustments to
27 agricultural management practices or the initiation of Safe Harbor Agreements. Finally, other
28 “important related actions” identified by the BDCP could further limit pesticide and herbicide
29 discharge in the study area, possibly leading to other reductions in crop yield or increases in
30 operating costs. These effects would be considered primarily economic in nature.

31 Beneficial effects could result from efforts to control nonnative aquatic vegetation under *CM13*
32 *Invasive Aquatic Vegetation Control* and limit the spread of invasive species under *CM20 Recreational*
33 *Users Invasive Species Program*. If successful, these measures could limit the spread of weeds and
34 pests, while keeping irrigation infrastructure free from aquatic vegetation.

35 While these effects would convert small areas of land to nonagricultural use and could change
36 agricultural practices or yields across a large area, conservation measures would also support the
37 continued use of land for agricultural purposes, even though some neighboring operators might no
38 longer be able to conduct operations in a way that causes chemicals to drift onto adjacent
39 properties. Overall, these effects would not be anticipated to result in the substantial restriction of
40 agricultural uses.

41 **NEPA Effects:** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
42 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
43 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
44 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
45 evaluation of these effects would depend on additional information relating to the location of these

1 activities and other detailed information. However, implementation of Mitigation Measures AG-1
2 and GW-5 will reduce the severity of these adverse effects.

3 **CEQA Conclusion:** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
4 alternative could create a significant impact on agriculture by converting substantial amounts of
5 Important Farmland to other uses through changes to groundwater elevation and seepage,
6 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
7 effects would depend on additional information relating to the location of these activities and other
8 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
9 severity of these impacts by implementing activities such as siting features to encourage continued
10 agricultural production; monitoring seepage effects; relocating or replacing agricultural
11 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
12 and other stakeholders in developing optional agricultural stewardship approaches; and/or
13 preserving agricultural land through off-site easements or other agricultural land conservation
14 interests. However, these impacts remain significant and unavoidable after implementation of these
15 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
16 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
17 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
18 stewardship approach does not focus principally on physical effects, but rather, focuses on
19 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
20 working on the land while maintaining the long-term viability of regional agricultural economies
21 and the economic health of local governments and special districts in the Delta.

22 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
23 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
24 **Subject to Williamson Act Contracts or in Farmland Security Zones**

25 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 4.

26 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

27 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
28 Chapter 7, *Groundwater*.

29 **14.3.3.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and**
30 **Intake 1 (3,000 cfs; Operational Scenario C)**

31 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
32 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
33 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

34 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
35 ***water conveyance facility***

36 Temporary and short-term effects on Important Farmland associated with construction of
37 structures under Alternative 5 would be similar to those described for Alternative 1A except that
38 Intakes 2, 3, 4, and 5 would not be built. Construction of facilities under this alternative would
39 necessitate temporary or short-term conversion of approximately 833 acres of Important Farmland
40 to other uses, including 747 acres of Prime Farmland, 11 acres of Farmland of Statewide
41 Importance, 17 acres of Unique Farmland, and 59 acres of Farmland of Local Importance.

1 Construction of a single-bore tunnel and reduced forebay sizes would be anticipated to result in
 2 effects on fewer areas. Table 14-8 displays a summary of temporary and short-term acreage and
 3 permanent acreage of Important Farmland that could be converted to non-agricultural uses under
 4 implementation of each alternative.

5 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 6 ***conveyance facility***

7 Permanent effects on Important Farmland associated with construction of structures under
 8 Alternative 5 would be similar to those described for Alternative 1A except that Intakes 2, 3, 4, and 5
 9 would not be built. Construction of facilities under this alternative would necessitate conversion of
 10 approximately 4,770 acres of Important Farmland to other uses, including 3,267 acres of Prime
 11 Farmland, 330 acres of Farmland of Statewide Importance, 1,049 acres of Unique Farmland, and 124
 12 acres of Farmland of Local Importance. Construction of a single-bore tunnel and reduced forebay
 13 sizes would be anticipated to result in effects on fewer areas. Table 14-8 displays a summary of
 14 temporary and short-term acreage and permanent acreage of Important Farmland that could be
 15 converted to non-agricultural uses under implementation of each alternative.

16 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
 17 ***Security Zones as a result of constructing the proposed water conveyance facility***

18 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
 19 Security Zones associated with construction of structures under Alternative 5 would be similar to
 20 those described for Alternative 1A except that Intakes 2, 3, 4, and 5 would not be built. Construction
 21 of facilities under this alternative would necessitate temporary or short-term conversion of
 22 approximately 632 acres of land subject to Williamson Act contracts, including 77 acres in Farmland
 23 Security Zones. Construction of a single-bore tunnel and reduced forebay sizes would be anticipated
 24 to result in effects on fewer areas. Table 14-9 displays a summary of temporary and short-term
 25 acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland Security
 26 Zones that could be converted to non-agricultural uses under implementation of each alternative.

27 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
 28 ***result of constructing the proposed water conveyance facility***

29 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
 30 associated with construction of structures under Alternative 5 would be similar to those described
 31 for Alternative 1A except that Intakes 2, 3, 4, and 5 would not be built. Construction of facilities
 32 under this alternative would necessitate conversion of approximately 2,753 acres of land subject to
 33 Williamson Act contracts, including 643 acres in Farmland Security Zones. Construction of a single-
 34 bore tunnel and reduced forebay sizes would be anticipated to result in effects on fewer areas. Table
 35 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land
 36 subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-
 37 agricultural uses under implementation of each alternative.

38 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
 39 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
 40 agricultural uses, as discussed above, would constitute an adverse effect on the physical
 41 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
 42 along with Mitigation Measure AG-1, would be available to reduce these effects.

1 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
 2 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 3 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 4 construction. Temporary and short-term construction of facilities would convert approximately 833
 5 acres of Important Farmland and 632 acres of land subject to Williamson Act contracts or in
 6 Farmland Security Zones to other uses. Physical structures would also permanently convert
 7 approximately 4,770 acres of Important Farmland and 2,753 acres of land subject to Williamson Act
 8 contracts or in Farmland Security Zones to other uses. These are considered significant impacts on
 9 the environment. However, implementation of Mitigation Measure AG-1 along with an
 10 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
 11 would reduce these impacts by implementing activities such as siting project footprints to
 12 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
 13 support of continued agricultural activities; engaging counties, owners/operators, and other
 14 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 15 agricultural land through off-site easements or other agricultural land conservation interests.
 16 However, these impacts remain significant and unavoidable after implementation of this measure
 17 because (i) even after effects from the footprints of project facilities are minimized through design,
 18 they would continue to require the conversion of substantial amounts of Important Farmland and
 19 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 20 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 21 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 22 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 23 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 24 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 25 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 26 viability of regional agricultural economies, the economic health of local governments and special
 27 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 28 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

29 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 30 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 31 **Subject to Williamson Act Contracts or in Farmland Security Zones**

32 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

33 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 34 **Proposed Water Conveyance Facility**

35 ***Effects on agriculture as a result of changes in groundwater elevation***

36 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 37 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 38 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 39 those identified under Alternative 1A, Impact AG-2. However, temporarily lower groundwater levels
 40 related to dewatering for pumping plant construction associated with Intakes 2, 3, 4, and 5 would
 41 not apply to this alternative. These effects could restrict or prevent agricultural uses on land in these
 42 areas.

1 ***Effects on agriculture as a result of changes in salinity***

2 Under Alternative 5, the operation of new physical facilities combined with hydrodynamic effects of
 3 habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing
 4 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
 5 operation of the water conveyance facility would result in an increase in the number of days EC
 6 objectives would be exceeded in the Sacramento River at Emmaton, San Joaquin River at San
 7 Andreas Landing and Old River at Tracy Bridge. The percent of days the Emmaton EC objective
 8 would be exceeded for the entire period modeled (1976–1991) would increase from 6% under
 9 Existing Conditions to 23% under Alternative 5, and the percent of days out of compliance would
 10 increase from 11% to 35%. Over the entire period modeled, the San Andreas Landing objective
 11 would increase from 1% to 4% of days in exceedance, and from 1% to 7% of days out of compliance
 12 with the EC objective. In Old River at Tracy Bridge, the percent of days exceeding the EC objective
 13 would increase from 4% conditions to 5% while the percent of days out of compliance would
 14 increase by less than 1%.

15 Average EC levels would decrease at western and southern Delta compliance locations, except at
 16 Emmaton in the western Delta, and would increase at the two interior Delta compliance locations.
 17 Where salinity levels decrease, higher quality irrigation water could benefit agricultural activities by
 18 reducing potential restrictions related to yields and crop selection. At Emmaton, average EC would
 19 increase by 3% for the entire period modeled and 10% for the drought period modeled. Over the
 20 entire period modeled, the S. Fork Mokelumne River at Terminous average EC would increase 3%
 21 and the San Joaquin River at San Andreas Landing average EC would increase 5%. Modeling of
 22 drought years estimates EC reaching as high as 1.591 dS/m at the Emmaton compliance location.
 23 Increased salinity levels suggest that a number of crops using this irrigation water may not be able
 24 to reach full yields, as reported in Table 14-6. In general, agricultural activities would be anticipated
 25 to continue on lands using these sources. Complete water quality modeling results are discussed in
 26 Chapter 8, *Water Quality*, Section 8.3.3.10, Impact WQ-11 and Appendix 8H, Tables EC-5 and EC-16.

27 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

28 Conflicts with existing irrigation and drainage facilities as a result of constructing the water
 29 conveyance facility would be similar to those described under Alternative 1A. The conveyance
 30 alignment constructed under this alternative would cross or interfere with approximately 37 miles
 31 of agricultural delivery canals and drainage ditches, including approximately 7 miles on Victoria
 32 Island, 5 miles on Bacon Island, 4 miles on Byron Tract, and 4 miles on Tyler Island. Where irrigation
 33 or drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
 34 the land could be jeopardized.

35 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
 36 under this alternative could create indirect but adverse effects on agriculture by converting
 37 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 38 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
 39 related to water quality could be adverse or beneficial, depending on the location. Implementation
 40 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
 41 effects.

42 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
 43 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
 44 uses through changes to groundwater elevation in localized areas and disruption of drainage and

1 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
 2 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
 3 will reduce the severity of these impacts by implementing activities such as siting project footprints
 4 to encourage continued agricultural production; monitoring changes in groundwater levels during
 5 construction; offsetting water supply losses attributable to construction dewatering activities;
 6 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
 7 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 8 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 9 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 10 through off-site easements or other agricultural land conservation interests. However, these impacts
 11 remain significant and unavoidable after implementation of these measures because (i) replacement
 12 water supplies associated with losses attributable to construction dewatering activities may not
 13 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
 14 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
 15 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 16 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
 17 stewardship approach does not focus principally on physical effects, but rather, focuses on
 18 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 19 working on the land while maintaining the long-term viability of regional agricultural economies
 20 and the economic health of local governments and special districts in the Delta.

21 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 22 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 23 environmental commitment to address the potential increased water treatment costs that could
 24 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 25 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 26 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 27 water quality effects relating to chloride, electrical conductivity, and bromide.

28 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 29 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 30 **Subject to Williamson Act Contracts or in Farmland Security Zones**

31 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

32 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 33 **Dewatering**

34 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 35 Chapter 7, *Groundwater*.

36 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

37 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 38 Chapter 7, *Groundwater*.

1 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 2 **Quality Conditions**

3 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 4 in Chapter 8, *Water Quality*.

5 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 6 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 7 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
 8 **and 21**

9 Effects of Alternative 5 related to the conversion of Important Farmland and land subject to
 10 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 11 measures would be similar to those described for Alternative 1A. However, Alternative 5 would
 12 restore 25,000 acres of tidal habitat, rather than 65,000 acres.

13 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 14 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 15 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
 16 contracts in Farmland Security Zones, it is anticipated that a substantial area of Important Farmland
 17 and land subject to Williamson Act contracts or in Farmland Security Zones would be directly
 18 converted to habitat purposes, resulting in an adverse effect. However, the extent of conversion
 19 would likely be smaller than for other alternatives. While conflicts with or cancellation of
 20 Williamson Act contracts would not—by itself—constitute an adverse effect on the quality of the
 21 human environment, the related conversion of the underlying agricultural resource would result in
 22 such an effect. Mitigation Measures AG-1 would be available to lessen the severity of these potential
 23 effects. Also, under the provisions of Government Code §51223, it may be feasible to rescind
 24 Williamson Act contracts for agricultural use, and enter into open space contracts under the
 25 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 26 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 27 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 28 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

29 **CEQA Conclusion:** This alternative would restore approximately 43,800 acres under conservation
 30 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 31 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 32 other conservation measures could result in conversion of a substantial amount of Important
 33 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 34 resulting in a significant impact on agricultural resources in the study area.

35 Further evaluation of these impacts would depend on additional information relating to the location
 36 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 37 reduce the severity of these impacts by implementing activities such as siting features to encourage
 38 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 39 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 40 developing optional agricultural stewardship approach; and/or preserving agricultural land through
 41 off-site easements or other agricultural land conservation interests. However, these impacts remain
 42 significant and unavoidable after implementation of this measure because (i) even after effects from
 43 the footprints of conservation measures are minimized through design, they would continue to
 44 require the conversion of substantial amounts of Important Farmland and land subject to

1 Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by means
 2 of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid a net
 3 loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security
 4 Zones and (iii) the proposed optional agricultural stewardship approach does not focus principally
 5 on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural economic
 6 effect on affected lands in the Delta as a result of the BDCP, taking into consideration the desire of
 7 individual Delta farmers to continue working on their land, the long-term viability of regional
 8 agricultural economies, the economic health of local governments and special districts, and the Delta
 9 as an evolving place.

10 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 11 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 12 **Subject to Williamson Act Contracts or in Farmland Security Zones**

13 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

14 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 15 **Conservation Measures 2-11, 13, 15, 16, 20, and 21**

16 ***Effects on agriculture as a result of changes in groundwater elevation***

17 Implementation of these conservation measures could indirectly affect agriculture by causing
 18 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 19 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. However the severity of these effects
 20 would be reduced when compared to other alternatives, based on the restoration of a smaller area
 21 of tidal habitat. Nonetheless, conservation activities could result in groundwater level rises and soil
 22 saturation on adjacent lands. While the geographic incidence and potential severity of these effects
 23 are unknown and would depend on existing localized groundwater levels in the vicinity of sites
 24 chosen for restoration, they could substantially restrict agricultural uses.

25 ***Effects on agriculture as a result of changes in salinity***

26 Effects related to salinity under Alternative 5 would be similar to those described for Alternative 1A,
 27 Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 28 these conservation measures would not introduce new sources of electrical conductivity into the
 29 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 30 anticipated to restrict agricultural uses in the study area.

31 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

32 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 33 conservation measures would be similar, but smaller in magnitude, to those described under
 34 Alternative 1A, Impact AG-4. Under this alternative, the restoration of large areas of tidal habitat
 35 could create a localized climate that would be less supportive of crop yields adjacent to areas chosen
 36 for habitat restoration. However, this effect is speculative and its potential severity would depend
 37 on site-specific conditions.

38 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

39 Effects related to disruption of infrastructure would be similar to those described under Alternative
 40 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities

1 and the permanent footprints associated with land acquired for habitat restoration, could directly or
2 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
3 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
4 uses could be substantially restricted. However, the location and severity of this effect would
5 depend on site-specific conditions.

6 ***Effects on agriculture as a result of increased frequency of inundation events***

7 Modified activities in the Yolo Bypass under Alternative 5 would be identical to those described in
8 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
9 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
10 continues later in the spring, this could result in a delay in ground preparation and planting
11 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
12 longer duration could result in a change to crop yields and production, due to a variety of factors
13 beyond delay in planting operations.

14 The new inundation schedule could substantially prevent agricultural use of these lands. The
15 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
16 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
17 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
18 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
19 mitigate this effect.

20 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the*** 21 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

22 Effects related to changes in agricultural practices and protection levels under Alternative 5 would
23 be similar to those described for Alternative 1A. The cultivated lands natural community strategy
24 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
25 agricultural use for covered species. While these effects would convert small areas of land to
26 nonagricultural use and could change agricultural practices or yields across a large area,
27 conservation measures would also support the continued use of land for agricultural purposes.
28 Overall, this effect would not be anticipated to substantially restrict agricultural use.

29 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
30 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
31 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
32 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
33 evaluation of these effects would depend on additional information relating to the location of these
34 activities and other detailed information. However, implementation of Mitigation Measures AG-1
35 and GW-5 will reduce the severity of these adverse effects.

36 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
37 alternative could create a significant impact on agriculture by converting substantial amounts of
38 Important Farmland to other uses through changes to groundwater elevation and seepage,
39 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
40 effects would depend on additional information relating to the location of these activities and other
41 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
42 severity of these impacts by implementing activities such as siting features to encourage continued
43 agricultural production; monitoring seepage effects; relocating or replacing agricultural

1 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 2 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 3 preserving agricultural land through off-site easements or other agricultural land conservation
 4 interests. However, these impacts remain significant and unavoidable after implementation of these
 5 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 6 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 7 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 8 stewardship approach does not focus principally on physical effects, but rather, focuses on
 9 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 10 working on the land while maintaining the long-term viability of regional agricultural economies
 11 and the economic health of local governments and special districts in the Delta.

