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APPENDIX 3.C
AVOIDANCE AND MINIMIZATION MEASURES

ADMINISTRATIVE DRAFT
BAY DELTA CONSERVATION PLAN

February 2012



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Appendix 3.C

Avoidance and Minimization Measures

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Note to Reader: This is a preliminary draft prepared by the BDCP EIR/EIS consultants and is based on partial information/data. It has not been reviewed or approved by the Lead Agencies and does not reflect the Lead Agencies' or Consultant's opinion that it is adequate for meeting the requirements of CEQA or NEPA. This document is expected to go through several revisions prior to being released for formal public review and comment in 2012. All members of the public will have an opportunity to provide comments on the public draft of the revised version of this document during the formal public review and comment period. Responses will be prepared only on comments submitted in the formal public review and comment period.

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Preliminary and Incomplete Draft

1 **Acronyms and Abbreviations**

AMM	avoidance and minimization measure
BMP	Best Management Practice
CM	Conservation Measure
CNDDB	California Natural Diversity Database
CRLF	California red-legged frog
CTS	California tiger salamander
DFG	California Department of Fish and Game
DPS	Distinct Population Segment
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
HCP	Habitat Conservation Plan
NCCP	Natural Community Conservation Plan
PCE	tetrachloroethylene
ppt	parts per thousand
SR	State Route
SWP/CVP	State Water Project/Central Valley Project
SWPPP	Storm Water Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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Appendix 3.C

Avoidance and Minimization Measures

As discussed in *Conservation Measure (CM) 22, Avoidance and Minimization Measures* (Section 3.4, *Conservation Measures*), of the BDCP, avoidance and minimization measures (AMMs) have been developed to avoid and minimize effects on covered species and natural communities that could result from BDCP covered activities. These measures will be implemented for covered activities throughout the BDCP permit term.

The AMMs fall into three categories.

- Project-level planning.
- Preconstruction.
- Project construction, operations and maintenance, and enhancement and management.

3.C.1 Project-Level Planning

3.C.1.1 AMM1 Conduct Planning Level Surveys

The BDCP Implementation Office will conduct planning surveys during the site-specific planning process to identify natural communities and elements of covered species habitat in the project area for the proposed implementation project. Planning surveys are required for all covered activities that result in ground disturbance or other potential adverse effects to natural communities or covered species habitat. Prior to conducting on the ground surveys, the Implementation Office will review existing information, including aerial photographs, BDCP file data, the most recent California Natural Diversity Database (CNDDDB) records, and any other relevant sources of information. The information review and initial surveys will be conducted by qualified biologists familiar with identifying the natural communities and covered species habitats in the Plan Area. These initial surveys are not intended to serve as presence/absence surveys for covered species or to formally map jurisdictional wetlands or waters, rather to identify natural communities and covered species habitat at the site level and to evaluate the need for specific avoidance and minimization measures. If such resources are identified in project areas for proposed implementation projects, additional surveys (e.g., wetland delineation, preconstruction surveys for covered species) may be required.

Planning level survey reports will be included with project application documents for covered activities and implementation of conservation measures. These planning survey reports will include the following.

- Description of the types of natural communities present in the project site.
- Maps of locations of suitable habitat and/or habitat features for covered species.
- Maps of covered species occurrences (CNDDDB and other).
- A list of the applicable AMMs (presented in this Appendix) required by the Plan.

1 Results of the planning survey will provide the information necessary to comply with the AMMs.
2 Applicable AMMs described in this section will be incorporated into the project design. The BDCP
3 Implementation Office will review and approve all planning survey reports before implementing any
4 activities under the BDCP. The Implementation Office will enter all relevant information in the
5 survey reports into a database and use these data to monitor plan compliance.

6 **3.C.1.2 AMM2 Design Projects to Avoid and Minimize** 7 **Impacts on Covered Species**

8 The BDCP Implementation Office will ensure that projects associated with the conservation
9 measures and other covered activities are designed to minimize the impact of take of covered
10 species to the maximum extent practicable, consistent with Section 10(a)(2)(B)(ii) of the ESA. The
11 BDCP Implementation Office will rely on existing information sources (BDCP and supporting
12 documents and data), the information generated from planning level surveys (AMM1), and any
13 additional surveys determined to be necessary by BDCP planners/biologists in order to design
14 projects to avoid particularly sensitive areas (AMM3 through AMM23), incorporate any necessary
15 seasonal or timing restrictions into project plans (e.g., avoid affecting nesting covered bird species),
16 and as practicable, any other design measures that can be implemented to avoid and minimize take
17 of covered species.

18 **3.C.1.3 AMM3 Design Projects to Avoid and Minimize Effects** 19 **on Critical Habitat**

20 The BDCP Implementation Office will insure that during the planning phase for projects associated
21 with conservation measures and other covered activities that they will be designed to avoid areas
22 that are designated as critical habitat for Contra Costa goldfields, Conservancy fairy shrimp, vernal
23 pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander (CTS), California red-
24 legged frog (CRLF), and several covered fish species. The AMMs presented below will be
25 implemented to ensure that all applicable restoration, enhancement, and other covered activities
26 avoid direct or indirect effects that might adversely modify critical habitat.

27 **3.C.1.3.1 AMM3.1 Avoid Adverse Modification of Critical Habitat for** 28 **Vernal Pool Crustaceans**

29 During the planning phase for individual restoration projects, the BDCP Implementation Office will
30 insure that proposed tidal restoration projects or other covered activities in Conservation Zones 1
31 and 11 will not result in the adverse modification of critical habitat for vernal pool crustaceans
32 (Figure X). Tidal restoration projects will be designed to avoid adverse modification of vernal pool
33 crustacean critical habitat that possess the primary constituent elements for the species as defined by
34 U.S. Fish and Wildlife Service (USFWS) (70 FR 46924-46998). Tidal restoration activities and other
35 ground-disturbing covered activities will occur at least 250 feet from vernal pool crustacean critical
36 habitat containing the primary constituent elements defined below or some lesser distance if it is
37 determined through project review with concurrence from USFWS that tidal restoration actions will
38 not result in changes in hydrology or soil salinity that could adversely modify the primary
39 constituent elements of vernal pool crustacean critical habitat.

1 Primary constituent elements for vernal pool fairy shrimp are defined as follows (70 FR 46924–
2 46998).

- 3 • Topographic features characterized by mounds and swales and depressions within a matrix of
4 surrounding uplands that result in complexes of continuously, or intermittently, flowing surface
5 water in the swales connecting the pools described below, providing for dispersal and
6 promoting hydroperiods of adequate length in the pools.
- 7 • Depressional features including isolated vernal pools with underlying restrictive soil layers that
8 become inundated during winter rains and that continuously hold water for a minimum of 18
9 days, in all but the driest years; thereby providing adequate water for incubation, maturation,
10 and reproduction. As these features are inundated on a seasonal basis, they do not promote the
11 development of obligate wetland vegetation habitats typical of permanently flooded emergent
12 wetlands.
- 13 • Sources of food, expected to be detritus occurring in the pools, contributed by overland flow
14 from the pools' watershed, or the results of biological processes within the pools themselves,
15 such as single-celled bacteria, algae, and dead organic matter, to provide for feeding.
- 16 • Structure within the pools described above, consisting of organic and inorganic materials, such
17 as living and dead plants from plant species adapted to seasonally inundated environments,
18 rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the
19 pools, that provide shelter.

20 Primary constituent elements for vernal pool tadpole shrimp are the same as above except for the
21 minimum period of inundation listed in the second bullet would be 41 days instead of 18 days.

22 Primary constituent elements for conservancy fairy shrimp are also the same as above except for the
23 minimum period of inundation listed in the second bullet would be 19 days instead of 18 days.

24 **3.C.1.3.2 AMM3.2 Avoid Adverse Modification of Critical Habitat for** 25 **California Tiger Salamander**

26 Designated critical habitat for California tiger salamander is present in Critical Habitat Unit 2 in the
27 Plan Area along the western edge of Conservation Zone 1. Critical Habitat Unit 2 extends along the
28 west side of State Route (SR) 113 from the short east-west portion of SR 113 south of Hay Road on
29 the north to Creed Road on the south (Figure X). During the planning phase for individual
30 restoration projects, the BDCP Implementation Office will insure that proposed tidal restoration
31 projects along Lindsey Slough and other covered activities near Jepson Prairie will not result in the
32 adverse modification of critical habitat for California tiger salamander in this area. Tidal restoration
33 projects will be designed to avoid adverse modification of California tiger salamander critical habitat
34 that posses the primary constituent elements for the species as defined by USFWS (70 FR 49379–
35 49458). Tidal restoration activities will occur at least 250 feet from California tiger salamander
36 critical habitat containing the primary constituent elements defined below or some lesser distance if
37 it is determined through project review and concurrence by USFWS that tidal restoration actions
38 will not result in changes in hydrology or soil salinity that could adversely modify the primary
39 constituent elements of California tiger salamander critical habitat.

40 Primary constituent elements for California tiger salamander are defined as follows (70 FR 49379–
41 49458).

- 1 • Standing bodies of fresh water, including natural and human-made (e.g., stock) ponds, vernal
2 pools, and other ephemeral or permanent water bodies that typically support inundation during
3 winter rains and hold water for a minimum of 12 weeks in a year of average rainfall.
- 4 • Upland habitats adjacent and accessible to and from breeding ponds that contain small mammal
5 burrows or other underground habitat that California tiger salamander depend upon for food,
6 shelter, and protection from the elements and predation.
- 7 • Accessible upland dispersal habitat between occupied locations that allow for movement
8 between such sites.

9 **3.C.1.3.3 AMM3.3 Avoid Adverse Modification of Critical Habitat for** 10 **California Red-legged Frog**

11 Designated critical habitat for the California red-legged frog overlaps with portions of Conservation
12 Zones 8 and 11 (Figure X). During the planning phase for the implementation of conservation
13 measures and other covered activities, the BDCP Implementation Office will insure that proposed
14 activities west of I-680 and Suisun Marsh and west of Clifton Court Forebay will not result in the
15 adverse modification of critical habitat for California red-legged frog. Covered activities will be
16 implemented to avoid adverse modification of California red-legged frog critical habitat that posses
17 the primary constituent elements for the species as defined by USFWS (75 FR 12816–12959).

