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## **5.0 PRE-APPLICATION SURVEY REQUIREMENTS AND AVOIDANCE AND MINIMIZATION MEASURES**

### **5.1 OVERVIEW**

This section constitutes the first component of the Solano HCP Conservation Program for achieving the purpose of the HCP: to promote the conservation of biological diversity and the preservation of Covered Species and their habitats within the Plan Area. The Conservation Program involves three main components: 1) avoidance and minimization, 2) preservation and restoration, and 3) monitoring and adaptive management. The overarching goal of the HCP is primarily achieved through avoidance and minimization. When avoidance is not desirable or practicable, impacts must be mitigated through preservation or restoration of high value conservation areas identified in the Conservation Analysis (Section 4.0). Mitigation requirements are detailed in the Conservation Strategy (Section 6.0). Once established, the reserves and preserves must be managed through a Monitoring and Adaptive Management Program (Section 7.0) to maintain and increase their value for Covered Species.

Under the Federal ESA incidental take standards, an HCP must “*to the maximum extent practicable, minimize and mitigate the impacts of such taking.*” Under Section 2081 of the California Fish and Game Code, a mitigation plan must “*minimize and fully mitigate the effects of the authorized taking.*” This section of the HCP addresses these mandated avoidance and minimization requirements. Section 6.0 addresses the mitigation or compensation requirements.

The Solano HCP employs a regional conservation approach for determining avoidance and minimization requirements. The HCP follows the standard hierarchical strategy of avoidance and minimization as a first priority provided such avoidance contributes to and/or is necessary for the conservation of Covered Species and Special Management Species or minimizes the direct take of species by providing opportunities for individual wildlife to avoid or escape construction areas. The Solano HCP Conservation Strategy recognizes that avoidance resulting in the creation of small, isolated, patches of habitat is not ecologically defensible or desirable. Generally, the Solano HCP requires avoidance only where: 1) avoided habitats contribute significantly to the value of adjacent conservation lands; 2) where smaller, “specialty” reserves are necessary to protect certain, high value resources; or 3) when adequate conservation of a Covered Species or Special Management Species is not available within the reserve system.

Section 5.2 identifies the specific pre-application survey requirements for each Natural Community or Covered Species. Section 5.3 describes avoidance and minimization requirements that address both project design standards (avoidance standards) and monitoring survey requirements.

### **5.2 PRE-APPLICATION SURVEY REQUIREMENTS**

Pre-application surveys are essential for determining avoidance and minimization requirements as well as conservation/mitigation requirements for Covered Activities. Pre-application surveys are

required prior to submission of an application for coverage under the HCP (see Section 10.4). The objectives of these surveys are to:

- Identify applicable avoidance and minimization requirements for Covered and Special Management Species (Section 5.3);
- Define appropriate parameters for gauging habitat conditions and determining required conservation measures (Section 6.0);
- Establish project baseline data to track projects per the compliance monitoring and reporting requirements (Section 7.0 and 10.0).

The Solano HCP does not require lengthy, detailed or “protocol” surveys to assess presence of most Covered Species and Special Management Species. For most projects, pre-application survey requirements focus on basic parameters such as project size and location, land cover types and natural community association, verified extent of wetlands and other aquatic communities, and the presence of uncommon landscape or vegetation features. Section 10.4 identifies the baseline, pre-application survey requirements for all Covered Activities. Additional pre-application survey requirements specific to each Natural Community or Covered Species are described below. Baseline survey requirements for Special Management Species are addressed in Section 10.4 (baseline survey requirements) and the additional Natural Community requirements described below.

### **5.2.1 Valley Floor Grassland and Vernal Pools Pre-Application Survey Requirements**

In addition to the baseline survey requirements identified in Section 10.4, the following information shall be provided for project sites within the Valley Floor Grassland and Vernal Pool Natural Community (Figure 4-2):

1. Wetlands shall be categorized according to expected duration of ponding<sup>1</sup>:
  - a. Pools: Greater than 1 inch of standing water for more than 10 continuous days with short (less than three weeks) to long (more than three weeks) durations of standing water, clear to moderate turbidity, and exhibiting significant vegetation cover.
  - b. Pools: Greater than 1 inch of standing water for more than 10 continuous days with typically long (more than three 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; often referred to as playa-type pools).
  - c. Swales or Mesic Grassland: Shallow, standing water (generally less than one inch) present for fewer than 10 continuous days.
  - d. Highly Alkaline Flats and Meadows: Shallow, standing water (generally less than one inch), present for fewer than 10 continuous days, and exhibits indicators of high alkalinity.
  - e. Springs/Seeps: A wetland formed and maintained by ground water discharge.
  - f. Perennial Wetland: Year round to nearly year-round standing water or saturated soils.

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<sup>1</sup> Assessments should be made in consideration of “normal or average” rainfall conditions.

- g. Channel: Feature formed and maintained by flowing water; exhibits a discernable ordinary high water mark/scouring along the bank. The channel type should be further defined by water flow (i.e., ephemeral, intermittent or perennial) and stream order.<sup>2</sup>
2. A soil map shall be provided.
3. Stands of native grasses where native grasses comprise a minimum of 10 percent of the cover shall be mapped.

Mapping shall include the entire project site and a 250-foot buffer. Mapping and assessment of features within the buffer may be accomplished using aerial photographs.

Project sites in High Conservation Value Areas (Figure 4.9) shall conduct botanical surveys as follows:

1. **Contra Costa Goldfield Core Population Areas and Potential Habitat Areas (Subareas 1A (in part), 1B, 1C, 1D, 1E, 1F, 1G, 2B, 2C, 2E, 2F and 2H; Figure 4-7).** Two years of surveys shall be conducted to determine the presence and map the distribution and relative abundance of Contra Costa goldfields. Relative abundance shall be determined based on calculated average flower density. If more than five years have elapsed between the last survey and the project application, at least one year of surveys shall be repeated.
2. **All High Value Conservation Areas.** Two years of focused botanical surveys are required in all Valley Floor Grassland and Vernal Pool High Conservation Value Areas where the project would directly or indirectly impact (e.g., target habitats are present within 250 feet of proposed development) suitable habitat for: Ferris's milk-vetch, vernal pool smallscale, Colusa grass, Solano grass, San Joaquin Valley orcutt grass, and Boggs Lake hedge-hyssop. Surveys for these species shall be conducted in vernal pools characterized by one or more of the following: 1) pools with more than 50 percent barren soils in the pool bottoms (typically in pools deeper than 1.5 feet), 2) pools with visible alkaline salt crusts, or 3) pools on Pescadero series soils.

All surveys shall be conducted using established protocols as provided by SCWA. Deviations from the standard protocols will require prior approval from SCWA and the Resource Agencies.

### 5.2.2 California Red-legged Frog Pre-Application Survey Requirements

Applicants seeking permission for Covered Activities that will result in the loss or conversion of California red-legged frog habitat within the Inner Coast Range or the California Red-legged Frog Conservation Area (Figure 4-15) shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. In addition, applicants shall provide an assessment of aquatic habitat functions for breeding and hydration habitat as defined below:

1. Breeding habitat consists of low-gradient freshwater bodies, including natural and manmade (e.g., stock) ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds (deep

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<sup>2</sup> Stream order is a classification based on the branching pattern of river systems. A first order stream is defined as the smallest un-branched tributary. As streams of equal order join, they result in a stream of the next higher order (i.e., when two first order streams join, they form a second order stream; when two second order streams join they form a third order stream). See Figure 5-1.

lacustrine water habitat) capable of holding water for a minimum of 20 weeks in all but the driest of years (lakes and reservoirs 50 acres or larger in size are excluded).

2. Nonbreeding/hydration aquatic habitat consists of typically shallow (non-lacustrine) freshwater features, such as streams, small seeps, and ponds that dry too quickly to support breeding.

### **5.2.3 Callippe Silverspot Butterfly Pre-Application Survey Requirements**

Applicants seeking permission for Covered Activities that will result in the loss or conversion of habitat within the Callippe Silverspot Butterfly Conservation Area (Figure 4-14) shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. Additional data requirements include:

1. Appropriately timed field surveys (generally between late March and early May) to identify, map, and estimate stand densities of the larval host plants (violet or Johnny jump-up) at their maximum extent;
2. Identification of hill tops and ridgelines;
3. Assessment of adult nectar plants (see Appendix B, Callippe silverspot butterfly description); and
4. Mapping of stands of native grasses where the native grasses comprise a minimum of 10 percent of the cover.

Mapping shall be completed for the project site and a minimum 300-foot buffer around the edge of the project site.