12 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 13 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 14 **Subject to Williamson Act Contracts or in Farmland Security Zones**

15 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

16 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

17 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 18 Chapter 7, *Groundwater*.

19 **14.3.3.11 Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and**
 20 **Intakes 1–5 (15,000 cfs; Operational Scenario D)**

21 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 22 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 23 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

24 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 25 ***water conveyance facility***

26 Temporary and short-term effects associated with construction of structures under Alternative 6A
 27 would be identical to those described for Alternative 1A. This alternative would convert
 28 approximately 1,329 acres of Important Farmland to other uses, including 1,126 acres of Prime
 29 Farmland, 13 acres of Farmland of Statewide Importance, 48 acres of Unique Farmland, and 143
 30 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term
 31 acreage and permanent acreage of Important Farmland that could be converted to non-agricultural
 32 uses under implementation of each alternative.

33 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 34 ***conveyance facility***

35 Permanent effects on Important Farmland associated with construction of structures under
 36 Alternative 6A would be identical to those described for Alternative 1A. The facilities associated
 37 with this alternative could convert approximately 4,984 acres of Important Farmland to project
 38 uses, including 3,427 acres of Prime Farmland, 330 acres of Farmland of Statewide Importance,
 39 1,054 acres of Unique Farmland, and 173 acres of Farmland of Local Importance. Table 14-8
 40 displays a summary of temporary and short-term acreage and permanent acreage of Important

1 Farmland that could be converted to non-agricultural uses under implementation of each
2 alternative.

3 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
4 ***Security Zones as a result of constructing the proposed water conveyance facility***

5 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
6 Security Zones associated with construction of structures under Alternative 6A would be identical to
7 those described for Alternative 1A. This alternative could convert approximately 787 acres of land
8 subject to Williamson Act contracts, including 77 acres in Farmland Security Zones. Table 14-9
9 displays a summary of temporary and short-term acreage and permanent acreage of land subject to
10 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
11 uses under implementation of each alternative.

12 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
13 ***result of constructing the proposed water conveyance facility***

14 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
15 associated with construction of structures under Alternative 6A would be identical to those
16 described for Alternative 1A. This alternative could convert approximately 2,857 acres of land
17 subject to Williamson Act contracts, including 643 acres in Farmland Security Zones. Table 14-9
18 displays a summary of temporary and short-term acreage and permanent acreage of land subject to
19 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
20 uses under implementation of each alternative.

21 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
22 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
23 agricultural uses, as discussed above, would constitute an adverse effect on the physical
24 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
25 along with Mitigation Measure AG-1, would be available to reduce these effects.

26 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
27 proposed under this alternative would occupy Important Farmland and land subject to Williamson
28 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
29 construction. Temporary and short-term construction of facilities would convert approximately
30 1,329 acres of Important Farmland and 787 acres of land subject to Williamson Act contracts or in
31 Farmland Security Zones to other uses. Physical structures would also permanently convert
32 approximately 4,984 acres of Important Farmland and 2,857 acres of land subject to Williamson Act
33 contracts or in Farmland Security Zones to other uses. These are considered significant impacts on
34 the environment. However, implementation of Mitigation Measure AG-1 along with an
35 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
36 would reduce these impacts by implementing activities such as siting project footprints to
37 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
38 support of continued agricultural activities; engaging counties, owners/operators, and other
39 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
40 agricultural land through off-site easements or other agricultural land conservation interests.
41 However, these impacts remain significant and unavoidable after implementation of this measure
42 because (i) even after effects from the footprints of project facilities are minimized through design,
43 they would continue to require the conversion of substantial amounts of Important Farmland and
44 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or

1 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 2 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 3 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 4 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 5 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 6 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 7 viability of regional agricultural economies, the economic health of local governments and special
 8 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 9 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

10 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 11 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 12 **Subject to Williamson Act Contracts or in Farmland Security Zones**

13 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

14 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 15 **Proposed Water Conveyance Facility**

16 ***Effects on agriculture as a result of changes in groundwater elevation***

17 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 18 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 19 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 20 those identified under Alternative 1A, Impact AG-2. These effects could restrict or prevent
 21 agricultural uses on land in these areas.

22 ***Effects on agriculture as a result of changes in salinity***

23 Under Alternative 6A, the operation of new physical facilities combined with hydrodynamic effects
 24 of habitat restoration activities under CM2 and CM4 could indirectly affect agriculture by causing
 25 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
 26 operation of the water conveyance facility would generally result in a decrease in the number of
 27 days EC objectives for agriculture would be exceeded at interior Delta compliance points. The
 28 frequency of days in exceedance or noncompliance with EC objectives in the south Delta would
 29 either remain the same or slightly decrease when compared to Existing Conditions. In the
 30 Sacramento River at Emmaton, the percent of days the EC objective would be exceeded would
 31 increase from 6% under Existing Conditions to 28% under Alternative 6A, and the percent of days
 32 out of compliance would increase from 11% under Existing Conditions to 40% under Alternative 6A.

33 Average EC levels would decrease at western and southern Delta compliance locations and at San
 34 Joaquin River at San Andreas Landing in the interior Delta. Where salinity levels decrease, higher
 35 quality irrigation water could benefit agricultural activities by reducing potential restrictions related
 36 to yields and crop selection. Over the entire period modeled, the S. Fork Mokelumne River at
 37 Terminous average EC would increase 7%. Modeling of drought years estimates EC reaching as high
 38 as 1.265 dS/m in the Sacramento River at Emmaton. Increased salinity levels suggest that a number
 39 of crops using this irrigation water may not be able to reach full yields, as reported in Table 14-6. In
 40 general, agricultural activities would be anticipated to continue on lands using these sources.
 41 Complete water quality modeling results are discussed in Chapter 8, *Water Quality*, Section 8.3.3.11,
 42 Impact WQ-11 and Appendix 8H, Tables EC-6 and EC-17.

1 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

2 Conflicts with existing irrigation and drainage facilities as a result of constructing the water
3 conveyance facility would be similar to those described under Alternative 1A. The conveyance
4 alignment constructed under this alternative would cross or interfere with approximately 38 miles
5 of agricultural delivery canals and drainage ditches, including approximately 7 miles on Victoria
6 Island, 5 miles on Bacon Island, 4 miles on Byron Tract, and 4 miles on Tyler Island. Where irrigation
7 or drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
8 the land could be jeopardized.

9 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
10 under this alternative could create indirect but adverse effects on agriculture by converting
11 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
12 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
13 related to water quality could be adverse or beneficial, depending on the location. Implementation
14 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
15 effects.

16 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
17 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
18 uses through changes to groundwater elevation in localized areas and disruption of drainage and
19 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
20 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
21 will reduce the severity of these impacts by implementing activities such as siting project footprints
22 to encourage continued agricultural production; monitoring changes in groundwater levels during
23 construction; offsetting water supply losses attributable to construction dewatering activities;
24 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
25 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
26 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
27 developing optional agricultural stewardship approaches; and/or preserving agricultural land
28 through off-site easements or other agricultural land conservation interests. However, these impacts
29 remain significant and unavoidable after implementation of these measures because (i) replacement
30 water supplies associated with losses attributable to construction dewatering activities may not
31 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
32 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
33 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
34 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
35 stewardship approach does not focus principally on physical effects, but rather, focuses on
36 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
37 working on the land while maintaining the long-term viability of regional agricultural economies
38 and the economic health of local governments and special districts in the Delta.

39 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
40 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
41 environmental commitment to address the potential increased water treatment costs that could
42 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
43 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
44 pursuant to this commitment in order to reduce the water quality treatment costs associated with
45 water quality effects relating to chloride, electrical conductivity, and bromide.

1 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 2 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 3 **Subject to Williamson Act Contracts or in Farmland Security Zones**

4 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

5 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 6 **Dewatering**

7 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 8 Chapter 7, *Groundwater*.

9 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

10 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 11 Chapter 7, *Groundwater*.

12 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 13 **Quality Conditions**

14 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 15 in Chapter 8, *Water Quality*.

16 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 17 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 18 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
 19 **and 21**

20 Effects of Alternative 6A related to the conversion of Important Farmland and land subject to
 21 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 22 measures would be similar to those described for Alternative 1A. Alternative 6A would restore
 23 approximately 83,800 acres under conservation measures geared toward the restoration of various
 24 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

25 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 26 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 27 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
 28 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
 29 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 30 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 31 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 32 quality of the human environment, the related conversion of the underlying agricultural resource
 33 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 34 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 35 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 36 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 37 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 38 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 39 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

1 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 2 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 3 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 4 other conservation measures could result in conversion of a substantial amount of Important
 5 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 6 resulting in a significant impact on agricultural resources in the study area.

7 Further evaluation of these impacts would depend on additional information relating to the location
 8 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 9 reduce the severity of these impacts by implementing activities such as siting features to encourage
 10 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 11 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 12 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 13 through off-site easements or other agricultural land conservation interests. However, these impacts
 14 remain significant and unavoidable after implementation of this measure because (i) even after
 15 effects from the footprints of conservation measures are minimized through design, they would
 16 continue to require the conversion of substantial amounts of Important Farmland and land subject
 17 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 18 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 19 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 20 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 21 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 22 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 23 desire of individual Delta farmers to continue working on their land, the long-term viability of
 24 regional agricultural economies, the economic health of local governments and special districts, and
 25 the Delta as an evolving place.

26 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 27 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 28 **Subject to Williamson Act Contracts or in Farmland Security Zones**

29 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

30 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 31 **Conservation Measures 2-11, 13, 15, 16, 20, and 21**

32 ***Effects on agriculture as a result of changes in groundwater elevation***

33 Implementation of these conservation measures could indirectly affect agriculture by causing
 34 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 35 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 36 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 37 restoration would result in increased groundwater recharge, which could result in groundwater
 38 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 39 severity of these effects are unknown and would depend on existing localized groundwater levels in
 40 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

1 ***Effects on agriculture as a result of changes in salinity***

2 Effects related to salinity under Alternative 6A would be similar to those described for Alternative
3 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
4 these conservation measures would not introduce new sources of electrical conductivity into the
5 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
6 anticipated to restrict agricultural uses in the study area.

7 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

8 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
9 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
10 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
11 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
12 However, this effect is speculative and its potential severity would depend on site-specific
13 conditions.

14 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

15 Effects related to disruption of infrastructure would be similar to those described under Alternative
16 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
17 and the permanent footprints associated with land acquired for habitat restoration, could directly or
18 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
19 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
20 uses could be substantially restricted. However, the location and severity of this effect would
21 depend on site-specific conditions.

22 ***Effects on agriculture as a result of increased frequency of inundation events***

23 Modified activities in the Yolo Bypass under Alternative 6A would be identical to those described in
24 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
25 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
26 continues later in the spring, this could result in a delay in ground preparation and planting
27 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
28 longer duration could result in a change to crop yields and production, due to a variety of factors
29 beyond delay in planting operations.

30 The new inundation schedule could substantially prevent agricultural use of these lands. The
31 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
32 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
33 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
34 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
35 mitigate this effect.

36 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the
37 proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

38 Effects related to changes in agricultural practices and protection levels under Alternative 6A would
39 be similar to those described for Alternative 1A. The cultivated lands natural community strategy
40 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
41 agricultural use for covered species. While these effects would convert small areas of land to

1 nonagricultural use and could change agricultural practices or yields across a large area,
2 conservation measures would also support the continued use of land for agricultural purposes.
3 Overall, this effect would not be anticipated to substantially restrict agricultural use.

4 **NEPA Effects:** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
5 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
6 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
7 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
8 evaluation of these effects would depend on additional information relating to the location of these
9 activities and other detailed information. However, implementation of Mitigation Measures AG-1
10 and GW-5 will reduce the severity of these adverse effects.

11 **CEQA Conclusion:** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
12 alternative could create a significant impact on agriculture by converting substantial amounts of
13 Important Farmland to other uses through changes to groundwater elevation and seepage,
14 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
15 effects would depend on additional information relating to the location of these activities and other
16 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
17 severity of these impacts by implementing activities such as siting features to encourage continued
18 agricultural production; monitoring seepage effects; relocating or replacing agricultural
19 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
20 and other stakeholders in developing optional agricultural stewardship approaches; and/or
21 preserving agricultural land through off-site easements or other agricultural land conservation
22 interests. However, these impacts remain significant and unavoidable after implementation of these
23 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
24 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
25 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
26 stewardship approach does not focus principally on physical effects, but rather, focuses on
27 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
28 working on the land while maintaining the long-term viability of regional agricultural economies
29 and the economic health of local governments and special districts in the Delta.

30 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
31 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
32 **Subject to Williamson Act Contracts or in Farmland Security Zones**

33 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

34 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

35 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
36 Chapter 7, *Groundwater*.

14.3.3.12 Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)

Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security Zones as a Result of Constructing the Proposed Water Conveyance Facility

Temporary and short-term conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Temporary and short-term effects on Important Farmland associated with construction of structures under Alternative 6B would be identical to those described for Alternative 1B. This alternative would convert approximately 2,144 acres of Important Farmland to other uses, including 1,769 acres of Prime Farmland, 61 acres of Farmland of Statewide Importance, 214 acres of Unique Farmland, and 99 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Permanent conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Permanent effects on Important Farmland associated with construction of structures under Alternative 6B would be identical to those described for Alternative 1B. The facilities associated with this alternative could convert approximately 18,875 acres of Important Farmland to project uses, including 15,800 acres of Prime Farmland, 530 acres of Farmland of Statewide Importance, 2,031 acres of Unique Farmland, and 513 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility

Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland Security Zones associated with construction of structures under Alternative 6B would be identical to those described for Alternative 1B. This alternative could convert approximately 1,326 acres of land subject to Williamson Act contracts, including 233 acres in Farmland Security Zones. Table 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural uses under implementation of each alternative.

Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility

Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones associated with construction of structures under Alternative 6B would be identical to those described for Alternative 1B. This alternative could convert approximately 14,080 acres of land subject to Williamson Act contracts, including 3,788 acres in Farmland Security Zones. Table 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural uses under implementation of each alternative.

1 **NEPA Effects:** The temporary and short-term conversion and permanent conversion of Important
 2 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
 3 agricultural uses, as discussed above, would constitute an adverse effect on the physical
 4 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
 5 along with Mitigation Measure AG-1, would be available to reduce these effects.

6 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
 7 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 8 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 9 construction. Temporary and short-term construction of facilities would convert approximately
 10 2,144 acres of Important Farmland and 1,326 acres of land subject to Williamson Act contracts or in
 11 Farmland Security Zones to other uses. Physical structures would also permanently convert
 12 approximately 18,875 acres of Important Farmland and 14,080 acres of land subject to Williamson
 13 Act contracts or in Farmland Security Zones to other uses. These are considered significant impacts
 14 on the environment. However, implementation of Mitigation Measure AG-1 along with an
 15 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
 16 would reduce these impacts by implementing activities such as siting project footprints to
 17 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
 18 support of continued agricultural activities; engaging counties, owners/operators, and other
 19 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 20 agricultural land through off-site easements or other agricultural land conservation interests.
 21 However, these impacts remain significant and unavoidable after implementation of this measure
 22 because (i) even after effects from the footprints of project facilities are minimized through design,
 23 they would continue to require the conversion of substantial amounts of Important Farmland and
 24 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 25 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 26 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 27 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 28 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 29 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 30 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 31 viability of regional agricultural economies, the economic health of local governments and special
 32 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 33 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

34 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 35 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 36 **Subject to Williamson Act Contracts or in Farmland Security Zones**

37 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

38 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 39 **Proposed Water Conveyance Facility**

40 ***Effects on agriculture as a result of changes in groundwater elevation***

41 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 42 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 43 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to

1 those identified under Alternative 1B. During long-term operations of the water conveyance
2 proposed under this alternative, increases and decreases in the groundwater level could occur in the
3 vicinity of an unlined canal, due to groundwater recharge from this facility. In the southern portion
4 of this alignment, recharge could result in near-surface groundwater levels, which could
5 compromise the viability of agricultural uses on land in these areas. If a lined canal were
6 constructed, canal-related seepage would be minimal.

7 ***Effects on agriculture as a result of changes in salinity***

8 Under this alternative, the operation of new physical facilities combined with hydrodynamic effects
9 of habitat restoration activities under CM2 and CM4 would be similar to those described under
10 Alternative 6A. BDCP operations could indirectly affect agriculture by causing changes to the quality
11 of irrigation water in parts of the study area. Relative to Existing Conditions, the frequency of
12 exceedance and non-compliance would generally decrease or remain unchanged for agricultural EC
13 compliance locations except for Sacramento River at Emmaton, for which the frequency of
14 exceedance and non-compliance with EC objectives would generally increase. Average EC levels
15 would decrease at western and southern Delta compliance locations and at San Joaquin River at San
16 Andreas Landing in the interior Delta but increase at the S. Fork Mokelumne River at Terminous
17 compliance point. Where salinity levels decrease, higher quality irrigation water could benefit
18 agricultural activities by reducing potential restrictions related to yields and crop selection.
19 However, increased salinity levels suggest that a number of crops using this irrigation water may
20 not be able to reach full yields. In general, agricultural activities would be anticipated to continue on
21 lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
22 *Water Quality*, Section 8.3.3.11, Impact WQ-11 and Appendix 8H, Tables EC-6 and EC-17.