18 Primary constituent elements for California red-legged frog are defined as follows (75 FR 12816–
19 12959).

- 20 • **Aquatic Breeding Habitat.** Standing bodies of fresh water (with salinities less than 4.5 parts
21 per thousand [ppt]), including natural and human-made (e.g., stock) ponds, slow-moving
22 streams or pools within streams, and other ephemeral or permanent water bodies that typically
23 become inundated during winter rains and hold water for a minimum of 20 weeks in all but the
24 driest of years.
- 25 • **Aquatic Nonbreeding Habitat.** Freshwater pond and stream habitat, as described above, that
26 may not hold water long enough for the species to complete its aquatic life cycle but which
27 provide for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult
28 California red-legged frogs. Other wetland habitats considered to meet these criteria include, but
29 are not limited to, plunge pools within intermittent creeks, seeps, quiet water refugia within
30 streams during high water flows, and springs of sufficient flow to withstand short-term dry
31 periods.
- 32 • **Upland Habitat.** Upland areas adjacent to or surrounding breeding and nonbreeding aquatic
33 and riparian habitat up to a distance of 1 mile in most cases (i.e., depending on surrounding
34 landscape and dispersal barriers) including various vegetational types such as grassland,
35 woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance
36 for the California red-legged frog. Upland features are also essential in that they are needed to
37 maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support
38 and surround the aquatic, wetland, or riparian habitat. These upland features contribute to
39 filling of aquatic, wetland, or riparian habitats, maintaining suitable periods of pool inundation
40 for larval frogs and their food sources, and providing nonbreeding, feeding, and sheltering
41 habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey
42 base, foraging opportunities, and areas for predator avoidance). Upland habitat should include

- 1 structural features such as boulders, rocks, and organic debris (e.g., downed trees, logs, small
2 mammal burrows, or moist leaf litter).
- 3 • **Dispersal Habitat.** Accessible upland or riparian habitat within and between occupied or
4 previously occupied sites that are located within 1 mile of each other, and that support
5 movement between such sites. Dispersal habitat includes various natural habitats, and altered
6 habitats such as agricultural fields, that do not contain barriers (e.g., heavily traveled roads
7 without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-
8 density urban or industrial developments with large expanses of asphalt or concrete, nor does it
9 include large lakes or reservoirs over 50 acres in size, or other areas that do not contain those
10 features identified in primary constituent elements 1, 2, or 3 as essential to the conservation of
11 the species.

12 **3.C.1.3.4 AMM3.4 Avoid Adverse Modification of Critical Habitat for**
13 **Delta Smelt**

14 *[Note to reader: This section will be prepared when the critical habitat effects analyses for fish are*
15 *conducted.]*

16 **3.C.1.3.5 AMM3.5 Avoid Adverse Modification of Critical Habitat for**
17 **Central Valley Spring Run Chinook Salmon and Central Valley**
18 **Steelhead**

19 *[Note to reader: This section will be prepared when the critical habitat effects analyses for fish are*
20 *conducted.]*

21 **3.C.1.3.6 AMM3.6 Avoid Adverse Modification of Critical Habitat for**
22 **Sacramento River Winter-Run Chinook Salmon**

23 *[Note to reader: This section will be prepared when the critical habitat effects analyses for fish are*
24 *conducted.]*

25 **3.C.1.3.7 AMM3.7 Avoid Adverse Modification of Critical Habitat for**
26 **Green Sturgeon**

27 *[Note to reader: This section will be prepared when the critical habitat effects analyses for fish are*
28 *conducted.]*

29 **3.C.2 Preconstruction Avoidance and Minimization**
30 **Measures for Natural Communities**

31 The following avoidance and minimization measures will be implanted when construction activities
32 or other covered activities occur in the vicinity of these natural communities.

3.C.2.1 AMM4 Avoid and Minimize Impacts on Natural Communities

Natural communities identified within project areas that will not be directly affected by construction related activities will be avoided and minimized to the maximum extent practicable. The locations of natural communities within projects areas will be clearly identified on construction plans and will be clearly demarcated in the field with construction fencing and signs indicating that these areas contain sensitive resources and are to be avoided. Additional avoidance and minimization measures pertaining to construction in and around sensitive resources are presented in AMM25 below.

3.C.2.2 AMM5 Restore Temporarily Affected Natural Communities

Prior to initiating any construction related activities associated with the conservation measures or other covered activities that will result in temporary effects on natural communities, a restoration and monitoring plan will be developed for construction-related activities temporarily affecting natural communities within the Plan Area. Restoration and monitoring plans will be submitted to the appropriate agencies for approval. These plans will include methods for restoring soil conditions, revegetating disturbed areas, monitoring and maintenance schedules, adaptive management strategies, reporting requirements, and success criteria.

3.C.3 Preconstruction Avoidance and Minimization Measures for Covered Species

Avoidance and minimization measures for covered species will be implemented prior to construction activities, or in some cases prior to the finalization of project plans, for covered activities. There are no verified occurrences of western spadefoot from the Planning Area and therefore protocol-level surveys are not warranted. Avoidance and minimization measure 7 identified below for vernal pool crustaceans and Measure 9 for California tiger salamander will provide protection for any western spadefoot that may be present

Table 3.C-1 summarizes these measures with more detail presented in the individual AMMs that follow.

Table 3.C-1. Summary of Avoidance and Minimization Measures for Covered Species

AMM Number	Covered Species	Summary of AMMs
6	Covered plants	Conduct botanical surveys and implement protective measures as necessary.
7	Vernal pool crustaceans	Redesign to avoid indirect effects to modeled habitat where practicable and avoid effects to core recovery areas. Where suitable habitat in core recovery areas for Conservancy fairy shrimp and longhorn fairy shrimp can't be avoided, conduct protocol level surveys for listed vernal pool crustaceans. Implement protective measures to minimize effects as necessary.

AMM Number	Covered Species	Summary of AMMs
8	Valley elderberry longhorn beetle	Conduct preconstruction surveys for elderberry shrubs within 100 feet of covered activities involving ground disturbance and implement protective measures as necessary.
9	California tiger salamander	Identify suitable habitat within 1.24 miles of the project footprint and implement protective measures as necessary.
10	California red-legged frog	Identify suitable habitat within 1 mile of the project footprint, conduct one preconstruction survey within 1 week of construction, and implement protective measures as necessary.
11	Giant garter snake	Identify suitable aquatic habitat (wetlands, ditches, canals) within project footprint limits. Conduct preconstruction surveys during active period (May 1 to September 30) of suitable habitat and 200 feet into adjacent uplands using USFWS and California Department of Fish and Game (DFG) approved survey protocols and implement protective measures as necessary.
12	Western pond turtle	Identify suitable aquatic habitat and upland nesting and overwintering habitat within 500 feet of the project footprint limits. Conduct preconstruction surveys in suitable habitat twice including one week before and within 48 hours of construction. Implement protective measures as necessary.
7	Western spadefoot	Implement avoidance and minimization measure 7 for vernal pool crustaceans.
13	White tailed kite and Swainson's hawk	Conduct preconstruction surveys of potentially-occupied breeding habitat within 0.25 mile from the project footprint limits (covered activities and habitat restoration projects) to locate active nest sites. A minimum of 6 surveys will be conducted between March 10 and April 20. Preconstruction surveys will be conducted early during the breeding season prior to project activity, and during the planned construction year. Implement protective measures as necessary.
14	California black rail and California clapper rail	Identify suitable habitat within 700 feet of the project footprint limits. Surveys should be initiated sometime between January 15 and February 1. A minimum of four surveys should be conducted. The survey dates should be spaced at least 2 to 3 weeks apart and should cover the time period from the date of the first survey through the end of March and mid-April. Implement protective measures as necessary.
15	Greater sandhill crane	Conduct preconstruction surveys within the identified greater sandhill crane winter use area to determine the presence of occupied winter roost sites within 0.5 miles of the project footprint limits during mid-September through March 7 of each construction year. Implement protective measures as necessary.
16	Tricolored blackbird	Conduct preconstruction surveys in breeding habitat within 500 feet of BDCP project footprint limits (covered activities and habitat restoration projects). Three surveys will be conducted within 15 days of ground disturbance. Preconstruction surveys will be conducted during the breeding season (approximately mid-March through late-August) prior to project activity, and during the construction year. Implement protective measures as necessary.

AMM Number	Covered Species	Summary of AMMs
17	California least tern	Conduct preconstruction surveys of potentially-occupied breeding habitat within 300 feet from the project footprint limit (covered activities and habitat restoration projects). Three surveys will be conducted within 15 days of ground disturbance. It may be necessary to conduct the breeding bird surveys during the preceding year depending on when construction is scheduled to start. Implement protective measures as necessary.
18	Suisun sparrow, yellow-breasted chat, least Bell's vireo, and western yellow-billed cuckoo	Conduct preconstruction surveys of potentially-occupied breeding habitat within 250 feet from the project footprint limit (covered activities and habitat restoration projects). Three surveys will be conducted within 15 days of ground disturbance. It may be necessary to conduct the breeding bird surveys during the preceding year depending on when construction is scheduled to start. Implement protective measures as necessary.
19	Western burrowing owl	Conduct preconstruction surveys of breeding and wintering habitat within 250 feet of the BDCP project footprint limit (covered activities and habitat restoration projects). Preconstruction surveys will be conducted during the breeding season (approximately February through August) or wintering season (approximately September through January) prior to project activity, and during the construction year. Implement protective measures as necessary.
20	San Joaquin kit fox	Conduct habitat assessment within 250 feet of project limits. If suitable habitat is present, implement USFWS guidelines and conduct preconstruction surveys 14–30 days before ground disturbance. Implement protective measures as necessary.
21	Riparian brush rabbit and riparian woodrat	Identify suitable habitat within XX feet of the project footprint limits following USFWS Draft Habitat Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat. Implement protective measures as necessary.
22	Saltmarsh harvest mouse and Suisun shrew	Identify suitable habitat within 50 feet of the project footprint limits for projects in the species range. Implement protective measures as necessary.
23	Townsend's big-eared bat	Identify suitable roost sites within the project footprint limits. If present implement the following surveys: (1) daytime and night-emergence surveys and (2) passive acoustic surveys as needed. Implement protective measures as necessary.

1

2 3.C.3.1 AMM6 Avoid and Minimize Effects on Covered Plant 3 Species

4 A complete botanical survey of project areas being implemented under the conservation measures
5 or other covered activities will be completed using USFWS *Guidelines for Conducting and Reporting*
6 *Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (U.S. Fish and Wildlife
7 Service 1996a) and California Department of Fish and Game (DFG) *Protocols for Surveying and*
8 *Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (California
9 Department of Fish and Game 2009).

