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Compliance Monitoring Table for Natural Communities and Covered Species in Solano HCP

Valley Floor Grassland and Vernal Pool Natural Community

General Measure Requirements: If a project is located in an area or contains conditions meeting one or more of the criteria identified in VPG DES 1, then VPG DES 2 and VPG DES 3 must be implemented.

VPG DES 1: Habitat Avoidance

In Covered Activity Zones 2 and 3 (Figure 1-4) maximum avoidance of vernal pools and other seasonal wetlands is required except for approved habitat enhancement/restoration activities described in Section 10.5.4. In Covered Activity Zone 1, maximum avoidance is required in the following locations where:

1. The wetlands contribute to habitat quality and value or reserve/preserve lands established (or expected to be established) in perpetuity for conservation purposes
2. The wetlands are adjacent to or contiguous with riparian or stream corridors or permanently protected lands, or
3. The wetlands are located in or contiguous to High Value Vernal Pool Conservation Areas.

Where temporary or permanent fill is proposed in any vernal pools or other seasonal wetlands in Covered Activity Zones 2 or 3 as well as the above-listed locations in Covered Activity Zone 1, the Plan Participant or eligible third-party applicant shall provide documentation explaining why avoidance isn't practicable and/or would not contribute to the conservation goals and objectives of the Habitat Conservation Plan (HCP), in accordance with the procedures in Section 10.4.1. The determination of compliance with VPG DES 1 of any proposed Covered Activity that would result in the filling of vernal pools or other seasonal wetlands will be made by the Solano County Water Agency (SCWA) in consultation with the HCP Technical Review Committee (see Sections 10.4.1 and 10.2.6).

VPG DES 2: Site Design Standards

The following site design standards shall apply to all Covered Development Activities affecting Valley Floor Grassland and Vernal Pools:

1. All Locations Specified Under VPG DES 1: (a through d below)
 - a. All avoided areas shall be preserved and managed consistent with the requirements in Sections 7.3 and 10.5. These areas shall also include sufficient buffers in compliance with the criteria outlined in VPG DES 3 and VPG DES 4.
 - b. Development shall be designed to minimize direct and indirect impacts to wetlands and edge effects to preserved areas.

- c. The applicant shall incorporate measures into the project design to accomplish the following:
 - 1) Preserve and maintain sufficient unaltered watershed area to prevent significant adverse changes in water quality, and the volume and timing of inflows to preserved wetlands.
 - 2) Avoid changes in nutrient input from adjacent upland sources into preserved wetlands.
 - 3) Provide sufficient upland habitat to support associated amphibian and terrestrial fauna and vernal pool plant pollinator species.
 - 4) Accommodate linkages/corridors between individual aggregations of vernal pools in a larger vernal pool complex.
 - 5) Provide a terrestrial buffer to protect the core wetland and associated upland habitat from edge effects associated with surrounding land uses (i.e., prohibit backyards from backing up to preserves, place firebreaks on the development side of preserve/development boundaries, provide for a vegetated buffer between roads and preserve boundaries).
 - 6) Minimize the potential for spread of invasive species from the development into preserved lands.
- d. Development shall not isolate existing populations or suitable habitat areas. To maintain connectivity between adjacent reserves, a corridor shall be established linking these areas. Corridor reserves shall conform to the minimum requirements specified in VPG DES 6, Corridors.

VPG DES 2: The following site design standards shall apply to all Covered Development Activities affecting Valley Floor Grassland and Vernal Pools:

- 1. Contra Costa Goldfield Core Population Areas (High Value Vernal Pool Conservation Areas 1B, 1C, 1D, 1E, 1F, 1G, and 1H)
 - a. No more than 10 percent of suitable wetland habitat for Contra Costa goldfields shall be directly impacted per project.
 - b. The 10 percent of suitable habitat impacted under Condition 1 shall not contain more than 50 percent of the current or historically documented occupied habitat on the site. The extent of occupied habitat shall be determined based on at least 2 years of field surveys/mapping at the site (occupied habitat area shall be based on the total area of the hydrologically contiguous occupied wetland, not just Contra Costa goldfield cover).
 - c. Implementation of Conditions 1 and 2 shall not result in preserves less than 80 contiguous acres in size.



VPG DES 3: Buffer Criteria for Covered Development Activities

Vegetated buffers shall be established around preserved vernal pools and seasonal wetlands. Buffers shall be consistent with the following criteria:

1. Vegetated buffers shall consist of valley floor grassland and vernal pool vegetation and/or other natural vegetation (i.e., oak savanna/woodland, coastal marsh or riparian habitats, if applicable)
2. Buffers shall not contain any irrigated or landscaped lands, fire breaks, or public or maintenance access trails or roads.
3. Habitats (vernal pools, uplands, etc.) within 250 feet of development in High and Medium Value Vernal Pool Conservation Areas and 100 feet in Low Value Vernal Pool Conservation Areas (Figure 4-8) (see potential exceptions below under VPG DES 4 for Extremely Rare and/or Range-Limited Species) will be considered to be indirectly impacted. All such indirect impacts shall be subject to mitigation requirements under Section 6.4.2.
4. Buffers shall be preserved in perpetuity and managed consistent with the HCP reserve criteria described in Sections 7.3 and 10.5.

VPG DES 4: Protection and Buffer Zones for Extremely Rare and/or Range-Limited Species

Populations of the following Covered Species that occur in vernal pools shall be protected in perpetuity if they are found on a site where a Covered Development Activity is proposed: Colusa grass, Solano grass, San Joaquin Valley Orcutt grass, Ferris's milk-vetch, as well as Conservancy fairy shrimp. All development projects shall include site-specific buffer zones that encompass, at a minimum, the immediate watershed for the occupied vernal pools and a 500 feet buffer beyond the watershed boundary. Applicants shall prepare and implement management plans and provide sufficient endowments for long-term management of these areas consistent with reserve management and approval requirements described in Sections 7.3 and 10.5.3.

VPG DES 5: Design Measures for New Roads

New roads or expanded existing roads meeting the following criterion shall include measures to accommodate movement by California tiger salamanders and other small animals, and to maintain hydrological connectivity for covered vernal pool crustacean species, vernal pool plant species, and their propagules (e.g., seeds, cysts):

1. The new or expanded road is in a High Value Vernal Pool Conservation Area or bisects a designated corridor (Figure 4-2) that has a design traffic volume of 20 cars per hour or greater at maximum capacity.

The design measures may include culverts, underpasses, and roadside barriers to prevent animals from accessing the roads. Crossings shall be provided in areas where concentrated movement is likely (i.e., along swales, significant slope breaks, near wetlands, and breeding sites). Plan Participants (or eligible third-party applicants) proposing road activities that meet the above criteria shall provide project plans to SCWA showing the specific crossing design measures and an analysis of how the design measures will accommodate crossing by the applicable Covered and Special Management Species. The plans and analysis will be subject to the review and approval of SCWA in consultation with the HCP Technical Review Committee (see Section 10.2.6).

VPG DES 6: Corridors

Projects in the following areas shall preserve and/or establish corridors linking the vernal pool complexes and reserves:

1. Upper Union Creek/northeastern McCoy Creek watersheds (Subareas 1B, 1C, and 1D) and Jepson Prairie (Subarea 1A)
 2. Jepson Prairie (Subarea 1A) and the Potrero Hills (Subarea 1F and 2F) (Figure 4-8).
- Corridors should have the following minimum dimensions:

- a) Corridors 500 feet or less in length shall have a minimum length of 500 feet.
- b) Corridors more than 500 feet in length but less than 1,320 feet in length shall have minimum dimensions of 1:1 (i.e., a 700-foot long corridor shall be 700 feet in length).
- c) Corridors 1,320 feet or longer shall have a minimum width of 1,320 feet.

All corridors shall be protected and maintained under a permanent Conservation Easement as required under Sections 7.3 and 10.5.2.

VPG CON 7: Best Management Practices (BMPs) to be Implemented During Operation and Maintenance (O&M) and Construction Activities in and Adjacent to Preserved and Avoided Habitats

1. Biological Monitor
 - a. An Approved Biologist shall monitor all ground-disturbing activities within 100 feet of preserved habitats (or as otherwise specified for species-specific avoidance requirements) to ensure that no unnecessary take of listed species or destruction of their habitat occurs. The biologist shall have the authority to stop all activities that may result in such take or destruction until appropriate corrective measures have been completed.



The biologist shall immediately notify SCWA of any unauthorized impacts; SCWA shall report to the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) within 24 hours of notification.

- b. The biological monitor shall provide instructions to all on-site construction personnel regarding the presence of listed species, the measures required by law to avoid impacts to vernal pool species and their habitat, and the possible penalties for not complying with these requirements.
2. Habitat Protection During Work Activities
- a. Vernal pool habitat and adjacent grassland/upland areas within the immediate work areas shall be identified and marked in the field prior to staging and construction/ground-disturbing activities.
 - b. Exclusion fencing shall be installed prior to any required preconstruction surveys and maintained between project work areas and adjacent preserved habitat during all work activities. Exclusion fencing will consist of silt fabric, plywood, aluminum, or other SCWA-approved material. The base of the fence will be buried a minimum of 3 to 5 inches in the ground to prevent animals from crawling under and be a minimum of 3 feet in height above ground to serve as a barrier for animals moving on the ground surface. Exclusion fences shall also include provisions (e.g., ramps, one-way doors, or exit funnels) for California tiger salamanders and reptile and amphibian species to leave the work area. The fence will be pulled taut at each support to prevent folds or snags. Construction personnel will also install an orange plastic-mesh construction fence 1 foot on the development side of the exclusion fence to increase visibility unless the exclusion fence is composed on high visibility materials. Exclusion fencing shall be inspected weekly and repaired immediately when damage is observed during construction work.
 - c. The following activities are prohibited, except as otherwise identified in an approved management plan, in all protected vernal pool and grassland habitat: (a) alteration of existing topography or any other alteration or uses for any purposes, including the exploration for or development of mineral extraction; (b) erection of any new structures; (c) dumping, burning, and/or burying of rubbish, garbage, or any other wastes or fill materials; (d) building of any new roads or trails; (e) killing, removal, or alteration of any existing native vegetation; (f) placement of storm water drains; (g) fire protection activities not required to protect existing structures at the project site except as provided for under Firebreak Construction and Maintenance (see below); and (h) use of pesticides or other toxic chemicals inconsistent with the product labeling.

3. Firebreak Construction and Maintenance

- a. Mowing to establish fuel breaks is preferred to disking. Mowing shall generally be conducted as late as possible in the spring, reducing the herbaceous cover to less than 2 inches in height.
- b. Where mowing is not practicable or will not provide an adequate fuel break, disking may be implemented under the following conditions:
 - 1) Prior to firebreak construction, “No Disk” zones shall be established for all wetlands and other significant habitat areas for Covered Species, as well as areas with concentrations of fossorial mammal burrows. “No Disk” zones shall be permanently staked using metal fence posts placed at least 50 feet from the edge of the pools. A post and sign shall be installed on either side of the pool (“No Disk” zone) to warn the disk operator of the presence of habitat from either direction.
 - 2) At those points designated as “No Disk” zones, the disk operator shall raise the disk blades out of the soil and cross the “No Disk” zone. Not until the disk blades are beyond the “No Disk” sign on the opposite side of the sensitive habitat shall the operator be allowed to lower the blades, and in no case shall the operator allow the blades to touch the soil while in the “No Disk” zone.
 - 3) “No Disk” zones shall not be crossed if water is standing in a wetland or aquatic habitat area or if the soil is wet. In such cases, the operator must raise the disk blades and make a detour around the wetland or aquatic area. Operators shall consult a site map, if available, to determine the best route around this wetland area.
 - 4) Where “No Disk” zones fuel levels in wetlands, aquatic habitat, and burrow areas may compromise a firebreak's effectiveness, the zone's vegetation may be mowed. The clippings shall be removed by hand, with rakes, or with equipment that lifts the cuttings off the surface without removing the surface soil. Machines that vacuum the clippings shall not be used because the vacuum action may remove seeds or eggs on the soil surface. Precautions described above for general firebreak construction shall also be followed when mowing.
1. “No Vehicle Access” areas shall also be identified. The purpose of this designation is to identify sensitive habitat areas where vehicle access shall be prohibited. Detour routes shall be identified on the site maps to allow tractors access the firebreak routes while avoiding the endangered species habitat. “No Vehicle Access” areas shall be identified in the field by temporary signs, arrows, and



flagging placed at detour points, along dirt roads, and at road intersections at least 1 week prior to firebreak construction.

4. Dust Abatement

- a. The use of dust suppressant (other than water) shall be limited to those shown to have little or no toxicity to aquatic invertebrates and vegetation.
 - b. Chemical dust suppressant shall only be used in a manner consistent with product label specifications and shall be applied employing the following BMPs:
 - 1) Roads and other areas to be treated shall be tight-bladed or processed (cut 2 inches and watered, then laid back with gravel and rolled [if applicable]) to bring fines to the surface.
 - 2) Chemical dust suppressants shall be applied such that the chemical agent remains on the treated area and does not leach into adjacent aquatic habitats.
2. Chemical dust suppressants shall not be applied in wet weather. Wet weather is defined as when there has been 0.25 inch of rain in a 24-hour period or when the National Weather Service 72-hour weather forecast indicates a 30 percent or greater potential for rain. Chemical dust suppressants shall also not be applied during a dry-out period of 48 hours after wet weather.

VPG MIT 1: Habitat Mitigation

Preservation and restoration of Covered Species habitat shall occur in the same level or higher level conservation area as the direct impact occurs (i.e., impacts to habitat in High Value Conservation Areas will be mitigated in High Value Conservation Areas, but impacts to habitat in Medium Value Conservation Areas shall be mitigated in either Medium or High Value Conservation Areas). Compensation for indirect impacts will be assessed on the location/conservation value of the habitat that is indirectly impacted and not the location of project activity (i.e., if a project activity will indirectly impact a habitat for Covered Species in a High Value Conservation Area but the project is located in a Medium or Low Value Conservation Area, compensatory mitigation shall be based on the type of habitat that is being indirectly impacted (in this case High Value Conservation Area) rather than the lower value project area. All mitigation ratios are based on impacts as assessed by acreage. Additional conditions of this mitigation requirement for impacts to occupied Contra Costa goldfield habitat are described in VPG MIT 3.

Mitigation Ratios for VPG MIT 1: see ratios for High, Medium, and Low Value Vernal Pool Conservation Areas as well as Temporary Impacts in next rows below
Conservation actions for streams and semi-permanently to permanently flooded wetlands in the Valley Floor Grassland and Vernal Pool Natural Community are addressed under the Riparian, Stream, and Freshwater Marsh Natural Community (Section 6.4.5). The intent of

this measure is to promote intact ecosystems and the prescribed mitigation ratios for upland and wetland components provide guidance on the required total acreage required for mitigation. Prescribed wetland ratios are minimum values to be provided. Upland requirements are intended to preserve the matrix in which vernal pool and swale communities exist. As such, upland habitat mitigation requirements may be achieved through preservation of additional vernal pool, swale, mesic grassland, and other suitable seasonal wetlands that contribute to overall preservation requirements provided they provide similar functional requirements for affected Covered Species.

VPG MIT 1- Wetland Component Direct Impacts:

1. Subareas 1A through 1F and 1I through 1L: Preserve vernal pool and swale habitats at a ratio of 9:1 (mitigation-to-impact), and restore vernal pool and swale habitats at a ratio of 1:1 if restored habitats are in place and functional at the time of impact or at a 2:1 ratio if habitats are restored concurrent with the impact.
2. Subareas 1G and 1H: Preserve vernal pool and swale habitats at a ratio of 6:1, and restore vernal pool and swale habitats at a ratio of 1:1 if restored habitats are in place and functional at the time of impact or at a 2:1 ratio if habitats are restored concurrent with the impact.

VPG MIT 1- Wetland Component Indirect Impacts:

1. Subareas 1A through 1F and 1I through 1L: Preserve vernal pool and swale habitats at a ratio of 3:1 for indirect impacts to avoided wetlands within 250 feet of proposed development.
2. Subareas 1G and 1H: Preserve vernal pool and swale habitats at a ratio of 2:1 for indirect impacts to avoided wetlands within 250 feet of proposed development.

VPG MIT 1- Upland Component Direct Impacts:

1. Subareas 1A through 1F and 1I through 1L: Preserve upland habitat at a ratio of 3:1.
2. Subareas 1G and 1H: Preserve upland habitat at a ratio of 2:1.

VPG MIT 1- Upland Component Indirect Impacts (all Subareas):

Preserve avoided uplands at a ratio of 1:1 for indirect impacts to uplands within 250 feet of proposed development.

VPG MIT 1- Temporary Impacts to Seasonal wetlands and Uplands in all Conservation Areas:

Temporary impacts to seasonal wetlands and uplands in all vernal pool conservation areas shall be subject to the mitigation and monitoring requirements described below.

Temporary impacts to wetlands shall be calculated for the entire wetland in which the impact occurs and not just the portion disturbed by the temporary impact.

1. Temporary Impacts All temporary impacts lasting no more than one growing season to seasonal wetlands and uplands in all vernal pool conservation areas shall



be mitigated by restoring the existing wetlands and uplands to pre-disturbance conditions. Impacts lasting longer than one growing season shall be mitigated at the standard conservation area ratios described above under conditions within VPG MIT 1 for High, Medium, and Low Value Conservation Areas.

2. **Restoration and Monitoring Plan:** The applicant shall provide a restoration plan consistent with the requirements in Section 10.5.4, including acceptable financial assurances, for review and approval by SCWA and Resource Agencies, to ensure successful implementation of the habitat restoration. All temporarily impacted wetland shall be monitored for a minimum of two wet seasons to document that hydrology has been restored to pre-project conditions. Additional monitoring and remedial measures may be required if hydrology is not reestablished.

The mitigation described above is applicable to all seasonal wetlands (i.e., saturated, seasonally flooded, and areas subject to temporary flooding sufficient to create wetlands).