23 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

24 Conflicts with existing irrigation and drainage facilities would be similar to those described under
25 Alternative 1B. Temporary construction activities and the permanent footprints associated with
26 physical features constructed as part of this alternative could create conflicts with existing irrigation
27 and drainage facilities throughout the study area. The conveyance alignment constructed under this
28 alternative would cross or interfere with approximately 136 miles of agricultural delivery canals
29 and drainage ditches, including approximately 32 miles on Roberts Island, 28 miles on Union Island,
30 13 miles on New Hope Tract, 11 miles on Terminous Tract, and 10 miles on Rindge Tract. Where
31 irrigation or drainage infrastructure is disconnected from the farmland it serves, continued
32 agricultural use of the land could be jeopardized.

33 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
34 under this alternative could create indirect but adverse effects on agriculture by converting
35 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
36 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
37 related to water quality could be adverse or beneficial, depending on the location. Implementation
38 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
39 effects.

40 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
41 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
42 uses through changes to groundwater elevation in localized areas and disruption of drainage and
43 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
44 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11

1 will reduce the severity of these impacts by implementing activities such as siting project footprints
 2 to encourage continued agricultural production; monitoring changes in groundwater levels during
 3 construction; offsetting water supply losses attributable to construction dewatering activities;
 4 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
 5 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 6 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 7 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 8 through off-site easements or other agricultural land conservation interests. However, these impacts
 9 remain significant and unavoidable after implementation of these measures because (i) replacement
 10 water supplies associated with losses attributable to construction dewatering activities may not
 11 meet the preexisting demands or planned land use demands of the affected party, (ii) seepage
 12 minimization may be infeasible in some instances, (iii) the feasibility and effectiveness of phased
 13 actions to reduce EC levels is uncertain, (iv) conservation or preservation by means of acquiring
 14 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
 15 Important Farmland and (v) the proposed optional agricultural stewardship approach does not
 16 focus principally on physical effects, but rather, focuses on supporting the Delta as an evolving place
 17 by encouraging existing owners and operators to continue working on the land while maintaining
 18 the long-term viability of regional agricultural economies and the economic health of local
 19 governments and special districts in the Delta.

20 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 21 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 22 environmental commitment to address the potential increased water treatment costs that could
 23 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 24 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 25 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 26 water quality effects relating to chloride, electrical conductivity, and bromide.

27 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 28 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 29 **Subject to Williamson Act Contracts or in Farmland Security Zones**

30 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

31 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 32 **Dewatering**

33 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 34 Chapter 7, *Groundwater*.

35 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

36 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 37 Chapter 7, *Groundwater*.

38 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 39 **Quality Conditions**

40 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 41 in Chapter 8, *Water Quality*.

1 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
3 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
4 **and 21**

5 Effects of Alternative 6B related to the conversion of Important Farmland and land subject to
6 Williamson Act contracts or in Farmland Security Zones associated with these conservation
7 measures would be similar to those described for Alternative 1B. Alternative 6B would restore
8 approximately 83,800 acres under conservation measures geared toward the restoration of various
9 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

10 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
11 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
12 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
13 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
14 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
15 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
16 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
17 quality of the human environment, the related conversion of the underlying agricultural resource
18 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
19 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
20 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
21 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
22 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
23 changes from agriculture to restoration and mitigation uses. For further discussion of potential
24 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

25 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
26 measures geared toward the restoration of various natural communities. Additionally, 20 linear
27 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
28 other conservation measures could result in conversion of a substantial amount of Important
29 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
30 resulting in a significant impact on agricultural resources in the study area.

31 Further evaluation of these impacts would depend on additional information relating to the location
32 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
33 reduce the severity of these impacts by implementing activities such as siting features to encourage
34 continued agricultural production; relocating or replacing agricultural infrastructure in support of
35 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
36 optional agricultural stewardship approaches; and/or preserving agricultural land through off-site
37 easements or other agricultural land conservation interests. However, these impacts remain
38 significant and unavoidable after implementation of this measure because (i) even after effects from
39 the footprints of conservation measures are minimized through design, they would continue to
40 require the conversion of substantial amounts of Important Farmland and land subject to
41 Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by means
42 of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid a net
43 loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security
44 Zones and (iii) the proposed optional agricultural stewardship approach does not focus principally
45 on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural economic

1 effect on affected lands in the Delta as a result of the BDCP, taking into consideration the desire of
 2 individual Delta farmers to continue working on their land, the long-term viability of regional
 3 agricultural economies, the economic health of local governments and special districts, and the Delta
 4 as an evolving place.

5 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 6 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 7 **Subject to Williamson Act Contracts or in Farmland Security Zones**

8 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

9 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 10 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

11 ***Effects on agriculture as a result of changes in groundwater elevation***

12 Implementation of these conservation measures could indirectly affect agriculture by causing
 13 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 14 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 15 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 16 restoration would result in increased groundwater recharge, which could result in groundwater
 17 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 18 severity of these effects are unknown and would depend on existing localized groundwater levels in
 19 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

20 ***Effects on agriculture as a result of changes in salinity***

21 Effects related to salinity under Alternative 6B would be similar to those described for Alternative
 22 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 23 these conservation measures would not introduce new sources of electrical conductivity into the
 24 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 25 anticipated to restrict agricultural uses in the study area.

26 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

27 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 28 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
 29 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
 30 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
 31 However, this effect is speculative and its potential severity would depend on site-specific
 32 conditions.

33 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

34 Effects related to disruption of infrastructure would be similar to those described under Alternative
 35 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 36 and the permanent footprints associated with land acquired for habitat restoration, could directly or
 37 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 38 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
 39 uses could be substantially restricted. However, the location and severity of this effect would
 40 depend on site-specific conditions.

1 ***Effects on agriculture as a result of increased frequency of inundation events***

2 Modified activities in the Yolo Bypass under Alternative 6B would be identical to those described in
 3 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
 4 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
 5 continues later in the spring, this could result in a delay in ground preparation and planting
 6 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
 7 longer duration could result in a change to crop yields and production, due to a variety of factors
 8 beyond delay in planting operations.

9 The new inundation schedule could substantially prevent agricultural use of these lands. The
 10 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
 11 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
 12 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
 13 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
 14 mitigate this effect.

15 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 16 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

17 Effects related to changes in agricultural practices and protection levels under Alternative 6B would
 18 be similar to those described for Alternative 1B. The cultivated lands natural community strategy
 19 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 20 agricultural use for covered species. While these effects would convert small areas of land to
 21 nonagricultural use and could change agricultural practices or yields across a large area,
 22 conservation measures would also support the continued use of land for agricultural purposes.
 23 Overall, this effect would not be anticipated to substantially restrict agricultural use.

24 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 25 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 26 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 27 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 28 evaluation of these effects would depend on additional information relating to the location of these
 29 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 30 and GW-5 will reduce the severity of these adverse effects.

31 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 32 alternative could create a significant impact on agriculture by converting substantial amounts of
 33 Important Farmland to other uses through changes to groundwater elevation and seepage,
 34 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 35 effects would depend on additional information relating to the location of these activities and other
 36 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 37 severity of these impacts by implementing activities such as siting features to encourage continued
 38 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 39 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 40 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 41 preserving agricultural land through off-site easements or other agricultural land conservation
 42 interests. However, these impacts remain significant and unavoidable after implementation of these
 43 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 44 preservation by means of acquiring agricultural land conservation interests, even at one-to-one

ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural stewardship approach does not focus principally on physical effects, but rather, focuses on supporting the Delta as an evolving place by encouraging existing owners and operators to continue working on the land while maintaining the long-term viability of regional agricultural economies and the economic health of local governments and special districts in the Delta.

Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land Subject to Williamson Act Contracts or in Farmland Security Zones

Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

Mitigation Measure GW-5: Agricultural Lands Seepage Minimization

Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in Chapter 7, *Groundwater*.

14.3.3.13 Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D)

Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security Zones as a Result of Constructing the Proposed Water Conveyance Facility

Temporary and short-term conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Temporary and short-term effects on Important Farmland associated with construction of structures under Alternative 6C would be identical to those described for Alternative 1C. This alternative would convert approximately 3,170 acres of Important Farmland to other uses, including 2,380 acres of Prime Farmland, 165 acres of Farmland of Statewide Importance, 160 acres of Unique Farmland, and 466 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Permanent conversion of Important Farmland as a result of constructing the proposed water conveyance facility

Permanent effects on Important Farmland associated with construction of structures under Alternative 6C would be identical to those described for Alternative 1C. The facilities associated with this alternative would convert approximately 13,014 acres of Important Farmland to project uses, including 11,124 acres of Prime Farmland, 291 acres of Farmland of Statewide Importance, 909 acres of Unique Farmland, and 690 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important Farmland that could be converted to non-agricultural uses under implementation of each alternative.

Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a result of constructing the proposed water conveyance facility

Temporary and short-term effects on land subject to Williamson Act contracts associated with construction of structures under Alternative 6C would be identical to those described for Alternative

1 1C. This alternative would convert approximately 1,243 acres of land subject to Williamson Act
 2 contracts. Table 14-9 displays a summary of temporary and short-term acreage and permanent
 3 acreage of land subject to Williamson Act contracts that could be converted to non-agricultural uses
 4 under implementation of each alternative.

5 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
 6 ***result of constructing the proposed water conveyance facility***

7 Permanent effects on land subject to Williamson Act contracts associated with construction of
 8 structures under Alternative 6C would be identical to those described for Alternative 1C. This
 9 alternative would convert approximately 7,647 acres of land subject to Williamson Act contracts.
 10 Table 14-9 displays a summary of temporary and short-term acreage and permanent acreage of land
 11 subject to Williamson Act contracts or in Farmland Security Zones that could be converted to non-
 12 agricultural uses under implementation of each alternative.

13 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
 14 Farmland and land subject to Williamson Act contracts to non-agricultural uses, as discussed above,
 15 would constitute an adverse effect on the physical environment. Disposal and reuse of RTM
 16 (described in Appendix 3B, *Environmental Commitments*), along with Mitigation Measure AG-1,
 17 would be available to reduce these effects.

18 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
 19 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 20 Act contracts, directly precluding agricultural use for the duration of construction. Temporary and
 21 short-term construction of facilities could convert approximately 3,170 acres of Important Farmland
 22 and 1,243 acres of land subject to Williamson Act contracts to other uses. Physical structures would
 23 also permanently convert approximately 13,014 acres of Important Farmland and 7,647 acres of
 24 land subject to Williamson Act contracts to other uses. These are considered significant impacts on
 25 the environment. However, implementation of Mitigation Measure AG-1 along with an
 26 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
 27 would reduce these impacts by implementing activities such as siting project footprints to
 28 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
 29 support of continued agricultural activities; engaging counties, owners/operators, and other
 30 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 31 agricultural land through off-site easements or other agricultural land conservation interests.
 32 However, these impacts remain significant and unavoidable after implementation of this measure
 33 because (i) even after effects from the footprints of project facilities are minimized through design,
 34 they would continue to require the conversion of substantial amounts of Important Farmland and
 35 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 36 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 37 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 38 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 39 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 40 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 41 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 42 viability of regional agricultural economies, the economic health of local governments and special
 43 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 44 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

1 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 2 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 3 **Subject to Williamson Act Contracts or in Farmland Security Zones**

4 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

5 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 6 **Proposed Water Conveyance Facility**

7 ***Effects on agriculture as a result of changes in groundwater elevation***

8 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 9 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 10 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 11 those identified under Alternative 1C. During long-term operations of the water conveyance
 12 proposed under this alternative, increases and decreases in the groundwater level could occur in the
 13 vicinity of an unlined canal due to groundwater recharge from this facility. Particularly in the
 14 northern portion of the unlined canal, agricultural drainage would be affected, which could
 15 compromise the viability of agricultural uses on land in these areas. If a lined canal were
 16 constructed, canal-related seepage would be minimal.

17 ***Effects on agriculture as a result of changes in salinity***

18 Under this alternative, the operation of new physical facilities combined with hydrodynamic effects
 19 of habitat restoration activities under CM2 and CM4 would be similar to those described under
 20 Alternative 6A. BDCP operations could indirectly affect agriculture by causing changes to the quality
 21 of irrigation water in parts of the study area. Relative to Existing Conditions, the frequency of
 22 exceedance and non-compliance would generally decrease or remain unchanged for agricultural EC
 23 compliance locations except for Sacramento River at Emmaton, for which the frequency of
 24 exceedance and non-compliance with EC objectives would generally increase. Average EC levels
 25 would decrease at western and southern Delta compliance locations and at San Joaquin River at San
 26 Andreas Landing in the interior Delta but increase at the S. Fork Mokelumne River at Terminous
 27 compliance point. Where salinity levels decrease, higher quality irrigation water could benefit
 28 agricultural activities by reducing potential restrictions related to yields and crop selection.
 29 However, increased salinity levels suggest that a number of crops using this irrigation water may
 30 not be able to reach full yields. However, agricultural activities would be anticipated to continue on
 31 lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
 32 *Water Quality*, Section 8.3.3.11, Impact WQ-11 and Appendix 8H, Tables EC-6 and EC-17.

33 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

34 Conflicts with existing irrigation and drainage facilities would be similar to those described under
 35 Alternative 1C. Temporary construction activities and the permanent footprints associated with
 36 physical features constructed as part of this alternative could create conflicts with existing irrigation
 37 and drainage facilities throughout the study area. The conveyance alignment constructed under this
 38 alternative would cross or interfere with approximately 124 miles of agricultural delivery canals
 39 and drainage ditches, including approximately 45 miles on Ryer Island, 37 miles on the Netherlands
 40 (north of Ryer Island), 20 miles on Byron Tract, and 12 miles on Merritt Island. Where irrigation or
 41 drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
 42 the land could be jeopardized.

1 **NEPA Effects:** Considered together, construction and operation of the water conveyance facility
2 under this alternative could create indirect but adverse effects on agriculture by converting
3 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
4 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
5 related to water quality could be adverse or beneficial, depending on the location. Implementation
6 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
7 effects.

8 **CEQA Conclusion:** Water conveyance facility construction and operation could create a significant
9 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
10 uses through changes to groundwater elevation in localized areas and disruption of drainage and
11 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
12 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
13 will reduce the severity of these impacts by implementing activities such as siting project footprints
14 to encourage continued agricultural production; monitoring changes in groundwater levels during
15 construction; offsetting water supply losses attributable to construction dewatering activities;
16 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
17 continued agricultural activities; identifying, evaluating, developing, and implementing feasible
18 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
19 developing optional agricultural stewardship approaches; and/or preserving agricultural land
20 through off-site easements or other agricultural land conservation interests. However, these impacts
21 remain significant and unavoidable after implementation of these measures because (i) replacement
22 water supplies associated with losses attributable to construction dewatering activities may not
23 meet the preexisting demands or planned land use demands of the affected party, (ii) seepage
24 minimization may be infeasible in some instances, (iii) the feasibility and effectiveness of phased
25 actions to reduce EC levels is uncertain, (iv) conservation or preservation by means of acquiring
26 agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of
27 Important Farmland and (v) the proposed optional agricultural stewardship approach does not
28 focus principally on physical effects, but rather, focuses on supporting the Delta as an evolving place
29 by encouraging existing owners and operators to continue working on the land while maintaining
30 the long-term viability of regional agricultural economies and the economic health of local
31 governments and special districts in the Delta.

32 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
33 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
34 environmental commitment to address the potential increased water treatment costs that could
35 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
36 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
37 pursuant to this commitment in order to reduce the water quality treatment costs associated with
38 water quality effects relating to chloride, electrical conductivity, and bromide.

39 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
40 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
41 **Subject to Williamson Act Contracts or in Farmland Security Zones**

42 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

1 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 2 **Dewatering**

3 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 4 Chapter 7, *Groundwater*.

5 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

6 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 7 Chapter 7, *Groundwater*.

8 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 9 **Quality Conditions**

10 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 11 in Chapter 8, *Water Quality*.

12 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 13 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 14 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
 15 **and 21**

16 Effects of Alternative 6C related to the conversion of Important Farmland and land subject to
 17 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 18 measures would be similar to those described for Alternative 1C. Alternative 6C would restore
 19 approximately 83,800 acres under conservation measures geared toward the restoration of various
 20 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

21 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 22 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 23 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
 24 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
 25 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 26 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 27 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 28 quality of the human environment, the related conversion of the underlying agricultural resource
 29 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 30 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 31 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 32 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 33 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 34 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 35 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

36 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 37 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 38 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 39 other conservation measures could result in conversion of a substantial amount of Important
 40 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 41 resulting in a significant impact on agricultural resources in the study area.

