# Interstate 80/Interstate 680/State Route 12 Interchange Project

## Biological Assessment

Near the cities of Fairfield and Suisun City
Solano County, California
District 4-SOL-80 (PM 10.8/17.0); SOL-680 (PM 10.0/13.1); SOL-SR 12 (PM1.7/L2.8); and SOL-SR 12 (PM L1.8/4.8)
EA 0A5300

**April 2011**

Caltrans

# Interstate 80/Interstate 680/State Route 12 Interchange Project

## Biological Assessment

Solano County, California

## April 2011

State of California
Department of Transportation

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# Summary of Findings, Conclusions, and Determinations

The following discussion summarizes the goal of the federal Endangered Species Act (FESA), the Section 7(a)(2) duties of the action agency, the purpose of the formal consultation, and the informational requirements to initiate a formal consultation. This discussion also summarizes the findings, conclusions, and determinations of this biological assessment (BA).

## S.1 Goal of Endangered Species Act

In 16 United States Code (U.S.C.) Section (§) 1531, FESA sets forth the goal of conserving threatened and endangered species (listed species) and the ecosystems on which they depend. Section 7(a)(2) of FESA, entitled "Interagency Cooperation," establishes the process whereby federal action agencies, their applicants (e.g., state transportation agencies), and the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) (hereafter, jointly referred to as the Services) work together to ensure that proposed actions are not likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Implementing procedures are set forth at 50 Code of Federal Regulations (CFR) Part 402.

## S.1 Section 7(a)(2) Duties of Action Agency

When the federal government takes action subject to FESA, it must comply with Section 7(a)(2). Section 7(a)(2) states:

> Each federal agency shall, in consultation with and with the Assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action by the Committee pursuant to subsection (h) of this section. In fulfilling the requirements of this paragraph each agency shall use the best scientific and commercial data available.

Courts have found two duties for a federal action agency embodied in this section. The first is an independent substantive duty for each federal action agency to ensure its action will not jeopardize the continued existence of an endangered species, or result in the destruction or adverse modification of critical habitat. To this end, a federal action agency must use the best scientific and commercial data available in assessing the effects of the proposed action. The second duty is procedural and is to consult with the Services and to use their assistance regarding the first duty not to jeopardize a listed species.

These are independent duties, and both must be fulfilled to comply with Section 7(a)(2) (*Pyramid Lake Paiute Tribe of Indians v. U.S. Department of the Navy*, 898 F.2d 1410, 1415 [9th Cir. 1990]; *Stop H3 Ass'n v. Dole*, 740 F.2d 1442, 1459 [9th Cir. 1984], *cert. denied*, 471 U.S. 1108 [1985]). As is noted in the preamble of the FESA rules, the purpose of Section 7(a)(2) is "to insure that any [agency] action is not likely to jeopardize the continued existence of any endangered species" (51 Federal Register [FR] 19926 [June 3, 1986]). In short, the consultation is not an end in itself, but a process for the federal action agency to ensure it does not jeopardize the listed species (*Roosevelt Campobello International Park Comm. v. U.S. EPA*, 684 F.2d 1041, 1049 [1st Cir. 1982]).

It should always be remembered that "[a]ll other federal agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purpose of this chapter by carrying out programs for the conservation of endangered and threatened species … ." (16 U.S.C. § 1536[a][1]). However, regarding this (§ 1536[a][1]) duty to support the goals of the FESA, a federal action agency has very broad discretion in fulfilling that duty (*Pyramid Lake Paiute Tribe of Indians v. U.S. Dept. of Navy*, 898 F.2d 1417 [9th Cir. 1990]; 50 CFR § 402.146).

It is the substantive duty of the federal action agency not to jeopardize the listed species, and Section 7(a)(2) does not give the Services veto over the action. As one court noted: "[O]nce an agency has had meaningful consultation with the Secretary of Interior concerning actions which affect an endangered species the final decision of whether or not to proceed with the action lies with the agency itself" (*National Wildlife Federation v. Coleman*, 529 F.2d 359, 371 [5th Cir. 1976]). "An agency's duty to consult … does not divest it of discretion to make a final decision"

once it concludes that it has done all it can to not jeopardize a listed species (*Roosevelt Campobello International Park Comm. v. U.S. EPA*, 684 F.2d 1041, 1049 [1st Cir. 1982]).