VPG MIT 1- Wetland Component Direct Impacts:

Preserve vernal pool and swale habitats at a ratio of 2:1, and restore vernal pool and swale habitats at a ratio of 1:1 if restored habitats are in place and functional at the time of impact or at a 2:1 ratio if habitats are restored concurrent with the impact.

VPG MIT 1- Wetland Component Indirect Impacts:

Preserve vernal pool and swale habitats at a ratio of 1:1 for indirect impacts to avoided wetlands within 250 feet of proposed development.

VPG MIT 1- Upland Component Direct Impacts:

In Subareas 2C, 2E, 2F, and 2I, preserve upland habitat at a ratio of 3:1.

VPG MIT 1- Upland Component Direct Impacts:

In the remaining Medium Value Subareas, preserve upland habitat at a ratio of 2:1.

VPG MIT 1- Upland Component Indirect Impacts:

Preserve avoided upland habitat at a ratio of 1:1 for indirect impacts to uplands within 250 feet of proposed development.

VPG MIT 1- Temporary Impacts to Seasonal wetlands and Uplands in all Conservation Areas:

Temporary impacts to seasonal wetlands and uplands in all vernal pool conservation areas shall be subject to the mitigation and monitoring requirements described below.

Temporary impacts to wetlands shall be calculated for the entire wetland in which the impact occurs and not just the portion disturbed by the temporary impact.

1. **Temporary Impacts** All temporary impacts lasting no more than one growing season to seasonal wetlands and uplands in all vernal pool conservation areas shall be mitigated by restoring the existing wetlands and uplands to pre-disturbance conditions. Impacts lasting longer than one growing season shall be mitigated at the standard conservation area ratios described above under conditions within VPG MIT 1 for High, Medium, and Low Value Conservation Areas. The mitigation described above is applicable to all seasonal wetlands (i.e., saturated, seasonally flooded, and areas subject to temporary flooding sufficient to create wetlands).
2. **Restoration and Monitoring Plan:** The applicant shall provide a restoration plan consistent with the requirements in Section 10.5.4, including acceptable financial assurances, for review and approval by SCWA and Resource Agencies, to ensure successful implementation of the habitat restoration. All temporarily impacted wetland shall be monitored for a minimum of two wet seasons to document that hydrology has been restored to pre-project conditions. Additional monitoring and remedial measures may be required if hydrology is not reestablished. The mitigation described above is applicable to all seasonal wetlands (i.e., saturated, seasonally flooded, and areas subject to temporary flooding sufficient to create wetlands).

VPG MIT 1- Wetland Component Direct Impacts:

Preserve vernal pool and swale habitats at a ratio of 1:1, and restore vernal pool and swale habitats at a ratio of 1:1 if restored habitats are in place and functional at the time of impact or at a 2:1 ratio if habitats are restored concurrent with the impact.

VPG MIT 1- Wetland Component Indirect Impacts:

Preserve vernal pool and swale habitats at a ratio of 1:1 for indirect impacts to wetlands within 100 feet of proposed development.

VPG MIT 2: Habitat Mitigation Similarity

All impacted seasonal wetlands shall be characterized according to the types below and mitigated by preservation of the same category of wetland according to the ratios in VPG MIT 1:

1. **Seasonal wetlands categories**
 - a. Pools with > 1 inch of standing water for > 10 continuous days with short (< 3 weeks) to long (> 3 weeks) durations of standing water, clear to moderate turbidity, and exhibiting significant vegetation cover.
 - b. Playa Pools with > 1 inch of standing water for > 10 continuous days with long (> 3 weeks) to very long durations of standing water, moderate to high turbidity, and exhibiting sparse vegetation cover (typically found in association with Pescadero Series Soils),



- c. Swales or mesic grassland with generally < 1 inch of shallow, standing water present for fewer than 10 continuous days.
- d. Alkaline flats and meadows with generally < 1 inch of shallow, standing water present for < 10 continuous days and exhibiting indicators of high alkalinity (salt deposits on soil surface, presence of salt-tolerant plants).
- 1. Deviations in the required mitigation acreage by type or category may be permitted by SCWA, in consultation with the HCP Technical Review Committee, if adequate acreage of the appropriate seasonal wetland type is not available for preservation or sale in approved commercial or institutional mitigation banks or other Reserve System lands. This remainder mitigation may be achieved through one of three options:
 - 1. Adequate funding (to be determined by SCWA) may be placed in a special fund to purchase applicable habitats when they become available; or
 - 2. Purchases of other mitigation types or categories may be substituted if the subject habitats are occupied by impacted Covered Species; or
 - 3. Less common vernal pool/seasonal wetland types are substituted for more common vernal pool/seasonal wetland types (e.g., playa pools may be substituted for pools, alkaline flats and meadows may be substituted for swales or mesic grassland).

Under VPG MIT 2, conservation habitats shall be proportional to impacts to Covered Species (Table 4-1) and Special Management Species associations (Table 4.2) (e.g., impacts to long duration, playa-type pool species such as Conservancy fairy shrimp shall not be mitigated by preservation of more abundant swale or mesic grasslands that do not support the species).

VPG MIT 3: Mitigation for Impacts to Occupied Contra Costa Goldfield Habitat

Direct Impacts: All direct impacts to extant stands of Contra Costa goldfields shall be mitigated by preserving occupied habitat at a 9:1 (mitigated-to-impacted) ratio in Subareas 1A through 1F and 1I through 1L and at a 6:1 ratio in Subareas 1G and 1H, and establishing new, self-reproducing populations of Contra Costa goldfields at a ratio of 4:1 (acres protected to acres impacted). The occupied habitat preservation component can be done concurrent with the mitigation requirements of VPG MIT 1 (i.e., the 9:1 ratio for preservation is concurrent with, not in addition to). This restoration requirement may be met by establishing new Contra Costa goldfield populations at a single-project mitigation site or by purchasing credits at an approved mitigation bank authorized to sell credits for this species in an amount equal to the 4:1 ratio.

Guidelines for establishing Contra Costa goldfields and the release schedule for mitigation credits at the commercial mitigation banks will be specified in the bank-enabling agreements and as certified by SCWA (see Section 10.5). Mitigation at single-project

mitigation sites would be subject to the same conditions as the commercial mitigation banks.

Establishment criteria shall also adhere to all the following conditions:

1. Impacted habitat area for which mitigation is required shall be equal to the entire occupied pool/swale area, and shall not just be limited to the area with Contra Costa goldfield cover in the impacted pool.
2. Contra Costa goldfield populations and other Covered Species (including vernal pool fairy shrimp, Conservancy fairy shrimp, and vernal pool tadpole shrimp) as well as Special Management Species midvalley fairy shrimp shall be established in constructed, restored, and enhanced wetlands in the known range of these species in Solano County.
3. Seed used to establish new populations of Contra Costa goldfields may be obtained from any Core Population Area. Seed collection shall not affect more than 10 percent of an individual preserved population. Seed and top soils shall be salvaged from occupied vernal pools and other wetlands in an impacted area prior to initiation of ground-disturbing activities.
4. Restoration may occur in existing preserved pools currently lacking Contra Costa goldfields or in restored pools and swales in other Core Population Areas (Figure 4-5). New populations must be established in currently unoccupied habitat.
5. Reestablished populations will be considered self-reproducing when:
 - a. Plants reestablish annually for a minimum of 5 years with no human intervention such as supplemental seeding, and habitat areas contain an occupied area and flower/plant density comparable to existing occupied habitat areas in similar pool types and Core Areas.
1. If Contra Costa goldfields cannot be established at the mitigation site within 5 years according to the conditions above, the preserved wetland restoration acreage shall be increased by 50 percent[1]. The applicant shall provide bonds or other acceptable financial assurances, subject to approval by SCWA, to ensure implementation of such measures (see Section 10.5).
2. VPG MIT 3- Indirect Impacts: All indirect impacts to extant stands of Contra Costa goldfields shall be mitigated by preserving occupied habitat at a 2:1 ratio. Refer to establishment criteria and applicable guidelines above for direct impacts.
3. VPG MIT 3- Temporary Impacts: Temporary impacts to extant stands of Contra Costa goldfields associated with Covered Activities shall not require direct compensation provided activities comply with VPG MIT 1 and all temporarily disturbed extant stands shall be restored to original conditions within 1 year at a minimum 1:1 ratio.



VPG MIT 4: Mitigation for Impacts to California Tiger Salamander Habitat

Mitigation shall be required for any Covered Activity in the known or potential range of the California tiger salamander (see Figure 4-6). Mitigation shall include preservation, enhancement, and restoration/establishment of suitable upland habitat, and preservation and construction/creation of new breeding habitat consistent with the mitigation requirements specified in VPG MIT 1, subject to the following additional requirements:

VPG MIT 4- Breeding Habitat Mitigation:

Direct impacts to all suitable California tiger salamander breeding habitat in the known or potential range of the species (Figure 4-6) will be mitigated (1) by preserving known breeding habitat at a 3:1 ratio (mitigated:impacted) and (2) creating new breeding habitat at a ratio of 1:1 or 0.35 ac, whichever is greater.

All preserved and created/established breeding habitat shall be contiguous to at least 350 acres of preserved upland habitat, and created breeding habitat shall be located within 2,067 feet of known breeding habitat.

1. All new breeding habitat shall be located within 2,067 feet of a known breeding site and be situated in a contiguous reserve/preserve area of 350 acres or more of suitable habitats. This may include other parcels if the lands are protected by conservation easements and are managed consistent with the Solano HCP Reserve Criteria in Section 10.5. For some existing preserved areas/mitigation sites, this may require that management agreements and endowments be extended to these sites.
2. New breeding habitat can consist of multiple sites within 1,300 feet of each other. For newly created breeding pond complexes with multiple ponds, each pond shall be a minimum of 0.2 acre resulting in a minimum combined area of 0.35 acre for the complex unless otherwise approved by SCWA and the Technical Review Committee.

VPG MIT 4- Breeding Habitat Mitigation:

Indirect impacts to salamander breeding habitat (impacts are within 500 feet of development) shall be mitigated by preserving breeding habitat at a 1:1 ratio. The minimum pond size shall be 0.35 acre for all created salamander breeding habitat to ensure the long-term viability of the breeding habitat whether it is created as mitigation for direct or indirect impacts.

VPG MIT 4- Upland Habitat Mitigation:

Impacts to uplands and other movement habitats (i.e., seasonal wetland swales, meadows) in the known or potential range of the California tiger salamander (Figure 4-6) shall be

mitigated at the ratios as described in VPG MIT 1 subject to the following additional conditions:

1. All upland mitigation preservation shall either be (1) within 2,067 feet of known breeding habitat itself or (2) within 1,300 feet of constructed breeding habitat if that constructed breeding habitat is within 2,067 feet of known breeding habitat.
2. New breeding habitat shall be established at a ratio of 0.001 acre per acre of upland directly and indirectly impacted by a project. Preserves established for California tiger salamander mitigation shall include measures for restoration of upland mounds, where applicable, in order to provide increased burrowing habitat for fossorial rodents and California tiger salamanders above the shallow, rainy-season water table (see Section 10.5.4.1).

VPG MIT 4- Temporary Impact Mitigation

Temporary impacts to all habitat in the known or potential range of the California tiger salamander including breeding habitat, uplands, and other movement habitats affected by Covered Activities shall not require direct compensation provided activities comply with VPG CON 7, and all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

VPG MIT 5: Invasive Species, Water Quality Control, Species Introductions, and Barrier Removal Enhancement Program

All development projects that create new or increase impervious surfaces shall provide funding to contribute toward a grant funding program for HCP goals and objectives in Chapter 5.0 (specifically Objectives VPG 2.2 through 2.14, RLF 1.4, RSM 2.1, GGS 1.1, and CM 1.1) that implement cost-share programs to control invasive species, implement additional water quality control measures, establish new populations/occurrences of Covered Species, and remove barriers to Covered Species movement. Costs shall be calculated on a per-acre basis of new or increased impervious surface.

Note: This measure is intended to contribute to mitigation for unavoidable, cumulative adverse effects of increased urban development runoff on downstream receiving waters and associated Covered Species. For the Valley Floor Grassland and Vernal Pool Natural Community and associated vernal pool Covered Species, this fund will primarily be used to contribute to invasive species control and to establish new populations/occurrences of Covered Species.

SH DES 1: Nest Tree Protection

Trees with active Swainson's hawk nests or with historically active nests (i.e., occupied within the last 10 years) shall be avoided to the maximum extent practicable. Applicants proposing to remove an otherwise healthy nest tree shall provide written justification for



the tree removal to SCWA. Sufficient rationale for tree removal shall be primarily based on declining or poor suitability of the tree as a nesting site for Swainson's hawk and/or to meet public safety needs. The justification letter shall provide a clear analysis of the biological value of the tree to Swainson's hawk under pre-project conditions and post-project conditions (if the tree were to be avoided), and will consider the presence of alternate nest sites in the vicinity of the project site. Nest trees shall only be removed if there is a biological basis that the use of the tree is unlikely under post-project conditions. SCWA, in consultation with the HCP Technical Review Committee, will be responsible for approval of the requests to remove healthy nest trees.

SH DES 2: Solano Irrigation District (SID) Annexations

SID may annex additional lands into its service area until either a maximum of 3,000 acres has been annexed or 600 acres of annexed lands have been converted into crop types or land uses that are incompatible with Swainson's hawk foraging. Crop types and land uses incompatible with Swainson's hawk foraging include:

1. Commercial feedlots, which are defined as any open or enclosed area where domestic livestock are grouped together for intensive feeding purposes;
2. Horticultural specialties, including sod, nursery stock, ornamental shrubs, ornamental trees, Christmas trees, or flowers;
3. Commercial greenhouses or plant nurseries,
4. Commercial aquaculture of aquatic plants, animals, and their byproducts;
5. Planting orchards or vineyards for the production of fruits, nuts, or berries except in designated farmstead areas; and
6. Cultivation of perennial vegetable crops such as artichokes and asparagus, as well as annual crops such as cotton or rice.

Annexations beyond the 3,000 acres maximum cap or 600 acres of cropland conversion (net total crop land conversion at the time of an annexation request) will require an amendment to the HCP (see Section 10.9.2.1).

SH CON 3: Preconstruction Nest Surveys

Between March 1 and August 3, an Approved Biologist shall conduct preconstruction surveys to identify and subsequently avoid nesting areas for Swainson's hawk. Surveys shall follow approved protocols and be of sufficient intensity to document nesting within 0.25 mile (1,320 feet) of planned work activities. A final survey shall be conducted no more than 15 days prior to the anticipated start of construction. If a lapse in project-related construction work of 15 days or longer occurs, additional preconstruction surveys shall be required before project work may be reinitiated.

SH CON 4: Active Nest Buffers

Construction work (including grading, earthmoving, and any operation of construction equipment) shall not occur within a 0.25 mile buffer zone around an active Swainson's hawk nest except as provided below. Construction work may commence in the buffer zone when an Approved Biologist has confirmed that nesting activity is complete (e.g., Swainson's hawk young have fully fledged and are capable of flight and have left the nest, or adults have abandoned the nest for a minimum of 7 days and there is no evidence of re-nesting activity). Nest trees may be removed between September 16 and February 1 when nests are unoccupied.

The size of nest site buffer zones may be reduced only under the following conditions:

1. A site-specific analysis is prepared by the Approved Biologist about the nesting pair not likely to be adversely affected by construction activities (e.g., the nest is located in an area where the hawks are habituated to human activity and noise levels comparable to anticipated construction work). SCWA and the Resource Agencies must approve this analysis before construction may begin within 0.25 mile of a nest.
2. Monitoring by an Approved Biologist is conducted for a sufficient time (during all construction activities for a minimum of 10 consecutive days following the initiation of construction), and the nesting pair does not exhibit adverse reactions to construction activities (e.g., changes in behavioral patterns, reactions to construction noise).
3. Monitoring is continued at least once a week through the nesting cycle at that nest. This longer-term monitoring may be reduced to a minimum of 2 hours in the morning and 2 hours in the afternoon during construction activities; however, additional and more frequent monitoring may be required if any adverse reactions are noted.
4. Weekly monitoring reports shall be submitted to SCWA and the Resource Agencies during construction and monitoring activities.

Note: If adverse effects are identified, construction activities shall cease immediately and construction shall not be resumed until the Approved Biologist, in consultation with SCWA, has determined that construction may continue under modified restrictions or that nesting activity is complete.

SH CON 5: Post-Construction Occupied Nest Avoidance

If a nest tree becomes occupied by Swainson's hawk during ongoing construction activities, construction activities shall not occur within 500 feet of the nest, except where monitoring consistent with the criteria in SH CON 4 documents that adverse effects will not occur.



General Notes about Mitigation Requirements: The following measures are designed to meet Goal SH 1 from Chapter 5.0 by providing foraging habitat to support the existing Swainson's hawk population in the Plan Area. Mitigation requirements for adverse effects to Swainson's hawk foraging habitat shall be provided through the preservation and management of suitable habitat, and are based on the type, location, and duration of impacts and the value of the impacted habitat area to Swainson's hawk. Mitigation for these impacts described below through preservation and management of Swainson's hawk foraging habitat are subject to reserve management requirements specified in Sections 7.3 and 10.5.3.

SH MIT 1: Irrigated Agriculture Foraging Habitat Conservation

Direct Impacts: Direct impacts to Swainson's hawk foraging habitat in the Irrigated Agriculture Conservation Area (Figure 4-21) shall be mitigated through the preservation and management of foraging habitat at a ratio of 1:1. Mitigation shall be provided in the Irrigated Agriculture Potential Reserve Area (Figure 4-27).

SH MIT 1- Indirect Impacts:

Indirect impacts to Swainson's hawk foraging habitat within 250 feet of development shall be mitigated through the preservation and management of foraging habitats at a ratio of 0.5:1.

