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1 Acronyms and Abbreviations

BDCP	Bay Delta Conservation Plan
BiOp	biological opinion
CalEPA	California Environmental Protection Agency
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CVP	Central Valley Project
CWA	Clean Water Act
DWR	California Department of Water Resources
EPA	U.S. Environmental Protection Agency
ERP	Ecosystem Restoration Program
ESA	federal Endangered Species Act
Fish & Game Code	California Fish and Game Code
FR	<i>Federal Register</i>
HCP	habitat conservation plan
MOA	Memorandum of Agreement
MLLW	mean lower low water
NCCPA	Natural Community Conservation Planning Act
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
RCRA	Resource Conservation and Recovery Act
Reclamation	Bureau of Reclamation
ROA	Restoration Opportunity Area
SARA	Superfund Amendments and Reauthorization Act
SFCWA	State and Federal Contractors Water Agency
SWP	State Water Project
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service

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Chapter 6

Plan Implementation

To effectively achieve the overall goals of ecosystem restoration and restored water supply reliability, the BDCP (or the Plan) sets out a conservation strategy that will be implemented over the 50-year permit duration. This chapter identifies the key issues related to plan implementation and describes the approaches that will be used to address those issues. This chapter establishes a schedule for the implementation of the conservation measures, which will guide the timing and sequencing of measures to maximize opportunities to advance the biological goals and objectives of the BDCP. It further describes requirements for planning, annual workplans and budgets, monitoring, compliance reporting, and scientific review to ensure transparency in decisions that lead to refinements in the manner in which the BDCP is implemented.

The chapter further describes the regulatory assurances under the federal Endangered Species Act (ESA) and the Natural Community Conservation Planning Act (NCCPA) that will be provided to the Permittees.¹ It also describes the commitment of the Authorized Entities to respond to foreseeable changes in circumstances that may adversely affect covered species and habitats, and identifies a process by which changes that are not foreseeable can be addressed. The chapter identifies the circumstances under which regulatory authorizations may be suspended or revoked. See Chapter 3, *Conservation Strategy*, for a full description of the conservation measures. See Chapter 7, *Implementation Structure*, for a description of the BDCP implementation structure and decision-making process. Finally, see Chapter 8, *Implementation Costs and Funding Sources*, which sets out the assurances of funding for the BDCP.

6.1 Implementation Schedule

The implementation of the conservation measures will be guided by the schedules in Table 6-1 and Table 6-2. Table 6-1 provides the schedule for conservation measures that address water operations and other stressors, and Table 6-2 shows the implementation schedule for natural community protection and restoration. The schedules were developed to meet the following goals.

- Ensure that key implementation actions occur early in the permit term to offset expected effects of covered activities and meet the NCCPA requirement for rough proportionality of effects and conservation.
- Ensure that implementation actions occur by the implementation deadlines established in Chapter 3, *Conservation Strategy*.
- Ensure that implementation actions occur on a feasible schedule and allow adequate time for landowner negotiation for acquisition, project planning, permitting, funding, design, and construction.
- Group the related implementation actions or covered activities together or in the proper sequence (e.g., implementing riparian restoration and channel margin enhancement together).

¹ The *Permittees* are the California Department of Water Resources (DWR) and the participating state and federal water contractors

- 1 • Require natural community protection and restoration to occur in almost every time period to
2 ensure that progress is always being made toward the total conservation requirement in
3 year 40.

4 The schedule for natural community protection and restoration (Table 6-1) establishes milestones
5 for both restoration and protection in rough proportion to impacts (see Section 6.1.2 *Maintaining*
6 *Rough Proportionality* for definitions and details). For restoration, these milestones are defined by
7 when restoration construction is completed because it will likely take years or even decades for
8 restored natural communities to be fully functioning biologically. The cumulative outcomes of
9 implementing BDCP natural community protection and restoration conservation measures under
10 this implementation schedule are depicted in Figure 6-1.

11 The implementation schedule represents a reasonable estimate of the temporal sequence for
12 implementation of the various interdependent implementation actions over the term of the BDCP
13 (an implementation action is an action undertaken to support achievement of one or more biological
14 objectives; implementation actions are components of conservation measures, but are usually
15 limited in scope compared to the conservation measures). The BDCP is a large and complex plan
16 and, to ensure successful implementation, the Implementation Office will need to retain a degree of
17 flexibility to adjust the implementation schedule to best ensure that the biological goals and
18 objectives are achieved. In addition, the timing of funding available from public sources for actions
19 that conserve the species in the Plan Area (not mitigation), may dictate the timing of some
20 implementation actions (Chapter 8, *Implementation Costs and Funding Sources*). Consequently, the
21 actual timing of some implementation actions may vary from the implementation schedules in Table
22 6-1 and Table 6-2, although implementation will maintain compliance with the *rough*
23 *proportionality* timeframes described in Section 6.1.2, *Maintaining Rough Proportionality*.

24 **6.1.1 Performing Implementation Actions**

25 As described in Chapter 3, *Conservation Strategy*, some conservation measures can be implemented
26 soon after issuance of regulatory authorizations under the ESA and the NCCPA because they require
27 minimal or no additional regulatory compliance (e.g., *CM3 Natural Communities Protection and*
28 *Restoration*, *CM8 Grassland Natural Community Restoration*, *CM14 Stockton Deep Water Ship Channel*
29 *Dissolved Oxygen Levels*, *CM17 Illegal Harvest Reduction*, *CM19 Urban Stormwater Treatment*).
30 Implementation of these conservation measures can occur early in the permit term because, although
31 additional planning is needed, they will require minimal, if any, additional review under the California
32 Environmental Quality Act (CEQA) or National Environmental Policy Act (NEPA). Moreover, all of the
33 “other stressors” conservation measures (*CM2 Yolo Bypass Fisheries Enhancement*, *CM13 Invasive*
34 *Aquatic Vegetation Control*, *CM14 Stockton Deep Water Ship Channel Dissolved Oxygen Levels*, *CM15*
35 *Localized Reduction of Predatory Fishes*, *CM16 Nonphysical Fish Barriers*, *CM17 Illegal Harvest*
36 *Reduction*, *CM18 Conservation Hatcheries*, *CM19 Urban Stormwater Treatment*, *CM20 Recreational*
37 *Users Invasive Species Program*, and *CM21 Nonproject Diversions*) may be implemented early and thus
38 the benefits expected of these measures would be accelerated. However, most of the implementation
39 actions will require additional planning and regulatory authorizations before they can be
40 implemented. An overview of the general steps involved in implementing each conservation measure
41 is provided below according to the following four elements.

1 **Table 6-1. Implementation Schedule for Water Facilities and Other Stressors Conservation Measures**

Conservation Measure	Implementation ^a Estimated to Start	Explanation
<i>CM1 Water Facilities and Operations</i>	year 2	<ul style="list-style-type: none"> Construction of the new north Delta diversion and conveyance facilities will begin approximately 2 years after permit issuance and continue for an estimated 9 to 10 years. Operations could begin as early as year 11.
<i>CM2 Yolo Bypass Fisheries Enhancement</i>	year 10	<ul style="list-style-type: none"> Because of the complexity of the projects planned, implementation will be phased (see CM2 in Chapter 3, <i>Conservation Strategy</i>, for a schedule). Planning, design, environmental compliance, permitting, and construction for fish passage facilities will likely be completed first, by year 10. Several years of study and adaptive management of fish passage facilities will be needed before more complex seasonally inundate floodplain restoration can occur. Modifications to Fremont Weir, Lisbon Weir, Sacramento Weir, lower Putah Creek Channel, and related projects will be initiated by year 11 and operations by year 13.
<i>CM13 Invasive Aquatic Vegetation Control</i>	year 2	<ul style="list-style-type: none"> Aquatic vegetation control will occur by year 2 to control the spread of Brazilian waterweed (<i>Egeria densa</i>) and other invasive species such as spongeplant. Control will occur in tidal wetland restoration sites as they are implemented and as needed.
<i>CM14 Stockton Deep Water Ship Channel Dissolved Oxygen Levels</i>	year 1	<ul style="list-style-type: none"> Funding for the current Stockton Deep Water Ship Channel dissolved oxygen diffuser demonstration project will be made available within 1 year of BDCP permit issuance.
<i>CM15 Reduction of Predatory Fishes</i>	year 3	<ul style="list-style-type: none"> Approximately 2 years of planning, prioritization, and environmental compliance will be needed to determine most effective sites and techniques for predator removal actions. Predator reduction efforts will begin by year 3 and continue throughout the permit term.
<i>CM16 Nonphysical Fish Barriers</i>	year 4	<ul style="list-style-type: none"> The existing barrier at the head of Old River will continue as a pilot project, pending construction of the Head of Old River Operable Gate. Planning, environmental compliance, and installation of barriers at the Delta Cross Channel and Georgiana Slough are expected to take 3 years. Timelines for subsequent barriers, if needed, are expected to be similar although planning and permitting times may be reduced.
<i>CM17 Illegal Harvest Reduction</i>	year 3	<ul style="list-style-type: none"> Expansion of the California Department of Fish and Wildlife Delta-Bay Enhanced Enforcement Program requires time to hire appropriate staff and purchase new vehicles and equipment. Enforcement actions under this conservation measure are expected to begin in year 3 of Plan implementation.

Conservation Measure	Implementation ^a Estimated to Start	Explanation
<i>CM18 Conservation Hatcheries</i>	years 4 and 7	<ul style="list-style-type: none"> • Planning, design, and construction of the expansion of the existing University of California, Davis conservation hatchery is expected to take 3 years, allowing operation by year 4. • Property acquisition, planning, and environmental compliance of the new California Department of Fish and Game hatchery are expected to take 3 years. Design, construction, and facility staffing is expected to take another 3 years.
<i>CM19 Urban Stormwater Treatment</i>	year 3	<ul style="list-style-type: none"> • Interagency agreements and program development are expected to take 2 years, with the program becoming operational in year 3 of Plan implementation. Individual actions under the program are expected to take approximately 5 years each to fund, design, permit, and construct.
<i>CM20 Recreational Users Invasive Species Program</i>	year 1	<ul style="list-style-type: none"> • Because this measure provides funding to support existing actions, implementation will begin in year 1 of Plan implementation, although full program development will likely take approximately 3 years.
<i>CM21 Nonproject Diversions</i>	year 3	<ul style="list-style-type: none"> • Interagency agreements and program development are expected to take 2 years, with the program becoming operational in year 3 of Plan implementation. Individual actions under the program are expected to take approximately 4 to 8 years each to design, permit, and construct.
<p>Notes:</p> <p>^a Implementation is defined as the completion of construction and beginning of operations to benefit covered species, natural communities, and ecosystems. If no construction is required, then implementation is defined as the initiation of the new program (e.g., CM13, CM14, CM15, CM17, CM19, CM20, and CM21)</p>		

1 **Table 6-2. Implementation Schedule for Natural Community Protection and Restoration Conservation Measures**

Conservation Measure	Total Requirement (acres)	Minimum Amount of Acquisition or Restoration by 5-Year Time Periods ^a									
		Near-Term (acres)		Early Long-Term (acres)	Late Long-Term (acres)						
		1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50
BDCP Reserve System											
<i>CM3 Natural Communities Protection and Restoration</i>											
Valley/foothill riparian	750	400	350								
Vernal pool complex	600	200	200	200							
Alkali seasonal wetland complex	150		120	5	5	5	5	5	5		
Grassland	8,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000		
Managed wetland ^b	1,500	500	1,000								
Managed wetland (natural community) ^c	6,600	1,400	1,900	600	550	550	550	550	500		
Cultivated lands (non-rice)	48,125	7,700	7,700	6,700	5,200	5,200	5,200	5,200	5,225		
Cultivated lands (rice)	500	100	100	100	100	100					
Cultivated lands (rice or equivalent) ^d	3,000	300	400	400	400	400	400	400	300		
Nontidal marsh ^e	50	10	15	5	5	5	5	5			
Total Acquisition	69,275	11,610	12,785	9,010	7,260	7,260	7,160	7,160	7,030		
<i>CM4 Tidal Natural Communities Restoration</i>											
Tidal brackish emergent wetland	6,000	1,000	1,000	2,050	350	400	400	400	400		
Tidal freshwater emergent wetland	24,000	4,425	4,425	4,450	2,150	2,150	2,150	2,150	2,10		
Tidal perennial aquatic (below MLLW)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Tidal wetland of any type and transitional uplands ^f	35,000	4,150	4,150	4,150	4,150	4,600	4,600	4,600	4,600		
Subtotal: Tidal wetland restoration^g	65,000	9,575	9,575	10,650	6,650	7,150	7,150	7,150	7,100		
<i>CM5 Seasonally Inundated Floodplain Restoration</i>	10,000			1,000	1,800	1,800	1,800	1,800	1,800		
<i>CM6 Channel Margin Enhancement (miles)</i>	20	5	5		5		5				
<i>CM7 Riparian Natural Community Restoration</i>	5,000	400	400	300	750	750	750	800	850		
<i>CM8 Grassland Natural Community Restoration</i>	2,000	570	570	340	100	100	100	100	120		
<i>CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration^h</i>											
Vernal pool complex ⁱ	67	20	20	27							
Alkali seasonal wetland ^j	72	29	29	5	5	4					

Conservation Measure	Total Requirement (acres)	Minimum Amount of Acquisition or Restoration by 5-Year Time Periods ^a									
		Near-Term (acres)		Early Long-Term (acres)	Late Long-Term (acres)						
		1 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	41 to 45	46 to 50
CM10 Nontidal Marsh Restoration^e											
Nontidal marsh restoration	1,200	200	200	100	100	150	150	150	150		
Managed wetland	500	250	250								
Total Restoration^k	83,839	11,044	11,044	12,422	9,405	9,954	9,950	10,000	10,020		
Total Acquisition and Restoration^l	153,139	22,654	23,829	21,432	16,665	17,214	17,110	17,160	17,050		

Notes:

^a See text for the rationale for the requirements by time period. In some cases, acquisition or restoration within a time period may be greater than shown in order to occur in rough step with permanent and long-term temporary loss and meet the NCCP standard for rough proportionality of impacts and conservation.

^b Managed wetland preservation to meet Objective SMHM1.1 for salt marsh harvest mouse.

^c Managed wetland preservation to meet Objective MWNC1.1 to support populations of native waterfowl.

^d 4,240 acres of rice, or “rice equivalent” will be protected to contribute to giant garter snake conservation (1,500 acres under Objective GGS1.4, and 2,740 acres under Objective GGS3.1). Rice equivalent is rice protection, nontidal restoration, or muted tidal restoration that meets the reserve design criteria described in CM4. Up to 1/3 of the rice equivalent may also consist of grasslands adjacent to protected or restored aquatic habitat. For the giant garter snake net effects analysis and the cost assumption chapter, it was assumed that 1,250 acres of the rice equivalent will consist of muted tidal restoration, which is a subset of the 24,000 acres of freshwater emergent wetland restoration. The difference between the total rice equivalent requirement (4,240 acres) and the assumed acreage of muted tidal restoration (1,250 acres) is 3,000 acres, rounded to the nearest 100.

^e 50 of the 1,200 acres of nontidal marsh restoration could substitute for 50 acres of nontidal marsh protection if those 50 acres meet habitat enhancement requirements for tricolored blackbird.

^f The preservation or restoration of transitional uplands adjacent to tidally restored sites to accommodate sea level rise. Grassland preservation that occurs to achieve this objective does not contribute toward the 8,000 acres of grassland preservation or the 2,000 acres of grassland restoration. Some or all of the transitional uplands may become tidal during the 50-year permit term or beyond, as a result of sea level rise.

^g The 65,000 acres includes restored tidal natural communities and transitional uplands to accommodate sea level rise (i.e., land available for upslope migration of tidal wetlands as sea level rises) during the permit term and beyond the permit term.

^h Alkali seasonal wetland and vernal pool complex restoration objectives requires no net loss of wetted acres. Actual restoration of alkali seasonal wetland and vernal pool complex acreage will depend on the amount lost and the density of wetted acres in the restored areas. Restoration numbers reflect that required with maximum allowable impacts and assumed density of wetted area of 15%.

ⁱ The acreage of vernal pool complex restored will depend on the amount removed. Projects will avoid direct and indirect effects on vernal pools to the extent feasible, Restoration acreage will be based on impact acreage, and the amount necessary to achieve no net loss of wetted acres. Restoration will take place consistent with the rough proportionality standard described in Section 6.1.2, *Maintaining Rough Proportionality*.

^j The acreage of alkali seasonal wetland complex restored will depend on the amount permanently impacted. Projects will avoid direct and indirect effects on alkali seasonal wetlands to the extent feasible, Restoration acreage will be based on impact acreage, and the amount necessary to achieve no net loss of wetted acres. Restoration will take place consistent with the rough proportionality standard described in Section 6.1.2, *Maintaining Rough Proportionality*.

^k Excludes channel margin enhancement (in miles).

^l This total includes 10,000 acres of seasonally inundated floodplain, which overlaps with restoration and protection for riparian and other natural communities. The 10,000 acres are not included in the total acreage of natural communities to be restored and protected under Objective L1.1.

MLLW = mean lower low water; NCCP = natural community conservation plan

- 1 • Property acquisition
 - 2 • Planning and design
 - 3 • Regulatory compliance
 - 4 • Implementation activities
- 5 These elements are expected to be implemented concurrently. All are taken into account in the
- 6 implementation schedules for each conservation measure (Table 6-1 and Table 6-2).

7 **6.1.1.1 Property Acquisition**

8 In many cases, conservation measures will be implemented on existing public land and will not

9 require the acquisition of property. Where this is not practicable, land will be acquired in fee or by

10 conservation easement. For example, property acquisition will be necessary to preserve natural

11 communities (Table 6-2). The criteria used to select properties for acquisition varies by

12 conservation measure (e.g., see *CM3 Natural Communities Protection and Restoration* for a

13 description of acquisition criteria for this conservation measure).

14 Thorough field assessments will be needed to assess the suitability of a particular property for

15 implementation of a conservation measure. The Implementation Office will also need to ensure that

16 property encumbrances (e.g., existing easements, leases, rights-of-way, title restrictions, resource

17 extraction rights, hazardous materials) do not conflict with the ability to achieve Plan goals and

18 objectives. For properties acquired using easements, easement terms should be negotiated before

19 purchase. Property acquisitions for actions that involve modifications to levees (e.g., setting back

20 levees to restore seasonally inundated floodplain habitat) include obtaining concurrence of the

21 responsible agencies to initiate planning studies.

22 **6.1.1.2 Planning and Design**

23 In some cases, additional planning and design work is needed to allow conservation measure

24 implementation. Design guidelines are provided within each applicable conservation measure

25 (*Chapter 3, Conservation Strategy*). In general, planning and design will likely include the following

26 steps, as appropriate.

- 27 • Funding and administrative support will be secured.
- 28 • Conceptual designs will be developed for natural community enhancement and restoration
- 29 (CM3 through CM12), construction of new facilities (CM1, CM2, CM16, CM18, CM21), or removal
- 30 of structures (CM4, CM5, CM15, CM21). Conceptual designs will need to be coordinated with
- 31 affected stakeholders (e.g., local, state, and federal agencies, potentially affected landowners).
- 32 • Based on conceptual designs, detailed designs and cost estimates will be developed for each
- 33 project.
- 34 • Based on the detailed design, bid specifications and drawings will be developed.
- 35 • Bids will be evaluated and contractors selected to implement the conservation measure at the
- 36 selected location.
- 37 • Other efforts needed to execute “other stressors” conservation measures will be planned.