### **5.2.4 Riparian, Stream, and Freshwater Marsh Pre-Application Survey Requirements**

Plan Participants and third party applicants seeking permission for Covered Activities that will result in the permanent loss or conversion of riparian and freshwater marsh habitats shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. The surveys shall be sufficient to provide a general characterization of the biological resources associated with these habitats. In addition, wetlands shall be categorized by type (see Section 5.2.1) and features formed and maintained by flowing water that exhibit a discernable ordinary high water mark/scouring along the bank (i.e., channels, streams) shall be further defined by water flow (i.e., ephemeral, intermittent, or perennial) and stream order (see Figure 5-1).

### **5.2.5 Giant Garter Snake Pre-Application Survey Requirements**

Plan Participants and third party applicants seeking permission for Covered Activities that will result in the permanent loss or conversion of riparian and freshwater marsh habitats within the Giant Garter Snake Conservation Areas shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. No additional pre-project species-specific surveys are required.

### 5.2.6 Coastal Marsh Pre-Application Survey Requirements

Plan Participants and third party applicants seeking permission for Covered Activities that will result in the permanent loss or conversion of coastal marsh habitat shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. The surveys shall be sufficient to provide a general characterization of the biological resources associated with these habitats. Additional information shall include:

1. Appropriately-timed, protocol-level surveys to determine the extent, population, and distribution of soft bird's beak, Suisun thistle, and Mason's lilaepsis in the project area and a 500-foot buffer area if suitable habitat is present;
2. Identification and mapping of core salt marsh harvest mouse habitat (generally mid to high marsh, pickleweed-dominated brackish and saline emergent wetlands; see Appendix B), California clapper rail, and California black rail habitat; and
3. Identification and mapping of tidal zone communities classified as deep water (below MLLW<sup>3</sup>), tidal flat (MLLW to MTL), low marsh (MTL to MHW), mid marsh (MHW to MHHW), high marsh (MHHW and the highest elevations of the marsh), and upland.

### 5.2.7 Swainson's Hawk Pre-Application Survey Requirements

Plan Participants and third party applicants seeking permission for HCP Covered Activities that will result in the permanent loss or conversion of habitat within the Swainson's Hawk Conservation Area (Figure 4-22) shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. No additional pre-project species-specific surveys are required.

### 5.2.8 Burrowing Owl Pre-Application Survey Requirements

Plan Participants and third party applicants seeking permission for Covered Activities that will result in the permanent loss or conversion of habitat within the Burrowing Owl Conservation Area (Figure 4-23) shall conduct surveys consistent with the baseline survey requirements identified in Section 10.4. No additional pre-project species-specific surveys are required.

## 5.3 AVOIDANCE AND MINIMIZATION MEASURES

### 5.3.1 Landscape Level Avoidance and Minimization Measures

The following measure is applicable to all operation, maintenance, and temporary construction activities conducted by Plan Participants (and approved third parties) in all Natural Community and Covered Species Conservation Areas.

**Avoidance and Minimization Measure LAN 1: Operations and Maintenance Manual.** Plan Participants shall adopt and incorporate the Operations and Maintenance Manual (Appendix D) into each applicant's public works and/or operation and maintenance programs for public facilities.

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<sup>3</sup> Tidal Datums: MLLW = mean lower low water; MLW = mean low water; MTL = mean tide line; MHW = mean high water; MHHW mean higher high water.

Operation and maintenance activities conducted by Plan Participants on public facilities shall be conducted in compliance with the procedures provided in the Operations and Maintenance Manual to minimize the potential for take of Covered Species. Compensatory mitigation will not be required if approved activities are conducted in accordance with the Operations and Maintenance Manual. Activities that cannot be completed in compliance with the Manual shall be subject to applicable compensatory mitigation and conservation requirements for affected Covered Species or Natural Communities as detailed in Section 6.0.

**Rationale.** The Operations and Maintenance Manual prescribes best management practices (BMPs) and measures to avoid impacts to Covered Species and habitats resulting from routine operation, maintenance, and temporary construction of facilities such as irrigation channels, roads, outfalls, flood control channels, and other facilities. These measures shall apply to most of the routine activities conducted at Plan Participants' facilities. Where avoidance is not practicable, compensatory conservation measures (Section 6.0) are required.

### **5.3.2 Valley Floor Grassland and Vernal Pool Avoidance and Minimization Measures**

The intent of the HCP guiding principles are to conserve, protect, and maintain viable populations of Covered Species and Natural Communities by establishing larger reserves and preventing the piecemeal fragmentation of habitats and establishment of "postage stamp" preserves in areas that are unlikely to have long-term viability. However, in some instances, avoidance is necessary to conserve the Natural Community (e.g., where vernal pools abut reserve/preserve land or preserved riparian or stream corridors). The following Avoidance and Minimization Measures identify criteria for determining where onsite avoidance is necessary and outline actions needed to conserve Covered Species, Special Management Species (Appendix C), and the Natural Community. These measures are required in addition to any pre-application surveys that may be required as described in Section 5.2.

**5.3.2.1 Natural Community Avoidance and Minimization Measures.** The following Avoidance and Minimization Measures promote the avoidance and minimization of Valley Floor Grassland and Vernal Pool habitat.

**Avoidance and Minimization Measure VPG 1: Habitat Avoidance.** To the maximum extent practicable, development projects shall avoid and minimize the permanent fill of seasonal wetlands, vernal pools, and associated uplands in the following areas: 1) where the wetlands contribute to the habitat quality and value of reserve/preserve lands established (or expected to be established) in perpetuity for conservation purposes; 2) that are contiguous to riparian or stream corridors, or other permanently protected land; 3) that are contiguous to High Value Vernal Pool Conservation Areas; and 4) that are located in High Value Vernal Pool Conservation Areas. Where permanent fill of wetlands in these areas is proposed, applicants shall provide documentation explaining why avoidance is not practicable and/or would not contribute to the conservation goals and objectives of the HCP.

**Rationale.** In general, the Solano HCP Conservation Strategy does not promote individual avoidance of seasonal wetlands and vernal pools, but instead promotes the preservation of large blocks of habitat containing substantial populations of Covered Species. Preservation of large

blocks of habitat is preferred to preservation of smaller blocks because large blocks of habitat typically provide a variety of habitat conditions and have greater ecosystem resilience (see Section 4.2, Reserve Design Principles). However, this Avoidance and Minimization Measure recognizes that in some cases, avoidance will be beneficial. For example, degraded habitats may have high conservation value if they link preserve areas together, include unique habitat features, contain key populations of Covered Species (e.g., Contra Costa goldfields), or have high potential for restoration and enhancement leading to the expansion of Covered Species' populations. Avoidance and Minimization Measure VPG 1 identifies the areas where avoidance should be considered. Compliance with these requirements will be determined by SCWA in consultation with the Regulatory Agencies (see Section 10.2.6).

**Avoidance and Minimization Measure VPG 2: Site Design Standards.** For Valley Floor Grassland and Vernal Pool areas identified in Avoidance and Minimization Measure VPG 1, the following site design standards shall apply:

All Areas Specified Under Avoidance and Minimization Measure VPG 1

1. All avoided areas shall be preserved and managed consistent with the requirements in Section 7.3 and 10.5. These areas shall also include sufficient buffers in compliance with the criteria outlined in Avoidance and Minimization Measures VPG 3 and VPG 4.
2. Development shall be located on the edges of the site or situated to minimize indirect impacts to wetlands and edge effects to preserved areas.
3. The applicant shall incorporate measures into the project design to eliminate significant adverse changes in water quality or the inflow of water that could change the timing and duration of inundation and changes in nutrient input to preserved wetlands from Covered Activities on adjacent uplands.
4. Development shall not isolate existing populations or suitable habitat areas. To maintain connectivity between adjacent reserves, a corridor shall be established linking these areas. The corridor shall have a minimum width of 500 feet.

Contra Costa Goldfield Core Population Areas (High Value Vernal Pool Conservation Areas 1A (in part), 1B, 1C, 1D, 1E, 1F, 1G and 1H)

1. No more than 10 percent of suitable wetland habitat for Contra Costa goldfields<sup>4</sup> shall be directly impacted per project.
2. The project shall not directly impact 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 two years of field surveys/mapping at the site<sup>5</sup> (occupied habitat area shall be

<sup>4</sup> All wetlands within core areas shall be initially considered suitable habitat for Contra Costa goldfields. Applicants may appeal this assumption to SCWA, USFWS, and CDFG pursuant to the Appeals Process described in Section 10.4.2. Appeals will require additional field surveys for species occurrences, habitat characterizations, and hydrological analysis of all wetlands on the site.