SH MIT 1- Temporary Impacts:

Temporary impacts to Swainson's hawk foraging habitat shall not require direct compensation provided activities comply with SH CON 4, and all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

SH MIT 2: Valley Floor Grassland Foraging Habitat Conservation

Direct Impacts: Direct impacts to Swainson's hawk foraging habitat in the Valley Floor Grassland Conservation Area (Figure 4-21) shall be mitigated through the preservation and management of foraging habitat at a ratio of 1:1. Mitigation shall be provided in the Irrigated Agriculture or Valley Floor Grassland Potential Reserve Areas (Figure 4-27). Preservation of valley floor grassland habitat may be satisfied through VPG MIT 1 if the minimum 1:1 mitigation ratio for foraging habitat is achieved.

SH MIT 2- Indirect Impacts:

Indirect impacts to Swainson's hawk foraging habitat within 250 feet of development are covered under mitigation requirements for the Valley Floor Grassland and Vernal Pool Natural Community, including VPG MIT 1 requirements.

SH MIT 2- Temporary Impacts:

Temporary impacts to Swainson's hawk foraging habitat are covered under mitigation requirements for the Valley Floor Grassland and Vernal Pool Natural Community, including VPG MIT 1 requirements. Temporary impacts to Swainson's hawk foraging habitat shall not require direct compensation provided all temporarily disturbed habitats are restored to original conditions within 1 year at a minimum 1:1 ratio.

SH MIT 3: Inner Coast Range Foraging Habitat Conservation-

Direct Impacts: Direct impacts to grassland and oak savanna habitat in the Inner Coast Range Conservation Area (Figure 4-21) shall be mitigated through the preservation and management of foraging habitat at a ratio of 1:1. Mitigation shall be provided in the Irrigated Agriculture, Valley Floor Grassland, or Inner Coast Range Potential Reserve Areas (Figure 4-27). Preservation of Inner Coast Range habitat may be satisfied through implementation of RLF MIT 2 and CSB MIT 1 if the minimum 1:1 ratio for foraging habitat is achieved.

Note for Exemptions: Covered Activities likely to have minimal effects on the extent and quality of Swainson's hawk foraging habitat are exempt from Swainson's hawk foraging habitat mitigation requirements. Such activities include: activities related to establishment of natural habitats (e.g., aquatic, riparian, and grassland habitats), construction of in-fill developments on small, in-fill lots (less than 5 acres of contiguous habitat) and bordered by contiguous urban development at the time the HCP is adopted, and other minor public and private facilities accessed via existing roads or that impact less than 0.5 acre of potential Swainson's hawk foraging habitat (e.g., pump stations, antennae sites, new irrigation canals, buried pipelines, or utilities).

SH MIT 3 - Indirect Impacts:

Indirect impacts to Swainson's hawk foraging habitat within 250 feet of development are covered under mitigation requirements for the California red-legged frog and Callippe silverspot butterfly protecting upland habitat within the Inner Coast Range Natural Community, including RLF MIT 1 and CSB MIT 1.

SH MIT 3 - Temporary Impacts:

Temporary impacts to Swainson's hawk foraging habitat are covered under mitigation requirements for the California red-legged frog and Callippe silverspot butterfly protecting upland habitat within the Inner Coast Range Natural Community. Temporary impacts to Swainson's hawk foraging habitat shall not require direct compensation provided all temporarily disturbed habitats are restored to original conditions within 1 year at a minimum 1:1 ratio.

General Notes about Mitigation Requirements: The following measures are designed to meet Goal SH 2 by providing nesting habitat in proximity to suitable foraging habitat to support the current Swainson's hawk population in the Plan Area.



SH MIT 4: Known Nest Trees

Covered Activities resulting in the take of a Swainson's hawk known or active nest site shall preserve an active nest site. Preservation of an active nest site may be achieved through purchase of occupied nest credits from an HCP-certified mitigation bank or approved project-specific reserve. If preserved active nest sites are unavailable, project proponents will provide funding to the HCP's Interim Nest Protection Program (see Objective SH 2.2 and Section 11.1.2). For the purposes of SH MIT 4, take of a known or active nest tree will occur if one of the following conditions is met:

1. The Covered Activity directly removes the nest tree or involves soil compaction or grading (excavation or fill) within more than 25 percent of the root zone of the nest tree. The root zone may be determined by a qualified arborist but shall, at a minimum, be the greater of the horizontal distance from the tree at least equal to the tree's height or the outer edge of the tree canopy.
2. The Covered Activity affects the nest such that active, Swainson's hawks are disturbed to a degree that causes (a) injury to nesting birds; (b) a decrease in productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (c) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Covered Activities within 250 feet of an active nest are presumed to have long-term effects on the nest.
3. Applicants affecting nests shall:
 - a. Directly comply with SH MIT 4 nest preservation requirements (e.g., purchase of occupied nest credits from an HCP-certified mitigation bank or approved project-specific reserve); or
 - b. Upon approval from SCWA and Resource Agencies (see Section 10.4.2), the applicant will pay the current nest-protection impact fee and monitor the nest tree for a minimum of two nesting seasons following completion and occupancy of the project. If the nest remains active or is affected by a subsequent project, the fee, with applicable interest, will be returned to the applicant; or
 - c. Demonstrate to and receive concurrence from SCWA and the Resource Agencies that the Covered Activity will not substantially increase disturbance to the nest site.
4. Important Note: Indirect effects described under Condition 2 above do not apply to O&M Covered Activities conducted in compliance with SH CON 4: Active Nest Buffers. If such activities cannot be conducted in compliance with SH CON 4, then the above requirements will apply.

SH MIT 4 will be accomplished through payment of fees and will be managed by SCWA through a process similar to that described under Objective SH 2.2, through targeted acquisition and conservation easements of suitable nesting habitat. Alternatively, project proponents may preserve known nest sites in Solano County subject to the requirements and approvals as specified in Section 10.5.

SH MIT 5: Preservation of Important Nesting Habitat

Covered Activities in Zone 1 will provide funding (see Section 11.1.2) to contribute to targeted preservation through direct acquisition or conservation easement of 1,000 acres of nesting habitat for Swainson's hawk and burrowing owl in the Swainson's Hawk Irrigated Agriculture Potential Reserve Area (Figure 4-27).

BO CON 1: Preconstruction Surveys

An Approved Biologist shall conduct preconstruction surveys in known or suitable habitat areas to identify and subsequently avoid nesting and wintering areas for burrowing owls for the entire project site, plus 500 feet of planned work activities and access roads and staging areas. An initial preconstruction survey shall be conducted within 14 days of the anticipated start of construction, followed by a second survey within 24 hours of the start of construction. All surveys shall follow standard Solano HCP protocols. If a lapse in project-related construction work of 14 days or longer occurs during the nesting season, an additional preconstruction survey shall be required within 24 hours before project work may be reinitiated.

BO CON 2: Vegetation Management

If burrowing owls or suitable nesting habitat are identified on site during the initial baseline surveys, applicants shall allow vegetation to grow over the entire project site (except for required fuel breaks) to a height of 36 inches or more above the ground, unless impracticable due to surrounding or adjacent land uses. The increased vegetation height, if in place by the beginning of the nesting season (e.g., retention of previous year's growth or planting during the previous winter), will discourage burrowing owl use of the site.

BO CON 3: Construction Buffers and Exclusion

If Avoidance and Minimization Measure BO CON 2 cannot be implemented or is not effective, the following measures shall be implemented for new construction activities:

1. During the non-breeding season (September 1 through January 31), a circular exclusion zone with a radius of 160 feet shall be established around occupied burrows.
2. If a buffer cannot be established during the non-breeding season, burrowing owls shall be evicted from the entire construction area using passive relocation techniques. The Applicant shall prepare an Exclusion Plan for review and approval



by SCWA and the Resource Agencies that addresses the following minimum requirements:

- a. Protocols to confirm that the burrow(s) is unoccupied by burrowing owls and other species prior to destruction. Protocols shall include:
 - 1) One-way doors in place a minimum of 48 hours prior to burrow excavation;
 - 2) Twice daily monitoring to confirm evidence that owls have been excluded from the burrow; and
 - 3) Scoping of the burrows to confirm absence.
 - b. Procedures for how the burrow(s) will be excavated. Excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible (may include using piping to stabilize the burrow to prevent collapsing until the entire burrow has been excavated and it can be determined that no owls reside inside the burrow).
 - c. Removal of other potential owl burrow surrogates or refugia on site.
 - d. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take.
 - e. Measures to make the site inhospitable to burrowing owls and fossorial mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until activity is complete.
 - f. Reports describing the exclusion activities shall be submitted to SCWA.
3. During the breeding season (February 1 through August 31), an Approved Biologist shall establish a circular exclusion zone with a radius of 250 feet around each occupied burrow. No construction-related activity (e.g., site grading, staking, surveying, any use of construction equipment) shall occur in the exclusion zone during the breeding season. Once the breeding season is over, passive relocation may proceed as described in Condition 2 above.
 4. Construction buffer widths may be reduced from the 250 feet wide breeding season buffers and 160 feet wide non-breeding season buffers in accordance with the following requirements:
 - a. A site-specific analysis prepared by an Approved Biologist indicates that the nesting pair(s) or wintering owl(s) would not be adversely affected by construction activities. SCWA, in consultation with the HCP Technical Review Committee, must approve this analysis in writing before construction can proceed.
 - b. Monitoring by an Approved Biologist is conducted for a sufficient time (during all construction activities for a minimum of 10 consecutive days

following the initiation of construction), the nesting pair does not exhibit adverse reactions to construction activities (e.g., changes in behavioral patterns, reactions to noise), and the burrows are not in danger of collapse due to equipment traffic.

- c. Monitoring is continued at least once a week through the nesting/wintering cycle at that site, and no change in behavior by the owls is observed. This longer-term monitoring may be reduced to a minimum of 2 hours in the morning and 2 hours in the afternoon during construction activities; however, additional and more frequent monitoring may be required if any adverse reactions are noted.
- d. Monitoring reports are submitted to SCWA.
- e. Note: If adverse effects are identified, construction activities shall cease immediately, and construction shall not be resumed until the Approved Biologist, in consultation with SCWA, has determined that construction may continue under modified restrictions or that nesting activity is complete.

BO CON 4: Active Relocation

Active relocation of burrowing owls may be implemented as part of the Burrowing Owl Conservation Program if the relocation action is approved by SCWA and the Resource Agencies. Active relocation may be used on sites under the following conditions: where BO CON 2 and BO CON 3 are impracticable; there is no adjacent habitat for owls to move into if passively relocated; or in order to establish owls on a reserve in the Valley Floor Grassland or Inner Coast Range Conservation Areas. Active relocation would be subject to the following requirements:

1. A biological assessment report shall be prepared for the reserve site where owls will be relocated. The assessment will discuss in detail the suitability of the site to support both foraging and nesting burrowing owls.
2. A conservation easement shall be placed on the reserve site prior to attempted relocations.
3. A Burrowing Owl Management Plan for the reserve site shall be prepared and approved by SCWA and Resource Agencies.
4. An assessment of the potential impacts to other burrowing owls in the vicinity shall be made. The proposed relocation must be found to have no impacts on the existing owl populations.
5. Impacts to other Covered Species shall be avoided at the reserve site.
6. A funding source shall be secured to fund the relocation, habitat maintenance, and monitoring of the relocated burrowing owls.



7. Approved Biologists shall be retained to carry out the monitoring program and prepare reports that will be submitted to SCWA.

General Notes about Mitigation Requirements: Mitigation measures for impacts to burrowing owl are applicable to most Covered Activities in the Plan Area; however, all or portions of the mitigation for loss of foraging habitat may be addressed concurrently with habitat preservation and management requirements specified for other Natural Communities.

BO MIT 1: Mitigation for Direct and Indirect Impacts to Foraging Habitat

Direct Impacts: Mitigation for the direct disturbance, destruction, or conversion of burrowing owl habitat for urban development or other permanent facilities shall be provided at a 1:1 ratio. Project sites that have been occupied during the nesting season at any time during the past 3 years or found to be nesting at the time of preconstruction surveys will be considered occupied by owls and require additional nesting habitat mitigation (see BO MIT 2). All burrowing owl habitat affected directly by the project will be subject to the compensation requirement. Mitigation lands used to satisfy mitigation measures for other Natural Communities and/or Covered Species (i.e., Valley Floor Grassland and Vernal Pool Natural Community [excluding the wetland restoration/construction component], Coastal Marsh Natural Community, Swainson's hawk, California red-legged frog, and Callippe silverspot butterfly) can be used to satisfy burrowing owl conservation if the reserve area meets the basic burrowing owl reserve management standards (Sections 7.3 and 10.5.3) and criteria specified in Objective BO 1.2 (Section 5.10.1).

Note for Exemption: In-fill projects on small, in-fill lots (which are not part of undeveloped lands greater than 5 acres of contiguous habitat) and which are bordered by contiguous urban development (based on conditions at the time the HCP is adopted) would have minimal effects on the extent and quality of burrowing owl habitat and are exempt from burrowing owl foraging habitat mitigation requirements unless a known or active nest is present. Additionally, project proponents are obligated to avoid destruction of active burrowing owl nests and take of burrowing owls in compliance with the Federal Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5 and to meet the requirements specified in BO CON 1, BO CON 2, BO CON 3, and BO MIT 3.

BO MIT 1- Indirect Impacts:

Indirect impacts to burrowing owl habitat from development in irrigated agriculture lands shall be mitigated through the preservation and management of foraging habitats at a ratio of 0.5:1. Indirect impacts in valley floor grassland habitat are covered under mitigation requirements for the Valley Floor Grassland and Vernal Pool Natural Community, including VPG MIT 1 requirements. Indirect impacts in coastal marsh habitat are covered

under mitigation requirements for the Coastal Marsh Natural Community, including CM MIT 2 requirements. Indirect impacts in Inner Coast Range habitat are covered under mitigation requirements for the California red-legged frog and Callippe silverspot butterfly protecting upland habitat within the Inner Coast Range Natural Community, including RLF MIT 1 and CSB MIT 1.

BO MIT 2: Known Nest Sites

Covered Activities resulting in the take of a known or active burrowing owl nest site shall preserve an active nest site. Preservation of an active nest site may be achieved through purchase of occupied nest credits from an HCP-certified mitigation bank or approved project-specific reserve. If preserved active nest sites are unavailable, project proponents will provide funding (\$25,000 per nest at 2016 costs) to the SCWA Interim Nest Protection Program (see Section 11.1.2). BO MIT 2 will be accomplished through payment of fees and will be managed by SCWA through a process similar to that described under Objective SH 2.2, through targeted acquisition and conservation easements of suitable nesting habitat. Alternatively, project proponents may preserve known nest sites in Solano County subject to the requirements and approvals specified in Section 10.5.

BO MIT 3: Preservation of Important Nesting Habitat

Covered Activities in Zone 1 will provide funding (to be implemented in conjunction with SH MIT 5 and Section 11.1.2) to contribute to targeted preservation through direct acquisition or conservation easement of 1,000 acres of nesting and associated nest buffer for burrowing owl and Swainson's hawk in the Swainson's Hawk Irrigated Agriculture Potential Reserve Area (Figure 4-27).

BO MIT 4: Mitigation for Temporary Impacts

If construction activities associated with development related Covered Activities (e.g., grading, staging areas, but excluding restoration and reserve management activities) result in loss of occupied nesting or wintering burrows (e.g., closure, collapse due to ground disturbance, or disturbance in the construction buffer zones), mitigation shall be provided according to the following criteria at all times of the year:

1. Alternative Burrow Plan: Applicants shall provide an Alternative Burrow Plan for review and approval by SCWA and the Resource Agencies. The Plan shall include but is not limited to the following:
 - a. An assessment of available suitable burrows within 330 feet of the edge of the construction area if suitable contiguous habitat remains.
 - b. Provisions to install artificial burrows if suitable donor burrows are not present.
 - c. A maintenance and monitoring program that includes a minimum of 2 years following completion of the project that resulted in the temporary impact. The maintenance program shall include provisions to maintain



artificial burrows, if required, in usable condition and vegetation height at 6 inches or less within 50 feet of the burrows. If the above measures cannot be implemented because sufficient habitat is not present in surrounding, contiguous lands to support burrowing owls or at the Applicant's discretion, temporary impacts shall be mitigated per the requirements of BO MIT 1 and BO MIT 2.

- d. Compliance with BO MIT 4 does not allow for the destruction or disturbance of an active nest site.

2. Temporary Impacts: All temporarily disturbed burrowing owl habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

General Note about Measures: Implementation of the following avoidance and minimization measures are applicable for all projects in the California Red-legged Frog Conservation Area (Figure 4-14).

RLF DES 1: Habitat Avoidance

Any Covered Activity in the California Red-legged Frog Conservation Area resulting in the loss of aquatic habitat and associated uplands shall be avoided to the maximum extent practicable where:

1. The aquatic habitat contributes to the habitat quality and value of reserve/preserve lands established (or expected to be established) in perpetuity for conservation purposes;
2. The aquatic habitat lies contiguous to other aquatic habitats, such as riparian or stream corridors, or other permanently protected land; or
3. The aquatic habitat lies contiguous to high quality California red-legged frog habitat.

Note: Plan Participants (or third-party applicants) proposing activities in above-listed locations that would impact California red-legged frog habitat shall provide documentation explaining why avoidance is not practicable and/or would not contribute to the conservation goals and objectives of the HCP in accordance with the procedures in Section 10.4.1 The determination of compliance with RLF DES 1 for any proposed activity that would result in the loss of California red-legged frog habitat shall be made by SCWA in consultation with the HCP Technical Review Committee (see Section 10.2.6). All avoided habitat shall be protected and maintained under a permanent Conservation Easement, as required under Sections 7.3 and 10.5.2.