Although the regulations at 50 CFR 402.12(c) identify the information necessary to initiate formal consultation, the regulation explicitly states that "the contents (of the biological assessment) are at the discretion of the federal (action) agency" (50 CFR § 402.12[f]). This federal agency discretion has been confirmed by numerous court decisions (see *City of Sausalito v. O'Neill*, 211 F. Supp. 2d 1175 [N.D. Cal. 2002]; *Defenders of Wildlife v. Babbitt*, 130 F. Supp. 2d 121, 126, n.4. [D.D.C 2001]; *Water Keeper Alliance v. U.S. Dept. of Defense*, 271 F.3d 21, 33 [1st Cir. 2091]; *Strahan v. Linno*, 967 F. Supp. 581, 594 [D. Mass. 1997]; and *Bay's Legal Fund v. Browner*, 828 F. Supp. 102, 110 n.19 [D. Mass 1993]).

As one court said: "[A] complete failure to conduct a biological assessment when required is subject to judicial review, but the contents of the assessment are not." There is no mandate about what goes into a BA or its structure. The action agency may use a draft environmental impact statement to document its BA (*City of Sausalito v. O'Neill*, 211 F.Supp.2d 1204).

This absence of a mandate about the contents of a BA is further supported by the section-by-section analysis found in the Federal Register that states:

> "The Service agrees that assessments should be as complete and thorough as possible, but declines to impose strict minimum standards that all Biological Assessments must satisfy. …Therefore, a new paragraph (f) [50 CFR § 402.12(f)] only contains suggestions of what a federal agency may include in a Biological Assessment…Basically, the assessment serves as an analytical instrument and can be used by the federal agency 'to build its case' as to whether a particular action is likely to adversely affect a listed species or its critical habitat" (51 Fed. Reg. 19947 [June 3, 1986]).

In spite of the authority of the action agency, the FESA clearly envisions a cooperative process between the Services and the action agencies. This BA has been prepared in the spirit of such cooperation, and is intended to satisfy all information requirements identified at 50 CFR § 402.14(c) that are necessary to initiate formal consultation with the Services.

## S.2 Purpose of Formal Consultation

Formal consultations determine whether a proposed agency action or actions are likely to jeopardize the continued existence of a listed species (jeopardy), or destroy or adversely modify critical habitat (adverse modification). They also determine the amount or extent of anticipated incidental take in an incidental take statement. Formal consultations perform several other functions: they (1) identify the nature and extent of the effects of federal (agency) actions on listed species and critical habitat; (2) identify reasonable and prudent alternatives, if any, when an action is likely to result in jeopardy or adverse modification; (3) provide an exception for specified levels of "incidental take" otherwise prohibited under Section 9 of the FESA; (4) provide mandatory reasonable and prudent measures to minimize the impacts of incidental take on listed species; (5) identify voluntary ways the action agencies can help conserve listed species or critical habitat when they undertake an action; and (6) provide an administrative record of effects on a species that can help establish the species' environmental baseline in future biological opinions.

As noted in the *Endangered Species Consultation Handbook* (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998), Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take. Accordingly, this BA focuses on identifying effects on listed species, and where appropriate, reasonable and prudent measures to minimize take of listed species.

In consulting with the Services, additional reasonable and prudent measures to minimize take of listed species may be required, consistent with the minor change rule. Reasonable and prudent measures can only include actions that occur within the action area, involve only minor changes to the project, and reduce the level of take associated with project activities. These measures should minimize incidental take to the extent reasonable and prudent. Measures are considered reasonable and prudent when they are consistent with the proposed action's basic design, location, scope, duration, and timing. The test for reasonableness is whether the proposed measure would cause more than a minor change to the project.

Compensatory mitigation for effects on wetlands and/or natural habitats may be included as part of the project description, but are expressly provided pursuant to the authorities of the Federal

Highway Administration or other state and federal resource and regulatory agencies, not the FESA administered by the Services. Compensatory mitigation is defined as the restoration, enhancement, creation and, under exceptional circumstances, preservation of wetlands, wetland buffer areas, and other natural habitats, carried out to replace or compensate for the loss of wetlands or natural habitat area or functional capacity resulting from federal-aid projects funded pursuant to the provisions of Title 23 U.S.C. Compensatory mitigation usually occurs in advance of or concurrent with the impacts to be mitigated, but may occur after such impacts in special circumstances.