<sup>5</sup> Field surveys required to determine the absence of Covered Species must be conducted per applicable protocols (e.g., multiple visits within appropriate seasonal conditions based on reference populations, see Section 5.2) and under appropriate weather and management conditions. Negative survey results may be rejected should weather patterns be unsuitable for adequate species identification and/or the lands are managed in such a way as to minimize species identification or emergence.

based on the total area of the occupied wetland, not just Contra Costa goldfield cover). Implementation of this site design standard should not result in preserves less than 80 acres in size and shall not apply to sites where avoidance can not be achieved without compromising other reserve design standards outlined in Section 10.5.

**Avoidance and Minimization Measure VPG 3: Buffer Criteria.** Development projects shall provide vegetated buffers between preserved wetlands to protect the wetland community and provide habitat for Covered Species and other native species. 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 be of sufficient width to:
  - a. Prevent significant adverse changes in water quality or the inflow of water that could change the timing and duration of inundation in the wetland;
  - b. Avoid changes in nutrient input from adjacent upland sources;
  - c. Provide upland habitat for pollinators, associated amphibian species as well as terrestrial species;
  - d. Accommodate linkages/corridors between individual aggregations of vernal pools within a larger vernal pool complex; and
  - e. Provide a general terrestrial buffer to protect the core wetland and associated upland habitat from edge effects associated with surrounding land uses.
3. Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.2 and 10.5.

Buffer distances of 500 feet or greater shall be presumed to meet the criteria in Condition 2 above. Buffer distances between 250 feet and 500 feet must provide qualitative assessments of the project's compliance with Condition 2a-e. Buffers less than 250 feet must provide quantitative hydrological assessments to document compliance with Conditions 2a and 2b and qualitative assessments for Conditions 2c-e.

**5.3.2.2 Species-Specific Avoidance and Minimization Measures.** The following Avoidance and Minimization Measures promote the avoidance and minimization of impacts to Valley Floor Grassland and Vernal Pool species, including Colusa grass, Solano grass, San Joaquin Valley orcutt grass, and Ferris's milkvetch.

**Avoidance and Minimization Measure VPG 4: Buffer Zones for Extremely Rare and/or Range Limited Species.** If Colusa grass, Solano grass, San Joaquin Valley orcutt grass, or Ferris's milkvetch are present at the project site, populations of these species shall be protected in perpetuity. Applicants shall develop site-specific buffer zones that encompass, at minimum, the immediate watershed for the occupied vernal pools and a 500-foot buffer beyond the watershed boundary. Applicants shall prepare and implement approved management plans and provide sufficient endowments for long-term management of these areas consistent with the reserve management requirements described in Sections 7.2 and 10.5.3.

### 5.3.3 California Red-Legged Frog Avoidance and Minimization Measures

The following avoidance and minimization measures promote habitat avoidance in protected areas that are part of and/or contribute to the quality and viability of the California red-legged frog population within the California Red-legged Frog Conservation Area.

**Avoidance and Minimization Measure RLF 1: Avoidance and Minimization.** To the maximum extent practicable, development projects shall avoid and minimize the permanent fill of aquatic habitat and associated uplands within the California Red-legged Frog Conservation Area in the following areas: 1) where 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) that are contiguous to other aquatic habitats, such as riparian or stream corridors, or other permanently protected land; and 3) that are contiguous to high quality California red-legged frog habitat. Where permanent fill of aquatic habitat in these areas is proposed, applicants shall provide documentation explaining why avoidance is not practicable and/or would not contribute to the conservation goals and objectives of the HCP.

**Rationale.** In general, the Solano HCP Conservation Strategy does not promote individual avoidance of all aquatic habitats for California red-legged frogs, but instead promotes the preservation of large blocks of habitats. Preservation of large blocks of habitat is preferred to preservation of smaller blocks because large blocks of habitat typically provide a variety of habitat conditions and have greater ecosystem resilience (see Section 4.2 Reserve Design Principles). However this Avoidance and Minimization Measure recognizes that in some cases avoidance will be beneficial. For example, degraded habitats may have high conservation value if they link existing preserve areas together. Avoidance and Minimization Measure RLF 1 identifies the areas where avoidance should be considered.

**Avoidance and Minimization Measure RLF 2: Aquatic Habitat Buffers.** For aquatic habitat identified in Avoidance and Minimization Measure RLF 1, the following site design standards shall apply:

1. Applicants shall provide a buffer of associated upland between suitable California red-legged frog aquatic breeding habitat<sup>6</sup> and urban development/active open space recreation areas to protect aquatic breeding habitats to the maximum extent practicable. Buffers shall be no less than 300 feet in width.
2. Corridors shall connect avoided or retained aquatic habitat to any suitable aquatic habitat within 0.7 miles. Corridors shall be at least 1,320 feet in width.
3. If a new or existing road with a predicted nighttime volume of more than 20 cars per hour bisects the corridor, design measures such as culverts, underpasses, and roadside barriers shall be implemented consistent with Conservation Measure RLF 1 to facilitate movement of small animals across the roadway.

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<sup>6</sup> Suitable red-legged frog aquatic breeding habitat is defined as all standing bodies of fresh water (with salinities less than 7.0 ppt), including: natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years (USFWS 2008b).

If aquatic buffers and corridors are not provided consistent with the above Avoidance and Minimization Measures, compensatory mitigation consistent with Conservation Measures RLF 2 and 3 will be required for the impacted areas.

**Avoidance and Minimization Measure RLF 3: Best Management Practices (BMPs).** For projects resulting in impacts to aquatic habitat that is known to or has the potential to support California red-legged frogs, the following BMPs shall apply:

1. At least 15 days prior to the onset of activities, the applicant shall submit the name(s) and credentials of biologists who will conduct activities associated with red-legged frogs. No project activities shall begin until the project proponent has received written approval from SCWA.
2. The approved biologist(s)<sup>7</sup> shall survey the work site two 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 relocated to secure sites approved by SCWA. Only approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.
3. Prior to commencement of construction activities, the approved biologist(s) shall conduct a training session for all construction personnel. At minimum, the training shall include: 1) a description of California red-legged frog habitat; 2) project-specific measures being implemented to conserve the red-legged frog; and 3) identification of the boundaries of permitted work areas.
4. A SCWA-approved biologist shall be present at the work site until all California red-legged frogs have been removed, instruction of workers has been conducted, and habitat disturbance has been completed. After that time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The monitor and the SCWA approved biologist shall have the authority to halt any action that might result in impacts in excess of anticipated levels.
5. During project activities, all trash that may attract predators shall be properly contained, removed from the work site and disposed of regularly.
6. All fueling and maintenance of vehicles and other equipment, and staging areas, shall be located at least 20 meters from the drainage. Prior to the onset of work, SCWA shall ensure that the applicant has prepared a plan to allow for a prompt and effective response to any accidental spills into the drainage. All workers shall be informed of the importance of preventing spills and the appropriate measures to take should a spill occur.
7. Access routes, staging areas, temporary grading, and the extent of all construction-related activity shall be limited to the minimum necessary to complete the project. Routes and boundaries shall be clearly demarcated and located outside of the riparian corridor.
8. When water is present, 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 after consulting with USFWS, CDFG, and NMFS.

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<sup>7</sup> The terms "approved" or "qualified" biologist as employed in the Solano HCP refers to biologists with a minimum of a bachelor's degree in wildlife or vertebrate biology or equivalent field of study and demonstrable experience in working with and knowledge of the subject species. All biologists providing required surveys or assessments shall be approved, in writing by SCWA, in consultation with the Regulatory Agencies, prior to commencing activities.

9. The applicant shall implement BMPs, as identified in the project's Stormwater Pollution Prevention Plan, to control erosion during and after project construction.
10. If pumping will be used to dewater the project site, intakes shall be completely screened with wire mesh no larger than five millimeters in size to prevent red-legged frogs from entering the pump.
11. Prior to dewatering, a qualified 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 water body above or below the project site<sup>8</sup>.
12. An approved biologist shall permanently remove, from within the project site, any exotic wildlife species, such as bullfrogs and crayfish, to the extent possible.
13. After construction activities are finalized, the stream channel shall be restored to preconstruction conditions.

#### **5.3.4 Callippe Silverspot Butterfly Avoidance and Minimization Measures**

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 within the Plan Area. The Avoidance and Minimization Measures apply to portions of the Inner Coast Range Natural Community within the Tri-City/County Planning Area, Nelson Hill in Cordelia, and the Rockville Hills area identified as the Callippe Silverspot Conservation Area (Figure 4-14).