- 1 • Special-status plant surveys required for project-specific permit compliance will be conducted
2 within 1 year prior to initiating construction. The purpose of these surveys will be to verify that
3 the locations of special-status plants identified in previous surveys are extant, identify any new
4 special-status plant occurrences, and cover any portions of the project area not previously
5 identified. The extent of mitigation of direct loss of or indirect effects on special-status plants
6 will be based on these survey results.
- 7 • Locations of special-status plants in proposed construction areas will be recorded using a global
8 positioning system (GPS) unit and flagged.
- 9 • Implement project site-specific measures approved by USFWS and DFG to avoid and minimize
10 effects on these species. Avoidance of effects may require case-by-case review with DFG or
11 USFWS. Establish site-appropriate buffers with approval of USFWS and DFG around covered
12 plant populations.

13 **3.C.3.2 AMM7 Avoid and Minimize Effects on Vernal Pool** 14 **Fairy Shrimp, Mid Valley Fairy Shrimp, Conservancy** 15 **Fairy Shrimp, Longhorn Fairy Shrimp, California** 16 **Linderiella, and Vernal Pool Tadpole Shrimp**

17 During the planning phase, modeled habitat for vernal pool crustaceans will be avoided to the
18 maximum extent practicable. Where practicable, no ground-disturbing activities or alterations to
19 hydrology will occur within 250 feet of vernal pool crustacean habitat. As identified in AMM3, the
20 Implementation Office will ensure that there will be no adverse modification of critical habitat for
21 vernal pool crustaceans.

22 If covered activities are to occur in core recovery areas, protocol level surveys for vernal pool
23 crustaceans will be conducted to determine whether listed branchiopods are present. Surveys will
24 be conducted according to the most recent USFWS guidelines. If Conservancy and longhorn fairy
25 shrimps are detected in core recovery areas then projects will be redesigned to insure that no
26 suitable habitat within these areas is adversely affected.

27 Where construction occurs within 250 feet of vernal pool crustacean habitat, Best Management
28 Practices (BMPs) (AMM26) will be implemented to insure that construction activities minimize
29 effects on their habitat. Protective fencing will be installed around vernal pool crustacean habitat
30 with signage identifying these areas as containing sensitive biological resources. A biological
31 monitor will ensure that fencing and BMPs are maintained for the duration of construction and that
32 construction personnel are provided the necessary worker awareness training (AMM25).

33 **3.C.3.3 AMM8 Avoid and Minimize Effects on Valley** 34 **Elderberry Longhorn Beetle**

35 During the planning phase, surveys for elderberry shrubs will be conducted in proposed project
36 areas. Elderberry shrubs will be avoided to the maximum extent practicable. Complete avoidance
37 (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and
38 maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at
39 ground level.

1 Shrubs identified within project footprints will be transplanted to previously approved conservation
2 areas in the Plan Area. Transplanting and associated compensation will follow the guidance outlined
3 in USFWS's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife
4 Service 1999). These guidelines also identify ratios of elderberry seedlings and associated native
5 vegetation to plant in conservation areas depending on shrub stem counts and sizes, and landscape
6 position (riparian or savannah).

7 For shrubs not directly affected by construction but that occur within 100 feet of ground-disturbing
8 activities, the following measures will be implemented.

- 9 • Fence and flag all areas to be avoided during construction activities. In areas where
10 encroachment on the 100-foot buffer has been approved by USFWS, provide a minimum setback
11 of at least 20 feet from the dripline of each elderberry plant.
- 12 • Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties
13 for not complying with these requirements.
- 14 • Erect signs every 50 feet along the edge of the avoidance area with the following information:
15 "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not
16 be disturbed. This species is protected by the Endangered Species Act of 1973, as amended.
17 Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly
18 readable from a distance of 20 feet, and must be maintained for the duration of construction.
- 19 • Instruct work crews about the status of the beetle and the need to protect its elderberry host
20 plant.

21 **3.C.3.4 AMM9 Avoid and Minimize Effects on California Tiger** 22 **Salamander**

23 The project proponent will implement AMM24 and AMM25 in addition to the following measures
24 during construction to avoid and minimize both direct and indirect effects on California tiger
25 salamanders.

26 **3.C.3.4.1 Habitat Assessment**

27 Avoidance and minimization measures for California tiger salamanders will be required only for
28 projects occurring within suitable habitat as identified from the habitat modeling and by additional
29 assessments conducted during the planning phase of construction or restoration projects. A
30 qualified biologist will conduct a field evaluation of suitable upland or aquatic for California tiger
31 salamander for all covered activities that occur within 1.24 miles of modeled habitat. Because
32 California tiger salamander occurrences are limited in areas of suitable habitat in the Plan Area,
33 USFWS protocol-level surveys to determine presence are not warranted. If the project does not fully
34 avoid effects on suitable habitat, the following measures will be implemented.

- 35 • To the extent feasible, construction activities within 1.24 mile of aquatic California tiger
36 salamander habitat will be restricted to the dry season, April 15 through October 15; the period
37 can be extended depending upon the onset or cessation of rains). If construction activities must
38 occur within suitable tiger salamander habitat during the wet season, when the species may be
39 migrating overland and breeding in the vicinity, the perimeter of construction sites will be
40 fenced with amphibian exclusion fencing by October 15. Installation of exclusion fencing will

1 occur under the supervision of a qualified biologist. The amphibian exclusion fencing will
2 remain in place for the duration of construction and will be monitored by the biological
3 monitors. Where access is necessary, gates will be installed with the exclusion fence.

- 4 • No construction activities will be conducted in areas where tiger salamanders may occur if there
5 is a greater than 70% chance of rain based on the National Oceanic and Atmospheric
6 Administration's National Weather Service forecast or within 48 hours following a rain event
7 greater than 0.25 inch, unless approved by the monitor.
- 8 • A USFWS-approved biologist will determine where exclusion fencing will be installed to protect
9 California tiger salamander habitat adjacent to the defined project footprint and to minimize the
10 potential for California tiger salamanders to enter the construction work area. The California
11 tiger salamander exclusion fencing will be shown on the final construction plans. The biological
12 monitor and construction foreman will be responsible for checking the exclusion fencing around
13 the work areas daily to ensure that they are intact and upright. This will be especially critical
14 during rain events, when flowing water can easily dislodge the fencing. Any necessary repairs
15 will be immediately addressed.
- 16 • A survey will be conducted each day immediately preceding construction activity that occurs in
17 designated tiger salamander habitat or in advance of any activity that may result in take of the
18 species. The biologist will search in pipes and beneath vehicles each morning before they are
19 moved. The survey will include a careful inspection of all potential hiding spots, such as large
20 downed woody debris, the perimeter of ponds, wetlands, and riparian areas. Any tiger
21 salamanders found will be captured and held for a minimum amount of time necessary in order
22 to relocate the animal to suitable habitat a minimum of 300 feet outside of the work area.
- 23 • Surface-disturbing activities will be designed to minimize or eliminate effects to rodent burrows
24 that may provide suitable aestivation habitat. Areas with a high concentration of burrows will be
25 avoided by surface-disturbing activities to the maximum extent practicable. In addition, when a
26 concentration of burrows is present in a project site, the area will be staked or flagged to ensure
27 that work crews are aware of their location and to facilitate avoidance of the area.

28 **3.C.3.5 AMM10 Avoid and Minimize Effects on California** 29 **Red-legged Frog**

30 The project proponent will implement AMM24 and AMM25 in addition to the following measures
31 during construction to avoid and minimize both direct and indirect effects on California red-legged
32 frogs.

33 **3.C.3.5.1 Habitat Assessment**

34 Avoidance and minimization measures for California red-legged frogs will only be required for
35 projects occurring within suitable habitat as identified from the habitat modeling and by additional
36 assessments conducted during the planning phase of construction or restoration projects. A
37 qualified biologist will conduct a field evaluation of suitable upland or aquatic for California red-
38 legged frogs for all covered activities that occur within 1 mile of modeled habitat. Because California
39 red-legged frog occurrences are limited in areas of suitable habitat in the Plan Area, USFWS
40 protocol-level surveys to determine presence are not warranted. If the project does not fully avoid
41 effects on suitable habitat, the following measures will be required.

- 1 • Disturbance to suitable aquatic and upland sites within or near the project footprint will be
2 avoided to the extent feasible, and the loss of aquatic habitat and grassland vegetation will be
3 minimized through adjustments in project design, as practicable.
- 4 • Appropriate buffer distances will be established by the qualified biologist and may be reduced if
5 the biologist determines, in consultation with USFWS, that the reduction will not affect habitat
6 (e.g., a stream crossing project is directionally bored under the occupied habitat) or that the
7 reduction will not result in an adverse effect to the species or reduction in the biological values
8 of the habitat.
- 9 • To the extent practicable, initial ground-disturbing activities will be avoided between November
10 1 and March 31 in areas of identified during the planning stages as providing potential California
11 red-legged frog habitat to avoid the period when they are most likely to be moving through
12 upland areas. When ground-disturbing activities must take place between November 1 and
13 March 31, daily monitoring will occur for California red-legged frog.
- 14 • No more than 1 week prior to any ground disturbance that could affect potential California red-
15 legged frog habitat, preconstruction surveys for red-legged frog will be conducted by a USFWS-
16 approved biologist. These surveys will consist of walking surveys of the project limits and
17 adjacent areas accessible not on private property to determine presence of the species. The
18 USFWS-approved biologists will investigate potential California red-legged frog cover sites. This
19 includes full investigation of mammal burrows using a burrow probe camera. If no California
20 red-legged frogs or other wildlife are observed then the burrows will be collapsed immediately.
21 Once work areas have been cleared, exclusion fence will be put in place to prevent California
22 red-legged frogs from entering the work area (AMM~~X~~ below).
- 23 • Any California red-legged frogs found will be captured and held for a minimum amount of time
24 necessary in order to relocate the animal to suitable habitat a minimum of 300 feet outside of
25 the work area.
- 26 • If construction activities will occur in streams, install temporary aquatic barriers such as
27 hardware cloth, and relocate and exclude animals from the work area. The qualified biologists
28 will establish an adequate buffer on both sides of creeks and around potential aquatic habitat
29 and entry will be restricted during the construction period.

30 **3.C.3.6 AMM11 Avoid and Minimize Effects on Giant Garter** 31 **Snake**

32 The project proponent will implement AMM24 and AMM25 in addition to the following measures
33 during construction to avoid and minimize both direct and indirect effects on giant garter snakes.