1 Further evaluation of these impacts would depend on additional information relating to the location
 2 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 3 reduce the severity of these impacts by implementing activities such as siting features to encourage
 4 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 5 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 6 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 7 through off-site easements or other agricultural land conservation interests. However, these impacts
 8 remain significant and unavoidable after implementation of this measure because (i) even after
 9 effects from the footprints of conservation measures are minimized through design, they would
 10 continue to require the conversion of substantial amounts of Important Farmland and land subject
 11 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 12 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 13 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 14 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 15 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 16 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 17 desire of individual Delta farmers to continue working on their land, the long-term viability of
 18 regional agricultural economies, the economic health of local governments and special districts, and
 19 the Delta as an evolving place.

20 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 21 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 22 **Subject to Williamson Act Contracts or in Farmland Security Zones**

23 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

24 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 25 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

26 ***Effects on agriculture as a result of changes in groundwater elevation***

27 Implementation of these conservation measures could indirectly affect agriculture by causing
 28 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 29 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 30 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 31 restoration would result in increased groundwater recharge, which could result in groundwater
 32 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 33 severity of these effects are unknown and would depend on existing localized groundwater levels in
 34 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

35 ***Effects on agriculture as a result of changes in salinity***

36 Effects related to salinity under Alternative 6C would be similar to those described for Alternative
 37 1A, Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 38 these conservation measures would not introduce new sources of electrical conductivity into the
 39 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 40 anticipated to restrict agricultural uses in the study area.

1 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

2 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 3 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
 4 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
 5 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
 6 However, this effect is speculative and its potential severity would depend on site-specific
 7 conditions.

8 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

9 Effects related to disruption of infrastructure would be similar to those described under Alternative
 10 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 11 and the permanent footprints associated with land acquired for habitat restoration, could directly or
 12 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 13 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
 14 uses could be substantially restricted. However, the location and severity of this effect would
 15 depend on site-specific conditions.

16 ***Effects on agriculture as a result of increased frequency of inundation events***

17 Modified activities in the Yolo Bypass under Alternative 6C would be identical to those described in
 18 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
 19 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
 20 continues later in the spring, this could result in a delay in ground preparation and planting
 21 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
 22 longer duration could result in a change to crop yields and production, due to a variety of factors
 23 beyond delay in planting operations.

24 The new inundation schedule could substantially prevent agricultural use of these lands. The
 25 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
 26 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
 27 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
 28 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
 29 mitigate this effect.

30 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 31 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

32 Effects related to changes in agricultural practices and protection levels under Alternative 6C would
 33 be similar to those described for Alternative 1C. The cultivated lands natural community strategy
 34 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 35 agricultural use for covered species. While these effects would convert small areas of land to
 36 nonagricultural use and could change agricultural practices or yields across a large area,
 37 conservation measures would also support the continued use of land for agricultural purposes.
 38 Overall, this effect would not be anticipated to substantially restrict agricultural use.

39 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 40 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 41 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 42 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further

1 evaluation of these effects would depend on additional information relating to the location of these
 2 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 3 and GW-5 will reduce the severity of these adverse effects.

4 **CEQA Conclusion:** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 5 alternative could create a significant impact on agriculture by converting substantial amounts of
 6 Important Farmland to other uses through changes to groundwater elevation and seepage,
 7 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 8 effects would depend on additional information relating to the location of these activities and other
 9 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 10 severity of these impacts by implementing activities such as siting features to encourage continued
 11 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 12 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 13 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 14 preserving agricultural land through off-site easements or other agricultural land conservation
 15 interests. However, these impacts remain significant and unavoidable after implementation of these
 16 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 17 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 18 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 19 stewardship approach does not focus principally on physical effects, but rather, focuses on
 20 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 21 working on the land while maintaining the long-term viability of regional agricultural economies
 22 and the economic health of local governments and special districts in the Delta.

23 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 24 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 25 **Subject to Williamson Act Contracts or in Farmland Security Zones**

26 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

27 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

28 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 29 Chapter 7, *Groundwater*.

30 **14.3.3.14 Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2,**
 31 **3, and 5, and Enhanced Aquatic Conservation (9,000 cfs;**
 32 **Operational Scenario E)**

33 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 34 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 35 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

36 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 37 ***water conveyance facility***

38 Temporary and short-term effects on Important Farmland associated with construction of
 39 structures under Alternative 7 would be similar to those described for Alternative 1A except that
 40 Intakes 1 and 4 would not be built. Construction of facilities under this alternative would necessitate
 41 temporary or short-term conversion of approximately 1,105 acres of Important Farmland to other

1 uses, including 979 acres of Prime Farmland, 13 acres of Farmland of Statewide Importance, 48
 2 acres of Unique Farmland, and 64 acres of Farmland of Local Importance. Table 14-8 displays a
 3 summary of temporary and short-term acreage and permanent acreage of Important Farmland that
 4 could be converted to non-agricultural uses under implementation of each alternative.

5 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 6 ***conveyance facility***

7 Permanent effects on Important Farmland associated with construction of structures under
 8 Alternative 7 would be similar to those described for Alternative 1A except that Intakes 1 and 4
 9 would not be built. Construction of facilities under this alternative would necessitate conversion of
 10 approximately 4,883 acres of Important Farmland to other uses, including 3,388 acres of Prime
 11 Farmland, 330 acres of Farmland of Statewide Importance, 1,054 acres of Unique Farmland, and 111
 12 acres of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term
 13 acreage and permanent acreage of Important Farmland that could be converted to non-agricultural
 14 uses under implementation of each alternative.

15 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
 16 ***Security Zones as a result of constructing the proposed water conveyance facility***

17 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
 18 Security Zones associated with construction of structures under Alternative 7 would be similar to
 19 those described for Alternative 1A except that Intakes 1 and 4 would not be built. Construction of
 20 facilities under this alternative would necessitate temporary or short-term conversion of
 21 approximately 744 acres of land subject to Williamson Act contracts, including 77 acres in Farmland
 22 Security Zones. Table 14-9 displays a summary of temporary and short-term acreage and permanent
 23 acreage of land subject to Williamson Act contracts or in Farmland Security Zones that could be
 24 converted to non-agricultural uses under implementation of each alternative.

25 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
 26 ***result of constructing the proposed water conveyance facility***

27 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
 28 associated with construction of structures under Alternative 7 would be similar to those described
 29 for Alternative 1A except that Intakes 1 and 4 would not be built. Construction of facilities under this
 30 alternative would necessitate conversion of approximately 2,847 acres of land subject to Williamson
 31 Act contracts, including 643 acres in Farmland Security Zones. Table 14-9 displays a summary of
 32 temporary and short-term acreage and permanent acreage of land subject to Williamson Act
 33 contracts or in Farmland Security Zones that could be converted to non-agricultural uses under
 34 implementation of each alternative.

35 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
 36 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
 37 agricultural uses, as discussed above, would constitute an adverse effect on the physical
 38 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
 39 along with Mitigation Measure AG-1, would be available to reduce these effects.

40 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
 41 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 42 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 43 construction. Temporary and short-term construction of facilities would convert approximately

1,105 acres of Important Farmland and 744 acres of land subject to Williamson Act contracts or in Farmland Security Zones to other uses. Physical structures would also permanently convert approximately 4,883 acres of Important Farmland and 2,847 acres of land subject to Williamson Act contracts or in Farmland Security Zones to other uses. These are considered significant impacts on the environment. However, implementation of Mitigation Measure AG-1 along with an environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*) would reduce these impacts by implementing activities such as siting project footprints to encourage continued agricultural production; relocating or replacing agricultural infrastructure in support of continued agricultural activities; engaging counties, owners/operators, and other stakeholders in developing optional agricultural stewardship approaches; and/or preserving agricultural land through off-site easements or other agricultural land conservation interests. However, these impacts remain significant and unavoidable after implementation of this measure because (i) even after effects from the footprints of project facilities are minimized through design, they would continue to require the conversion of substantial amounts of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the desire of individual Delta farmers to continue working on their land, the long-term viability of regional agricultural economies, the economic health of local governments and special districts, and the Delta as an evolving place. For further discussion of potential incompatibilities with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land Subject to Williamson Act Contracts or in Farmland Security Zones

Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the Proposed Water Conveyance Facility

Effects on agriculture as a result of changes in groundwater elevation

Construction and operation of water conveyance facilities would indirectly affect agriculture by causing seepage or changes in the elevation of groundwater within the study area, as discussed in Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to those identified under Alternative 1A, Impact AG-2. However, temporarily lower groundwater levels related to dewatering for pumping plant construction associated with Intakes 1 and 4 would not apply to this alternative. These effects could restrict or prevent agricultural uses on land in these areas.

Effects on agriculture as a result of changes in salinity

Under Alternative 7, the operation of new physical facilities combined with hydrodynamic effects of habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,

1 Sacramento River at Emmaton and San Joaquin River at San Andreas Landing and Brandt Bridge
 2 would experience an increase in the number of days when water would exceed or be out of
 3 compliance with electrical conductivity objectives. The percent of days the Emmaton EC objective
 4 would be exceeded for the entire period modeled (1976–1991) would increase from 6% under
 5 Existing Conditions to 16% under Alternative 7, and the percent of days out of compliance would
 6 increase from 11% to 26%. The San Andreas Landing objective would increase from 1% to 3% of
 7 days in exceedance, and from 1% to 6% of days out of compliance with the EC objective. At Brandt
 8 Bridge, the frequency of exceedance would rise from 3% to 4% and that of non-compliance would
 9 increase from 8% to 9%. Additionally, the San Joaquin River at Vernalis exhibits a minor decrease in
 10 the frequency of exceedance of EC objectives, while the number of days out of compliance with
 11 objectives at this location would increase by 1%. Average EC levels would decrease at western and
 12 southern Delta compliance locations and at San Joaquin River at San Andreas Landing. Where
 13 salinity levels decrease, higher quality irrigation water could benefit agricultural activities by
 14 reducing potential restrictions related to yields and crop selection. Over the entire period modeled,
 15 the S. Fork Mokelumne River at Terminous average EC would increase 6%. Modeling of drought
 16 years estimates EC reaching as high as 1.266 dS/m at the Emmaton compliance location. Increased
 17 salinity levels suggest that a number of crops using this irrigation water may not be able to reach full
 18 yields, as reported in Table 14-6. In general, agricultural activities would be anticipated to continue
 19 on lands using these sources. Complete water quality modeling results are discussed in Chapter 8,
 20 *Water Quality*, Section 8.3.3.14, Impact WQ-11 and Appendix 8H, Tables EC-7 and EC-18.

21 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

22 Conflicts with existing irrigation and drainage facilities as a result of constructing the water
 23 conveyance facility would be similar to those described under Alternative 1A. The conveyance
 24 alignment constructed under this alternative would cross or interfere with approximately 38 miles
 25 of agricultural delivery canals and drainage ditches, including approximately 7 miles on Victoria
 26 Island, 5 miles on Bacon Island, 4 miles on Byron Tract, and 4 miles on Tyler Island. Where irrigation
 27 or drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
 28 the land could be jeopardized.

29 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
 30 under this alternative could create indirect but adverse effects on agriculture by converting
 31 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 32 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
 33 related to water quality could be adverse or beneficial, depending on the location. Implementation
 34 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
 35 effects.

36 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
 37 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
 38 uses through changes to groundwater elevation in localized areas and disruption of drainage and
 39 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
 40 depending on the location. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
 41 will reduce the severity of these impacts by implementing activities such as siting project footprints
 42 to encourage continued agricultural production; monitoring changes in groundwater levels during
 43 construction; offsetting water supply losses attributable to construction dewatering activities;
 44 monitoring seepage effects; relocating or replacing agricultural infrastructure in support of
 45 continued agricultural activities; identifying, evaluating, developing, and implementing feasible

1 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 2 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 3 through off-site easements or other agricultural land conservation interests. However, these impacts
 4 remain significant and unavoidable after implementation of these measures because (i) replacement
 5 water supplies associated with losses attributable to construction dewatering activities may not
 6 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
 7 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
 8 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 9 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
 10 stewardship approach does not focus principally on physical effects, but rather, focuses on
 11 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 12 working on the land while maintaining the long-term viability of regional agricultural economies
 13 and the economic health of local governments and special districts in the Delta.

14 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 15 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 16 environmental commitment to address the potential increased water treatment costs that could
 17 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 18 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 19 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 20 water quality effects relating to chloride, electrical conductivity, and bromide.

21 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 22 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 23 **Subject to Williamson Act Contracts or in Farmland Security Zones**

24 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

25 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 26 **Dewatering**

27 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 28 Chapter 7, *Groundwater*.

29 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

30 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 31 Chapter 7, *Groundwater*.

32 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 33 **Quality Conditions**

34 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 35 in Chapter 8, *Water Quality*.

1 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
3 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
4 **and 21**

5 Effects of Alternative 7 related to the conversion of Important Farmland and land subject to
6 Williamson Act contracts or in Farmland Security Zones associated with these conservation
7 measures would be similar to those described for Alternative 1A. However, effects would be more
8 widely distributed because Alternative 7 would restore 20,000 acres of seasonally-inundated
9 floodplain and enhance 40 miles of channel margin habitat rather than the 10,000 acres that would
10 be restored and 20 miles enhanced under Alternative 1A. Across all habitat types, Alternative 7
11 would restore approximately 93,800 acres under a number of conservation measures.

12 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
13 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
14 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
15 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
16 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
17 directly converted to habitat purposes, resulting in an adverse effect. The extent of conversion
18 would likely be larger than for other alternatives. While conflicts with or cancellation of Williamson
19 Act contracts would not—by itself—constitute an adverse effect on the quality of the human
20 environment, the related conversion of the underlying agricultural resource would result in such an
21 effect. Mitigation Measures AG-1 would be available to lessen the severity of these potential effects.
22 Also, under the provisions of Government Code §51223, it may be feasible to rescind Williamson Act
23 contracts for agricultural use, and enter into open space contracts under the Williamson Act, or open
24 space easements pursuant to the Open Space Easement Act. To the extent this mechanism is used, it
25 would eliminate the Williamson Act conflicts otherwise resulting from changes from agriculture to
26 restoration and mitigation uses. For further discussion of potential incompatibilities with land use
27 policies, see Chapter 13, *Land Use*, Impact LU-4.

28 **CEQA Conclusion:** This alternative would restore approximately 93,800 acres under conservation
29 measures geared toward the restoration of various natural communities. Additionally, 40 linear
30 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
31 other conservation measures could result in conversion of a substantial amount of Important
32 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
33 resulting in a significant impact on agricultural resources in the study area.

34 Further evaluation of these impacts would depend on additional information relating to the location
35 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
36 reduce the severity of these impacts by implementing activities such as siting features to encourage
37 continued agricultural production; relocating or replacing agricultural infrastructure in support of
38 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
39 developing optional agricultural stewardship approaches; and/or preserving agricultural land
40 through off-site easements or other agricultural land conservation interests. However, these impacts
41 remain significant and unavoidable after implementation of this measure because (i) even after
42 effects from the footprints of conservation measures are minimized through design, they would
43 continue to require the conversion of substantial amounts of Important Farmland and land subject
44 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
45 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid

1 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 2 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 3 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 4 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 5 desire of individual Delta farmers to continue working on their land, the long-term viability of
 6 regional agricultural economies, the economic health of local governments and special districts, and
 7 the Delta as an evolving place.

8 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 9 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 10 **Subject to Williamson Act Contracts or in Farmland Security Zones**

11 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

12 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 13 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

14 ***Effects on agriculture as a result of changes in groundwater elevation***

15 Implementation of these conservation measures could indirectly affect agriculture by causing
 16 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 17 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. However the severity of these effects
 18 would be expanded when compared to other alternatives, based on the restoration of a larger area
 19 of seasonally-inundated floodplain and channel margin habitat enhancement. Nonetheless,
 20 conservation activities could result in groundwater level rises and soil saturation on adjacent lands.
 21 While the geographic incidence and potential severity of these effects are unknown and would
 22 depend on existing localized groundwater levels in the vicinity of sites chosen for restoration, they
 23 could substantially restrict agricultural uses.

24 ***Effects on agriculture as a result of changes in salinity***

25 Effects related to salinity under Alternative 7 would be similar to those described for Alternative 1A,
 26 Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 27 these conservation measures would not introduce new sources of electrical conductivity into the
 28 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
 29 anticipated to restrict agricultural uses in the study area.

30 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

31 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
 32 conservation measures would be similar, but larger in magnitude, to those described under
 33 Alternative 1A, Impact AG-4. Under this alternative, the restoration of large areas of tidal habitat
 34 could create a localized climate that would be less supportive of crop yields adjacent to areas chosen
 35 for habitat restoration. However, this effect is speculative and its potential severity would depend
 36 on site-specific conditions.

37 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

38 Effects related to disruption of infrastructure would be similar to those described under Alternative
 39 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
 40 and the permanent footprints associated with land acquired for habitat restoration, could directly or

1 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
 2 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
 3 uses could be substantially restricted. However, the location and severity of this effect would
 4 depend on site-specific conditions.