1 **6.1.1.3 Regulatory Compliance**

2 Depending on the implementation action, preparation and submittal of documents and applications
3 may be required to allow for further environmental review or to obtain necessary regulatory
4 authorizations, such as the following.

- 5 • Additional project-level review under CEQA and NEPA.
- 6 • Sections 401 and 404 of the federal Clean Water Act (CWA).
- 7 • California Water Code Sections 1000 *et seq.* (water rights).
- 8 • Water Code Sections 13000 *et seq.* (water quality).
- 9 • Sections 10 (33 United States Code [USC] 403) and 14 (33 USC 408) of the Rivers and Harbors
10 Act of 1899.
- 11 • Section 1602 of the California Fish and Game Code (Fish & Game Code) (Streambed and Lakebed
12 Alteration Agreements).
- 13 • Section 106 of the National Historic Preservation Act.
- 14 • Encroachment permits for work on levees from the Central Valley Flood Protection Board and
15 reclamation districts.

16 **6.1.1.4 Implementation Activities**

17 This implementation element includes all activities related to construction.

- 18 • Contractor mobilization.
- 19 • Site preparation, including grading, excavation, and placement of dredge or fill.
- 20 • Construction/installation of water management, utility, and other operations infrastructure.
- 21 • Demolition or refurbishment of existing infrastructure.
- 22 • Construction of dikes, levees, docks, or roads.
- 23 • Planting vegetation.
- 24 • Construction monitoring (Section 3.6, *Adaptive Management and Monitoring Program*, and *CM22*
25 *Avoidance and Minimization Measures*).
- 26 • Site remediation, if necessary.
- 27 • Operations and maintenance.

28 **6.1.1.5 Natural Community Restoration Schedule**

29 The implementation schedule for natural community restoration conservation measures (CM4
30 through CM10 in Table 6-2) is described below for each natural community.

- 31 • ***CM4 Tidal Natural Communities Restoration.*** The implementation schedule for tidal natural
32 community restoration actions is based on the assumption that property acquisition, planning,
33 and any required environmental or regulatory compliance activities for the first 4,000 acres of
34 tidal natural community restoration will be initiated immediately after BDCP permit
35 authorization. Initial restoration actions will require less time to plan and permit than
36 restoration actions for other natural communities because tidal natural community restoration

1 is likely to be implemented first on public lands. The schedule for subsequent tidal wetland
2 restoration assumes that it will take several years to acquire properties suitable for restoration,
3 conduct analyses, develop conceptual plans, obtain any outstanding environmental and
4 regulatory approvals and permits, develop bid specifications and drawings, construct new
5 levees (if required) and natural community features, and breach existing levees.

- 6 • **CM5 Seasonally Inundated Floodplain Restoration.** Restoration of seasonally inundated
7 floodplains will require extensive levee setbacks to reconnect historical floodplain with Delta
8 channels. The implementation schedule (Table 6-2) assumes that 1,000 acres of floodplain will
9 be restored by year 15 and that restoration of the remaining 9,000 acres of floodplain
10 restoration will be completed in increments of 1,800 acres for each 5-year time period until year
11 40. Each floodplain restoration project will, on average, require 5 years to identify potential
12 floodplain restoration properties; coordinate planning with the U. S. Army Corps of Engineers
13 (USACE), California Department of Water Resources (DWR) and other flood control agencies
14 and reclamation districts; and conduct feasibility studies prior to implementation. Following
15 approval of floodplain restoration plans, an additional 5 years will be required to acquire
16 properties suitable for restoration, obtain any outstanding regulatory approvals and permits,
17 develop bid specifications and drawings, construct the new levees and floodplain, and breach
18 existing levees. Therefore, the first seasonally inundated floodplain restoration project is not
19 expected to be completed until after the first 10 years of Plan implementation.
- 20 • **CM6 Channel Margin Enhancement.** The implementation schedule assumes that channel
21 margin enhancements will be completed in increments of 5 miles of channel (achieved at
22 multiple properties for a total of 5 miles of channel margin length) by years 5, 10, 20, and 30 and
23 that channel margin enhancement will be a component of seasonally inundated floodplain and
24 riparian natural community restoration. Each channel margin natural community enhancement
25 increment will, on average, require 5 years to identify potential channel margin enhancement
26 sites; coordinate planning with USACE, DWR, and other flood control agencies and reclamation
27 districts; and conduct feasibility studies prior to implementation. Following approval of
28 enhancement plans, an additional several years will be required to obtain any outstanding
29 regulatory approvals and permits, develop bid specifications and drawings, and implement
30 channel margin enhancements. Linear miles of enhancement will be measured along one side or
31 the other of a given channel segment (e.g., if both sides of a channel are enhanced for a length of
32 1 mile, this would account for a total of 2 miles of channel margin enhancement).
- 33 • **CM7 Riparian Natural Community Restoration.** Restoration of the riparian natural community
34 will be a component of tidal natural community restoration (CM4), seasonally inundated
35 floodplain restoration (CM5), and channel margin natural community enhancement (CM6)
36 projects; therefore, the schedule for planning, property acquisition, environmental compliance,
37 and implementation of riparian restoration actions is linked to the implementation schedule for
38 those restoration actions. Most of the 5,000 acres of riparian restoration is expected to occur
39 with seasonally inundated floodplain restoration and tidal natural community restoration in the
40 south Delta.
- 41 • **CM8 Grassland Natural Community Restoration.** The implementation schedule assumes that
42 all grassland natural community restoration actions will be implemented between years 3 and
43 30 (Table 6-2). A total of 1,140 acres of grassland will be restored in the near-term
44 implementation period, 340 acres in the early long-term implementation period, and the
45 remaining amount in the late long-term implementation period. Over half of the grassland
46 restoration needs to occur in the near-term period to offset the expected loss of this natural

1 community from covered activities, mostly construction of the new water facility by year 10.
 2 The implementation schedule assumes that property acquisition, planning, and adaptive
 3 management activities for grassland restoration to be completed by year 5 are initiated in the
 4 first year or two following permit authorization.

- 5 • **CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration.** The vernal pool
 6 restoration objective (Objective VPNC1.2) requires that restoration occur to achieve no net loss
 7 of vernal pool complex. Based on the estimated maximum loss of vernal pools, up to 67 acres of
 8 restoration will be needed to achieve this objective. Most vernal pool complex restoration
 9 actions will likely need to be implemented in the first 15 years of implementation in order to
 10 stay in rough step with the effects of vernal pool losses (Table 6-2). Property acquisition,
 11 planning, and regulatory compliance activities for vernal pool complex restoration will likely
 12 require 2 to 3 years to complete.
- 13 • **CM10 Nontidal Marsh Restoration.** The implementation schedule assumes that all nontidal
 14 marsh restoration actions will be completed by year 10 to provide giant garter snake habitat
 15 (Table 6-2). Construction of nontidal marsh restoration designed to offset impacts will be
 16 completed in rough step with impacts on this natural community. The implementation schedule
 17 assumes that property acquisition, planning, and regulatory compliance-related activities for
 18 each 100 acres of restoration will require approximately 2 years to complete, with the
 19 restoration actions being completed in the third year.

20 **6.1.1.6 Post-Permit Term Implementation**

21 Certain implementation activities will continue beyond the permit term and will be implemented *in*
 22 *perpetuity*. These actions will be funded by endowment, as described in Chapter 8, *Implementation*
 23 *Costs and Funding*.

- 24 • All lands in the reserve system will be protected *in perpetuity*.
- 25 • Management of reserve system lands will be continued *in perpetuity* using techniques identified
 26 in *CM11 Natural Communities Enhancement and Management*, commensurate with endowment
 27 funding limitations.

28 **6.1.2 Maintaining Rough Proportionality**

29 The conservation measures under a natural community conservation plan (NCCP) must be
 30 implemented in a manner roughly proportional in time and extent to the impact of covered activities
 31 on habitat and covered species authorized under the plan (California Fish and Game Code
 32 2805(g)(3)(C) and (2820)(b)(3)(B)). Similarly, the ESA requires that habitat conservation plans
 33 (HCPs) minimize and mitigate the impacts of the taking to the maximum extent practicable (ESA
 34 Section 10(a)(2)(B)(ii)). The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries
 35 Service (NMFS) will consider whether the mitigation proposed in an HCP is sufficient to address the
 36 impact of the taking.

37 While the Plan provides net environmental benefits, many of the conservation measures entail
 38 habitat effects that must be proportionally mitigated during the course of Plan implementation.
 39 These effects and their timing are quantified in Chapter 5, *Effects Analysis*. Implementation of
 40 conservation measures in rough proportionality in time and extent to impacts will be assured under
 41 the BDCP through the following provisions. First, CM2 and CM13 through CM21 will be implemented
 42 according to the schedule in Table 6-1, as described in more detail in Chapter 3, *Conservation*

1 *Strategy*, for each conservation measure. Although most of these conservation measures are
2 intended to contribute to the conservation of the covered species, their implementation schedule
3 provides for their implementation concurrent with or prior to the effects associated with the
4 construction and operation of the water conveyance facility. In this respect, the implementation
5 schedule is consistent with the rough proportionality standard and ESA requirements.

6 Second, conservation measures that involve the protection or restoration of natural communities
7 and habitat for covered species (CM3 through CM10) will be implemented according to the schedule
8 in Table 6-2. This schedule was designed to ensure that the implementation of these conservation
9 measures, including mitigation actions, occurs in rough proportion to impacts on natural
10 communities and habitat for covered species (see Figures 5.4-1 through 5.4-7 in Chapter 5, *Effects*
11 *Analysis*, depicting the timelines for restoration and protection versus loss for most natural
12 communities). Management and enhancement activities for the protected natural communities
13 (*CM11 Natural Communities Enhancement and Management*) will be undertaken at the same pace as
14 the assembly of the reserve system, which will also occur in rough step with impacts. With respect
15 to *CM12 Methylmercury Management*, methylmercury management activities will be carried out on a
16 project-specific basis as applicable restoration projects are completed.

17 Rough proportionality for CM3² will be measured by comparing actual preservation of natural
18 communities, as measured from the date of recordation of fee title or conservation easement,
19 against the permanent impacts to each natural community (see trajectories of conservation and
20 impact illustrated in Figures 5.4-1 through 5.4-7 of Chapter 5, *Effects Analysis*). CM4 through CM10
21 require restoration of natural communities that provide species habitat. For these conservation
22 measures, rough proportionality will be determined through a comparison of the amount of natural
23 communities constructed (i.e., restoration is counted toward the requirement once construction is
24 completed) with the permanent impacts on the same species habitat (see same trajectories of
25 conservation and impact illustrated in Figures 5.4-1 through 5.4-7 of Chapter 5, *Effects Analysis*).
26 These trajectories are designed to ensure that conservation proceeds in roughly proportional steps
27 to impacts and also makes steady progress towards each applicable 5-year implementation
28 requirement (Table 6-2) and the overall target for each natural community by year 40. For the
29 purposes of compliance with the rough proportionality standards, the pace of conservation measure
30 implementation may not fall behind the pace of covered activity impacts by more than 10%.

31 Measurements necessary to monitor compliance with the rough proportionality standard for all
32 conservation measures will be reported by the Implementation Office on an annual basis at the end
33 of each calendar year as part of the Annual Report. This will include details on progress made
34 toward implementation of conservation measures that are not being evaluated for compliance with
35 the rough proportionality standard in that year. This information will become available beginning at
36 the end of the second full calendar year of Plan implementation to allow the Implementation Office
37 to reach operational capacity and focus its efforts on acquiring and restoring land. Compliance with
38 the rough proportionality standard will be measured based on the schedule in Table 6-3.

² *CM3 Natural Communities Protection and Restoration* requires acquisition of land in order to protect and enhance areas of existing natural communities and covered species habitat; protect and maintain occurrences of selected plant species with limited distributions; and/or provide habitat connectivity among the conservation lands, and connectivity to other conservation lands inside and outside the Plan Area.

1 **6.2 Interim Implementation Actions**

2 Implementation actions that occur before permit issuance and after the execution of the Planning
3 Agreement (Anonymous 2006) (October 6, 2006) count toward meeting BDCP requirements as long
4 as those actions are consistent with the Plan, help to meet its biological goals and objectives, and do
5 not provide mitigation for an interim project.³ These actions, called interim implementation actions,
6 will help the Implementation Office to meet the implementation schedules (Table 6-1 and Table 6-2)
7 early in the permit term.

8 Interim implementation actions that have been completed, are in process, or are planned to be
9 initiated prior to permit issuance are listed in Table 6-4 and mapped in Figure 6-2. These actions
10 include natural community preservation and restoration. These actions may count toward the
11 fulfillment of the conservation measures set out in Chapter 3, *Conservation Strategy*, to the degree
12 they are consistent with those conservation measures. Table 6-4 provides an estimate of how each
13 interim project may fulfill BDCP requirements for natural community protection or restoration. How
14 each interim implementation action may count toward BDCP requirements will be determined
15 through a process similar to the existing Fish Agency Strategy Team process as required under the
16 Fish Restoration Program Agreement. For any interim conservation action, the project proponent
17 submits a crediting prospectus to the fish and wildlife agencies. The agencies will then review the
18 prospectus and provide a credit letter agreeing to the project's appropriate early contribution to the
19 BDCP. (This process would only apply to interim implementation actions, not to BDCP
20 implementation after permit issuance.)

21 The following sections summarize 13 of the interim implementation actions listed in Table 6-4 and
22 describe their applicability to the BDCP.

³ See BDCP Planning Agreement Section 7.7.

1 **Table 6-3. Compliance Schedule for Rough Proportionality Measurements**

Conservation Measure	Compliance Schedule for Rough Proportionality¹	Rationale
<i>CM3 Natural Communities Protection and Restoration</i>	Initial compliance at end of third full calendar year, every 2 years thereafter	Land acquisition would likely rely mostly on large acquisitions that may take more than one year to close. The acquisition of cultivated land would likely require conservation easements on many relatively small parcels; more time is needed to develop and apply template easements acceptable to landowners and to acquire sufficient land to offset impacts.
<i>CM4 Tidal Natural Communities Restoration</i>	Initial compliance at end of third full calendar year, every 2 years thereafter	Because of the time required for land acquisition, planning and design, permitting, and construction, it is expected that projects to implement CM4 will take 3–5 years to complete.
<i>CM5 Seasonally Inundated Floodplain Restoration</i>	Initial compliance at end of 15th full calendar year, every 2 years thereafter	Floodplain restoration schedule is outlined in Table 6-2, with requirements starting in year 15 to allow for extensive planning, design, land acquisition, and construction in the south Delta.
<i>CM6 Channel Margin Enhancement</i>	Initial compliance at end of fifth full calendar year, every 2 years thereafter	Channel margin enhancement requirements start in year 5 to allow for planning, design, land acquisition, and construction at sites along and near the Sacramento River.
<i>CM7 Riparian Natural Community Restoration</i>	Initial compliance at end of second full calendar year, every 2 years thereafter	Riparian restoration is expected to occur in large blocks, each of which is expected to take more than one year to acquire, plan, design, and implement.
<i>CM8 Grassland Natural Community Restoration</i>	Initial compliance at end of second full calendar year, every 2 years thereafter	Grassland restoration is expected to occur in large blocks, each of which is expected to take more than one year to acquire, plan, design, and construct.
<i>CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration</i>	Initial compliance at end of second full calendar year, every 2 years thereafter ¹	Vernal pool complex restoration is expected to occur in large blocks, each of which is expected to take more than one year to acquire, plan, design, and construct.
<i>CM10 Nontidal Marsh Restoration</i>	Initial compliance at end of second full calendar year, every 2 years thereafter	Nontidal marsh restoration is expected to occur in large blocks, each of which is expected to take more than one year to acquire, plan, design, and construct.
<i>CM2 Yolo Bypass Fisheries Enhancement, CM13–CM21</i>	See Table 6-1 for compliance schedule	
Notes:		
¹ Land acquisition and restoration milestones also occur at 5-year intervals (year 5, 10, 15; Table 6-2), so compliance with the rough proportionality standard will also be measured at these times.		

2

1 **Table 6-4. Interim Implementation Actions: Restoration Projects with Potential to Contribute to Meeting BDCP Requirements**

Project	Property Owner/ Operator	Location	Size (acres)	Covered Species Benefitted	Status	Potential Overlap with BDCP (Associated Conservation Measure)
Calhoun Cut/ Lindsey Slough Tidal Habitat Restoration	CDFW	Cache Slough Complex	927	Delta smelt, longfin smelt, juvenile Chinook salmon, juvenile Central Valley steelhead, Sacramento splittail, juvenile green sturgeon, juvenile white sturgeon	In process	≤165 acres of tidal marsh restored (CM4, CM7)
Lower Yolo Restoration Project	Westlands Water District	Cache Slough Complex	3,408	Delta smelt, longfin smelt, juvenile Chinook salmon, juvenile Central Valley steelhead, Sacramento splittail, juvenile green sturgeon, juvenile white sturgeon	In process	1,305 acres of wetland creation, 700 acres of wetland enhancement, 50 acres of riparian enhancement (CM4, CM7)
Dutch Slough Tidal Marsh Restoration	DWR	West Delta	1,166	Sacramento splittail, juvenile salmon, steelhead, Delta smelt, longfin smelt, sturgeon, black rail	Planned	200–800 acres of restored tidal marsh, 20 acres of enhanced channel margin, 20 acres of restored riparian, total estimated area affected: 240–840 acres. Potential loss of 1,000 grazing acres (CM4, CM7, CM10)
McCormack- Williamson Tract	The Nature Conservancy	Cosumnes/ Mokelumne East Delta	1,660	Chinook salmon, steelhead, delta smelt, Valley elderberry longhorn beetle	Planned	1,200–1,300 acres of restored tidal marsh, 100–200 acres of restored riparian (CM4, CM7)
Grizzly Slough	DWR	Cosumnes/ Mokelumne East Delta	489	Chinook salmon, steelhead, delta smelt	Planned	470 acres of floodplain and riparian habitat (CM5, CM7)
Experimental Fremont Weir Fish Passage Improvements	Sacramento San Joaquin Drainage District (Central Valley Flood Protection Board). DWR maintains Weir. CDFW operates existing fish ladder and leases Fremont Weir Wildlife Area.	Yolo Bypass	N/A	Chinook salmon, Central Valley steelhead, Sacramento splittail, green and white sturgeon	Planned	Fremont Weir improvements (CM2)

Project	Property Owner/ Operator	Location	Size (acres)	Covered Species Benefitted	Status	Potential Overlap with BDCP (Associated Conservation Measure)
Fremont Weir Modifications/ Floodplain Enhancement	Owner: Sacramento San Joaquin Drainage District (Central Valley Flood Protection Board). DWR maintains Weir. CDFW operates existing fish ladder and leases Fremont Weir Wildlife Area.	Yolo Bypass	TBD	Chinook salmon, Central Valley steelhead, delta smelt, Sacramento splittail, lamprey	Planned	5,000–20,000 acres of inundated floodplain in the Yolo Bypass (CM2)
Lisbon Weir Fish Passage Enhancement	CDFW and private obligations	Yolo Bypass	N/A	Chinook salmon, Central Valley steelhead, Sacramento splittail	Planned	Yolo Bypass enhancements (CM2)
Putah Creek Fish Passage Enhancement	CDFW	Yolo Bypass	N/A	Chinook salmon, Sacramento splittail	Planned	3–10 acres of restored tidal marsh, 50–500 acres of inundated tidal plain, 1–5 acres of restored channel margin, 1–5 acres of restored riparian
Sacramento Weir Improvements	Sacramento San Joaquin Drainage District (Central Valley Flood Protection Board). DWR maintains Weir. CDFW operates existing fish ladder and leases Sacramento Bypass Wildlife Area.	Yolo Bypass (the Sacramento Bypass is a tributary of the Yolo Bypass).	N/A	Chinook salmon, Central Valley steelhead, delta smelt, Sacramento splittail, lamprey	Planned	Yolo Bypass enhancements (CM2)
Southport Project	City of West Sacramento, DWR	Sacramento River between RM 52.8 and 56.0	280		Planned	280 acres of floodplain restoration (CM5)
Agricultural Crossings	Private ownership	Yolo Bypass	N/A	Chinook salmon, Central Valley steelhead, Sacramento splittail	Planned	N/A