34 **3.C.3.6.1 Habitat Assessment**

35 Avoidance and minimization measures for giant garter snakes will be required only for projects
36 occurring within suitable habitat as identified from the habitat modeling and by additional
37 assessments conducted during the planning phase of construction or restoration projects. A
38 qualified biologist will conduct a field evaluation of suitable upland or aquatic for giant garter snake
39 for all covered activities that occur within 200 feet of modeled habitat. If the project does not fully
40 avoid disturbance of suitable habitat, the following measures will be required.

- 1 • To the extent practicable, avoid construction activities within 200 feet from the banks of giant
2 garter snake aquatic habitat. Confine clearing to the minimal area necessary to facilitate
3 construction activities. Giant garter snake habitat will be clearly designated with construction
4 fencing and signage identifying these areas as sensitive.
- 5 • Conduct construction activity in giant garter snake aquatic and upland habitat in and around
6 agricultural ditches during the active period for giant garter snakes to the extent feasible, in
7 order to reduce injury or mortality by allowing snakes to move out of the way of construction
8 activities. The active period is generally between May 1 and October 1. Depending on weather
9 conditions and consultation with USFWS and DFG, it may be possible to extend the construction
10 period.
- 11 • Prior to any construction within suitable giant garter snake aquatic habitat (drainages and rice
12 fields), the habitat must remain dry (either through dewatering or, in the case of rice fields, not
13 irrigating the area of effect) for at least 15 consecutive days after April 15 and prior to
14 excavating or filling of habitat.
- 15 • A USFWS-approved biologist will conduct a survey in suitable habitat no more than 24 hours
16 before construction and will be onsite during construction activity in potential aquatic and
17 upland habitat. The construction area will be resurveyed whenever there is a lapse in
18 construction activity of two weeks or more.

19 **3.C.3.7 AMM12 Avoid and Minimize Effects on Western** 20 **Pond Turtle**

21 The project proponent will implement AMM24 and AMM25 in addition to the following measures
22 during construction to avoid and minimize both direct and indirect effects on western pond turtles.

23 **3.C.3.7.1 Habitat Assessment**

24 Avoidance and minimization measures for western pond turtle will only be required for projects
25 occurring within suitable habitat as identified from the habitat modeling and by additional
26 assessments conducted during the planning phase of construction or restoration projects. A
27 qualified biologist will conduct a field evaluation of suitable upland or aquatic for western pond
28 turtles for all covered activities that occur within 500 feet of modeled habitat. If the project does not
29 fully avoid effects on suitable habitat, the following measures will be required.

- 30 • The project proponent will retain a qualified wildlife biologist to conduct a preconstruction
31 survey 1 week before and within 48 hours of disturbance in aquatic and riparian habitats. The
32 survey objectives are to determine presence or absence of pond turtles within the construction
33 work area.
- 34 • If possible, the surveys should be timed to coincide with the time of day and year when turtles
35 are most likely to be active (during the cooler part of the day, 8:00 a.m. to 12:00 p.m. during
36 spring, summer, and late summer). Prior to conducting presence/absence surveys the biologist
37 should locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a
38 location to quietly observe turtles.

- 1 • Each survey should include a 30-minute wait time after arriving onsite to allow startled turtles
2 to return to open basking areas. The survey should consist of a minimum 15-minute observation
3 time per area where turtles could be observed.
- 4 • If turtles are observed during a survey, they will be relocated outside of the construction area to
5 appropriate aquatic habitat by a biologist with a valid memorandum of understanding from DFG
6 and as determined during coordination with DFG.
- 7 • If turtles are present they can either be hand-captured or trapped and then moved. If turtles are
8 captured and moved up or downstream, install exclusion fence perpendicular to the irrigation
9 canal or between the construction work area and the aquatic habitat extending upslope an
10 appropriate distance, determined based on topography and site vegetation. If this is determined
11 to be infeasible, a monitor will need to be present during in-water construction (and
12 construction within riparian habitat areas) to ensure that turtles do not move into the
13 construction area.

14 **3.C.3.8 AMM13 Avoid and Minimize Effects on Swainson's** 15 **Hawk and White-Tailed Kite**

16 Preconstruction surveys will be conducted for active raptor nest sites (i.e., trees) within 0.25 miles
17 of BDCP project sites. It may be necessary to conduct the nest surveys the year prior to construction
18 to allow the project applicant to determine the best approach to avoiding effects on nesting birds
19 and to ensure that a nesting bird does not hold up construction. The survey methodology will allow
20 surveying for both raptor species at the same time.

21 Table 3.C-2 summarizes the recommended timing and methodology for Swainson's hawk nesting
22 surveys in the California's Central Valley (Swainson's Hawk Technical Advisory Committee 2000).
23 To meet the minimum level of protection for the species, surveys should be completed for at least
24 the two survey periods immediately prior to a project's initiation. For example, if a project is
25 scheduled to begin on June 20, you should complete 3 surveys in Period III and 3 surveys in Period
26 V. However, it is always recommended that surveys be completed in Periods II, III, and V. Surveys
27 should not be conducted in Period IV. The survey periods are defined by the timing of migration,
28 courtship, and nesting in a "typical" year for the majority of Swainson's hawks from San Joaquin
29 County to Northern Yolo County. Dates should be adjusted in consideration of early and late nesting
30 seasons, and geographic differences (northern nesters tend to nest slightly later, etc.).

31 A 200-yard radius no-disturbance buffer will be established around each active white-tailed kite
32 nest site and Swainson's hawk nest site. No entry of any kind related to the BDCP construction
33 activity will be allowed in the buffer while a nest site is occupied by white-tailed kite or Swainson's
34 hawk during the breeding season. The buffer size may be modified based on the determination of a
35 qualified biologist and with concurrence from USFWS and DFG based on line-of-sight, topography,
36 land use, type of disturbance, existing ambient noise and disturbance levels, and other relevant
37 factors. Entry into the buffer will be granted when a qualified biologist, with concurrence from
38 USFWS and DFG, determines that the young have fledged and are capable of independent survival
39 and the nest site is no longer active. If nest tree removal is necessary, tree removal will occur only
40 during the nonbreeding season (September through February).

1 **Table 3.C-2. Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys**

Survey Dates	Survey Time	Number of Surveys	Methodology
Period I: January to March 20	All day	1	Prior to the start of nesting season, determine potential nest locations. Locate and map all raptor nest sites. After March 1 will start to observe Swainson's hawk staging in traditional territories.
Period II: March 20 to April 5 (birds arrive and establishing territories)	Sunrise to 1000 and 1600 to sunset	3	Most Swainson's hawk return by April 1. It is easy to observe old nests, staging birds, and competing species. Swainson's hawk usually on their territories during the survey hours, while soaring and foraging in the mid-day hours.
Period III: April 5 to April 20 (nest building and courtship)	Sunrise to 1200; 1630 to Sunset	3	Trees less transparent, activity at the nest site increases significantly. Swainson's hawk are nest building, with territorial and courtship displays increasing. Birds tend to vocalize and nest locations are most easily identified.
Period IV: April 21 to June 10 (incubation)	Monitoring nest sites only	Initiating Surveys not recommended	Nests are difficult to locate this time of year while the birds are incubating and difficult to see.
Period V: June 10 to July 30 (post fledging)	Sunrise to 1200; 1600 to sunset	3	Young are active and visible with both adults making numerous trips to feed young.
Notes: Summarized from Swainson's Hawk Technical Advisory Committee (Swainson's Hawk Technical Advisory Committee 2000).			

2

3 **3.C.3.9 AMM14 Avoid and Minimize Effects on California**

4 **Clapper Rail and California Black Rail**

5 If construction or restoration activities are necessary during the breeding season, preconstruction

6 surveys for California clapper rail and California black rail will be conducted where suitable habitat

7 for these species occurs within or adjacent to work areas. These surveys will involve the following

8 protocols (based on California Department of Fish and Game 2007), or other USFWS and DFG

9 approved survey methodologies.

10 Surveys should be initiated sometime between January 15 and February 1. A minimum of four

11 surveys should be conducted. The survey dates should be spaced at least 2 to 3 weeks apart and

12 should cover the time period from the date of the first survey through the end of March and mid-

13 April. This will allow the surveys to encompass the time period when the highest frequency of calls

14 is likely to occur.

- 15
- 16
- Listening stations will be established at 450-foot intervals along roads, trails and levees that will be affected by conservation measures and other covered activities.
 - California clapper rail and California black rail vocalization recordings will be played at each station.
- 17
- 18

- 1 • For California clapper rails, each listening station will be occupied for a period of 10 minutes,
2 followed by 1 minute of playing California clapper rail vocalization recordings, then followed by
3 an additional minute of listening.
- 4 • For California black rails, each listening station will be occupied for 1 minute of passive
5 listening, 1 minute of “grr” calls followed by 30 seconds of “ki-ki-krrr” calls, then followed by
6 another 3.5 minutes of passive listening.
- 7 • Sunrise surveys will begin 60 minutes before sunrise and conclude 75 minutes after sunrise (or
8 until presence is detected).
- 9 • Sunset surveys will begin 75 minutes before sunset and conclude 60 minutes after sunset (or
10 until presence is detected).
- 11 • Surveys will not be conducted when tides are greater than 4.5 Geodetic Vertical Datum or when
12 sloughs and marshes are more than bankfull.
- 13 • California clapper rail and California black rail vocalizations will be recorded. A GPS receiver will
14 be used to identify call location and distances. The call type, location, distance, and time will be
15 recorded on a data sheet.
- 16 If California clapper rail or California black rail is present in the immediate construction area, the
17 following measures will apply during construction activities.
- 18 • To avoid the loss of individual California clapper rails or California black rails, activities within
19 or adjacent to California clapper rail or California black rail habitat will not occur within 2 hours
20 before or after extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge),
21 when the marsh plan is inundated, because protective cover for California clapper rails is
22 limited and activities could prevent them from reaching available cover.
- 23 • To avoid the loss of individual California clapper rails or California black rails, activities within
24 or adjacent to tidal marsh areas will be avoided during the rail breeding season from February 1
25 through August 31 each year unless surveys are conducted to determine rail locations and
26 territories can be avoided.
- 27 • If breeding California clapper rails or California black rails are determined to be present,
28 activities will not occur within 700 feet of an identified calling center. If the intervening distance
29 is across a major slough channel or across a substantial barrier between the rail calling center
30 and any activity area is greater than 200 feet, it may proceed at that location within the breeding
31 season.
- 32 • **Exception:** Only inspection, maintenance, research, or monitoring activities may be performed
33 during the California clapper rail or California black rail breeding season in areas within or
34 adjacent to breeding habitat with USFWS and DFG approval under the supervision of a qualified
35 biologist.