5 ***Effects on agriculture as a result of increased frequency of inundation events***

6 Modified activities in the Yolo Bypass under Alternative 7 would be identical to those described in
 7 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
 8 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
 9 continues later in the spring, this could result in a delay in ground preparation and planting
 10 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
 11 longer duration could result in a change to crop yields and production, due to a variety of factors
 12 beyond delay in planting operations.

13 The new inundation schedule could substantially prevent agricultural use of these lands. The
 14 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
 15 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
 16 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
 17 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
 18 mitigate this effect.

19 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 20 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

21 Effects related to changes in agricultural practices and protection levels under Alternative 7 would
 22 be similar to those described for Alternative 1A. The cultivated lands natural community strategy
 23 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 24 agricultural use for covered species. While these effects would convert small areas of land to
 25 nonagricultural use and could change agricultural practices or yields across a large area,
 26 conservation measures would also support the continued use of land for agricultural purposes.
 27 Overall, this effect would not be anticipated to substantially restrict agricultural use.

28 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 29 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 30 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 31 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 32 evaluation of these effects would depend on additional information relating to the location of these
 33 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 34 and GW-5 will reduce the severity of these adverse effects.

35 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 36 alternative could create a significant impact on agriculture by converting substantial amounts of
 37 Important Farmland to other uses through changes to groundwater elevation and seepage,
 38 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 39 effects would depend on additional information relating to the location of these activities and other
 40 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 41 severity of these impacts by implementing activities such as siting features to encourage continued
 42 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 43 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,

1 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 2 preserving agricultural land through off-site easements or other agricultural land conservation
 3 interests. However, these impacts remain significant and unavoidable after implementation of these
 4 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 5 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 6 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 7 stewardship approach does not focus principally on physical effects, but rather, focuses on
 8 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 9 working on the land while maintaining the long-term viability of regional agricultural economies
 10 and the economic health of local governments and special districts in the Delta.

11 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 12 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 13 **Subject to Williamson Act Contracts or in Farmland Security Zones**

14 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

15 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

16 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 17 Chapter 7, *Groundwater*.

18 **14.3.3.15 Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2,**
 19 **3, and 5 and Increased Delta Outflow (9,000 cfs; Operational**
 20 **Scenario F)**

21 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 22 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 23 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

24 ***Temporary and short-term conversion of Important Farmland as a result of constructing the proposed***
 25 ***water conveyance facility***

26 Temporary and short-term effects on Important Farmland associated with construction of
 27 structures under Alternative 8 would be identical to those described for Alternative 7. Construction
 28 of facilities under this alternative would necessitate temporary or short-term conversion of
 29 approximately 1,105 acres of Important Farmland to other uses, including 979 acres of Prime
 30 Farmland, 13 acres of Farmland of Statewide Importance, 48 acres of Unique Farmland, and 64 acres
 31 of Farmland of Local Importance. Table 14-8 displays a summary of temporary and short-term
 32 acreage and permanent acreage of Important Farmland that could be converted to non-agricultural
 33 uses under implementation of each alternative.

34 ***Permanent conversion of Important Farmland as a result of constructing the proposed water***
 35 ***conveyance facility***

36 Permanent effects on Important Farmland associated with construction of structures under
 37 Alternative 8 would be identical to those described for Alternative 7. Construction of facilities under
 38 this alternative would necessitate conversion of approximately 4,883 acres of Important Farmland
 39 to other uses, including 3,388 acres of Prime Farmland, 330 acres of Farmland of Statewide
 40 Importance, 1,054 acres of Unique Farmland, and 111 acres of Farmland of Local Importance. Table

1 14-8 displays a summary of temporary and short-term acreage and permanent acreage of Important
 2 Farmland that could be converted to non-agricultural uses under implementation of each
 3 alternative.

4 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
 5 ***Security Zones as a result of constructing the proposed water conveyance facility***

6 Temporary and short-term effects on land subject to Williamson Act contracts or in Farmland
 7 Security Zones associated with construction of structures under Alternative 8 would be identical to
 8 those described for Alternative 7. Construction of facilities under this alternative would necessitate
 9 temporary or short-term conversion of approximately 744 acres of land subject to Williamson Act
 10 contracts, including 77 acres in Farmland Security Zones. Table 14-9 displays a summary of
 11 temporary and short-term acreage and permanent acreage of land subject to Williamson Act
 12 contracts or in Farmland Security Zones that could be converted to non-agricultural uses under
 13 implementation of each alternative.

14 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
 15 ***result of constructing the proposed water conveyance facility***

16 Permanent effects on land subject to Williamson Act contracts or in Farmland Security Zones
 17 associated with construction of structures under Alternative 8 would be identical to those described
 18 for Alternative 7. Construction of facilities under this alternative would necessitate conversion of
 19 approximately 2,847 acres of land subject to Williamson Act contracts, including 643 acres in
 20 Farmland Security Zones. Table 14-9 displays a summary of temporary and short-term acreage and
 21 permanent acreage of land subject to Williamson Act contracts or in Farmland Security Zones that
 22 could be converted to non-agricultural uses under implementation of each alternative.

23 ***NEPA Effects:*** The temporary and short-term conversion and permanent conversion of Important
 24 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
 25 agricultural uses, as discussed above, would constitute an adverse effect on the physical
 26 environment. Disposal and reuse of RTM (described in Appendix 3B, *Environmental Commitments*),
 27 along with Mitigation Measure AG-1, would be available to reduce these effects.

28 ***CEQA Conclusion:*** Construction of physical structures associated with the water conveyance facility
 29 proposed under this alternative would occupy Important Farmland and land subject to Williamson
 30 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
 31 construction. Temporary and short-term construction of facilities would convert approximately
 32 1,105 acres of Important Farmland and 744 acres of land subject to Williamson Act contracts or in
 33 Farmland Security Zones to other uses. Physical structures would also permanently convert
 34 approximately 4,883 acres of Important Farmland and 2,847 acres of land subject to Williamson Act
 35 contracts or in Farmland Security Zones to other uses. These are considered significant impacts on
 36 the environment. However, implementation of Mitigation Measure AG-1 along with an
 37 environmental commitment to reuse RTM (described in Appendix 3B, *Environmental Commitments*)
 38 would reduce these impacts by implementing activities such as siting project footprints to
 39 encourage continued agricultural production; relocating or replacing agricultural infrastructure in
 40 support of continued agricultural activities; engaging counties, owners/operators, and other
 41 stakeholders in developing optional agricultural stewardship approaches; and/or preserving
 42 agricultural land through off-site easements or other agricultural land conservation interests.
 43 However, these impacts remain significant and unavoidable after implementation of this measure
 44 because (i) even after effects from the footprints of project facilities are minimized through design,

1 they would continue to require the conversion of substantial amounts of Important Farmland and
 2 land subject to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or
 3 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 4 ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act contracts
 5 or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship approach
 6 does not focus principally on physical effects, but rather, focuses on providing, at a minimum, a
 7 neutral agricultural economic effect on affected lands in the Delta as a result of the BDCP, taking into
 8 consideration the desire of individual Delta farmers to continue working on their land, the long-term
 9 viability of regional agricultural economies, the economic health of local governments and special
 10 districts, and the Delta as an evolving place. For further discussion of potential incompatibilities
 11 with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

12 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 13 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 14 **Subject to Williamson Act Contracts or in Farmland Security Zones**

15 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

16 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 17 **Proposed Water Conveyance Facility**

18 ***Effects on agriculture as a result of changes in groundwater elevation***

19 Construction and operation of water conveyance facilities would indirectly affect agriculture by
 20 causing seepage or changes in the elevation of groundwater within the study area, as discussed in
 21 Chapter 7, *Groundwater*, Impacts GW-1, GW-2, GW-4, and GW-5. These effects would be similar to
 22 those identified under Alternative 1A, Impact AG-2. However, temporarily lower groundwater levels
 23 related to dewatering for pumping plant construction associated with Intakes 1 and 4 would not
 24 apply to this alternative. These effects could restrict or prevent agricultural uses on land in these
 25 areas.

26 ***Effects on agriculture as a result of changes in salinity***

27 Under Alternative 8, the operation of new physical facilities combined with hydrodynamic effects of
 28 habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing
 29 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
 30 there would be an increase number of days when electrical conductivity objectives would be
 31 exceeded in the Sacramento River at Emmaton, San Joaquin River at Vernalis and at Brandt Bridge,
 32 and in the Old River near Middle River. The percent of days the Emmaton EC objective would be
 33 exceeded for the entire period modeled (1976–1991) would increase from 6% under Existing
 34 Conditions to 16% under Alternative 8, and the percent of days out of compliance would increase
 35 from 11% to 28%. During operation of Alternative 8, the frequency of days in exceedance of the
 36 Vernalis objective increases less than 1% compared to Existing Conditions, remaining at 3%. The
 37 frequency of days out of compliance with this EC objective would increase from 7% to 8%. At Brandt
 38 Bridge, the frequency of exceedance would rise from 3% to 4% and that of non-compliance would
 39 increase from 8% to 9%. The frequency of days in exceedance of or out of compliance with the Old
 40 River objective increases less than 1%, remaining at 3% and 8%, respectively. Average EC levels
 41 would decrease at western and southern Delta compliance locations and at San Joaquin River at San
 42 Andreas Landing (in the interior Delta). Where salinity levels decrease, higher quality irrigation

1 water could benefit agricultural activities by reducing potential restrictions related to yields and
2 crop selection. Over the entire period modeled, the S. Fork Mokelumne River at Terminous average
3 EC would increase 5%. Modeling of drought years estimates EC reaching as high as 1.317 dS/m at
4 the Emmaton compliance location. Increased salinity levels suggest that a number of crops using
5 this irrigation water may not be able to reach full yields, as reported in Table 14-6. In general,
6 agricultural activities would be anticipated to continue on lands using these sources. Complete
7 water quality modeling results are discussed in Chapter 8, *Water Quality*, Section 8.3.3.15, Impact
8 WQ-11 and Appendix 8H, Tables EC-8 and EC-19.

9 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

10 Conflicts with existing irrigation and drainage facilities as a result of constructing the water
11 conveyance facility would be similar to those described under Alternative 1A. The conveyance
12 alignment constructed under this alternative would cross or interfere with approximately 38 miles
13 of agricultural delivery canals and drainage ditches, including approximately 7 miles on Victoria
14 Island, 5 miles on Bacon Island, 4 miles on Byron Tract, and 4 miles on Tyler Island. Where irrigation
15 or drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
16 the land could be jeopardized.

17 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
18 under this alternative could create indirect but adverse effects on agriculture by converting
19 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
20 in localized areas and disruption of drainage and irrigation facilities. Effects of this alternative
21 related to water quality could be adverse or beneficial, depending on the location. Implementation
22 of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11 will reduce the severity of these adverse
23 effects.

24 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
25 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
26 uses through changes to groundwater elevation in localized areas, increased levels of salinity, and
27 disruption of drainage and irrigation facilities. In other areas, effects of this alternative related to
28 water quality could be beneficial. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and
29 WQ-11 will reduce the severity of these impacts by implementing activities such as siting project
30 footprints to encourage continued agricultural production; monitoring changes in groundwater
31 levels during construction; offsetting water supply losses attributable to construction dewatering
32 activities; monitoring seepage effects; relocating or replacing agricultural infrastructure in support
33 of continued agricultural activities; identifying, evaluating, developing, and implementing feasible
34 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
35 developing optional agricultural stewardship approaches; and/or preserving agricultural land
36 through off-site easements or other agricultural land conservation interests. However, these impacts
37 remain significant and unavoidable after implementation of these measures because (i) replacement
38 water supplies associated with losses attributable to construction dewatering activities may not
39 meet the preexisting demands or planned land use demands of the affected party, (ii) the feasibility
40 and effectiveness of phased actions to reduce EC levels is uncertain, (iii) conservation or
41 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
42 ratio, may not avoid a net loss of Important Farmland and (iv) the proposed optional agricultural
43 stewardship approach does not focus principally on physical effects, but rather, focuses on
44 supporting the Delta as an evolving place by encouraging existing owners and operators to continue

1 working on the land while maintaining the long-term viability of regional agricultural economies
2 and the economic health of local governments and special districts in the Delta.

3 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
4 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
5 environmental commitment to address the potential increased water treatment costs that could
6 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
7 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
8 pursuant to this commitment in order to reduce the water quality treatment costs associated with
9 water quality effects relating to chloride, electrical conductivity, and bromide.

10 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
11 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
12 **Subject to Williamson Act Contracts or in Farmland Security Zones**

13 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

14 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
15 **Dewatering**

16 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
17 Chapter 7, *Groundwater*.

18 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

19 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
20 Chapter 7, *Groundwater*.

21 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
22 **Quality Conditions**

23 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
24 in Chapter 8, *Water Quality*.

25 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
26 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
27 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
28 **and 21**

29 Effects of Alternative 8 related to the conversion of Important Farmland and land subject to
30 Williamson Act contracts or in Farmland Security Zones associated with these conservation
31 measures would be similar to those described for Alternative 1A. Alternative 8 would restore
32 approximately 83,800 acres under conservation measures geared toward the restoration of various
33 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

34 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
35 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
36 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
37 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
38 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
39 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or

1 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 2 quality of the human environment, the related conversion of the underlying agricultural resource
 3 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 4 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 5 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 6 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 7 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 8 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 9 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

10 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 11 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 12 miles of channel margin habitat would be enhanced. Implementation of restoration activities and
 13 other conservation measures could result in conversion of a substantial amount of Important
 14 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 15 resulting in a significant impact on agricultural resources in the study area.

16 Further evaluation of these impacts would depend on additional information relating to the location
 17 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 18 reduce the severity of these impacts by implementing activities such as siting features to encourage
 19 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 20 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 21 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 22 through off-site easements or other agricultural land conservation interests. However, these impacts
 23 remain significant and unavoidable after implementation of this measure because (i) even after
 24 effects from the footprints of conservation measures are minimized through design, they would
 25 continue to require the conversion of substantial amounts of Important Farmland and land subject
 26 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 27 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 28 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 29 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 30 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 31 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 32 desire of individual Delta farmers to continue working on their land, the long-term viability of
 33 regional agricultural economies, the economic health of local governments and special districts, and
 34 the Delta as an evolving place.

35 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 36 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 37 **Subject to Williamson Act Contracts or in Farmland Security Zones**

38 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

39 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 40 **Conservation Measures 2-11, 13, 15, 16, 20, and 21**

41 ***Effects on agriculture as a result of changes in groundwater elevation***

42 Implementation of these conservation measures could indirectly affect agriculture by causing
 43 changes to the elevation of groundwater in the study area, as described under Alternative 1A,

1 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
2 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
3 restoration would result in increased groundwater recharge, which could result in groundwater
4 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
5 severity of these effects are unknown and would depend on existing localized groundwater levels in
6 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

7 ***Effects on agriculture as a result of changes in salinity***

8 Effects related to salinity under Alternative 8 would be similar to those described for Alternative 1A,
9 Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
10 these conservation measures would not introduce new sources of electrical conductivity into the
11 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
12 anticipated to restrict agricultural uses in the study area.

13 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

14 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
15 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
16 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
17 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
18 However, this effect is speculative and its potential severity would depend on site-specific
19 conditions.

20 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

21 Effects related to disruption of infrastructure would be similar to those described under Alternative
22 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
23 and the permanent footprints associated with land acquired for habitat restoration, could directly or
24 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
25 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
26 uses could be substantially restricted. However, the location and severity of this effect would
27 depend on site-specific conditions.

28 ***Effects on agriculture as a result of increased frequency of inundation events***

29 Modified activities in the Yolo Bypass under Alternative 8 would be identical to those described in
30 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
31 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
32 continues later in the spring, this could result in a delay in ground preparation and planting
33 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
34 longer duration could result in a change to crop yields and production, due to a variety of factors
35 beyond delay in planting operations.

36 The new inundation schedule could substantially prevent agricultural use of these lands. The
37 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
38 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
39 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
40 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
41 mitigate this effect.

1 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the***
 2 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

3 Effects related to changes in agricultural practices and protection levels under Alternative 8 would
 4 be similar to those described for Alternative 1A. The cultivated lands natural community strategy
 5 under CM3 would acquire agricultural land and manage it for specific habitat values corollary to
 6 agricultural use for covered species. While these effects would convert small areas of land to
 7 nonagricultural use and could change agricultural practices or yields across a large area,
 8 conservation measures would also support the continued use of land for agricultural purposes.
 9 Overall, this effect would not be anticipated to substantially restrict agricultural use.

10 ***NEPA Effects:*** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 11 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 12 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 13 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 14 evaluation of these effects would depend on additional information relating to the location of these
 15 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 16 and GW-5 will reduce the severity of these adverse effects.