Project	Property Owner/ Operator	Location	Size (acres)	Covered Species Benefitted	Status	Potential Overlap with BDCP (Associated Conservation Measure)
Meins Landing Tidal Habitat Restoration (Identified for Delta Ecosystem Enhancement Program)	DWR	Suisun Marsh	666	Chinook salmon, delta smelt, Sacramento splittail, salt marsh harvest mouse, Suisun shrew, California clapper rail, California black rail	Planned	633 acres of restored tidal marsh, 33 acres of restored riparian. total estimated affected: 666 acres (CM4)
Hill Slough Tidal Habitat Restoration	CDFW and Private obligations	Suisun Marsh	1,750	Chinook salmon, delta smelt, California clapper rail, California black rail, salt marsh harvest mouse, Suisun shrew, Suisun Marsh covered plant species	In process	846 acres of restored tidal marsh, 94 acres restored riparian. total estimated affected: 940 acres (CM4)
Tule Red Restoration	Westervelt Ecological Services, Inc.	Suisun Marsh	Est. 300	Chinook salmon, Delta smelt, California clapper rail, California black rail, salt marsh harvest mouse, Suisun shrew, Suisun Marsh covered plant species	Planned	300 acres tidal marsh creation and 1,300 acres of possible tidal marsh enhancement (CM4)
Rush Ranch Tidal Habitat Restoration	Solano Land Trust	Suisun Marsh	2,070	Delta smelt, longfin smelt, splittail, Chinook salmon, California black rail, California clapper rail, Suisun song sparrow, salt marsh common yellowthroat, burrowing owl, salt marsh harvest mouse, Suisun ornate shrew, Suisun thistle, soft bird's beak, Delta tule pea, Suisun Marsh aster	Planned	70 acres of restored tidal marsh, 3 acres of enhanced channel margin (CM4)
Prospect Island Tidal Habitat Restoration	DWR	Cache Slough Complex	1,316	Delta smelt, longfin smelt, juvenile Chinook salmon, juvenile steelhead, green sturgeon, white sturgeon	Planned	450–1,300 acres of restored tidal marsh and riparian habitat (CM4, CM7)
Chipps Island	Chipps Island	Suisun Marsh	750	Delta smelt, longfin smelt, juvenile Chinook salmon, juvenile steelhead, green sturgeon, white sturgeon	Planned	100–250 acres restored tidal marsh (CM4)
Decker Island		Eastern Decker Island	110	Salmon and steelhead	Planned	110 acres of tidal natural communities

6.2.1 Calhoun Cut and Lindsey Slough Restoration

The Calhoun Cut Ecological Reserve is located on the northwest edge of the Sacramento Delta, in Conservation Zone 1 (Figure 6-2), in the Cache Slough ROA. The 927-acre property, which is owned by CDFW, consists of 334 acres of wetlands and 593 acres of upland areas. The restoration project is designed to increase the area of functional intertidal freshwater marsh habitat, restore processes necessary to create riparian canopy adjacent to tidal channels, and create conditions that allow for the natural regeneration of a mosaic of different wetland habitats ranging from tidal marsh to riparian to upland transitional alkali panne habitat. The restoration of the tidal channel system to Lindsey Slough consists of removing several existing features that restrict flow through the slough and excavate starter channels to restore Lindsey Slough's tidal channel system.

The project is not associated with any mitigation requirement. Environmental documentation is almost complete; however, funding sources are still needed for permitting, design, and construction. If the Implementation Office or its partner agencies provides additional funding, the project may be eligible to count for tidal wetland restoration, riparian restoration, and potential other natural community restoration targets (e.g., grassland, vernal pool) under BDCP.

6.2.2 Lower Yolo Restoration Project

The Lower Yolo Restoration Project is located in Conservation Zone 1 (Figure 6-2) at the southern end of the Yolo Bypass in the Cache Slough ROA. The restoration project is intended to help fulfill the tidal wetland mitigation requirement for the 2008 biological opinion (BiOp) on the Coordinated Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP) (U.S. Fish and Wildlife Service 2008) and the CESA 2081(b) permit for longfin smelt for the SWP (California Department of Fish and Game 2009). Based on the Memorandum of Agreement (MOA) between the Bureau of Reclamation (Reclamation), USFWS, DWR, NMFS, CDFW, and State and Federal Contractors Water Agency (SFCWA) (California Department of Water Resources 2011), this restoration project may also count toward BDCP tidal wetland restoration requirements. The project entails breaching levees along the Stairstep Channel and channel excavation to return tidal action to approximately 50% of the 3,408-acre property known as Yolo Ranch in order to restore tidal marsh-open-water habitat and upland and riparian habitats. Yolo Ranch was acquired by Westlands Water District in 2007 with the intention of creating tidal marsh and open water habitat to benefit delta smelt and the delta food web.

The restoration project was part of the 2008 USFWS BiOp, described above, and the CALFED Ecosystem Restoration Program (ERP). Funding sources for the project include the ERP, Fish Restoration Program Agreement, and members of SFCWA. The Yolo Ranch EIR was certified in July 2013. Construction is anticipated to begin in 2014.

6.2.3 Dutch Slough Tidal Restoration Project

The Dutch Slough Tidal Restoration Project takes place on a 1,178-acre property located in Conservation Zone 6 (Figure 6-2) and is part of the West Delta ROA. DWR purchased the property in 2003. Restoration and natural community enhancement will take place on the entire area. The Dutch Slough property offers an opportunity for large-scale tidal marsh restoration, natural community enhancement, and open space preservation. The project will restore a diversity of tidal wetland,

1 riparian, and other natural communities. The project has been designed with an adaptive
2 management framework to test various restoration approaches.

3 The project is not required as mitigation and is not part of an originating agreement. Therefore, the
4 project may count toward BDCP obligations for tidal wetland restoration (CM4), riparian restoration
5 (CM7), or possibly nontidal marsh restoration (CM10). Partial funding for construction has been
6 secured through the DWR Delta Levees Program, the CALFED ERP and the California Coastal
7 Conservancy. Construction is expected to begin in 2013 or 2014.

8 **6.2.4 McCormack-Williamson Tract Restoration**

9 The McCormack-Williamson Tract element of the North Delta Flood Control and Ecosystem
10 Restoration Program was proposed to be funded by DWR and the CALFED Levee Stability Program.
11 This project and the Grizzly Slough project described below will provide a nearly contiguous
12 corridor along the downstream portion of the Cosumnes Preserve. The McCormack-Williamson
13 Tract, a 1,660-acre property located in Conservation Zone 4 (Figure 6-2) in the Cosumnes-
14 Mokelumne ROA, was purchased by The Nature Conservancy in 1999 using a CALFED grant (USFWS
15 funds). The project will help regulate peak flood flows and prevent flood surges in the North Delta
16 where the Mokelumne and Cosumnes Rivers converge. The project will entail breaching the
17 McCormack-Williamson Tract levees to restore ecosystem function, create floodplain and tidal
18 marsh natural communities, and benefit native species. Restoration is anticipated to take place on
19 approximately 1,500 acres.

20 Additional project details can be found in the *North Delta Flood Control and Ecosystem Restoration*
21 *Project Final EIR*, released in November 2010. This project may count toward BDCP floodplain and
22 tidal marsh restoration requirements.

23 **6.2.5 Grizzly Slough**

24 The Grizzly Slough Property, part of the Cosumnes Preserve, is a 489-acre parcel that was purchased
25 in 1992 as mitigation for the SWP. The property, owned by DWR, is in the Cosumnes River
26 watershed and is located near the Cosumnes-Mokelumne ROA in Conservation Zone 4 (Figure 6-2)
27 approximately 2 miles northeast of the town of Thornton. Nearly 70 acres has been utilized to
28 mitigate for the Delta Levee Program, while the remaining approximately 450 acres is planned as
29 riparian and floodplain restoration to provide additional attenuation of peak flows in the North
30 Delta. Funding for the project has not been identified but is needed for environmental
31 documentation and permitting, design, and construction. Additional project details can be found in
32 the *North Delta Flood Control and Ecosystem Restoration Project Final EIR*, released in November
33 2010. If the Implementation Office or its partner agencies provided funding for the project, portions
34 of the site could count toward BDCP riparian or floodplain restoration requirements.

35 **6.2.6 Southport Project**

36 The Southport Early Implementation Project will implement flood risk-reduction measures along
37 the Sacramento River South Levee that protects the Southport community and will provide 280
38 acres of floodplain restoration. The property, located in Conservation Zone 3 (Figure 6-2) along the
39 Sacramento River between river miles 52.8 and 56.0, is owned by the City of West Sacramento and
40 DWR. The ecosystem restoration portion of the project will satisfy an existing mitigation
41 requirement. Partial funding for the project was secured through the DWR Early Implementation

1 Project; however, floodplain design and restoration funding has not been determined. A partner
2 agency is needed to help fund the riparian floodplain restoration for the portion of the property that
3 will not be used as mitigation for the flood control project. Depending on the funding source, this
4 project may count toward BDCP floodplain restoration.

5 **6.2.7 Meins Landing Restoration Project**

6 Meins Landing, a 666-acre waterfowl hunting club in Conservation Zone 11 (Figure 6-2) in the
7 Suisun Marsh ROA, was purchased in December 2005, by DWR in partnership with the Suisun Marsh
8 Preservation Agreement Agencies (DWR, CDFW, Reclamation, Suisun Resource Conservation
9 District), and the California Coastal Conservancy. The project will restore up to 666 acres to a fully
10 functioning, self-sustaining marsh ecosystem by restoring natural hydrologic and biological
11 processes. It will increase the area and contiguity of intertidal, subtidal, and emergent wetlands in
12 Suisun Marsh providing habitat for aquatic and tidal marsh species. The created tidal habitat will
13 provide mitigation for wetlands and salt marsh harvest mouse habitat losses during levee
14 improvements on 24 miles of levees in Suisun Marsh during the Delta Levees Program.

15 The project is part of the Van Sickle Island Levee Improvement Program. Funding for environmental
16 documentation and permitting, design, and construction has not yet been determined. Three
17 underground pipelines with easements transect the property and prevent open breaches and full
18 tidal inundation. Control structures that would allow full tidal flow yet still be able to give dry access
19 to pipelines in case of maintenance requirements are being investigated. The project is currently
20 awaiting funding and further assessment of the lands suitability for tidal marsh restoration. Portions
21 of the land not counted as mitigation for other DWR programs may be eligible to count toward BDCP
22 tidal wetland restoration or salt marsh harvest mouse protection obligations.

23 **6.2.8 Hill Slough Tidal Restoration Project**

24 The Hill Slough Tidal Restoration Project will restore tidal habitat to approximately 640 acres of
25 diked seasonal wetlands and enhance 200 acres of mixed perennial wetlands in Suisun Marsh. The
26 project will reintroduce tidal action to the site, restoring a transition of perennial aquatic habitat in
27 the deepest areas, low intertidal marsh, high intertidal marsh, and lowland alluvial habitat. The
28 1,723-acre property is located in Conservation Zone 11 (Figure 6-2) in the Suisun Marsh ROA and is
29 owned by CDFW.

30 The project was initiated through an agreement with CALFED and the Suisun Marsh Plan. Partial
31 funding for the project was secured through the CALFED ERP; however, funding for the final design
32 and construction has not been secured. Grizzly Island Road would need to be elevated in order to
33 restore the site. A draft environmental impact report is in preparation. The BDCP may be eligible to
34 count all or a portion of this project towards its tidal wetland restoration obligations.

35 **6.2.9 Tule Red Restoration Project**

36 In 2011, Westervelt Ecological Services purchased the Tule Red property, located in Conservation
37 Zone 11 (Figure 6-2) in the Suisun Marsh ROA. The restoration project will help fulfill the tidal
38 wetland mitigation requirement for the 2008 USFWS BiOp on the Coordinated Long-Term Operation
39 of the CVP and SWP (U.S. Fish and Wildlife Service 2008). Based on the MOA between Reclamation,
40 USFWS, DWR, NMFS, CDFW, and SFWCA (California Department of Water Resources 2011), this
41 restoration project may also count toward BDCP tidal wetland restoration requirements. The

1 restoration project would create 350 acres of tidal marsh with the potential to enhance an
2 additional 1,300 acres. Restoration on the Tule Red Property is highly economical because its
3 location is adjacent to dynamic sediment sources and its surface elevations are conducive to tidal
4 marsh restoration. The restoration may be expanded into adjacent land that is already owned by
5 CDFW. The first phase of construction is planned for 2014.

6.2.10 Rush Ranch Restoration Project

8 Rush Ranch, acquired by the Solano Land Trust in 1988, is a 2,070-acre ranch located along the
9 northern edge of Suisun Marsh in Conservation Zone 11 (Figure 6-2) in the Suisun Marsh ROA. The
10 restoration project is intended to help fulfill the tidal wetland mitigation requirement for the 2008
11 USFWS BiOp for the Coordinated Long-Term Operation of the CVP and SWP (U.S. Fish and Wildlife
12 Service 2008). Based on the MOA between Reclamation, USFWS, DWR, NMFS, CDFW, and SFWCA
13 (California Department of Water Resources 2011), this restoration project may also count toward
14 BDCP tidal wetland restoration requirements. The property consists of 940 acres of grassland, a 70-
15 acre diked marsh, and 1,050 acres of tidal wetlands that form one of the largest extant tracts of
16 undiked, brackish marsh in the San Francisco Estuary. The 70-acre diked marsh restoration project
17 site is situated in the northwest corner of Rush Ranch, on the edge of Suisun Slough. The project will
18 breach the levee and create a starter channel to allow daily tidal inundation and restore natural
19 patterns of sedimentation and evolution of marsh plain and channels.

20 The project was initiated through agreement between DWR, Reclamation, and the Suisun Marsh
21 Plan. Partial funding for the project was secured through the CALFED ERP; however, funding for
22 environmental documentation and permitting, design, and construction has not been secured.
23 Additional funding is needed for a USACE permit, baseline data collection, and final restoration
24 designs. The Implementation Office or its partner agencies could provide funding to complete the
25 project and could count some of the restoration toward the tidal wetland restoration requirements
26 of the Plan.

6.2.11 Prospect Island Restoration Project

28 Prospect Island, located in Conservation Zone 2 (Figure 6-2) in the Cache Slough ROA, is one of three
29 Delta islands specified for early implementation in the Plan. The restoration project is intended to
30 help fulfill the tidal wetland mitigation requirement for the 2008 USFWS BiOp for the Coordinated
31 Long-Term Operation of the CVP and SWP (U.S. Fish and Wildlife Service 2008). Per the Fish
32 Restoration Program Agreement (2010) between CDFW and DWR and the MOA between
33 Reclamation, USFWS, DWR, NMFS, CDFW, and SFWCA (California Department of Water 2011), this
34 restoration project may also count toward BDCP tidal wetland restoration requirements. DWR
35 acquired 1,306 acres on the northern part of Prospect Island from the federal General Services
36 Administration in January 2010. The project will entail breaching the Prospect Island levees to
37 restore from 460 up to 1,300 acres of tidal marsh, open water habitat, and some upland/riparian
38 habitat. Prospect Island offers a unique opportunity for restoration on a site with comparatively
39 little subsidence, resulting in elevations in the island interior that are assumed suitable for tidal
40 wetlands. The project is fully funded by the SWP through the Fish Restoration Program Agreement.

1 **6.2.12 Chippis Island Restoration**

2 Chippis Island is a 1,000-acre island located in Conservation Zone 11 (Figure 6-2) at the confluence
3 of the Sacramento and San Joaquin Deltas, within the Suisun Marsh ROA. The property is composed
4 of three different tracts of land. On one, some 250 acres have already been set aside for a previous
5 mitigation project. The final two tracts account for roughly 750 acres of land owned by two groups
6 and used primarily for duck hunting. Chippis Island is actively marketed by the landowners as a
7 property for tidal wetland restoration, mitigation, dredge spoils dumping, carbon credits and/or
8 conservation and may be sold as a whole or in two parcels.

9 **6.2.13 Decker Island Restoration**

10 Decker Island is an artificial 658-acre property located in Conservation Zone 10 along the
11 Sacramento River in the Cache Slough ROA. The island was created in the early 1900s when USACE
12 constructed the Deep Water Ship Channel through alluvial fan deposits from the Montezuma Hills.
13 Approximately 473 acres on the western side of the island is privately owned, CDFW owns 34 acres
14 on the north end of the island, and Port of Sacramento owns approximately 140 acres along the
15 eastern portion of the Island. The Port of Sacramento is planning a 110-acre restoration project that
16 would provide habitat to migrating salmon and steelhead.

17 **6.3 Planning, Compliance, and Progress Reporting**

18 The Implementation Office will prepare, on a regular basis, planning documents and implementation
19 reports to demonstrate compliance with the BDCP and its associated authorizations. Under the ESA,
20 HCPs are required to establish monitoring programs to assess the effects of plan implementation on
21 covered species (50 Code of Federal Regulations [CFR] 17. 22(b)(3) and 50 CFR 222. 307(b)(5)). In
22 addition, the USFWS/NMFS Five-Point Policy (65 *Federal Register* [FR] 106, June 1, 2000)
23 recommends that such plans provide annual reporting on matters related to compliance with permit
24 terms and conditions. Similarly, the NCCPA requires that implementation agreements include
25 “provisions for periodic reporting to wildlife agencies and the public for purposes of information
26 and evaluation of plan progress” (Fish & Game Code 2820(b)(7)). The Implementation Office will,
27 over the term of the BDCP, submit various reports and plans to the fish and wildlife agencies that
28 serve the following purposes.

- 29 • Establish that the BDCP is being properly implemented in a manner consistent with the
30 provisions of the Plan, the Implementing Agreement, and the associated regulatory
31 authorizations.
- 32 • Identify the effect of BDCP implementation on covered species, natural communities, and
33 ecosystems, and measure the progress of the conservation strategy in meeting the biological
34 goals and objectives.
- 35 • Document actions taken under the adaptive management and monitoring program (e.g., process,
36 decisions, changes, results, corrective actions).
- 37 • Disclose issues and challenges concerning BDCP implementation, and identify potential
38 modifications or amendments to the BDCP that would increase the likelihood of success.

- 1 • Set out schedule and budgets related to the implementation of actions over 1-year and 5-year
2 timeframes.

3 Throughout the course of implementation, the Implementation Office will prepare and submit to the
4 fish and wildlife agencies the following documents, as described in this chapter.

- 5 • Annual Work Plan and Budget
6 • Annual Water Operations Plan
7 • Annual Progress Report
8 • Annual Water Operations Report
9 • Five-Year Comprehensive Review
10 • Five-Year Implementation Plan

11 The Implementation Office will confer with the Authorized Entity Group, Permit Oversight Group,
12 the Adaptive Management Team, and the Stakeholder Council, during the development of these
13 planning and reporting documents, as appropriate (the composition and roles of these groups are
14 described in Chapter 7, *Implementation Structure*). The totality of these documents will enable the
15 range of interested public and private stakeholders and the general public to assess, on an ongoing
16 basis, the progress and performance of the BDCP toward meeting its biological goals and objectives
17 and to make informed recommendations to the Implementation Office regarding plan
18 implementation. These reports will be available to the public and posted on the BDCP website.