RLF DES 2: Aquatic Habitat Buffers and Corridors

For aquatic habitat identified in RLF DES 1, the following site design standards shall apply in order to minimize impacts to California red-legged frog:

1. Applicants shall provide an upland buffer between suitable California red-legged frog aquatic breeding habitat and urban development/active open space recreation areas to protect aquatic breeding habitats to the maximum extent practicable. Suitable habitats for California red-legged frogs within 300 feet of development shall be considered to be indirectly impacted and will be subject to mitigation requirements identified in Section 6.4.3. In addition, corridors shall connect avoided aquatic habitat to other suitable aquatic habitat within 0.7 mile.
2. Corridors shall connect avoided aquatic habitat to other suitable aquatic habitat within 0.7 mile. Corridors should have the following minimum dimensions:
 - a. Corridors 500 feet or less in length shall have a minimum width of 500 feet
 - b. Corridors more than 500 feet in length but less than 1,320 feet in length shall have minimum dimensions of 1:1 (i.e., a 700 feet long corridor shall be 700 feet in length).
 - c. Corridors 1,320 feet or longer shall have a minimum width of 1,320 feet.
1. All corridors shall be protected and maintained under a permanent Conservation Easement, as required under Sections 7.3 and 10.5.2.

RLF DES 3: Design Measures for New Roads

New roads or the expansion of existing roads with a projected night-time traffic volume of more than 20 cars per hour in the California Red-legged Frog Conservation Area shall incorporate design measures to facilitate the movement of small animals and maintain hydrological connectivity. Design measures may include culverts, underpasses, and roadside barriers to prevent animals from accessing the roads. Crossings between open space areas shall be provided in areas where concentrated movement is likely (along swales, significant slope breaks, near wetlands and breeding sites, etc.). Plan Participants (or third-party applicants) proposing road activities in the California Red-legged Frog Conservation Area shall provide project plans to SCWA that show the specific crossing design measures, and an analysis of how the design measures will accommodate crossing by the applicable Covered and Special Management Species. The plans and analysis will be subject to the review and approval of SCWA in consultation with the HCP Technical Review Committee (see Section 10.2.6).

RLF CON 4: Best Management Practices to be Implemented During O&M and Construction Activities

This measure is applicable to project design considerations and is required to be implemented within 300 feet of the California Red-Legged Frog Conservation Area (Figure 4-14). These mandatory requirements include the following:

1. Biological Monitor



- a. At least 15 days prior to the onset of work activities, the applicant shall submit the name(s) and credentials of biologists who will conduct California red-legged frog monitoring activities. No work activities shall begin until written approval has been received from SCWA.
 - b. Prior to commencement of work activities, the Approved Biologist shall conduct a training session for all construction personnel. At minimum, the training shall include: (1) a description of California red-legged frog and its habitat; (2) project-specific measures being implemented to conserve the red-legged frog and the possible penalties for not complying with these requirements; (3) who is authorized to handle and relocate frogs; and (4) identification of the boundaries of permitted work areas.
 - c. The Approved Biologist shall be present at the work site to monitor compliance with all minimization measures. The Approved Biologist shall have the authority to halt any action that might result in impacts in excess of anticipated levels. The Approved Biologist will submit a report detailing the results of the activities to SCWA within 7 days of the completion of the habitat disturbance.
- 2. Habitat Protection and Take Avoidance During Work Activities
 - a. Exclusion fencing shall be installed prior to any required preconstruction surveys and maintained between project work areas and adjacent to preserved habitat during all work activities. Exclusion fencing will consist of silt fabric, plastic, plywood, aluminum, or other SCWA-approved material. The base of the fence will be buried a minimum of 3 to 5 inches in the ground to prevent animals from crawling under and be a minimum of 3 feet in height above ground to serve as a barrier for animals moving on the ground surface. The fence will be pulled taut at each support to prevent folds or snags and the supports shall be placed on the inside of the exclusion fence. Exclusion fences shall also include provisions (e.g., ramps, one-way doors, or exit funnels) for California red-legged frogs and other species to leave the work area. Construction personnel will also install an orange plastic-mesh construction fence 1 foot on the development side of the exclusion fence to increase visibility unless the exclusion fence is composed of high visibility materials. Exclusion fencing shall be inspected weekly and repaired immediately when damage is observed during construction work.
 - b. Control of dense vegetation in and adjacent to water delivery canals (either mechanical or chemical) shall not be conducted until individuals have had sufficient time (minimum of 24 hours) to move away from the work area to more suitable habitats.
- 3. Preconstruction Surveys

- a. The Approved Biologist shall survey the work site 2 weeks prior to the onset of construction activities. Any life stage of California red-legged frogs (adults, tadpoles, or eggs) found in construction areas shall be captured and relocated to secure sites approved by SCWA in consultation with the HCP Technical Review Committee. Only Approved Biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.
4. Work Timing
 - a. Work activities in riparian and aquatic habitat shall be completed between June 15 and October 15. If the applicant can demonstrate a need to conduct activities outside this time period, SCWA may authorize such activities in writing after consulting with USFWS and CDFW.
 - b. Ground-disturbing, mechanical clearing of vegetation and associated work activities in uplands shall be conducted between June 1 and November 1 or until the first fall rain that produces 0.25 inch of rainfall, unless prior surveys have been conducted and California red-legged frogs are shown to be absent from the site and the site boundary is fenced to preclude California red-legged frogs from moving onto the site.
5. Dewatering Activities
 - a. If pumping will be used to dewater the project site, intakes shall be completely screened with wire mesh no larger than 5 millimeter in size to prevent California red-legged frog adults and tadpoles from entering the pump.
 - b. Prior to dewatering, the Approved Biologist shall capture and relocate any native fish or other vertebrate species found at the project site. Captured animals shall be relocated to a suitable pool or other location in the same waterbody above or below the project site.
 - c. All dewatering shall be pumped into a temporary siltation pond/desilting basin, Baker tank, or similar detention device in order to allow adequate time for settling of sediments prior to their release downstream in accordance with the approved Storm Water Pollution Prevention Plan (SWPPP).
 - d. Following adequate settling time, water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.
6. Exotic Species Removal
 - a. The Approved Biologist shall permanently remove and humanely euthanize any exotic wildlife species, such as bullfrogs and crayfish, to the extent possible from within the project site.



7. Site Restoration

- a. After completion of any work activities that would temporarily disturb California red-legged frog aquatic or upland habitat, temporarily disturbed areas shall be restored to their original condition, including pre-work topography and hydrology. Disturbed areas shall be reseeded, if necessary, using local, native, noninvasive species seed mixes. All such restoration work shall be conducted under the supervision of an Approved Biologist.
- b. Plastic monofilament or wire mesh straw wattles or erosion control blankets shall not be used. Only erosion control materials (blankets, rolls, mats, etc.) with a minimum 2-inch square mesh made of natural coir fibers or other netting approved by SCWA in consultation with the HCP Technical Review Committee shall be used.

8. Firebreak Construction and Maintenance

- a. Mowing to establish fuel breaks is preferred to disking. Mowing shall generally be conducted as late as possible in the spring, reducing the herbaceous cover to less than 2 inches in height.
- b. Where mowing is not practicable or will not provide an adequate fuel break, disking may be implemented under the following conditions:
 - 1) Prior to firebreak construction, “No Disk” zones shall be established for wetlands and any significant habitat areas such as California red-legged frog aquatic habitat, as well as areas with concentrations of fossorial mammal burrows. “No Disk” zones shall be permanently staked using metal fence posts placed at least 50 feet from the edge of the pools. A post and sign shall be installed on either side of the pool (“No Disk” zone) to warn the disk operator of the presence of habitat from either direction.
 - 2) At those points designated as “No Disk” zones, the disk operator shall raise the disk blades out of the soil and cross the “No Disk” zone. Not until the disk blades are beyond the “No Disk” sign on the opposite side of the sensitive habitat shall the operator be allowed to lower the blades, and in no case shall the operator allow the blades to touch the soil while in the “No Disk” zone.
 - 3) “No Disk” zones shall not be crossed if water is standing in wetlands, aquatic habitat, or if the soil is wet. In such cases, the operator must raise the disk blades and make a detour around the wetland or aquatic area. Operators shall consult a site map, if available, to determine the best route around this area.

RLF MIT 1: Mitigation for Direct and Indirect Impacts to Upland Habitat in the California Red-legged Frog Conservation Area

Direct Impacts: As mitigation for conversion of upland habitats in the California Red-legged Frog Conservation Area, upland habitat shall be preserved and managed at a 3:1 ratio (mitigation-to-impacted) for direct impacts. All upland preservation shall occur in the California Red-legged Frog Conservation Area and be located within 0.7 mile of breeding habitats and non-breeding aquatic habitats.

RLF MIT 1-Indirect Impacts:

Indirect impacts resulting from new development within 300 feet of upland habitat in the California Red-Legged Frog Conservation Area shall provide an additional 1.5:1 ratio with preservation of known occupied upland habitat in the California Red-Legged Frog Conservation Area.

RLF MIT 2: Mitigation for Direct and Indirect Impacts to Riparian, Stream, Pond, and Freshwater Habitats in the California Red-legged Frog Conservation Area

Mitigation for unavoidable impacts to riparian, in-stream, pond, and freshwater marsh habitats in the California Red-legged Frog Conservation Area shall be provided through the preservation, construction, and/or restoration of similar habitats at a prescribed mitigation ratio (acres restored to acres impacted) consistent with RSM MIT 2 for the Riparian, Stream, and Freshwater Marsh Natural Community, but subject to the following conditions:

Direct Impacts to Aquatic Breeding Habitat. Impacted breeding habitat shall be mitigated by preserving existing occupied breeding habitat at a 2:1 ratio and constructing new breeding habitat at a minimum 2:1 ratio. If occupied breeding habitat is not available for preservation, construction of additional new breeding habitat at this same ratio may be substituted for this requirement (increasing the constructed pond ratio to 4:1). All habitat preservation, restoration, or creation shall also occur in the California Red-legged Frog Conservation Area and be located within at least 1 mile of occupied ponds.

RLF MIT 2- Direct Impacts to Non-breeding Aquatic and Riparian Habitats

Impacts to other wetland/aquatic and riparian habitats will be mitigated at a: (a) 2:1 ratio for created or restored aquatic habitats, or (b) 3:1 ratio where enhancement measures for existing habitat areas are implemented and the affected habitat is replaced (constructed) at a minimum 1:1 ratio. Non-breeding aquatic habitat consists of any typically shallow (non-lacustrine) freshwater features not suitable as breeding habitat, such as streams, small seeps, and ponds that dry too quickly for successful recruitment (USFWS 2008b). The restoration of suitable habitat or construction of new riparian and aquatic habitats shall



occur in the California Red-legged Frog Conservation Area and be located within dispersal distance of occupied habitat. An endowment fund or other approved funding source for long-term operation and maintenance (O&M) of the features shall also be provided, including control of invasive plant and animal species (i.e., bullfrogs, pepperweed).

RLF MIT 2- Indirect Impacts to Aquatic and Riparian Habitats

Indirect impacts resulting from new development within 300 feet of wetland/aquatic and riparian habitats in the California Red-Legged Frog Conservation Area shall provide an additional 1.5:1 ratio with preservation of known occupied wetland/aquatic and riparian habitat in the California Red-Legged Frog Conservation Area.

RLF MIT 3: Mitigation for Temporary Impacts to Upland, Marsh, Pond/Aquatic, and Riparian Habitats

Temporary impacts associated with soil disturbance and removal of vegetation for ordinary channel operation as well as other Covered Activities in breeding and non-breeding aquatic habitats in the California Red-legged Frog Conservation Area shall not require direct compensation for the temporary loss of herbaceous vegetation or woody vegetation less than 1 inch in diameter, provided activities comply with the riparian vegetation replacement mitigation ratios specified in RSM MIT 1 and all work is conducted with specified work windows and conditions under RLF CON 4 (Section 6.3.3). Also, all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

If work cannot be completed in one season, mitigation shall be provided at half the habitat-specific ratios and conditions as specified in RLF MIT 1 for uplands and RLF MIT 2 for aquatic, wetland, and riparian habitats:

Uplands: Preserve uplands at a 1.5:1 ratio.

RLF MIT 3- Temporary Impacts to Aquatic Breeding Habitat:

Preserve existing occupied breeding habitat at a 1:1 ratio and construct new breeding habitat at a minimum 1:1 ratio.

RLF MIT 3- Temporary Impacts to Non-breeding Aquatic and Riparian Habitats:

Create or restore similar aquatic habitat at a 1:1 or 1.5:1 ratio where enhancement measures for existing habitat areas are implemented and the affected habitat is replaced (constructed) at a minimum 0.5:1 ratio.

RLF MIT 4: Mitigation for Impacts to Breeding and Non-Breeding Aquatic Habitat Outside of the California Red-legged Frog Conservation Area

Compensatory mitigation for unavoidable impacts to suitable breeding and non-breeding aquatic habitat (e.g., riparian, stream, pond, and freshwater marsh habitats) outside of the

California Red-legged Frog Conservation Area shall be provided through the construction and/or restoration of similar habitats at a prescribed mitigation ratio consistent with RSM MIT 2, and an endowment fund or other approved funding source shall be provided to implement management plans for preserved lands in perpetuity consistent with Sections 7.3 and 10.5.

RLF MIT 5: Nonnative Predator Habitat

Development activities (including golf courses) in the California Red-legged Frog Conservation Area and the Inner Coast Range Natural Community shall not establish new perennial ponds (including ornamental ponds), small lakes, or other perennial water bodies that could provide habitat for nonnative species that prey on California red-legged frogs (i.e., bullfrog, crayfish, and warm water fish). Storm water runoff and other associated discharges from Covered Activities shall be controlled to prevent “perennialization” of intermittent creeks. An endowment fund or other approved funding source for long-term O&M of storm water features shall also include sufficient contingency funds to control invasive species (e.g., bullfrogs) if, in the future, these features are found to support these invasive species.

The following avoidance and minimization measures promote habitat avoidance in protected areas that are part of and contribute to the quality and viability of the Callippe silverspot butterfly population in the Plan Area. The avoidance and minimization measures apply to portions of the Inner Coast Range Natural Community identified as the Callippe Silverspot Conservation Area (Figure 4-13).

General Measure Notes for CSB DES 1: The following site design standards shall apply where core breeding habitat occurs within the Callippe Silverspot Conservation Area (Figure 4-13):

CSB DES 1: Site Design Standards in Core Breeding Habitat

1. All core breeding areas shall be avoided to the maximum extent practicable. Core breeding habitat is defined as a patch or series of small patches comprising approximately 0.1 acre in size with minimum *Viola pedunculata* density greater than 1 percent cover or 0.1 plant per square yard. Core breeding habitat shall be determined based on the survey requirements contained in Section 6.2.2.4.
2. Occupied habitat shall be determined based on a minimum of one season of field surveys/mapping at the site.
3. Direct loss of core breeding habitat shall be limited to no more than 20 percent of any breeding habitat area.
4. All preserves established in core breeding habitat shall have a minimum 300 feet buffer consisting of upland grassland or other natural vegetation (i.e., oak savanna/woodland or riparian habitats if applicable) between the outer edge of the core breeding habitat area and incompatible uses. Breeding areas with buffers less than 300 feet will be considered to be impacted.



5. All avoided breeding habitat shall have natural corridors at least 300 feet wide that are oriented along hilltops and ridgelines.
6. All avoided areas, including breeding habitat as well as associated corridor and buffer areas, shall be preserved in perpetuity and managed consistent with the requirements described in Section 7.3 and 10.5.

CSB CON 2: Best Management Practices to be Implemented During O&M and Construction Activities

1. Within the 300 feet buffer zone around core breeding habitat, all ground disturbance activities that could harm Johnny jump-up stands and adult nectar sources shall be limited to the period of August and April, when the Callippe silverspot butterfly is not active.
2. Prior to the start of work, temporary construction fencing and appropriate warning signs shall be placed a minimum of 300 feet from the habitat. Exclusion fencing shall be installed and maintained between project work areas and adjacent preserved habitat during all work activities. Exclusion fencing will consist of silt fabric, plywood, aluminum, or other SCWA-approved material at least 3 feet in height. The fence will be pulled taut at each support to prevent folds or snags. Construction personnel will also install an orange plastic-mesh construction fence 1 foot on the development side of the exclusion fence to increase visibility unless the exclusion fence is composed of high visibility materials. Exclusion fencing shall be inspected and repaired on a weekly basis during construction work.
3. Firebreak Construction and Maintenance
 - a. Mowing to establish fuel breaks is preferred to disking. Mowing shall generally be conducted as late as possible in the spring, reducing the herbaceous cover to less than 2 inches in height.
 - b. Where mowing is not practicable or will not provide an adequate fuel break, disking may be implemented under the following conditions:
 - 1) Prior to firebreak construction, "No Disk" zones shall be established for wetlands and other significant habitat areas such as Callippe silverspot butterfly aquatic habitat, as well as areas with concentrations of fossorial mammal burrows. "No Disk" zones shall be permanently staked using metal fence posts placed at least 50 feet from the edge of the pools. A post and sign shall be installed on either side of the wetland ("No Disk" zone) to warn the disk operator of the presence of habitat from either direction.
 - 2) At those points designated as "No Disk" zones, the disk operator shall raise the disk blades out of the soil and cross the "No Disk" zone. Not until the disk blades are beyond the "No Disk" sign on the opposite side of the sensitive habitat shall the

operator be allowed to lower the blades, and in no case shall the operator allow the blades to touch the soil while in the “No Disk” zone.

“No Disk” zones shall not be crossed if water is standing in wetlands, aquatic habitat, or if the soil is wet. In such cases, the operator must raise the disk blades and make a detour around the wetland or aquatic area. Operators shall consult a site map, if available, to determine the best route around this area.

- 3) In addition, prior to firebreak construction “No Disk” zones will be established with the above requirements within 50 feet of any Johnny jump-up stands and adult nectar sources.

Note: This measure applies to portions of the Inner Coast Range Natural Community in the Tri-City/County Planning Area, Nelson Hill in Cordelia, and the Rockville Hills area identified as the Callippe Silverspot Conservation Area (Figure 4-13).

CSB MIT 1: Mitigation for Direct, Indirect, and Temporary Impacts to Non-breeding Habitat in the Callippe Silverspot Conservation Area

Mitigation for the conversion of non-breeding habitats in the Callippe Silverspot Butterfly Conservation Area shall be provided as described below. This measure shall be implemented concurrently with RLF

MIT 1. All preserved lands shall meet the management and funding requirements identified in Sections 7.3 and 10.5.