17 ***CEQA Conclusion:*** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 18 alternative could create a significant impact on agriculture by converting substantial amounts of
 19 Important Farmland to other uses through changes to groundwater elevation and seepage,
 20 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 21 effects would depend on additional information relating to the location of these activities and other
 22 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 23 severity of these impacts by implementing activities such as siting features to encourage continued
 24 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 25 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 26 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 27 preserving agricultural land through off-site easements or other agricultural land conservation
 28 interests. However, these impacts remain significant and unavoidable after implementation of these
 29 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 30 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 31 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 32 stewardship approach does not focus principally on physical effects, but rather, focuses on
 33 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 34 working on the land while maintaining the long-term viability of regional agricultural economies
 35 and the economic health of local governments and special districts in the Delta.

36 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 37 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 38 **Subject to Williamson Act Contracts or in Farmland Security Zones**

39 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

40 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

41 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 42 Chapter 7, *Groundwater*.

1 **14.3.3.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs;**
 2 **Operational Scenario G)**

3 This alternative would construct two fish-screened intakes, fourteen operable barriers, two
 4 pumping plants and other associated facilities, two culvert siphons, three canal segments, new
 5 levees, and new channel connections. Some existing channels would also be enlarged under this
 6 alternative. Nearby areas would be altered as work or staging areas or used for the deposition of
 7 spoils. Areas used for borrow and then for spoils would also be anticipated to have an effect on
 8 agricultural resources. To operate this conveyance facility, the construction of transmission lines,
 9 access roads, two bridges, and other associated facilities would also be necessary.

10 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 11 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 12 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

13 *Temporary and short-term conversion of Important Farmland as a result of constructing the proposed*
 14 *water conveyance facility*

15 Temporary and short-term construction of water conveyance facilities associated with Alternative 9
 16 would convert existing agricultural land to construction-related uses, directly precluding
 17 agricultural use for the duration of construction. This alternative would convert approximately 559
 18 acres of Important Farmland to other uses, including 388 acres of Prime Farmland, 71 acres of
 19 Farmland of Statewide Importance, 3 acres of Unique Farmland, and 97 acres of Farmland of Local
 20 Importance.

21 Of these areas of Important Farmland, operable barrier work areas would require the temporary or
 22 short-term conversion of nearly 200 acres. These areas would be adjacent to proposed operable
 23 barriers including on the Sacramento River at Georgiana Slough, Three Mile Slough, and Delta Cross
 24 Channel; on the Mokelumne River near Lost Slough; on Meadows Slough near the Sacramento River;
 25 on Snodgrass Slough north of Delta Cross Channel; on the San Joaquin River at head of Old River; on
 26 Middle River south of Victoria Canal; at Victoria Canal/North Canal; on Woodward Canal/North
 27 Victoria Canal; on Railroad Cut; on Connection Slough; at Frank's Tract; and on Fisherman's Cut.
 28 Siphon work areas would convert approximately 125 acres on Coney Island and west Union Island
 29 for culvert siphons crossing Old River and West Canal. Work areas associated with proposed canals
 30 would require nearly 70 acres south of Clifton Court Forebay and on west Union Island. Other
 31 temporary work areas, including those necessary for the construction of access roads, barge
 32 facilities, dredging and channel enlargement activities, fish screens, levees, and transmission lines
 33 would also be located on farmland within the conveyance alignment. Mapbook Figure M14-9 shows
 34 all of the construction features (including temporary work areas) associated with this proposed
 35 water conveyance facility alignment along with Important Farmland. Table 14-8 displays a summary
 36 of temporary and short-term acreage and permanent acreage of Important Farmland that could be
 37 converted to non-agricultural uses under implementation of each alternative.

38 *Permanent conversion of Important Farmland as a result of constructing the proposed water*
 39 *conveyance facility*

40 Physical structures associated with construction of water conveyance facilities would occupy
 41 agricultural lands designated as Important Farmland, directly precluding future agricultural use.
 42 The facilities associated with this alternative would convert approximately 2,459 acres of Important

1 Farmland to project uses, including 2,104 acres of Prime Farmland, 307 acres of Farmland of
2 Statewide Importance, 7 acres of Unique Farmland, and 41 acres of Farmland of Local Importance.

3 Of these areas of Important Farmland, areas dedicated to borrow or spoils would convert
4 approximately 2,000 acres under this alternative. These areas would be located throughout the
5 conveyance alignment, with some of the largest areas identified adjacent to Middle River on Bacon
6 Island, Woodward Island, and Jones Tract and north of Victoria Canal and Victoria Island. As
7 described in Appendix 3B, *Environmental Commitments*, it is anticipated that dredged material
8 would be removed from storage areas and reused, as appropriate, as bulking material for levee
9 maintenance, as fill material for habitat restoration projects, or other beneficial means of reuse
10 identified for the material. Approximately 340 acres would be converted to canals between Victoria
11 Canal and Clifton Court Forebay and between Clifton Court Forebay and the Tracy Fish Facility.
12 Channel enlargement areas, fish screens, operable barriers, and transmission lines would also
13 require conversion of lands to nonagricultural uses. Mapbook Figure M14-9 shows all of the
14 construction features (including temporary work areas) associated with this proposed water
15 conveyance facility alignment along with Important Farmland. Table 14-8 displays a summary of
16 temporary and short-term acreage and permanent acreage of Important Farmland that could be
17 converted to non-agricultural uses under implementation of each alternative.

18 ***Temporary and short-term conversion of land subject to Williamson Act contracts or in Farmland***
19 ***Security Zones as a result of constructing the proposed water conveyance facility***

20 Temporary or short-term construction activities related to building the physical components of
21 Alternative 9 would directly convert land subject to Williamson Act contracts or in Farmland
22 Security Zones. This alternative would convert approximately 790 acres of land subject to
23 Williamson Act contracts, including 132 acres in Farmland Security Zones. For further discussion of
24 potential incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-1.

25 Of this land subject to Williamson Act contracts or in Farmland Security Zones, operable barrier
26 work areas would require the temporary or short-term conversion of approximately 370 acres,
27 primarily adjacent to Middle River south of Mildred Island. Operable barrier work areas would be
28 located on nearly 130 acres. These areas would be adjacent to proposed barriers throughout the
29 conveyance alignment. Siphon work areas would convert approximately 125 acres on Coney Island
30 and west Union Island for culvert siphons crossing Old River and West Canal. Other temporary work
31 areas, including those necessary for the construction of canals, access roads, barge facilities,
32 dredging and channel enlargement activities, fish screens, levees, and transmission lines would also
33 be located on land subject to Williamson Act contracts or in Farmland Security Zones within the
34 conveyance alignment. Mapbook Figure M14-10 shows all of the construction features (including
35 temporary work areas) associated with this proposed water conveyance facility alignment along
36 with land subject to Williamson Act contracts or in Farmland Security Zones. Table 14-9 displays a
37 summary of temporary and short-term acreage and permanent acreage of land subject to
38 Williamson Act contracts or in Farmland Security Zones that could be converted to non-agricultural
39 uses under implementation of each alternative.

40 ***Permanent conversion of land subject to Williamson Act contracts or in Farmland Security Zones as a***
41 ***result of constructing the proposed water conveyance facility***

42 Physical components of Alternative 9 would directly and permanently convert land subject to
43 Williamson Act contracts or in Farmland Security Zones to non-agricultural uses. This alternative
44 would convert approximately 2,347 acres of land subject to Williamson Act contracts, including 919

1 acres in Farmland Security Zones. For further discussion of potential incompatibilities with land use
2 policies, see Chapter 13, *Land Use*, Impact LU-1.

3 Of this land subject to Williamson Act contracts or in Farmland Security Zones, areas dedicated to
4 borrow or spoils would convert more than 1,900 acres under this alternative. These areas would be
5 located throughout the conveyance alignment, with some of the largest areas identified adjacent to
6 Middle River on Bacon Island, Woodward Island, and Jones Tract and north of Victoria Canal and
7 Victoria Island. As described in Appendix 3B, *Environmental Commitments*, it is anticipated that
8 dredged material would be removed from storage areas and reused, as appropriate, as bulking
9 material for levee maintenance, as fill material for habitat restoration projects, or other beneficial
10 means of reuse identified for the material. Approximately 240 acres would be converted to canals
11 between Victoria Canal and Clifton Court Forebay and between Clifton Court Forebay and the Tracy
12 Fish Facility. Channel dredging and enlargement areas, fish screens, operable barriers, and
13 transmission lines would also require conversion of lands to nonagricultural uses. Mapbook Figure
14 M14-10 shows all of the construction features (including temporary work areas) associated with
15 this proposed water conveyance facility alignment along with land subject to Williamson Act
16 contracts or in Farmland Security Zones. Table 14-9 displays a summary of temporary and short-
17 term acreage and permanent acreage of land subject to Williamson Act contracts or in Farmland
18 Security Zones that could be converted to non-agricultural uses under implementation of each
19 alternative.

20 **NEPA Effects:** The temporary and short-term conversion and permanent conversion of Important
21 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones to non-
22 agricultural uses, as discussed above, would constitute an adverse effect on the physical
23 environment. Disposal and reuse of dredged material (described in Appendix 3B, *Environmental*
24 *Commitments*), along with Mitigation Measure AG-1 would be available to reduce these effects.

25 **CEQA Conclusion:** Construction of physical structures associated with the water conveyance facility
26 proposed under this alternative would occupy Important Farmland and land subject to Williamson
27 Act contracts or in Farmland Security Zones, directly precluding agricultural use for the duration of
28 construction. Temporary and short-term construction of facilities could convert approximately 559
29 acres of Important Farmland and 790 acres of land subject to Williamson Act contracts or in
30 Farmland Security Zones to other uses. Physical structures would also permanently convert
31 approximately 2,459 acres of Important Farmland and 2,347 acres of land subject to Williamson Act
32 contracts or in Farmland Security Zones to other uses. These are considered significant impacts on
33 the environment. However, implementation of Mitigation Measure AG-1 along with an
34 environmental commitment to reuse dredged material (described in Appendix 3B, *Environmental*
35 *Commitments*) would reduce these impacts by implementing activities such as siting project
36 footprints to encourage continued agricultural production; relocating or replacing agricultural
37 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
38 and other stakeholders in developing optional agricultural stewardship approaches; and/or
39 preserving agricultural land through off-site easements or other agricultural land conservation
40 interests. However, these impacts remain significant and unavoidable after implementation of this
41 measure because (i) even after effects from the footprints of project facilities are minimized through
42 design, they would continue to require the conversion of substantial amounts of Important
43 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones, (ii)
44 conservation or preservation by means of acquiring agricultural land conservation interests, even at
45 one-to-one ratio, may not avoid a net loss of Important Farmland and land subject to Williamson Act
46 contracts or in Farmland Security Zones and (iii) the proposed optional agricultural stewardship

1 approach does not focus principally on physical effects, but rather, focuses on providing, at a
 2 minimum, a neutral agricultural economic effect on affected lands in the Delta as a result of the
 3 BDCP, taking into consideration the desire of individual Delta farmers to continue working on their
 4 land, the long-term viability of regional agricultural economies, the economic health of local
 5 governments and special districts, and the Delta as an evolving place. For further discussion of
 6 potential incompatibilities with land use designations, see Chapter 13, *Land Use*, Impact LU-1.

7 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 8 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 9 **Subject to Williamson Act Contracts or in Farmland Security Zones**

10 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

11 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 12 **Proposed Water Conveyance Facility**

13 ***Effects on agriculture as a result of changes in groundwater elevation***

14 Construction and operation of water conveyance facilities under Alternative 9 would not be
 15 anticipated to substantially affect groundwater levels and recharge in the Delta. While new, small
 16 canal sections and channel connections would be operated as part of this alternative, their effects
 17 would be minor.

18 ***Effects on agriculture as a result of changes in salinity***

19 Under Alternative 9, the operation of new physical facilities combined with hydrodynamic effects of
 20 habitat restoration activities under CM2 and CM4, could indirectly affect agriculture by causing
 21 changes to the quality of irrigation water in parts of the study area. Relative to Existing Conditions,
 22 there would be an increase in the number of days when the San Joaquin River at San Andreas
 23 Landing would be out of compliance with electrical conductivity objectives, increasing from 1% to
 24 2% of days. The percent of days the Emmaton EC objective would be exceeded for the entire period
 25 modeled (1976–1991) would increase from 6% to 17%, and the percent of days out of compliance
 26 would increase from 11% to 28%. Additionally, in Three Mile Slough near the Sacramento River,
 27 there would be a minor decrease in the frequency of exceedance of EC objectives, while the number
 28 of days out of compliance with objectives at this location would increase by less than 1%.

29 Average EC levels would decrease at western and southern Delta compliance locations, except at
 30 Emmaton, and at S. Fork Mokelumne River at Terminous. Where salinity levels decrease, higher
 31 quality irrigation water could benefit agricultural activities by reducing potential restrictions related
 32 to yields and crop selection. In the Sacramento River at Emmaton, average EC would increase 22%
 33 for the entire period modeled and 36% during the drought period modeled. Over the entire period
 34 modeled, the average EC in the San Joaquin River at San Andreas Landing would increase 16%.
 35 Modeling of drought years estimates EC reaching as high as 1.976 dS/m in the Sacramento River at
 36 Emmaton. Increased salinity levels suggest that a number of crops using this irrigation water may
 37 not be able to reach full yields, as reported in Table 14-6. In general, agricultural activities would be
 38 anticipated to continue on lands using these sources. Complete water quality modeling results are
 39 discussed in Chapter 8, *Water Quality*, Section 8.3.3.16, Impact WQ-11 and Appendix 8H, Tables EC-9
 40 and EC-20.

1 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

2 Temporary construction activities like dredging and work areas for constructing levees, canals,
 3 siphons, pumping plants, and operable barriers could change the quantity and quality of water
 4 available through agricultural delivery canals. The conveyance alignment constructed under this
 5 alternative would cross or interfere with approximately 27 miles of agricultural delivery canals and
 6 drainage ditches, including approximately 8 miles on Victoria Island, 4 miles on Jones Tract, 4 miles
 7 on Coney Island, and 4 miles on Woodward Island. Additionally, approximately 370 delivery canals
 8 and drainage ditches lie along the corridors used under this conveyance alignment. Several
 9 modifications to drainage facilities would also be necessary under this alternative, in order to
 10 separate the water supply corridors from those designated for fish movement. Construction
 11 activities requiring excavation or use of land where irrigation canals are currently located could
 12 disrupt the delivery of water to crops, which would compromise a key condition for the productive
 13 use of the land for agriculture. Similarly, where construction or the long-term placement of
 14 conveyance facilities associated with this alternative requires an existing agricultural drainage
 15 facility to be disconnected, high groundwater levels could expose crops to soil conditions that would
 16 prevent the continuation of most agricultural activities on the affected land. Where irrigation or
 17 drainage infrastructure is disconnected from the farmland it serves, continued agricultural use of
 18 the land could be jeopardized.

19 ***NEPA Effects:*** Considered together, construction and operation of the water conveyance facility
 20 under this alternative could create indirect but adverse effects on agriculture by converting
 21 substantial amounts of Important Farmland to other uses through disruption of drainage and
 22 irrigation facilities. Effects of this alternative related to water quality could be adverse or beneficial,
 23 depending on the location. Implementation of Mitigation Measures AG-1 and WQ-11 will reduce the
 24 severity of these adverse effects.

25 ***CEQA Conclusion:*** Water conveyance facility construction and operation could create a significant
 26 adverse impact on agriculture by converting substantial amounts of Important Farmland to other
 27 uses through disruption of drainage and irrigation facilities. Effects of this alternative related to
 28 water quality could be adverse or beneficial, depending on the location. Implementation of
 29 Mitigation Measures AG-1 and WQ-11 will reduce the severity of these impacts by implementing
 30 activities such as siting project footprints to encourage continued agricultural production; relocating
 31 or replacing agricultural infrastructure in support of continued agricultural activities; identifying,
 32 evaluating, developing, and implementing feasible phased actions to reduce EC levels; engaging
 33 counties, owners/operators, and other stakeholders in developing optional agricultural stewardship
 34 approaches; and/or preserving agricultural land through off-site easements or other agricultural
 35 land conservation interests. However, these impacts remain significant and unavoidable after
 36 implementation of these measures because (i) the feasibility and effectiveness of phased actions to
 37 reduce EC levels is uncertain, (ii) conservation or preservation by means of acquiring agricultural
 38 land conservation interests, even at one-to-one ratio, may not avoid a net loss of Important
 39 Farmland and (iii) the proposed optional agricultural stewardship approach does not focus
 40 principally on physical effects, but rather, focuses on supporting the Delta as an evolving place by
 41 encouraging existing owners and operators to continue working on the land while maintaining the
 42 long-term viability of regional agricultural economies and the economic health of local governments
 43 and special districts in the Delta.

44 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 45 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-

1 environmental commitment to address the potential increased water treatment costs that could
 2 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 3 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 4 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 5 water quality effects relating to chloride, electrical conductivity, and bromide.

6 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 7 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 8 **Subject to Williamson Act Contracts or in Farmland Security Zones**

9 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

10 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 11 **Quality Conditions**

12 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 13 in Chapter 8, *Water Quality*.