### S.2.1 Information Requirements to Initiate Formal Consultation

Although action agencies possess considerable discretion regarding the contents of the BAs used in part to initiate Section 7(a)(2) consultation, it is the legal responsibility of these action agencies to ensure through consultation with the Services that their actions meet the legal requirements of FESA Section 7(a)(2).

To fulfill this responsibility, action agencies must provide the six types of information identified in 50 CFR § 402.14(c).

1. A description of the action to be considered.
2. A description of the specific area that may be affected by the action.
3. A description of any listed species or critical habitat that may be affected by the action.
4. A description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effects.
5. Relevant reports prepared, including any environmental impact statement, environmental assessment, or BA.
6. Any other relevant available information on the action, the affected listed species, or critical habitat.

This BA is intended to satisfy all information requirements identified in 50 CFR § 402.14(c). From this and other information (best scientific and commercial data available), the Services will

develop their Biological Opinion (BO) as to the likelihood of the action agencies' proposed activities jeopardizing the continued existence of a listed species and destroying or adversely modifying critical habitat under standards defined in 50 CFR § 402.02.

## S.3 Project Description

The full-build project involves comprehensive improvements to the Interstate (I-) 80/I-680 /State Route (SR) 12 interchange complex to meet the future traffic demand over the 20-year planning horizon and includes the widening of I-680 and I-80 and the relocation, upgrade, and expansion of the westbound truck scales on I-80. The full scope of these improvements is not currently funded under the Metropolitan Transportation Commission's (MTC's) Regional Transportation Plan, 2035. Consequently, a fundable first phase of the full-build project has been developed (referred to as Phase 1). For the purposes of this BA, Phase 1 is considered the proposed project.

The proposed project comprises the following components.

- Improvements to the I-80/I-680/SR 12 West (SR 12W) interchange.
- A realignment of I-680.
- A new interchange at I-680 and Red Top Road.
- A new road connecting the I-80/Red Top Road interchange to Business Center Drive.
- A new interchange at SR 12W and the new Red Top Road alignment.
- An improved interchange at I-80 and Green Valley Road.
- New bridges over Green Valley Creek.
- Widened I-80.
- A new lane on eastbound SR 12 East (SR 12E).
- A widened bridge over Ledgewood Creek.

## S.4 Purpose and Need

### S.4.1 Purpose

The purpose of the full-build project is to achieve the following.

- Reduce congestion through the I-80/I-680/SR 12 interchange complex.
- Reduce the amount of cut-through traffic on local roads.
- Encourage the use of high-occupancy vehicle lanes and ridesharing.
- Improve safety conditions.
- Accommodate current and future truck volumes on highways.
- Facilitate adequate inspection and enforcement at truck scales.

The proposed project addressed in this document would address all these needs to some extent, with the exception of facilitating adequate inspection and enforcement at truck scales. The full-build project would address all these needs.

### S.4.2 Need

The current I-80/I-680/SR 12 interchange complex was constructed approximately 40 years ago. Since the 1960s, the San Francisco Bay Area (Bay Area) and Northern California region have experienced rapid population growth, resulting in substantial increases in regional traffic and truck traffic passing, resulting in congestion, delays, and unacceptable levels of service (LOS). The project will address the related deficiencies listed below.

- Traffic congestion.
- Traffic diverting to local roads.
- Truck-related congestion.
- Unreliable freight transport.
- Traffic safety.

## S.5 Vegetation Communities and Aquatic Habitat

Vegetation communities within the biological study area (BSA) were identified and mapped as 14 vegetated and 2 unvegetated habitat types. The total acreage of each community type within Phase 1 is listed below. Figure 3-1 (Sheets 1–35) shows the location of natural communities and other biological resources in the BSA.