36 **3.C.3.10 AMM15 Avoid and Minimize Effects on Greater** 37 **Sandhill Crane**

38 If projects under the conservation measures or other covered activities are to occur during the
39 greater sandhill crane's wintering season (generally mid-September through early March), then

1 preconstruction surveys will be conducted for greater sandhill crane roost sites within 0.5 mile of
2 the project area. Surveys will be conducted over multiple days within the survey area.

3 If preconstruction surveys determine that a greater sandhill crane roost site is located within or
4 adjacent to a BDCP project site, a no-disturbance buffer will be established around each identified
5 roost area. The size of the buffer will be determined on a case by case basis by a qualified biologist in
6 consultation with USFWS and DFG. Construction and other work activity in the buffer will be
7 restricted based on crane use patterns of the roost while the site is occupied during the winter
8 season (generally mid-September through early March). During the wintering season, construction
9 equipment greater than 50 feet in height will avoid locations that could lead to strikes by greater
10 sandhill crane. When locating permanent facilities that could pose a bird strike hazard for greater
11 sandhill crane, specific site locations will be chosen that minimize bird strike hazard to greater
12 sandhill crane. Bird strike risk to greater sandhill crane will be considered when locating
13 transmission, sub-transmission, and distribution power lines and conductor and ground lines will be
14 fitted with flight diverters in compliance with the best available practices such as those specified in
15 the USFWS Avian Protection Guidelines.

16 **3.C.3.11 AMM16 Avoid and Minimize Effects on Tricolored** 17 **Blackbird**

18 Prior to implementation of covered activities, a qualified biologist will conduct a preconstruction
19 survey to establish use of marsh habitat by colonies of tricolored blackbirds. Surveys will be
20 conducted within suitable habitat within 500 feet of proposed project areas. Three surveys will be
21 conducted within 15 days of construction with one of the surveys no later than 5 days prior to
22 construction. If active tricolored blackbird nesting colonies are identified, minimization
23 requirements and construction monitoring will be required.

24 Covered activities must avoid active tricolored blackbird nesting colonies and associated habitat
25 during the breeding season (generally March 15–July 31). Avoidance measures will include
26 relocating covered activities away from the nesting colonies and associated habitat to the maximum
27 extent practicable. Avoidance and minimization measures will be incorporated into the project
28 design and other portions of the application package prior to submission for coverage under the
29 Plan.

30 Covered activities will be prohibited within 250 feet of an active tricolored blackbird colony. This
31 buffer may be reduced in areas with dense forest, buildings, or other habitat features between the
32 construction activities and the active nest colony, or where there is sufficient topographic relief to
33 protect the colony from excessive noise or visual disturbance. Depending on site characteristics, the
34 sensitivity of the colony, and surrounding land uses, the buffer zone may be increased. Land uses
35 potentially affecting a colony will be observed by a qualified biologist to verify that the activity is not
36 disrupting the colony. If it is, the buffer will be increased. Implementing Entity technical staff will
37 coordinate with the Wildlife Agencies and evaluate exceptions to the minimum no-activity buffer
38 distance on a case-by-case basis.

39 If construction takes place during the breeding season, a qualified biologist will monitor
40 construction to ensure that the 250-foot buffer zone is enforced. If monitoring indicates that
41 construction outside of the buffer is affecting a breeding colony, the buffer will be increased if space

1 allows (e.g., move staging areas farther away). If space does not allow, construction will cease until
2 the colony abandons the site or until the end of the breeding season, whichever occurs first.

3 **3.C.3.12 AMM17 Avoid and Minimize Effects on California** 4 **Least Tern**

5 If suitable nesting habitat for California least tern (flat, unvegetated areas near aquatic foraging
6 habitat) is identified during planning surveys, at least 3 surveys for this species will be conducted
7 during the nesting season. Projects will be designed to avoid loss of California least tern nesting
8 colonies. No construction will take place within 500 feet of California least tern nests during the
9 nesting season (April 15 to August 15, or as determined through surveys).

10 *Exception:* Only inspection, maintenance, research, or monitoring activities may be performed
11 during the least tern breeding season in areas within or adjacent to least tern breeding habitat with
12 USFWS and DFG approval under the supervision of a qualified biologist.

13 **3.C.3.13 AMM18 Avoid and Minimize Effects on Suisun Song** 14 **Sparrow, Yellow-Breasted Chat, Least Bell's Vireo,** 15 **Yellow-Billed Cuckoo**

16 Conduct preconstruction surveys of potential breeding habitat for the Suisun song sparrow, yellow-
17 breasted chat, least Bell's vireo, and western yellow-billed cuckoo within 250 feet project activities.
18 At least three surveys should be conducted in suitable habitats within the 15 days prior to
19 construction, with the last no later than 5 days prior to construction.

20 If an active nest site is present, a 250-foot no-disturbance buffer will be established around the nest
21 site during the breeding season (generally late February through late-August for chat, vireo and
22 cuckoo) and (generally early April through late August for Suisun song sparrow). Entry into the
23 buffer may be granted if a qualified biologist, with concurrence from USFWS and DFG, determines
24 that healthy young have fledged and nest sites are no longer active, or nesting birds do not exhibit
25 significant adverse reaction to construction activities.

26 Disturbance to previous Least Bell's vireo nesting sites (for up to 3 years) will also be avoided
27 during the breeding season unless the disturbance is required for the conservation strategy or to
28 maintain public safety. Least Bell's vireos use previous nesting sites, and disturbance during the
29 breeding season may preclude birds from using existing nests.

30 The required buffer may be reduced in areas where there are sufficient barriers or topographic
31 relief to protect the nest from excessive noise or other disturbance. Implementing Entity technical
32 staff will coordinate with the Wildlife Agencies and evaluate exceptions to the minimum no-activity
33 buffer distance on a case-by-case basis.

34 If occupied nests are identified, a qualified biologist will monitor construction activities in the
35 vicinity of all active yellow breasted chat and least Bell's vireo nests to ensure that covered activities
36 do not affect nest success.

1 **3.C.3.14 AMM19 Avoid and Minimize Effects on Western** 2 **Burrowing Owl**

3 To avoid or minimize direct effects on western burrowing owls, the procedures described below will
4 be implemented. This AMM incorporates survey, avoidance, and minimization guidelines taken
5 primarily from DFG's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and
6 Game 1995).

7 **3.C.3.14.1 Western Burrowing Owl Habitat Survey**

8 Western burrowing owl habitat surveys will be required in the study area in all occupied burrowing
9 owl habitat and in potential burrowing owl nesting/overwintering habitat. Surveys are not required
10 in sites that are mapped as only overwintering habitat. Modeled habitat may change throughout the
11 permit term based best available scientific data. Species surveys in occupied burrowing owl habitat
12 and potential burrowing owl nesting/overwintering habitat are required in both breeding and
13 nonbreeding seasons. If the project site falls within occupied habitat or potential
14 nesting/overwintering habitat, a qualified biologist will map areas with burrows (i.e., areas of
15 highest likelihood of burrowing owl activity) and all burrows that may be occupied (as indicated by
16 tracks, feathers, egg shell fragments, pellets, prey remains, or excrement) on the project site. This
17 mapping will be conducted while walking transects throughout the entire project footprint, plus all
18 accessible areas within a 250-foot radius from the project footprint. The centerline of these
19 transects will be no more than 50 feet apart and will vary in width to account for changes in terrain
20 and vegetation that can preclude complete visual coverage of the area. For example, in hilly terrain
21 with patches of tall grass, transects will be closer together, while in open areas with little vegetation
22 they can be 50 feet apart.

23 This methodology is consistent with other accepted survey protocols for this species (California
24 Burrowing Owl Consortium 1993). The BDCP Implementation Office may update this protocol
25 during the permit term based on changes to the accepted protocol with the concurrence of DFG and
26 USFWS. Adjacent parcels under different land ownership will be surveyed only if access is granted
27 or if the parcels are visible from authorized areas. If the project does not fully avoid effects on
28 suitable breeding habitat, preconstruction surveys will be required. Occupied habitat and potential
29 nesting/overwintering habitat is fully avoided if the project footprint does not impinge on a 250-
30 foot buffer around the suitable burrow during breeding season or a 160-foot buffer during
31 nonbreeding season. Presence of burrowing owls or their sign (pellets, whitewash, etc.) anywhere
32 within the 250-foot accessible radius around a suitable burrow during the breeding season or a 160-
33 foot buffer during nonbreeding season will be recorded and mapped and preconstruction surveys
34 will be required.

35 **3.C.3.14.2 Preconstruction Survey**

36 Prior to any ground disturbance related to covered activities, a qualified biologist will conduct
37 preconstruction surveys in areas identified in the habitat surveys as having suitable burrowing owl
38 burrows. The surveys will establish the presence or absence of western burrowing owls and
39 evaluate use by owls in accordance with current DFG and/or USFWS survey guidelines, if available.

40 To maximize the likelihood of detecting owls, the preconstruction survey will last a minimum of 3
41 hours. The survey will begin 1 hour before sunrise and continue until 2 hours after sunrise (3 hours

1 total) or begin 2 hours before sunset and continue until 1 hour after sunset. Additional time may be
2 required for large project sites. For sites where owls have been observed during the previous three
3 years, or if surveys have not been conducted on the site within the previous three years, a minimum
4 of two surveys will be conducted (if owls are detected on the first survey, a second survey is not
5 needed). All owls observed will be counted and mapped.

6 Surveys will conclude no more than two calendar days prior to construction. Therefore, the project
7 proponent must begin surveys no more than 6 days prior to construction (4 days of surveying plus
8 up to 2 days between surveys and construction) if a single survey is required and 14 days prior to
9 construction if two surveys are required. To avoid last-minute changes in schedule or contracting
10 that may occur if burrowing owls are found, the project proponent may also conduct a preliminary
11 survey up to 14 days before construction. If the project requires two surveys, this preliminary
12 survey may count as the first of the two surveys as long as the second survey concludes no more
13 than 2 days in advance of construction. During the breeding season (February 1–August 31), surveys
14 will document if owls are nesting in or directly adjacent to disturbance areas. During the
15 nonbreeding season (September 1–January 31), surveys will document if owls are using habitat in
16 or directly adjacent to any disturbance area.