**Avoidance and Minimization Measure CSB 1: Site Design Standards.** The following site design standards shall apply to areas within the Callippe Silverspot Butterfly Conservation Area containing 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 one-quarter acre in size with *Viola pedunculata* density of at least 10 percent. The core breeding area also includes the outer edge of viola stands where the viola density is at least 1 plant per square meter or one percent of the total cover. Core breeding habitat shall be determined based on a minimum of one year of field surveys/mapping at a site.
2. Indirect impacts to core breeding habitat shall be avoided through the establishment of appropriate open space buffers (minimum 300-foot buffer from incompatible uses).
3. Direct loss of core breeding habitat shall be limited to no more than 20 percent of any breeding habitat area.
4. All avoided areas, including buffer areas, shall be preserved and managed consistent with the requirements described in Section 7.3 and 10.5.

**Avoidance and Minimization Measure CSB 2: Construction Windows in Buffer Zones.** Short-term construction or other incompatible land use activities within 300 feet of core viola larval host

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<sup>8</sup> Transportation of exotic wildlife, without appropriate permits, is prohibited under California Fish and Game Code.

plant stands, adult nectar sources and in corridor areas shall be conducted between August and April, when the Callippe silverspot butterfly is not active (flying, feeding, mating, laying eggs).

### **5.3.5 Riparian, Stream and Freshwater Marsh Avoidance and Minimization Measures**

The Riparian, Stream and Freshwater Marsh Natural Community Avoidance and Minimization Measures apply to all freshwater, aquatic, marsh and riparian habitats within the Plan Area, excluding vernal pools and seasonal wetlands associated with the Vernal Pool and Valley Floor Grassland Community (Figure 4-2).

**5.3.5.1 Natural Community Avoidance and Minimization Measures.** The following Avoidance and Minimization Measures promote the avoidance and minimization of riparian, stream and freshwater marsh habitat.

**Avoidance and Minimization Measure RSM 1: Habitat Avoidance.** Permanent fill or destruction of riparian, stream, and associated buffer habitats in Priority Drainages (Figure 4-11); second order streams with riparian vegetation; and third, fourth, and higher order streams in non-priority watersheds shall not be permitted except where necessary for routine activities or where no other practicable alternatives exists<sup>9</sup>. Routine activities include minor road and utility crossings, stormwater outfalls, bank stabilization, flood control, and other incidental public services (e.g., activities meeting U.S. Army Corps of Engineers Nationwide Permit criteria for routine activities). Where no practicable alternative exists, the applicant shall provide documentation explaining why avoidance measures are not practicable and would not contribute to the conservation objectives of the HCP (see information requirements under Section 10.4).

**Avoidance and Minimization Measure RSM 2: Minimize Impacts.** All work within riparian and stream environments shall be minimized. Development activities such as road crossings, utility crossings, high flow flood control bypass channels and other associated flood control activities, bank stabilization, and storm water outfalls shall avoid and limit disturbance to riparian and stream habitat. Removal of riparian vegetation shall be limited to the minimum amount necessary to conduct such activities and shall be specified in the project plan, with appropriate justifications and mitigation (see Section 6.0), prior to conducting any work. Changes to the approved amount shall be specified in writing with justification for the additional removal and submitted at least 30 days prior to vegetation removal.

**Avoidance and Minimization Measure RSM 3: BMPs.** Covered Activities affecting riparian, stream and freshwater marsh habitat shall be designed and implemented using BMPs that minimize new disturbances to prevent erosion, off-site degradation, and increased sedimentation. Bank stabilization projects shall also incorporate bio-engineering techniques and other measures to promote re-establishment of native vegetation. BMPs include, but are not limited to:

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<sup>9</sup> Fills must be demonstrated to be in compliance with EPA's *Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredge or Fill Material* (40 CFR §230)

1. Construction work shall be conducted between April 15 and October 15 or as otherwise described for streams with salmonids or California red-legged frogs. When necessary, the CDFG may grant extensions of this time period on a case-by-case basis.
2. Disturbance to existing grades and vegetation shall be limited to the project site and necessary access routes. Placement of all roads, staging areas, and other facilities shall avoid and limit disturbance to stream bank or stream channel habitat as much as possible. When possible, existing ingress or egress points shall be used and/or work shall be performed from the top of the creek banks. Upon completion, applicants shall return the contours of the creek bed and creek flows to pre-construction condition or better.
3. Every reasonable precaution to protect streams, lakes, reservoirs, bays, and coastal waters from pollution with fuels, oils, bitumens, calcium chloride and other harmful materials shall be implemented.
4. Construction by-products and pollutants such as petroleum products, chemicals, fresh cement, or deleterious materials shall not be allowed to discharge into streams or waters, and will be collected and transported to an authorized disposal area.
5. A plan for the emergency clean up of any spills of fuel or other material shall be prepared and implemented, as needed.
6. Applicants shall treat water containing mud or silt from construction activities by filtration, or retention in a settling pond, to prevent turbid water from entering live streams.
7. Equipment shall be refueled and serviced at designated construction staging areas. All construction material and fill shall be stored and contained in a designated area that is located away from channel areas to prevent transport of materials into adjacent streams. A silt fence shall be installed to collect any discharge, and adequate materials for spill cleanup shall be maintained on site.
8. Construction vehicles and equipment shall be maintained to prevent contamination of soil or water from external contaminants (i.e., grease and oil) or from leaking hydraulic fluid, fuel, oil, and grease.
9. Building material storage areas containing hazardous or potentially toxic materials shall have an impermeable membrane between the ground and the hazardous material and shall be bermed to prevent the discharge of pollutants to ground water and storm water runoff.
10. Applicants shall implement good housekeeping practices, utilize safer alternative products, such as biodegradable hydraulic fluids, where feasible, and conduct employee training programs. Employee training shall emphasize prevention and reduction of pollutant discharge from construction activities to waters and the appropriate measures to take should a spill occur.
11. Work shall only occur in a dry channel.
12. If a work site is to be temporarily de-watered or filled, the de-watering and other required maintenance shall be conducted within the following time frames:
  - a. Between September 1 to November 1 or until the first fall rain producing 0.25 inch of rain in areas of California red-legged frog habitat;
  - b. Between June 15 and October 15 in salmonid streams; and

- c. Habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat in giant garter snake areas.
13. If pumping will be used to temporarily de-water the project site, intakes shall be completely screened with wire mesh no larger than five millimeters in size to prevent California red-legged frogs and other amphibians from entering the pump system. During construction, water shall be released or pumped downstream at an appropriate rate to maintain downstream flows. Upon completion of construction activities, all barriers to flow shall be removed so that flow can resume with minimal disturbance to the substrate.
14. Erosion control and sediment detention devices (e.g., well anchored sandbag cofferdams, certified weed free straw bales, or silt fences) shall be incorporated into the project design and implemented at the time of construction. Areas within the Giant Garter Snake Conservation Area shall not use erosion control blankets, but other devices that are safe for this species (see Section 5.3.6). These devices shall be in place during construction and following construction, if necessary, to minimize fine sediment and sediment/water slurry input to flowing water and to detain sediment-laden water on-site. These devices shall be placed at all locations where sediment input is likely to occur. A supply of erosion control materials, such as monofilament (no plastic mesh or straw waddles), shall be readily available to cover small sites that may become bare and to respond to sediment emergencies. Plastic mesh or straw waddles shall not be used for erosion control.
15. Inspection of instream habitat and performance of sediment control devices shall occur at least once a day during construction to ensure devices are functioning properly.
16. Sediment shall be removed from sediment controls once the sediment has reached 1/3 of the exposed height of the control. Applicants shall dispose of sediment collected in these devices at approved disposal sites away from the collection area. Collection devices shall be inspected at least once a day to ensure they are functioning properly. If a control measure does not function effectively, it shall be immediately repaired or replaced. Additional controls shall be installed as necessary.
17. All disturbed soils shall undergo erosion control treatment, including temporary seeding and sterile straw mulch, prior to October 15 and following completion of construction. Erosion control blankets shall be installed on disturbed soils on a gradient of over 30 percent. Permanent revegetation and tree replanting with native species shall occur in small openings in the erosion control blanket.
18. Any stockpiles of soil used for fill material during construction shall be covered with a tarp or erosion control blanket and silt fences shall be installed to prevent soils from moving into area waterways. If a greater than 50 percent chance of rain is forecast, the project site shall be "rain-proofed" with erosion control measures to ensure that no sediment or turbidity enters the stream.
19. 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 disposal site. Applicants shall prevent petroleum products, chemicals, silt, fine soils, and any substance or material deleterious to Covered Species from entering the stream channel. No side-casting of material into any waterway shall occur.
20. All materials placed in streams, rivers, lakes or reservoirs, such as pilings and bulkheads, shall be non-toxic. Any combination of wood, plastic, cured concrete, steel pilings or other materials used for in-channel structures shall not contain coatings or treatments or consist of substances

deleterious to aquatic organisms that may leach into the surrounding environment in amounts harmful to aquatic organisms.