Direct Impacts: Suitable habitat shall be preserved and managed at a 3:1 ratio. All habitat preservation shall occur in the Callippe Silverspot Butterfly Conservation Area.

CSB MIT 1- Indirect Impacts: Indirect impacts resulting from new development within 300 feet of upland habitat in the Callippe Silverspot Butterfly Conservation Area shall provide an additional 1.5:1 ratio with preservation of known occupied non-breeding habitat in the Callippe Silverspot Butterfly Conservation Area.

CSB MIT 1- Temporary Impacts:

Temporary impacts to non-breeding habitat in the Callippe Silverspot Butterfly Conservation Area shall not require direct compensation for the temporary loss of habitat provided Covered Activities are conducted within specified work windows and are consistent with CSB CON 2, and all temporarily disturbed habitat is restored within 1 year at a minimum 1:1 ratio.



If work cannot be completed in one year, mitigation shall be provided at half the habitat-specific ratio and conditions as specified above (in CSB MIT 1) for direct impacts to non-breeding habitat:

Non-breeding Habitat in the Callippe Silverspot Conservation Area: Suitable habitat shall be preserved and managed at a 1.5:1 ratio for direct impacts.

CSB MIT 2: Mitigation for Direct, Indirect, and Temporary Impacts to Breeding Habitat in the Callippe Silverspot Butterfly Conservation Area

Impacts to larval host plant stands known as Johnny jump-up, adult nectar sources, and associated buffer habitats in the Callippe Silverspot Butterfly Conservation Area shall meet the following mitigation requirements. All preserved lands shall meet the management and funding requirements identified in Sections 7.3 and 10.5.

Preservation Component: Mitigation for direct, indirect, and temporary impacts to known or potential breeding habitat shall be provided as described below.

Direct Impacts: Compensatory mitigation for the conversion/loss of known or potential breeding habitat (i.e., a core breeding area) in the Callippe Silverspot Butterfly Conservation Area shall provide an additional 3:1 ratio with preservation of known occupied habitat in the Callippe Silverspot Butterfly Conservation Area. Permanent loss of core breeding habitat shall be limited to no more than 20 percent of any breeding habitat. Core breeding habitat is defined as a patch or series of small patches comprising approximately 0.1 acre in size with minimum *Viola pedunculata* density greater than 1 percent cover or 0.1 plant per square yard. Core breeding habitat shall be determined based on the survey requirements contained in Section 6.2.2.4.

CSB MIT 2- Indirect Impacts:

Indirect impacts resulting from new development within 300 feet of known or potential breeding habitat in the Callippe Silverspot Butterfly Conservation Area shall provide an additional 1.5:1 ratio with preservation of known occupied habitat in the Callippe Silverspot Butterfly Conservation Area.

CSB MIT 2- Temporary Impacts:

Temporary impacts to breeding habitat in the Callippe Silverspot Butterfly Conservation Area shall not require direct compensation for the temporary loss of habitat provided Covered Activities are conducted within specified work windows and are consistent with CSB CON 2, and all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

If work cannot be completed in one year, mitigation shall be provided at half the habitat-specific ratio and conditions as specified above (in CSB MIT 2) for direct impacts to breeding habitat.

Breeding Habitat in the Callippe Silverspot Conservation Area: Suitable habitat shall be preserved and managed at a 1.5:1 ratio for direct impacts.

Restoration Component: Both direct and indirect (within 300 feet) impacts to core Johnny jump-up host plant stands and direct impacts to adult nectar sources in the Callippe Silverspot Butterfly Conservation Area shall develop and fund additional restoration/enhancement of host plant (*Viola pedunculata*) and nectar plant habitat at a minimum 3:1 ratio. An endowment fund or other approved funding source shall be provided to implement management plans for restored lands into perpetuity.

The Riparian, Stream, and Freshwater Marsh Natural Community avoidance and minimization measures apply to all seasonal and perennial wetlands, aquatic, marsh, and riparian habitats in the Plan Area, excluding vernal pools and seasonal wetlands associated with the Valley Floor Grassland and Vernal Pool Natural Community and Coastal Marsh Natural Community. Avoidance and minimization measures associated with wetlands in these two communities are addressed under the respective Natural Community measures. Figure 6-1 provides a schematic diagram of stream order designations, and Figure 4-10 identifies Priority Drainages and Watersheds referred to in several measures.

RSM DES 1: Habitat Avoidance

Plan Participants (or third-party applicants) shall avoid activities that will result in the loss of riparian or stream habitat that meet any one of the following conditions:

1. Riparian, stream, and habitats in associated buffer zones located in Priority Drainages and Watersheds
 1. (Figure 4-10) (see RSM DES 2 for buffer zone description)
 2. More than 300 feet of channel in first or second order streams lacking woody riparian vegetation
 3. Second order streams with riparian vegetation
 4. Third, fourth, and higher order streams in non-priority watersheds
 5. Activities that will create a significant barrier to wildlife movement along the stream corridor and/or significantly affect hydrological connectivity
 6. Within Covered Activity Zones 2 and 3

If Plan Participants (or third-party applicants) are proposing to fill any portion of a stream or permanently remove riparian habitat in any of the conditions described above, they must provide documentation explaining why avoidance is not practicable and/or would not contribute to the conservation goals and objectives of the Solano HCP. The determination of compliance with RSM DES 1 for any proposed activity that



would result in the loss of such habitat types shall be made by SCWA in consultation with the HCP Technical Review Committee (see Sections 10.2.6 and 10.4.1). In general, the level of documentation required for a project varies by the significance of the project. Activities involving perpendicular crossings for roads, utility lines, or other Covered Activities are preferable and will generally require less documentation than longitudinal impacts.

Plan Participants (or third-party applicants) conducting routine O&M activities are exempt from the above-stated requirement, provided they comply with all applicable avoidance and minimization measures described under Section 6.3.5.2.

RSM DES 2: Setbacks and Buffer Zones

Native vegetated buffer zones shall be established between development and stream corridors to protect riparian and stream habitats in accordance with the following standards:

1. For infill[2] projects buffer zone widths shall, at a minimum, correspond to existing buffer widths found in the existing adjacent developed areas or a minimum of 1.5 times the drip line of trees and shrubs at maturity, whichever is greater. To the maximum extent practicable, buffer zones shall be widened to accomplish all of the following: (a) restoration of historical riparian vegetation stands; (b) establishment of protected zones of riparian vegetation that are at least the width of four mature riparian tree canopies; and (c) incorporation of existing native perennial upland vegetation (e.g., native grassland, oak woodland, elderberry stands, and other native shrubs).
2. For projects in the urban expansion areas along third or higher order streams and lower order streams that support riparian vegetation (Figure 6-1), buffer zones shall extend at least 100 feet from either: (a) the top of the bank, or (b) the outside edge of the existing riparian vegetation, whichever distance is greater.
3. Development may encroach into the buffer zone required under Conditions 1 and 2 provided that offsets are provided elsewhere in the buffer zone. The offsets shall be situated in the remainder of the buffer zone and shall be equal or greater in size to the encroachment areas. Under no circumstances shall the total area of all encroachments exceed 25 percent of the total buffer zone area or length as specified in Condition 2.
4. The outer edges of the buffer (not to exceed 25 percent of the buffer width along third or higher order streams and lower order streams that support riparian vegetation) may also be used for public access and passive recreation such as hiking, wildlife viewing, and bicycling. For avoided first and second order streams lacking riparian vegetation, public access is limited to no more than 5 percent of the outer edge of the buffer.

5. For projects in the urban expansion areas along avoided first and second order streams lacking riparian vegetation (Figure 6-1), stream setbacks shall be at least 25 feet from the top of the bank.
6. For those projects that involve reconstruction/restoration of channelized streams (including both widening of riparian corridors and reestablishment of watercourse meander patterns), setbacks shall be at least 50 feet from either: (a) the top of the bank, or (b) the edge of the restored riparian corridor, whichever distance is greater. Creating meanders from a straight watercourse will require a wide area that encompasses the meanders and the additional 50 feet buffer from the top of bank (of the edge of the meandering watercourse) or edge of riparian vegetation (of a non-meandering watercourse). This area should provide a sufficient buffer for the watercourse and can support other native upland communities such as grasslands and oak woodlands.
7. Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.3 and 10.5.2.

RSM CON 3: Riparian Tree Protection

1. Where trees and/or riparian shrubs are present and will be preserved, ground disturbance shall avoid the drip line of the riparian trees and shrubs. Temporary construction fencing shall be placed at the edge of the work outside the edge of the tree drip lines. No construction work, storage of equipment or materials, or other disturbance shall be allowed in the protected areas.
2. Excavation work within a distance of 1.5 times the radius of the drip line or within a 25 feet radius of the drip lines, whichever is greater, of native riparian trees shall be done with hand tools or with light mechanized equipment (e.g., mini or light excavator or backhoe) in order to minimize disturbance or damage to roots.
3. An air spade or the equivalent shall be used to aerate and loosen any compacted soil in the structural root zone of protected trees to minimize physical injury to the tree roots.
4. Branch or root pruning of native riparian trees, if required, shall be conducted under the supervision of a Certified Arborist.
5. Equipment staging areas/storage areas shall not be located within a distance of 1.5 times the radius of the drip line or within a 25 feet radius of the drip line, whichever is greater, of native riparian trees.
6. Fill, gravel, or other construction materials shall not be stockpiled in the drip lines of native riparian trees.

RSM CON 4: Best Management Practices to be Implemented During O&M and Construction Activities

1. Habitat Protection During Work Activities



- a. Removal of riparian vegetation to conduct O&M activities shall be limited to the minimum amount necessary to conduct such activities. Any such removal will require compensatory mitigation to reestablish riparian vegetation in accordance with Section 6.4.5.
 - b. Exclusion fencing shall be installed prior to preconstruction surveys and maintained between project work areas and adjacent avoided habitat during all work activities. Exclusion fencing will consist of silt fabric, plywood, aluminum, or other SCWA-approved material at least 3 feet in height. The base of the fence will be buried in the ground to prevent animals from crawling under. The remainder of the fence will be left above ground to serve as a barrier for animals moving on the ground surface. Exclusion fences shall also include provisions (e.g., ramps, one-way doors, or exit funnels) for small mammal, reptile and amphibian species to leave the work area. The fence will be pulled taut at each support to prevent folds or snags. Construction personnel will also install an orange plastic-mesh construction fence 1 foot on the development side of the exclusion fence to increase visibility unless the exclusion fence is composed of high visibility materials. Exclusion fencing shall be inspected and repaired on a weekly basis during construction work.
- 2. Firebreak Construction and Maintenance
 - a. To the maximum extent practicable, fire breaks shall be placed along the outer edge of riparian vegetation (in accordance with the requirements of the general avoidance and minimization measures in Section 6.3.1), rather than within the riparian vegetation.
 - b. If fuel breaks are needed in a stand of riparian woodland vegetation, the following measures shall apply to the maximum extent practicable[3]:
 - 1) Only understory vegetation and lower tree branches shall be removed in order to establish a minimum 8 feet vertical clearance between the lowest live branches and understory fuels.
 - 2) All branches up to 3 inches in diameter may be pruned. For trees that are less than 24 feet tall, a maximum of one-third of the tree height may be pruned.
 - 3) Trimming shall be done in a manner to encourage and maintain a closed canopy in all riparian woodlands so as to minimize understory growth.
- 3. Dewatering Activities
 - a. Water drafting, pumping, or other water diversion shall be done in a manner that is not harmful to fish or other aquatic or semi-aquatic life. Pump inflow tubes or hoses shall be screened within a 0.5 mm mesh-screened

cage to exclude aquatic wildlife that may otherwise be harmed in the process.

- b. Prior to dewatering, the Approved Biologist shall capture and relocate any native fish or other native vertebrate species found at the project site. Captured animals shall be relocated to another suitable waterbody preapproved by SCWA in consultation with the Resource Agencies unaffected by the work or downstream of the work area. All nonnative invasive species shall be captured, removed from the project site, and humanely euthanized.
- c. All dewatering shall be pumped into a temporary siltation pond/desilting basin, Baker tank, or similar detention device in order to allow adequate time for settling of sediments prior to their release downstream in accordance with the approved SWPPP.
- d. Following adequate settling time, water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.
- e. If coffer dams are used, turbid water pumped out of the dam shall not reenter the channel until the sediment has settled out to prevent any increase in turbidity in downstream waters.

4. Work Timing

- a. Construction work in riparian, stream, and freshwater marsh habitats shall be conducted between April 15 and October 15, except for streams and other water bodies in California Red-legged Frog and Giant Garter Snake Conservation Area (Figures 4-14 and 4-18), in steelhead or Chinook salmon streams (Figure 4-17), or where more restrictive time frames to protect nesting birds and other Covered and Special Management Species may apply.

5. Habitat Protection and Site Restoration

- a. Disturbed areas shall be hydroseeded or stabilized using other erosion control measures prior to October 15. Hydroseed mixes used along and immediately above stream banks to stabilize disturbed areas shall not contain fertilizers or nonnative invasive species. When necessary, SCWA, in consultation with the HCP Technical Review Committee, may grant extensions of this deadline on a case-by-case basis.
- b. Streambed and bank construction work shall not create any physical barriers to fish migration such as artificial berms or a uniformly flat channel profile.
- c. Bank stabilization projects shall also incorporate bioengineering techniques and other measures to promote reestablishment of native vegetation (e.g.,



- anchored rootwads or ballast bucket plantings in riprap). The use of hardscape such as rock riprap and floodwalls shall be minimized.
- d. All debris, sediment, rubbish, vegetation, or other material removed from the channel banks, channel bottom, or sediment basins shall be disposed of at an approved upland disposal site.
 - e. Excess drainage from the construction site shall be routed away from riparian, stream, and freshwater marsh habitats.
 - f. Any riprap placed such that it will encounter water shall incorporate large woody cover (logs), other applicable bioengineering techniques, and/or vegetation planting depending on the character of the surrounding (natural) stream banks.
 - g. During construction, inspection of in-stream habitat and performance of sediment control devices shall occur at least once a day when there are surface waters in the channel to ensure devices are functioning properly.
 - h. Where erosion control blankets are placed in riparian zones, plantings of native riparian trees and shrub species shall occur in small openings in the erosion control blanket.
 - i. Plastic monofilament or wire mesh straw wattles or erosion control blankets shall not be used. Only erosion control materials (blankets, rolls, mats, etc.) with a minimum 2-inch square mesh made of natural coir fibers or other netting approved by SCWA in consultation with the HCP Technical Review Committee shall be used.

RSM CON 5 for Salmonids

The following measure applies to all Covered Activities affecting the main stems and tributaries (e.g., headwaters to the bay) of the following stream systems that support or have the potential to support salmonids: Green Valley Creek, Suisun Creek, Ledge wood Creek, Gordon Valley Creek, Lynch Canyon Creek (a.k.a. American Canyon), Jameson Canyon Creek, the Napa River, and Putah Creek (only for Chinook salmon) (Figure 4-17).

1. In Covered Activity Zones 1 and 2 (Figure 1-4), in-stream work shall only be allowed from June 15 to October 31 during low-flow conditions.
2. No fill material, including concrete, shall be allowed to enter any waterways. Concrete piers, footings, or other structures shall be poured in tightly sealed forms and shall not encounter surface waters until the cement has fully cured (at least 30 days). Commercial sealants may be applied to the poured concrete surface where difficulty in excluding water flow for a long period may occur. If sealant is used, water shall be excluded from the site until the sealant is dry.
3. Channel disturbance shall be minimized and no material shall be left in the channel. If bridge footings are to be protected by riprap, the channel bottom elevation shall not be raised above the natural channel bottom.

4. For bridge removal, no portions of the old structure shall be left in the channel; and where abutments are removed, no depressions shall remain. Depressions shall be filled with a 2- to 5-inch layer of clean, round, river rock cobble or gravel.
5. Bridges and culverts shall be designed as full span and avoid impacts to channel hydraulics. Bridge and road design shall prevent discharge (such as culverts or bridge drains) of any untreated storm water runoff directly into any waterways.
6. Construction BMPs and erosion control methods (including revegetation of bare soil prior to October 15, unless an extension is granted by the applicable Resource Agencies) shall be implemented to prevent an increase in sediment entering waterways.
7. Construction sites shall be monitored to ensure no salmonids are present that could be harmed by construction activities. If salmonids are present, a qualified fishery biologist shall capture and relocate the fish in suitable habitat downstream of the work area.
8. Materials used for column repairs shall be non-toxic to aquatic life.
9. All equipment refueling and maintenance shall occur outside the creek channel, and appropriate measures shall be implemented to prevent the discharge of fuels or other contaminants into the stream in the event of spills.
10. Water that contacts wet concrete and has a pH greater than 9 shall be pumped out and disposed of outside the creek channel.
11. Conduct cleaning activities in designated salmonid habitat (see Chapter 4.0; Figure 4-17) during an appropriate work window when salmonids are less likely to be present (e.g., June 15 through October 31).
12. Have a qualified fishery biologist present to monitor the site for the presence of salmonids and, if necessary, provide for their escape or capture and relocation.
13. All seasonal or temporary diversion dams on known or suspected salmonid streams and their tributaries shall be removed by October 31 each year, unless extensions are granted by CDFW and the National Oceanic Atmospheric Association, National Marine Fisheries Service (NOAA NMFS).
14. Operation of heavy construction equipment in stream channels with wetted areas shall be avoided.
15. Large woody debris shall be relocated rather than removed from the stream channel in order to maintain habitat for steelhead and Chinook.
16. A hydroacoustic impact analysis and monitoring plan shall be submitted to the SCWA and the Resource Agencies for all pile driving in aquatic habitats supporting steelhead or salmon for review and written approval. This plan will contain details regarding any limitations on which type of driver should be used (e.g., vibratory or impact driver), which size pile(s) to use, what level of hydroacoustic monitoring is required, whether a noise attenuation method such as a bubble curtain should be utilized to reduce underwater sound levels, as well as any seasonal restrictions on pile driving that may negatively affect specific fish



species. The following general measures (based on 2015 interim guidelines by the Fisheries Hydroacoustic Working Group (FHWG) Caltrans 2015) that shall be implemented, as applicable include:

- a. Both the vibratory hammer driver and impact hammer pile driver are subject to the performance standards as specified by the FHWG, the specifics in the hydroacoustic monitoring plan, and what is stated below.
- b. A vibratory driver shall be used to the greatest extent possible before the impact driver is utilized to reduce the impact to fish species in the area.
- c. Where practicable, at the beginning of each construction day pile driving shall be started at a lower decibel level to stimulate avoidance behavior in fish and allow the fish time to vacate the area (known as a soft start). Then the pile driving shall be ramped up (limiting the maximum noise level to Measure 16.e below) to complete the pile driving faster. The details of the soft start will be included in the hydroacoustic monitoring plan.
- d. Pile driving with an impact driver shall only occur during the seasonal in-water work window specified by NOAA NMFS for this region, which is from August 1 through November 30. This limitation is for general avoidance of potential impacts to fish species in this region. The proposed work window may be adjusted based on the USFWS programmatic consultation on delta smelt. Conducting work within the work window will minimize the possibility that work activities may impact fish species as listed fish species are less likely to utilize the Plan Area as a migratory corridor during this period.
- e. The following sound requirements apply to pile driving with an impact hammer: accumulated sound exposure levels (SELs) shall not exceed 187 decibels (dB) measured at 33 feet (equivalent to 10 meters) for all listed fish, except those that are 0.07 ounce (equivalent to 2 grams) or less (Caltrans 2015). Accumulated SELs for fish weighing 0.07 ounce or less shall not exceed 183 dB measured at 33 ft. In addition, the peak sound pressure level for any single strike is 206 dB re: 1 micro-Pascal (μPa) for all listed fish, except those that are 0.07 ounce or less. As a conservative measure, NOAA NMFS has also identified a behavioral disturbance threshold of 150 dB re: 1 μPa Root-Mean-Square (RMS) pressure for salmonids and green sturgeon as appropriate, until new information and research indicates otherwise. According to the FHWG, there are no established injury criteria for vibratory hammer pile driving (Caltrans 2015).