**Table S-1. Total Area of Vegetation Communities and Drainages in the BSA**

| Community Type | Acreage in BSA |
|---|---|
| Riparian woodland | 4.16 |
| Upland scrub | 10.48 |
| Valley oak woodland | 0.16 |
| Live oak woodland | 36.79 |
| Other woodland | 0.65 |
| Eucalyptus grove | 6.18 |
| Nonnative annual grassland | 374.27 |
| Ruderal | 36.56 |
| Row crops | 51.23 |
| Orchard | 2.48 |
| Landscaped | 11.81 |
| Perennial drainage | 1.99 |
| Seasonal drainage | 6.75 |
| Perennial marsh | 16.37 |
| Alkali seasonal marsh | 1.25 |
| Seasonal wetland | 12.70 |
| **Total**[a] | **573.83** |

[a] Total acreage does not include approximately 334.14 acres of developed land in the BSA.

Natural communities of special concern are habitats considered sensitive because of their high species diversity, high productivity, unusual nature, limited distribution, or declining status. The California Natural Diversity Database (CNDDB) contains a current list of rare natural communities throughout the state. The habitats that meet criteria for natural communities of special concern are riparian woodland, live oak woodland, valley oak woodland, and perennial drainages.

## S.6 Special-Status Species Impacts

Based on the species distribution and habitat requirements, results of field surveys, and conversations with species experts and resource agency personnel, the wildlife and plant species

designated critical habitat listed below were considered to have potential to occur in the action area and may be affected by the proposed project. Accordingly, these species and critical habitats are addressed in this BA.

- Contra Costa goldfields (*Lasthenia conjugens*)—endangered.
- Contra Costa goldfields critical habitat Unit 5B.
- Showy Indian clover (*Trifolium amoenum*)—endangered.
- Callippe silverspot butterfly (*Speyeria callippe callippe*)—endangered.
- Vernal pool fairy shrimp (*Branchinecta lynchi*)—threatened.
- Vernal pool tadpole shrimp (*Lepidurus packardi*)—endangered.
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)—threatened.
- California red-legged frog (*Rana draytonii*)—threatened.
- California red-legged frog critical habitat Units SOL-2 and SOL-3.
- California tiger salamander (*Ambystoma californiense*)—threatened.

Direct (temporary and permanent) and indirect project effects are described below for each of the seven Construction Packages under Phase I. Direct effects will result from construction activities. Indirect effects are those effects that are reasonably certain to occur, but will occur later in time as a result of the proposed project.

Caltrans and STA have identified two species on which the proposed Phase 1 would have an adverse effect: California red-legged frog (CRLF) and valley elderberry longhorn beetle (VELB).

### S.6.1 California Red-Legged Frog

Direct temporary and permanent effects on approximately 137.73 acres of potential CRLF habitat would occur as a result of the proposed Phase I. Direct temporary effects would be associated with construction access and construction staging of materials and equipment. Direct permanent effects on CRLF and potential CRLF habitat would be associated with grading,

paving, excavating, extension and installation of cross culverts, installation of structural hardscape, and installation and relocation of utilities.

Caltrans and STA anticipate that the proposed project would have direct permanent effects on approximately 0.08 acre of potential aquatic breeding habitat, 2.78 acres of potential aquatic non-breeding habitat, and 128.51 acres of potential upland dispersal habitat within the action area. Based on the analysis of current level of design detail, Caltrans and STA do not anticipate any direct temporary disturbance on potential CRLF aquatic breeding or aquatic non-breeding habitat. However, there would be approximately 6.36 acres of temporary disturbance of potential CRLF upland dispersal habitat within the action area.

**Table S-2. Area of Direct Effect on Potential CRLF Habitat**

| Habitat Type | Area of Direct Effects in Acres | |
|---|---|---|
| | Permanent | Temporary |
| Potential breeding habitat | 0.08 | 0.00 |
| Potential aquatic non-breeding habitat | 2.78 | 0.00 |
| Potential upland dispersal and aestivation habitat | 128.51 | 6.36 |
| **Total potential habitat** | **131.37** | **6.36** |

### S.6.1.1 California Red-Legged Frog Critical Habitat

Portions of the action area are within critical habitat Units SOL-2 and SOL-3. SOL-2 is 1,360 acres and SOL-3 is 1,861 acres, for a total combined acreage of 3,221 acres. These two units are separated by SR 12W. I-80 separates Sol-3 from SOL-1, which is just south of the action area. All four of the PCEs for CRLF are present within the BSA and occur in critical habitat Units SOL-2 and SOL-3

Caltrans and STA anticipate that Construction Package 1 would temporarily affect approximately 0.34 acre and permanently affect approximately 3.50 acres of designated critical habitat that contains the PCEs. Construction Packages 3, 4, 5, and 7 would temporarily affect approximately 0.13 acre and permanently affect approximately 18.88 acres of designated critical habitat that contains the PCEs.