17 If evidence of western burrowing owls is found during the breeding season (February 1–August 31),
18 the following measures will be implemented.

19 The project proponent will avoid all nest sites that could be disturbed by project construction
20 during the remainder of the breeding season or while the nest is occupied by adults or young
21 (occupation includes individuals or family groups foraging on or near the site following fledging).
22 Avoidance will include establishment of a 250-foot non-disturbance buffer zone around nests.
23 Construction may occur outside of the 250-foot non-disturbance buffer zone. Construction may
24 occur inside of the 250-foot non-disturbance buffer during the breeding season if the nest is not
25 disturbed, and the project proponent develops a monitoring plan for review by the Implementing
26 Entity, DFG, and USFWS based on the following criteria.

- 27 • A qualified biologist monitors the owls for at least 3 days prior to construction to determine
28 baseline nesting and foraging behavior (i.e., behavior without construction).
- 29 • The same qualified biologist monitors the owls during construction and finds no change in owl
30 nesting and foraging behavior in response to construction activities.
- 31 • If there is any change in owl nesting and foraging behavior as a result of construction activities,
32 these activities will cease within the 250-foot buffer. Construction cannot resume within the
33 250-foot buffer until the juveniles from the occupied burrows have fledged and moved out of the
34 project site.
- 35 • If monitoring indicates that the nest is abandoned prior to the end of nesting season and the
36 burrow is no longer in use by owls, the non-disturbance buffer zone may be removed. The
37 biologist will excavate the burrow to prevent reoccupation.

38 If the evidence of western burrowing owl is detected during the nonbreeding season (September 1–
39 January 31) the project applicant will implement the following measures.

- 40 • Establish a 160-foot non-disturbance buffer around occupied burrows as determined by a
41 qualified biologist. Construction activities outside of this 160-foot buffer are allowed.

- 1 Construction activities within the non-disturbance buffer are allowed if the following criteria are
2 met in order to prevent owls from abandoning important overwintering sites.
- 3 ● A qualified biologist monitors the owls for at least 3 days prior to construction to determine
4 baseline foraging behavior (i.e., behavior without construction).
 - 5 ● The same qualified biologist monitors the owls during construction and finds no change in owl
6 foraging behavior in response to construction activities.
 - 7 ● If there is any change in owl nesting and foraging behavior as a result of construction activities,
8 these activities will cease within the 160-foot buffer.
 - 9 ● If the owls are gone for at least one week, the project proponent may request that a qualified
10 biologist excavate usable burrows to prevent owls from re-occupying the site. After all usable
11 burrows are excavated, the buffer zone will be removed and construction may continue.

12 If construction continues from the breeding season into the nonbreeding season, and a non-
13 disturbance buffer zone is in place, a qualified biologist may reduce the buffer zone from 250 feet to
14 160 feet around the active burrow. Monitoring must continue as described above for the
15 nonbreeding season as long as the burrow remains active.

16 The passive or active relocation of owls has been used in the past in the study area to remove and
17 exclude owls from active burrows during the nonbreeding season. This practice is not initially
18 allowed under the Plan because DFG assumes that it has a high likelihood to result in owl mortality.
19 Direct mortality of migratory birds is not allowable by law (Migratory Bird Treaty Act of 1918 and
20 California Fish and Game Code). Therefore, activities that have a high likelihood of resulting in
21 mortality but are still allowable by law (e.g., passive or active relocation) would not be allowed
22 under the Plan until the owl population in the study area increases to an acceptable level and shows
23 a trend of population growth. Once this occurs, the capture, harm, and harassment of owls that
24 occurs during passive or active owl exclusion would be allowed on project sites in the nonbreeding
25 season if the other measures described in this condition allow work to continue.

26 If passive or active relocation is eventually allowed, a qualified biologist can passively exclude birds
27 from their burrows during nonbreeding season only by installing one-way doors in burrow
28 entrances. These doors will be in place for 48 hours to ensure owls have left the burrow, and then
29 the biologist will excavate the burrow to prevent reoccupation. Burrows will be excavated using
30 hand tools. During excavation an escape route will be maintained at all times. This may include
31 inserting an artificial structure into the burrow to avoid having the overburden collapse into the
32 burrow and trapping owls inside.

33 **3.C.3.15 AMM20 Avoid and Minimize Effects on San Joaquin** 34 **Kit Fox**

35 No take authorization for injury or death to kit fox is provided by this Plan due to the rarity of the
36 species in the Plan Area. To avoid direct effects of the BDCP conservation measures and other
37 covered activities on San Joaquin kit fox, the following procedures will be implemented. This
38 program was based on USFWS's *Standardized Recommendations for Protection of the Endangered*
39 *San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service 2011).

1 **3.C.3.15.1 Habitat Assessment**

2 San Joaquin kit fox surveys will only be required for projects occurring within suitable habitat as
3 identified from the habitat modeling and by additional assessments conducted during the planning
4 phase of construction and restoration projects. A qualified biologist will conduct a field evaluation of
5 suitable breeding or denning habitat for kit fox for all covered activities that occur within modeled
6 habitat. If the project does not fully avoid effects on suitable habitat, preconstruction surveys will be
7 required. Suitable breeding habitat is fully avoided if the project footprint does not overlap with a
8 suitable den or with a 250-foot buffer around the suitable den.

9 **3.C.3.15.2 Preconstruction Survey**

10 Within 14–30 days prior to ground disturbance related to covered activities, a qualified biologist
11 will conduct a preconstruction survey in areas identified by the habitat assessment as being suitable
12 breeding or denning habitat. The biologist will survey the proposed disturbance footprint and a
13 250-foot radius from the perimeter of the proposed footprint to identify known or potential San
14 Joaquin kit fox dens. Adjacent parcels under different land ownership will not be surveyed unless
15 access is granted within the 250-foot radius. The biologists will conduct these searches by
16 systematically walking 30- to 100-foot-wide transects throughout the survey area; transect width
17 will be adjusted based on vegetation height and topography (California Department of Fish and
18 Game 1990). Dens will be classified in one of the following four den status categories.

- 19 • **Potential den.** Any subterranean hole within the species' range that has entrances of
20 appropriate dimensions for which available evidence is sufficient to conclude that it is being
21 used or has been used by a kit fox. Potential dens comprise (1) any suitable subterranean hole
22 or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel)
23 that otherwise has appropriate characteristics for kit fox use.
- 24 • **Known den.** Any existing natural den or artificial structure that is used or has been used at any
25 time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or
26 current radiotelemetry or spotlighting data; kit fox sign such as tracks, scat, and/or prey
27 remains; or other reasonable proof that a given den is being or has been used by a kit fox.
- 28 • **Natal or pupping den.** Any den used by kit foxes to whelp and/or rear their pups.
29 Natal/pupping dens may be larger with more numerous entrances than dens occupied
30 exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the
31 vicinity of the den and may have a broader apron of matted dirt and/or vegetation at one or
32 more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not
33 necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is
34 difficult to distinguish between the two; therefore, for purposes of this definition, either term
35 applies.
- 36 • **Atypical den.** Any artificial structure that has been or is being occupied by a San Joaquin kit fox.
37 Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

38 Disturbance to all San Joaquin kit fox dens will be avoided to the extent possible. Limited destruction
39 may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are
40 observed.

- 1 • If a suitable San Joaquin kit fox den is discovered in the proposed development footprint, the
2 den will be monitored for 3 days by a USFWS- and DFG-approved biologist using a tracking
3 medium or an infrared beam camera to determine if the den is currently being used.
- 4 • Unoccupied dens will be destroyed immediately to prevent subsequent use.
- 5 • If a natal or pupping den is found, USFWS and DFG will be notified immediately. The den will not
6 be destroyed until the pups and adults have vacated and then only after further consultation
7 with USFWS and DFG.
- 8 • If kit fox activity is observed at the den during the initial monitoring period, the den will be
9 monitored for an additional 5 consecutive days from the time of the first observation to allow
10 any resident animals to move to another den while den use is actively discouraged. For dens
11 other than natal or pupping dens, use of the den can be discouraged by partially plugging the
12 entrance with soil such that any resident animal can easily escape. Once the den is determined
13 to be unoccupied it may be excavated under the direction of the biologist. Alternatively, if the
14 animal is still present after 5 or more consecutive days of plugging and monitoring, the den may
15 have to be excavated by hand when, in the judgment of a biologist, it is temporarily vacant
16 (i.e., during the animal's normal foraging activities). If at any point during excavation a kit fox is
17 discovered inside the den, the excavation activity shall cease immediately and monitoring of the
18 den as described above will be resumed. Destruction of the den may be completed when, in the
19 judgment of the biologist, the animal has escaped from the partially destroyed den.
- 20 • Construction and operational requirements from *Standardized Recommendations for Protection*
21 *of the San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service
22 2011) or the latest guidelines will be implemented.
- 23 • If active or suitable dens are identified within the proposed disturbance footprint or outside the
24 proposed project footprint but within a 250-foot buffer, exclusion zones around each den
25 entrance or cluster of entrances will be demarcated. The configuration of exclusion zones will be
26 circular, with a radius measured outward from the den entrance(s). No covered activities will
27 occur within the exclusion zones. Exclusion zone radii for atypical dens and suitable dens will be
28 at least 50 feet and will be demarcated with four to five flagged stakes. Exclusion zone radii for
29 known dens will be at least 100 feet and will be demarcated with staking and flagging that
30 encircles each den or cluster of dens but does not prevent access to the den by the foxes.
- 31 • Written results of the surveys will be submitted to USFWS within 5 calendar days of the
32 completion of surveys and prior to the beginning of ground disturbance and/or construction
33 activities likely to affect San Joaquin kit foxes.

34 **3.C.3.16 AMM21 Avoid and Minimize Effects on Riparian** 35 **Woodrat and Riparian Brush Rabbit**

36 The Implementation Office will ensure that no more than 43 acres of modeled riparian habitat for
37 riparian brush rabbit are permanently removed, and no more than 25 acres are temporarily
38 removed, from Conservation Zone 7. The Implementation Office will also ensure that tidal natural
39 communities restoration projects are designed to avoid permanent or temporary removed of
40 occupied riparian brush rabbit and riparian woodrat habitat.

1 The project proponent will implement AMM24 and AMM25 in addition to the following measures
2 during construction to avoid and minimize both direct and indirect effects on riparian woodrat and
3 riparian brush rabbit.