RSM CON 6 for Valley Elderberry Longhorn Beetle



The following measures apply to all Covered Activities that would entail ground-disturbing activities within 100 feet of elderberry plants:

1. A minimum setback of 20 feet from the drip line of each elderberry plant shall be established between the development and all elderberry plants containing stems measuring 1 inch in diameter or greater at ground level, except where elderberry plants are established immediately along existing roads or other paved or graveled surfaces (e.g., sidewalks, bike/pedestrian paths, facility access roads).
2. Where elderberry plants are established adjacent to existing roads and facilities, construction avoidance fencing shall be provided to protect the trunk and main stems of the plant.
3. All contractors shall be briefed on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements. Work crews shall be instructed on the status of the valley elderberry longhorn beetle and the need to protect its elderberry host plant.
4. Signs shall be placed every 50 feet along the edge of the buffer zone with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Federal Endangered Species Act. Violators are subject to prosecution, fines, and imprisonment." The signs shall be clearly readable from a distance of 20 feet and must be maintained for the duration of construction.
5. Routine trimming of overgrown and overhanging elderberry shrubs that may pose a human safety threat along pathways, trails, bike paths, roadways shall adhere to the following restrictions:
 - a. Only branches and stems less than 1 inch in diameter may be trimmed or cut.
 - b. Trimming may only occur between September 1 and March 14. Trimming is recommended from November through the first 2 weeks in February, when plants are dormant and have lost their leaves.
 - c. Trimming shall not occur after the shrubs have leafed out (when adult valley elderberry longhorn beetles are likely to be active).
 - d. Vegetation clearing within 5 feet of elderberry shrub stems shall be done by hand (pulling, clipping, etc.).
6. Following completion of construction work affecting the buffer zone, any damage done to the buffer zone shall be restored with using native erosion control seed mixes and native riparian plant species, as appropriate.
7. Any elderberry plants that cannot be avoided during construction shall be transplanted to other appropriate locations in the buffer zone, and other mitigation as specified in Section 6.4.5.2 shall be implemented.
8. After construction, buffer zones must continue to be protected from adverse effects of the development project. Protection measures such as fencing and signage shall



- be included in the project plans and are subject to the approval of SCWA in consultation with the HCP Technical Review Committee.
9. No insecticides, herbicides, fertilizers, or other chemicals that might harm the valley elderberry longhorn beetle or its host plant shall be used in the buffer areas or within 100 feet of any elderberry plant with one or more stems measuring 1 inch in diameter or greater at ground level.
 10. Fire fuel breaks (disked land) may not be included within the 100 feet setback; however, vegetation in the setback may be cleared by mowing (e.g., mower, mechanical trimmers, and hand tools) to less than 2 inches in height. The mowing of grasses/ground cover in the buffer zone may occur from July through April to reduce fire hazards. No mowing shall occur within 5 feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).
 11. An Approved Biologist shall be retained to monitor implementation and compliance of all the above measures.

RSM CON 7 for Tricolored Blackbird

The following measures are for Covered Activities that are within 250 feet of suitable tricolored blackbird breeding habitat:

1. During the breeding season (February 1 through August 31), an Approved Biologist shall conduct preconstruction surveys for all Covered Activities (including weed abatement/wildfire fuel reduction) in known or suitable nesting habitat areas no more than 15 days prior to scheduled work. Suitable nesting habitat includes any of the following: (a) dense vegetation near open water; (b) emergent marsh vegetation, especially cattails and tules; (c) thickets of willow, blackberry, wild rose, or thistles; (d) silage and other grain fields such as sorghum.
2. Preconstruction surveys shall be conducted for each phase of development. If ground-disturbing activities are delayed or suspended for more than 15 days following completion of the preconstruction survey, an Approved Biologist shall resurvey the site and shall conduct a second follow-up survey at least 5 days prior to the start of construction activities.
3. A minimum 250 feet buffer shall be established between work activities and any active nests. Construction buffers may be reduced under the following conditions:
 - a. A site-specific analysis prepared by an Approved Biologist indicates that construction activities would not adversely affect nesting birds. SCWA, in consultation with the HCP Technical Review Committee, must approve the analysis in writing before construction can proceed.

- b. Nesting birds do not exhibit significant adverse reaction to construction activities (e.g., changes in behavioral patterns, reactions to noise) based on sufficient monitoring (minimum of 3 consecutive days following construction initiation). Construction will stop if a significant adverse reaction is observed during any of the monitoring days and will only commence again with a 250 feet buffer once behavioral patterns return to preconstruction activities.
 - c. Additional monitoring shall be required any time there is a change in heavy equipment use or activity that results in greater noise levels. A change in heavy equipment use or greater noise levels that may require additional monitoring will be determined by an Approved Biologist.
 - d. Monitoring is continued at least once a week through the nesting cycle until the young have fledged and left the nest area.
 - e. Monitoring reports are submitted to SCWA.
- 4. The Approved Biologist has the authority to stop work at any time if signs of disturbance to the nesting colony are noted. If adverse effects are identified, construction activities shall cease immediately and construction shall not resume until SCWA and the Resource Agencies are consulted to determine if construction may continue under modified restrictions or shall be suspended until nesting activity is complete.
- 5. Plan Participant and eligible third party facilities and properties known to support tricolored blackbird breeding colonies shall retain at least 50 percent of originally available suitable nesting habitat for this species in the facility/property in any given year unless nesting has not occurred for a period of 5 consecutive years. If more than half the originally available nesting habitat is removed for more than one year, mitigation per RSM MIT 13 for permanent impacts shall be required.
- 6. General Notes about Mitigation Requirements: Not all riparian, stream, and marsh communities are mapped on Figures 3-5 and 4-10. Habitat mitigation will vary depending on the type of impact (direct, indirect, or temporary) and the conservation value of the impacted area. Mitigation for temporary impacts associated with routine O&M activities shall include implementation of invasive species control programs and direct replacement of native vegetation. Restoration programs shall include measures to control and remove invasive species, replant native vegetation in existing riparian corridors and marshes, and, where possible, restore riparian corridor widths to historical margins to provide for natural stream behavior and flood regimes. In general, the preference for the following mitigation requirements is through on-site enhancement, creation, or restoration in open space areas. These open space areas shall have a minimum 100 feet wide buffer from either: (a) the top of the bank, or (b) the outside edge of the existing riparian vegetation, whichever distance is greater, the establishment of an endowment or other suitable funding source for long-term management of the mitigation habitat,



and a conservation easement (see Section 10.5). Where on-site mitigation is not practicable, the purchase of credits at an approved mitigation bank or off-site mitigation site will be acceptable (except where on-site channel relocation/rerouting requirements for longitudinal fills are required).

RSM MIT 1: Mitigation for Direct Impacts to Riparian, Stream, and Freshwater Marsh Habitat

Mitigation for direct impacts to Riparian, Stream, and Freshwater Marsh habitat associated with riverine systems in the Plan Area shall be provided through restoration of in-kind habitat. Restoration of riparian habitat or creation of new habitat must occur either on site, at an approved mitigation bank, or at another high-quality site, and must be capable of supporting similar quality and species as the impacted site. All Riparian Restoration Plans (see Section 10.5.4) shall be reviewed and approved by the SCWA in consultation with the HCP Technical Review Committee. Plan Participants shall direct restoration and enhancement activities toward severely degraded stream segments in Priority Drainages and Watersheds (Figure 4-10). Basic mitigation requirements are based on impact area, vegetation replacement, and designated conservation values of the Riparian, Stream, and Freshwater Marsh habitat as assessed in Section 4.3.6.3.

1. **Vegetation.** All native, woody vegetation greater than 1 inch in diameter shall be replaced by planting native woody vegetation at the minimum ratios and performance standards:

Vegetation Replacement Size (inches)

Note: Performance Criteria – The number of native riparian plants that become established at the end of the 5 year monitoring period shall equal a minimum of 80 percent of total required plantings. Established plants may include natural regeneration and volunteer plants.

The goal of the riparian vegetation replacement is to contribute to the establishment of a multi-story riparian community with a variety of native riparian species appropriate for the mitigation site. Plantings are not required to directly replace impacts on a species-by-species basis.

2. **Area.** Riparian and channel mitigation shall also achieve the following area criteria based on whether the mitigation is achieved through enhancement (e.g., supplemental planting of existing riparian habitats) or through establishment of new channel and woody riparian habitats (e.g., existing or created channel lacking native woody riparian vegetation):

Area ratios for priority drainages: Enhancement is mitigated at a 4:1 ratio, created/restored at a 2:1 ratio.

Area ratios for non-priority drainages: Enhancement is mitigated at a 3:1 ratio, created/restored at a 2:1 ratio.

3. **Hydrological and Biological Connectivity-** Mitigation for direct impacts to third and higher order streams and second order streams with riparian vegetation shall maintain the hydrologic and biological connectivity between downstream and upstream areas. Facilities such as bridges, culverts, outfalls, and grade control structures shall not create cumulative gaps in the channel or riparian corridor greater than 100 feet in length than conditions at the time of the adoption of the HCP. Bypass or rerouted channels shall be constructed where necessary to replace impacted habitats and to limit gaps between existing riparian habitats.
 Note: The intent of requiring mitigation for removal of nonnative trees and shrubs is to protect riparian habitat. It is not intended to require mitigation for the removal of nonnative trees or shrubs as a part of riparian restoration or enhancement projects.

The above measure does not apply to the undergrounding or lining of irrigation supply ditches for water conservation purposes. However, conversion or loss ditches subject to Section 404 of the Clean Water Act for urban development or other Zone 1 or 2 Covered Activities would be subject to the mitigation requirements.

RSM MIT 2: Mitigation for the Loss or Fill of Ponds, Freshwater Marsh Habitat, and Channels

Direct Impacts: Mitigation for direct impacts to ponds, freshwater marsh habitat, and channels shall be provided at a 2:1 ratio for non-priority drainages and at a 3:1 ratio for priority drainages. This mitigation may be achieved by creating/restoring on-site open space areas with a minimum 100 feet wide buffer, establishing an endowment or other suitable funding source for long-term management of the mitigation habitat, or purchasing credits at an approved mitigation bank.

Indirect Impacts: No mitigation is required for indirect impacts to ponds, freshwater marsh habitat, and channels provided that the project complies with RSM DES 2.

RSM MIT 3: Mitigation for the Loss or Fill of Seasonal Wetlands

Direct Impacts: Mitigation for direct impacts to seasonal wetlands in the Plan Area shall be provided at a 2:1 ratio.

Indirect Impacts: Mitigation for indirect impacts to seasonal wetlands within 100 feet of the seasonal wetlands shall be provided at a 1:1 ratio.

RSM MIT 4: Mitigation for Temporary Impacts to Riparian, Stream, and Freshwater Marsh Habitat



Temporary impacts (i.e., typically where project activities result in the removal of vegetation, except woody riparian vegetation, lasting no more than one growing season) associated with ordinary channel O&M activities conducted by Plan Participants, or construction/installation of permanent features (e.g., outfalls, bridges, utility lines), except in designated giant garter snake habitat areas (see Section 6.4.6), shall comply with the following conditions:

1. Implement appropriate erosion control measures, including reseeded disturbed soils with an appropriate seed mix, for all disturbed areas above the waterbody's ordinary high water mark consistent with general avoidance and minimization measures (Section 6.3.1).
2. Conduct all work associated with ordinary channel O&M activities in compliance with general avoidance and minimization measures (Section 6.3.1).
3. Implement BMPs consistent with general Avoidance and Minimization Measures (Section 6.3.1) for all work associated with new development projects.
4. Replace all native, woody riparian vegetation greater than 1 inch in diameter consistent with the replacement mitigation ratios specified in RSM MIT 1.
5. Restore channel or bank disturbance to original conditions at a 1:1 ratio.

Note: The above measure does not apply to O&M of constructed irrigation supply ditches associated with ongoing agricultural activities.

RSM MIT 5: Base Flow

New developments shall not result in any increase in the base flood elevation. "Base flood" means a flood with a 1 percent chance of being equaled or exceeded in any given year (also called the "100-Year Flood").

RSM MIT 6: Development in Watersheds of Priority Drainages

In Priority Drainages and Watersheds (Figure 4-10), new urban development projects more than 10 acres in size shall detain water for a minimum of 12 to 24 hours for discharges that exceed pre-project level, 2-year recurrence, and 24-hour storm event discharges. All flood control and water quality basins in Priority Drainages and Watersheds shall be designed to minimize the establishment and expansion of nonnative species such as bullfrog and warm water fish consistent with RSM MIT 8.

RSM MIT 7: Restoring Naturalized Channel Processes

New urban development projects bordering Priority Drainages (Figure 4-10) shall restore and expand riparian habitat along existing stream and flood channels to allow more naturalized channel processes to occur and riparian vegetation to establish. Channel design standards shall include establishing a two-stage floodplain corridor that allows natural channel meander patterns to develop while still providing for riparian habitat restoration and protection, and adequate capacity to meet flood control requirements.

RSM MIT 8: Prevent the “Perennialization” of Ponds and Intermittent Creeks

Development activities shall not establish perennial ponds and small lakes, and urban runoff shall be controlled to prevent “perennialization” of intermittent creeks in the Inner Coast Range Natural Community and California Red-legged Frog Conservation Area.

RSM MIT 9: Storm Water Discharge

Municipal Plan Participants shall require all new development and redevelopment projects that will increase directly connected impervious area (DCIA) to filter, retain, detain, or infiltrate storm water prior to discharge consistent with National Pollutant Discharge Elimination System (NPDES) permit requirements established by the Regional Water Quality Control Board (RWQCB). Such developments shall be required to implement storm water management plans to adequately treat urban runoff prior to discharge into wetlands, streams, rivers, ponds, or other local water bodies or into municipal storm systems that discharge to aquatic habitats. Minimum design standards for structural or treatment control storm water runoff shall be determined by one of the following methods:

1. Volumetric Treatment Control BMPs (e.g., water quality ponds, treatment wetlands)
 - a. Treat runoff up to and including the 85th percentile, 24-hour runoff event determined as the maximum capture of storm water volume for a specific jurisdiction, according to the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87 (or most current update); or
 - b. Treat runoff up to and including the annual runoff volume based on a unit basin storage water quality volume, by the method recommended in California Stormwater Best Management Practices Handbook – Industrial Commercial (CASQA 2004) to achieve 80 percent or more volume treatment; or
 - c. Treat runoff up to and including the runoff volume produced from a 0.75-inch storm event, prior to its discharge to a storm water conveyance system; or
 - d. Treat runoff up to and including the runoff volume produced from a historical record-based reference, 24-hour criterion for “treatment” that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile, 24-hour runoff event; or
 - e. Treat runoff up to and including the flow of runoff produced by a rain event of at least 0.2 inch per hour; or
 - f. Treat runoff up to and including the flow of runoff produced by a rain event of at least twice the 85th percentile hourly rainfall intensity for the applicable Plan Participant jurisdiction; or



- g. Treat runoff up to and including the flow of runoff produced by a rain event resulting in the treatment of an equivalent portion of runoff as treated by the volumetric standards above.

The water quality protection measures are adapted from the SWRCB Phase II NPDES general storm water permit standards and contribute to maintaining and improving the chemical, physical, and biological integrity of waters in the Plan Area. All storm water-related mitigation measures shall conform to NPDES permit requirements in place at the time of a project's approval when such permit requirements exceed the minimum standards presented in the HCP (e.g., the more protective standards shall apply).

RSM MIT 10: Invasive Species, Water Quality Control, Species Introductions, and Barrier Removal Enhancement Program

All development projects that create new or increase impervious surfaces shall provide funding to contribute toward a grant funding program (see Chapter 5.0 Objectives RSM 2.1, GGS 1.1, and CM 1.1) to implement cost-share programs to control invasive species, implement additional water quality control measures, establish new populations/occurrences of Covered Species, and remove in-stream barriers. Costs shall be based on a per-acre basis of new or increased impervious surface.

Note: RSM MIT 10 is intended to contribute to mitigation for unavoidable, cumulative adverse effects of increased urban development runoff on downstream receiving waters and associated Covered Species.