14 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 15 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 16 **Zones as a Result of Implementing the Proposed Conservation Measures 2–11, 13, 15, 16, 20,**
 17 **and 21**

18 Effects of Alternative 9 related to the conversion of Important Farmland and land subject to
 19 Williamson Act contracts or in Farmland Security Zones associated with these conservation
 20 measures would be similar to those described for Alternative 1A. Potential variations could result
 21 from areas in which physical features associated with this alternative conflict with potential
 22 restoration areas thereby necessitating implementation elsewhere. Alternative 9 would restore
 23 approximately 83,800 acres under conservation measures geared toward the restoration of various
 24 natural communities. Additionally, 20 linear miles of channel margin habitat would be enhanced.

25 **NEPA Effects:** Because locations have not been selected for these activities, the extent of this effect is
 26 unknown and a definitive conclusion cannot be reached. However, based on the large proportion of
 27 land in the conservation zones designated as Important Farmland and/or subject to Williamson Act
 28 contracts or in Farmland Security Zones, it is anticipated that a substantial area of Important
 29 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones would be
 30 directly converted to habitat purposes, resulting in an adverse effect. While conflicts with or
 31 cancellation of Williamson Act contracts would not—by itself—constitute an adverse effect on the
 32 quality of the human environment, the related conversion of the underlying agricultural resource
 33 would result in such an effect. Mitigation Measures AG-1 would be available to lessen the severity of
 34 these potential effects. Also, under the provisions of Government Code §51223, it may be feasible to
 35 rescind Williamson Act contracts for agricultural use, and enter into open space contracts under the
 36 Williamson Act, or open space easements pursuant to the Open Space Easement Act. To the extent
 37 this mechanism is used, it would eliminate the Williamson Act conflicts otherwise resulting from
 38 changes from agriculture to restoration and mitigation uses. For further discussion of potential
 39 incompatibilities with land use policies, see Chapter 13, *Land Use*, Impact LU-4.

40 **CEQA Conclusion:** This alternative would restore approximately 83,800 acres under conservation
 41 measures geared toward the restoration of various natural communities. Additionally, 20 linear
 42 miles of channel margin habitat would be enhanced. Implementation of restoration activities and

1 other conservation measures could result in conversion of a substantial amount of Important
 2 Farmland and conflict with land subject to Williamson Act contracts or in Farmland Security Zones,
 3 resulting in a significant impact on agricultural resources in the study area.

4 Further evaluation of these impacts would depend on additional information relating to the location
 5 of these activities and other detailed information. Implementation of Mitigation Measure AG-1 will
 6 reduce the severity of these impacts by implementing activities such as siting features to encourage
 7 continued agricultural production; relocating or replacing agricultural infrastructure in support of
 8 continued agricultural activities; engaging counties, owners/operators, and other stakeholders in
 9 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 10 through off-site easements or other agricultural land conservation interests. However, these impacts
 11 remain significant and unavoidable after implementation of this measure because (i) even after
 12 effects from the footprints of conservation measures are minimized through design, they would
 13 continue to require the conversion of substantial amounts of Important Farmland and land subject
 14 to Williamson Act contracts or in Farmland Security Zones, (ii) conservation or preservation by
 15 means of acquiring agricultural land conservation interests, even at one-to-one ratio, may not avoid
 16 a net loss of Important Farmland and land subject to Williamson Act contracts or in Farmland
 17 Security Zones and (iii) the proposed optional agricultural stewardship approach does not focus
 18 principally on physical effects, but rather, focuses on providing, at a minimum, a neutral agricultural
 19 economic effect on affected lands in the Delta as a result of the BDCP, taking into consideration the
 20 desire of individual Delta farmers to continue working on their land, the long-term viability of
 21 regional agricultural economies, the economic health of local governments and special districts, and
 22 the Delta as an evolving place.

23 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 24 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 25 **Subject to Williamson Act Contracts or in Farmland Security Zones**

26 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

27 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 28 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

29 ***Effects on agriculture as a result of changes in groundwater elevation***

30 Implementation of these conservation measures could indirectly affect agriculture by causing
 31 changes to the elevation of groundwater in the study area, as described under Alternative 1A,
 32 Impact AG-4 and in Chapter 7, *Groundwater*, Impact GW-6. Increased frequency of inundation
 33 associated with proposed tidal habitat, channel margin habitat, and seasonally inundated floodplain
 34 restoration would result in increased groundwater recharge, which could result in groundwater
 35 level rises and soil saturation on adjacent lands. While the geographic incidence and potential
 36 severity of these effects are unknown and would depend on existing localized groundwater levels in
 37 the vicinity of sites chosen for restoration, they could substantially restrict agricultural uses.

38 ***Effects on agriculture as a result of changes in salinity***

39 Effects related to salinity under Alternative 9 would be similar to those described for Alternative 1A,
 40 Impact AG-4. As discussed in Chapter 8, *Water Quality*, under Impact WQ-12, implementation of
 41 these conservation measures would not introduce new sources of electrical conductivity into the

1 study area. Therefore, as they relate to salinity of irrigation water, these measures would not be
2 anticipated to restrict agricultural uses in the study area.

3 ***Effects on agriculture as a result of changes in microclimates and localized growing conditions***

4 Effects on agriculture as a result of changes to microclimates introduced by the implementation of
5 conservation measures would be similar to those described under Alternative 1A, Impact AG-4.
6 Under this alternative, the restoration of large areas of tidal habitat could create a localized climate
7 that would be less supportive of crop yields adjacent to areas chosen for habitat restoration.
8 However, this effect is speculative and its potential severity would depend on site-specific
9 conditions.

10 ***Effects on agriculture as a result of disruptions to agricultural infrastructure***

11 Effects related to disruption of infrastructure would be similar to those described under Alternative
12 1A, Impact AG-4. Implementation of CM21, Nonproject Diversions, along with construction activities
13 and the permanent footprints associated with land acquired for habitat restoration, could directly or
14 indirectly disrupt existing agricultural irrigation and drainage facilities throughout the study area.
15 Where irrigation or drainage infrastructure is disconnected from the farmland it serves, agricultural
16 uses could be substantially restricted. However, the location and severity of this effect would
17 depend on site-specific conditions.

18 ***Effects on agriculture as a result of increased frequency of inundation events***

19 Modified activities in the Yolo Bypass under Alternative 9 would be identical to those described in
20 Alternative 1A, Impact AG-4, and would indirectly affect agricultural practices by increasing the
21 frequency, duration, and magnitude of floodplain inundation in the Yolo Bypass. If inundation
22 continues later in the spring, this could result in a delay in ground preparation and planting
23 operations for crops within the Yolo Bypass. Additionally, the increased presence of water over a
24 longer duration could result in a change to crop yields and production, due to a variety of factors
25 beyond delay in planting operations.

26 The new inundation schedule could substantially prevent agricultural use of these lands. The
27 amount of agricultural land potentially affected by these and related activities (up to 17,000 acres)
28 suggests the potential for an adverse effect on agricultural resources; however, the extent of these
29 effects is unknown at this point and will be analyzed in forthcoming documents for the YBFEP,
30 which would be completed under CM2. Additionally, Mitigation Measure AG-1 is available to
31 mitigate this effect.

32 ***Changes to agricultural practices and protection of agricultural land as a result of implementing the*** 33 ***proposed Conservation Measures 2–11, 13, 15, 16, 20, and 21***

34 Effects related to changes in agricultural practices and protection levels under Alternative 9 would
35 be similar to those described for Alternative 1A. Potential changes could result from areas chosen
36 for protection based on the physical alignment of facilities under this alternative. The cultivated
37 lands natural community strategy under CM3 would acquire agricultural land and manage it for
38 specific habitat values corollary to agricultural use for covered species. While these effects would
39 convert small areas of land to nonagricultural use and could change agricultural practices or yields
40 across a large area, conservation measures would also support the continued use of land for
41 agricultural purposes. Overall, this effect would not be anticipated to substantially restrict
42 agricultural use.

1 **NEPA Effects:** Considered together, implementation of Conservation Measures 2–11, 13, 15, 16, 20,
 2 and 21 under this alternative could create indirect but adverse effects on agriculture by converting
 3 substantial amounts of Important Farmland to other uses through changes to groundwater elevation
 4 and seepage, disruption of drainage and irrigation facilities, or increased inundation. Further
 5 evaluation of these effects would depend on additional information relating to the location of these
 6 activities and other detailed information. However, implementation of Mitigation Measures AG-1
 7 and GW-5 will reduce the severity of these adverse effects.

8 **CEQA Conclusion:** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under this
 9 alternative could create a significant impact on agriculture by converting substantial amounts of
 10 Important Farmland to other uses through changes to groundwater elevation and seepage,
 11 disruption of drainage and irrigation facilities, or increased inundation. Further evaluation of these
 12 effects would depend on additional information relating to the location of these activities and other
 13 detailed information. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the
 14 severity of these impacts by implementing activities such as siting features to encourage continued
 15 agricultural production; monitoring seepage effects; relocating or replacing agricultural
 16 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 17 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 18 preserving agricultural land through off-site easements or other agricultural land conservation
 19 interests. However, these impacts remain significant and unavoidable after implementation of these
 20 measures because (i) seepage minimization may be infeasible in some instances, (ii) conservation or
 21 preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 22 ratio, may not avoid a net loss of Important Farmland and (iii) the proposed optional agricultural
 23 stewardship approach does not focus principally on physical effects, but rather, focuses on
 24 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 25 working on the land while maintaining the long-term viability of regional agricultural economies
 26 and the economic health of local governments and special districts in the Delta.

27 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 28 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 29 **Subject to Williamson Act Contracts or in Farmland Security Zones**

30 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

31 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

32 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 33 Chapter 7, *Groundwater*.

34 **14.3.4 Cumulative Analysis**

35 This cumulative impact analysis considers projects that could affect agricultural resources and,
 36 where relevant, in the same time frame as an action alternative, result in a cumulative impact.
 37 Agricultural resources are expected to change as a result of past, present, and reasonably
 38 foreseeable future projects related to population growth and changes in economic activity in the
 39 study area (for further discussion of these changes, see Chapter 16, *Socioeconomics*, and Chapter 30,
 40 *Growth Inducement and Other Indirect Effects*). It is expected that some changes related to
 41 agriculture, including conversion of Important Farmland and land subject to Williamson Act
 42 contracts or in Farmland Security Zones, would take place, even though it is assumed that

1 reasonably foreseeable future projects would include typical design and construction practices to
2 avoid or minimize potential impacts.

3 When the effects of any of the BDCP alternatives are considered in combination with the effects of
4 initiatives listed in Table 14-12, the cumulative effects on agriculture would be adverse. The specific
5 programs, projects, and policies are identified below for each impact category based on the potential
6 to contribute to a BDCP impact that could be deemed cumulatively considerable. The potential for
7 cumulative impacts on agriculture is described for effects related to the construction of water
8 conveyance facilities and effects stemming from the long-term implementation of CM2-22.

9 The following list includes projects considered for this cumulative effects section; for a complete list
10 of such projects, consult Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project*
11 *Alternative, and Cumulative Impact Conditions.*

12 **Table 14-12. Effects on Agriculture from the Plans, Policies, and Programs Considered for Cumulative**
13 **Analysis**

Agency	Program/ Project	Status	Description of Program/Project	Effects on Agriculture
Department of Water Resources	North Delta Flood Control and Ecosystem Restoration Project	Final EIR completed in 2010	Project implements flood control and ecosystem restoration benefits in the north Delta	Project includes changes to land uses from restoration of floodplain areas and levee protection elements
Freeport Regional Water Authority and Bureau of Reclamation	Freeport Regional Water Project	Project was completed late 2010. Estimated completion of water treatment plant in 2012	Project includes an intake/pumping plant near Freeport on the Sacramento River and a conveyance structure to transport water through Sacramento County to the Folsom South Canal	Project resulted in permanent conversion of approximately 50-70 acres of farmland to nonagricultural uses. Approximately 35-45 acres of farmland and 415 acres of land subject to Williamson Act contracts were temporarily affected
Reclamation District 2093	Staten Island Wildlife-Friendly Farming Demonstration	Ongoing program	Habitat restoration project allowing longer flooding duration on agricultural lands	Longer inundation period over 2,500 - 5,000 acres of corn
California Department of Fish and Wildlife	Fremont Landing Conservation Bank	Program under development. Mitigated Negative Declaration issued in 2009		Could convert active farmland to nonagricultural use
California Department of Fish and Wildlife	Restoring Ecosystem Integrity in the Northwest Delta	Ongoing program	Acquisition of conservation easements on habitat and agricultural lands	Currently acquiring agricultural easement on 292 acres

Agency	Program/ Project	Status	Description of Program/Project	Effects on Agriculture
Bureau of Reclamation	Delta-Mendota Canal/California Aqueduct Intertie	Project completed in 2012	The purpose of the intertie is to better coordinate water delivery operations between the California Aqueduct (state) and the Delta-Mendota Canal (federal) and to provide better pumping capacity for the Jones Pumping Plant. New project facilities include a pipeline and pumping plant	Under the preferred alternative, approximately 2 acres of grazing land has been permanently converted to developed land
California Department of Water Resources	South Delta Temporary Barriers Project	Ongoing project	Project to increase water levels and improve circulation patterns and water quality while improving operational flexibility of the State Water Project	Barriers improve water quality for agricultural uses
Bureau of Reclamation and San Luis & Delta Mendota Water Authority	Grassland Bypass Project, 2010-2019, and Agricultural Drainage Selenium Management Program	Program under development. Final EIS/EIR in 2009	Reduce effects from agricultural drainage	Affects regulatory compliance for agricultural operators
Central Valley Regional Water Quality Board	Irrigated Lands Regulatory Program	Ongoing program	Program to prevent agricultural discharges from impairing waters	Affects regulatory compliance for agricultural operators

1

2 The above list of related projects evaluated for cumulative impacts includes a number of projects

3 that would convert agricultural lands to nonagricultural uses and otherwise affect agricultural

4 activities in the study area. The proposed BDCP, in conjunction with other projects that affect

5 agricultural use, would convert Important Farmland and land subject to Williamson Act contracts or

6 in Farmland Security Zones to nonagricultural uses, while also creating indirect effects on

7 agriculture. Agricultural conversion could occur through urban development in the study area,

8 habitat restoration efforts, water supply projects, and water quality programs. The actual amount of

9 land and that may be converted by other projects is not known. Considering two major projects in

10 the vicinity of the BDCP alternatives, Mountain House and River Islands development,

11 approximately 7,241 acres of agricultural land would be converted to developed uses. Additionally,

12 the Delta Wetlands Project would convert Bacon Island and Webb Tract into reservoirs while using

13 Bouldin Island and Holland Tract for agriculture and wildlife habitat. This project would also be

14 anticipated to convert land to nonagricultural uses; however, associated mitigation may also be

15 provided in the form of easements on 5,500 acres of agricultural land in San Joaquin County

16 (Stockton Recordnet 2013).

14.3.4.1 Cumulative Effects of the No Action Alternative

Under the No Action Alternative, agricultural production would continue largely as it has under Existing Conditions. This alternative includes continued implementation of SWP/CVP operations, maintenance, enforcement, and protection programs by federal, state, and local agencies and non-profit groups, as well as projects that are permitted or assumed to be constructed by 2060. This includes implementation of the 2008 and 2009 Biological Opinions issued by NMFS and USFWS, which establish certain RPAs requiring habitat restoration that may result in conversion of agricultural land to nonagricultural uses (National Marine Fisheries Service 2009, U.S. Fish and Wildlife Service 2008). The effects of climate change that would occur with or without the BDCP are also part of the No Action Alternative. A complete list and description of programs, plans, and other assumptions considered under the No Action Alternative is provided in Chapter 3, *Description of Alternatives*, Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*.

Temporary Conversion, Short-Term Conversion, and Permanent Conversion of Important Farmland and of Land Subject to Williamson Act Contracts or in Farmland Security Zones

A selection of the programs, plans, and projects included under the No Action Alternative that are relevant to the discussion of agricultural resources are summarized in Table 14-7, and a selection of those relevant for consideration of cumulative effects are summarized in Table 14-12. Because the amount of Important Farmland that could be converted to nonagricultural uses under the No Action Alternative is substantial in the context of the study area, these plans, policies, and programs would be deemed to have cumulative adverse effects upon agricultural resources. If species and habitat conservation requires the conversion of farmland, it would necessitate its own environmental review process to determine the potential for adverse effects on agriculture.

Other Effects on Agriculture

As described in Appendix 3D, *Defining Existing Conditions, No Action Alternative, No Project Alternative, and Cumulative Impact Conditions*, SWP/CVP operations identified as continuing actions under the No Action Alternative include repair, maintenance, or protection of imperiled infrastructure such as levees, and may also include actions for water quality management, habitat and species protection, or flood management. While these continuing actions could result in indirect cumulative effects on agriculture depending on the type of construction needed for repairs, or adjustments to potential irrigation water and drainage needed for water quality and flood management, these effects would be temporary in nature and would not be anticipated to result in the conversion of Important Farmland, land subject to Williamson Act contracts or in Farmland Security Zones, or otherwise substantially restrict agricultural uses.

