

Section 22

Cumulative Impact Assessment

This section describes the cumulative impact assessment methodology used in this Environmental Impact Report (EIR), the projects considered in the cumulative impact assessment, and the potential cumulative impacts of the Proposed Project and Alternatives 1A, 1B, 2, and 3.

22.1 CEQA Requirements

Under the California Environmental Quality Act (CEQA), an EIR is required to discuss the cumulative impacts of a project when the project's incremental effect is cumulatively considerable (CEQA Guidelines section 15130(a)(1)). "Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines section 15065(a)(3); Public Resources Code section 21083(b)(2)). Cumulative impacts are further defined in the CEQA Guidelines as two or more individual impacts that, even if individually minor, when considered together, are considerable or that compound or increase other environmental impacts (see CEQA Guidelines section 15355). Hence, for purposes of this EIR, a cumulative impact is a change in the physical environment that results from the combined implementation of the Proposed Project or one of the alternatives with other projects that would cause related impacts (CEQA Guidelines section 15130(a)(1)).

This cumulative impact assessment considers projects and programs ("projects") identified under existing conditions (which includes the current effects of past projects) and reasonably foreseeable and probable future projects. Hence, this EIR uses the list of projects approach authorized in CEQA Guidelines section 15130(b)(1)(A). The criterion for considering whether a project is reasonably foreseeable and probable in this EIR is whether the project has been defined in adequate detail, either through the completion of publicly available preliminary evaluations, feasibility studies, or draft environmental and engineering documents, to estimate potential impacts. Projects that were only in the development phase without detailed descriptions, operations criteria, or general locations at the time that this cumulative impact assessment was written were not considered further. A list and a brief description of the potential projects considered in this cumulative impact assessment are presented in Table 22-1. (Table 22-1 is attached at the end of this section.)

The Proposed Project and the alternatives are composed of policies and recommendations. While their implementation could result in other agencies or entities taking future actions, it would not directly result in the construction of facilities or infrastructure, implementation of regulatory programs, or any other projects. Instead, the Delta Plan will be implemented through (1) requiring the statutorily defined covered actions of other public agencies to be consistent with the Delta Plan; and (2) providing recommendations to other public agencies regarding future actions they may take. This EIR, in turn, evaluates these potential actions as part of the Proposed Project, even though the Delta Plan will not directly cause (and the Delta Stewardship Council will not have regulatory authority over) those actions in most cases. For

1 these reasons, the analysis in this EIR is inherently cumulative in many regards, in that the Proposed
2 Project consists of the reasonably foreseeable, probable future projects of other agencies that the Delta
3 Plan will regulate or make recommendations about. The focus of this cumulative impact analysis,
4 therefore, is on how existing conditions (including the current effects of past projects) and reasonably
5 foreseeable and probable future projects that the Delta Plan does not address (Table 22-1) interrelate with
6 the Delta Plan and the alternatives in a manner that could result in cumulative impacts to which the Delta
7 Plan and the alternatives could make a considerable contribution.

8 22.2 Cumulative Impacts of the Proposed Project

9 As stated in each resource section of this EIR, “[t]he Delta Plan alternatives could encourage the
10 implementation of actions or activities by other agencies to construct and operate facilities or
11 infrastructure that are described in Sections 2A, Proposed Project and Alternatives and 2B, Introduction to
12 Resource Sections. Examples of potential actions include the construction and operation of water and
13 wastewater treatment plants; conveyance facilities, including pumping plants; surface water or
14 groundwater storage facilities; ecosystem restoration projects; flood control levees; or recreation facilities.
15 Implementation of these types of actions and construction and operation of these types of facilities could
16 result in [significant environmental] impacts.” This section provides a summary of the potential
17 cumulative impacts, organized by resource area, which would result from the implementation of the
18 Proposed Project and the projects summarized in Table 22-1. Mitigation measures to reduce significant
19 cumulative impacts are also included.

20 22.2.1 Water Resources

21 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
22 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
23 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
24 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
25 significant adverse cumulative impacts that are similar to the Proposed Project’s impacts on water
26 resources as described in Section 3, Water Resources. These cumulative water resources impacts would
27 include the following:

- 28 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
29 flood control, and Delta enhancement projects could violate water quality standards or waste
30 discharge requirements, or otherwise degrade water quality. This includes the potential release of
31 hazardous materials during construction (e.g., gasoline, diesel fuel, motor oil, hydraulic fluid,
32 solvents, cleaners, sealants, welding flux, various lubricants, paint, paint thinner) or the release of
33 hazardous materials by disturbance (e.g., dredging). Projects with considerable heavy equipment
34 use are likely to have the greatest potential water quality impacts during construction.
35 Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake
36 Water Resources Investigation; Bay Delta Conservation Plan; San Diego County Water Authority
37 Emergency Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge
38 Project; fish screen projects; Liberty Island Conservation Bank; Meins Landing restoration; the
39 five listed habitat conservation plans; the CALFED Levee Stability Program; the Delta Levees
40 Flood Protection Program, and channel dredging projects. These impacts could be significant.
41 The water quality impacts of the Proposed Project (i.e., Impact 3-1a – 3-1e) could constitute a
42 significant contribution to this significant cumulative impact. Mitigation measures similar to
43 Mitigation Measure 3-1 should be considered for these other actions as well as the Proposed
44 Project.
- 45 ♦ Physical improvements associated with the *operation* other ecosystem restoration and flood
46 control projects could result in water quality impacts because new floodplains, channels, or

1 restoration areas may create long-term changes in the balance of sedimentation and scour within
2 channels or newly created restoration areas. In addition, operation of Delta enhancement projects
3 could increase in boating activity in the Delta, and waves generated by boat traffic could cause an
4 increase in stream bank erosion and sediments added to the water. Representative projects from
5 Table 22-1 that could lead to these impacts include the Bay Delta Conservation Plan, Delta
6 Wetlands, Meins Landing restoration, the five listed habitat conservation plans, the CALFED
7 Levee Stability Program, and the Delta Levees Flood Protection Program. These impacts could be
8 significant. The soil loss impacts of the Proposed Project (i.e., Impacts 3-2b, 3-2d, and 3-2e)
9 could constitute a significant contribution to this significant cumulative impact. Mitigation
10 measures similar to Mitigation Measure 3-2 should be considered for these other actions as well
11 as the Proposed Project.

- 12 ♦ Physical improvements associated with construction and operation of other water supply and
13 water quality projects, and with the construction of other ecosystem restoration, flood control, and
14 Delta enhancement projects could result in water quality impacts due to erosion and
15 sedimentation. Project types with the greatest potential for erosion and sedimentation are those
16 with the greatest construction disturbance area, such as new surface water storage projects
17 (especially with earthen dams), large ecosystem restoration projects, and levee improvement
18 projects. Representative projects from Table 22-1 that could lead to these impacts include the Bay
19 Delta Conservation Plan; San Diego County Water Authority Emergency Storage Project;
20 El Monte Valley Mining, Reclamation, and Groundwater Recharge Project; Meins Landing
21 restoration; the five listed habitat conservation plans; the CALFED Levee Stability Program; and
22 the Delta Levees Flood Protection Program. However, these impacts are likely to be less than
23 significant because of standard construction practices including erosion control best management
24 practices. Erosion and sedimentation impacts from the Proposed Action would be less than
25 significant. Because the Proposed Project also would include similar projects following similar
26 construction practices, it would have a less than cumulatively considerable impact.
- 27 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
28 flood control, and Delta enhancement projects could deplete groundwater supplies or interfere
29 with groundwater recharge. Potential adverse impacts could include loss of groundwater through
30 loss of recharge supplies (e.g., treated wastewater diverted to reuse) and introduction of saline
31 water (e.g., from tidal marsh restoration). In addition, some types of projects (e.g., groundwater
32 banking, water transfers) would have adverse effects during drawdown period as well as
33 beneficial effects during recharge periods. Representative projects from Table 22-1 that could
34 lead to these impacts include the Riverside-Corona Feeder Project, Liberty Island Conservation
35 Bank, and the Dutch Slough Tidal Marsh Restoration Project. However, these impacts are likely
36 to be less than significant because of the likelihood of overall beneficial effects. Groundwater
37 impacts from the Proposed Project would be less than significant for the same reason. Because
38 the Proposed Project also has the potential for beneficial effects, it would have a less than
39 cumulatively considerable impact.

40 22.2.2 Biological Resources

41 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
42 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
43 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
44 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
45 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on biological

1 resources as described in Section 4, Biological Resources. These cumulative biological resources impacts
2 would include the following:

- 3 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
4 flood control, and Delta enhancement projects could impact sensitive natural communities
5 (e.g., wetlands and riparian habitat), special-status species, or the habitat of common fish and
6 wildlife species (ecosystem restoration projects only). Impacts could occur as a result of many
7 different processes including ground disturbance or indirect effects (e.g., dust, noise) during
8 construction, site preparation for and construction of new permanent facilities, impoundment in
9 new storage reservoirs, changes in instream flow or water quality conditions, and the spread of
10 invasive species or noxious weeds. These types of impacts could be created by construction and
11 operation of any type of project listed in Table 22-1, especially projects with large footprints of
12 disturbance. These impacts could be significant. The fish and wildlife species and habitat impacts
13 of the Proposed Project (i.e., Impacts 4-1a – 4-1e, 4-2a – 4-2e, and 4-3a – 4-3e) could constitute a
14 significant contribution to this significant cumulative impact. Mitigation measures similar to
15 Mitigation Measure 4-1 (for sensitive natural communities), Mitigation Measure 4-2 (for special-
16 status species), and Mitigation Measure 4-3 (for common fish and wildlife habitat impacts of
17 ecosystem restoration projects) should be considered for these other actions as well as the
18 Proposed Project.
- 19 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
20 flood control, and Delta enhancement projects could potentially interfere with the movement of
21 native resident or migratory fish or wildlife species or with established native resident or
22 migratory wildlife corridors. Impacts are most likely to occur from projects with large space
23 requirements (e.g., surface storage) or with large instream disturbance areas. Representative
24 projects from Table 22-1 that could lead to these impacts include the Shasta Lake Water
25 Resources Investigation; Bay Delta Conservation Plan, San Diego County Water Authority
26 Emergency Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge
27 Project; the CALFED Levee Stability Program; the Delta Levees Flood Protection Program; and
28 both of the deep water ship channel dredging projects. These impacts could be significant. The
29 fish and wildlife movement and migration impacts of the Proposed Project (i.e., Impacts 4-4a –
30 4-4e) could constitute a significant contribution to this significant cumulative impact. Mitigation
31 measures similar to Mitigation Measure 4-4 should be considered for these other actions as well
32 as the Proposed Project.
- 33 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
34 flood control, and Delta enhancement projects could potentially conflict with local requirements
35 protecting biological resources, or the provisions of adopted habitat conservation or protection
36 plans. The geographic scope of this potential impact would be limited to areas with approved
37 plans for biological resources protection, such as eastern Contra Costa County (East Contra Costa
38 County Habitat Conservation Plan/ Natural Community Conservation Plan). Representative
39 projects from Table 22-1 that could lead to conflicts with plans for biological resources include
40 the San Diego County Water Authority Emergency Storage Project, the CALFED Levee Stability
41 Program, the Delta Levees Flood Protection Program, and both of the deep water ship channel
42 dredging projects. These impacts could be significant. Under the Proposed Project, plan conflicts
43 (i.e., Impacts 4-5a – 4-5e) could constitute a significant contribution to this significant cumulative
44 impact. Mitigation measures similar to Mitigation Measure 4-5 should be considered for these
45 other actions as well as the Proposed Project.

22.2.3 Delta Flood Risk

The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta Plan does not contemplate these as covered projects and makes no recommendations regarding them). When the impact of actions that the Delta Plan would permit or encourage are considered in connection with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially significant adverse cumulative impacts that are similar to the Proposed Project's impacts on flood management as described in Section 5, Delta Flood Risk. These cumulative flood management impacts would include the following:

- Physical improvements associated with other water supply, ecosystem restoration, water quality, flood control, and Delta enhancement projects may expose people or structures to flood hazards. Processes due to alteration of drainage patterns (including stream and river alterations), increasing the rate or amount of surface runoff, exceeding storm drainage capacity, dam or levee failure, or construction within flood hazard areas. Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake Water Resources Investigation; Bay Delta Conservation Plan; San Diego County Water Authority Emergency Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge Project; the CALFED Levee Stability Program; and the Delta Levees Flood Protection Program. These impacts could be significant. The flood hazard impacts of the Proposed Project (i.e., Impacts 5-1a – 5-1e through 5-5a – 5-5e) could constitute a significant contribution to this significant cumulative impact. Mitigation measures similar to Mitigation Measures 5-1 through 5-5 should be considered for these other actions as well as the Proposed Project.

22.2.4 Land Use and Planning

The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta Plan does not contemplate these as covered projects and makes no recommendations regarding them). When the impact of actions that the Delta Plan would permit or encourage are considered in connection with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially significant adverse cumulative impacts that are similar to the Proposed Project's impacts on land use and planning as described in Section 6, Land Use and Planning. These cumulative land use and planning impacts would include the following:

- Construction of physical improvements associated with other water supply, ecosystem restoration, water quality, flood control, and Delta enhancement projects could cause short-term disruptions from construction activities that temporarily cut off roadways and bridge access, thus isolating communities. Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake Water Resources Investigation, Bay Delta Conservation Plan, the San Diego County Water Authority Emergency Storage Project, the 2-Gates Project, fish screen projects, the Franks Tract project, the CALFED Levee Stability Program, and the Delta Levees Flood Protection Program. However, these impacts are likely to be less than significant because traffic could be rerouted during the construction period. Construction-phase land use impacts from the Proposed Action would be less than significant. Because the Proposed Project also would include similar projects following similar construction practices, it would have a less than cumulatively considerable impact.
- Construction of physical improvements associated with other water supply, ecosystem restoration, water quality, and flood control projects could cause a long-term and permanent disruption of local development patterns, including as a result of road closures or rerouting. Representative projects from Table 22-1 that could lead to these impacts include the Bay Delta Conservation Plan, Shasta Lake Water Resources Investigation, Bay Delta Conservation Plan, the

1 San Diego County Water Authority Emergency Storage Project, the 2-Gates Project, fish screen
2 projects, the Franks Tract project, the CALFED Levee Stability Program, and the Delta Levees
3 Flood Protection Program. These impacts could be significant. Under the Proposed Project,
4 dividing an established community (i.e., Impacts 6-1a – 6-1e) would be less than significant.
5 Mitigation measures similar to Mitigation Measure 6-1 should be considered for these other
6 actions as well as the Proposed Project.

- 7 ◆ Operation of physical improvements associated with other Delta enhancement projects could
8 cause a long-term and permanent disruption of local development patterns, including as a result
9 of road closures or rerouting. Representative projects from Table 22-1 that could lead to these
10 impacts include implementation of the Land Use and Resource Management Plan Update and
11 Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh. However, these
12 impacts are likely to be less than significant because impacts are likely to be beneficial
13 (i.e., access would be increased). Operations-phase land use impacts from the Proposed Action
14 would be less than significant. Because the Proposed Project also would enhance access to Delta
15 communities, it would have a less than cumulatively considerable impact.