RSM MIT 11: New Stream Crossings

New crossings in streams that are known to, or have the potential to, support salmonids (i.e., the main stems and tributaries to Lynch Canyon, Jameson Canyon, Ledgewood, Green Valley, Gordon Valley and Suisun creeks, and the Napa River) shall adhere to the guidelines developed by NOAA NMFS and CDFW for safe passage of salmonids. Note: The following alternatives and structure types shall be considered in order of preference:

1. Nothing: Realign the road to avoid crossing the stream,
2. Bridge: Span the stream to allow for long-term dynamic channel stability,
3. Streambed Simulation Strategies: Implement a bottomless arch, embedded culvert design, or ford,
4. Non-embedded Culvert: Utilize a non-embedded culvert or hydraulic design for limited to low slopes,
5. Baffled Culvert or Structure Designed with a Fishway: Utilize a baffled culvert or similar facility for steeper slopes.

If a crossing is proposed in a known salmonid spawning area, only full-span bridges or culverts that provide natural streambed substrates are acceptable.

RSM MIT 12: Elderberry Shrub Mitigation for Valley Elderberry Longhorn Beetle

Where removal of elderberry shrubs or their stems measuring 1 inch in diameter or greater is unavoidable, these impacts shall be mitigated. Removal of elderberry shrubs or stems 1 inch in diameter or greater and associated riparian vegetation shall not create cumulative gaps in a riparian corridor greater than 100 feet in length over conditions at the time of the adoption of the HCP. Mitigation will include salvaging and replanting affected elderberry shrubs and planting additional elderberry shrubs and associated native riparian plants according to the following criteria:

1. **Transplanting Removed Elderberry Shrubs.** Transplant removed elderberry shrubs to an approved, secure site, such as an approved mitigation bank location in Solano County or non-bank relocation site to be approved by SCWA. All non-bank relocation sites shall meet the minimum reserve standards identified in Section 10.5 (e.g., site shall be protected by a conservation easement or other applicable protection measure, and funding shall be provided for long-term monitoring and maintenance). Transplanting shall occur between June 15 and March 15 (November through February is the optimal period for transplanting). Elderberry may not be transplanted between March 16 and June 14 except where isolated bushes are located more than 0.5 mile from other suitable valley elderberry longhorn beetle habitat and no signs of use (exit holes) have been identified.
2. **Mitigation for Whole Shrub Removal.** For each removed elderberry bush, plant a minimum of 5 elderberry seedlings or rooted cuttings and 5 associated native, woody riparian plants in the mitigation area, or purchase applicable credits from a mitigation bank approved under the Solano HCP to sell valley elderberry longhorn beetle credits.
3. **Mitigation for Trimming/Removal of Stems 1 Inch in Diameter or Greater.** Trimming/removal of elderberry stems 1 inch in diameter or greater shall be mitigated by planting elderberry seedlings and associated native plant species at the following ratios based on stem size and presence of valley elderberry longhorn beetle exit holes:

Elderberry Stem Size

Stems $\geq 1''$ & $\leq 3''$

Stems $> 3''$ & $\leq 5''$

Stems $> 5''$

Mitigation plantings shall occur, to the maximum extent practicable, in areas adjacent to the impact area and/or in existing gaps in riparian corridors. Priority areas for riparian revegetation and planting of elderberry include Alamo, Ulatis, and Putah creeks in order to



expand suitable habitat for the valley elderberry longhorn beetle in the Plan Area. The requirements for associated native, woody riparian plant establishment may be fulfilled in combination with the woody riparian vegetation replacement requirements prescribed under RSM MIT 1.

RSM MIT 13: Direct Loss or Conversion of Tricolored Blackbird Foraging Habitat

Mitigation for the direct disturbance, destruction, or conversion of tricolored blackbird foraging habitat for urban development or other permanent facilities shall be provided at a 1:1 ratio. Sites that have been occupied at any time during the past 5 years will be considered occupied by tricolored blackbirds and will require additional nesting habitat mitigation including funding for protection of the existing tricolored blackbird colonies (Section 11.1.5). All foraging habitat affected either directly or indirectly by the project will be subject to the compensation requirement. Mitigation lands used to satisfy mitigation measures for other Natural Communities and/or Covered Species (i.e., Valley Floor Grassland and Vernal Pool Natural Community [excluding the wetland restoration/construction component] Coastal Marsh Natural Community, Swainson's hawk, California red-legged frog, and Callippe silverspot butterfly) can be used to satisfy tricolored blackbird conservation if the reserve area meets the basic reserve management standards (Sections 7.3 and 10.5.3) and criteria specified in Objective RSM 1.2 (Section 5.6.1).

Exemption: In-fill projects on small, in-fill lots (which are not part of undeveloped lands greater than 5 acres of contiguous habitat) and which are bordered by contiguous urban development (based on conditions at the time the HCP is adopted) would have minimal effects on the extent and quality of tricolored blackbird habitat and are exempt from foraging habitat mitigation requirements. Nonetheless, project proponents are obligated to avoid destruction of active tricolored blackbird nest colonies and take of tricolored blackbirds in compliance with the Federal Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5 and to meet the requirements specified in RSM CON 7..

RSM MIT 13- Temporary Impacts:

Temporary impacts associated with Covered Activities affecting tricolored blackbird foraging habitat shall not require direct compensation provided activities comply with RSM CON 7, and all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

GGs CON 1: Timing of Work

In-channel and upland work in the Giant Garter Snake Conservation Area shall occur between May 1 and October 1. Between October 2 and April 30, in-channel work that is limited to removal of accumulated sediments and aquatic vegetation may occur in accordance with the following restrictions: (a) all excavation/dredging shall be confined to

the channel bed (below the ordinary high water mark); (b) channel banks shall not be disturbed; and (c) any dredged or excavated material shall be hauled off site or placed in areas lacking rodent burrows, riprap, or other material that might provide dormant period cover for giant garter snakes.

GGs CON 2: Best Management Practices to be Implemented During O&M and Construction Activities

1. An Approved Biologist shall identify all areas of giant garter snake habitat to be avoided in or adjacent to the work area. The avoided areas shall be flagged, and signage stating “Environmentally Sensitive Area” shall be erected.
2. All vehicles travelling on secondary roads (i.e., roads other than highways, city/county roads, and surface streets) within 200 feet of aquatic habitat in the Giant Garter Snake Conservation Area shall observe a speed limit of no greater than 20 miles per hour.
3. Movement of heavy equipment shall be confined to existing roadways, and excavation equipment shall be operated from the tops of banks to minimize habitat disturbance.
4. When mowing fields near streams or canals, workers shall start mowing farthest from the water in order to force snakes toward the water. By cutting the swath along the water last, the snakes will be allowed to maintain cover and escape. Vegetation shall be mowed to a minimum height of 4 inches. To maintain cover for garter snakes next to a canal, opposite banks shall be mowed on alternate years.
5. All workers shall receive training from the Approved Biologist on how to recognize a giant garter snake and its habitat(s).
6. Twenty-four hours prior to construction activities, the work area shall be surveyed for giant garter snakes by an Approved Biologist. Surveys shall be repeated if a lapse in construction activity of 2 weeks or greater occurs. If a giant garter snake is encountered during work, all work activities shall cease until the biologist has determined that the snake will not be harmed. Any sightings or incidental take shall be reported to SCWA.
7. Dewatering shall be limited to the period between May 1 and October 1. Any dewatered habitat shall remain dry for at least 15 consecutive days prior to excavating or filling dewatered habitat. Any exceptions that may need to be made regarding this requirement needs to be approved by SCWA in consultation with the Resource Agencies and may be subject to mitigation requirements.
8. Gas cartridge rodenticides will not be used to fumigate burrows in areas supporting giant garter snake between October 1 and April 30.
9. Plastic monofilament or wire mesh straw wattles or erosion control blankets shall not be used. Only erosion control materials (blankets, rolls, mats, etc.) with a minimum 2-inch square mesh made of natural coir fibers or other netting approved



by SCWA in consultation with the HCP Technical Review Committee shall be used.

General Notes about Mitigation Requirements: The following mitigation measures are for Covered Activities within 200 feet of suitable giant garter snake aquatic habitat in the Giant Garter Snake Conservation Area (Figure 4-18).

GGS MIT 1: O&M Habitat Mitigation

The Solano County Water Agency (SCWA), Reclamation District No. 2068 (RD 2068), Maine Prairie Water District (MPWD), Dixon Resource Conservation District (Dixon RCD), the City of Vallejo Water Division, and Solano Irrigation District (SID) shall acquire, enhance/restore, and manage 85 acres of aquatic and 22 acres of associated upland habitat for giant garter snake as mitigation for ongoing O&M activities for their facilities in the Giant Garter Snake Conservation Area (Figure 4-18).

GGS MIT 2: Mitigation for Direct and Indirect Impacts to Giant Garter Snake Habitat

Compensatory mitigation for unavoidable direct and indirect impacts to suitable aquatic and associated upland habitat (i.e., 200 feet from the edge of aquatic habitat) in the Giant Garter Snake Conservation Area (Figure 4-18) shall be provided as follows:

Aquatic Component Direct Impacts. Restore aquatic habitat at a ratio of 3:1 (mitigation-to-impact)

Direct Upland Impacts: Restore upland habitat adjacent to restored aquatic habitat at a ratio of 2:1 restored upland acres to restored aquatic acres.

Notes: Upland mitigation requirements are based on required aquatic habitat mitigation. Mitigation requirements for direct impacts to uplands within 200 feet of giant garter snake aquatic habitat are specified as part of the broader Valley Floor Grassland and Vernal Pool Natural Community or Swainson's Hawk/Agricultural Community conservation requirements. The 175 acres of restored and enhanced aquatic habitat for giant garter snakes (Objective GGS 1.2 and 1.3) will also contribute to the conservation of the Covered Species tricolored blackbird, and Special Management Species Modesto song sparrow and yellow-headed blackbird. GGS MIT 2 meets Goal GGS 1 and Objective GGS 1.2 and 1.3.

GGS MIT 2- Aquatic Component Indirect Impacts

Restore aquatic habitat at a ratio of 1.5:1 for avoided wetlands within 200 feet of proposed development

Indirect Upland Impacts: Restore upland habitat adjacent to restored aquatic habitat at a ratio of 1:1 restored upland acres to restored aquatic acres.

Upland mitigation requirement may be substituted by providing additional giant garter snake aquatic habitat at a ratio of 0.5:1 (additional aquatic habitat: required upland mitigation), if a sufficient portion (generally 20 to 25 percent) of the reserve is composed of associated upland habitat.

GGS MIT 2- Temporary Impacts.

Temporary impacts associated with Covered Activities affecting giant garter snake habitat shall not require direct compensation provided activities comply with GGS CON 1, GGS CON 2, RSM CON 4, and all temporarily disturbed habitats shall be restored to original conditions within 1 year at a minimum 1:1 ratio.

GGS MIT 3: Invasive Species, Water Quality Control, Species Introduction, and Barrier Removal Enhancement Program

All development projects which create new or increase impervious surfaces shall provide funding to contribute toward a grant funding program (see Chapter 5.0 Objectives RSM 2.1, GGS 1.1, and CM 1.1) to implement cost-share programs to control invasive species, implement additional water quality control measures, establish new populations/occurrences of Covered Species, and remove in-stream barriers. Costs shall be based on a per-acre basis of new or increased impervious surface.

Note: GGS MIT 3 is intended to contribute to mitigation for unavoidable, cumulative adverse effects of increased urban development runoff on downstream receiving waters and associated Covered Species.

CM DES 1: Habitat Avoidance

Permanent fill of coastal marsh habitat shall be avoided to the maximum extent practicable. Where permanent fill is proposed, the Plan Participant (or third-party applicant) shall provide documentation explaining why avoidance is not practicable and/or would not contribute to the conservation goals and objectives of the HCP, in accordance with the procedures in Section 10.4.1. The determination of compliance with CM DES 1 of any proposed activity that would result in the filling of coastal marsh habitat will be made by SCWA in consultation with the HCP Technical Review Committee (see Section 10.2.6).

CM DES 2: Buffers

Coastal marsh habitat shall be protected from direct and indirect impacts from Covered Development Activities through establishment of site-specific buffers that are designed to preclude changes to water and soil salinity and the flooding/inundation regime. Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.2 and 10.5. Habitats within 500 feet of the boundary of existing (as of the effective date of the HCP) roads or development (includes vacant but graded and filled



building pads) shall be considered to be indirectly impacted and subject to the mitigation requirements in Section 6.4.7.

CM CON 3: Best Management Practices to be Implemented During O&M and Construction Activities

1. Temporary fill/disturbance of coastal marsh habitats shall be avoided to the maximum extent practicable. Any projects resulting in the loss of marsh vegetation for more than one growing season shall be required to mitigate at the ratios specified in Section 6.4.7.
2. Native vegetation trimmed or removed on the project site will be stockpiled during work. After construction activities, when removal of temporary mats and construction-related materials and application of native seed mix have been completed, stockpiled native vegetation will be reapplied over temporarily disturbed wetlands to provide temporary soil protection and as a seed source.
3. Where wetland vegetation removal is required, work will be conducted using hand-held tools, unless other methods are approved by SCWA, USFWS, and CDFW, to enable wildlife to escape. Vegetation will be cut starting at the outside edge (nearest unvegetated or disturbed areas) working toward the project limits to allow wildlife opportunity to escape toward appropriate cover.
4. Removal of vegetation in wetland habitat will be conducted with an Approved Biologist present. This monitor will watch for special-status wildlife species and temporarily stop work if special-status species are encountered. Wildlife will be allowed to escape before work is resumed. Service-approved biologist with appropriate qualifications to handle special-status species will be allowed to move special-status species to safe locations as permitted by the terms of their credentials.
5. Temporarily affected wetlands (restored within 1 year) will be restored by removing construction related debris and trash. Affected areas will be seeded with a certified weed-free, site-appropriate native seed mix, as provided in the revegetation plan developed in cooperation with the Resource Agencies. Mulch with certified weed-free mulch. Rice straw may be used to mulch upland areas.
6. Prior to removing upland habitat adjacent to pickleweed-dominated coastal marsh habitat, the upland habitat shall be mowed during the dry season so that vegetative cover has a height of no greater than 2 inches for a period of at least 2 weeks prior to the habitat removal.

CM CON 4: Use of Riprap

In order to avoid attracting predators of Covered and Special Management Species associated with salt marsh habitat, the use of rock riprap shall be avoided to the maximum extent practicable within 500 feet of coastal salt marsh habitat. Where such use is

unavoidable, all exposed riprap shall be covered with soil and revegetated with native marsh plants.

CM CON 5 Soft Bird's-beak and Suisun Thistle

In areas where soft bird's-beak or Suisun thistle are known to occur or suitable upper coastal marsh zone habitat exists, the following avoidance and minimization measures shall be implemented for all Covered Activities:

1. Prior to any ground-disturbing activities, a qualified botanist shall survey for the presence of these plants or suitable habitat for these species (see Appendix B Covered Species Accounts).
2. During Covered O&M Activities, buffers at least 100 feet wide shall be established around occupied habitat. Buffers may be reduced, if necessary, provided temporary construction fencing is installed and construction is monitored daily. Suitable habitat shall not be directly or indirectly affected through changes in hydrology, sedimentation, or contamination of the habitat or the surrounding area. Upon completion, surrounding areas shall be restored to their original condition. If seeding is necessary, local, native, noninvasive species that will not compete with the listed plants shall be used.

CM CON 6 Salt Marsh Harvest Mouse

Covered Activities shall not cause mortality of salt marsh harvest mouse or loss of occupied habitat. Where the presence of salt marsh harvest mouse has been verified or where suitable core habitat (pickleweed-dominated saline emergent wetlands; see Appendix B) for the species occurs, an Approved Biologist shall assess the extent of uplands needed to provide both suitable buffer protection as well as suitable upland refuge habitat for salt marsh harvest mouse. For development activities adjacent to suitable habitat, the requirements of CM CON 3 shall be met at a minimum; however, additional upland area may need to be protected. The final proposed upland protection zone shall be subject to the approval of SCWA in consultation with the HCP Technical Review Committee (see Section 10.2.6).

For temporary construction work in salt marsh harvest mouse habitat, the following measures shall be implemented:

1. An Approved Biologist, with previous salt marsh harvest mouse monitoring and surveying experience, will conduct preconstruction surveys for the mouse prior to project initiation and will remain on site during construction activities occurring in wetlands. The Approved Biologist will document compliance with the project permit conditions and avoidance and minimization measures. The Approved Biologist has the authority to stop project activities if any of the requirements



associated with these measures is not being fulfilled. If the Approved Biologist has requested work stoppage because of take of any of the listed species, SCWA and the Resource Agencies will be notified within 1 day by electronic mail or telephone.

2. If a salt marsh harvest mouse, or any mouse that construction personnel may believe is this species, is encountered during project construction, all work that could result in direct injury, disturbance, or harassment of the individual animal will immediately cease, and the site construction foreman and Approved Biologist will be immediately notified. The Approved Biologist will monitor it until he/she determines that the animal(s) is not imperiled by predators or other dangers. The Approved Biologist will notify the SCWA and the Resource Agencies within 1 working day via electronic mail and telephone following any encounters and immediately after inadvertently killing or injuring a potential salt marsh harvest mouse during construction.
3. Disturbance to wetland vegetation will be avoided to the extent feasible in order to reduce potential impacts on salt marsh harvest mouse. If wetland plants cannot be avoided, they will be removed by hand (and/or by another SCWA, USFWS, and CDFW-approved method). The Approved Biologist will be on site to monitor all wetland vegetation removal activities.
4. The upper 6 inches of soil excavated within salt marsh harvest mouse habitat will be stockpiled separately and replaced on top of the backfilled material.
5. Vegetation must be cleared to bare ground.
6. Vegetation should be removed from all areas (driving roads, action area, or anywhere else that vegetation could be stepped on).
7. Work will be scheduled to avoid extreme high tides when there is potential for salt marsh harvest mouse to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use.
8. To prevent salt marsh harvest mouse from moving through the project site during construction, temporary exclusion fencing will be placed around a defined work area before construction activities start and immediately after vegetation removal. The fence should be made of a material that does not allow salt marsh harvest mouse to pass through or over, and the bottom should be buried to a depth of 2 inches so that mice cannot crawl under the fence except in situations where burial of the fence would significantly affect other species. Any supports for the salt marsh harvest mouse exclusion fencing must be placed on the inside of the project area.
9. Prior to the start of daily construction activities during initial ground disturbance, the Approved Biologist will inspect the salt marsh harvest mouse-proof boundary fence to ensure that it has no holes or rips and the base is still buried. The fenced area also will be inspected to ensure that no mice are trapped in it. Any mice found

along and outside the fence will be closely monitored until they move away from the construction area.