19 **6.3.1 Annual Work Plan and Budget**

20 On an annual basis⁴, the Implementation Office will prepare the Annual Work Plan and Budget for
21 the upcoming implementation year. The work plan will identify planned actions regarding the
22 implementation of conservation measures and the adaptive management and monitoring program.
23 The budget will set out projected expenditures and identify the sources of funding for those
24 expenditures. A final Annual Work Plan and Budget will be completed no later than 1 month prior to
25 the beginning of the implementation year.

26 The Program Manager will solicit input on the draft Annual Work Plan and Budget from the Permit
27 Oversight Group and the Stakeholder Council, and submit the Annual Work Plan and Budget to the
28 Authorized Entity Group for review and approval. The Permit Oversight Group will review the draft
29 Annual Work Plan and Budget and confirm that final decisions of the group or of the individual fish
30 and wildlife agencies, or decisions in which they participated in making, are accurately reflected in
31 the draft, particularly with respect to matters involving adaptive management and biological
32 monitoring and research. A draft of the Annual Work Plan and Budget will be submitted for review
33 and comments to the Authorized Entity Group no later than 3 months, and the Permit Oversight
34 Group and the Stakeholder Council no later than 2 months, prior to the release of the final Annual
35 Work Plan and Budget. A final Annual Work Plan and Budget will be completed no later than 1
36 month prior to the beginning of the implementation year.

37 At a minimum, the Annual Work Plan and Budget will contain the following information.

⁴ The Implementation Office will decide how the planning year will be bounded (e.g., calendar year, federal fiscal year, state fiscal year, or water year).

- 1 • A description of the planned actions (including matters under consideration in the adaptive
2 management process) associated with the implementation of conservation measures (for water
3 operations conservation measures, see Section 6.3.4, *Annual Water Operations Report*) and the
4 entities that will carry out the actions.
- 5 • A description of the planned monitoring actions and the entities that will implement those
6 actions.
- 7 • A description of the anticipated research studies to be undertaken and the entities that will
8 conduct the studies.
- 9 • A budget reflecting the costs of implementing the planned actions.
- 10 • A description of the sources of funds that will be used to support the budget.

11 **6.3.2 Annual Delta Water Operations Plan**

12 On an annual basis, DWR and Reclamation will jointly develop an Annual Delta Water Operations
13 Plan. The first of such plans will be prepared in the year prior to the initiation of operations of the
14 north Delta diversion and conveyance facilities (assumed to be year 9). Subsequent plans will be
15 prepared and finalized no later than 3 months prior to each implementation year. The Annual Delta
16 Water Operations Plan will include the following elements.

- 17 • Operational priorities for both fisheries and water supply for the upcoming year.
- 18 • Expected operations, including consideration of real time operational adjustments, consistent
19 with the criteria established in the water operations conservation measure.
- 20 • Monitoring, data collection, research efforts, and potential adaptive management actions
21 associated with water operations for the upcoming year.

22 DWR and Reclamation will use prior years' Annual Water Operations Reports to inform
23 development of the Annual Delta Water Operations Plan. DWR and Reclamation will seek input from
24 the Implementation Office, Permit Oversight Group, Adaptive Management Team, and the
25 Stakeholder Council regarding the draft Annual Delta Water Operations Plan. DWR and Reclamation
26 will retain final approval authority over the plan. The Permit Oversight Group will, within 30 days of
27 receipt of the draft plan, review the draft plan and confirm that the plan is consistent with the
28 provisions of the BDCP, the Implementing Agreement,⁵ and the associated regulatory
29 authorizations.

30 If the Permit Oversight Group concludes that the draft plan is not consistent with the provisions of
31 the BDCP, it will notify DWR and Reclamation in writing, within 30 days, of the specific reasons for
32 its conclusion. In such event, DWR and Reclamation may modify the plan to the satisfaction of the
33 Permit Oversight Group. If they do not, DWR, Reclamation and the Permit Oversight Group will, in a
34 timely manner, meet and confer in an effort to resolve the matter in dispute. If these parties are
35 unable to reach resolution, the elevation process described in Chapter 7, Section 7.1.7, *Elevation and*
36 *Review of Implementation Decisions*, may be invoked by any of these parties. The Implementation
37 Office will incorporate, for informational purposes, the final Annual Delta Water Operations Plan

⁵ The Implementing Agreement, Appendix 7.A, is a separate legal document, the purpose of which is to establish the obligations of the parties with respect to the implementation of the Plan.

1 into the Annual Work Plan and Budget (Section 6.3, *Planning and Compliance and Progress*
2 *Reporting*).

3 **6.3.3 Annual Progress Report**

4 At the end of each implementation year, the Implementation Office will prepare an Annual Progress
5 Report. The reports will be based upon existing information, data, and analysis. These reports will
6 provide an overview of the Plan activities carried out during the previous implementation year and
7 an assessment of the progress made regarding Plan implementation. Annual reports will be
8 completed within 6 months of the close of the reporting year and will be provided to the Permit
9 Oversight Group for its acceptance.

10 The annual reports will include, among other things, the following types of information.

- 11 • A summary of the Annual Water Operations Report (Section 6.3.4, *Annual Water Operations*
12 *Report*).
- 13 • Documentation of the implementation of natural community conservation measures (i.e.,
14 protection, enhancement, creation, restoration of habitat) in relation to the implementation
15 schedule set out in Section 6.1, *Implementation Schedule*, including the following components.
 - 16 ○ A summary of the implementation actions that have been initiated, are in progress, or have
17 been completed, including information regarding the type, extent, and location of protected,
18 enhanced, and restored natural communities and modeled habitat for covered species.⁶ This
19 summary will identify the covered species that are expected to benefit from these
20 implementation actions. The report will document these actions on an annual and
21 cumulative basis.
 - 22 ○ The status of the conservation lands system and an assessment of the progress toward
23 meeting all land acquisition goals and objectives, including those related to landscape
24 connectivity, natural communities and covered species. This will include details on progress
25 made toward implementation of conservation measures that are not being evaluated for
26 compliance with the rough proportionality standard in that year.
 - 27 ○ A general summary of all land management activities undertaken on conservation lands,
28 including a description of the management issues associated with each preserve unit.
 - 29 ○ Identification of natural community implementation actions that have not been
30 implemented in accordance the implementation schedule (i.e., actions that are either behind
31 or ahead of the implementation schedule) and an explanation for the deviation from the
32 schedule. For actions that are behind the implementation schedule, a suggested schedule or
33 process for completing them will also be included.
 - 34 ○ An assessment of progress toward meeting the biological goals and objectives applicable to
35 all natural community and species conservation measures.
- 36 • Documentation of the implementation of “other stressors” conservation measures (CM12
37 through CM21) in relation to the implementation schedule set out in Section 6.1, *Implementation*
38 *Schedule*, including the following information.

⁶ Species habitat distribution models may change over the course of the Plan as understanding of species’ ecology improves. However, loss of modeled habitat for covered species will be reported based on models at the time of Plan approval to ensure consistent tracking throughout the permit term.

- 1 ○ A summary of the actions that have been initiated, are in progress, or have been completed
2 for each conservation measure, including information related to type, location, and method
3 of implemented actions. This summary will identify the expected benefits to covered species
4 resulting from each action. The report will document this on an annual and cumulative
5 basis.
- 6 ○ An assessment of progress toward meeting the biological goals and objectives applicable to
7 the “other stressors” conservation measures.
- 8 ● A description of the implementation of covered activities and their impacts on natural
9 communities and covered species, including the following items.
- 10 ○ An assessment of nature and extent of the effects of covered activities on covered natural
11 communities and covered species. The report also will contain the following elements.
- 12 ● A brief description of the covered activity and the entity that carried out the covered
13 activity.
- 14 ● The location of a natural community or covered species modeled habitat permanently or
15 temporarily affected.
- 16 ● The identity and location of any known occurrences of covered species affected by the
17 covered activities (e.g., take of covered species).
- 18 ○ A brief description of the type, extent, and location of measures implemented to avoid and
19 minimize the potential effects of covered activities on covered species during the reporting
20 period.
- 21 ○ A summary of the overall level of effects, both beneficial and adverse, over the course of the
22 reporting year and a summation of effects of all prior years of covered activities on natural
23 communities and covered species.
- 24 ● Summary of the results of monitoring and research activities, including descriptions of the
25 following activities.
- 26 ○ Ecosystem/landscape-scale, natural community, and species monitoring activities (as
27 described in Section 3.6, *Adaptive Management and Monitoring Program*, or in monitoring
28 plans developed by the Adaptive Management Team) undertaken during the reporting
29 period and a summary of monitoring results as they relate to the effects and effectiveness of
30 the BDCP.
- 31 ○ Directed research conducted pursuant to the BDCP during the reporting period and a
32 summary of research results to date.
- 33 ● Descriptions of actions taken pursuant to the adaptive management programs.
- 34 ○ Adaptive management decisions made during the reporting period, including the scientific
35 rationale for the action.
- 36 ○ Use of independent scientists or other experts in the adaptive management decision-making
37 processes.
- 38 ○ Changes in the manner in which conservation measures are implemented, based on
39 interpretation of monitoring results and research findings, or other information.

- 1 • An accounting of the funding provided to support implementation activities, including funding
2 used to support the Implementation Office. The accounting will identify the source of the funds,
3 the annual and cumulative expenditures to support implementation activities by cost category,
4 any deviations in expenditures from the annual budget, and other relevant information as
5 appropriate (a detailed budget will be included in the Annual Workplan and Budget [Chapter 6,
6 Section 6.3.1, *Annual Workplan and Budget*]).
- 7 • Descriptions of actions implemented or pending in response to the occurrence of a changed
8 circumstance.
 - 9 ○ Identification of any changed circumstances that have occurred and the potential or actual
10 effect of such changed circumstances on covered species and natural communities.
 - 11 ○ Actions that have been taken in response to a changed circumstance and the effectiveness of
12 those actions in addressing adverse effects on covered species or natural communities.
- 13 • A summary of any administrative changes, minor modifications, or major amendments to the
14 Plan proposed or approved during the reporting period.

15 **6.3.4 Annual Water Operations Report**

16 Beginning in the first year that the proposed north Delta diversions and conveyance become
17 operational, and at the end of each implementation year, the Implementation Office, with input from
18 the Authorized Entities, the state and federal fish and wildlife agencies, and the Stakeholder Council,
19 will prepare an Annual Water Operations Report on the prior water year. Annual reports will be
20 completed within 6 months of the close of the reporting year. The report will be provided to the
21 Permit Oversight Group for its acceptance. The report will include the following components.

- 22 • A summary of the prior year's operations and deliveries, including a comparison of the actual
23 operations with planned operations.
- 24 • Description of the real-time operational adjustments made during the year, including the
25 triggering environmental event, what adjustments to operations were undertaken, and the
26 benefit to aquatic species expected.
- 27 • Description of the extent to which water supply projections in the prior year's Annual Water
28 Operations Plan were met, and if not met, identification of factors affecting water supplies.
- 29 • Recommendations for water operations modifications to support the Plan goal of water supply
30 reliability.
- 31 • An assessment of progress toward meeting all goals and objectives relevant to CM1.
- 32 • Recommendations concerning whether any conservation measures should be altered in light of
33 new information or in response to their effect on advancing biological goals and objectives.
- 34 • Documentation of compliance with the water operation criteria in effect during the reporting
35 period.
- 36 • Documentation and rationale for any deviations from the water operation criteria in effect
37 during the reporting period.

1 **6.3.5 Five-Year Comprehensive Review**

2 At 5-year increments (in year 5, year 10, etc.), the Implementation Office will prepare a Five-Year
3 Comprehensive Review. The purpose of this review is to provide periodic, program-level
4 assessments of the progress made toward achieving the biological goals and objectives. As such, the
5 review will be focused on identifying and evaluating broad ecological trends in the Delta, including
6 covered species abundance, variability, distribution, and population growth rate; ecological
7 processes and stressors such as hydrodynamics, foodwebs, and contaminants; natural community
8 distribution, function, and diversity; natural community restoration extent and functionality; and
9 other relevant measures.

10 The objectives of the Five-Year Comprehensive Review are as follows.

- 11 • To provide an overview of the status of BDCP implementation, including implementation of
12 conservation measures and the progress made toward meeting biological goals and objectives.
- 13 • To assess covered species trends and natural community conditions associated with BDCP
14 implementation relative to overall trends and conditions for covered species and natural
15 communities based on all relevant information.
- 16 • To evaluate the relevance of the various monitoring actions and research projects to the
17 effective implementation of the BDCP.
- 18 • To evaluate the BDCP monitoring program, including the program's capacity to adequately
19 measure the BDCP's progress toward achieving biological goals and objectives.

20 The Five-Year Comprehensive Review will be developed by the Implementation Office in close
21 coordination with the Adaptive Management Team, the Interagency Ecological Program, Delta
22 Science Program, and Independent Science Board. The Implementation Office will work with the
23 Interagency Ecological Program lead scientist and the Delta Science Program Science Manager to
24 consolidate data and information from a range of sources.

25 The Program Manager will solicit input on the draft findings of the Five-Year Comprehensive Review
26 from the Permit Oversight Group and the Stakeholder Council, and submit the review report to the
27 Authorized Entity Group for review and approval. The Implementation Office will complete and
28 submit the Five-Year Comprehensive Review report to the fish and wildlife agencies for their
29 acceptance within 6 months of the close of the 5-year period subject to the review.

30 **6.3.6 Five-Year Implementation Plan**

31 Based on the Five-Year Comprehensive Review, the Implementation Office will prepare a Five-Year
32 Implementation Plan that addresses issue prospectively over a five year period. At a minimum, the
33 Five-Year Implementation Plan will contain the following information.

- 34 • Description of potential changes to program administration.
- 35 • Description of potential adaptive management changes to conservation measures, biological
36 objectives, or the monitoring, and research programs.
- 37 • Summary of the planned actions and schedule, including potential revisions to those actions
38 and schedules, related to the implementation of the conservation strategy.

- 1 • Description of expected long-term and system-wide monitoring actions and anticipated
- 2 research studies.
- 3 • Budget projections reflecting the costs of implementing the planned actions.

4 In years when Five-Year Implementation Plans are prepared, the Annual Workplan and Budget may
5 be included with or prepared separately from the Five-Year Implementation Plan.

6 **6.4 Regulatory Assurances, Changed Circumstances,** 7 **and Unforeseen Circumstances**

8 **6.4.1 Regulatory Assurances**

9 ESA regulations and provisions of the NCCPA provide for regulatory and economic assurances to
10 parties covered by approved HCPs or natural community conservation plans (NCCPs) concerning
11 their financial obligations under a plan. Specifically, these assurances are intended to provide a
12 degree of certainty regarding the overall costs associated with species mitigation and other
13 conservation measures, and add durability and reliability to agreements reached between
14 Authorized Entities and the fish and wildlife agencies. That is, if unforeseen circumstances occur
15 that adversely affect species covered by an HCP or NCCP, the fish and wildlife agencies will not
16 require additional land, water, or financial compensation or impose additional restrictions on the
17 use of land, water, or other natural resources.

18 The assurances provided under the ESA and the NCCPA do not prohibit or restrain USFWS, NMFS,
19 CDFW, or any other public agency from taking additional actions to protect or conserve species
20 covered by an NCCP or HCP. The state and federal agencies may use the variety of tools at their
21 disposal and take actions to reduce the effects of other stressors to ensure that the needs of species
22 affected by unforeseen events are adequately addressed.

23 **6.4.1.1 Regulatory Assurances under the Endangered Species Act—The** 24 **No Surprises Rule**

25 Under the No Surprises rule (63 FR 8859, Feb. 23, 1998), once an incidental take permit has been
26 issued pursuant to an HCP, and its terms and conditions are being fully implemented, the federal
27 government will not require additional conservation or mitigation measures, including land, water
28 (including quantity and timing of delivery), money, or restrictions on the use of those resources
29 (63 FR 8868).⁷ If the status of a species addressed under an HCP unexpectedly declines, the primary
30 obligation for undertaking additional conservation measures rests with the federal government,
31 other government agencies, or other nonfederal landowners who have not yet developed HCPs. The
32 federal fish and wildlife agencies provide the following explanation.

33 Once an HCP permit has been issued and its terms and conditions are being fully complied with, the
34 permittee may remain secure regarding the agreed upon cost of conservation and mitigation. If the
35 status of a species addressed under an HCP unexpectedly worsens because of unforeseen
36 circumstances, the primary obligation for implementing additional conservation measures would be

⁷ The No Surprises rule was promulgated jointly by the Department of the Interior (U. S. Fish and Wildlife Service) and the Department of Commerce (National Marine Fisheries Service).

1 the responsibility of the Federal government, other government agencies, and other non-Federal
2 landowners who have not yet developed an HCP (63 FR 8867).

3 However, the federal fish and wildlife agencies may, in the event of unforeseen circumstances,
4 require additional measures provided they are limited to modifications in conserved natural
5 community areas or to the conservation plan's operating conservation program (i.e., the
6 conservation strategy) for the affected species, and that these measures do not involve additional
7 financial commitments or resource restrictions without the consent of the Permittee (the Permittees
8 will be those Authorized Entities that receive permits from USFWS and NMFS pursuant to Section
9 10. Those Authorized Entities that are covered under permits issued under Section 10 are expected
10 to include DWR and certain SWP and CVP water contractors). These assurances are provided to all
11 HCP Permittees that properly implement their plans. The No Surprises rule, however, does not apply
12 to Reclamation, which will use the BDCP as the basis for a biological assessment to support the
13 issuance of take authorizations from USFWS and NMFS pursuant to Section 7 of the ESA for its
14 actions in the Delta.

15 The assurances provided by the No Surprises rule are not absolute and are tempered by other
16 regulatory provisions of the ESA. The Permit Revocation rule moderates the scope of the No
17 Surprises rule, providing that in instances where a species covered by an HCP is threatened with
18 extinction, assurances may be nullified and NMFS or USFWS may revoke the HCP permit (50 CFR 17.
19 22(b)(8)). The federal fish and wildlife agencies may exercise this authority even if a Permittee is in
20 compliance with the terms and conditions of the permit, provided the permitted activity would
21 appreciably reduce the likelihood of the survival and recovery of the species in the wild (69 FR
22 71723, 71727; December 10, 2004).

23 **6.4.1.2 Regulatory Assurances under the** 24 **Natural Community Conservation Planning Act**

25 Under the NCCPA, CDFW provides assurances to the Permittees (those Plan participants, excluding
26 Reclamation, that receive permits from CDFW pursuant to Section 2835 of the NCCPA)
27 commensurate with the long-term conservation assurances and associated implementation
28 measures of the BDCP. In its determination of the level and term of the assurances to be afforded a
29 Permittee, CDFW takes into account the conditions specific to the plan, including such factors as:

- 30 • the level of knowledge of the status of covered species and natural communities;
- 31 • the adequacy of analysis of the impact of take on covered species;
- 32 • the use of the best available science to make assessments of the impacts of take, reliability of
33 mitigation strategies, and appropriateness of monitoring techniques;
- 34 • the degree of coordination and accessibility of centralized data for analysis and evaluation of
35 the effectiveness of the plan;
- 36 • the sufficiency of mechanisms for long-term funding of all components of the Plan and
37 contingencies;
- 38 • the degree to which a thorough range of foreseeable circumstances are considered and
39 provided for under the adaptive management program; and

- 1 • the size and duration of the plan and the appropriateness of the size and duration of the plan
2 with respect to the quality and amount of data.