Water Quality Effects

The potential cumulative effects of the No Action Alternative on agriculture due to changes in salinity were evaluated by comparing the No Action water quality analysis for salinity to those for Existing Conditions. Relative to Existing Conditions, the No Action Alternative would result in a fewer number of days when Bay-Delta WQCP compliance locations in the western, interior, and southern Delta would exceed EC objectives or be out of compliance with the EC objectives, with the exception of the Sacramento River at Emmaton.

1 **Future of Agriculture in the Delta**

2 The future of agricultural activities in the study area is uncertain. Over time, subsidence places
 3 greater stress on levees, and it will continue to increase the already high costs of continued levee
 4 maintenance and repair. Should the breach of a levee surrounding a Delta island devoted to
 5 agriculture occur, it is possible that the island might be permanently lost to agricultural production.
 6 Seismic risks and the effects of a changing climate also represent uncertainty with respect to the
 7 future of agricultural production in the study area. The No Action Alternative assumes that levee
 8 failures would be repaired under ongoing programs and does not include changes in land use to
 9 accommodate climate change or cumulative adverse impacts associated with climate change. These
 10 issues are discussed further in Appendix 3E, *Potential Seismic And Climate Change Risks to SWP/CVP*
 11 *Water Supplies*, and Chapter 29, *Climate Change*. While similar risks would occur under
 12 implementation of the action alternatives, these risks may be reduced by BDCP-related levee
 13 improvements along with those projects identified for the purposes of flood protection in Table 14-
 14 12.

15 Continuing activities related to operation of SWP and CVP facilities, changes in water quality, and
 16 other indirect effects are not changes in the existing environment that would result in the
 17 conversion of substantial amounts of Important Farmland to nonagricultural use. However, because
 18 Important Farmland and land subject to Williamson Act contracts or in Farmland Security Zones in
 19 the study area would be converted to nonagricultural uses under existing plans and programs, the
 20 No Action Alternative would have direct and adverse cumulative effects upon agricultural resources
 21 in the study area.

22 **14.3.4.2 Cumulative Effects of the Action Alternatives**

23 **Impact AG-1: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of** 24 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security** 25 **Zones as a Result of Constructing the Proposed Water Conveyance Facility**

26 **NEPA Effects:** Construction and ongoing operations associated with each BDCP alternative would
 27 convert Important Farmland and land subject to Williamson Act contracts or in Farmland Security
 28 Zones to nonagricultural uses. Temporary and short-term impacts on Important Farmland would
 29 range from 559 to 3,170 acres while permanent impacts would fall between 2,459 and 18,874 acres,
 30 depending on the BDCP alternative selected. Land subject to Williamson Act contracts or in
 31 Farmland Security Zones affected by temporary and short-term construction activities would range
 32 from 632 to 1,877 acres while those at risk of permanent conversion would be between 2,347 and
 33 14,125 acres. Other projects that would potentially convert Important Farmland and land subject to
 34 Williamson Act contracts or in Farmland Security Zones are listed in Table 14-12. Implementing
 35 these projects in combination with any of Alternatives 1A through 9 would result in cumulative
 36 adverse effects. Mitigation Measure AG-1 would be available to reduce those effects created by
 37 BDCP-related activities.

38 **CEQA Conclusion:** Construction and ongoing operations associated with each BDCP alternative
 39 would convert Important Farmland and land subject to Williamson Act contracts or in Farmland
 40 Security Zones to nonagricultural uses. Other projects that would potentially convert Important
 41 Farmland and land subject to Williamson Act contracts or in Farmland Security Zones are listed in
 42 Table 14-12. Implementing these projects in combination with any of BDCP Alternatives 1A through
 43 9 would result in a significant cumulative impact and the incremental contribution to this impact of

1 any of BDCP Alternatives 1A through 9 would be cumulatively considerable. Mitigation Measure AG-
 2 1 will reduce the severity of impacts created by BDCP-related activities by implementing activities
 3 such as siting project footprints to encourage continued agricultural production; relocating or
 4 replacing agricultural infrastructure in support of continued agricultural activities; engaging
 5 counties, owners/operators, and other stakeholders in developing optional agricultural stewardship
 6 approaches; and/or preserving agricultural land through off-site easements or other agricultural
 7 land conservation interests. However, these impacts remain significant and unavoidable after
 8 implementation of this measure because (i) even after effects from the footprints of project facilities
 9 are minimized through design, they would continue to require the conversion of substantial
 10 amounts of Important Farmland and land subject to Williamson Act contracts or in Farmland
 11 Security Zones, (ii) conservation or preservation by means of acquiring agricultural land
 12 conservation interests, even at one-to-one ratio, may not avoid a net loss of Important Farmland and
 13 land subject to Williamson Act contracts or in Farmland Security Zones and (iii) the proposed
 14 optional agricultural stewardship approach does not focus principally on physical effects, but rather,
 15 focuses on providing, at a minimum, a neutral agricultural economic effect on affected lands in the
 16 Delta as a result of the BDCP, taking into consideration the desire of individual Delta farmers to
 17 continue working on their land, the long-term viability of regional agricultural economies, the
 18 economic health of local governments and special districts, and the Delta as an evolving place.

19 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 20 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 21 **Subject to Williamson Act Contracts or in Farmland Security Zones**

22 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

23 **Impact AG-2: Other Effects on Agriculture as a Result of Constructing and Operating the**
 24 **Proposed Water Conveyance Facility**

25 **NEPA Effects:** Considered together, construction and operation of the water conveyance facility
 26 under any of BDCP Alternatives 1A through 9 could create indirect but adverse effects on agriculture
 27 by converting substantial amounts of Important Farmland to other uses through localized changes
 28 in groundwater levels and/or disruption of drainage and irrigation facilities. Effects of the
 29 alternatives related to water quality could be adverse or beneficial, depending on the location. Other
 30 projects that would potentially carry similar effects are listed in Table 14-12. Implementing these
 31 projects in combination with any of BDCP Alternatives 1A through 9 could result in cumulative
 32 adverse effects. However, implementation of Mitigation Measures AG-1, GW-1, GW-5, and WQ-11
 33 would reduce the severity of these adverse effects created by BDCP-related activities.

34 **CEQA Conclusion:** Water conveyance facility construction and operation could convert substantial
 35 amounts of Important Farmland to other uses through localized changes in groundwater levels
 36 and/or disruption of drainage and irrigation facilities. In other areas, effects of the alternatives
 37 related to water quality could be adverse or beneficial, depending on the location. Other projects
 38 that would potentially carry similar effects are listed in Table 14-12. Implementing these projects in
 39 combination with any of BDCP Alternatives 1A through 9 could result in a significant cumulative
 40 impact and the incremental contribution to this impact of any of BDCP Alternatives 1A through 9
 41 would be cumulatively considerable. Implementation of Mitigation Measures AG-1, GW-1, GW-5, and
 42 WQ-11 will reduce the severity of these impacts by implementing activities such as siting project
 43 footprints to encourage continued agricultural production; monitoring changes in groundwater
 44 levels during construction; offsetting water supply losses attributable to construction dewatering

1 activities; monitoring seepage effects; relocating or replacing agricultural infrastructure in support
 2 of continued agricultural activities; identifying, evaluating, developing, and implementing feasible
 3 phased actions to reduce EC levels; engaging counties, owners/operators, and other stakeholders in
 4 developing optional agricultural stewardship approaches; and/or preserving agricultural land
 5 through off-site easements or other agricultural land conservation interests. However, these
 6 cumulatively considerable impacts remain significant and unavoidable after implementation of
 7 these measures because (i) replacement water supplies associated with losses attributable to
 8 construction dewatering activities may not meet the preexisting demands or planned land use
 9 demands of the affected party, (ii) seepage minimization may be infeasible in some instances, (iii)
 10 the feasibility and effectiveness of phased actions to reduce EC levels is uncertain, (iv) conservation
 11 or preservation by means of acquiring agricultural land conservation interests, even at one-to-one
 12 ratio, may not avoid a net loss of Important Farmland and/or (v) the proposed optional agricultural
 13 stewardship approach does not focus principally on physical effects, but rather, focuses on
 14 supporting the Delta as an evolving place by encouraging existing owners and operators to continue
 15 working on the land while maintaining the long-term viability of regional agricultural economies
 16 and the economic health of local governments and special districts in the Delta.

17 As described under Alternative 1A, Impact AG-2, above, in addition to and to supplement Mitigation
 18 Measure WQ-11, the BDCP proponents have incorporated into the BDCP a separate, non-
 19 environmental commitment to address the potential increased water treatment costs that could
 20 result from electrical conductivity effects on agricultural water purveyor operations. Please refer to
 21 Appendix 3B, *Environmental Commitments*, for the full list of potential actions that could be taken
 22 pursuant to this commitment in order to reduce the water quality treatment costs associated with
 23 water quality effects relating to chloride, electrical conductivity, and bromide.

24 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 25 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 26 **Subject to Williamson Act Contracts or in Farmland Security Zones**

27 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

28 **Mitigation Measure GW-1: Maintain Water Supplies in Areas Affected by Construction**
 29 **Dewatering**

30 Please see Mitigation Measure GW-1 under Impact GW-1 in the discussion of Alternative 1A in
 31 Chapter 7, *Groundwater*.

32 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

33 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 34 Chapter 7, *Groundwater*.

35 **Mitigation Measure WQ-11: Avoid, Minimize, or Offset, as Feasible, Reduced Water**
 36 **Quality Conditions**

37 Please see Mitigation Measure WQ-11 under Impact WQ-11 in the discussion of Alternative 1A
 38 in Chapter 8, *Water Quality*.

1 **Impact AG-3: Temporary Conversion, Short-Term Conversion, and Permanent Conversion of**
 2 **Important Farmland or of Land Subject to Williamson Act Contracts or in Farmland Security**
 3 **Zones as a Result of Implementing the Proposed Conservation Measures 2-11, 13, 15, 16, 20,**
 4 **and 21**

5 **NEPA Effects:** Implementation of these conservation measures under any of BDCP Alternatives 1A
 6 through 9 would restore tidal wetland habitat, seasonally-inundated floodplain, riparian habitat,
 7 grassland communities, vernal pool complex habitat, and nontidal marsh areas. Because locations
 8 have not been selected for these activities, the extent of this effect is unknown and a definitive
 9 conclusion cannot be reached. However, based on the large proportion of land in the conservation
 10 zones designated as Important Farmland and/or subject to Williamson Act contracts or in Farmland
 11 Security Zones, it is anticipated that a substantial area of Important Farmland and land subject to
 12 Williamson Act contracts or in Farmland Security Zones would be directly converted to habitat
 13 purposes. Other projects that would potentially convert Important Farmland and land subject to
 14 Williamson Act contracts or in Farmland Security Zones are listed in Table 14-12. Implementing
 15 these projects in combination with any of BDCP Alternatives 1A through 9 would result in
 16 cumulative adverse effects. Mitigation Measure AG-1 would be available to reduce those effects
 17 created by BDCP-related activities. Also, under the provisions of Government Code §51223, it may
 18 be feasible to rescind Williamson Act contracts for agricultural use, and enter into open space
 19 contracts under the Williamson Act, or open space easements pursuant to the Open Space Easement
 20 Act. To the extent this mechanism is used, it would eliminate the Williamson Act conflicts otherwise
 21 resulting from changes from agriculture to restoration and mitigation uses.

22 **CEQA Conclusion:** Implementation of Conservation Measures 2-11, 13, 15, 16, 20, and 21 under
 23 BDCP alternatives would restore tidal wetland habitat, seasonally-inundated floodplain, riparian
 24 habitat, grassland communities, vernal pool complex habitat, and nontidal marsh areas.
 25 Implementation of restoration activities and other conservation measures could result in conversion
 26 of a substantial amount of Important Farmland and conflict with land subject to Williamson Act
 27 contracts or in Farmland Security Zones, resulting in a potentially significant impact on agricultural
 28 resources in the study area. Other projects that would potentially convert Important Farmland and
 29 land subject to Williamson Act contracts or in Farmland Security Zones are listed in Table 14-12.
 30 Implementing these projects in combination with any of BDCP Alternatives 1A through 9 could
 31 result in a significant cumulative impact and the incremental contribution to this impact of any of
 32 BDCP Alternatives 1A through 9 could be cumulatively considerable. Mitigation Measure AG-1 will
 33 reduce the severity of impacts created by BDCP-related activities by implementing activities such as
 34 siting features to encourage continued agricultural production; relocating or replacing agricultural
 35 infrastructure in support of continued agricultural activities; engaging counties, owners/operators,
 36 and other stakeholders in developing optional agricultural stewardship approaches; and/or
 37 preserving agricultural land through off-site easements or other agricultural land conservation
 38 interests. However, these cumulative impacts remain significant and unavoidable after
 39 implementation of this measure because (i) even after effects from the footprints of conservation
 40 measures are minimized through design, they would continue to require the conversion of
 41 substantial amounts of Important Farmland and land subject to Williamson Act contracts or in
 42 Farmland Security Zones, (ii) conservation or preservation by means of acquiring agricultural land
 43 conservation interests, even at one-to-one ratio, may not avoid a net loss of Important Farmland and
 44 land subject to Williamson Act contracts or in Farmland Security Zones and (iii) the proposed
 45 optional agricultural stewardship approach does not focus principally on physical effects, but rather,
 46 focuses on providing, at a minimum, a neutral agricultural economic effect on affected lands in the

1 Delta as a result of the BDCP, taking into consideration the desire of individual Delta farmers to
 2 continue working on their land, the long-term viability of regional agricultural economies, the
 3 economic health of local governments and special districts, and the Delta as an evolving place.

4 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 5 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 6 **Subject to Williamson Act Contracts or in Farmland Security Zones**

7 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

8 **Impact AG-4: Other Effects on Agriculture as a Result of Implementing the Proposed**
 9 **Conservation Measures 2–11, 13, 15, 16, 20, and 21**

10 **NEPA Effects:** Implementation of these conservation measures under any of BDCP Alternatives 1A
 11 through 9 could convert substantial amounts of Important Farmland to other uses through changes
 12 in groundwater levels, disruption of drainage and irrigation facilities, changes in inundation
 13 frequency, and changes to agricultural practices. Other projects that would potentially carry similar
 14 effects are listed in Table 14-12. Implementing these projects in combination with any of BDCP
 15 Alternatives 1A through 9 could result in cumulative adverse effects. However, implementation of
 16 Mitigation Measures AG-1 and GW-5 would reduce the severity of these adverse effects created by
 17 BDCP-related activities.

18 **CEQA Conclusion:** Implementation of Conservation Measures 2–11, 13, 15, 16, 20, and 21 under any
 19 of BDCP Alternatives 1A through 9 could convert substantial amounts of Important Farmland to
 20 other uses through changes in groundwater levels, disruption of drainage and irrigation facilities,
 21 changes in inundation frequency, and changes to agricultural practices. Other projects that would
 22 potentially carry similar effects are listed in Table 14-12. Other projects that would potentially carry
 23 similar effects are listed in Table 14-12. Implementing these projects in combination with any of
 24 BDCP Alternatives 1A through 9 could result in a significant cumulative impact and the incremental
 25 contribution to this impact of any of BDCP Alternatives 1A through 9 would be cumulatively
 26 considerable. Implementation of Mitigation Measures AG-1 and GW-5 will reduce the severity of
 27 impacts created by BDCP-related activities by implementing activities such as siting features to
 28 encourage continued agricultural production; monitoring seepage effects; relocating or replacing
 29 agricultural infrastructure in support of continued agricultural activities; engaging counties,
 30 owners/operators, and other stakeholders in developing optional agricultural stewardship
 31 approaches; and/or preserving agricultural land through off-site easements or other agricultural
 32 land conservation interests. However, these impacts remain significant and unavoidable after
 33 implementation of these measures because (i) seepage minimization may be infeasible in some
 34 instances, (ii) conservation or preservation by means of acquiring agricultural land conservation
 35 interests, even at one-to-one ratio, may not avoid a net loss of Important Farmland and (iii) the
 36 proposed optional agricultural stewardship approach does not focus principally on physical effects,
 37 but rather, focuses on supporting the Delta as an evolving place by encouraging existing owners and
 38 operators to continue working on the land while maintaining the long-term viability of regional
 39 agricultural economies and the economic health of local governments and special districts in the
 40 Delta.

1 **Mitigation Measure AG-1: Develop an Agricultural Lands Stewardship Plan (ALSP) to**
 2 **Maintain Agricultural Productivity and Mitigate for Loss of Important Farmland and Land**
 3 **Subject to Williamson Act Contracts or in Farmland Security Zones**

4 Please see Mitigation Measure AG-1 under Impact AG-1 in the discussion of Alternative 1A.

5 **Mitigation Measure GW-5: Agricultural Lands Seepage Minimization**

6 Please see Mitigation Measure GW-5 under Impact GW-5 in the discussion of Alternative 1A in
 7 Chapter 7, *Groundwater*.

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