**Table S-3. Area of Direct Effect on CRLF Critical Habitat**

| Critical Habitat Type | Area of Direct Effects in Acres | | | |
|---|---|---|---|---|
| | Permanent | | Temporary | |
| | SOL 2 | SOL 3 | SOL 2 | SOL 3 |
| PCE 1 Breeding | 0.01 | 0.00 | 0.00 | 0.00 |
| PCE 2 non-breeding | 0.02 | 0.00 | 0.00 | 0.00 |
| PCE 3 upland | 21.89 | 0.46 | 0.47 | 0.00 |
| PCE 4 dispersal | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Critical Habitat** | **22.38** | | **0.47** | |

The combined permanent and temporary effects on designated critical habitat for CRLF would encompass 22.85 acres—less than 1% of the total combined 3,221 acres that constitute SOL-2 and SOL-3. There are approximately 65 acres within the area between I-80, SR 12W, and the Business Center Drive Extension (BCDE) that could potentially be isolated by constructing the BCDE. This area includes breeding and non-breeding aquatic habitat and upland habitat for CRLF.

### S.6.2 Valley Elderberry Longhorn Beetle

Phase 1, Construction Package 1 would directly affect 10 elderberry shrubs along the north and south sides of SR 12W in the vicinity of Jameson Canyon Creek (Table S-4). Phase 1, Construction Package 3 would indirectly affect shrubs 11 and 12 along Neitzel Road. No other Construction Packages would affect VELB or elderberry shrubs.

## S.7 Avoidance and Minimization Measures

Caltrans will implement the following general avoidance and minimization measures to minimize potential adverse effects on federally listed species.

- Design features to minimize the project footprint.
- Establish general work windows for aquatic areas.
- Provide environmental education for construction crews.
- Perform general and species-specific preconstruction surveys.
- Delineate the work area and all the environmentally sensitive areas with restrictive fencing.

- Install exclusion fencing to prevent to prevent dispersal of species into the construction area.
- Employ Caltrans Standard Construction Best Management Practices (BMPs).
- Require that an onsite biological monitor (USFWS-approved biologist) be present during activities that may affect sensitive biological resources.

More detailed descriptions of the general and species-specific measures can be found in chapters 1 and 4, respectively.

## S.8 Compensatory Mitigation

The fundamental duty of a federal lead agency under FESA Section 7 is to ensure that federal actions do not jeopardize the continued existence of listed species and that reasonable and prudent measures are implemented to minimize the level of take. As noted on page 4-53 of the *Endangered Species Consultation Handbook*, "Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take." Reasonable and prudent measures and terms and conditions are developed by USFWS in coordination with the action agency (i.e., Caltrans). Caltrans, as state and federal lead agency, must determine if any other state or federal statutory authority, policy, or regulation requires or compels the provision of compensatory mitigation to address the potential effects on listed species under the specific circumstances and impacts of the proposed action as provided in Table S-2.

### S.8.1 California Red-Legged Frog

The proposed project would have a significant effect on CRLF as defined under the California Environmental Quality Act (CEQA). The proposed project would result in the loss of aquatic, upland, and critical habitat and would potentially isolate a CRLF breeding pond from critical habitat. Together, these effects could restrict the range of the CRLF. Consequently, Caltrans and STA propose compensatory mitigation for these impacts pursuant to CEQA.

**Compensate for Loss and Disturbance of California Red-Legged Frog Habitat**

Caltrans or STA proposes to mitigate the potential direct effects on CRLF as defined by permanent and temporary disturbance to potential CRLF aquatic breeding, aquatic non-breeding, upland, and designated critical habitat in the action area. Caltrans or STA will conserve approximately 128.51 acres at a ratio of 1:1 to compensate for permanent effects on CRLF upland habitat and 2.86 acres at a ratio of 3:1 to compensate for permanent effects on CRLF aquatic habitat. The proposed mitigation ratio takes into account that Caltrans and STA will implement a suite of measures to minimize and avoid take of CRLF as well as the temporary loss of CRLF habitat. Caltrans or STA will also restore approximately 6.36 acres of upland dispersal habitat onsite to address the temporary effects on upland dispersal habitat.