21. Any rip-rap placed such that it will encounter water shall incorporate large woody cover (logs), other applicable bio-engineering techniques, and/or vegetation planting depending on the character of the surrounding (natural) stream or river banks.
22. Applicants shall implement additional erosion control measures outlined in Avoidance and Minimization Measure RSM 5 to prevent excess erosion and protect remaining riparian vegetation.

**Avoidance and Minimization Measure RSM 4: Setbacks and Buffer Zones.** Vegetated buffers dominated by native vegetation shall be established between development and stream corridors to protect riparian and stream habitats.

1. For in-fill projects, stream setbacks shall correspond to existing setbacks found in adjacent development. When possible, setbacks shall be widened, as appropriate, to expand and restore riparian vegetation to historic levels or at least the width of four mature tree canopies and to incorporate existing native perennial upland vegetation such as native grassland, oak or other woodlands, and stands of elderberry and other native shrubs.
2. For projects within the urban expansion areas along third or higher order streams and lower order streams that support riparian vegetation (Figure 5-1), stream setbacks shall extend at least 100 feet from either: 1) the top of the bank or 2) the outside edge of the existing riparian vegetation, whichever distance is greater. Minor encroachments into these setbacks shall be permitted on a case-by-case basis if offsets, equal to the affected buffer area, are provided in the remainder of the buffer zone. Minor encroachments shall be no greater than 25 feet and shall not encompass more than 25 percent of the setback area.
3. For projects within the urban expansion areas along avoided first and second order streams lacking riparian vegetation (Figure 5-1), stream setbacks shall be at least 25 feet from the top of the bank.
4. For those projects that involve reconstruction/restoration of channelized streams including both widening of riparian corridors and re-establishment of watercourse meander patterns, setbacks shall be at least 50 feet from the top of bank or the edge of the restored riparian corridor, whichever distance is greater. Creating meanders from a straight watercourse will require a wide area, encompassing the meanders and the additional 50-foot buffer from the top of bank (of the edge of the meandering watercourse) or edge of riparian vegetation. This area should provide a sufficient buffer for the watercourse and can support other native upland communities such as grasslands and oak woodlands.
5. The outer edges, not to exceed 25 percent of the buffer width, may also be used for public access and passive recreation such as hiking, wildlife viewing, and bicycling.
6. Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.2 and 10.5.

**Rationale.** These Avoidance and Minimization Measures are compatible with the basic standards and requirements of existing regulatory programs such as the Clean Water Act, Streambed Alteration Agreement, and Porter-Cologne Water Quality Act. Management Plans must be

developed and implemented to maintain and improve the basic functions and values of the retained habitat/community over time.

**Avoidance and Minimization Measure RSM 5: Avoid Excess Erosion.** Applicants shall prevent excess erosion and protect riparian vegetation utilizing the following basic standards:

1. Applicants shall minimize the extent of ground disturbance.
2. Where trees and/or riparian shrubs are present, ground disturbance shall avoid the dripline of the trees/shrubs. If trees/shrubs are to be surrounded by development, an area 1.5 times the dripline shall be preserved.
3. Disturbed areas shall be hydromulched or stabilized using other erosion control measures prior to October 15. When necessary, the CDFG may grant extensions of this deadline on a case-by-case basis.
4. Excess drainage shall be routed away from sensitive areas, including the outside canopy of trees/shrubs.

**5.3.5.2 Species Specific Avoidance and Minimization Measures.** The following Avoidance and Minimization Measures promote the avoidance and minimization of impacts to Riparian, Stream and Freshwater Marsh species.

**Avoidance and Minimization Measure RSM 6: Salmonid BMPs.** Within Solano County, the primary streams that support or have the potential to support salmonids (steelhead and fall-run Chinook salmon) are the main stems and tributaries to American Canyon, Jameson Canyon, Ledge wood, Green Valley, Suisun Valley, and Putah creeks and the Napa River. For projects that will result in impacts to such streams, the following BMPs shall apply:

1. In Zones 1 and 2, in-stream work shall only be allowed at specified times from June 15 to October 15 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 14-28 days).
3. Channel disturbance shall be minimized and no material shall be left in the channel. If bridge footings are to be protected by rip-rap, 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 clean, river rock/gravel of an appropriate size (approximately two to four inches).
5. Where practicable, bridges 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, erosion control methods, including revegetation of bare soil prior to the rainy season shall be implemented to prevent an increase in sediment entering waterways.

7. 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.
8. 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.
9. Materials used for column repairs shall be non-toxic to aquatic life.
10. 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.
11. Water that contacts wet concrete and has a pH greater than 9 shall be pumped out and disposed of outside the creek channel.

**Avoidance and Minimization Measure RSM 7: Valley Elderberry Longhorn Beetle.** Ground disturbing activities within 100 feet of elderberry plants containing stems measuring one inch or greater in diameter at ground level shall conform to the following measures:

1. The applicant shall provide a minimum setback of at least 20 feet from the drip line of each elderberry plant containing stems measuring 1.0 inch or greater in diameter at ground level or to the edge of an established road, intensively farmed field, or facility (whichever is closer). Setbacks shall be fenced and flagged to prevent encroachment of equipment and materials. Fire fuel breaks (disked land) may not be included within the 20-foot setback; however, vegetation within the setback may be cleared by mowing (e.g., mower, mechanical trimmers, hand tools) to less than two inches in height. Where encroachment into the setback results in new soil disturbance (e.g., disking, trenching, grading), the applicant shall provide compensatory mitigation at 50 percent of the standard requirements identified in Conservation Measure RSM 2.
2. Construction contractors shall be briefed on the need to avoid damaging the elderberry plants and the penalties for failing to comply with these requirements.
3. Work crews shall be instructed on the status of the beetle and the need to protect its elderberry host plant.
4. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant shall be used in buffer areas, or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.
5. Mowing of grasses/ground cover shall only occur from July through April to reduce fire hazard. Mowing shall avoid damaging plants (e.g., avoid stripping away bark through careless use of mowing/trimming equipment).
6. Trimming of elderberry stems less than 1.0 inch in diameter shall occur between September 1 and March 14. Trimming is recommended from November through the first two weeks in February when plants are dormant and have lost their leaves.

**Avoidance and Minimization Measure RSM 8: Tricolored Blackbird.** The following measures shall be implemented in and within 250 feet of suitable tricolored blackbird breeding habitat:

1. During the breeding season (February 1 through August 31), a qualified biologist shall conduct pre-construction surveys within known or suitable nesting habitat areas no more than 30 days

prior to scheduled work. Suitable nesting habitat includes dense vegetation near open water, in emergent wetland vegetation, especially cattails and tules, or in thickets of willow, blackberry, wild rose, tall herbs, and willow thickets and in silage and other grain fields such as sorghum. Pre-construction surveys shall be conducted for each phase of development. If ground-disturbing activities are delayed or suspended for more than 30 days following completion of the pre-construction survey, a qualified biologist shall re-survey the site and shall conduct a second follow up survey at least five days prior to the start of construction activities.

2. A minimum 250-foot 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 a qualified biologist indicates that construction activities would not adversely affect nesting birds. SCWA, in consultation with the Resource Agencies, 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 three consecutive days following construction initiation);
  - c. Monitoring is continued at least once a week through the nesting cycle; and
  - d. Monitoring reports are submitted to SCWA.
3. If adverse effects are identified, construction activities shall cease immediately and construction shall not resume until CDFG is consulted to determine if construction may continue under modified restrictions or shall be suspended until nesting activity is complete.

### **5.3.6 Giant Garter Snake Avoidance and Minimization Measures**

The giant garter snake is limited to eastern Solano County within the area identified as the potential current range of the species (Figure 4-19). The Avoidance and Minimization Measures for giant garter snake apply within the Giant Garter Snake Conservation Area (Figure 4-19).