- 16 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
17 flood control, and Delta enhancement projects could potentially conflict with land use plans,
18 policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect
19 (e.g., agricultural preservation) if the projects are developed in locations protected by these plans,
20 policies and regulations (e.g., lands designated in the general plan for agriculture). In addition,
21 operation of these projects could create land use conflicts if they are incompatible with adjacent
22 uses (e.g., industrial operations in close proximity to residential uses). These conditions could be
23 created by development of any type of project listed in Table 22-1. These impacts could be
24 significant. Under the Proposed Project, land use conflicts (i.e., Impacts 6-2a – 6-2e) could
25 constitute a significant contribution to this significant cumulative impact. Mitigation measures
26 similar to Mitigation Measure 6-2 should be considered for these other actions as well as the
27 Proposed Project.

28 22.2.5 Agriculture and Forestry Resources

29 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
30 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
31 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
32 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
33 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on agriculture
34 and forestry resources as described in Section 7, Agriculture and Forestry Resources. These cumulative
35 agriculture and forestry resources impacts would include the following:

- 36 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
37 flood control, and Delta enhancement projects could require the conversion of farmland to
38 accommodate new project features, and could conflict with existing agricultural zoning and
39 Williamson Act contracts. Project features involving farmland conversion or agricultural zoning/
40 Williamson Act conflicts could include wetland and other habitat restoration sites, surface water
41 storage areas, and typical water infrastructure facilities with a defined "footprint" (e.g., waste-
42 water treatment plants, levees). These effects could be temporary (e.g., spoils storage, soil
43 compaction from heavy equipment, pipeline construction) as well as permanent. Representative
44 projects from Table 22-1 that could lead to these impacts include the Bay Delta Conservation
45 Plan, Delta Wetlands project, the five listed habitat conservation plans, the Grasslands Bypass
46 Project, channel dredging projects, and Delta Levees Flood Protection Program. These impacts
47 could be significant. The farmland conversion and zoning conflict impacts of the Proposed

1 Project (i.e., Impacts 7-1a – 7-1e, 7-2a – 7-2e, and 7-5a – 7-5e) could constitute a significant
2 contribution to this significant cumulative impact. Mitigation measures similar to Mitigation
3 Measure 7-1 (for farmland conversion) and Mitigation Measure 7-2 (for agricultural zoning and
4 Williamson Act conflicts) should be considered for these other actions as well as the Proposed
5 Project.

- 6 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
7 flood control, and Delta enhancement projects could require the conversion of forestland to
8 accommodate new project features, and could conflict with existing forest zoning (including
9 Timberland Production Zones [TPZ]). Project features involving forestland conversion or forest
10 zoning/TPZ conflicts could include surface water storage areas and typical water infrastructure
11 facilities with a defined “footprint” (e.g., wastewater treatment plants, levees). These effects
12 could be temporary (e.g., pipeline construction) as well as permanent. Representative projects
13 from Table 22-1 that could lead to these impacts include the Shasta Lake Water Resources
14 Investigation and the five listed habitat conservation plans. These impacts could be significant.
15 The farmland conversion and zoning conflict impacts of the Proposed Project (i.e., Impacts 7-3a –
16 7-3e, 7-4a – 7-4e, and 7-5a – 7-5e) could constitute a significant contribution to this significant
17 cumulative impact. Mitigation measures similar to Mitigation Measure 7-3 (for forest zoning and
18 TPZ conflicts) and Mitigation Measure 7-4 (for forestland conversion) should be considered for
19 these other actions as well as the Proposed Project.

20 22.2.6 Visual Resources

21 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
22 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
23 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
24 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
25 significant adverse cumulative impacts that are similar to the Proposed Project’s impacts on visual
26 resources as described in Section 8, Visual Resources. These cumulative visual resources impacts would
27 include the following:

- 28 ♦ Improvements associated with other water supply, ecosystem restoration, water quality, flood
29 control, and Delta enhancement projects would introduce new physical features into the existing
30 landscape, which could degrade visual quality, affect scenic vistas and scenic resources, and
31 introduce new sources of light and glare. Project features that could substantially alter existing
32 rural and natural landscapes that currently have high visual quality could include surface water
33 storage areas and typical water infrastructure facilities with a defined “footprint” (e.g., waste-
34 water treatment plants, levees). These effects could be temporary (e.g., stockpiling of dredge
35 spoils) as well as permanent (e.g., new buildings, large earthen structures). Representative
36 projects from Table 22-1 that could lead to these impacts include the Shasta Lake Water
37 Resources Investigation, Bay Delta Conservation Plan, the 2-Gates Project, fish screen projects,
38 the Franks Tract project, the South Delta Temporary Barriers program, channel dredging projects,
39 and the Delta Levees Flood Protection Program. These impacts could be significant. Under the
40 Proposed Project, degradation of visual quality, adverse effects on scenic vistas and scenic
41 resources, and new sources of substantial light and glare (i.e., Impacts 8-1a – 8-1e, 8-2a – 8-2e,
42 and 8-3a – 8-3e) could constitute a significant contribution to this significant cumulative impact.
43 Mitigation measures similar to Mitigation Measure 8-1 (for degradation of visual quality),
44 Mitigation Measure 8-2 (for effects on scenic vistas and scenic resources), and Mitigation
45 Measure 8-3 (for light and glare) should be considered for these other actions as well as the
46 Proposed Project.

22.2.7 Air Quality

The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta Plan does not contemplate these as covered projects and makes no recommendations regarding them).

When the impact of actions that the Delta Plan would permit or encourage are considered in connection with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially significant adverse cumulative impacts that are similar to the Proposed Project's impacts on air quality as described in Section 9, Air Quality. These cumulative air quality impacts would include the following:

- ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality, flood control, and Delta enhancement projects could conflict with adopted air quality plans (e.g., State Implementation Plan, Air Quality Management Plan) or substantially contribute to an air quality violation. These impacts could occur during construction (primarily from construction equipment emissions) or during project operations. Construction-related emissions for projects would arise from a variety of activities, including: (1) generation of fugitive dust by equipment used for grading, excavation, road building, and other earth-moving activities; (2) fugitive dust from travel by construction equipment, haul trucks, and worker vehicles on paved and unpaved surfaces; (3) fugitive dust from establishing borrow sites and from storing and handling materials; and (4) exhaust from fuel combustion in construction equipment, trucks, and worker vehicles. These conditions could be created by construction and operation of any type of project listed in Table 22-1, especially projects with large footprints of disturbance and large amounts of construction activities. Operation-phase emissions could occur from fuel consumption (e.g., from maintenance activities) and from treatment processes (e.g., chemical feeds). Representative projects from Table 22-1 with potential operation-phase impacts include the three listed desalination projects (Bay Area, Huntington Beach, and Carlsbad). These impacts could be significant. The air quality plan conflicts of the Proposed Project (Impacts 9-1a – 9-1e) could constitute a significant contribution to this significant cumulative impact. Mitigation measures similar to Mitigation Measure 9-1 should be considered for these other actions as well as the Proposed Project.
- ◆ Physical improvements associated with other ecosystem restoration and water quality projects could result in exposure of sensitive receptors to objectionable odors. Various types of projects may generate odors from sources such as algal growth and anaerobic digestion (with ammonia and hydrogen sulfide emissions). Representative projects from Table 22-1 with potential impacts include the Bay Delta Conservation Plan, the three listed desalination projects (Bay Area, Huntington Beach, and Carlsbad), the Delta Smelt Interim Refuge, Dutch Slough Tidal Marsh Restoration Project, and the five listed habitat conservation plans. These impacts could be significant. The odor impacts of the Proposed Project (Impacts 9-2a – 9-2e) could constitute a significant contribution to this significant cumulative impact. Mitigation measures similar to Mitigation Measure 9-2 should be considered for these other actions as well as the Proposed Project.
- ◆ Physical improvements associated with other water supply, flood control, and Delta enhancement projects could result in exposure of sensitive receptors to objectionable odors. Various types of projects may generate odors from sources such as algal growth and brine storage. Representative projects from Table 22-1 with potential operation-phase impacts include the three listed desalination projects (Bay Area, Huntington Beach, and Carlsbad). However, these impacts are likely to be less than significant because these types of project typically do not generate substantial odors. Odor impacts from the Proposed Project would be less than significant. Because the Proposed Project also would include similar projects with no odor impacts, it would have a less than cumulatively considerable impact.

- 1 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
2 flood control, and Delta enhancement projects could expose sensitive receptors to substantial
3 pollutant concentrations (e.g., carbon monoxide, toxic air contaminants). These impacts are most
4 likely to occur during construction, primarily from exhaust from construction equipment, trucks,
5 and worker vehicles. These conditions could be created by construction and operation of any type
6 of project listed in Table 22-1, especially projects with large amounts of construction activity.
7 These impacts could be significant. The pollutant concentration impacts of the Proposed Project
8 (Impacts 9-3a – 9-3e) could constitute a significant contribution to this significant cumulative
9 impact. Mitigation measures similar to Mitigation Measure 9-3 should be considered for these
10 other actions as well as the Proposed Project.

11 22.2.8 Cultural Resources

12 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
13 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
14 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
15 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
16 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on cultural
17 resources as described in Section 10, Cultural Resources. These cumulative cultural resources impacts
18 would include the following:

- 19 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
20 flood control, and Delta enhancement projects could result in disturbance or destruction of
21 prehistoric or historic archaeological resources; historic buildings, structures, and linear features,
22 and unrecorded human remains. Construction projects also could result in the alteration or
23 removal of character-defining features of a cultural landscape. These conditions could be created
24 by construction and operation of any type of project listed in Table 22-1, especially projects with
25 large footprints of disturbance. These impacts could be significant. The archaeological and
26 historical resource impacts of the Proposed Project (i.e., Impacts 10-1a – 10-1e, 10-2a – 10-2e,
27 10-3a – 10-3e, and 10-4a – 10-4e) could constitute a significant contribution to this significant
28 cumulative impact. Mitigation measures similar to Mitigation Measures 10-1 (for archaeological
29 resources), 10-2 (for unrecorded human remains), 10-3 (for historic resources), and 10-4 (for
30 cultural landscapes) should be considered for these other actions as well as the Proposed Project.

31 22.2.9 Geology and Soils

32 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
33 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
34 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
35 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
36 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on geological
37 resources as described in Section 11, Geology and Soils. These cumulative geological resources impacts
38 would include the following:

- 39 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
40 flood control, and Delta enhancement projects may expose people or structures to seismic hazards
41 including fault rupture and strong ground motion. Project types with the greatest risk of loss,
42 injury, or death include surface storage projects and flood control projects. Representative
43 projects from Table 22-1 that could lead to these impacts include the Bay Delta Conservation
44 Plan, Shasta Lake Water Resources Investigation; San Diego County Water Authority Emergency
45 Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge Project; the
46 CALFED Levee Stability Program; and the Delta Levees Flood Protection Program. These

1 impacts could be significant. The seismic hazard impacts of the Proposed Project (i.e., Impacts
2 11-1a – 11-1e and 11-2a – 11-2e) could constitute a significant contribution to this significant
3 cumulative impact. Mitigation measures similar to Mitigation Measure 11-1 (for fault rupture)
4 and Mitigation Measure 11-2 (for strong ground motion) should be considered for these other
5 actions as well as the Proposed Project.

6 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
7 flood control, and Delta enhancement projects may expose people or structures to unstable
8 geological conditions including unstable geology (e.g., loss of bearing value, lateral spreading,
9 subsidence, liquefaction, collapse), expansive soils, landslides, and high organic matter soils.
10 Projects built on sites with these geological constraints may experience greater hazardous
11 conditions during construction and greater risk of structural damage to complete projects.
12 Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake
13 Water Resources Investigation, Bay Delta Conservation Plan, the 2-Gates Project, fish screen
14 projects, the Franks Tract Project, the CALFED Levee Stability Program, and the Delta Levees
15 Flood Protection Program. These impacts could be significant. The geological hazard impacts of
16 the Proposed Project (i.e., Impacts 11-3a – 11-3e, 11-5a – 11-5e, 11-7a – 11-7e, and 11-9a –
17 11-9e) could constitute a significant contribution to this significant cumulative impact. Mitigation
18 measures similar to Mitigation Measure 11-3 (for unstable geological conditions), Mitigation
19 Measure 11-5 (for expansive soils), Mitigation Measure 11-7 (for landslides), and Mitigation
20 Measure 11-9 (for high organic matter soils) should be considered for these other actions as well
21 as the Proposed Project.

22 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
23 flood control, and Delta enhancement projects could result in a loss of topsoil associated with
24 ground disturbance, with resulting erosion and sedimentation impacts. Project types with the
25 greatest potential for soil loss are those with the greatest area of construction disturbance, such as
26 new surface water storage projects (especially with earthen dams), large ecosystem restoration
27 projects, and levee improvement projects. Representative projects from Table 22-1 that could lead
28 to these impacts include the Bay Delta Conservation Plan, San Diego County Water Authority
29 Emergency Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge
30 Project; Meins Landing restoration; the five listed habitat conservation plans; the CALFED Levee
31 Stability Program; and the Delta Levees Flood Protection Program. These impacts could be
32 significant. The soil loss impacts of the Proposed Project (i.e., Impacts 11-4a – 11-4e) could
33 constitute a significant contribution to this significant cumulative impact. Mitigation measures
34 similar to Mitigation Measure 11-4 should be considered for these other actions as well as the
35 Proposed Project.

36 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
37 flood control, and Delta enhancement projects could result in the unintentional formation of seeps
38 and springs and the resulting occurrence of nuisance water. Project types with the greatest
39 potential for nuisance water soil loss are those that impound water (including levees) or involve
40 substantial excavation. Representative projects from Table 22-1 that could lead to these impacts
41 include the Shasta Lake Water Resources Investigation; San Diego County Water Authority
42 Emergency Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge
43 Project; the CALFED Levee Stability Program; and the Delta Levees Flood Protection Program.
44 These impacts could be significant. The nuisance water impacts of the Proposed Project
45 (i.e., Impacts 11-6a – 11-6e) could constitute a significant contribution to this significant
46 cumulative impact. Mitigation measures similar to Mitigation Measure 11-6 should be considered
47 for these other actions as well as the Proposed Project.

- 1 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
2 and Delta enhancement projects may require locating facilities in remote areas without access to
3 municipal wastewater systems. In these locations, onsite septic systems would be required but
4 could occur in areas with soil conditions that are unable to properly treat effluent. Representative
5 projects from Table 22-1 that could lead to these impacts include the 2-Gates Project, fish screen
6 projects, and the Franks Tract Project. These impacts could be significant. The septic system
7 impacts of the Proposed Project (i.e., Impact 11-8) could constitute a significant contribution to
8 this significant cumulative impact. Mitigation measures similar to Mitigation Measure 11-8
9 should be considered for these other actions as well as the Proposed Project.
- 10 ♦ Physical improvements associated with other flood control projects may require locating facilities
11 in remote areas without access to municipal wastewater systems. Onsite septic systems are not
12 expected to be required for flood control projects but could occur in areas with soil conditions
13 that are unable to properly treat effluent. Representative projects from Table 22-1 that could lead
14 to these impacts include the CALFED Levee Stability Program and the Delta Levees Flood
15 Protection Program. Septic system impacts from the Proposed Project would be less than
16 significant. Because the Proposed Project also would include similar flood control projects that
17 are not expected to require septic systems, it would have a less than cumulatively considerable
18 impact.