3 Based on an evaluation of these factors, CDFW will provide the Authorized Entities with regulatory
4 assurances for the 50-year duration of the Plan.

5 The assurances provided to the entities receiving permits under the NCCPA will ensure that if there
6 are unforeseen circumstances, no additional financial obligations or restrictions on the use of
7 resources will be required of the Permittees without their consent. Specifically, the NCCPA directs
8 that,

9 [i]f there are unforeseen circumstances, additional land, water, or financial compensation or
10 additional restrictions on the use of land, water, or other natural resources shall not be required
11 without the consent of plan participants for a period of time specified in the implementation
12 agreement, unless [CDFW] determines that the plan is not being implemented consistent with the
13 substantive terms of the implementation agreement (Fish & Game Code 2829(f)(2)).

14 However, like the provision in the ESA regulations, the NCCPA requires that CDFW suspend or
15 revoke a permit, in whole or in part, if the continued take of a covered species would jeopardize its
16 continued existence.

17 **6.4.1.3 Obligations of the Parties Pursuant to Regulatory Assurances**

18 The BDCP sets out a comprehensive conservation strategy for the Delta that has been designed to
19 appropriately address the effects of covered activities on the species covered by the Plan and to
20 provide for the conservation and management of those species and the natural communities upon
21 which they depend. To accomplish these goals, the BDCP participants will undertake a range of
22 actions involving substantial alterations to water conveyance infrastructure and water management
23 regimes in combination with extensive restoration of habitat and measures to reduce the impacts of
24 various biological stressors.

25 A number of provisions of the BDCP are intended to maximize the effectiveness of the Plan and to
26 minimize risks associated with uncertainty. Those provisions include the establishment of an
27 adaptive management and monitoring program, which provides a mechanism for significant
28 midcourse corrections to the Plan's conservation strategy should new information support such
29 changes. Similarly, the changed circumstance provisions of the BDCP further increase the capacity of
30 the Plan to adjust to certain events as they occur during the course of implementation.

31 The funding levels set out in Chapter 8, *Implementation Costs and Funding*, represent the financial
32 resources that are considered necessary to properly implement the BDCP throughout the term of
33 the permits. Chapter 8 further reflects the extent of the financial obligations of the Authorized
34 Entities and the anticipated commitments of state and federal governments with respect to the
35 implementation of the BDCP. If, during the course of Plan implementation, resources beyond those
36 set out in Chapter 8 were considered to be desirable, such additional resources could be made
37 available but only in a manner consistent with the regulatory assurances provided for under the ESA
38 and the NCCPA.

39 **6.4.2 Changed Circumstances**

40 Ecological conditions in the Delta are likely to change as a result of future events and circumstances
41 that may occur during the course of the implementation of the BDCP. This section identifies changes

1 in circumstances that are reasonably foreseeable and that could adversely affect reserve system
2 lands or waters in the Plan Area, consistent with the “changed circumstances” provisions of ESA
3 regulations and in the NCCPA. To ensure successful implementation of the conservation strategy, the
4 Plan further sets out measures designed to respond to these anticipated future changes.

5 In the context of the ESA, changed circumstances are defined as “changes in circumstances affecting
6 a species or geographic area covered by a conservation plan that can reasonably be anticipated by
7 plan developers and the [USFWS and NMFS] and that can be planned for.” The NCCPA similarly
8 defines changed circumstances as “reasonably foreseeable circumstances that could affect a covered
9 species or geographic area covered by the plan” (50 CFR 17. 3, 50 CFR 222. 102, and Fish & Game
10 Code 2805(c).

11 This section identifies the specific changed circumstances that can reasonably be anticipated in the
12 Plan Area during the course of plan implementation and that may compromise the effectiveness of
13 the implementation actions set out in the BDCP. The section further describes the range of
14 responses that will be implemented through the BDCP to adequately address such events and their
15 potential to prevent or impede the BDCP from achieving the Plan’s biological objectives. The specific
16 approaches and steps related to many of the planned responses largely will be developed and
17 implemented through the adaptive management and monitoring program (Section 3.6, *Adaptive
18 Management and Monitoring Program*). However, for certain changed circumstances, responsive
19 actions will fall outside the scope of the adaptive management and monitoring program; these
20 actions are specifically described in this section.

21 For each changed circumstance, the cost of implementing the planned responses was accounted for
22 in the budget established for the BDCP (Chapter 8, *Implementation Costs and Funding Sources*).

23 **6.4.2.1 Process to Identify Changed Circumstances**

24 The Implementation Office or the Permit Oversight Group may identify the onset of a changed
25 circumstance, using information obtained from system-wide or effectiveness monitoring, scientific
26 study, or information provided by other sources. Once the Implementation Office or the Permit
27 Oversight Group has become aware that a changed circumstance has occurred or is likely to occur,
28 they will take immediate steps to investigate and confirm the event. If a changed circumstance
29 appears to have occurred, the Implementation Office will notify other appropriate parties of such
30 circumstances, including the Authorized Entities, Permit Oversight Group, and the Stakeholder
31 Council.

32 After documenting the occurrence of a changed circumstance, the Implementation Office will
33 determine specific responsive actions that are consistent with the requirements set out in this
34 section and develop a schedule for their implementation. The Implementation Office will confer with
35 the fish and wildlife agencies regarding the details of the response and a timeframe for
36 implementation. For actions implemented through the adaptive management and monitoring
37 program, the decision-making process described in Section 3.6, *Adaptive Management and
38 Monitoring Program*, will be used. After implementing these actions, the Implementation Office will
39 monitor their effectiveness and report the associated results and findings through the annual
40 reporting process.

1 **6.4.2.2 Changed Circumstances Related to the BDCP**

2 The following changed circumstances are described and will be addressed in implementation if they
3 occur.

- 4 • Levee failures
- 5 • Flooding
- 6 • New species listing
- 7 • Drought
- 8 • Wildfire
- 9 • Toxic or hazardous spills
- 10 • Nonnative invasive species or disease
- 11 • Climate change
- 12 • Vandalism

13 The Implementation Office will respond to all changed circumstance events that meet the changed
14 circumstances criteria as defined in the following sections. Implementation of significant new
15 projects or regulations that may affect the Delta are not considered changed circumstances.⁸

16 **6.4.2.2.1 Levee Failures**

17 **Nature of Changed Circumstance**

18 During the course of implementation, levee failures may occur in the Plan Area, and such failures
19 may compromise or eliminate the benefits provided by some reserve system lands or by some
20 conservation measures. Levees in the Delta sometime fail as a result of events or conditions such as
21 earthquakes, flooding, and structural inadequacy (also known as “sunny day events”) (California
22 Department of Water Resources 2009, 2011). All levee failures are considered a changed
23 circumstance under the BDCP if the failure meets any of the following criteria and is within the
24 limits described in the following paragraphs.

- 25 • Diminishes significantly the function of reserve system lands, as jointly determined by the
26 Implementation Office and the fish and wildlife agencies.
- 27 • Precludes implementation of conservation measures.
- 28 • Impedes the implementation of water operations conservation measures.

29 Given the current and anticipated future state of the Delta, all reserve system lands and other
30 resources conserved by the plan that are currently or will be protected by a levee are susceptible to
31 the consequences of levee failures due to the influence of external events on levees. It is foreseeable
32 that several natural community types in the reserve system could be affected by this changed
33 circumstance. These include managed wetlands and cultivated lands in Conservation Zones 1 and 11
34 (up to 9,000 acres) and other natural seasonal wetlands, nontidal permanent freshwater emergent
35 wetlands, and nontidal perennial aquatic in Conservation Zones 2 and 4 (up to 400 acres total). In

⁸ The response of the Implementation Office to significant new water projects or regulations that may affect the Delta is described in Section 6.4.4, *BDCP Relationship to Significant Future Projects or Governmental Regulations*.

1 addition, all natural community enhancement or restoration in levee-protected floodplains will be
2 vulnerable to flooding caused by a levee failure. Natural community enhancement or restoration in
3 floodplains could be damaged if levee failure occurs before riparian plantings become established.
4 Finally, a single levee failure event could temporarily impede implementation of water operation
5 conservation measures either in the north or south Delta, but not both simultaneously. The
6 Implementation Office will implement corrective actions for all changed circumstance events that
7 meet this definition.

8 **Rationale**

9 Different types of events are likely to cause different kinds of levee failures, which result in different
10 types of effects. A single external event may cause the failure of one or more levees, causing the
11 flooding of one or more islands or tracts in tidally influenced areas. An earthquake or large peak
12 flow event may result in multi-levee failure and multi-island or multi-tract flooding (California
13 Department of Water Resources 2009). A sunny day event is more likely to cause the failure of a
14 single levee and to affect nearby areas (California Department of Water Resources 2009). As such,
15 levee failures hold the potential to cause widespread or localized flooding, which could extend to
16 multiple islands or be confined to a levee subsection.

17 Available historical data suggest that external events will likely occur during the permit term that
18 cause levee failures. Since 1900, an average of 1.31 failures per year have occurred, excluding
19 earthquakes and Suisun Marsh (historical records in Suisun Marsh are incomplete). Looking at
20 trends in more recent years (1950 through 2006) that are more likely to represent future risks,
21 74 storm-related levee failures (1.36 per year) and 8 sunny-day failures (0.10 failures per year in
22 the Delta and 0.04 per year in Suisun Marsh) have occurred in the Plan Area (California Department
23 of Water Resources 2008).

24 In most of the Delta, a levee failure causes the flooded area to become tidally influenced. The depth
25 and extent of the flooded area will change with the tides. One or more levee failures could affect the
26 volume of water that moves in and out of the area during the tidal cycle (i.e., the tidal prism).
27 Multiple levee failures could expand the tidal prism enough to cause the high tide to be lower and/or
28 the low tide to be higher than normal. Such changes, if not reversed by levee repair, could alter the
29 distribution of tidally influenced natural communities, all of which are sensitive to small variations
30 in depth, frequency, and duration of tidal inundation. Over a period of years, the affected natural
31 communities will reach equilibrium with the new tidal range, but the end result will be changes in
32 the distribution and acreage of each tidally influenced natural community.

33 There are a number of compounding effects that make it difficult to use historical data to accurately
34 predict future events. Both the likelihood of failure and locations within the reserve system or water
35 system operations vulnerable to levee failure need to be considered. Likelihood of failure is
36 influenced by external events, levee condition (e.g., age, location, height, construction), current site
37 characteristics (e.g., geology, groundwater conditions, tidal conditions), and changing conditions
38 (e.g., amount of water, sea level rise, earthquakes). Locations vulnerable to failure include current
39 and future locations below sea level (e.g., subsided islands/tracts). To that end, the changed
40 circumstances analysis looks at which areas of the reserve system or water system could be affected
41 by a levee failure.

42 Many conservation measures protecting or restoring natural communities will be implemented in
43 areas that are not within tidal elevation ranges, but some of these measures will occur in areas
44 protected by and behind levees. Failure of those levees may compromise the function of these

1 protection and restoration actions. Identifying the natural communities vulnerable to this impact
2 depends on the final configuration of levee removal or relocation projects, but these communities
3 may include managed wetlands and cultivated lands in Conservation Zones 1 and 11, as well as
4 other natural seasonal wetlands, nontidal permanent freshwater emergent wetlands, and nontidal
5 perennial aquatic communities in Conservation Zones 2 and 4. If an adjacent levee is breached, the
6 function of these protected or restored communities could be diminished. If levee repair does not
7 occur, these areas may change to natural communities associated with floodplains, such as
8 valley/foothill riparian, grassland, alkali seasonal wetland, nontidal freshwater perennial emergent
9 wetland, or seasonally flooded cultivated lands.

10 Levees protect infrastructure required for implementation of water operations conservation
11 measures. The dual conveyance system will allow operational flexibility if levee failure impedes
12 water withdrawals from the north Delta or south Delta intakes; however, increased withdrawals
13 may be required from the undamaged intakes, provided those operations do not violate the required
14 pumping criteria in effect at that time. Levee failure could also restrict water delivery to the Yolo
15 Bypass and the level of flooding required for conservation measure implementation will be difficult
16 to maintain. Because of the distance separating the north Delta and south Delta facilities, it is
17 foreseeable that levee failure will impede water operations in the north Delta or south Delta, not
18 both simultaneously. Levee repair may be required to ensure implementation of water operations
19 conservation measures.

20 Levees also protect floodplains adjacent to waterways (e.g., along the San Joaquin River). Breaching
21 of these levees is possible during flood events in the rainy season. The effects of such flooding will
22 likely be temporary because water will ultimately recede. Seasonally inundated floodplain
23 restoration, channel margin enhancement, or riparian natural community restoration may occur in
24 levee-protected floodplains; however, the natural communities created by these efforts are adapted
25 to and therefore resilient to flooding. They are shaped by their proximity to streams and are
26 maintained by seasonal flooding in winter and spring and by drought in summer. Diminished
27 function of these natural communities from levee failures is not anticipated; however, new riparian
28 plantings may need to be replaced if levee failure results in their destruction.

29 **Planned Responses**

30 The two foreseeable scenarios described below involve the failure of levees that result in either the
31 loss or degradation of natural community or create an impediment to the proper implementation of
32 the conservation strategy, including the operations of the SWP and CVP. The remedial actions that
33 will be undertaken to address such circumstances are described for each scenario. The scenarios
34 cover those events that occur as a result of failures of BDCP levees and those that occur as a result of
35 failure of non-BDCP levees.

36 **Failure of levees constructed as part of the BDCP (BDCP-related levees).** BDCP-related levees
37 will be designed and constructed to standards required by USACE and the jurisdictional flood
38 management authority, to minimize the risk of failure. In the event of the failure of a BDCP-related
39 levee, the Implementation Office will either repair the breached levee or undertake other measures
40 that produce equivalent benefits for covered species and natural communities affected by the event.
41 These measures will be consistent with the process and schedule identified in this section.

42 The Implementation Office will be responsible for undertaking, in a timely manner, an assessment of
43 the levee failure, which will include the following actions.

- 1 • An evaluation of the effects of the failure on the covered species and natural communities
2 addressed by the BDCP.
- 3 • A description of the proposed remedial actions.
- 4 • A process and schedule for their implementation.

5 The Implementation Office will evaluate the affected site to determine whether biological conditions
6 for any of the covered species have been degraded and what, if any, feasible and reasonably
7 achievable corrective actions are necessary.

8 Corrective actions could occur at the affected site or at another location. Actions taken on site will
9 likely include the repair of the levee, restoration of the affected site, or equivalent measures.

10 In most cases, levees will need to be repaired or replaced to maintain permit compliance. However,
11 in cases where the levee does not need to be fixed, alternative sites may be protected or restored at
12 lower cost and effort than required for levee replacement. Offsite corrective actions will require a
13 different process and timeline than onsite actions. Offsite natural community restoration
14 replacement will require the identification of a site suitable for a replacement project. The
15 Implementation Office will identify and oversee the acquisition of an appropriate property and
16 manage the planning, design, and permitting, if any, necessary to effectuate the project.

17 **Failure of levees not constructed as part of a covered activity (non-BDCP levees).** The
18 Implementation Office will also be responsible for implementing remedial measures associated with
19 the failure of non-BDCP levees when those failures adversely affect natural communities protected
20 through covered activities, including by interfering with the operations of the projects, and will seek
21 funding or reimbursement costs from the appropriate responsible entity. A similar process to that
22 identified above for failure of BDCP-constructed levees will be followed. However, the schedule for
23 remedial action implementation will likely be longer because of the necessary involvement of third
24 parties with responsibility for the affected levee.

25 Several responsible flood management entities in the Plan Area manage non-BDCP levees. These
26 entities include USACE and local water districts. State and federal levees in the Delta that are at risk
27 of failure or that otherwise require repair or replacement are covered by the levee repairs program
28 under Section 821 of the Disaster Preparedness and Flood Prevention Bond Act of 2006
29 (Proposition 1E). Local agencies that maintain levees may seek funding assistance through the local
30 levee grant program, which provides for cost-sharing between the state and local agencies for work
31 done on lands deemed critical by DWR.

32 In the event of a non-BDCP levee breach, the Implementation Office will evaluate the affected site to
33 determine whether covered species or their habitat have been adversely affected, or whether the
34 breach had the potential to adversely affect aquatic habitats used by covered species. Adverse
35 effects could include reduced benefits to covered species from diminished conservation measures.
36 The site of the levee failure will be evaluated to allow adequate time for the Implementation Office
37 to contact and coordinate with the responsible flood management entity. For example, the
38 Implementation Office may need to obtain permission from the local entity to access the property.

39 The Implementation Office will follow the same procedure for site assessment as it will for a BDCP-
40 related levee failure. The Implementation Office will also coordinate with the responsible flood
41 management entity to ensure that the responsible entity repairs the levee. The responsible flood
42 management entity will therefore assume financial responsibility for the costs of the remedial

1 action, including for the levee repair work and the restoration of the affected reserve system lands.
2 However, to ensure that the repair work occurs quickly and permit compliance is not compromised,
3 the Implementation Office may need to assist the responsible local flood management entity (e.g.,
4 provide funding to be reimbursed or complete repairs and be reimbursed).

5 **6.4.2.2 Flooding**

6 **Nature of Changed Circumstance**

7 Any flood events in the reserve system caused by excessive precipitation, or floods of a magnitude
8 up to a 200-year level, will be considered a changed circumstance if the flooding is determined to
9 cause permanent loss of the ecological benefits provided by conservation measures. The
10 Implementation Office will implement corrective actions for all changed circumstance events that
11 meet this definition.

12 **Rationale**

13 Flooding is a natural event in stream systems, having both beneficial and detrimental effects on
14 natural communities. Seasonally inundated floodplain restoration, channel margin enhancement, or
15 riparian natural community restoration are resilient to flooding because they may occur in
16 floodplains. These communities are shaped by their proximity to streams and are maintained by
17 seasonal flooding in winter and spring and by drought in summer. Any adverse effects of flooding
18 will likely be temporary because flood waters will ultimately recede. However, severe flooding along
19 stream channels with new riparian plantings could destroy restoration efforts.

20 Damage or destruction of facilities and infrastructure constructed to implement the conservation
21 strategy due to flooding is not expected. Facilities and infrastructure will be constructed outside of
22 floodplains or to withstand a severe peak flow event.

23 **Planned Response**

24 The conservation strategy includes measures to reduce the risk of natural flooding of certain reserve
25 system lands. Still, remedial measures may be necessary if flooding causes permanent loss of natural
26 community values created through covered activities. The remedial measure implemented in
27 response to a flood event less than the 200-year event will be to repair or replace the restoration
28 site once flood water recedes, consistent with the conservation strategy described in Chapter 3,
29 *Conservation Strategy*, and any permits acquired for the original project (e.g., USACE permit).

30 **6.4.2.3 New Species Listings**

31 **Nature of the Changed Circumstance**

32 USFWS, NMFS, or CDFW may list additional species that occur in the Plan Area as threatened or
33 endangered under the ESA or the California Endangered Species Act (CESA).⁹ In the event that a fish
34 and wildlife agency lists a species not covered by the BDCP, the provisions of this changed
35 circumstance will be triggered. The Implementation Office will implement corrective actions for all
36 changed circumstance events that meet this definition. A new species listing of a covered species

⁹ A species designated by the State of California as a candidate for listing also receives regulatory protection during the review of the candidacy. As such, the provisions set out in this changed circumstance will apply to state-designated candidate species.