STA will provide 137.09 acres of compensatory mitigation for the permanent effects on CRLF habitat. This would be accomplished through one or more of the following.

- Purchase of CRLF mitigation credits at an approved bank.
- Preservation of land with CRLF habitat through conservation easements.
- Acquisition and preservation of land with CRLF habitat in fee title.
- A combination of two or more of these options.

### S.8.2 Valley Elderberry Longhorn Beetle

Phase 1, Construction Package 1 would directly affect 10 elderberry shrubs along the north and south sides of SR 12W in the vicinity of Jameson Canyon Creek (Table S-4). Phase 1, Construction Package 3 would indirectly affect shrubs 11 and 12 along Neitzel Road. No other Construction Packages would affect VELB or elderberry shrubs. Implementation of the described avoidance and minimization measures and the proposed mitigation described below would reduce the potential direct and indirect effects on VELB.

Caltrans and STA will compensate for direct effects on VELB through a combination of replacement plantings and transplantation. Compensation for the beetle will occur prior to

beginning of ground-disturbing activities. Compensation for effects on VELB and VELB habitat are outlined in Table S-4.

**Table S-4. Affected Elderberry Plant Compensation Ratios Based on Location, Stem Diameter, and Presence of Exit Holes[a]**

| Location | Stems | Holes | Number of Stems | Elderberry Ratios (multiply number of stems by) | Elderberry Planting | Associated Native Planting | Native Ratios |
|---|---|---|---|---|---|---|---|
| Non-riparian | 1–3 | No | 8 | 1 | 8 | 8 | 1 |
| | | Yes | 2 | 2 | 4 | 8 | 2 |
| Non-riparian | 3–5 | No | 7 | 2 | 14 | 14 | 1 |
| | | Yes | 1 | 4 | 4 | 8 | 2 |
| Non-riparian | >5 | No | 5 | 3 | 15 | 15 | 1 |
| | | Yes | 2 | 6 | 12 | 24 | 2 |
| Riparian | 1–3 | No | 20 | 2 | 40 | 40 | 1 |
| | | Yes | 0 | 4 | 0 | 0 | 2 |
| Riparian | 3–5 | No | 8 | 3 | 24 | 24 | 1 |
| | | Yes | 0 | 6 | 0 | 0 | 2 |
| Riparian | >5 | No | 9 | 4 | 36 | 36 | 1 |
| | | Yes | 0 | 8 | 0 | 0 | 2 |
| **Totals** | | | **62** | | **157** | **177** | |
| **Total acres needed for compensation** | | | | **1.38** | | | |

[a] Compensation acreages were calculated using a template provided by USFWS and follow formulas found in USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle, July 9, 1999.

## S.9 Effect Determination

### S.9.1 Contra Costa Goldfields

The proposed Phase 1 **may affect,** but **is not likely to adversely affect** Contra Costa goldfields.

The proposed Phase 1 **may affect,** but **will not adversely modify** designated Contra Costa goldfields critical habitat.

### S.9.2 Showy Indian Clover

The proposed Phase 1 would have **no effect** on showy Indian clover.

### S.9.3 Callippe Silverspot Butterfly

The proposed Phase 1 **may affect,** but **is not likely to adversely affect** callippe silverspot butterfly. Should surveys result in the discovery of callippe silverspot butterflies, Caltrans and STA will reinitiate consultation with USFWS.

### S.9.4 Vernal Pool Fairy Shrimp/Vernal Pool Tadpole Shrimp

The proposed Phase 1 **may affect** but **is not likely to adversely affect** vernal pool fairy shrimp and vernal pool tadpole shrimp. Should surveys result in the discovery of vernal pool tadpole shrimp or vernal pool fairy shrimp, Caltrans and STA will reinitiate consultation with USFWS.

### S.9.5 Valley Elderberry Longhorn Beetle

The proposed Phase 1 **is likely to adversely affect,** but **will not jeopardize** the continued existence of VELB.