19 22.2.10 Paleontological Resources

20 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
21 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
22 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
23 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
24 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on
25 paleontological resources as described in Section 12, Paleontological Resources. These cumulative
26 paleontological resources impacts would include the following:

- 27 ♦ Physical improvements associated with other water supply, water quality, and flood control
28 projects could result in destruction of paleontological resources. These conditions could be
29 created by construction and operation of any type of project listed in Table 22-1, especially
30 projects with large footprints of disturbance and deep excavation. These impacts could be
31 significant. The paleontological resource impacts of the Proposed Project (i.e., Impacts 12-1a,
32 12-1c, and 12-1d) could constitute a significant contribution to this significant cumulative impact.
33 Mitigation measures similar to Mitigation Measure 12-1 should be considered for these other
34 actions as well as the Proposed Project.
- 35 ♦ Physical improvements associated with other ecosystem restoration and Delta enhancement
36 projects could result in destruction of paleontological resources. These conditions could be
37 created by construction and operation of any type of project listed in Table 22-1, especially
38 projects with large footprints of disturbance. However, these impacts are likely to be less than
39 significant because these types of projects are likely to occur on disturbed soils and would not
40 include deep excavation (i.e., below the surface soil horizon). The paleontological resource
41 impacts of ecosystem restoration and Delta enhancement projects (i.e., Impacts 12-1b and 12-1e)
42 would be less than significant. Because the Proposed Project also would include similar projects
43 in disturbed areas without deep excavation, it would have a less than cumulatively considerable
44 impact.

22.2.11 Mineral Resources

The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta Plan does not contemplate these as covered projects and makes no recommendations regarding them). When the impact of actions that the Delta Plan would permit or encourage are considered in connection with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially significant adverse cumulative impacts that are similar to the Proposed Project's impacts on mineral resources as described in Section 13, Mineral Resources. These cumulative mineral resources impacts would include the following:

- Physical improvements associated with other water supply, ecosystem restoration, water quality, flood control, and Delta enhancement projects could result in a loss of access to known mineral resources, including sites delineated in local plans. Project types with the greatest potential for mineral resource impacts are those located outside of the Delta and Suisun Marsh that could be developed in Mineral Resource Zone 2 (MRZ-2) areas (see Section 13, Mineral Resources), because there are no MRZ zones in these areas. Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake Water Resources Investigation and the San Diego County Water Authority Emergency Storage Project. Other project types with potential mineral resource impacts are those located in areas within the Delta and Suisun Marsh that contain natural gas resources, the use of which could be precluded by the project. Representative projects from Table 22-1 that could lead to these impacts include the Bay Delta Conservation Plan, Delta Wetlands project, Delta Smelt Interim Refuge, Liberty Island Conservation Bank, Dutch Slough Tidal Marsh Restoration Project, Meins Landing restoration, and the five listed habitat conservation plans. These impacts could be significant. The mineral resource impacts of the Proposed Project (i.e., Impacts 13-1 and 13-2) could constitute a significant contribution to this significant cumulative impact. Mitigation measures similar to Mitigation Measures 13-1 and 13-2 should be considered for these other actions as well as the Proposed Project.

22.2.12 Hazards and Hazardous Materials

The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta Plan does not contemplate these as covered projects and makes no recommendations regarding them). When the impact of actions that the Delta Plan would permit or encourage are considered in connection with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially significant adverse cumulative impacts that are similar to the Proposed Project's impacts with regard to hazards and hazardous materials as described in Section 14, Hazards and Hazardous Materials. These cumulative hazards and hazardous materials impacts would include the following:

- Physical improvements associated with other water supply, ecosystem restoration, water quality, flood control, and Delta enhancement projects could result in exposure of the environment and sensitive receptors to hazardous materials such as gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants, paint, and paint thinner. This includes the potential release of existing onsite hazardous materials that are uncovered or otherwise disrupted during construction. Some of these impacts could occur within 0.25 miles of a school. Projects that involve considerable heavy equipment use are likely to have the greatest potential hazardous materials impacts. These types of projects include new surface water storage projects, large ecosystem restoration projects, and levee improvement projects. Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake Water Resources Investigation; Bay Delta Conservation Plan; San Diego County Water Authority Emergency Storage Project; El Monte Valley Mining, Reclamation, and Groundwater Recharge Project; fish screen projects; Liberty Island Conservation Bank; Meins Landing restoration; the five listed habitat conservation plans; the CALFED Levee Stability Program; the Delta Levees

1 Flood Protection Program, and channel dredging projects. These impacts could be significant.
2 The hazardous materials impacts of the Proposed Project (i.e., Impacts 14-1a – 14-1e, 14-2a –
3 14-2e, 14-5a – 14-5e, and 14-6a – 14-6e) could constitute a significant contribution to this
4 significant cumulative impact. Mitigation measures similar to Mitigation Measures 14-1, 14-2,
5 and 14-3 should be considered for these other actions as well as the Proposed Project.

- 6 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
7 flood control, and Delta enhancement projects could result in new areas of standing water, which
8 increases the potential creation of mosquito breeding habitat. These conditions could be created
9 by construction and operation of any type of project listed in Table 22-1. These impacts could be
10 significant. The vector impacts of the Proposed Project (i.e., Impacts 14-3a – 14-3e) could
11 constitute a significant contribution to this significant cumulative impact. Mitigation measures
12 similar to Mitigation Measure 14-4 should be considered for these other actions as well as the
13 Proposed Project.

- 14 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
15 flood control, and Delta enhancement projects could result in new areas of standing water within
16 5 miles of an Airport Operations Area, which could become a hazardous wildlife attractant. These
17 conditions could be created by construction and operation of any type of project listed in
18 Table 22-1. These impacts could be significant. The bird strike impacts of the Proposed Project
19 (i.e., Impacts 14-7a – 14-7e) could constitute a significant contribution to this significant
20 cumulative impact. Mitigation measures similar to Mitigation Measure 14-6 should be considered
21 for these other actions as well as the Proposed Project.

22 22.2.13 Noise

23 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
24 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
25 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
26 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
27 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on noise as
28 described in Section 15, Noise. These cumulative noise impacts would include the following:

- 29 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
30 flood control, and Delta enhancement projects could result in exposure of sensitive receptors to
31 excessive temporary, short-term construction noise. Projects with considerable heavy equipment
32 use near residences or similar receptors, or that require a large number of vehicle trips (e.g., to
33 haul materials) are likely to have the greatest construction noise impacts. These types of projects
34 include new surface water storage projects, large ecosystem restoration projects, and levee
35 improvement projects. Representative projects from Table 22-1 that could lead to these impacts
36 include the Shasta Lake Water Resources Investigation; Bay Delta Conservation Plan; San Diego
37 County Water Authority Emergency Storage Project; El Monte Valley Mining, Reclamation, and
38 Groundwater Recharge Project; fish screen projects; Liberty Island Conservation Bank; Meins
39 Landing restoration; the five listed habitat conservation plans; the CALFED Levee Stability
40 Program; the Delta Levees Flood Protection Program, and channel dredging projects. These
41 impacts could be significant. The construction noise impacts of the Proposed Project (i.e.,
42 Impacts 15-1a – 15-1e) could constitute a significant contribution to this significant cumulative
43 impact. Mitigation measures similar to Mitigation Measure 15-1 should be considered for these
44 other actions as well as the Proposed Project.
- 45 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
46 flood control, and Delta enhancement projects could result in temporary and short-term exposure
47 of sensitive receptors to excessive groundborne vibrations. Projects that may induce substantial

1 groundborne vibration during construction are those with considerable heavy equipment use
2 (especially pile-driving and vibratory equipment) near fragile historic structures, vibration-
3 sensitive equipment (e.g., some medical and manufacturing businesses), or residents. These types
4 of projects include new surface water storage projects and levee improvement projects.

5 Representative projects from Table 22-1 that could lead to these impacts include the Shasta Lake
6 Water Resources Investigation; San Diego County Water Authority Emergency Storage Project;
7 El Monte Valley Mining, Reclamation, and Groundwater Recharge Project; fish screen projects;
8 the CALFED Levee Stability Program; and the Delta Levees Flood Protection Program. These
9 impacts could be significant. The construction vibration impacts of the Proposed Project
10 (i.e., Impacts 15-2a – 15-2e) could constitute a significant contribution to this significant
11 cumulative impact. Mitigation measures similar to Mitigation Measure 15-2 should constitute
12 considered for these other actions as well as the Proposed Project.

- 13 ♦ Physical improvements associated with other water supply, water quality, and Delta enhancement
14 projects could result in the long-term exposure of sensitive receptors to excessive noise from
15 operations. Projects that require large pumps (e.g., wells) or surface water projects with
16 hydroelectric features (e.g., turbines with falling water) are likely to have the greatest operational
17 noise impacts. Recreation projects also could generate operational noise impacts (e.g., dog parks,
18 playing fields, parking lots, marinas). Representative projects from Table 22-1 that could lead to
19 these impacts include the Shasta Lake Water Resources Investigation, Bay Delta Conservation
20 Plan, and Delta Wetlands project. These impacts could be significant. The operational noise
21 impacts of the Proposed Project (i.e., Impacts 15-3a – 15-3e) could constitute a significant
22 contribution to this significant cumulative impact. Mitigation measures similar to Mitigation
23 Measure 15-3 should be considered for these other actions as well as the Proposed Project.

- 24 ♦ Physical improvements associated with other ecosystem restoration and flood control projects
25 could result in the long-term exposure of sensitive receptors to excessive noise from operations.
26 Some noise would be generated by maintenance of new or modified restoration sites or flood
27 control features (e.g., levees). Representative projects from Table 22-1 that could lead to these
28 impacts include the Bay Delta Conservation Plan, Liberty Island Conservation Bank, Meins
29 Landing restoration, the five listed habitat conservation plans, the CALFED Levee Stability
30 Program, and the Delta Levees Flood Protection Program. These projects, however, would only
31 generate operation-phase noise in a limited or periodic manner – maintenance activities could be
32 audible, but would occur over large areas and over time periods ranging from days to years.
33 Operations-phase noise impacts from the Proposed Project would be less than significant.
34 Because the Proposed Project also would include similar projects that generate only limited or
35 periodic noise, it would have a less than cumulatively considerable impact.

36 22.2.14 Population and Housing

37 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
38 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
39 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
40 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
41 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on population
42 and housing as described in Section 16, Population and Housing. These cumulative population and
43 housing impacts would include the following:

- 44 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
45 flood risk reduction, and Delta enhancements projects could displace housing and/or people,
46 which would necessitate the construction of replacement housing elsewhere. The impact would
47 be significant if the resulting housing demand cannot be met with existing housing in the specific

1 project area. However, these categories of projects would most often occur in rural areas that are
2 zoned for agriculture, or in urban areas with established manufacturing and construction
3 industries and labor pools. In addition, construction activities in sparsely populated areas would
4 be temporary and unlikely to contribute substantive changes to local labor pools. For these
5 reasons, cumulative impacts are expected to be less than significant. Because the Proposed
6 Project also would include similar projects in rural, sparsely populated areas, or in urban areas
7 with an established construction industry, it would have a less than cumulatively considerable
8 impact.

9 22.2.15 Public Services

10 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
11 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
12 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
13 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
14 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on public
15 services as described in Section 17, Public Services. These cumulative public services impacts would
16 include the following:

- 17 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
18 flood control, and Delta enhancement projects could place additional demands on public services
19 (e.g., from job site accidents and job site security during construction) and disrupt the delivery of
20 police, fire, and ambulance service by blocking access or otherwise interfering with established
21 service routes. These impacts could result in the need for new or expanded public service
22 facilities. Representative projects from Table 22-1 that could lead to these impacts include the
23 Bay Delta Conservation Plan, Delta Wetlands Project, the 2-Gates Project, Liberty Island
24 Conservation Bank, and the Delta Levees Flood Protection Program. The need for new or
25 physically altered public service facilities, however, is mostly prompted by increased demand,
26 typically as a result of new land development and/or population growth. The projects listed in
27 Table 22-1 do not include new land development and/or population growth, and therefore would
28 not add only negligible new demands to existing public services. For this reason, cumulative
29 impacts are expected to be less than significant. Because the Proposed Project also would include
30 similar projects with no new land development or population growth, it would have a less than
31 cumulatively considerable impact.

32 22.2.16 Recreation

33 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
34 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
35 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
36 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
37 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on recreation as
38 described in Section 18, Recreation. These cumulative recreation impacts would include the following:

- 39 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
40 and flood control projects could impair, degrade, or eliminate recreational facilities and activities.
41 Examples of these impacts include:
 - 42 • Displacement of existing recreation facilities (e.g., marinas).
 - 43 • Inundation of shoreline trails, launching ramps, and use areas (e.g., docks, tie-ups).
 - 44 • Changes in water flow patterns and elevations.

- 1 • Conversion of actively used turf areas to drought-tolerant plantings.
- 2 • Change in species composition (e.g., reduced numbers of striped bass).

3 These types of impacts may require recreational users to travel longer distances to recreation sites, or
4 could provide less or lower-quality recreation than the original facilities. Representative projects from
5 Table 22-1 that could lead to these impacts include the Shasta Lake Water Resources Investigation,
6 Bay Delta Conservation Plan, San Diego County Water Authority Emergency Storage Project,
7 2-Gates Project, Franks Tract Project, Liberty Island Conservation Bank, Delta Smelt Interim Refuge,
8 Meins Landing restoration, Mayberry Farms Subsidence Reversal Project, Dutch Slough Tidal Marsh
9 Restoration Project, the five listed habitat conservation plans, the CALFED Levee Stability Program,
10 and the Delta Levees Flood Protection Program. These impacts could be significant. The recreation
11 impacts of the Proposed Project (i.e., Impacts 18-1a – 18-1e) could constitute a significant
12 contribution to this significant cumulative impact. Mitigation measures similar to Mitigation
13 Measure 18-1 should be considered for these other actions as well as the Proposed Project.

14 ♦ Physical improvements associated with other Delta enhancement projects would not impair,
15 degrade, or eliminate recreational facilities and activities. Representative projects from
16 Table 22-1 that could potentially lead to these impacts include the Land Use and Resource
17 Management Plan Update and the Recreation Proposal for the Sacramento-San Joaquin Delta and
18 Suisun Marsh. However, these types of actions are likely to enhance, rather than degrade,
19 recreational facilities and activities. Recreation impacts from the Proposed Project (Delta
20 enhancements) would be less than significant. Because the Proposed Project also would include
21 similar projects that would enhance recreation, it would have a less than cumulatively
22 considerable impact.