**Avoidance and Minimization Measure GGS 1: BMPs.** Covered Activities affecting aquatic and associated upland habitat (i.e., 200 feet from the edge of the aquatic habitat) within the Giant Garter Snake Conservation Area (Figure 4-19) shall implement BMPs to avoid and minimize potential impacts to giant garter snake. These BMPs include:

1. Ground disturbing activities (grading, excavation, dredging, etc.) in streambeds, channels, or adjacent banks shall be subject to the following constraints:
  - a. From May 1 to October 1, all standard activity and species-specific mandatory conditions described in the Operations and Maintenance Manual (Appendix D) shall apply. During this period giant garter snakes are active and the risk of direct mortality is reduced because snakes are more likely to move and avoid danger.
  - b. From October 2 to April 30, only in-channel work involving removal of accumulated sediments and aquatic vegetation shall occur provided certain conditions are met. These conditions include: 1) all excavation/dredging is confined to the channel bed (below the ordinary high water mark), 2) channel banks are not disturbed, and 3) any dredged or

excavated material is hauled off-site or placed in areas lacking rodent burrows, rip-rap, or other material that might provide dormant period cover for giant garter snakes.

2. Applicants shall only clear the area necessary for construction activities. Areas of giant garter snake habitat to be avoided within or adjacent to the project site shall be flagged and designated as “Environmentally Sensitive Areas.” All construction personnel shall avoid these areas.
3. Movement of heavy equipment shall be confined to existing roadways and excavation equipment shall be operated from the top of banks to the extent possible to minimize habitat disturbance.
4. When working near flooded fields and canals during the summer months, vehicle speeds shall not exceed 15 MPH in areas where the line of site is obstructed and 25 MPH in other areas to avoid hitting giant garter snakes (and other wildlife).
5. When mowing fields near streams or canals, workers shall start mowing furthest from the water in order to force snakes toward the water; cutting the swath along the water last will allow the snakes to maintain cover and escape.
6. To maintain cover for garter snakes next to a canal, applicants shall mow opposite banks on alternate years.
7. Construction personnel shall receive USFWS-approved worker environmental awareness training to recognize giant garter snake and its habitat(s).
8. Twenty-four hours prior to construction activities, the project area shall be surveyed for giant garter snakes. Surveys shall be repeated if a lapse in construction activity of two weeks or greater occurs. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Any sightings or incidental take shall be reported to SCWA.
9. Any dewatered habitat shall remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling dewatered habitat.
10. Upon completion, all temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions. Restoration work shall include replanting species removed from banks or with emergent vegetation in the active channel.

### **5.3.7 Coastal Marsh Avoidance and Minimization Measures**

The Coastal Marsh Natural Community Avoidance and Minimization Measures apply to all marsh habitats within the historic influence of tidal action, including areas that are currently influenced by tidal action or are diked and no longer affected by tides. These marshes exhibit a broad range of characteristics and include the current and historic estuarine-influenced marshes of San Pablo Bay/Lower Napa River, Southampton Marsh in the Carquinez Straits, Suisun Marsh, and tidally influenced freshwater marshes in the upper regions of the sloughs and creeks in the Delta Region of Solano County (Figure 4-2).

**5.3.7.1 Natural Community Avoidance and Minimization Measures.** The following Avoidance and Minimization Measures promote the avoidance and minimization of coastal marsh habitat.

**Avoidance and Minimization Measure CM 1: Habitat Avoidance.** Permanent fill or conversion of coastal marsh habitat shall be avoided to the maximum extent practicable. Where permanent fill is proposed, the applicant shall provide documentation explaining why avoidance measures are not practicable and/or would not contribute to the conservation objectives of the HCP (see Section 10.4). Activities exempt from this Avoidance and Minimization Measure include road and utility crossings, high flow flood control and bypass channels, bank stabilization, and storm water outfalls.

**Avoidance and Minimization Measure CM 2: Temporary Impacts to Coastal Marsh Habitat.** Temporary or short-term impacts (i.e., impacts that result in the removal of vegetation lasting less than one growing season) associated with vegetation removal resulting from ordinary channel operation and maintenance activities conducted by Plan Participants (see Appendix C for typical requirements) or construction and installation of permanent features (e.g., outfalls, bridges, utility lines), except in designated giant garter snake habitat areas (see Section 4.3.7), shall not require direct compensation for the temporary loss of marsh vegetation if BMPs are implemented. BMPs shall minimize new disturbances to prevent erosion, off-site degradation, increased sedimentation, and reduce overall impacts. BMPs include, but are not limited to:

1. Appropriate erosion control measures shall be implemented for all disturbed areas above the ordinary high water mark consistent with Avoidance and Minimization Measure RSM 5. All native, woody riparian vegetation greater than one inch in diameter shall be replaced by planting sufficient native riparian vegetation to achieve a 3:1 replacement ratio after five years. No compensation is required for removal of non-native trees and shrubs.
2. Soil excavated within the root zone of emergent wetland vegetation shall be salvaged and stockpiled to the maximum extent practicable for restoration of disturbed wetland sites.
3. In-water work shall be restricted to protect impacted species as specified in Avoidance and Minimization Measures CM 5, CM7, CM 8, and GGS 1.
4. Workers shall be trained to foster awareness of biological concerns and methods to reduce potential impacts. Prior to commencement of construction activities, a permitted/approved biological monitor shall conduct a training session for all construction personnel. At minimum, the training shall include: 1) a description of marsh habitat and associated species of concern; 2) project-specific measures to conserve species of concern; 3) the importance of preventing hazardous materials spills (e.g., fuel, hydraulic fluid, and/or other petroleum-based products) and the appropriate measures to implement should a spill occur; and 4) the boundaries of the project site.
5. Contractors shall construct and maintain barrier fencing consisting of, at minimum, 18-inch tall silt fencing and 4-foot tall orange (or other applicable color) fabric along the edge of the construction area and any staging areas. The fencing shall delineate the extent of construction, preclude construction personnel and equipment from entering non-work areas, and prevent debris from entering avoided habitats. The construction boundary fencing may also inhibit movement of species such as the salt marsh harvest mouse and Suisun shrew into the construction area.
6. A qualified biologist, approved by SCWA and/or USFWS, CDFG and NMFS, as appropriate, shall be present at the work site until the construction barrier fencing is installed, instruction of workers has been conducted, and direct habitat disturbance has been completed. After that time, the contractor or permittee shall designate a person to monitor on-site compliance with all

minimization measures. The monitor and qualified biologist shall have the authority to halt any action that might result in impacts that exceed anticipated levels.

7. If temporary structures, work and discharges, including cofferdams, are necessary for construction activities or if dewatering of construction sites is necessary, the following measures shall be implemented:
  - a. Maintain near normal downstream flows and minimize flooding.
  - b. Fill shall consist of materials, and placed in a manner, that will not be eroded by expected high flows.
  - c. Dredged material shall only be used if SCWA determines that it will not cause more than minimal adverse effects to aquatic resources.
  - d. All temporary fill shall be removed to upland areas and dredged material shall be returned to its original location following completion of construction activities, and affected areas shall be restored to the pre-project conditions.
  - e. Cofferdams shall not be used to dewater wetlands or other aquatic areas so as to change their use.
8. During project activities, all trash and construction debris shall be properly contained, removed from the work site and disposed of regularly. Food trash and waste that may attract predators shall be removed daily.
9. All staging areas, including vehicle and equipment fueling and maintenance areas, shall be clearly identified and confined to specific locations. Staging areas shall be clearly delineated and fenced to prevent disturbance to surrounding wetland habitats.
10. A Hazardous Spill Plan shall be developed prior to construction, and shall identify those actions to be taken in the event of a spill. The plan shall also incorporate preventive measures, such as placement of refueling facilities, storage, and handling of hazardous materials. This plan shall be kept on-site to help prevent and respond to accidental spills.
11. Contaminants/hazardous material shall be stored within bermed containment areas lined with an impermeable membrane and designed to hold 125 percent of the total capacity of stored materials. Containment areas shall be located within the staging area and as far from live water as possible. Contaminant absorbent materials shall be stored within each containment area. Water collected within containment areas shall be disposed of according to federal, State, and local regulations.
12. Equipment shall be refueled only on existing roads, pullouts, or staging areas. Prior to refueling, the contractor shall verify that potential spills can be easily contained before the spill reaches live water. Fuel absorbent mats shall be used when refueling equipment.
13. All equipment shall be maintained free of petroleum leaks. No equipment shall enter live water.
14. Absorbent materials shall be maintained at each worksite in sufficient quantity to effectively immobilize the volume of petroleum-based fluids contained in the largest tank present at the site. Acceptable absorbent materials are those manufactured specifically for the containment and clean-up of hazardous materials. Sands or soils are not approved absorbent materials.
15. In the event of a contaminant spill, work at the site shall cease immediately while absorbent materials are deployed to contain, control, and mitigate the spill. The contractor shall notify

SCWA and the applicable agencies about spills greater than five gallons and shall comply with the Oil Pollution Act.