4 **3.C.3.16.1 Habitat Assessment**

5 Avoidance and minimization measures for both species will only be required for projects occurring
6 within suitable habitat as identified from the habitat modeling and by additional assessments
7 conducted during the planning phase of construction or restoration projects. A qualified biologist
8 will conduct a field evaluation of suitable habitat for both species for all covered activities that occur
9 within CZ 7. There is one known population of riparian brush rabbit in CZ 7 and none for riparian
10 woodrat in the Plan Area. If the project does not fully avoid effects on suitable habitat, the following
11 measures will be required.

- 12 • Assess habitat suitability for both species and if habitat is considered potentially occupied and
13 cannot be avoided conduct protocol-level surveys according to the USFWS Draft Habitat
14 Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian
15 Woodrat.
- 16 • If occupied riparian woodrat or riparian brush rabbit habitat is present in project area, re-
17 design project to the extent possible to avoid occupied habitat. Design tidal natural communities
18 restoration projects (*CM4 Tidal Natural Communities Restoration*) to completely avoid
19 permanent or temporary loss of occupied riparian brush rabbit and riparian woodrat habitat. If
20 occupied riparian woodrat or riparian brush rabbit habitat is present in the construction facility
21 corridor, consider reducing the corridor width to avoid occupied riparian habitat, and if feasible,
22 tunnel beneath the occupied riparian corridor.
- 23 • If occupied riparian woodrat or riparian brush rabbit habitat cannot be avoided, avoid mortality
24 through implementation of a trapping and relocation program. Develop the program in
25 coordination with USFWS, and relocate to site approved by USFWS prior to construction
26 activities.

27 **3.C.3.17 AMM22 Avoid and Minimize Effects on Salt Marsh** 28 **Harvest Mouse and Suisun Shrew**

29 Where suitable salt marsh harvest mouse or Suisun shrew habitat has been identified within a work
30 area or within 50 feet of a work area, vegetation will be removed only with non-mechanized hand
31 tools (e.g.,hoe, rake, and shovel). No motorized equipment, including weed trimmers or lawn
32 mowers, will be used to remove this vegetation. Vegetation will be removed under supervision of a
33 DFG- and USFWS-approved biological monitor familiar with salt marsh harvest mouse and Suisun
34 shrew. If a mouse of any species is observed within the areas being removed of vegetation, it will be
35 allowed to leave the project area on its own. Vegetation removal will start at the edge farthest from
36 the salt marsh and work its way towards the salt marsh. This method of removal provides cover for
37 salt marsh harvest mouse and Suisun shrew and allows them to move towards the salt marsh as
38 vegetation is being removed.

39 In areas of salt marsh harvest mouse habitat, the installation of exclusion fencing described in
40 AMM26 will occur immediately following the vegetation clearing. In these areas the biological

1 monitor will insure that fence stakes will face towards the works site to prevent mice from using
2 these to climb into work areas.

3 Tidal restoration work will be scheduled to avoid extreme high tides (6.5 feet or above, as measured
4 at the Golden Gate Bridge) when there is potential for salt marsh harvest mouse and Suisun shrew to
5 move to higher, drier grounds.

6 **3.C.3.18 AMM23 Avoid and Minimize Effects on Townsend's** 7 **Big-Eared Bat**

8 The project proponent will implement AMM25 through AMM27 in addition to the following
9 measures during construction to avoid and minimize both direct and indirect effects on Townsend's
10 big-eared bat.

11 **3.C.3.18.1 Habitat Assessment**

12 If initial planning surveys, CNDDDB search, or habitat models (*Appendix A, Covered Species Accounts*)
13 indicate suitable roosting sites (e.g., buildings, bridges, tunnels) for Townsend's big-eared bat are
14 present on BDCP project sites, qualified biologists will implement preconstruction surveys to
15 attempt to determine presence of Townsend's big-eared bat.

16 **3.C.3.18.2 Preconstruction Surveys**

17 If presence of this bat is determined at any point in the surveys described below, the remaining
18 surveys would not be needed; however, absence should not be assumed until all surveys have been
19 completed with negative results. While Townsend's big-eared bat is a relatively sedentary species
20 and is closely associated with its primary roost site during the maternity season, it may not be
21 present as consistently during the remainder of the year. Multiple visits throughout the year and
22 within the season of interest increase the likelihood of detecting bats that are using the habitat
23 feature (Pierson et al. 1999). All surveys should be scheduled for highest likelihood of detection
24 based on seasonal and daily variation in roost site requirements and patterns of Townsend's big-
25 eared bat movements, as described in Pierson et al. 1999.

26 **3.C.3.18.3 Daytime and Night Emergence Surveys**

27 Qualified biologists will conduct daytime surveys for bat sign (guano, culled insect parts, etc.) and
28 evening emergence surveys within the season that the construction disturbance or bridge/
29 building/tunnel removal will be taking place. Emergence surveys will consist of two or more
30 biologists watching for bats emerging from all potential exits or otherwise using the structure from
31 a half hour before sunset until at least 2 hours after sunset (Pierson et al. 1999) for a minimum of
32 four nights (Sherwin et al. 2003 in Gruver and Keinath 2006). If there is evidence that the structure
33 is used as a night roost (detection of guano and/or prey remains, passive acoustic records),
34 biologists will extend the survey to 4 hours past sunset, or as needed to determine whether the
35 structure is being used for this purpose. If surveys are conducted during the hibernation season,
36 bats should be viewed under red light only and disturbance should be kept to an absolute minimum
37 (Pierson et al. 1999).

1 Biologists will use night vision goggles if available and active acoustic monitoring using full
2 spectrum bat detectors to assist in identifying species observed during emergence surveys.
3 Biologists will stay an adequate distance from the potential roosting site so as to not disturb
4 Townsend's big-eared bats, and will, as appropriate, adapt specific survey recommendations
5 described in the External Evaluation Protocol in Pierson et al. 1999.

6 **3.C.3.18.4 Passive Acoustic Surveys**

7 Additionally, four to eight nights of passive acoustic monitoring surveys using full spectrum bat
8 detectors will be conducted at each site within the season that the construction will be taking place.
9 If possible, detectors will be set to record bat calls for the duration of each night. Acoustic records
10 can provide evidence of the presence of Townsend's big-eared bat, but given the low volume
11 echolocation calls characteristic of this species, acoustic surveys alone should not be used to suggest
12 absence. The biologists will analyze the bat call data and prepare a memo report with the results of
13 the surveys.

14 To the extent possible, all surveys and monitoring will be conducted during favorable weather
15 conditions (calm nights with no precipitation predicted). If Townsend's big eared bat is not detected
16 during any of the surveys, no further measures are required (except as needed to comply with other
17 special-status bat species requirements). If Townsend's big-eared bat is detected during the surveys,
18 the BDCP permit applicant will implement the following measures.

- 19 ● Hibernacula or breeding sites may be located during planning or preconstruction surveys,
20 especially for bridge reconstruction and the demolition of abandoned buildings. Impacts to
21 maternity colonies are not permitted under this Plan.
- 22 ● To avoid effects on maternity colonies or hibernating bats, no construction or disturbance of the
23 structure or within 500 feet of the structure will occur while bats are present, generally between
24 April 1 and September 15 (maternity season) and from October 30 to March 1 (hibernation).
- 25 ● Removal of roosting habitat will only occur following the maternity season and prior to
26 hibernation, generally between September 15 and October 30, unless exclusionary devices are
27 first installed (as described below).
- 28 ● If the roosting site will be removed, additional surveys in each season may be necessary to
29 determine presence of bats during other portions of the year, and determine appropriate
30 compensation.
- 31 ● Installation of exclusion devices will occur before maternity colonies establish or after they
32 disperse, generally from March 1–30 or September 15–October 30 to preclude bats from
33 occupying a roost site during construction. Exclusionary devices will only be installed by or
34 under the supervision of an experienced bat biologist.

3.C.4 Project Construction, Operations and Maintenance, and Enhancement and Management Avoidance and Minimization Measures

The following avoidance and minimization measures will be implemented prior and during the construction of the water conveyance facility, construction of transmission lines, initiation of restoration activities, and the implementation of other covered activities, where applicable.

3.C.4.1 AMM24 Conduct Worker Awareness Training

The BDCP Implementation Office will provide training to field management and construction personnel on the importance of protecting sensitive natural resources. Training will be conducted during preconstruction meetings so that construction personnel are aware of their responsibilities and the importance of compliances. All trainees will be required to sign a sheet indicating their attendance and completion of environmental training. The training sheets will be provided to the agencies if requested.

Construction personnel will be educated on the types of sensitive resources located in the project area and the measures required to avoid and minimize effects on these resources. Materials covered in the training program will include environmental rules and regulations for the specific project and requirements for limiting activities to approved work areas and avoiding sensitive resource areas. In general, trainings will include the following components.

- The legal requirements for resource avoidance and protection.
- Identification of species.
- Brief discussions of species and natural communities of concern.
- Boundaries of the work area.
- Avoidance and minimization commitments.
- Exclusion and construction fencing methods.
- Roles and responsibilities.
- What to do when wildlife is encountered (dead, injured, or entrapped) in work areas.
- Penalties for non-compliance.
- A fact sheet or other supporting materials containing this information will be prepared and distributed.
- A list of contacts (names, numbers, and affiliations).

A representative shall be appointed by the project proponent to be the contact source for any employee or contractor who might inadvertently kill, or a representative will be identified during the employee education program and the representative's name and telephone number shall be provided to USFWS.

1 If new construction personnel are added to the project, the contractor will ensure that the personnel
2 receive the mandatory training before starting work.

3 **3.C.4.2 AMM25 Implement Construction Best Management** 4 **Practices and Monitoring**

5 The BDCP Implementation Office will insure that all construction activities associated with the
6 water conveyance facilities as well as restoration actions in and adjacent to sensitive resources
7 areas (e.g., species habitats, wetlands, open water) identified in the BDCP, or subsequent project
8 level documents, implement BMPs, and have construction monitored by qualified technical
9 specialist so as to avoid and minimize effects to natural communities and covered wildlife.
10 Depending on the resource of concern and construction timing, construction areas will be monitored
11 for compliance with water quality regulations (Storm Water Pollution Prevention Plan [SWPPP]
12 monitoring) and compliance with avoidance and minimization measures developed for sensitive
13 biological resources (biological monitoring).