23 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
24 flood control, and Delta enhancement projects could place additional demands on recreation
25 facilities by attracting more recreation users or displacing people from existing recreation
26 facilities. These impacts could require construction of new recreation facilities or expansion of
27 existing facilities. Representative projects from Table 22-1 that could lead to these impacts
28 include the Bay Delta Conservation Plan, Delta Wetlands Project, the 2-Gates Project, Delta
29 Smelt Interim Refuge, Franks Tract, Liberty Island Conservation Bank, Meins Landing
30 Restoration, Mayberry Farms Subsidence Reversal Project, Dutch Slough Tidal Marsh
31 Restoration Project, and the five listed habitat conservation plans. These impacts could be
32 significant. The recreation demand impacts of the Proposed Project (Impacts 18-2a – 18-2e and
33 18-3a – 18-3e) could constitute a significant contribution to this significant cumulative impact.
34 Mitigation measures similar to Mitigation Measures 18-2 and 18-3 should be considered for these
35 other actions as well as the Proposed Project.

36 22.2.17 Transportation, Traffic, and Circulation

37 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
38 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
39 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
40 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
41 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on transportation
42 as described in Section 19, Transportation, Traffic, and Circulation. These cumulative transportation
43 impacts would include the following:

44 ♦ Construction of physical improvements associated with other water supply, ecosystem
45 restoration, water quality, flood control, and Delta enhancement projects could conflict with
46 adopted plans and policies for roadway performance, and for bicycle and pedestrian paths and
47 trails. These impacts could occur by blocking access or otherwise interfering with established

1 routes, increasing traffic congestion (e.g., from construction vehicles), or by damaging road
2 surfaces. Representative projects from Table 22-1 that could lead to these impacts include Bay
3 Delta Conservation Plan, the Delta Wetlands Project, the 2-Gates Project, Liberty Island
4 Conservation Bank, and the Delta Levees Flood Protection Program. These impacts could be
5 significant. The conflicts of the Proposed Project with transportation plans (Impacts 19-1a –
6 19-1e) could constitute a significant contribution to this significant cumulative impact. Mitigation
7 measures similar to Mitigation Measure 19-1 should be considered for these other actions as well
8 as the Proposed Project.

- 9 ♦ Construction of physical improvements associated with other water supply, ecosystem
10 restoration, water quality, flood control, and Delta enhancement projects could conflict with
11 adopted plans and policies for rail and transit performance. These impacts could occur by
12 requiring service delays in the construction area, and potentially by rerouting service. Because
13 these impacts would be temporary, cumulative impacts are expected to be less than significant.
14 Because the Proposed Project is not expected to interrupt railroad and transit operations (other
15 than minor delays and detours) during construction, it would have a less than cumulatively
16 considerable impact.

- 17 ♦ Construction of physical improvements associated with other ecosystem restoration and flood
18 control projects could conflict with adopted plans and policies for navigation, ports, waterways,
19 and ferries. These impacts could occur by blocking access or otherwise interfering with
20 established routes through the use of in-water construction (e.g., cofferdams, floating dredging
21 equipment, barge deliveries), or during operation (e.g., from operable barriers, channelization,
22 levee degradation). Representative projects from Table 22-1 that could lead to these impacts
23 include the Bay Delta Conservation Plan, 2-Gates Project, Franks Tract Project, Liberty Island
24 Conservation Bank, and the Delta Levees Flood Protection Program. These impacts could be
25 significant. The conflicts of the Proposed Project with transportation plans (Impacts 19-1a –
26 19-1e) could constitute a significant contribution to this significant cumulative impact. Mitigation
27 measures similar to Mitigation Measure 19-1 should be considered for these other actions as well
28 as the Proposed Project.

- 29 ♦ Physical improvements associated with other water supply, ecosystem restoration, flood control,
30 and Delta enhancement projects could conflict with adopted plans and policies for roadway
31 performance. These impacts could occur by generating substantial new trips during operations
32 and maintenance activities. Representative projects from Table 22-1 that could lead to these
33 impacts include all of the listed desalination projects (Bay Area, Huntington Beach, Carlsbad) or
34 implementation of the Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun
35 Marsh. These impacts could be significant. The conflicts of the Proposed Project with
36 transportation plans (Impacts 19-1a – 19-1e) could constitute a significant contribution to this
37 significant cumulative impact. Mitigation measures similar to Mitigation Measure 19-1 should be
38 considered for these other actions as well as the Proposed Project.

- 39 ♦ Physical improvements associated with other ecosystem restoration projects could conflict with
40 adopted plans and policies for rail performance. These impacts could occur from floodplain
41 management actions that could overtop rail lines and erode the railroad base. Representative
42 projects from Table 22-1 that could lead to these impacts include the Bay Delta Conservation
43 Plan, Meins Landing Restoration Project, the Mayberry Farms Duck Club Subsidence Reversal
44 Project, and the five listed habitat conservation plans. These impacts could be significant. The
45 plan conflicts of the Proposed Project (Impacts 19-1a – 19-1e) could constitute a significant
46 contribution to this significant cumulative impact. Mitigation measures similar to Mitigation
47 Measure 19-1 should be considered for these other actions as well as the Proposed Project.

- 1 ♦ Physical improvements associated with other water supply projects could increase traffic hazards
2 as a result of road relocation. Representative projects from Table 22-1 that could lead to these
3 impacts include potential actions under the Shasta Lake Water Resources Investigation, the Bay
4 Delta Conservation Plan, and the San Diego County Water Authority Emergency Storage Project.
5 Because State and local building design criteria, however, would prevent construction of facilities
6 that would not comply with the new design criteria, the impacts are likely to be less than
7 significant. Water supply projects under the Proposed Project are not expected to create traffic
8 hazards for the same reason, and therefore it would have a less than cumulatively considerable
9 impact.
- 10 ♦ Physical improvements associated with other ecosystem restoration also could increase
11 navigation hazards related to design features (e.g., tree snags, shoal formation/expansion).
12 Representative projects from Table 22-1 that could lead to these impacts include potential actions
13 under the Bay Delta Conservation Plan, Delta Smelt Recovery Plan, Delta Smelt Interim Refuge,
14 Liberty Island Conservation Bank, and levee programs that include use of setback levees. These
15 impacts could be significant. The navigation hazard impacts of the Proposed Project
16 (Impact 19-2b) could constitute a significant contribution to this significant cumulative impact.
17 Mitigation measures similar to Mitigation Measure 19-2 should be considered for these other
18 actions as well as the Proposed Project.
- 19 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
20 flood control, and Delta enhancement projects could result in inadequate emergency access by
21 blocking access or otherwise interfering with established emergency service routes (including
22 boat access) during construction. Representative projects from Table 22-1 that could lead to these
23 impacts include the Bay Delta Conservation Plan, Delta Wetlands Project, the 2-Gates Project,
24 Liberty Island Conservation Bank, and the Delta Levees Flood Protection Program. These
25 impacts could be significant. The emergency services impacts of the Proposed Project (Impacts
26 19-3a – 19-3e) could constitute a significant contribution to this significant cumulative impact.
27 Mitigation measures similar to Mitigation Measure 19-3 should be considered for these other
28 actions as well as the Proposed Project.
- 29 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
30 flood control, and Delta enhancement projects could conflict with adopted plans, policies, or
31 programs for bicycle and pedestrian paths and trails by blocking access or otherwise interfering
32 with established bicycle and pedestrian routes. Representative projects from Table 22-1 that could
33 lead to these impacts include the Bay Delta Conservation Plan, Delta Wetlands Project, the
34 2-Gates Project, Liberty Island Conservation Bank, and the Delta Levees Flood Protection
35 Program. These impacts could be significant. The bicycle and pedestrian plan conflicts of the
36 Proposed Project (Impacts 19-4a – 19-4e) could constitute a significant contribution to this
37 significant cumulative impact. Mitigation measures similar to Mitigation Measure 19-4 should be
38 considered for these other actions as well as the Proposed Project.

39 22.2.18 Utilities and Service Systems

40 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
41 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
42 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
43 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
44 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on utilities as
45 described in Section 20, Utilities and Service Systems. These cumulative utilities impacts would include
46 the following:

- 1 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
2 flood control, and Delta enhancement projects would not place additional demands on municipal
3 water, wastewater, and stormwater systems (e.g., from construction and operational water
4 demands, portable restrooms at job sites, vault toilets at new park areas), solid waste disposal
5 capacity (e.g., demolition debris, sludge and brine cake disposal, spoils disposal), or electricity
6 supplies. Representative projects from Table 22-1 that could potentially lead to these impacts
7 include the Bay Area Regional Desalination Project, Bay Delta Conservation Plan, the three listed
8 desalination projects, Delta Wetlands Project, the 2-Gates Project, Liberty Island Conservation
9 Bank, the Ballast Water Management Program, various dredging actions, and the Delta Levees
10 Flood Protection Program. However, the need for new or physically altered utility systems is
11 mostly caused by increased demand, typically as a result of new land development and/or
12 population growth. The projects listed in Table 22-1 do not include new land development and/or
13 population growth, and therefore would not add only negligible new demands to existing utilities.
14 For this reason, cumulative impacts are expected to be less than significant. Because the Proposed
15 Project also would include similar projects with no new land development or population growth,
16 it would have a less than cumulatively considerable impact.
- 17 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
18 flood control, and Delta enhancement projects could result in unintentional damage to or
19 disruption of underground utilities. These impacts could occur by construction of any type of
20 project listed in Table 22-1, especially projects that include trenching, auguring, or other ground-
21 disturbing activity. However, these impacts are likely to be less than significant because of
22 standard construction practices including pre-construction utility surveys. Utility conflicts from
23 the Proposed Action (i.e., Impact 20-6) would be less than significant. Because the Proposed
24 Project also would include similar projects following similar construction practices, it would have
25 a less than cumulatively considerable impact.

26 22.2.19 Climate Change and Greenhouse Gas Emissions

27 The projects listed in Table 22-1 are not addressed, directly or indirectly, by the Delta Plan (i.e., the Delta
28 Plan does not contemplate these as covered projects and makes no recommendations regarding them).
29 When the impact of actions that the Delta Plan would permit or encourage are considered in connection
30 with the potential impacts of the projects listed in Table 22-1, the combination would result in potentially
31 significant adverse cumulative impacts that are similar to the Proposed Project's impacts on climate
32 change and greenhouse gas emissions as described in Section 21, Climate Change and Greenhouse Gas
33 Emissions. These cumulative climate change and greenhouse gas emissions (GHG) impacts would
34 include the following:

- 35 ♦ Physical improvements associated with other water supply, ecosystem restoration, water quality,
36 flood control, and Delta enhancement projects could result in an increase in GHG emissions. For
37 the types of projects listed in Table 22-1, GHG emissions are primarily generated during
38 construction activities due to the considerable use of heavy equipment and construction vehicle
39 trips (e.g., to haul materials) are likely to have the greatest construction GHG emissions. Every
40 project listed in Table 22-1 that includes physical activities has the potential for substantial
41 increase in GHG emissions, with the impact proportionate to the size of the construction activity.
42 These impacts could be significant. In addition, some categories of projects could result in
43 additional GHG emissions during operations. These operational impacts also could be significant,
44 although likely to a lesser extent than the construction impacts because many of the projects
45 (e.g., ecosystem restoration sites, levees) would have limited day-to-day activity. Operation-phase
46 GHG impacts could occur from fuel consumption (e.g., from maintenance activities), treatment
47 processes (e.g., chemical feeds, methane emissions), and indirectly as a result of electricity use
48 (e.g., for pumps). Representative projects from Table 22-1 with potential operation-phase impacts

1 include the three listed desalination projects (Bay Area, Huntington Beach, and Carlsbad). These
2 impacts could be significant. The GHG emission impacts of the Proposed Project (i.e., Impacts
3 21-1a – 21-1e) could constitute a significant contribution to this significant cumulative impact.
4 Mitigation measures similar to Mitigation Measure 21-1 should be considered for these other
5 actions as well as the Proposed Project. In addition, there is some potential for beneficial impacts
6 during operations, such as the generation of hydroelectric power and carbon sequestration
7 (e.g., from habitat restoration).

- 8 ◆ Physical improvements associated with other water supply, ecosystem restoration, water quality,
9 flood control, and Delta enhancement projects could conflict with applicable plans, policies, and
10 regulations adopted for the purpose of reducing GHG emissions. Many of the types of projects
11 listed in Table 22-1, however, would directly support several GHG reduction measures
12 recommended by the California Air Resources Board. These include measures such as promoting
13 water use efficiency and using cleaner energy sources to move and treat water. For this reason,
14 cumulative impacts are expected to be less than significant. Because the Proposed Project would
15 implement similar projects that directly support GHG plans, policies, and regulations, it would
16 have a less than cumulatively considerable impact.
- 17 ◆ Operation of other water supply, ecosystem restoration, water quality, flood control, and Delta
18 enhancement projects could be affected by climate change (e.g., more frequent extreme rainfall
19 and snowmelt events) and sea level rise. Facilities with intake or outfall structures (e.g., water and
20 wastewater treatment plants, storm drains) could be inoperable for periods of time when the
21 surface water elevations would either be too high or too low. Changes in rainfall patterns could
22 affect reservoir and flood control operations, and resources such as groundwater (e.g., recharge
23 rates) and ecosystems (e.g., habitat composition shifts). Representative projects from Table 22-1
24 that could be affected by climate change and sea level rise include the Bay Area Regional
25 Desalination Project, Bay Delta Conservation Plan, the three listed desalination projects (Bay
26 Area, Huntington Beach, and Carlsbad), Delta Wetlands Project, the 2-Gates Project, Liberty
27 Island Conservation Bank, and many others. These impacts could be significant. The climate
28 change impacts of the Proposed Project (i.e., Impacts 21-3a – 21-3e) could constitute a significant
29 contribution to this significant cumulative impact. Mitigation measures similar to Mitigation
30 Measures 21-2, 21-3, and 21-5 should be considered for these other actions as well as the
31 Proposed Project. In addition, there is some potential for beneficial impacts during operations,
32 such as the generation of hydroelectric power and carbon sequestration (e.g., from habitat
33 restoration).

34 22.3 Cumulative Impacts of No Project 35 Alternative

36 This section provides a summary of the potential cumulative impacts that would result from the
37 implementation of the No Project Alternative and the projects and programs summarized in Table 22-1.
38 Similar cumulative impacts to many resources would occur under the No Project Alternative as described
39 above for the Proposed Project, except that the No Project Alternative would make greater contributions
40 to cumulative impacts to flood risk, ecosystem health, water quality and water reliability (particularly in
41 the Delta) because existing conditions would continue to degrade due to lack of encouragement of
42 projects and programs that would be encouraged under the Delta Plan.

22.4 Cumulative Impacts of Alternative 1A

This section provides a summary of the potential cumulative impacts that would result from the implementation of Alternative 1A and the projects and programs summarized in Table 22-1. Similar cumulative impacts on many resources would occur under Alternative 1A as described above for the Proposed Project, but Alternative 1A's contribution to some significant cumulative impacts would be less because fewer projects would be implemented. Although the contribution from Alternative 1A would be less, the extent of impacts is still likely to be significant because of the large number of projects involved. In addition, Alternative 1A would make a greater contribution to cumulative impacts on Delta ecosystem health and water quality, because Alternative 1A delays and makes less certain the establishment of Delta water flow criteria and Delta flow and water quality objectives, and because the Alternative involves less ecosystem restoration (floodplains, riparian habitats and tidal marsh) in the Delta. Alternative 1A also would make a greater contribution to cumulative impacts on flood risk because it would prioritize levee maintenance and modifications to levees that protect water supply corridors, which would result in lower flood risk reduction in other parts of the Delta. Thus, the conditions of existing ecosystem health, water quality and risk from flooding would continue to degrade. Mitigation measures similar to the Proposed Project should be considered for Alternative 1A as well. For impacts that are less than cumulatively considerable (as described above for the Proposed Project), the reduced number of projects under Alternative 1A indicate that Alternative 1A also would have less than cumulatively considerable impacts.