1 will not trigger this changed circumstance because the Plan already anticipates such actions by
2 providing for the conservation of each covered species. Thus, take coverage for the newly listed
3 covered species will be automatic.

4 **Planned Response**

5 Upon a new listing of a species (not covered by the BDCP) under state or federal endangered species
6 laws, the Implementation Office will undertake the following measures.

- 7 • Evaluate the potential effects of covered activities on the newly listed species and conduct an
8 assessment of the presence of suitable habitat in areas of potential effect.
- 9 • Implement measures to avoid effects on the newly listed species until such time as take
10 authorization for the newly listed species has been secured, either by amending the Plan to
11 include the newly listed species as a covered species, or by securing a new and separate take
12 authorization.

13 In the event that a species not covered by the BDCP becomes listed as threatened or endangered, is
14 designated as a candidate species, or is proposed or petitioned for listing, the Implementation Office,
15 on behalf of the Authorized Entities, may request that the appropriate fish and wildlife agency add
16 the species to the relevant take authorizations issued pursuant to the BDCP. In determining whether
17 to seek take coverage for the species, the Implementation Office will consider, among other things,
18 whether the species is present in the Plan Area, whether the covered activities could result in
19 incidental take of the species, and whether the existing conservation measures benefit the species
20 and avoid and minimize effects of covered activities on the species. If incidental take coverage is
21 sought, the BDCP and its authorizations will be amended. Alternatively, the Implementation Office,
22 on behalf of the Authorized Entities, could seek new and separate take authorizations. The
23 procedures for plan modifications and amendments are described in Section 6.5, *Changes to the Plan*
24 *or Permits*.

25 **6.4.2.2.4 Drought**

26 **Nature of Changed Circumstance**

27 Changed circumstances related to drought are defined as two or more successive water years with
28 75% or less of the median inflow. This changed circumstance covers only drought-related impacts in
29 the terrestrial reserve system. For the aquatic natural communities, BDCP modeling has taken into
30 account the historical and expected future frequencies of short- and long-term droughts, and the
31 effects associated with those drought conditions have been addressed in the conservation strategy
32 for aquatic resources. Therefore, the expected effects of droughts on the aquatic natural
33 communities are not considered a changed circumstance.

34 **Rationale**

35 Drought is a characteristic of Mediterranean climate systems to which species and natural
36 communities have adapted. Nonetheless, a prolonged drought could adversely affect the reserve
37 system, especially new restoration plantings and enhanced or created populations of covered plants
38 that have yet to become established. This changed circumstance has been defined to reflect the type
39 of drought conditions and the frequency of such events that are expected to occur within the Plan
40 Area. Droughts that do not meet this definition are considered unforeseen circumstances.

1 Nine droughts (two or more successive water years with 75% or less of the median inflow) have
2 occurred over the last 100 years in northern California: 1912–13, 1918–20, 1923–24, 1929–34,
3 1947–50, 1959–61, 1976–77, 1987–92, and 2007–2010 (California Department of Water Resources
4 2010). The longest droughts in the historic record lasted six years (1929–34 and 1987–92). Over
5 this 101-year period of record (1912–2012), droughts occurred over 32 years, or 32% of the time.
6 Climate change is expected to increase the frequency and duration of droughts due to reduced
7 average spring rainfall, higher variability in rainfall, and reduced winter snowpack. However, the
8 extent to which the frequency and magnitude of drought conditions are likely to increase is not fully
9 understood.

10 Based on historical data and conservative application of climate change predictions, changed
11 circumstances related to drought will be further defined as no more than six drought events over
12 the course of the 50-year permit term (four or five droughts would be expected in 50 years based on
13 the historical record alone). Of the six droughts, one is anticipated to be up to 8 years in duration (2
14 years longer than the maximum length experienced historically). Drought events that occur after six
15 prior occurrences during the term of the permit or any drought event with a duration of more than 8
16 years will be considered unforeseen circumstances and remedial actions in response to such events
17 for the terrestrial natural communities will not be addressed through the BDCP.

18 As described in Appendix 5.C, *Flow, Passage, Salinity, and Turbidity*, Attachment A, *CALSIM and DSM2*
19 *Modeling*, all hydrologic modeling incorporates the 82-year historic record of water years in
20 California. Hydrologic modeling was adjusted to account for climate change related effects in the
21 early- and late-long term periods, as described in Appendix 5.A.2, *Climate Change Approach and*
22 *Implications for Aquatic Species*. Through this approach, the expected effects of droughts on the
23 aquatic natural communities are taken into account in the conservation strategy and therefore are
24 not considered a changed circumstance.

25 **Planned Response**

26 The reserve system will be monitored on an ongoing basis, minimizing the risk of damage to or loss
27 of restored natural communities due to prolonged drought. Should these terrestrial natural
28 communities or restoration sites in the reserve system be adversely affected as a result of a drought-
29 related changed circumstance, the Implementation Office will assess the drought damage and
30 initiate the following remedial measures within 6 months of damage or loss.

- 31 ● Prepare a damage assessment report.
- 32 ● Identify and implement actions to remediate restoration sites (e.g., provide supplemental
33 irrigation, install replacement plantings). Outside restoration sites, identify and implement
34 actions to restore or improve damaged habitat for terrestrial covered species (e.g., provide
35 supplemental irrigation for vegetation, provide temporary artificial water sources for species
36 that depend on surface water).

37 **6.4.2.2.5 Wildfire**

38 **Nature of Changed Circumstance**

39 Wildfire will be considered a changed circumstance in the event that any number of fires not
40 prescribed by the Implementation Office (i.e., as part of conservation strategy implementation in
41 conservation lands) damages or destroys sufficient amounts of vegetation to substantially degrade
42 the intended natural community functions of conservation lands for covered species. The scope of

1 the remedial actions required for a single event will be limited to an area of no greater than 1,300
2 acres of reserve system lands in Conservation Zones 1, 8, or 11 because of the expected
3 configuration and land cover type composition of these lands. This limit corresponds to the expected
4 limit in size of a wildfire in any of these three zones. The remedial actions will be limited to no more
5 than 1,300 acres. The Implementation Office and the fish and wildlife agencies will jointly determine
6 the nature and extent of habitat loss resulting from the fire. The Implementation Office will
7 implement corrective actions for all changed circumstance events that meet this definition.

8 **Rationale**

9 Fire-adapted natural communities in conservation lands include grassland and inland dune scrub,
10 totaling at least 8,000 acres in the conservation lands. Other natural communities in the
11 conservation lands are not fire-adapted or fire-prone because of their low fuel loads and high
12 moisture context (e.g., cultivated lands, wetlands, riparian areas). Wildfire in grassland or inland
13 dune scrub is unlikely to substantially degrade these communities because they are both fire-
14 adapted, early-successional natural communities. Because of the layout of conservation lands, the
15 distribution of the fire-prone communities, and the presence of many waterways that serve as
16 barriers to fire, it is likely that a single wildfire event will affect a contiguous area no greater than
17 1,300 acres in Conservation Zones 1, 8, or 11 (i.e., a single fire of no more than 1,300 acres in any of
18 these three zones).

19 **Planned Response**

20 In the event of a fire in conservation lands, the Implementation Office will notify the fish and wildlife
21 agencies of the fire event and conduct a preliminary assessment of the likely effects of the fire on
22 covered species and reserve system lands of a size that is defined above as foreseeable. This
23 information will be used to make an initial determination of whether a changed circumstance has
24 occurred. In most cases, a wildfire will be deemed a natural event that has neutral or beneficial
25 effects on a fire-adapted community. If a changed circumstance is determined to exist, the
26 Implementation Office will implement a series of remedial measures. First, the Implementation
27 Office will conduct a more detailed assessment within 3 months of the event to identify appropriate
28 post-fire restoration and rehabilitation actions, if any. Such actions, which may include natural
29 community restoration, nonnative invasive species control, or erosion management, will be
30 undertaken to ensure reestablishment of covered plants and other native vegetation through active
31 or passive means, as appropriate. In addition, appropriate erosion control structures and
32 applications (e.g., seeding) will be put in place before the upcoming rainy season.

33 The Implementation Office will also implement a post-fire monitoring plan for a 2-year period
34 following the fire. If over the course of the monitoring period it is determined that vegetation was
35 not recovering sufficiently in the burned area to reestablish the original functions of the affected
36 natural community, the Implementation Office will develop and implement a natural community
37 restoration plan to restore natural community functions of the affected areas.

38 **6.4.2.2.6 Toxic or Hazardous Spills**

39 **Nature of Changed Circumstance**

40 Toxic or hazardous spills resulting from a BDCP action will be considered a changed circumstance if
41 the spill of chemicals into Delta waters or into a protected or restored aquatic natural community
42 could substantially and adversely affect habitat functions for a covered species, as jointly

1 determined by the Implementation Office and the fish and wildlife agencies. The scope of the
2 remedial actions required will be limited to an area of no greater than 4,000 acres of reserve system
3 lands, inclusive of restoration sites. The Implementation Office will implement corrective actions for
4 any event that meets this definition.

5 **Rationale**

6 A single spill of toxic or hazardous materials could not affect the entire reserve system (i.e.,
7 protected and restored lands and waters) because the system is noncontiguous and dispersed. The
8 parameters defining this changed circumstance reflect the amount of land that will ultimately be
9 protected in the reserve system that may be vulnerable to a spill event. The largest contiguous area
10 of potential restoration occurs in Conservation Zone 11. Conservation targets in Zone 11 include
11 Suisun Marsh ROA tidal restoration (7,000 acres), and additional restoration and protection that is
12 assumed to be 9,000 acres, for a total estimated size in Suisun Marsh of 16,000 acres. A toxic or
13 hazardous spill is not expected to affect the entire reserve in this area, so the changed circumstance
14 threshold represents 25% of the reserve system land base in Conservation Zone 11. Only spills that
15 meet this criteria will be considered a changed circumstance under the BDCP.

16 **Planned Responses**

17 There are existing local, state, and federal statutory frameworks that dictate the process and
18 approach to the cleanup of toxic and hazardous waste. The U. S. Environmental Protection Agency
19 (EPA) is the lead federal agency responsible for the enforcement of federal regulations associated
20 with hazardous materials. The primary legislation governing hazardous materials are the
21 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC
22 Section 9601 *et seq.* 1980); the Resource Conservation and Recovery Act (RCRA) (42 USC Section
23 6901 *et seq.* 1976); and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

24 The cleanup of toxic or hazardous spills is governed by CERCLA. CERCLA provides for federal
25 funding to support the cleanup of uncontrolled or abandoned hazardous waste sites, accidents,
26 spills, discharges, and other emergency releases of pollutants and contaminants into the
27 environment. Through CERCLA, EPA has the authority to seek out those parties responsible for any
28 hazardous release and assure their cooperation in the cleanup. The California equivalent to CERCLA
29 is the California Hazardous Substance Account Act (Division 20 of the Health and Safety Code,
30 Chapter 6.8). This act requires past and present owners and operators to assume liability for the
31 remediation of hazardous waste sites within the State of California. At the local level, the Unified
32 Program consolidates, coordinates, and makes consistent the administrative requirements, permits,
33 inspections, and enforcement activities of six environmental and emergency response programs.
34 The California Environmental Protection Agency (CalEPA) and other state agencies set the standards
35 for their programs, and local governments implement the standards. These local implementing
36 agencies are called Certified Unified Program Agencies. All remedial actions implemented by the
37 Implementation Office or other responsible parties will be carried out in a manner consistent with
38 the existing statutory framework.

39 The conservation strategy includes implementation of best management practices to avoid or
40 minimize adverse effects from contaminant spills on covered species and natural communities that
41 could result from covered activities (*CM22 Avoidance and Minimization Measures*). This includes the
42 development and implementation of a hazardous materials management plan. The plan will include
43 appropriate practices to reduce the likelihood of a spill of toxic chemicals and other hazardous
44 materials during construction. A specific protocol for the proper handling and disposal of materials

1 will be established before construction activities begin and will be enforced by DWR. All work will
2 be performed in accordance with the rules and regulations pertaining to safety established by the
3 California Division of Industrial Safety. The avoidance and minimization measures that will be
4 implemented through this framework are detailed in Appendix 3.C, *Avoidance and Minimization*
5 *Measures*. For any spill event caused by a covered activity, the Implementation Office will
6 immediately coordinate its response with CDFW's Office of Oil Spill Prevention and Response, the
7 Regional Water Quality Control Board, and other state and federal regulatory entities as appropriate
8 to the nature of the spill event to curtail the immediate spread of the spill and minimize its effects.

9 As soon as practicable, or as otherwise directed by the aforementioned regulatory entities, the
10 Implementation Office will identify and undertake management measures sufficient to remediate
11 the effects of the toxic substance on covered species and affected habitats (e.g., removal or isolation
12 of the material) and restore the ecological functions of the affected habitat. Onsite habitat
13 restoration or enhancement will be initiated, to the extent practicable, within 1 year of the spill.

14 If the affected habitat areas cannot be practicably and effectively restored, the Implementation
15 Office will identify and implement measures to contain the ecological effects of the spill and either
16 compensate for the loss of habitat functions at other locations or implement alternative
17 conservation measures (e.g., expanded or additional contaminant reduction measures) that provide
18 equivalent or greater ecological benefits to the affected covered species. Offsite habitat restoration
19 or enhancement will be initiated, to the extent practicable, within 2 years of the spill to allow for an
20 appropriate site to be identified and protected, if necessary.

21 If a spill event has not been caused by a covered activity, the Implementation Office will coordinate
22 with responsible regulatory agencies and the parties responsible for the spill event (responsible
23 regulatory agencies and parties). The responsible regulatory agencies and parties will assume
24 financial responsibility for the costs of remedial action, including spill cleanup and restoration of
25 affected reserve system lands. However, to ensure that the spill cleanup occurs quickly, the
26 Implementation Office may need to assist the responsible regulatory agencies and parties. The
27 Implementation Office will ensure that responsible regulatory agencies and parties take immediate
28 steps to contain the spill and minimize its impact on affected species and habitats. Within 3 months
29 of spill event, the Implementation Office will work with the responsible regulatory agencies and
30 parties to complete an assessment of the spill site and provide that assessment to the fish and
31 wildlife agencies for review and concurrence (as per the process identified in Section 6.4.2.2.1, *Levee*
32 *Failures*). On the basis of this assessment, the Implementation Office will coordinate with
33 responsible regulatory agencies and parties to identify the measures that will need to be funded
34 and/or undertaken by the responsible parties to adequately remediate the effects of the spill and
35 restore the ecological functions of the affected habitat for covered species.

36 **6.4.2.2.7 Nonnative Invasive Species and Disease**

37 **Nature of Changed Circumstance**

38 The introduction and spread of a new disease or a new nonnative invasive species will be
39 considered a changed circumstance if the Implementation Office or the Permit Oversight Group
40 confirm the following conditions.

- 41 • The new disease or invasive species has the potential to adversely affect a covered species.

- 1 • The new disease or invasive species is likely to prevent the achievement of or seriously threaten
2 the ability of the Plan to meet one or more biological objectives.
- 3 • There are practical control methods available that could reduce these threats to the covered
4 species.
- 5 • The control measures would not have adverse effects on other covered species beyond that
6 evaluated in the effects analysis.

7 **Rationale**

8 Diseases or pathogens could be introduced into the Plan Area and adversely affect covered species.
9 Examples of diseases that may threaten covered species in the Plan Area include chytrid fungus and
10 ranaviruses, both of which could affect California red-legged frog or California tiger salamander
11 (Miller et al. 2011; U.S. Fish and Wildlife Service 2002; 69 FR 48570–48649). It is unknown whether
12 these diseases are a problem for populations in the Plan Area due to a lack of surveys. In general, the
13 effects of diseases on the survival and reproduction of covered species are poorly known.

14 An example of a disease that has affected a natural community near the Plan Area is sudden oak
15 death. The disease, first identified in 1995, has since spread to 12 coastal California counties and
16 killed tens of thousands of trees. Research shows that coast live oaks and black oaks are highly
17 susceptible to this disease (Rizzo and Garbelotto 2003). Sudden oak death is caused by the pathogen
18 *Phytophthora ramorum* and is a serious threat to oak woodlands and mixed evergreen forests in
19 northern California. California bay, buckeye, and maple host the pathogen without being killed by it.
20 Valley oak, which is the most abundant oak in the Plan Area, has not shown symptoms of the
21 pathogen (nor has blue oak).

22 Nonnative invasive species are a global in nature and adversely affect covered species and natural
23 communities both inside and outside of the Plan Area. All of the natural communities represented in
24 the Plan Area currently support a large number of nonnative invasive species, including plants,
25 amphibians, fish, and invertebrates. The conservation strategy includes many measures to identify,
26 treat, and, if possible, eradicate nonnative invasive species in the Plan Area in aquatic and terrestrial
27 natural communities. These measures were designed to treat nonnative invasive species currently
28 known in the Plan Area and that have widespread adverse effects on the covered species and natural
29 communities. However, it is foreseeable that new nonnative invasive species will appear in the Plan
30 Area during Plan implementation. Northern pike, quagga mussel and zebra mussel, represent some
31 of the principal invasive species risks in the Delta. If these or other invasive species were to become
32 widespread, they could cause harmful effects on covered species or natural communities not
33 considered by the effects analysis or the conservation measures. Nonnative invasive species or
34 diseases that are unintentionally introduced and spread in the Plan Area as a result of conservation
35 actions (e.g., restoration actions that create conditions for colonization of new nonnative invasive
36 species) will be the responsibility of the Authorized Entities, through the Implementation Office, to
37 control and eradicate, if practicable.

38 Nonnative invasive species or diseases that are introduced and spread in the Plan Area independent
39 of conservation measures will be identified and treated by the Implementation Office within the
40 reserve system and in the Plan Area within the limits of the Plan (e.g., *CM13 Invasive Aquatic*
41 *Vegetation Control* targets invasive aquatic vegetation throughout the Plan Area) if they meet the
42 criteria identified above. In all other cases it is not the sole responsibility of Authorized Entities to
43 remediate or eradicate diseases or invasive species from the Plan Area. The Implementation Office

1 will support efforts to detect, treat, control, and if feasible, eradicate these new nonnative invasive
2 species as part of the implementation of the conservation measures and through the adaptive
3 management and monitoring program.

4 **Planned Response**

5 The Implementation Office will take steps to detect, through the monitoring and adaptive
6 management program and through collaboration with the Delta Science Program and other
7 appropriate entities, the establishment and spread of new invasive species and diseases in the Plan
8 Area. If a new invasive species or pathogen is discovered, the Implementation Office will conduct an
9 assessment to determine the possible threats of the invasive species or pathogen to covered species
10 and protected and/or restored natural communities. Remedial responses will be informed by the
11 results of the assessment.

12 Based on results of the assessment, the Implementation Office will identify and implement, to the
13 extent reasonable and practicable, measures to reduce and/or control the adverse effects of new
14 nonnative species or pathogen on the functions provided by the conservation measures under the
15 Plan. If methods to adequately reduce and/or control adverse effects of the nonnative species or
16 pathogen on the functions of restored physical natural communities are not available or practicable,
17 the Implementation Office will identify practicable alternative design, implementation, and
18 management approaches to future natural community restoration actions to avoid or minimize
19 potential adverse effects of the invasive species or pathogen on covered species. If methods are not
20 available to reduce and/or control adverse effects of invasive species or diseases on water
21 operations, physical natural community, and other conservation measures, the Implementation
22 Office will identify, propose, and potentially implement alternative conservation measures that
23 provide equivalent or greater benefits to covered species and their habitats to the extent reasonable
24 and practicable. The effectiveness of remedial measures will be monitored over time and, based on
25 their efficacy, such measures may be adjusted.