14 Before implementing an approved project, the BDCP Implementation Office will prepare a
15 construction monitoring plan. The construction monitoring plan will include the following elements.

- 16 • Reference to or inclusion of the SWPPP prepared under the Construction General Permit, where
17 one is needed.
- 18 • Summaries or copies of planning and preconstruction surveys (if applicable) for covered natural
19 communities and species.
- 20 • Description of avoidance and minimization measures to be implemented, including a description
21 of project-specific measures or additional measures not included in the Habitat Conservation
22 Plan (HCP)/Natural Community Conservation Plan (NCCP).
- 23 • Descriptions of monitoring activities, including the specific activities to be monitored (e.g.,
24 grading activities), monitoring frequency and duration.
- 25 • Description of the onsite authority of the monitors to modify construction activity and protocols
26 for consultation with DFG and USFWS, if needed.
- 27 • A daily monitoring log to be completed by the construction monitoring that documents that
28 day's construction activities, notes any problems identified and solutions to those problems,
29 documents weather conditions, and documents general site conditions.

30 The following measures will be implemented prior to and during construction related activities or
31 other covered activities with potential to result in the disturbance of natural communities or
32 covered species. Additional measures may be developed for site specific conditions or specific
33 species during the review of individual projects.

- 34 • Construction monitoring by qualified biologists will occur in areas identified during the
35 planning stages and species surveys as having sensitive natural communities or covered species.
36 The intent of the biological monitoring is to ensure that specific avoidance and minimization
37 measures that have been integrated into the project design and permit requirements are being
38 implemented.
- 39 • Biological monitors will be selected based on their knowledge with the natural communities
40 and/or covered species being monitored for. The qualifications of the biologist(s) will be

- 1 presented to USFWS for review and written approval prior to groundbreaking at the project site
2 where the project could reasonably affect covered species. The biological monitor will have the
3 authority to temporarily cease work in an area where a covered species has been located until
4 that individual has passively or physically been moved outside of the work area.
- 5 ● During construction, the non-disturbance buffer zones described under covered species
6 *Avoidance and Minimization Measures* will be established and maintained if applicable. A
7 qualified biologist will monitor the site consistent with the requirements described for covered
8 species to ensure that buffers are enforced and covered resources are not disturbed.
 - 9 ● Exclusionary fencing will be placed at the edge of active construction and staging areas (cleared
10 by biological surveys) to restrict wildlife access from the adjacent habitats. The need for
11 exclusionary fencing will be determined during the preconstruction surveys and may vary
12 depending on the species. The fencing will consist of taut silt fabric 24 inches high (36 inches
13 high for California red-legged frogs), staked at 10-foot intervals, with the bottom buried 6 inches
14 below grade. Fence stakes will face toward the work area (on the opposite side of adjacent
15 habitat) to prevent wildlife from using stakes to climb over the exclusion fencing. Exclusion
16 fencing will be maintained such that it is intact during rain events and 24 hours after any rain
17 event. Fencing will be checked by the biological monitor or construction foreman periodically
18 throughout each work day. If fencing becomes damaged, no work will occur within 300 feet of
19 the damaged fencing until it is repaired and the adjacent work area is surveyed to insure that no
20 sensitive wildlife have entered.
 - 21 ● Active construction and staging areas will be delineated with high-visibility temporary fencing
22 at least 4 feet in height, flagging, or other barrier to prevent encroachment of construction
23 personnel and equipment outside the described project footprint. Such fencing will be inspected
24 and maintained daily by the construction foreman until completion of the project. The fencing
25 will be removed from areas only after all construction equipment is removed. No project
26 activities will occur outside the delineated project construction areas.
 - 27 ● Project-related vehicles will observe a speed limit of 20 miles per hour within construction
28 areas, except on county roads and state and federal highways. A vehicle speed limit of 20 miles
29 per hour will be posted and enforced on all non-public access roads, particularly on rainy nights
30 when California tiger salamanders and California red-legged frogs are most likely to be moving
31 between breeding and upland habitats.
 - 32 ● All access in the project site will be restricted to those routes identified in the project
33 description. Cross-country access routes will be clearly marked in the field with appropriate
34 flagging and signs.
 - 35 ● All vehicle parking will be restricted to previously determined areas or existing roads.
36 Necessary vehicles belonging to the biological monitors and construction supervisors will be
37 parked at the nearest point on existing access roads.
 - 38 ● To the maximum extent practicable, nighttime construction will be minimized. However if it
39 does occur, then the speed limit should be reduced to 10 miles per hour.
 - 40 ● All major construction activities, such as the use of equipment and vehicles, in sensitive habitat
41 areas will cease one half hour before sunset and will not resume prior to one half hour after
42 sunrise. Clean up and demobilization activities may continue to occur in the evening as long as
43 the monitor determines that there is sufficient light to survey or detect sensitive species. In the

- 1 event that construction activities need to continue beyond one half hour after sunset, the
2 biological monitor will notify USFWS within 24 hours of work being extended. If USFWS
3 ultimately determines that work continuation beyond one half hour after sunset is occurring too
4 often, USFWS and biological monitor will evaluate the work schedule to determine appropriate
5 steps to be taken to ensure better compliance with the conservation measure.
- 6 • To eliminate attracting predators, all food-related trash items such as wrappers, cans, bottles,
7 and food scraps will be disposed of in closed containers and removed at least once a week from
8 a construction or project site.
 - 9 • To avoid injury or death to wildlife, no firearms will be allowed on the project site except for
10 those carried by authorized security personnel or local, state, or federal law enforcement
11 officials.
 - 12 • To prevent harassment, injury, or mortality of sensitive wildlife by dogs or cats, no canine or
13 feline pets will be permitted in the active construction area.
 - 14 • To prevent inadvertent entrapment of wildlife during construction, all excavated, steep-walled
15 holes or trenches more than 1 foot deep will be covered at the close of each working day with
16 plywood or similar material, or provided with one or more escape ramps constructed of earth
17 fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected
18 for trapped animals. If a covered species is encountered during construction work, activities will
19 cease until the animal leaves the area or is removed and relocated by a USFWS-approved
20 biologist.
 - 21 • Capture and relocation of trapped or injured individuals can only be attempted by USFWS-
22 permitted personnel. Any sightings and any incidental take will be immediately reported to DFG
23 and USFWS via email. A follow-up report will be sent to these agencies, including dates,
24 locations, habitat description, and any corrective measures taken to protect covered species
25 encountered. For each covered species encountered, the biologist will submit a completed
26 CNDDDB field survey form (or equivalent) to DFG no more than 90 days after completing the last
27 field visit to the project site.
 - 28 • All work will be performed in accordance with a SWPPP. BMPs will be implemented and may
29 include the use of silt fences, sandbags, detention basins, and other means as appropriate to
30 prevent sedimentation and degradation of water quality down-gradient from the proposed
31 project.
 - 32 • Plastic monofilament netting (erosion control matting) or similar material will not be used at
33 the project site because smaller wildlife may become entangled or trapped in it. Acceptable
34 substitutes include coconut coir matting or tackified hydroseeding compounds. This limitation
35 will be communicated to the contractor through special provisions included in the bid
36 solicitation package.
 - 37 • Covered wildlife can be attracted to den-like structures such as pipes and may enter stored
38 pipes and become trapped or injured. All construction pipes, culverts, or similar structures;
39 construction equipment; or construction debris left overnight in areas that may be occupied by
40 wildlife will be inspected by the biological monitor prior to the beginning of each day's activities.
41 If a covered species is discovered inside a pipe, that section of pipe should not be moved until
42 USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the

- 1 pipe may be moved only once to remove it from the path of construction activity, until the
2 covered species has escaped or been relocated.
- 3 • Use of rodenticides and herbicides will be utilized in such a manner to prevent primary or
4 secondary poisoning of covered species and depletion of prey populations on which they
5 depend. All uses of such compounds will observe label and other restrictions mandated by EPA,
6 the California Department of Pesticide Regulation, and other appropriate state and federal
7 regulations, as well as additional project-related restrictions that USFWS or DFG deems
8 necessary. If rodent control must be conducted in San Joaquin kit fox habitat, zinc phosphide
9 should be used because of a proven lower risk to kit fox. In addition, the method of rodent
10 control will comply with the methods of rodent control discussed in the 4(d) rule published in
11 the final listing rule for tiger salamander (69 FR 47211–47248). The rodent control restrictions
12 described above will be implemented in perpetuity.
 - 13 • Nets or bare hands may be used to capture covered species. An approved biologist will not use
14 soaps, oils, creams, lotions, insect repellents, or solvents of any sort on their hands within
15 2 hours before handling amphibians. Latex gloves will not be used. To avoid transferring
16 diseases or pathogens between aquatic habitats during the course of surveys or handling, the
17 biologists will follow the Declining Amphibian Task Force's "Code of Practice." While in captivity,
18 individuals will be kept in a cool, moist, aerated environment such as a bucket containing a
19 damp sponge. Containers used for holding or transporting these species will be sanitized and
20 will not contain any standing water.
 - 21 • USFWS will be notified within 1 working day of the discovery of death or injury to a covered
22 species that results from project-related activities or is observed at the project site. Notification
23 will include the date, time, and location of the incident or of the finding of a dead or injured
24 animal clearly indicated on a U.S. Geological Survey (USGS) 7.5-minute quadrangle and other
25 maps at a finer scale, as requested by USFWS, and any other pertinent information.
 - 26 • Habitat subject to permanent and temporary construction disturbances and other types of
27 ongoing project-related disturbance activities should be minimized by adhering to the following
28 activities. Project designs should limit or cluster permanent project features to the smallest area
29 possible while still permitting achievement of project goals. To minimize temporary
30 disturbances, all project-related vehicle traffic should be restricted to established roads,
31 construction areas, and other designated areas. These areas should also be included in
32 preconstruction surveys and, to the extent possible, should be established in locations disturbed
33 by previous activities to prevent further effects.
 - 34 • Upon completion of the project, all areas subject to temporary ground disturbances, including
35 storage and staging areas, temporary roads, pipeline corridors, etc. should be re-contoured if
36 necessary, and revegetated to promote restoration of the area to preproject conditions. An area
37 subject to "temporary" disturbance means any area that is disturbed during the project, but
38 after project completion will not be subject to further disturbance and has the potential to be
39 revegetated. Appropriate methods and plant species used to revegetate such areas should be
40 determined on a site-specific basis in consultation with USFWS, DFG, and revegetation experts
41 (AMM5).

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