22.5 Cumulative Impacts of Alternative 1B

This section provides a summary of the potential cumulative impacts that would result from the implementation of Alternative 1B and the projects and programs summarized in Table 22-1. Similar cumulative impacts on many resources would occur under Alternative 1B as described above for the Proposed Project, but Alternative 1B's contribution to some significant cumulative impacts would be less because, in general, fewer projects would be implemented. Although the contribution from Alternative 1B would be less, the extent of impacts is still likely to be significant because of the large number of projects involved, and because of the potential for increased changes in Delta water quality (generally beneficial) and hydrodynamic conditions. In addition, Alternative 1B would make greater contributions to cumulative impacts to flood risk, ecosystem health, water quality and water supply reliability because, by comparison to the Proposed Project, it changes regulatory policies to recommendations and calls for studies rather than projects or actions, thereby weakening the ability of the Council to move the State closer to achieving the coequal goals. Thus, existing conditions would continue to degrade due to lack of encouragement of projects and programs that would be encouraged under the Delta Plan. Mitigation measures similar to the Proposed Project should be considered for Alternative 1B as well. For impacts that are less than cumulatively considerable (as described above for the Proposed Project), the reduced number of projects under Alternative 1B indicate that Alternative 1B also would have less than cumulatively considerable impacts.

22.6 Cumulative Impacts of Alternative 2

This section provides a summary of the potential cumulative impacts that would result from the implementation of Alternative 2 and the projects and programs summarized in Table 22-1. Similar cumulative impacts on many resources would occur under Alternative 2 as described above for the Proposed Project, but Alternative 2's contribution to some significant cumulative impacts would be less because fewer projects would be implemented including projects with the greatest potential for disruption impacts (e.g., large surface storage facilities and major levee improvements). Although the contribution from Alternative 2 would be less, the extent of impacts is still likely to be significant because of the large number of projects involved. In addition, Alternative 2 would make greater contributions to cumulative

1 impacts due to flood risk, because it involves fewer levees and levee modifications and less levee
2 maintenance. Alternative 2 also would make greater contributions to cumulative impacts on water supply
3 reliability because it would reduce Delta exports, may or may not be able to be replaced with local
4 supplies and would reduce redundancies in and the reliability of the water supply system. Thus, existing
5 flood risk and water supply reliability conditions would continue to degrade. Alternative 2 would also
6 make a greater contribution to cumulative conversion of agricultural land by converting the use of Tulare
7 Lake to water storage. Mitigation measures similar to the Proposed Project should be considered for
8 Alternative 2 as well. For impacts that are less than cumulatively considerable (as described above for the
9 Proposed Project), the reduced number of large projects under Alternative 2 indicate that Alternative 2
10 also would have less than cumulatively considerable impacts.

11 22.7 Cumulative Impacts of Alternative 3

12 This section provides a summary of the potential cumulative impacts that would result from the
13 implementation of Alternative 3 and the projects and programs summarized in Table 22-1. Similar
14 cumulative impacts on many resources would occur under Alternative 3 as described above for the
15 Proposed Project, but Alternative 3's contribution to some significant cumulative impacts would be less
16 because fewer large projects (e.g., surface storage facilities) would be implemented. Although the
17 contribution from Alternative 3 would be less, the extent of impacts is still likely to be significant because
18 of the large number of projects involved and the greater number of small water supply projects
19 (e.g., treatment plants, wells, pipelines). In addition, Alternative 3 would make greater contributions to
20 cumulative impacts on ecosystem health because it involves fewer ecosystem restoration projects and
21 focuses them on publicly owned lands. Alternative 3 also would make greater contributions to cumulative
22 impacts on flood risk because it involves fewer new levees. Thus, the existing ecosystem health and flood
23 risk conditions would continue to degrade. Mitigation measures similar to the Proposed Project should be
24 considered for Alternative 3 as well. For impacts that are less than cumulatively considerable (as
25 described above for the Proposed Project), the reduced number of large projects under Alternative 3
26 indicate that Alternative 3 also would have less than cumulatively considerable impacts.