16. Site work shall not resume until the spill kit is re-supplied with a sufficient quantity of material to effectively immobilize the volume of petroleum-based fluids contained in the largest tank present on the site.
17. Containers for storage, transportation, and disposal of contaminated absorbent materials shall be provided on the project site. Petroleum products and contaminated soils shall be disposed of according to federal, State, and local regulations.

**Avoidance and Minimization Measure CM 3: Buffers.** Coastal marsh habitat shall be protected from direct and indirect impacts associated with urban development 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 at least 500 feet wide or extend to the boundary of existing (as of March 1999) roads or development (includes vacant, but graded and filled building pads). Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.2 and 10.5.

**5.3.7.2 Species Specific Avoidance and Minimization Measures.** The following measures are designed to avoid and minimize impacts to Suisun thistle, soft bird's-beak, and Suisun Marsh aster:

**Avoidance and Minimization Measure CM 4: Soft Bird's-beak and Suisun Thistle.** In areas where soft bird's-beak or Suisun thistle are known to occur or suitable habitat exists, the following avoidance and minimization measures shall be implemented:

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).
2. During construction 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, non-invasive species that will not compete with the listed plants shall be used.
3. To avoid and minimize direct and indirect impacts associated with urban development, populations of soft bird's beak, Suisun thistle, and/or suitable mid to high marsh habitat shall be protected through establishment of site specific buffers that are designed to preclude changes to water and soil salinity and flooding/inundation regime. The buffers shall be at least 500 feet wide or extend to the current boundary of existing (as of March 1999) roads or development (includes vacant, but graded lots and filled building pads). Buffers shall be preserved in perpetuity and managed consistent with the reserve criteria described in Sections 7.2 and 10.5.

**Avoidance and Minimization Measure CM 5: Salt Marsh Harvest Mouse.** All core salt marsh harvest mouse habitat (pickleweed-dominated saline emergent wetlands; see Appendix B) shall be avoided and protected through establishment of site-specific buffers designed to preclude changes to

water and soil salinity and flooding/inundation regime. The buffers shall be at least 500 feet wide or extend to the current boundary of existing (as of March 1999) roads or development (includes vacant, but graded lots and filled building pads). Applicants shall prepare and implement approved management plans and provide sufficient endowments for long-term management of these buffer areas consistent with the reserve management requirements described in Sections 7.2 and 10.5.

**Avoidance and Minimization Measure CM 6: Upland/Transition Habitat.** Uplands or transition habitat adjacent to core pickleweed-dominated habitat that may be impacted shall be mowed or cleared of weedy cover. During the dry season, vegetative cover shall be maintained at a height no greater than two inches for a period of at least 2 weeks prior to construction.

**Avoidance and Minimization Measure CM 7: Delta Smelt, Longfin Smelt, and Sacramento Splittail.** For projects that may result in temporary impacts to Delta smelt, longfin smelt 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.
2. Dredged material shall not be placed on aquatic vegetation.
3. Conduct dredging/excavation during low flow periods and/or use silt trapping devices to minimize downstream sedimentation.
4. Minimize use of rock rip-rap in low flow channels to the maximum extent practicable.

**Avoidance and Minimization Measure CM 8: California Clapper Rail, California Black Rail, Suisun Song Sparrow.** In areas with suitable habitat for California clapper rail, California black rail, and Suisun song sparrow, work shall be conducted during the period from September 1 to January 31. Covered Activities conducted outside of this time period shall implement the following additional avoidance and minimization measures:

1. A qualified biologist shall conduct pre-construction, protocol surveys to identify and subsequently avoid nesting areas for these Covered Species. Surveys for California clapper rail, California black rail, Suisun song sparrow and other bird species shall be conducted using standard protocols established by SCWA. Surveys shall be designed and of sufficient intensity to document rail and raptor nesting within 500 feet of planned work activities and within 100 feet for passerine nesting activity.
2. If Suisun song sparrow or other passerines are found to be nesting within the planned work area, a minimum 50-foot wide buffer shall be maintained between construction activities and the nest location. For rails and raptors, a 500-foot buffer shall be maintained. Buffer zones may be reduced if it can be demonstrated to the satisfaction of SCWA, in consultation with the Resource Agencies, that the birds would be un-affected by project-related activities. Buffers shall be maintained until the young have fledged and are capable of flight or September 15. No buffers are required between September 1 and January 31.

### **5.3.8 Swainson's Hawk Avoidance and Minimization Measures**

The following measures promote habitat avoidance in protected areas that are part of, and contribute to, the quality and viability of Swainson's hawks within the Plan Area. These measures are consistent

with provisions of the Migratory Bird Treaty Act and California Fish and Game Code that prohibit the destruction of active raptor nests.

**Avoidance and Minimization Measure SH 1: Pre Construction Nest Surveys.** A qualified biologist shall conduct pre-construction surveys to identify and subsequently avoid nesting areas for Swainson's hawks. Between March 15 and August 31, surveys shall be conducted no later than 30 days prior to the anticipated start of construction. Surveys shall be designed and of sufficient intensity to document nesting within 0.25 mile of planned work activities.

**Avoidance and Minimization Measure SH 2: New Construction Nest Buffers.** Applicants shall not initiate new construction (e.g., land grading, seismic testing, equipment traffic, vegetation clearing) associated with urban development and other Covered Activities within 0.25 mile of an active Swainson's hawk nest. An active nest is defined as a site (i.e., tree) at which nest building/refurbishment, egg-laying, incubation, or feeding of young is occurring. (Note: this definition differs from that of active nesting territories for establishing mitigation requirements for impacts to known nest sites). Nesting shall be considered complete once the young have fledged and are capable of flight or the adults have abandoned the nest for a minimum of seven days. The typical nesting period for Swainson's hawks is between March 15 and August 31 and is typically when this restriction will apply. Nest trees may be removed between September 1 and February 1, when nests are unoccupied.

Nest site buffers shall be reduced only under the following conditions:

1. A site-specific analysis prepared by a qualified biologist indicates that the nesting pair under consideration would not be adversely affected by construction activities. SCWA, in consultation with the Resource Agencies, must approve this analysis before construction may begin within 0.25 mile of a nest.
2. Monitoring is conducted for a sufficient time (minimum of three consecutive days following the initiation of construction) and the nesting pair does not exhibit significant adverse reaction to construction activities (i.e., changes in behavioral patterns, reactions to construction noise, etc.).
3. Monitoring is continued at least once a week through the nesting cycle at that nest.
4. Monitoring reports are submitted to SCWA.

If adverse effects are identified, construction activities shall cease immediately and construction shall not be resumed until SCWA and CDFG are consulted to determine if construction may continue under modified restrictions or shall be suspended until nesting activity is complete.

**Avoidance and Minimization Measure SH 3: Occupied Nest Avoidance.** If Swainson's hawk occupy a nest during ongoing construction activities, construction activities shall not occur within 500 feet of the nest, except where monitoring consistent with the criteria in Avoidance and Minimization Measure SH 1 documents that adverse effects will not occur.

**Avoidance and Minimization Measure SH 4: Active Nest Tree Avoidance.** Known active and historic (i.e., occupied within last ten years) Swainson's hawk nest trees within the Plan Area shall be avoided to the maximum extent practicable. Applicants proposing to remove trees shall provide written justification for tree removal to the appropriate Plan Participant. Sufficient rationales for tree

removal include, but are not limited to, declining or poor suitability for nesting and public safety. Where an applicant wishes to remove an otherwise healthy tree to accommodate the project design, the justification letter shall clearly state why avoidance of the tree is not feasible.

**Rationale.** The Swainson's hawk technical advisory committee has recommended a 0.25-mile buffer standard to avoid impacts to active nests. However, as discussed in the Swainson's hawk conceptual model (Appendix B), Swainson's hawks can be relatively tolerant of or habituate readily to ongoing human activities, particularly later in the nesting cycle. A number of currently active nests in Solano County are located in or adjacent to urban uses such as high volume roads, trees at residential and commercial sites, and golf courses. The buffer reduction criteria, described above are designed to accommodate development activities in cases where it can be demonstrated that hawk nesting activity will not be impacted. Avoidance and Minimization Measures SH2 and SH3 address the species' strong site fidelity (e.g., individuals typically returning to nest in the same general area year after year). Retention of existing nest trees may allow individual pairs of hawks to continue to nest in traditional areas even though suitable foraging habitat is limited near the immediate nest site.

### 5.3.9 Burrowing Owl Avoidance and Minimization Measures

The following Avoidance and Minimization Measures promote habitat avoidance in protected areas that are part of and contribute to the quality and viability of burrowing owls within the Plan Area. These measures are consistent with provisions of the Migratory Bird Treaty Act and California Fish and Game Code that prohibit the destruction of active raptor nests.