26 **6.4.2.2.8 Climate Change**

27 **Nature of Changed Circumstance**

28 Long-term changes in sea level, watershed hydrology, precipitation, or temperature (air or water)
29 that are of the magnitude or effect assumed for the effects analysis and that adversely affect
30 conservation strategy implementation or covered species are considered a changed circumstance.
31 The occurrence of this changed circumstance will be determined jointly by the Implementation
32 Office and fish and wildlife agencies. Because the BDCP already anticipates the effects of climate
33 change, no additional actions will be required to remediate climate change effects on covered
34 species and natural communities in the reserve system.

35 **Rationale**

36 The BDCP incorporates the results of a coordinated effort to analyze the effects of future climate
37 change. Appendix 2.C, *Climate Change Implications and Assumptions* summarizes the methodology
38 for selection and application of climate scenarios specific to this process, discussion and selection of
39 sea level rise scenarios, and the use of these climate change projections in the primary analytical
40 tools to be used in the BDCP planning. A technical subgroup consisting of key staff at DWR,
41 Reclamation, USFWS, and NMFS met over the course of 2009 and early 2010 to discuss the merits of
42 various approaches and methods. The recommended approach consists of the selection of five

1 “ensemble-informed” climate scenarios for each future analysis period. These regional climate
2 scenarios use subsets of the 112 available downscaled climate projections to characterize the range
3 of future climate possibilities indicated by the current state of global climate models. Importantly,
4 the scenarios are derived from multiple projections, rather than a single global climate model
5 projection, thus reducing the “noise” primarily associated with multi-decadal variability and
6 sampling of global climate model period changes.

7 Climate change is evaluated as a cumulative effect. Regional climate change scenarios and sea level
8 rise estimates are provided for the two long-term periods. The proposed method for incorporating
9 climate changes preserves both the projected changes in mean climate and the projected changes in
10 climate variability. Midrange sea level rise estimates selected for use at the two long-term timelines
11 are 15 centimeters (6 inches) by 2025 and 45 centimeters (18 inches) by 2060. These estimates are
12 derived from review of various sources used by DWR, recommendations by the CALFED
13 Independent Science Board, and recent guidance from USACE.

14 The expected effects of climate change presented in Appendix 2. C, *Climate Change Implications and*
15 *Assumptions* are discussed in detail in Chapter 2, Section 2.3.2.1.5, *Effects of Anthropogenic Influence*
16 *and Future Climate Change*. The assumptions for climate change used in the effects analysis are
17 described in Chapter 5, *Effects Analysis* and Appendix 5.A, *Climate Change Implications*. These
18 assumptions are considered a reasonable scenario.

19 **Planned Response**

20 The conservation strategy, monitoring and research program, and adaptive management and
21 monitoring program already include responses to anticipate climate change effects at the landscape,
22 natural community, and species scales. For example, biological goals and objectives have been
23 established at the landscape level to take climate change into account during conservation strategy
24 implementation by providing upland areas where tidal natural communities can expand in response
25 to sea level change. Natural community restoration and protection will take into account natural
26 community and species ecological responses to climate change, such as changes in range,
27 abundance, distribution, and habitat suitability (*CM3 Natural Communities Protection and*
28 *Restoration* and *CM4 Tidal Natural Communities Restoration*). Construction and preferential
29 operation of a new water diversion facility in the north Delta is proposed in part because of climate
30 change considerations.

31 The adaptive management and monitoring program (Section 3.6, *Adaptive Management and*
32 *Monitoring Program*) will monitor climate change effects and assumes that conservation measures
33 will need to be adjusted in response to these effects. This will allow the Implementation Office to
34 continually adjust conservation measures to the changing conditions in the Plan Area as part of the
35 adaptive management program. Such adaptive management responses may include identifying
36 alternative locations for implementing natural community restoration or protection actions in the
37 Plan Area to increase habitat availability and suitability and to allow movement across
38 environmental gradients. Examples include creation of cool water refugia in the Plan Area,
39 expansion of the range of environmental gradients included in restoration design, or selection of
40 protected sites to provide for shifting species distributions and habitats. All of these potential
41 responses will be made as part of the adaptive management and monitoring program. A change in
42 conservation measures in response to climate change beyond that considered in Chapter 3,
43 *Conservation Strategy*, and through the adaptive management and monitoring program is

1 considered an unforeseen circumstance. Therefore, no remedial actions are required for this
2 changed circumstance.

3 **6.4.2.2.9 Vandalism**

4 Structures or equipment in the reserve system such as gates, fences, signs, recreational facilities,
5 field structures (e.g., field equipment storage sheds), or field vehicles may be vandalized during the
6 permit term. Alternatively, trash could be dumped in the reserves or vehicles or equipment
7 abandoned in those areas. Such acts of vandalism are reasonably likely to occur during the permit
8 term and will be considered a changed circumstance.

9 If such damage occurs, the Implementation Office will repair or replace the damaged structure,
10 equipment, or vehicle. The budget will provide for funding of periodic repair or replacement of
11 damaged structures, equipment, or vehicles. In addition, funds will be available to the
12 Implementation Office to maintain the reserve system, including taking steps to remove trash and
13 other debris.

14 **6.4.3 Unforeseen Circumstances**

15 USFWS and NMFS define *unforeseen circumstances* as those changes in circumstances that affect a
16 species or geographic area covered by an HCP that could not reasonably have been anticipated by
17 the plan participants during the development of the conservation plan, and that result in a
18 substantial and adverse change in the status of a covered species (50 CFR 17.3, 50 CFR 222.102).
19 Under ESA regulations, if unforeseen circumstances arise during the life of the BDCP, USFWS and/or
20 NMFS may not require the commitment of additional land or financial compensation, or additional
21 restrictions on the use of land, water, or other natural resources other than those agreed to in the
22 plan, unless the Authorized Entities consent.

23 Within these constraints, USFWS and/or NMFS may require additional measures, but only if the
24 following conditions apply.

- 25 • The agencies prove an unforeseen circumstance exists.
- 26 • Such measures are limited to modifications of the conservation measures to benefit the affected
27 species.
- 28 • The original terms of the Plan are maintained to the maximum extent practicable.
- 29 • The overall cost of implementing the BDCP is not increased by the modification (see Chapter 8,
30 *Implementation Costs and Funding Sources*, for a description of costs).

31 USFWS and/or NMFS bear the burden of demonstrating that unforeseen circumstances exist. A
32 finding of unforeseen circumstances must be clearly documented, based on the best available
33 scientific and commercial information, and made considering certain specific factors.¹⁰ If such a
34 finding is made and additional measures are required, the Authorized Entities will work with

¹⁰ These factors include the following: (1) size of the current range of the affected species; (2) percentage of range adversely affected by the conservation plan; (3) percentage of range conserved by the conservation plan; (4) ecological significance of that portion of the range affected by the conservation plan; (5) level of knowledge about the affected species and the degree of specificity of the species' conservation program under the conservation plan; and (6) whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild. 50 CFR 17. 22(b)(5)(iii)(C); 50 CFR 222. 307(g)(3)(iii).

1 USFWS and/or NMFS to appropriately redirect resources to address the unforeseen circumstances,
2 consistent with the intent of the Plan.

3 Similarly, *unforeseen circumstances* are defined in the NCCPA as changes affecting one or more
4 species, habitat, natural community, or the geographic area covered by a conservation plan that
5 could not reasonably have been anticipated at the time of plan development, and that result in a
6 substantial adverse change in the status of one or more covered species (Fish & Game Code
7 2805(k)). The NCCPA further provides that, in the event of unforeseen circumstances, CDFW will not
8 require additional land, water, or financial compensation or additional restrictions on the use of
9 land, water, or other natural resources without the consent of the plan participants for a period of
10 time specified in the Implementation Agreement. However, such assurances are not applicable in
11 those circumstances in which CDFW determines that the plan is not being implemented in a manner
12 consistent with the substantive terms of the Implementation Agreement (Fish & Game Code
13 2820(f)(2)).

14 **6.4.4 BDCP Relationship to Significant Future Projects or** 15 **Governmental Regulations**

16 The BDCP is one element of the state's long-range strategy to meet the anticipated future water
17 needs of Californians in the face of an expanding population and the expected effects of climate
18 change. Additional projects related to the California water system may be proposed and
19 implemented throughout the state, such as new south-of-Delta water storage (e.g., expanding San
20 Luis Reservoir) or new water storage upstream of the Delta (e.g., expanding Shasta Reservoir). In
21 addition, new state and federal regulatory requirements are likely to be adopted that affect the
22 Delta, such as new Delta flow criteria issued by the State Water Resources Control Board, or
23 additional water quality criteria issued by EPA.

24 These future projects or regulations may affect the conservation strategy in ways that cannot be
25 predicted. For example, a new project or regulation may compromise the Plan's ability to meet the
26 biological goals and objectives. In other cases, a new project or regulation may augment The
27 conservation strategy and make it easier for the BDCP to meet its biological goals and objectives.

28 Many of the future projects will be required to evaluate their effects on the BDCP. For example, if
29 ESA or CESA compliance is required of a project, an assessment will need to be conducted regarding
30 its consistency with the BDCP. Similarly, projects subject to CEQA must document any
31 inconsistencies with approved regional conservation plans, including the BDCP.

32 The Implementation Office will ensure that the potential effects of these future projects or
33 regulations are fully considered with respect to their impact on the BDCP. If necessary, the
34 Implementation Office may propose adjustments to the BDCP to accommodate these projects or
35 ensure compliance with new regulatory requirements. In such cases, the Implementation Office will
36 implement the following process regarding any proposed project or regulations that has the
37 potential to affect the conservation strategy or its ability to achieve its biological goals and
38 objectives.

- 39 ● The Implementation Office will work closely with project proponents or regulatory agencies to
40 ensure that the project or new regulatory requirements are consistent with the BDCP.
- 41 ● If inconsistencies between the BDCP and the proposed project or regulatory requirements
42 remain, the Implementation Office will ensure that sufficient analysis is performed to evaluate

1 the effects of the proposed project or regulations on the BDCP's ability to implement its
2 conservation measures or achieve its biological goals and objectives.

- 3 • The Implementation Office, in cooperation with the fish and wildlife and water agencies, will
4 then evaluate the significance of these effects on the BDCP and determine whether adjustments
5 are needed to the conservation strategy. The Implementation Office will work with the project
6 proponent or regulatory agency to eliminate any inconsistencies, and to make the proposed
7 project or regulations consistent with the BDCP.

8 The Implementation Office will confer with the fish and wildlife agencies and the Authorized Entities
9 to determine whether any changes to the Plan should be made, and if so, how the change will be
10 implemented to account for the effects of the proposed project or regulation. These changes could
11 include an administrative change, a minor modification, or a Plan amendment as described Section
12 6.5, *Changes to the Plan or Permits*.

13 **6.4.5 Applicability of Other Federal Endangered Species Act** 14 **Issues to the BDCP**

15 **6.4.5.1 Future Recovery Plans**

16 Recovery plans under the ESA delineate actions necessary to protect and recover federally listed
17 species. These plans provide useful information and recommendations that can assist in the
18 development of conservation measures in HCPs designed to minimize or mitigate for the take of
19 species. Recovery plans are not, however, intended to establish the obligations of permit applicants
20 under Section 10 of the ESA. As such, ESA recovery plans will not affect the implementation of the
21 BDCP, except to the extent that they may contribute information that helps advance efforts to
22 achieve the goals and objectives of the plan.

23 **6.4.5.2 Future Section 7 Consultations**

24 The BDCP is intended to meet the requirements of the ESA and provide the basis for regulatory
25 coverage for a range of activities identified in the Plan. Some of the covered activities may require
26 funding or regulatory authorizations from other federal agencies. In such instances, these federal
27 agencies may need to consult with USFWS and/or NMFS under Section 7 of the ESA with respect to
28 the effect of the activity on listed species and critical habitat. Similarly, associated federal actions
29 undertaken by Reclamation may also trigger the consultation process.

30 Unless otherwise required by law or regulation, in any Section 7 consultation on a covered activity
31 that may affect a covered species, USFWS and NMFS will ensure that the resulting BiOps are
32 consistent with the integrated BiOp for the BDCP. USFWS and NMFS will not require additional land,
33 water, or other natural resources, or financial compensation or additional restrictions on the use of
34 land, water, or other natural resources for covered activities that may affect covered species beyond
35 the measures provided for under the BDCP, the Implementing Agreement, the incidental take
36 permits, and the integrated BiOp.

37 In any Section 7 consultation subsequent to approval of the BDCP involving actions, other than
38 covered activities or associated federal actions, undertaken by any person, firm, or entity that may
39 have an effect on covered species and their habitats in the Plan Area, USFWS and NMFS will give
40 notice thereof to the Authorized Entity Group and the Implementation Office.

1 **6.4.5.2.1 Critical Habitat**

2 The BDCP provides a comprehensive, habitat-based approach to the protection of covered species
3 by focusing on the areas essential for the long-term conservation of the covered species. This
4 approach is consistent with the overall purposes of the ESA to provide a means whereby the
5 ecosystems upon which endangered and threatened species depend may be conserved. If critical
6 habitat for any covered species is designated within the Plan Area, no mitigation, compensation, or
7 other protective measures beyond those measures set forth in the BDCP will be required of
8 Permittees (50 CFR 17.77(b)(5), 50 CFR 17.32(b)(5), 50 CFR 222.307(g)).

9 **6.5 Changes to the Plan or Permits**

10 This section describes the processes that will be used to change the plan or the permits. The Plan
11 can be modified during implementation in accordance with CDFW, USFWS, and NMFS regulations
12 and the terms of the permits and Implementing Agreement. Plan modifications may be needed
13 periodically to clarify provisions or correct unanticipated inconsistencies in the documents. Plan
14 changes fall into three broad categories: administrative changes, minor modifications, and formal
15 amendments. Only some plan changes also require a permit amendment. The process for a permit
16 extension and permit suspension or revocation are also discussed below.

17 **6.5.1 Administrative Changes**

18 The administration and implementation of the BDCP will require frequent and ongoing
19 interpretation of the provisions of the Plan. Actions taken on the basis of these interpretations that
20 do not substantively change the purpose or intent of the Plan provisions will not require
21 modification or amendment of the BDCP or its associated authorizations. Such actions related to the
22 ordinary administration and implementation of the BDCP may include, but are not limited to, the
23 following.

- 24 • Clerical corrections to typographical, grammatical, and similar editing errors that do not change
25 the intended meaning; or to maps or other exhibits to address insignificant errors.
- 26 • Variations in the day-to-day management of reserve system lands, such as adjusting irrigation
27 schedules for created or restored natural community on the basis of observed water needs of
28 planted vegetation.
- 29 • Adaptations to the design of directed studies.
- 30 • Adjustments to monitoring protocols to incorporate new protocols approved by the fish and
31 wildlife agencies.
- 32 • Administration of the Implementation Office.
- 33 • Changes in the membership of BDCP advisory committees.
- 34 • Minor corrections to land ownership descriptions.
- 35 • Changes to survey, monitoring, reporting and/or management protocols that do not adversely
36 affect covered species or habitat functions and values.
- 37 • Updates or corrections to the land cover or other resource maps or species occurrence data.

1 **6.5.2 Minor Modifications or Revisions**

2 As part of the process of Plan implementation, the Implementation Office may need to make minor
3 modifications or revisions to the BDCP from time to time to respond appropriately to new
4 information, scientific understanding, technological advances, and other such circumstances. Minor
5 modifications or revisions are likely to be technical in nature and not involve changes that will
6 adversely affect covered species, the level of take, or the obligations of Authorized Entities.

7 Minor modifications or revisions may include, but are not limited to, the following circumstances.

- 8 • Adaptive management changes to conservation measures or biological objectives, including
9 actions to avoid, minimize, and mitigate impacts, or modifications to habitat management
10 strategies developed through and consistent with the adaptive management and monitoring
11 program described in Chapter 3, *Conservation Strategy*.
- 12 • Transfers of targeted acreages between ROAs consistent with criteria set out in Chapter 3,
13 *Conservation Strategy*.
- 14 • Transfers of targeted natural community acreages among conservation zones, provided such
15 change does not preclude meeting preserve assembly requirements, significantly increase the
16 cost of BDCP management, or preclude achieving covered species and natural community goals
17 and objectives.
- 18 • Extensions of earth-moving or ground disturbance outside the right-of-way limits analyzed in
19 the BDCP for covered activities involving infrastructure development or natural community
20 restoration.
- 21 • Other proposed changes to the Plan that the fish and wildlife agencies have determined to be
22 unsubstantial and appropriate for implementation as a minor modification.

23 A change in the permit area (either a decrease or an increase) is also considered a minor
24 modification, as long as the change meets the following criteria.

- 25 • Is compatible with the conservation goals of the Plan.
- 26 • Is consistent with the impact analysis of the Plan.
- 27 • Addresses activities that are already covered by the Plan.

28 **6.5.2.1 Procedures for Minor Modifications or Revisions**

29 The Implementation Office, the Authorized Entities, or the fish and wildlife agencies may propose
30 minor modifications or revisions by providing written notice to the Implementation Office,
31 Authorized Entities, and fish and wildlife agencies. Such notice will include a description of the
32 proposed minor modifications or revisions, an explanation of the reason for the proposed minor
33 modifications or revisions, an analysis of their environmental effects including any impacts on
34 covered species, and an explanation of why the effects of the proposed minor modifications or
35 revisions will have the following characteristics.

- 36 • They will not significantly differ from, and will be biologically equivalent or superior to, the
37 effects described in the BDCP, as originally adopted.
- 38 • They will not conflict with the terms and conditions of the BDCP, as originally adopted.
- 39 • They will not significantly impair implementation of the conservation strategy.

1 The fish and wildlife agencies and/or the Authorized Entities may submit comments on the
2 proposed minor modification or revision in writing within 60 days of receipt of notice. The
3 Authorized Entities must agree to any proposed minor modification; however, the concurrence of
4 the Authorized Entities is not required for minor modifications that involve changes to conservation
5 measures or biological objectives adopted through the adaptive management process, as described
6 in Section 3.6, *Adaptive Management and Monitoring Program*. If the fish and wildlife agencies do not
7 concur that the proposed minor modification or revision meets the requirements for a minor
8 modification or revision, the proposal must be approved according to the amendment process
9 described in Section 6.5.3, *Formal Amendment*. Any Authorized Entity or fish and wildlife agency
10 may institute the informal meet and confer process set forth in the Implementing Agreement to
11 resolve disagreements concerning a proposed minor modification or revision.

12 Any proposed adaptive change to a conservation measure or biological objective or to the approach
13 to effectiveness monitoring will be subject to the process described in Section 3.6, *Adaptive
14 Management and Monitoring Program*. All other proposed minor modifications or revisions to the
15 Plan will following the procedure outlined above. Any such proposed minor modifications will
16 require the agreement of the Authorized Entities. If the fish and wildlife agencies concur that the
17 requirements for a minor modification or revision have been met and the modification or revision
18 should be incorporated into the plan, the BDCP will be modified accordingly. If any fish and wildlife
19 agency fails to respond to the written notice within the 60-day period, the agency will be deemed to
20 have approved the proposed minor modification or revision.