27 22.8 Reference

28 CNRA (California Natural Resources Agency). 2011. Bay Delta Conservation Plan. Public Meeting.
29 August 11.

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Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|--|----------------------------|---|
| RELIABLE WATER SUPPLY | | | |
| California Department of Water Resources | California Water Plan Update 2013 | Ongoing program. | The California Water Plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Plan, which is updated every five years, presents basic data and information on California's water resources (including water supply evaluations and assessments of agricultural, urban, and environmental water uses) to quantify the gap between water supplies and uses. The Plan also identifies and evaluates existing and proposed statewide demand management and water supply augmentation programs and projects to address the State's water needs (Water Code sections 10004-10013). Water Plan 2013 to be published by December 2013. |
| U.S. Bureau of Reclamation | Surface Water Storage Investigation Shasta Lake Water Resources Investigation | Program under development. | The Shasta Lake Water Resources Investigation is currently being undertaken by the U.S. Bureau of Reclamation (Reclamation) to determine the type and extent of federal interest in a multiple purpose plan to modify Shasta Dam and Reservoir to increase survival of anadromous fish populations in the upper Sacramento River; increase water supplies and water supply reliability to agricultural, municipal and industrial, and environmental purposes; and, to the extent possible through meeting these objectives, include features to benefit other identified ecosystem, flood damage reduction, and related water resources needs. Anticipated alternatives for expansion of Shasta Lake include, among other features, raising the dam from 6.5 to 18.5 feet above current elevation, which would result in additional storage capacity of 256,000 to 634,000 acre-feet, respectively. The increased capacity is expected to improve water supply reliability and increase the cold water pool, which would provide improved water temperature conditions for anadromous fish in the Sacramento River downstream of the dam. |
| California Department of Water Resources | FERC License Renewal for Oroville Project | Program under development. | The Oroville Facilities, as part of State Water Project (SWP), are also operated for flood management, power generation, water quality improvement in the Sacramento-San Joaquin Delta, recreation, and fish and wildlife enhancement. The objective of the relicensing process was to continue operation and maintenance of the Oroville Facilities for electric power generation, along with implementation of any terms and conditions to be considered for inclusion in a new Federal Energy Regulatory Commission (FERC) hydroelectric license. The initial FERC license for the Oroville Facilities, issued on February 11, 1957, expired on January 31, 2007. Final EIR and environmental impact statement (EIS) in 2008. Revised biological opinions and FERC license not issued. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|------------------------------------|----------------------------|--|
| California Department of Water Resources | Bay Delta Conservation Plan (BDCP) | Program under development. | <p>The BDCP is a multiple-stakeholder Habitat Conservation Plan (HCP) and Natural Communities Conservation Plan (NCCP) to make significant contributions to the recovery of covered species and restore a more naturally functioning Delta ecosystem while securing a reliable freshwater source from the Delta for human use. The BDCP is currently being developed through a collaboration of the California Department of Water Resources (DWR), Reclamation, Metropolitan Water District of Southern California, Kern County Water Agency, Santa Clara Valley Water District, Zone 7 Water Agency, San Luis and Delta-Mendota Water Authority, Westlands Water District, and Mirant Delta LLC (owners of an electric power generating facilities located near Antioch and Pittsburg). The BDCP permits and the related EIR/ EIS are scheduled to be completed by December 2012 (CNRA 2011). If approved, the BDCP would provide incidental take permits for covered species related to the following general categories of actions:</p> <ul style="list-style-type: none"> • The operation of existing SWP Delta facilities and construction and operation of facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and federal Central Valley Project (CVP) pumping plants located in the Southern Delta. • The implementation of any conservation actions that have the potential to result in take of species that are or may become listed under the federal Endangered Species Act (ESA), pursuant to the ESA at Section 10(a)(1)(B) and its implementing regulations and policies. • The diversion and discharge of water by Mirant for power generation in the Western Delta. <p>DWR is the CEQA lead agency for the BDCP.</p> <p>It is anticipated that the BDCP will include actions to restore native fish, wildlife, and plant habitat in the Delta; modify SWP and CVP Delta water conveyance facilities and operations in the Delta; and reduce other ecological stressors that impair the function or the use of desirable habitat for ecosystem restoration or recovery in the Delta, such as physical barriers to fish migration (such as levees, weirs, or gates), non-native and invasive species, and poor water quality.</p> |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|--|----------------------------|---|
| Semitropic Water Storage District | Delta Wetlands | Program under development. | <p>In 1987, Delta Wetlands, a California Corporation, proposed a project for water storage and wildlife habitat enhancement on four privately owned islands in the Sacramento-San Joaquin Delta. The four islands considered were Bacon Island and Bouldin Island in San Joaquin County and Holland Tract and Webb Tract in Contra Costa County, encompassing approximately 23,000 acres. The project would involve a diversion and storage of winter flows on Bacon Island and Webb Tract for beneficial uses in summer, and developing seasonal wetlands and riparian habitats on Bouldin Island and most of Holland Tract. The project would divert 312,000 acre-feet of water from Delta through large siphons during December 15 through May 1. The stored water would be discharged to Delta outflows from May through July. From August to December, the habitat islands would be vegetated with wetland plants to support wintering waterfowl. From October through December, the islands would be managed as waterfowl habitat, where private hunting would be permitted.</p> <p>In 2007, the Semitropic Water Storage District (Semitropic WSD) partnered with the Delta Wetlands Project in response to State Water Resources Control Board (SWRCB) requirements to identify buyers of water provided by the project. Under the current proposal, the project would: 1) provide water to Semitropic WSD to augment its water supply, 2) bank water within the Semitropic Groundwater Storage Bank and Antelope Valley Water Bank, and 3) provide water to other places, including the service areas of the Golden State Water Company and Valley Mutual Water Company. The San Bernardino Valley Municipal Water District, Western Municipal Water District of Riverside County, and Metropolitan Water District of Southern California also are potential places of use. Semitropic WSD would operate the Delta Wetlands Project in conjunction with the Semitropic groundwater storage bank to maximize project flexibility and yield. Delta Wetlands Project water would be provided to Semitropic WSD landowners for irrigation purposes and to other places of use. Semitropic WSD issued a Draft EIR in 2010.</p> <p>This project also was evaluated by DWR and Reclamation as part of the In-Delta Storage Project under the Surface Water Storage Investigation. This project was not studied after a Draft Supplemental Report was completed in 2006.</p> |
| East Bay Municipal Utility District, Contra Costa Water District, Santa Clara Valley Water District, and San Francisco Public Utility Commission | Bay Area Regional Desalination Project | Program under development. | <p>The Bay Area's four largest water agencies are jointly exploring the development of regional desalination facilities that would benefit Bay Area residents and businesses served by these agencies. The Bay Area Regional Desalination Project could consist of one or more desalination facilities, with an initial capacity of about 25 million gallons per day. The project would provide an additional source of water during emergencies, such as earthquakes or levee failures, increase supply reliability, and provide water during droughts or maintenance of other facilities. A pilot plant was constructed and operated at Mallard Slough.</p> |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|---|---|----------------------------|--|
| San Luis & Delta Mendota Water Authority and U.S. Bureau of Reclamation | 2-Gates Project | Program under development. | The 2-Gates Fish Protection Demonstration Project would install and operate removable gate structures at two key Delta locations to test the ability of the structures to improve protection for delta smelt and other sensitive aquatic species. In a five-year pilot study, the gates would control flows in selected interior Delta channels to evaluate whether these changes reduce entrainment of fish into pumps and improve water supplies to the SWP and CVP. The project hypothesis is that by operating the gates, movement of adult and juvenile delta smelt into the South Delta pumping area can be controlled. Gates would be closed for short periods December through February to control adult delta smelt movement and for moderate periods March through June to control larvae/juvenile delta smelt movement. Boat ramps would be used to allow boat passage when the gates are closed. From July through November, a period of high Delta boating activity, the gates would not operate, remaining in a fully open position. The central Delta locations are on Old River between Bacon Island and Holland Tract, and Connection Slough between Mandeville and Bacon Islands. Draft Environmental Assessment published by Reclamation in October 2009. |
| Western Municipal Water District and U.S. Bureau of Reclamation | Riverside-Corona Feeder Conjunctive Use Project | Program under development. | The Riverside-Corona Feeder Conjunctive Use Project will deliver water from the San Bernardino Groundwater Basin Areas to communities throughout western Riverside and San Bernardino counties and the cities of San Bernardino, Colton, Rialto, Grand Terrace, and Riverside during drought and emergency periods. The project will connect local groundwater basins to allow regional management and distribution of groundwater and connect the Chino Desalter Phase 3 project (described below) into the regional system. This project was initially evaluated in the 2005. A Draft Supplemental EIR/EIS for the Riverside-Corona Feeder Pipeline was completed in January 2011. The project includes the Bunker Hill groundwater extraction facility and the feeder pipeline. The Supplemental EIR/EIS evaluated the No Action Alternative/No Project Alternative and four alternative pipeline alignments to deliver up to 40,000 acre-feet/year. The alignment alternatives include connections to Jurupa Community Services District and to the existing San Bernardino Valley Municipal Water District inland and central feeders to provide flexibility and facilitate connections to provide regional water management. |
| City of Huntington Beach | Seawater Desalination Project at Huntington Beach | Program under development. | The Seawater Desalination Project at Huntington Beach is proposed for the site of the existing Huntington Beach Generating Station. An EIR was first completed in 2003. However, significant new information was added following the 2003 EIR. Therefore, the EIR was recirculated in 2005, and subsequently certified in 2005. The 2005 EIR was challenged in the Orange County Superior Court. The Court's final judgment was in favor of the City of Huntington Beach. Subsequently, City of Huntington Beach determined that the project had changed substantially and new information was available. Therefore, a subsequent EIR was prepared in 2010. |
| City of Carlsbad | Carlsbad Seawater Desalination Plant | Program under development. | The Carlsbad Seawater Desalination Plant is proposed for the site of the existing Encina Power Station. An EIR was completed in 2005. The Final Addendum to the EIR was completed in 2009. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|------------------------------------|--|----------------------------|---|
| San Diego County Water Authority | Emergency Storage Project | Program under development. | The San Diego County Water Authority Emergency Storage Project increases storage of water imported from the Delta or Colorado River to be used if the imported water supplies are disrupted by a drought or catastrophe. The Emergency Storage Project includes construction of the new Olivenhain Reservoir, expansion of San Vicente Reservoir and Reservoir, pipelines to connect Olivenhain and San Vicente reservoirs to the Second Aqueduct. |
| Helix Water District | El Monte Valley Mining, Reclamation, and Groundwater Recharge Project | Program under development. | The first phase of this project will be for a surface mining project to remove 12 million tons of material over a 10-year period on a 580-acre parcel. The second phase will be for Helix Water District to use the quarry for groundwater recharge of highly purified recycled water. The third phase will be to reclaim the surface area of the mine. Helix Water District is initiating the planning and environmental documentation process in 2011. Padre Dam Municipal Water District may also participate in this project. |
| DELTA ECOSYSTEM RESTORATION | | | |
| U.S. Fish and Wildlife Service | Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes | Ongoing program. | The recovery plan addresses the recovery needs for several fishes that occupy the Sacramento-San Joaquin Delta, including delta smelt, Sacramento splittail, longfin smelt, green sturgeon, Chinook salmon (spring-run, late fall-run, and San Joaquin fall-run), and Sacramento perch (believed to be extirpated). The objective of the plan is to establish self-sustaining populations of these species that will persist indefinitely. This would be accomplished by managing the estuary to provide better habitat for aquatic life in general and for the fish addressed by the plan. Recovery actions include tasks such as increasing freshwater flows; reducing entrainment losses to water diversions; reducing the effects of dredging, contaminants, and harvest; developing additional shallow-water habitat, riparian vegetation zones, and tidal marsh; reducing effects of toxic substances from urban non-point sources; reducing the effects of introduced species; and conducting research and monitoring. |
| National Marine Fisheries Service | Public Draft Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon and Central Valley Steelhead | Ongoing program. | The Draft Recovery Plan provides a roadmap that describes the steps, strategy, and actions that should be taken to return winter-run Chinook salmon, spring-run Chinook salmon, and steelhead to viable status in the Central Valley, California thereby ensuring their long-term persistence and evolutionary potential. The general near-term strategic approach to recovery includes methods to: secure all extant populations, monitor for <i>O. mykiss</i> in habitats accessible to anadromous fish, and minimize straying from hatcheries to natural spawning areas. Conduct critical research on fish passage and reintroductions with climate change, and develop recovery plan for sustainable populations that have minimal susceptibility to catastrophic events. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|--|-------------------------|---|
| <p>U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Bureau of Reclamation, and California Department of Water Resources</p> | <p>Biological Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (delta smelt)</p> <p>Biological Opinion on the Long-Term Operations of the Central Valley Project and State Water Project (Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, Southern Distinct Population Segment of North American green sturgeon, and Southern Resident killer whales)</p> | <p>Ongoing program.</p> | <p>On December 15, 2008, the U.S. Fish and Wildlife Service (USFWS) issued a final Biological Opinion to Reclamation on the effects of the continued operation of the federal CVP and SWP on the delta smelt and its designated critical habitat. USFWS determined that the continued operation of these two water projects is likely to jeopardize the continued existence of the delta smelt and adversely modify its critical habitat. USFWS identified the Reasonable and Prudent Alternative (RPA) intended to protect each life-stage and critical habitat of this federally protected species.</p> <p>On June 4, 2009, National Marine Fisheries Service (NMFS) issued a final Biological Opinion finding that continued operations of the CCVP/SWP would likely jeopardize several listed species, including Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, Southern Distinct Population Segment of North American green sturgeon, and Southern Resident killer whales. The Biological Opinion is effective through December 31, 2030. In its final Biological Opinion, NMFS identified an RPA to avoid the likelihood of jeopardizing the continued existence of these listed species.</p> <p>The actions identified in the RPAs would be undertaken by Reclamation and/or DWR as operators of the Central Valley Project and State Water Project. The actions included several provisions in the Delta watershed and in the Delta that would change the operations of the CVP and SWP water supply facilities, change hatchery operations, and provide for ecosystem restoration in the Delta.</p> <p>Several lawsuits have been filed against these opinions. On December 14, 2010, Judge Oliver Wanger of the United States District Court for the Eastern District of California remanded portions of the 2008 USFWS Biological Opinion. On March 29, 2011, Judge Wanger ruled that Reclamation violated the National Environmental Policy Act (NEPA) by failing to conduct a NEPA review prior to provisionally accepting the 2008 USFWS RPA. Judge Wanger ordered Reclamation to complete review of the new RPA in accordance with NEPA. Similarly, in the Consolidated Salmonid Cases, Judge Wanger found that Reclamation violated NEPA by failing to undertake a NEPA analysis before accepting and implementing the RPA included in the 2009 NMFS Biological Opinion.</p> |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|---|----------------------------|---|
| University of California, Davis, California Department of Water Resources, California Department of Fish and Game, U.S. Fish and Wildlife Service, and U.S. Bureau of Reclamation | Delta Smelt Refuge Population and Delta Smelt Interim Refuge Smelt Hatchery Pilot Program | Ongoing program. | DWR, USFWS, and the University of California at Davis is working through USFWS Delta Smelt Captive Propagation Work Group to establish a permanent smelt refugia to ensure the conservation of the genetic diversity of delta smelt. The refugia would provide the brood stock for a conservation hatchery if and when the State and federal fishery agencies decide it is needed to supplement the remaining wild population of delta smelt or to restock the Delta if the wild population is extirpated. The initial site is located at the Banks Pumping Plant site near Byron. The facility rears and provides over 20,000 juvenile and adult fish annually to researchers carrying out elements of the pelagic organism decline investigation and evaluating ways to improve the performance of existing and new fish screening facilities. These research fish are the progeny of wild fish collected in the Delta in 2006, and, with the curtailment of the collection of wild fish due to the declining population, they are now the only source of live research fish. |
| U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, California Department of Water Resources, and California Department of Fish and Game | Upgrade of Facilities to Restore Delta Smelt and Other Native Aquatic Species | Program under development. | <p>The <i>Interim Federal Action Plan for the California Bay-Delta</i> included an action item for a federal-State and local partnership, led by USFWS to promote the development of a permanent fish restoration facility (the Bay Delta Center for Collaborative Science and Restoration Propagation of Native Imperiled Aquatic Species) to be located at Rio Vista. This facility would be capable of maintaining genetic refugia of delta smelt and other imperiled native aquatic species and producing the numbers of fish necessary for restoration and recovery. Federal agencies expect to partner with the State and local agencies in conducting initial engineering design, site demolition and preparation activities, planning and environmental compliance consultation, and other activities.</p> <p>In addition to the fish restoration facility, the plan calls for developing a backup delta smelt refugium to guard against a catastrophic event and loss of genetic diversity and to provide an interim restoration propagation facility until the Rio Vista facility is operational. Federal agencies will work with the University of California, Davis and the State to upgrade and ensure safety compliance for the existing facility Delta Smelt Research and Culture Facility at Banks Pumping Plant.</p> |
| U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, and California Department of Fish and Game | San Joaquin Basin Action Plan | Ongoing program. | The San Joaquin Basin Action Plan is a cooperative agreement between Reclamation, USFWS, and the California Department of Fish and Game (DFG) to jointly develop a habitat acquisition and wetland enhancement project on approximately 23,500 acres of lands within the Northern San Joaquin River Basin. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|---------------------------------------|------------------|---|
| U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Water Resources and California Department of Fish and Game | San Joaquin River Restoration Program | Ongoing program. | <p>The San Joaquin River Restoration Program is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river while reducing or avoiding adverse water supply impacts from restoration flows. The program's two primary goals are to:</p> <ul style="list-style-type: none"> • Restore and maintain fish populations in "good condition" in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish, and • Reduce or avoid adverse water supply impacts to all of the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided for in the settlement. <p>The program requires specific releases of water from Friant Dam to the confluence of the Merced River, which are designed primarily to meet the various life stage needs for spring- and fall-run Chinook salmon. The release schedule assumes continuation of the current average Friant Dam release of 116,741 acre-feet, with additional flow requirements depending on the year type. Interim flows began in October 2009, and full restoration flows would begin no later than January 2014. Salmon will be reintroduced in the upper reaches no later than December 31, 2012. There are many physical improvements within and near the San Joaquin River that will be undertaken to fully achieve the river restoration goal. The improvements will occur in two separate phases that will focus on a combination of water releases from Friant Dam, as well as structural and channel improvements.</p> |
| U.S. Bureau of Reclamation and US Fish and Wildlife Service | Anadromous Fish Screen Program | Ongoing program. | <p>The primary objective of the Anadromous Fish Screen Program is to protect juvenile Chinook salmon, steelhead, green and white sturgeon, striped bass and American shad from entrainment at priority diversions throughout the Central Valley. Section 3406 (b)(21) of the Central Valley Project Improvement Act (CVPIA) requires the Secretary of the Interior to assist the State of California in developing and implementing measures to avoid losses of juvenile anadromous fish resulting from unscreened or inadequately screened diversions on the Sacramento and San Joaquin rivers, their tributaries, the Delta, and the Suisun Marsh.</p> |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|---|----------------------------------|------------------|---|
| California Department of Fish and Game and U.S. Fish and Wildlife Service | Hatchery and Stocking Program | Ongoing program. | DFG operates a statewide system of fish hatchery facilities that rear and subsequently release millions of trout, salmon, and steelhead into State waters. The Hatchery Program includes: 14 trout hatchery facilities owned by DFG, 8 salmon and steelhead hatchery facilities owned by others, and 2 salmon and steelhead hatchery facilities owned by DFG. The fundamental objectives of DFG's Hatchery Program are to continue the rearing and stocking of fish from its existing hatchery facilities for the recreational use of anglers, for mitigation of habitat loss due to dam construction and blocked access to upstream spawning areas, for mitigation of fish losses caused by operation of the State-operated Delta pumps, and for conservation and species restoration. In 2006, a lawsuit was filed against DFG claiming that DFG's fish stocking operation did not comply with CEQA. In 2007, DFG was ordered by the Sacramento Superior Court to comply with CEQA regarding its fish stocking operations. DFG and USFWS completed a Final EIR/EIS in 2010. |
| Department of Boating and Waterways | Aquatic Pest Control Program | Ongoing program. | The Department of Boating and Waterways (DBW) is the lead State agency in controlling <i>Egeria densa</i> and water hyacinth in the Delta, its tributaries, and Suisun Marsh. DBW adopted an EIR in 2001 and a second addendum in 2006 for programs to control <i>Egeria densa</i> . In 2007, NMFS issued a Biological Opinion on the <i>Egeria densa</i> Control Program and potential impacts on listed salmonids and green sturgeon species. The program includes treatment with herbicides, environmental monitoring, regulatory compliance, and surveillance. DBW published a Draft Programmatic EIR in September 2009 for continuation of the Water Hyacinth Control Program. The document has not been finalized. |
| State Lands Commission | Marine Invasive Species Program | Ongoing program. | The California Marine Invasive Species Program established in accordance with the 1999 Ballast Water Management for Control of Nonindigenous Species Act to prevent or minimize the introduction of nonindigenous species to California waters from commercial vessels. In 2003, the Marine Invasive Species Act (MISA) was passed, reauthorizing and expanding the 1999 Act. Subsequent amendments to the Act and additional legislation have further expanded the scope of the program. The State Lands Commission oversees the program with a comprehensive approach that includes: ballast water and vessel fouling management tracking, compliance, and enforcement; applied research; and outreach. In response to the Coastal Ecosystems Protection Act of 2006, the State Lands Commission adopted performance standards for the discharge of ballast water in October 2007. |
| U.S. Coast Guard | Ballast Water Management Program | Ongoing program. | The Coast Guard conducts a ballast water management program for all vessels equipped with ballast water tanks that enter or operate within U.S. waters. This program requires vessels to maintain a ballast water management plan that is specific for that vessel and allows any master or appropriate official to understand and execute the ballast water management strategy for that vessel. The Coast Guard may impose a civil penalty if ships headed to the U.S. fail to submit a ballast water management reporting form. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|---|--|----------------------------|---|
| California Department of Fish and Game | Delta-Bay Enhanced Enforcement Program | Ongoing program. | The Delta-Bay Enhanced Enforcement was initiated in 1991 through the Four Pumps Agreement between DFG and DWR (funded by the State Water Project Contractors). In 1994, Reclamation began funding additional warden positions. The program provides increased enforcement to reduce illegal harvest of species in the San Francisco Bay and Delta, upstream into the Sacramento and San Joaquin basins. In the Sacramento Basin, the program targets enforcement during the spring-run Chinook salmon migration and summer holding period. |
| California Department of Fish and Game | Private Lands Incentive Programs | Ongoing program. | DFG manages the California Waterfowl Habitat Program (Presley Program), a multi-faceted wetland incentive program designed to improve habitat for waterfowl on private lands. Consistent with its primary waterfowl habitat objectives, the program also endeavors to enhance habitat for shorebirds, wading birds, and other wetland-dependent species. The program pays private landowners \$20/acre (\$30/acre in the Tulare Basin) annually for a 10-year duration to implement habitat practices in accordance with a detailed management plan. In cooperation with Wildlife Conservation Board's Inland Wetland Conservation Program, DFG also administers the Permanent Wetland Easement Program that pays willing landowners approximately 50-70% of their property's fair market value to purchase the farming and development rights in perpetuity. Landowner retains many rights including: trespass rights, the right to hunt and/or operate a hunting club, and the ability to pursue other types of undeveloped recreation (fishing, hiking, etc.). Easement landowners are required to follow a cooperatively developed wetland management plan. DFG also administers the Landowner Incentive Program funded by USFWS to annual incentive payments to landowners to enhance and manage their lands to protect wetlands, native grasslands, and riparian habitat. |
| Reclamation District 2093 | Liberty Island Conservation Bank | Ongoing Program. | Liberty Island private levees failed in the 1997 flood and were not recovered, leaving all but the upper 1,000 acres and the adjacent levees permanently flooded. This project would restore the upper 1,000 acres in a conservation bank to preserve, create, restore, and enhance habitat for native Delta fish species, including Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, California Central Valley steelhead, delta smelt, and Central Valley fall- and late fall-run Chinook salmon. The project consists of creating tidal channels, perennial marsh, riparian habitat, and occasionally flooded uplands on the site. The project also includes the breaching of the northernmost east-west levee, and preservation and restoration of shaded riverine aquatic habitat along the levee shorelines of the tidal sloughs. This project received permits and approvals in 2009. |
| California Department of Water Resources, Suisun Marsh Preservation Agreement agencies, and State Coastal Conservancy | Meins Landing Restoration | Program under development. | The 666-acre property is currently a mosaic of managed wetlands and upland habitats. The area long used as a managed wetlands for a duck club will be restored to tidal marsh and to provide meet wetlands restoration goals of other projects, including levee improvements on Van Sickle Island. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
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| California Department of Fish and Game | Fish Screen Project at Sherman and Twitchell Islands | Program under development. | The project would install fish screens on up to 10 currently unscreened agricultural intakes used to irrigate State-owned lands on Sherman and Twitchell Islands in the Delta. The project is intended to contribute to the protection of delta smelt and other sensitive aquatic species and the restoration of habitat in the Delta. |
| California Department of Fish and Game | Lower Sherman Island Wildlife Area Land Management Plan | Ongoing program. | The Lower Sherman Island Wildlife Area (LSIWA) occupies roughly 3,100 acres, primarily marsh and open water, at the confluence of the Sacramento and San Joaquin Rivers in the western Delta. The purpose of the Land Management Plan (LMP) is to: (1) guide management of habitats, species, and programs described in the LMP to achieve the DFG's mission to protect and enhance wildlife values; (2) serve as a guide for appropriate public uses of the LSIWA; (3) serve as descriptive inventory of fish, wildlife, and native plant habitats that occur on or use the LSIWA; (4) provide an overview of the property's operation and maintenance and of the personnel requirements associated with implementing management goals (this LMP also serves as a budget planning aid for annual regional budget preparation); and (5) present the environmental documentation necessary for compliance with State and federal statutes and regulations, provide a description of potential and actual environmental impacts that may occur during plan management, and identify mitigation measures to avoid or lessen these impacts. |
| California Department of Water Resources | Bay Delta Conservation Plan (BDCP) | Program under development. | BDCP is described in Section 23. |
| California Department of Water Resources | Mayberry Farms Duck Club Subsidence Reversal Project on Sherman Island | Ongoing program. | The Mayberry Farms Subsidence Reversal Project designed to restore approximately 274 acres of palustrine emergent wetlands on a 308-acre parcel on Sherman Island that is owned by DWR. Project construction included new berms, ditches, water conveyance channels, intake siphons, and islands. Over 191,717 cubic yards of peat were excavated and used to form berms, levees, and islands. |
| California Department of Water Resources | Dutch Slough Tidal Marsh Restoration Project | Construction initiated on first phase. | The Dutch Slough Tidal Marsh Restoration Project, near Oakley to restore wetland and uplands, and provide public access to the 1,166-acre property. The property is composed of three parcels separated by narrow constructed sloughs. The project to provide ecosystem benefits, including habitat for sensitive aquatic species. The project will be integrated with the City of Oakley's proposed 55-acre Community Park and 4 miles of levee trails. Ironhouse Sanitary District is proposing the West Marsh Creek Delta Restoration Project on a portion of the Marsh Creek delta that will provide fill material for the Dutch Slough project. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|--|----------------------------|---|
| California Department of Water Resources | Franks Tract Project | Program under development. | DWR and Reclamation are evaluating the feasibility of modifying the hydrodynamic conditions near Franks Tract to improve Delta water quality and enhance the aquatic ecosystem. Initial results indicated that modifying hydrodynamic conditions near Franks Tract may substantially reduce salinity and protect fishery resources in the central and southern Delta. Currently, the evaluation is considering installation of operable gates to control the flow of water at key locations (Threemile Slough and/or West False River) to reduce sea water intrusion, and to positively influence movement of fish species of concern to areas that provide favorable habitat conditions. The project gates would be operated seasonally and during certain hours of the day, depending on fisheries and tidal conditions. Boat passage facilities would be included to allow for passing of watercraft when the gates are in operation. Franks Tract was previously evaluated as part of DWR's Flooded Island Pre-Feasibility Study Report (2006). |
| US Fish and Wildlife Service | Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan | Ongoing program. | USFWS published a final Comprehensive Conservation Plan for Stone Lakes National Wildlife Refuge in 2007 to describe the selected alternative for managing Stone Lakes National Wildlife Refuge for the next 15 years. Under the plan, the Refuge will continue its focus of providing wintering habitat for migratory birds and management to benefit endangered species. Management programs for migratory birds and other Central Valley wildlife will be expanded and improved and public use opportunities will also be expanded. |
| East Bay Municipal Utility District | Lower Mokelumne River Spawning Habitat Improvement Project | Ongoing program. | The Mokelumne River is tributary to the Sacramento-San Joaquin River Delta and supports five species of anadromous fish. The project is a collaborative effort between East Bay Municipal Utility District, USFWS, DFG, and the University of California at Davis to initially place 4,000 to 5,000 cubic yards of suitably sized salmonid spawning gravel annually for a 3-year period at two specific sites, and then provide annual supplementation of 600 to 1,000 cubic yards thereafter. Fall-run Chinook salmon and steelhead are the primary management focus. |
| California Department of Fish and Game | Staten Island Wildlife-Friendly Farming Demonstration | Ongoing program. | Part of the implementation of Cosumnes River Preserve LMP recommendations. |
| California Department of Water Resources | South Delta Temporary Barriers Program (does not include permanent barriers) | Ongoing program. | The South Delta Temporary Barriers Project, initiated as a test project in 1991. The South Delta Temporary Barriers Project consists of 3 rock barriers and 1 non-physical barrier across South Delta channels to increase water levels, improve water circulation patterns and water quality in the southern Delta for local agricultural diversions, and improve operational flexibility of the SWP to help reduce fishery impacts and improve fishery conditions. The barriers have been installed at the Head of Old River, Middle River, Old River near Tracy, and Grantline Canal. Installation of the barriers is dependent upon flow conditions, presence of specific fish species in the South Delta near water intakes, requirements of water users, and regulatory requirements of the DFG, USFWS, NMFS, and U.S. Army Corps of Engineers (USACE). |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|--|---|------------------|--|
| Contra Costa County and East Contra Costa County Habitat Conservancy | East Contra Costa County HCP/NCCP | Ongoing program. | <p>The East Contra Costa County Habitat Conservation Plan / Natural Community Conservation Plan (Plan) was adopted in 2006 and provides regional conservation and development guidelines to protect natural resources while improving and streamlining the permit process for endangered species and wetland regulations. The Plan was developed by a team of scientists and planners with input from independent panels of science reviewers and stakeholders. Within the 174,018- acre inventory area, the Plan provides permits for between 8,670 and 11,853 acres of development and will permit impacts on an additional 1,126 acres from rural infrastructure projects. The Plan will result in the acquisition of a preserve system that will encompass 23,800 to 30,300 acres of land that will be managed for the benefit of 28 species as well as the natural communities that they depend upon.</p> <p>The East Contra Costa County Habitat Conservancy is a joint exercise of powers authority formed by Contra Costa County and the cities of Brentwood, Clayton, Oakley and Pittsburg to implement the Plan. It allows Contra Costa County, the Contra Costa County Flood Control and Water Conservation District, the East Bay Regional Park District and the cities of Brentwood, Clayton, Oakley, and Pittsburg (collectively, the Permittees) to control permitting for activities and projects they perform or approve in the region that have the potential to adversely affect State- and federally listed species. The Plan also provides for comprehensive species, wetlands, and ecosystem conservation and contributes to the recovery of endangered species in northern California. The Plan avoids project-by-project permitting that often results in uncoordinated and biologically ineffective mitigation.</p> |
| San Joaquin Council of Governments | San Joaquin County Multi-Species Habitat Conservation and Open Space Plan | Ongoing program. | <p>Completed in 2000, the key purpose of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan is to provide a strategy for balancing the need to conserve open space and the need to convert open space to non-open space uses. These goals are intended to be met while protecting the region's agricultural economy; preserving landowner property rights; providing for the long-term management of plant, fish and wildlife species, especially those that are currently listed, or may be listed in the future, under the federal ESA or the California Endangered Species Act (CESA); providing and maintaining multiple-use open spaces that contribute to the quality of life of the residents of San Joaquin County; and accommodating a growing population while minimizing costs to project proponents and society at large. The Plan identifies zones distinguished by a discrete association of soil types, water regimes (e.g., Delta lands subject to tidal influence, irrigated lands, lands receiving only natural rainfall), elevation, topography and vegetation types. In general, impacts within a particular zone are mitigated within the same zone.</p> |