10. No materials or supplies that could potentially entrap salt marsh harvest mice will be stored in potential salt marsh harvest mouse habitat. All equipment will be stored away from salt marsh harvest mouse habitat when not in use.
11. All disturbed areas shall be restored to the pre-project topographic and hydrologic conditions. A reclamation plan to restore vegetation to pre-disturbance or better conditions for the salt marsh harvest mouse shall be developed, reviewed, and approved by SCWA and the Resource Agencies and implemented and monitored for performance.

CM CON 7 Delta Smelt, Longfin Smelt, North American Green Sturgeon Southern Distinct Population Segment (DPS), and Sacramento Splittail

For Covered Activities that may result in temporary impacts to delta smelt, longfin smelt, green sturgeon, and Sacramento splittail habitat, the following avoidance and minimization measures shall be implemented:

1. In-water work shall be restricted to the period between August 1 and November 30 for the longfin smelt, green sturgeon, and Sacramento splittail, and between August 1 and October 15 for the delta smelt. Work outside these designated windows will require approval from SCWA in consultation with the HCP Technical Review Committee (see Section 10.2.6), and compliance with requirements for mitigation (see Section 6.4.7).
2. Water drafting, pumping, or other water diversion shall be done in a manner that is not harmful to fish or other aquatic or semi-aquatic life. Pump inflow tubes or hoses shall be screened within a 0.5 mm mesh-screened cage to exclude aquatic wildlife that may otherwise be harmed in the process.
3. The following actions are required for any dewatering in Coastal Marsh Conservation areas:
 - a. An Approved Biologist shall capture and relocate any native fish or other native vertebrate species found at the project site. Captured animals shall be relocated to another suitable waterbody preapproved by SCWA in consultation with the Resource Agencies; the water body shall be unaffected by the work or downstream of the work area. All nonnative invasive species shall be captured, removed from the project site, and humanely euthanized.
 - b. Discharge water in construction sites exceeding the following background standards of the receiving waters, as measured in Nephelometric Turbidity Unit (NTU), shall not be directly discharged according to the following (CRWQCB 2009):



3. Turbidity of 50 NTU post-BMPs or limit increase in turbidity above background level:
4. Receiving Water Background Incremental Increase
 - Dry Creek 50 NTU
 - < 50 NTU 5 NTU
 - 50–100 NTU 10 NTU
 - 100 NTU 10% of background
5. All discharge water exceeding these background levels shall be pumped into a temporary siltation pond/desilting basin, Baker tank, or similar detention device in order to allow adequate time for settling of sediments prior to their release downstream in accordance with the approved SWPPP.
 - c. Following adequate settling time, water shall be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow shall be removed in a manner that would allow flow to resume with the least disturbance to the substrate.
 - d. If coffer dams are used, turbid water pumped out of the dam shall not re-enter the channel until the sediment has settled out to prevent any increase in turbidity in downstream waters.
4. Dredged material shall not be placed on aquatic vegetation.
5. Dredging or excavation shall be conducted only during low-flow periods.
6. Silt-trapping devices shall be used to minimize downstream sedimentation.
7. The use of rock riprap in low-flow channels shall only be used where riprap is determined to be the only feasible stabilization approach. Individual bank stabilization activities using rock riprap shall not exceed 500 feet in length along the bank and the amount of riprap used shall not exceed 1 cubic yard per running foot placed along the bank below the ordinary high water mark without specific authorization from the Resource Agencies (see Section 10.4.2).
8. A hydroacoustic impact analysis and monitoring plan shall be submitted to the SCWA and the Resource Agencies for all pile driving in aquatic habitats supporting steelhead or salmon for review and written approval. This plan will contain details regarding any limitations on which type of driver should be used (e.g., vibratory or impact driver), which size pile(s) to use, what level of hydroacoustic monitoring is required, whether a noise attenuation method such as a bubble curtain should be utilized to reduce underwater sound levels, as well as any seasonal restrictions on pile driving that may negatively affect specific fish species. The following general measures (based on 2015 interim guidelines by the Fisheries Hydroacoustic Working Group (FHWG) Caltrans 2015) that shall be implemented, as applicable include:

- a. Both the vibratory hammer driver and impact hammer pile driver are subject to the performance standards as specified by the FHWG, the specifics in the hydroacoustic monitoring plan, and what is stated below.
 - b. A vibratory driver shall be used to the greatest extent possible before the impact driver is utilized to reduce the impact to fish species in the area.
 - c. Where practicable, at the beginning of each construction day pile driving shall be started at a lower decibel level to stimulate avoidance behavior in fish and allow the fish time to vacate the area (known as a soft start). Then the pile driving shall be ramped up (limiting the maximum noise level to Measure 8.e below) to complete the pile driving faster. The details of the soft start will be included in the hydroacoustic monitoring plan.
 - d. Pile driving with an impact driver shall only occur during the seasonal in-water work window specified by NOAA NMFS for this region, which is from August 1 through November 30. This limitation is for general avoidance of potential impacts to fish species in this region. The proposed work window may be adjusted based on the USFWS programmatic consultation on delta smelt. Conducting work within the work window will minimize the possibility that work activities may impact fish species as listed fish species are less likely to utilize the Plan Area as a migratory corridor during this period.
 - e. The following sound requirements apply to pile driving with an impact hammer: accumulated sound exposure levels (SELs) shall not exceed 187 decibels (dB) measured at 33 feet (equivalent to 10 meters) for all listed fish, except those that are 0.07 ounce (equivalent to 2 grams) or less (Caltrans 2015). Accumulated SELs for fish weighing 0.07 ounce or less shall not exceed 183 dB measured at 33 ft. In addition, the peak sound pressure level for any single strike is 206 dB re: 1 micro-Pascal (μPa) for all listed fish, except those that are 0.07 ounce or less. As a conservative measure, NOAA NMFS has also identified a behavioral disturbance threshold of 150 dB re: 1 μPa Root-Mean-Square (RMS) pressure for salmonids and green sturgeon as appropriate, until new information and research indicates otherwise. According to the FHWG, there are no established injury criteria for vibratory hammer pile driving (Caltrans 2015).
9. If these measures cannot be implemented, additional project-specific measures may be proposed and implemented subject to review and written approval from SCWA and the Resource Agencies.

CM CON 8 California Clapper Rail, California Black Rail, Suisun Song Sparrow



In areas with suitable habitat for these California clapper rail, California black rail, and Suisun song sparrow, work for Covered Activities shall be conducted between September 1 and January 31 to the maximum extent practicable. Covered Activities conducted outside of this time period shall implement the following additional avoidance and minimization measures:

1. An Approved Biologist shall conduct preconstruction protocol surveys to identify and subsequently avoid nesting areas for California clapper rail, California black rail, and Suisun song sparrow. Surveys for these species shall be conducted using standard protocols established by SCWA and the Resource Agencies. Surveys shall be designed and of sufficient intensity to document rail nesting within 500 feet of planned work activities and within 100 feet for Suisun song sparrow nesting activity.
2. If Suisun song sparrow is found to be nesting in the planned work area, a minimum 100 feet wide buffer shall be maintained between construction activities and the nest location. Buffer zones may be reduced if it can be demonstrated to the satisfaction of SCWA and the Resource Agencies, that the birds would be unaffected by project-related activities. Buffers shall be maintained until the young have fledged and are capable of flight or until September 15.
3. If California clapper rail or California black rail are present in the immediate construction area, the following measures will apply during construction activities.
 - a. To minimize or avoid the loss of individual rails, activities within or adjacent to suitable rail habitat will not occur within 2 hours before or after extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge), when the marsh plain is inundated.
 - b. To minimize or avoid the loss of individual California clapper rails and black rails, activities within or adjacent to tidal marsh areas will be avoided during the breeding season from February 1 through August 31 each year unless surveys are conducted to determine rail locations and rail territories can be avoided.
 - c. If breeding California clapper rails or black rails are determined to be present, activities will not occur within 700 feet of an identified calling center. If the intervening distance across a major slough channel or across a substantial barrier between the California clapper rail or black rail calling center and any activity area is greater than 200 feet, the activities may proceed at that location within the breeding season.
 - d. Exception: Only inspection, maintenance, research, or monitoring activities may be performed during the California clapper rail breeding season in areas within or adjacent to California clapper rail breeding habitat with approval of the USFWS and CDFW under the supervision of a qualified biologist.



4. An Approved Biologist familiar with the habitat and ecology of California clapper rail shall be present on site during all construction activities to ensure that avoidance and minimization measures and construction limits are enforced. The Approved Biologist shall have the authority to stop any construction activity that is not consistent with approved plans and amendments.

CM MIT 1: Mitigation for Direct Impacts to Marsh Habitat

Mitigation for unavoidable direct impacts to coastal marsh habitats shall be provided through the creation and/or restoration of tidally-influenced coastal marsh at a 3:1 ratio of acres restored to acres impacted. Required ratios shall be applied and implemented to establish marsh communities (e.g., deep water, shallow water/mudflat, low marsh, mid marsh, high marsh, and upland) commensurate with impacted habitat.

CM MIT 2: Mitigation for Indirect Impacts to Marsh Habitat

Mitigation for indirect impacts to avoided marsh habitat within 500 feet of proposed development shall be provided through the restoration of tidally-influenced coastal marsh at a 1.5:1 ratio of acres restored to acres impacted. Required ratios shall be applied and implemented to establish marsh communities (e.g., deep water, shallow water/mudflat, low marsh, mid marsh, high marsh, and upland) commensurate with impacted habitat.

CM MIT 3: Mitigation for Direct Impacts to Shallow Water Habitat

Mitigation for the fill or shading of shallow water habitat shall be provided through the restoration of shallow water habitat at a 3:1 ratio or enhancement of existing shallow water habitat at a 4:1 ratio (impacts and mitigation are acreage based). Shallow water habitat is defined as waters between Mean High Water and 10 feet below the Mean Lower Low Water mark. The footprint of the structure shall be used to calculate the shadow zone and to offset all adverse effects resulting from the project. For example, a boat dock with a surface area of 400 square feet (sf) (40 feet by 10 feet) will need to preserve, create, or restore 1,200 sf (a 3:1 ratio) of shallow water habitat.

CM MIT 4: Mitigation for Temporary Impacts to Marsh Habitat

Mitigation for unavoidable temporary impacts (requires no more than one growing season to reestablish native coastal marsh vegetation or benthic communities in shallow water habitat) to coastal marsh habitats shall be provided through the restoration or enhancement of tidally-influenced coastal marsh at a 1.5:1 ratio of acres restored to acres impacted. Required ratios shall be applied and implemented to establish marsh communities (e.g., deep water, shallow water/mudflat, low marsh, mid marsh, high marsh, and upland) commensurate with impacted habitat. Restoration efforts shall be required to develop a Restoration and Enhancement Plan consistent with the criteria in Section 7.3.2.1.

CM MIT 5: Dry Season Nuisance Flows



All new and redevelopment projects in watercourses that drain to Suisun Marsh, Southampton Marsh, Napa River, and San Pablo Bay shall incorporate source control and treatment measures to evaporate or infiltrate all dry season runoff.

CM MIT 6: Invasive Species, Water Quality Control, Species Introduction, and Barrier Removal Enhancement Program

All development projects that create new or increase impervious surfaces shall provide funding to contribute toward a grant funding program (see Chapter 5.0 Objectives RSM 2.1, GGS 1.1, and CM 1.1) to implement cost-share programs to control invasive species, implement additional water quality control measures, establish new populations/occurrences of Covered Species, and remove in-stream barriers. Costs shall be based on a per-acre basis of new or increased impervious surface.

Note: CM MIT 6 is intended to contribute to mitigation for unavoidable, cumulative adverse effects of increased urban development runoff on downstream receiving waters and associated Covered Species.

CM MIT 7: Covered Plant Species Salvage and Recovery

Covered Activities that will impact populations of soft bird's-beak, Suisun thistle, and Mason's lilaeopsis shall be required to implement salvage and recovery programs. Salvage and recovery plans shall include measures to transplant plants or collect seed from impacted populations for at least one season prior to loss. Salvaged plants and collected seeds shall be used to establish new populations of similar size and number of plants impacted. Salvage and restoration plans shall be subject to review and approval by SCWA and the Resource Agencies.

CM MIT 8: Mitigation for Delta Smelt and Sacramento Splittail Habitat

SCWA, RD 2068, MPWD, and Dixon RCD shall acquire, enhance/restore, and manage 85 acres of shallow water aquatic habitat suitable for delta smelt and Sacramento splittail as mitigation for ongoing O&M activities for their facilities in the Giant Garter Snake Conservation Area (Figure 4-18). This mitigation measure shall be implemented in conjunction with GGS MIT 1.

General Measure Requirements: The following avoidance and minimization measures are for Covered Activities that could affect Special Management Animal Species, as listed in Table 1-2 with the exception of Suisun song sparrow (see CM CON 8).

SMS CON 1: Preconstruction Surveys

In Valley Floor Grassland and Vernal Pool, Coastal Marsh, and Riparian, Stream, and Freshwater Marsh Natural Communities, preconstruction surveys shall be conducted between February 1 and August 31 to identify and subsequently avoid nesting areas for applicable Special Management Bird Species. An Approved Biologist shall conduct these surveys no more than 15 days before the anticipated start of construction. Surveys shall be

designed and of sufficient intensity to document nesting activity within 100 feet of planned work activities for passerines and within 500 feet of planned work activities for raptors. These surveys may be concurrently conducted with surveys for Covered Species.

SMS CON 2: Buffer Zones

If nesting passerines are present; a minimum 50 feet wide buffer shall be established between construction activities and the nest location. A minimum 250 feet wide buffer shall be established for Special Management Raptor Species. Buffers shall be maintained until the young have fledged the nest and are capable of independent flight.

Construction buffers may be reduced from the above-stated distances in accordance with the following requirements:

1. A site-specific analysis prepared by an Approved Biologist indicates that the nesting birds would not be adversely affected by construction activities.
2. Monitoring by the Approved Biologist is conducted for a sufficient time (minimum of 10 consecutive days following the initiation of construction), and the nesting birds do not exhibit adverse reactions to construction activities (e.g., changes in behavioral patterns, reactions to noise).
3. Regular monitoring is continued through the nesting/wintering cycle at that site, and no change in nesting bird behavior is observed.
4. Monitoring reports are submitted to SCWA.
5. If adverse effects are identified, construction activities shall cease immediately and construction shall not be resumed until the Approved Biologist, in consultation with SCWA, has determined that construction may continue under modified restrictions or that nesting activity is complete.

SMS CON 3: Avoidance of “Perennialization” of Ponds and Intermittent Creeks to Protect Foothill Yellow-Legged Frogs and Western Pond Turtles

Covered Activities shall not increase urban and agricultural runoff to the extent that perennial aquatic habitats are created in the Inner Coast Range Natural Community.

Covered Activities shall not construct or establish perennial ponds, water features, and small lakes in the Inner Coast Range Natural Community (see RLF CON 4).

SMS CON 4: Minimize Impacts to Foothill Yellow-Legged Frogs and Western Pond Turtles

For projects resulting in impacts to aquatic habitat known to have or that has the potential to support foothill yellow-legged frog or western pond turtle, the following BMPs shall be implemented:

1. An Approved Biologist shall survey work sites for Covered Activities 2 weeks prior to the onset of construction activities. If any life-stage of foothill yellow-



- legged frog or western pond turtle is found and the habitat area cannot be avoided, the animal(s) shall be relocated to secure sites approved by SCWA.
2. The Approved Biologist shall be present at the work site until all foothill yellow-legged frogs and western pond turtles have been removed and the habitat disturbance has been completed. At that time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The monitor and the Approved Biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated. Other required avoidance and minimization measures for the Riparian, Stream, and Freshwater Marsh Natural Community (Section 6.3.5.1) and California red-legged frog (Section 6.3.2.2) provide additional measures that will be implemented concurrently with the above measure and provide various protection measures such as habitat buffers and setbacks to protect aquatic habitats for these species, applicable work windows in aquatic habitats, inclusion of barriers to prevent animal movement into construction areas, and establishment of secure uplands that can provide opportunities for western pond turtle breeding.

General Mitigation Requirements for Special Management Species: Special Management Species will receive substantial conservation benefit from implementation of the habitat preservation and restoration, water quality protection, invasive species control, and reserve management associated with the Conservation Strategies for Natural Communities and Covered Species described in Chapter 5.0. No additional direct mitigation requirements are required for these species.

BA = Biological Assessment
 BMP = Best Management Practices
 CDFW = California Department of Fish and Wildlife
 Dixon RCD = Dixon Resource Conservation District
 DPS = Distinct Population Segment
 ESU = Evolutionarily Significant Unit
 HCP = Habitat Conservation Plan
 MMP = Mitigation and Monitoring Plan
 MPWD = Maine Prairie Water District
 NOAA NMFS = National Oceanic Atmospheric Association, National Marine Fisheries Service
 NPDES = National Pollutant Discharge Elimination System
 O&M = Operation and Maintenance
 RD 2068 = Reclamation District 2068
 RSM = Riparian, Stream, and Freshwater Marsh
 RWQCB = Regional Water Quality Control Board
 SCWA = Solano County Water Agency
 SID = Solano Irrigation District
 SWPPP = Storm Water Pollution Prevention Plan
 USFWS = United States Fish and Wildlife Service