21 **6.5.3 Formal Amendment**

22 Under some circumstances, it may be necessary to substantially amend the BDCP. Any proposed
23 changes to the BDCP that do not qualify for treatment as described in Sections 6.5.1, *Administrative
24 Changes*, or 6.5.2, *Minor Modifications or Revisions*, will require a formal amendment. Formal
25 amendment to the BDCP also will require corresponding amendment to the authorizations/permits,
26 in accordance with applicable laws and regulations regarding permit amendments. The
27 Implementation Office will be responsible for submitting any proposed amendments to the fish and
28 wildlife agencies.

29 Amendments to the BDCP likely will occur infrequently and will follow the process set forth in
30 Section 6.5.3.1, *Process for Formal Amendment*. Formal amendments include, but are not limited to,
31 these following changes.

- 32 ● Modifications of any important action or component of the conservation strategy, including
33 funding, that may substantially affect levels of authorized take, effects of the covered activities,
34 or the nature or scope of the conservation program.
- 35 ● Substantive changes to the boundary of the Plan Area, other than those associated with the
36 acquisition of terrestrial natural community in the surrounding Delta counties, as described in
37 Chapter 1, Section 1.4.1, *Geographic Scope of the BDCP*.
- 38 ● Additions of species to the covered species list.
- 39 ● Increase in the allowable take limits of covered activities or adding new covered activities to the
40 plan.
- 41 ● Substantial changes in implementation schedules that will have significant adverse effects on
42 the covered species.

- 1 • Changes to the BDCP that may be necessary to accommodate certain water projects, water
2 acquisition programs, government regulations, or state-mandated flow standards that occur
3 subsequent to the adoption of the BDCP and that would substantially change the conservation
4 strategy, its effects, or the assumptions on which the BDCP effects analysis is based.
- 5 • Changes in water operations beyond those described under *CM1 Water Facilities and Operations*
6 or those that would fall under the *Minor Modifications or Revisions* category described above.

7 **6.5.3.1 Process for Formal Amendment**

8 Formal amendments will involve the same process that was required for the original approval of the
9 BDCP, including submission of a formal application (form and required fees) with a revised HCP, and
10 implementing agreement. In most cases, an amendment will require public review and comment,
11 CEQA and NEPA compliance (publication in the *Federal Register*), and intra-Service Section 7
12 consultation. After public comment, the Services may approve or deny the permit amendment
13 application. There would be a revised NCCP, which CDFW would consider and approve or deny.
14 Amendments will also be subject to review and approval by the Implementation Office and the
15 Authorized Entities. The fish and wildlife agencies will use reasonable efforts to process proposed
16 amendments within 180 days.

17 **6.5.4 Extension of Permit Duration**

18 The Authorized Entities are seeking take authorizations from the state and federal fish and wildlife
19 agencies with terms of 50 years. The terms of the take authorizations issued under the BDCP will
20 begin from the date of their issuance. Prior to expiration of the take permits, the Authorized Entities
21 may apply to the fish and wildlife agencies to renew them. The Authorized Entities will initiate the
22 permit renewal process prior to the expiration of the initial 50-year period and with ample time to
23 allow for the review and processing of the permit renewal.

24 **6.5.5 Suspension of the Federal Permits**

25 Under certain circumstances defined by federal regulation, USFWS or NMFS may suspend, in whole
26 or in part, the regulatory authorizations they issue under the BDCP. However, except where USFWS
27 or NMFS determines that emergency action is necessary to avoid irreparable harm to a covered
28 species, it will not suspend an authorization without first attempting to resolve the issue through
29 the dispute resolution process set forth in the Implementing Agreement, and identifying the facts or
30 action/inaction that may warrant the suspension and providing the Implementation Office a
31 reasonable opportunity to implement appropriate responsive actions. Any decision to suspend one
32 or both federal permits must be in writing and must be signed by the Secretary of the Interior or the
33 Secretary of Commerce, as the case may be.

34 **6.5.5.1 Reinstatement of Suspended Federal Permit**

35 If USFWS and/or NMFS suspend a federal permit, as soon as possible but no later than 10 days after
36 the suspension, the agency(ies) will meet and confer with the Implementation Office and Authorized
37 Entities to discuss how the permits can be reinstated. At the conclusion of the meeting, USFWS
38 and/or NMFS will identify reasonable, specific actions needed to address the suspension. Upon
39 performance or completion of the actions, the applicable agency(ies) will immediately reinstate the
40 federal permit.

6.5.6 Revocation of the Federal Permits

The No Surprises rule, as promulgated in 1998, did not address circumstances in which a species covered by a permitted HCP experienced significant decline and the continuation of an activity covered by the HCP would contribute to the likelihood of jeopardy to the species. To address such circumstances, USFWS issued a regulation in 2004, known as the Permit Revocation Rule, that allows USFWS to nullify regulatory assurances granted under the No Surprises rule and revoke the Section 10 permit only in specified instances, including where continuation of a permitted activity would jeopardize the continued existence of a species covered by an HCP and the impact of the permitted activity on the species has not been remedied in a timely manner (69 FR 7172, December 10, 2004).

In the event that such unforeseen circumstances were to arise under the BDCP, USFWS and/or NMFS would work with the Implementation Office and the Authorized Entities to avoid a permit revocation. The federal fish and wildlife agencies will engage in the following process prior to taking any steps to revoke the BDCP permits.

- The Implementation Office and the USFWS or NMFS will determine, through the adaptive management process, whether changes can be made to the conservation strategy to remedy the situation.
- The USFWS or NMFS will determine whether the fish and wildlife agencies or other state and federal agencies can undertake actions that will remedy the situation. The determination must be based on a thorough review of best available practices considering species population status and the effects of multiple federal and nonfederal actions. It is recognized that the fish and wildlife agencies have available a wide array of authorities and resources that can be used to provide additional protection for the species, as do other state and federal agencies.
- The Implementation Office and the USFWS or NMFS will determine whether there are additional voluntary implementation actions that the Authorized Entities could undertake to remedy the situation.

The USFWS or NMFS will begin the revocation process only if it is determined that the continuation of a covered activity will appreciably reduce the likelihood of survival and recovery of one or more covered species and that no remedy can be found and implemented by the Authorized Entities. The USFWS or NMFS also could begin the revocation process if the Authorized Entities fail to fulfill their obligations under the BDCP, but only after completing the dispute resolution process described in the Implementing Agreement, and identifying the actions or inactions that may warrant the revocation and giving the Implementation Office a reasonable opportunity to implement appropriate responsive actions. The USFWS or NMFS will participate in the dispute resolution process and follow the administrative procedures set out in the Implementing Agreement in addition to the regulations implementing the Permit Revocation rule (50 CFR 13. 28 and 13. 29). Any decision to revoke one or both federal permits must be in writing and must be signed by the Secretary of the Interior or the Secretary of Commerce, as the case may warrant.

6.5.7 Suspension or Revocation of the State Permit

The NCCPA requires that the implementation agreement include specific provisions that, if violated, would result in suspension or revocation of the Section 2835 take permit. Such provisions must include a description of CDFW's actions if the plan participant fails to provide adequate funding; fails

1 to maintain rough proportionality between impacts on habitats or covered species and conservation
2 measures; adopts, amends, or approves any plan or project that is inconsistent with the objectives
3 and requirements of the plan without concurrence of CDFW; or if the level of take exceeds the level
4 of take set forth in the permit (Fish & Game Code 2820(b)(3)). CDFW also must suspend or revoke a
5 Section 2835 take permit if continued take would result in jeopardy to a species (Fish & Game Code
6 2823).

7 If the Authorized Entities violate the terms and conditions of the state permit, or if necessary to
8 avoid jeopardizing the continued existence of a species included in the Section 2835 take permit,
9 CDFW may suspend or revoke the permit in whole or in part. However, unless immediate revocation
10 is necessary to avoid the likelihood of jeopardy to a listed species or to address rough
11 proportionality (Section 6.5.7.1, *Failure to Maintain Rough Proportionality*), CDFW will first notify
12 the Implementation Office and Authorized Entities of the action or inaction that may warrant the
13 suspension or revocation, meet and confer with Plan participants, and provide the Implementation
14 Office and Authorized Entities with a reasonable opportunity to take appropriate responsive action,
15 in accordance with suspension or revocation processes provided in the Implementing Agreement.
16 Any decision to suspend or revoke the state permit must be in writing and must be signed by the
17 Director of CDFW.

18 **6.5.7.1 Failure to Maintain Rough Proportionality**

19 The NCCPA requires that the Permittees maintain rough proportionality between impacts on
20 habitats or covered species and conservation measures to address those impacts. Rough
21 proportionality will be maintained through the implementation of the conservation measures
22 substantially in accordance with the plan implementation schedule set out in this chapter and
23 consistent with Section 6.1.2, *Maintaining Rough Proportionality*. If CDFW determines, after
24 conferring with the Implementation Office, that rough proportionality is not being maintained,
25 CDFW, the Program Manager, and the Authorized Entities will meet and confer and, within 45 days
26 of CDFW's determination, the Authorized Entities will either regain rough proportionality, or enter
27 into an agreement with CDFW to expeditiously restore rough proportionality.

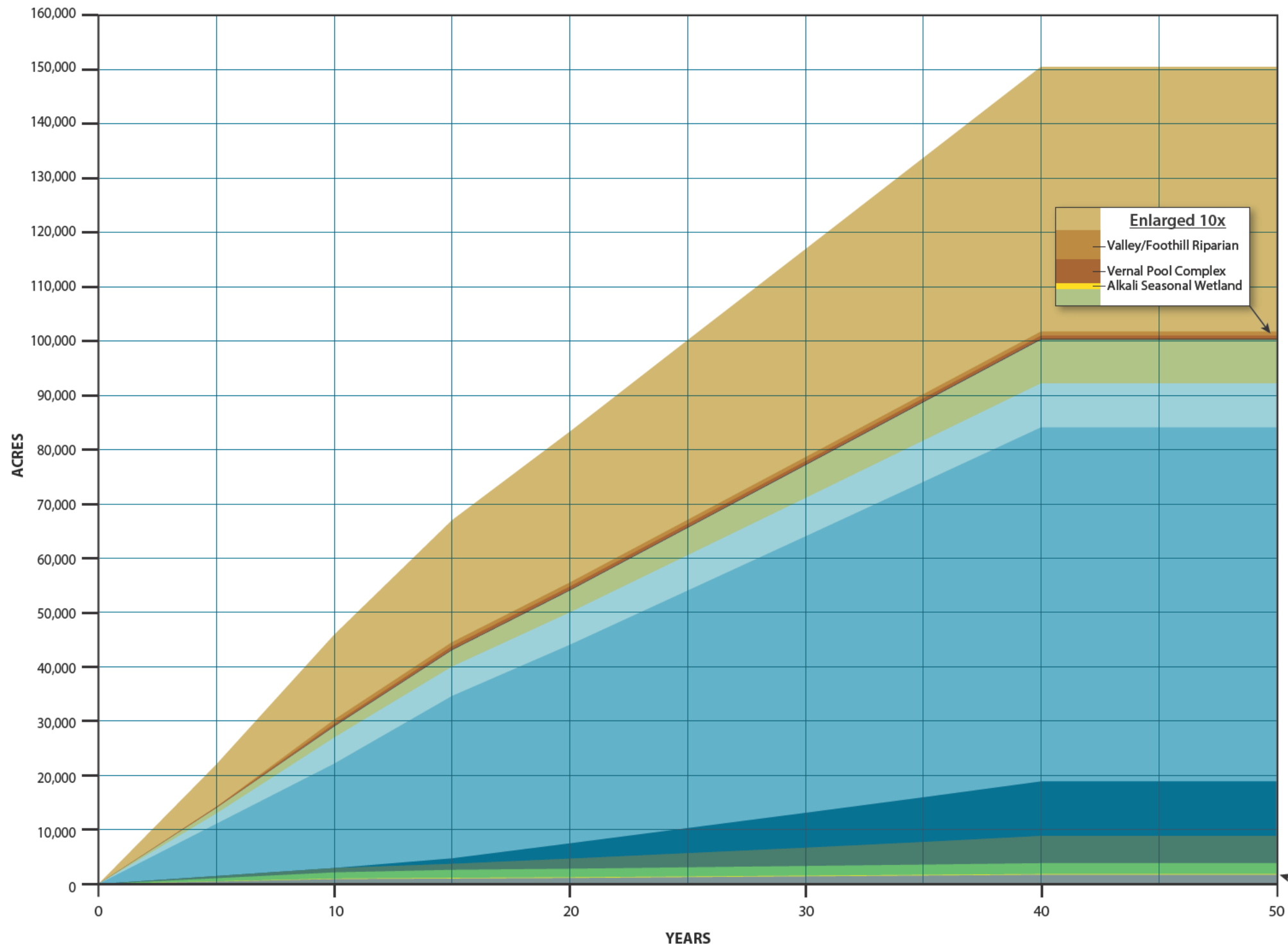
28 Adjustments to the implementation schedule may involve advancing or accelerating efforts to
29 acquire, restore, or enhance habitat for covered species. Once such adjustments have been agreed
30 upon, the Implementation Office will take the necessary steps to comply with the revised schedule.
31 Alternatively, the Implementation Office may remedy the situation by demonstrating that
32 implementation actions are occurring in a manner consistent with the implementation schedule.

33 **6.6 References Cited**

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Conservation Measures that Restore and Protect Natural Communities

CM3 Natural Communities Protection and Restoration

- Cultivated Lands Protected: 48,625 acres ①
- Valley/Foothill Riparian Protected: 750 acres
- Vernal Pool Complex Protected: 600 acres
- Alkali Seasonal Wetland Complex Protected: 150 acres
- Grassland Protected: 8,000 acres
- Managed Wetland Protected: 8,100 acres

CM4 Tidal Natural Communities Restoration

- Tidal Wetland and Sea Level Rise Accommodation Protected and Restored: 65,000 acres ②

CM5 Seasonally Inundated Floodplain Restoration

- Seasonally Inundated Floodplain Restored: 10,000 acres ③

CM7 Riparian Natural Community Restoration

- Valley/Foothill Riparian Restored: 5,000 acres

CM8 Grassland Natural Community Restoration

- Grassland Restored: 2,000 acres

CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration

- Vernal Pool and Alkali Seasonal Wetland Complex Restored: 139 acres ④

CM10 Nontidal Marsh and Managed Wetland Restoration

- Nontidal Marsh and Managed Wetland Protected and Restored: 1,700 acres

Note: Graph shows restoration and protection occurring gradually as measures are implemented over the permit term. Actual restoration and protection will occur more stepwise as large acquisitions or restoration projects are implemented.

① This does not include 3,000 acres of "rice or equivalent" for giant garter snake, which may consist of additional rice protection, additional nontidal marsh restoration, or muted tidal restoration or grasslands that would be a subset of the target acreages for those natural communities.

② The 65,000 acres includes restored tidal natural communities and transitional uplands to accommodate sea level rise.

③ Seasonally Inundated Floodplain is not a natural community under BDCP. Seasonally Inundated Floodplain restoration will overlap with Riparian Natural Community restoration, and may overlap with protection and restoration requirements for other BDCP natural communities.

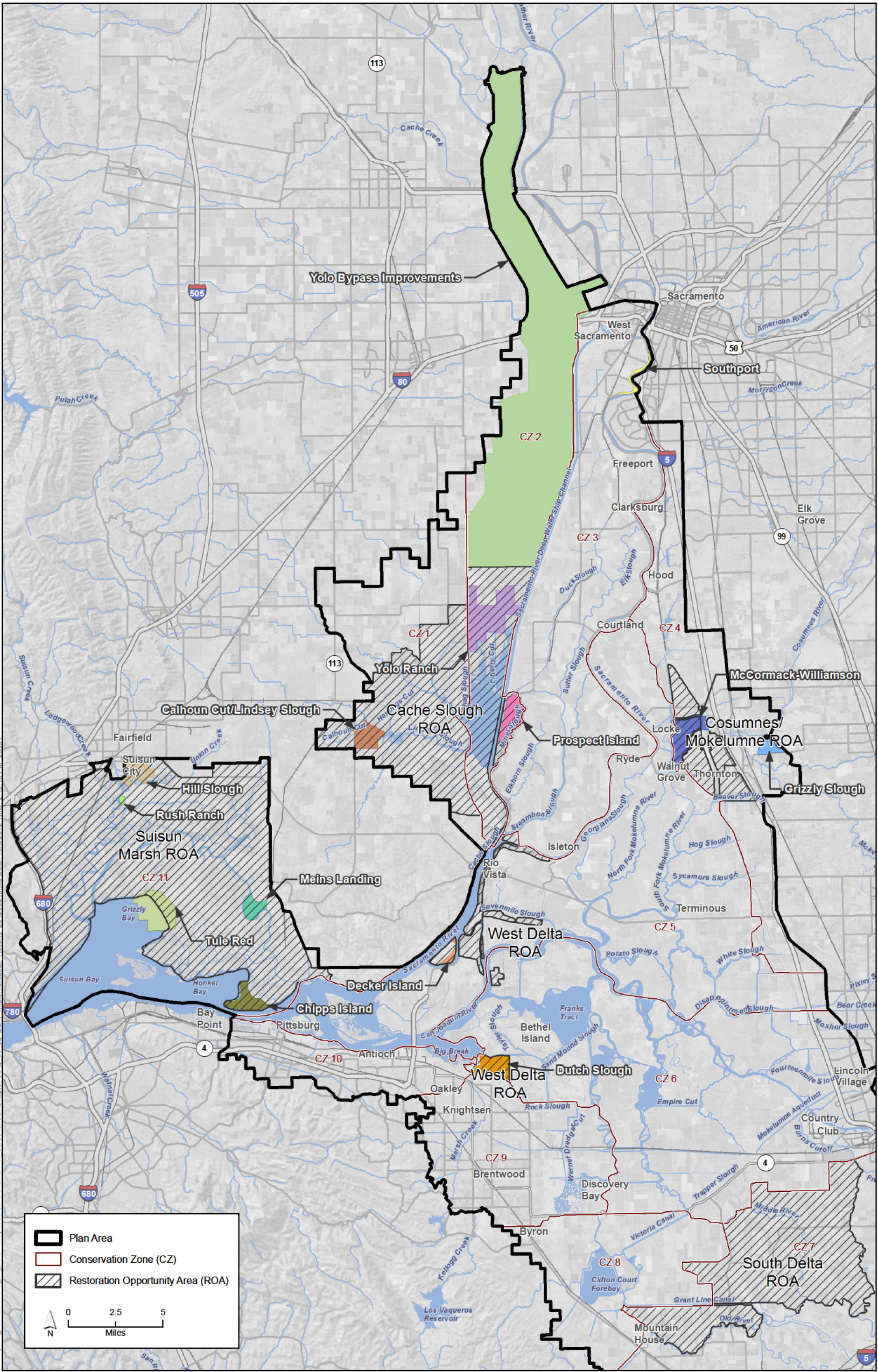
④ This is an estimate and the total will depend on the wetted acres lost. Vernal pools and alkali seasonal wetlands will be restored to achieve no net loss of wetted acres.

Enlarged 10x

- Grassland
- Vernal Pool and Alkali Seasonal Wetland Complex
- Nontidal Marsh and Managed Wetland

Graphics...BDCP.HCP (10-4-13) TM

Figure 6-1
Amounts of Natural Communities Protected and Restored over the Permit Term



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GIS Data Source: Early Implementation Actions, DHCCP 2012; Restoration Opportunity Areas, ICF 2012; Conservation Zones, SAIC 2012; Plan Area, ICF 2012

Figure 6-2
Early Implementation Actions