Table 22-1
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| Agency | Program | Basis | Brief Description |
|--|---|----------------------------|---|
| Sacramento County and U.S. Fish and Wildlife Service | South Sacramento Habitat Conservation Plan | Program under development. | The proposed South Sacramento HCP is a regional plan to address issues related to species conservation, agricultural protection, and urban development in south Sacramento County. The proposed HCP would cover 40 different species of plants and wildlife including 10 that are State or federally listed as threatened or endangered, and allow land owners to engage in the "incidental take" of listed species (i.e., to destroy or degrade habitat) in return for conservation commitments from local jurisdictions. The conservation measures outlined in the HCP would minimize and mitigate the impact of incidental take and provide for the conservation of covered species that may occur in the plan area. The geographic location of the proposed HCP includes a combined 341,000 acres within south Sacramento County (unincorporated area) and the cities of Rancho Cordova, Elk Grove, and Galt. |
| Yolo County Joint Powers Authority | Yolo County Habitat/Natural Community Conservation Plan | Program under development. | The Yolo County Habitat Joint Powers Authority (JPA), consisting of five local public agencies, launched the Yolo Natural Heritage Program in March 2007. This effort includes the continuing preparation of a joint HCP/NCCP. Member agencies include: Yolo County, City of Davis, City of Woodland, City of West Sacramento and City of Winters. The HCP/NCCP will describe the measures that local agencies will implement in order to conserve biological resources, obtain permits for urban growth and public infrastructure projects, and continue to maintain the agricultural heritage and productivity of the county. The nearly 653,820-acre planning area provides habitat for 28 sensitive species occurring within five dominant habitats/natural communities. This list includes seven State-listed species: palmate-bracted bird's beak, Colusa grass, Crampton's tuctoria, giant garter snake, Swainson's hawk, western yellow-billed cuckoo, and bank swallow. Interim conservation activities include acquiring permanent conservation easements for sensitive species habitat in the plan area. |
| Solano County Water Agency | Solano Multispecies Habitat Conservation Plan | Program under development. | The Solano HCP is intended to support the issuance of an incidental take permit under the federal ESA for a period of 30 years for the Solano Project Contract Renewal Biological Opinion between the USFWS and Reclamation. Thirty-seven (37) species are proposed to be covered under the Solano HCP. The minimum geographical area to be covered is the Solano County Water Agency's contract service area including the cities of Fairfield, Vacaville, Vallejo, Suisun City, the Solano Irrigation District and the Maine Prairie Water District. The area covered by the HCP is all of Solano County and a small portion of Yolo County. The HCP includes a Coastal Marsh Natural Community Conservation Strategy designed to maintain the water and sediment quality standards, hydrology and ecological functions of this natural community; contribute to the restoration of tidally influenced coastal marsh habitat; contribute to the conservation and recovery of associated covered species; and promote habitat connectivity. Primary conservation actions include preservation (primarily through avoidance), restoration, invasive species control, and improvement of water quality. The plan area Covers 580,000 acres, which includes 12,000 acres of proposed development and 30,000 acres that will be preserved. Final Administrative Draft in 2009. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|---|---|----------------------------|--|
| WATER QUALITY IMPROVEMENT | | | |
| State Water Resources Control Board and Department of Public Health | Financial Assistance Programs for Wastewater and Water Facilities for Small Communities | Ongoing Program. | SWRCB Resolution No. 200800048 includes the Small Community Wastewater Strategy to assist small and/or disadvantaged communities with wastewater needs for training and funding. The Small Community Wastewater Grant Program and Clean Water State Revolving Fund Program provide grants, low-interest loans and bonds for construction of wastewater facilities. The Department of Public Health Drinking Water State Revolving Fund provides grants and low-interest loans for disadvantaged and small communities. |
| State Water Resources Control Board | California Water Boards' Strategic Plan Update – 2008-2012 | Program under development. | <p>The Strategic Plan Update broadly identifies the SWRCB's vision and direction for the future. It identifies goals intended to achieve that vision, which include: implementing strategies to fully support the beneficial uses for all 2006-listed water bodies; improving and protecting groundwater quality in high-use basins; increasing sustainable local water supplies available for meeting existing and future beneficial uses and ensuring adequate flows for fish and wildlife habitat; comprehensively addressing water quality protection and restoration in consideration of the connections between water quality, water quantity, and climate change, throughout California's water planning processes; improving Water Board transparency and accountability; enhancing consistency across the Water Boards; and ensuring that the Water Boards have access to information and expertise. The plan also identifies environmental priorities that focus on strategies for achieving environmental outcomes associated with protecting the State's surface waters and groundwaters, and promoting sustainable water supplies.</p> <p>To better address the implementation of coordinated activities in the Bay-Delta, the State Water Board adopted Resolution 2007-0079 in 2007; similar resolutions were adopted by the San Francisco Bay and Central Valley regional water boards. In those resolutions, the Water Boards committed to ensure the protection of beneficial uses of water, and to the equitable administration of water rights in the Bay-Delta and its tributaries. A strategic work plan, completed in July 2008, describes the actions the Water Boards will undertake to protect beneficial uses of water in the Bay-Delta and the timelines and resource needs for implementing those actions. Workplan activities are divided into the nine broad elements covering a range of actions that: 1) implement the Water Boards' core water quality responsibilities; 2) continue meeting prior Water Board commitments; 3) are responsive to priorities identified by the Governor and the Delta Vision Blue Ribbon Task Force; and 4) build on existing processes, such as the BDCP. The Water Boards do not have the capacity or responsibility to conduct all the planning and implementation activities needed to protect and restore fisheries, aquatic habitats, and other beneficial uses in the Bay-Delta. Accordingly, the work plan identifies activities that will need to be coordinated with other efforts.</p> |

Table 22-1
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| Agency | Program | Basis | Brief Description |
|---|---|----------------------------|--|
| Central Valley Regional Water Quality Control Board | Irrigated Lands Regulatory Program | Program under development. | <p>The Irrigated Lands Regulatory Program regulates discharges from irrigated agricultural lands. Its purpose is to prevent agricultural discharges from impairing the waters that receive the discharges. The California Water Code authorizes the SWRCB and Regional Water Quality Control Boards (RWQCBs) to conditionally waive waste discharge requirements if this is in the public interest. On this basis, the Los Angeles, Central Coast, Central Valley, and San Diego regional water quality control boards have issued conditional waivers of waste discharge requirements to growers that contain conditions requiring water quality monitoring of receiving waters. In 2010, the Central Valley RWQCB proposed to expand the requirements to groundwater especially for regulation of discharges with higher concentrations of nutrients. Participation in the waiver program is voluntary; however, non-participant dischargers must file a permit application as an individual discharger, stop discharging, or apply for coverage by joining an established coalition group. The waivers must include corrective actions when impairments are found.</p> |
| U.S. Bureau of Reclamation and San Luis & Delta Mendota Water Authority | Grassland Bypass Project, 2010 - 2019 Agricultural Drainage Selenium Management Program | Program under development. | <p>The purposes and objectives of the proposed continuation of the Grassland Bypass Project, 2010–2019 are: 1) to extend the San Luis Drain Use Agreement in order to allow the Grassland Basin Drainers time to acquire funds and develop feasible drainwater treatment technology to meet revised Basin Plan objectives (amendment underway) and Waste Discharge Requirements by December 31, 2019; 2) to continue the separation of unusable agricultural drainage water discharged from the Grassland Drainage Area from wetland water supply conveyance channels for the period 2010–2019; and 3) to facilitate drainage management that maintains the viability of agriculture in the Project Area and promotes continuous improvement in water quality in the San Joaquin River. All discharges of drainage water from the Grassland Drainage Area into wetlands and refuges have been eliminated. The selenium load discharged from the Grassland Drainage Area has been reduced by 61percent (from 9,600 lbs to 3,700 lbs) and the salt load has been reduced by 39 percent (from 187,300 tons to 113,600 tons). Prior to the project, the monthly mean concentration of selenium in Salt Slough was 16 parts per billion. Since October 1996, the concentration has been less than the water quality objective of 2 parts per billion. The drainage water is conveyed to Mud Slough. Grasslands Water District and others are currently evaluating alternative plans to comply with Central Valley RWQCB water quality objectives for selenium and salinity in the San Joaquin River at the end of this project in 2019. One of the alternatives could be zero discharge with complete recycle of the drainwater to salinity-tolerant crops.</p> |