**Avoidance and Minimization Measure BO 1: Preconstruction Surveys.** To avoid "take" of an active nest burrow or individual owl due to construction activities, a qualified burrowing owl biologist<sup>10</sup> shall conduct pre-construction surveys no more than 30 days prior to scheduled work within known or suitable habitat areas. Surveys shall include at least one burrow survey (to assess a site's potential to support owls). If suitable burrows are present, an additional observation survey shall be conducted from one hour before to two hours after sunrise and/or two hours before to one hour after sunset. Surveys shall be conducted without regard to season, as the region provides both potential breeding and wintering habitat for burrowing owls. Pre-construction surveys shall be conducted for each phase of development. If ground-disturbing activities are delayed or suspended for more than 30 days following the pre-construction survey, a qualified biologist shall re-survey the site, and shall conduct a second follow up survey at minimum five days before start of construction. SCWA shall provide a list of biologists qualified to conduct burrowing owl pre-construction surveys in compliance with this conservation measure.

**Avoidance and Minimization Measure BO 2: Exclusion.** If burrowing owls are identified onsite during the initial pre-construction surveys (or during early biological site assessments), applicants are encouraged to 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. The increased vegetation height, if in place by the

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<sup>10</sup> For the purposes of this HCP, a qualified burrowing owl biologist has a bachelor's degree in wildlife or vertebrate biology or equivalent field of study and has conducted at least three burrowing owl habitat assessments and/or burrowing owl surveys in California in the past five years.

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.

**Avoidance and Minimization Measure BO 3: Construction Buffers and Passive Relocation.** If Avoidance and Minimization Measure BO 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–January 31), a circular exclusion zone with a radius of 160 feet (50 meters) shall be established around occupied burrows. If a buffer cannot be established (except as provided below), burrowing owls shall be evicted from the entire construction area using passive relocation techniques. One-way doors shall be installed in all suitable burrows, left in place for a minimum of 48 hours, and monitored daily to evaluate owl exclusion and to ensure doors are functioning properly. Burrows shall then be excavated, using hand tools whenever possible, and re-filled to prevent reoccupation. Sections of flexible plastic pipe shall be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.
2. During the breeding season (February 1–August 31), a qualified burrowing owl biologist shall establish a circular exclusion zone with a radius of 250 feet (75 meters) around each occupied burrow. No construction-related activity (e.g., site grading, staking, surveying) shall occur within the exclusion zone until the burrows are confirmed to be unoccupied and/or juveniles are foraging and capable of independent survival. Only biologists familiar with burrowing owl behavior shall be permitted to determine whether juveniles are capable of independent survival. Once the burrows are unoccupied or the young are capable of independent survival, passive relocation techniques (as described above) shall be implemented to evict the owls from the burrows before construction can occur within the exclusion zone. Burrows shall be excavated, using hand tools whenever possible, and re-filled to prevent reoccupation before construction can occur within the exclusion zone. Sections of flexible plastic pipe shall be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

Construction buffers may be reduced under the following conditions:

1. A site-specific analysis prepared by a qualified burrowing owl biologist indicates that the nesting pair(s) or wintering owl(s) would not be adversely affected by construction activities. SCWA, in consultation with the Resource Agencies, must approved this analysis in writing before construction can proceed;
2. Monitoring is conducted for a sufficient time (minimum of three consecutive days following the initiation of construction) and the nesting pair does not exhibit significant adverse reaction 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;
3. Monitoring is continued at least once a week through the nesting/wintering cycle at that site; and
4. Monitoring reports are submitted to SCWA.

If adverse effects are identified, construction activities shall cease immediately and construction shall not resume until CDFG is consulted to determine if construction may continue under modified restrictions or shall be suspended until nesting activity is complete.

**Note:** The above avoidance measures are intended to be consistent with provisions of the Migratory Bird Treaty Act and California Fish and Game Code that prohibit the destruction of active raptor nests and are adapted from the CDFG Staff Report on Burrowing Owl Mitigation (CDFG 1995). The Monitoring and Adaptive Management Program (Section 7.0) identifies development of alternative measures involving active relocation of owls as a targeted study topic. If new, more effective techniques are developed and current regulations are revised to allow active relocations, the Solano HCP Conservation Program will also incorporate these new measures.

### **5.3.10 Special Management Species Avoidance and Minimization Measures**

The following avoidance and minimization measures are required for the ten resident/nesting birds, one reptile, and one amphibian Special Management Species:

**Preconstruction Surveys.** In Valley Floor Grasslands and Vernal Pool, Coastal Marsh, and Riparian, Stream and Freshwater Marsh Natural Communities, pre-construction surveys shall be conducted between February 1 through August 31 to identify and subsequently avoid nesting areas for applicable Special Management Bird Species. Special Management Bird Species include northern harrier, short-eared owl, San Francisco Common yellowthroat, yellow-breasted chat, loggerhead shrike, grasshopper sparrow, Modesto song sparrow, Suisun song sparrow, Samuels song sparrow, and yellow-headed blackbird(Appendix C). A permitted/approved biologist shall conduct these surveys no more than 30 days prior to the anticipated start of construction. Surveys shall be designed and of sufficient intensity to document passerine nesting activity within 100 feet of planned work activities and 500 feet for raptors and may be conducted concurrent with surveys for Covered Species.

**Buffers.** If nesting passerines are present, a minimum 50-foot wide buffer shall be established between construction activities and the nest location. A minimum 250-foot wide buffer shall be established for Special Management Raptor Species. Buffers shall be maintained until the young in the nest have fledged and are capable of independent flight. Buffers may be reduced subject to the criteria outlined Avoidance and Minimization Measure RSM 8.

**“Perennialization” of Ponds and Intermittent Creeks.** In order to minimize impacts to foothill yellow-legged frog and pond turtle, activities associated with urban and agricultural development that could result in the expansion of predator (bullfrog, crayfish, and warm water fish) populations (range and numbers) into undeveloped areas in the Inner Coast Range Natural Community in western Solano County shall be prohibited. Applicants shall avoid development activities that could result in the establishment of perennial ponds and small lakes and shall control urban runoff to prevent “perennialization” of intermittent creeks.

**Minimize Impact Through BMPs.** For projects resulting in impacts to aquatic habitat known to or has the potential to support foothill yellow-legged frog and pond turtle, the following BMPs shall be implemented:

1. At least 15 days prior to the onset of activities, the applicant shall submit the name(s) and credentials of biologists who would conduct activities associated with yellow-legged frog and pond turtle. No project activities shall begin until the applicant has received written approval from SCWA.

2. The approved biologist(s) shall survey the work sites two weeks prior to the onset of construction activities. If any life stage of yellow-legged frog or pond turtle are found in construction areas, they shall be relocated to secure sites approved by SCWA. Only approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.
3. Before any construction activities begin on the project, the approved biologist(s) shall conduct a training session for all construction personnel. At minimum, the training shall include: 1) description of yellow-legged frog and pond turtle habitat; 2) project-specific measures to conserve the yellow-legged frog and pond turtle; and 3) project site boundaries .
4. A SCWA-approved biologist shall be present at the work site until all yellow-legged frog and pond turtle have been removed, instruction of workers has been conducted, and 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 SCWA-approved biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated.
5. During project activities, all trash that may attract predators shall be properly contained, removed from the work site and disposed of regularly.
6. All fueling and maintenance of vehicles and other equipment, and staging areas, shall be located at least 20 meters from the drainage. Prior to the onset of work, SCWA shall ensure that the applicant has prepared a plan to allow for a prompt and effective response to any accidental spills into the drainage. All workers shall be informed of the importance of preventing spills and the appropriate measures to take should a spill occur.
7. Access routes, staging areas, and the extent of activity shall be limited to the minimum necessary to complete the project. Routes and boundaries shall be clearly demarcated, and located outside the riparian corridor.
8. When water is present, 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 after consulting with USFWS, CDFG, and NMFS.
9. The applicant shall implement BMPs, as identified by the project's Stormwater Pollution Prevention Plan, to control erosion during and after construction.
10. If pumping will be used to temporarily de-water the site, intakes shall be completely screened with wire mesh no larger than five millimeters in size to prevent red-legged frogs from entering the pump.
11. Prior to dewatering, a qualified 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 above or below the project site.
12. An approved biologist shall permanently remove, from within the project site, any exotic wildlife species, such as bullfrogs and crayfish, to the extent possible.
13. After construction activities are finalized, the stream channel shall be restored to preconstruction conditions.

Figure 5-1: Stream Order Designation