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| Agency | Program | Basis | Brief Description |
|---|---|----------------------------|--|
| California Department of Water Resources | Stockton Deep Water Ship Channel Demonstration Dissolved Oxygen Project | Program under development. | The Stockton Deep Water Ship Channel Demonstration Dissolved Oxygen Project is a multiple-year study of the effectiveness of elevating dissolved oxygen (DO) especially during the summer when the San Joaquin River waters are warmer and flows are low. The low DO levels can adversely affect aquatic life including the health and migration behavior of anadromous fish (e.g., salmon). The objective of the study is to maintain DO levels above the minimum recommended levels specified in the State of California Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River basins. The project's full-scale aeration system includes two 200-foot-deep U-tube aeration tubes with pumps and a liquid-to-gas oxygen supply system to deliver approximately 10,000 pounds of oxygen per day into the Deep Water Ship Channel. The aeration system is anticipated to be operated only when channel DO levels are below the Basin Plan DO water quality objectives (approximately 100 days per year). The project study includes an on-going assessment of DO levels in the channel and vicinity and a study of potential adverse effects of low DO on salmon. Operations are limited by availability of funds. |
| State Water Resources Control Board, Central Valley Regional Water Quality Control Board, and Department of Public Health | Groundwater Ambient Monitoring and Assessment Program | Program under development. | The SWRCB and/or Central Valley RWQCB have an ongoing program to establish water quality objectives to protect beneficial uses of surface water and groundwater. Existing programs have focused on hazardous substances from landfills, waste disposal sites, fuel storage, and industrial facilities. The Groundwater Ambient Monitoring and Assessment program has been implemented to identify emerging pollutants and other constituents that affect drinking water quality. Currently, there is only one subbasin in the Central Valley that is under study as priority basin (western San Joaquin Valley near Tracy). This program is being coordinated with the Department of Public Health California Drinking Water Source Assessment and Protection program that provides information to water users. Information from these programs is used by these agencies to establish cleanup programs to protect groundwater quality. |
| FLOOD RISK REDUCTION | | | |
| U.S. Army Corps of Engineers | San Francisco Bay Long-Term Management Strategy for Dredging | Ongoing program. | The San Francisco Bay Long-Term Management Strategy for Dredging is a cooperative planning effort to coordinate, plan, and implement beneficial reuse of sediments in the Bay developed by USACE, U.S. Environmental Protection Agency, San Francisco Bay Conservation and Development Commission, and the San Francisco Bay RWQCB. The final plan will coordinate dredging needs and sediment management in and around San Francisco Bay to assist in maintaining and improving channel function (navigation, water conveyance, flood control, and recreation), levee rehabilitation, and ecosystem restoration. The Strategy includes a sediment management plan and a regulatory process for dredging and dredged material management so that project evaluations are coordinated, efficient, timely, and protective of resources to facilitate future dredging programs in the Delta. The Strategy includes approved locations for dredge spoils disposals. Environmental documentation and permits were completed as part of the Strategy development. |

Table 22-1
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| Agency | Program | Basis | Brief Description |
|------------------------------|---|----------------------------|---|
| U.S. Army Corps of Engineers | Suisun Bay Channel Operations and Maintenance | Ongoing Program. | The project is located 30 miles northeast of San Francisco and is part of the San Francisco Bay to Stockton Ship Channel. The project provides for annual maintenance dredging of the main channel, 300 feet wide and 35 feet deep at Mean Lower Low Water, from the Carquinez Strait at Martinez to Pittsburg (called Suisun Bay Channel), and maintenance dredging of New York Slough Channel farther upstream to Antioch (a distance of 17 miles). The project also provides annual maintenance dredging for a channel 250 feet wide and 20 feet deep south of Seal Islands, from the main channel at Point Edith to the main channel again at Port Chicago at mile 6. |
| U.S. Army Corps of Engineers | Suisun Channel (Slough) Operation and Maintenance | Ongoing program. | The Suisun Channel connects the City of Suisun near Fairfield to Grizzly Bay and thus to Suisun Bay 30 miles northeast of San Francisco. Project operations and maintenance provides for maintenance dredging of an entrance channel in Suisun Bay 200 feet wide and 8 feet deep, and thence a channel 100 to 125 feet wide and 8 feet deep for 13 miles to the head of navigation at City of Suisun, with a turning basin. This shallow draft channel is maintained on an infrequent basis. |
| U.S. Army Corps of Engineers | San Francisco Bay to Stockton Deep Water Ship Channel Project | Program under development. | The San Francisco Bay to Stockton Deep Water Ship Channel Project is a congressionally authorized project being implemented by USACE, the Port of Stockton, and Contra Costa County Water Agency. A joint EIS/EIR will evaluate the action of navigational improvements to the Stockton Deep Water Ship Channel. A General Reevaluation Report is being prepared to determine the feasibility of modifying the current dimensions of the West Richmond, Pinole Shoal, Suisun Bay, and Stockton Ship Channels, which are currently maintained to 35 feet and provide access to oil terminals, industry in Pittsburg, and the Port of Stockton. The proposed action consists of altering the depth of the deep draft navigation route. |
| U.S. Army Corps of Engineers | Sacramento Deep Water Ship Channel Project | Program under development. | The Sacramento River Deep Water Ship Channel Project is a Congressionally authorized project being implemented by USACE and the Port of Sacramento. The proposed project would complete the deepening and widening of the navigation channel to its authorized depth of 35 feet. Deepening of the existing ship channel is anticipated to allow for movement of cargo via larger, deeper draft vessels. Widening portions of the channel would increase navigational safety by increasing maneuverability. The 46.5-mile-long ship channel lies within Contra Costa, Solano, Sacramento, and Yolo counties and serves the marine terminal facilities at the Port of Sacramento. The Sacramento Deep Water Ship Channel joins the existing 35-foot-deep channel at New York Slough, thereby affording the Port of Sacramento access to San Francisco Bay Area harbors and the Pacific Ocean. |

Table 22-1
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| Agency | Program | Basis | Brief Description |
|--|--------------------------------------|----------------------------|---|
| California Department of Water Resources | Central Valley Flood Protection Plan | Program under development. | <p>Legislation passed in 2007 directed DWR to develop three documents that will guide improvement of integrated flood management:</p> <ul style="list-style-type: none"> • State Plan of Flood Control (SPFC) Descriptive Document to inventory and describe the flood management facilities, land, programs, conditions, and mode of operations and maintenance for the State-federal flood protection system in the Central Valley. This was completed in 2010. • Flood Control System Status Report to assess the status of the facilities included in the SPFC Descriptive Document, identify deficiencies, and make recommendations. A Progress Report was completed in 2011. • Central Valley Flood Protection Plan to describe a sustainable, integrated flood management plan that reflects a system-wide approach for protecting areas of the Central Valley currently receiving protection from flooding by existing facilities of the SPFC. The plan will incorporate the SPFC and Flood Control System Status Update. The plan is scheduled for adoption by the Central Valley Flood Control Board in 2012. |
| California Department of Water Resources | FloodSAFE California | Program under development. | <p>In 2006, DWR initiated FloodSAFE California, a multi-faceted program to improve public safety through integrated flood management. Under the FloodSAFE Program, DWR works with local, regional, State, tribal and federal officials to improve flood management and emergency response systems throughout California, primarily by investing funds provided by Propositions 1E and 84. The FloodSAFE vision is a sustainable integrated flood management and emergency response system throughout California that improves public safety, protects and enhances environmental and cultural resources, and supports economic growth by reducing the probability of destructive floods, promoting beneficial floodplain processes, and lowering the damages caused by flooding statewide with a significant emphasis on the Central Valley and Delta. Integrated Flood Management includes recognition of: the interconnection of flood management actions within broader water resources management and land use planning, the need to evaluate opportunities and potential impacts from a system perspective, and the importance of environmental stewardship and sustainability. This program is ongoing.</p> |

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| Agency | Program | Basis | Brief Description |
|---|--|----------------------------|--|
| California Department of Water Resources | Delta Levees Flood Protection Program | Program under development. | <p>DWR administers the Delta Levees Flood Protection Program (Water Code sections 12300 - 12318 and 12980 - 12995). This is a grants program that works with more than 60 reclamation districts in the Delta and Suisun Marsh to maintain and improve the flood control system and provide protection to public and private investments in the Delta including water supply, habitat, and wildlife. The program, through its two major components (Delta Levees Maintenance Subventions Program and Delta Levees Special Flood Control Projects), works with the local agencies to maintain, plan, and complete levee rehabilitation projects.</p> <p>The Delta Levees Maintenance Subventions Program provides financial assistance to local levee maintaining agencies for the maintenance and rehabilitation of non-project levees in the Delta under the authority of the Central Valley Flood Protection Board and managed by DWR.</p> <p>The Delta Levees Special Flood Control Projects provides financial assistance to local levee maintaining agencies for rehabilitation of levees in the Delta. The program presently focuses on flood control projects and related habitat projects for eight western Delta Islands (Bethel, Bradford, Holland, Hotchkiss, Jersey, Sherman, Twitchell and Webb Islands) and for the towns of Thornton and Walnut Grove.</p> |
| California Department of Water Resources | Levee Repair-Levee Evaluation Program | Program under development. | <p>On February 24, 2006, Governor Arnold Schwarzenegger declared a State of Emergency for California's levee system, commissioning up to \$500 million of State funds to repair and evaluate State/federal project levees. Following the emergency declaration, the Governor directed DWR to secure the necessary means to fast-track repairs of critical erosion sites. Hundreds of levee sites have been identified for immediate repair throughout the Central Valley. These repairs are necessary to maintain the functionality of flood control systems that have deteriorated over time and/or do not meet current design standards. In general, repairs to State/federal project levees are being conducted under three main programs: the Critical Erosion Repairs Program, the Sacramento River Bank Protection Project, and the PL84-99 Rehabilitation Program. A fourth program to repair critically damaged levees on the San Joaquin Flood Control System is under development by DWR.</p> |
| U.S. Army Corps of Engineers and California Department of Water Resources | Delta Islands and Levees Feasibility Study | Program under development. | <p>The feasibility study will address flood risk management, ecosystem restoration, water quality, water supply, and a variety of other issues. DWR Delta Risk Management Strategy studies will be used to define problems, opportunities, and specific planning objectives. The feasibility study provides the mechanism by which the USACE can participate in a coordinated feasibility study.</p> |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|---|--|----------------------------|---|
| U.S. Army Corps of Engineers | CALFED Levee Stability Program | Program under development. | The California Bay-Delta Program's (CALFED) levee stability program provides for long-term protection of resources in the Delta by maintaining and improving the integrity of the area's extensive levee system. Funds will be used by USACE to continue levee stability projects in the Delta. The federal CALFED Act (PL 108-361) directed USACE to deliver a report that identified and prioritized potential levee stability projects in the Delta that could be carried out with the authorized \$90 million in federal funds. An additional \$106 million was authorized to be appropriated by Section 3015 of WRDA 2007. To identify critically needed projects with active non-federal support, USACE invited Delta stakeholders to submit project proposals with letters stating their willingness to participate as cost-sharing sponsors. In response, Delta area reclamation districts and flood management agencies submitted 54 project proposals totaling more than \$1 billion in estimated costs. USACE evaluated proposals and prioritized potential projects according to how well they met USACE environmental, economic, and other implementation criteria. The USACE short-term strategy is to move quickly to construction on high priority levee reconstruction projects identified in that report. As part of this program, USACE is conducting emergency response planning. USACE has entered into a Memorandum of Agreement with DWR that allows the agencies to initiate geographic information system Flood Contingency Mapping for Delta counties and the Delta region. |
| U.S. Army Corps of Engineers | Lower San Joaquin River Feasibility Study | Program under development. | USACE, Central Valley Flood Protection Board, and San Joaquin Area Flood Control Agency with DWR with 10 reclamation districts, City of Lodi, and San Joaquin County Flood Control and Water Conservation District are completing the Lower San Joaquin River Feasibility Study to develop flood protection systems to provide or exceed a 200-year flood level of flood protection in accordance with State law for areas with populations of more than 10,000. |
| PROTECTION AND ENHANCEMENT OF DELTA AS AN EVOLVING PLACE | | | |
| Delta Protection Commission | Delta Protection Commission Land Use and Resource Management Plan Update | Ongoing Program. | The Delta Protection Commission is responsible for developing and periodically updating the Land Use and Resource Management Plan for the Primary Zone. The most recent update was adopted in 2010. The Management Plan outlines the long-term land use requirements for the Sacramento-San Joaquin Delta and sets out findings, policies, and recommendations in the areas of environment, utilities and infrastructure, land use, agriculture, water, recreation and access, levees, and marine patrol/boater education/safety programs. The Commission develops priorities and timelines for tasks to be implemented each year, and provides annual progress reports to the legislature. |

Table 22-1
Related Actions, Programs, and Projects Considered in the Cumulative Impact Assessment

| Agency | Program | Basis | Brief Description |
|------------------------------------|---|----------------------------|--|
| Department of Parks and Recreation | Central Valley Vision | Program under development. | In 2003, California State Parks began work on a long-term Central Valley Vision to develop a strategic plan for State Parks expansion in the Central Valley. The plan will provide a 20-year road map for State Park actions to focus on increasing service to Valley residents and visitors. Within the Great Central Valley (San Joaquin Valley, Sacramento Valley and the Delta region), California State Parks operates and maintains 32 State park units representing 7% of the total State park system acreage. The 2009 Central Valley Vision Implementation Plan proposed 11 new parks in the Central Valley (including a park at Barker Slough in the Delta), additions to many existing park (including 8 parks in the Delta), and 5 proposed Heritage Corridors (including one in the Delta). Information was used in development of the 2011 Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh.. |
| Department of Parks and Recreation | Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh | Program under development. | In 2011, California State Parks developed a Recreation Proposal for the Delta and Suisun Marsh in response to the requirements in SBX7 1. The proposal recommends that communities on the edge of the Delta or Suisun Marsh with access to major transportation routes be developed as "gateways" to provide supplies and information to visitors about recreation opportunities available in an area. Recommendations also include collaboration with other agencies and other partners to expand wildlife viewing, angling, and hunting opportunities; and expansion of the State Park system in the Delta. |
| Sacramento County | Sacramento County General Plan Update | Program under development. | In 2002, the County initiated a comprehensive general plan update to guide the growth and development of the County through the year 2030. In June 2007, the county issued a draft updated general plan and began environmental review. The general plan update covers the entire unincorporated portion of Sacramento County, including portions of the Delta within Sacramento County. The update also includes a Delta Protection Element that identifies goals and objectives within the primary zone of the Delta. |
| San Joaquin County | San Joaquin County General Plan Update | Program under development. | The San Joaquin County General Plan 2010 was adopted on July 29, 1992. The general plan provides guidance for future growth in a manner that preserves the county's natural and rural assets. Most of the urban growth is directed to existing urban communities. In June 2008, San Joaquin County began the process to update the 1992 general plan. The general plan update will provide the blueprint for growth in the county unincorporated areas through 2030. |