### S.9.6 California Red-Legged Frog

The proposed Phase 1 **is likely to adversely affect**, but **will not jeopardize** the continued existence of CRLF.

Although implementation of the avoidance, minimization, and compensation measures described above would ensure that project effects on critical habitat do not appreciably diminish the value of critical habitat for both the survival and recovery of CRLF, construction of the proposed project **may affect,** but **is not likely to adversely modify** designated CRLF critical habitat.

### S.9.7 California Tiger Salamander

The proposed Phase 1 **may affect** but **is not likely to adversely affect** CTS.

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# List of Abbreviated Terms

| | |
|---|---|
| APN | assessor's parcel number |
| BA | biological assessment |
| Bay Area | San Francisco Bay Area |
| BMP | best management practice |
| BSA | biological study area |
| Cal-IPC | California Invasive Plant Council |
| Caltrans | California Department of Transportation |
| CCG | Contra Costa goldfields |
| CDFA | California Department of Food and Agriculture |
| CDFG | California Department of Fish and Game |
| CESA | California Endangered Species Act |
| CNPS | California Native Plant Society |
| CNDDB | California Natural Diversity Database |
| Construction Package 1 | initial construction package |
| CRLF | California red-legged frog |
| CTS | California tiger salamander |
| CWA | Clean Water Act |
| EPA | U.S. Environmental Protection Agency |
| ESA | environmentally sensitive area |
| FESA | federal Endangered Species Act |
| FHWA | Federal Highway Administration |
| HOV | high-occupancy vehicle |
| ICF | ICF International |
| I-680 | Interstate 680 |
| I-80 | Interstate 80 |
| kV | kilovolt |
| LHD | load-haul-dump |
| LOS | levels of service |
| MSE | mechanically stabilized embankment |
| MTC | Metropolitan Transportation Commission |
| NEPA | National Environmental Policy Act |
| NISC | National Invasive Species Council |
| PCE | primary constituent element |
| PM | post mile |
| RE | Resident Engineer |
| ROD | record of decision |
| RWQCB | regional water quality control board |

| | |
|---|---|
| SCR 17 | Senate Concurrent Resolution 17 |
| STA | Solano Transportation Authority |
| SR 12 | State Route 12 |
| SR 12E | SR 12 East |
| SR 12W | SR 12 West |
| USACE | U.S. Army Corps of Engineers |
| USDA | U.S. Department of Agriculture |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| UPRR | Union Pacific Railroad |
| VELB | valley elderberry longhorn beetle |
| WEF | wildlife exclusion fencing |

# Chapter 1 Introduction

The purpose of this biological assessment (BA) is to provide technical information and to review the proposed project in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The BA is prepared in accordance with legal requirements found in Section 7 (a)(2) of the federal Endangered Species Act (16 U.S.C. 1536[c]) (FESA) and with Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance. The document presents technical information upon which later decisions regarding project impacts are developed.

The full-build project involves comprehensive improvements to the Interstate (I-) 80/I-80/State Route (SR) 12 interchange complex to meet the future traffic demand over the 20-year planning horizon, and includes the widening of I-680 and I-80 and the relocation, upgrade, and expansion of the westbound truck scales on I-80. However, the full scope of these improvements is not currently funded within the Metropolitan Transportation Commission's (MTC's) regional transportation plan for 2035. Accordingly, a fundable first phase of the project, which has independent utility and logical termini, has been identified (Figure 1-1). This fundable first phase is referred to as Phase 1 and is described in this BA as the proposed project or federal action. Phase 1 construction consists of seven Construction Packages. Caltrans may reinitiate Section 7 consultation with USFWS for the various Construction Packages should the project footprint requirements and effects change.

The components of the proposed project (Phase 1) are described in Section 1.2 and will be divided into seven Construction Packages (Section 1.2.4). Construction Package 1 is scheduled to begin as early as 2012. The final construction package, Construction Package 7, is scheduled to begin in 2018. Construction of the proposed project is anticipated to be completed by 2020.

## 1.1 Project History

Two major interstate freeways, I-80 and I-680, and one state highway, SR 12, converge in Solano County at the I-80/I-680/SR 12 interchange (Figure 1-1). When constructed in the 1960s,

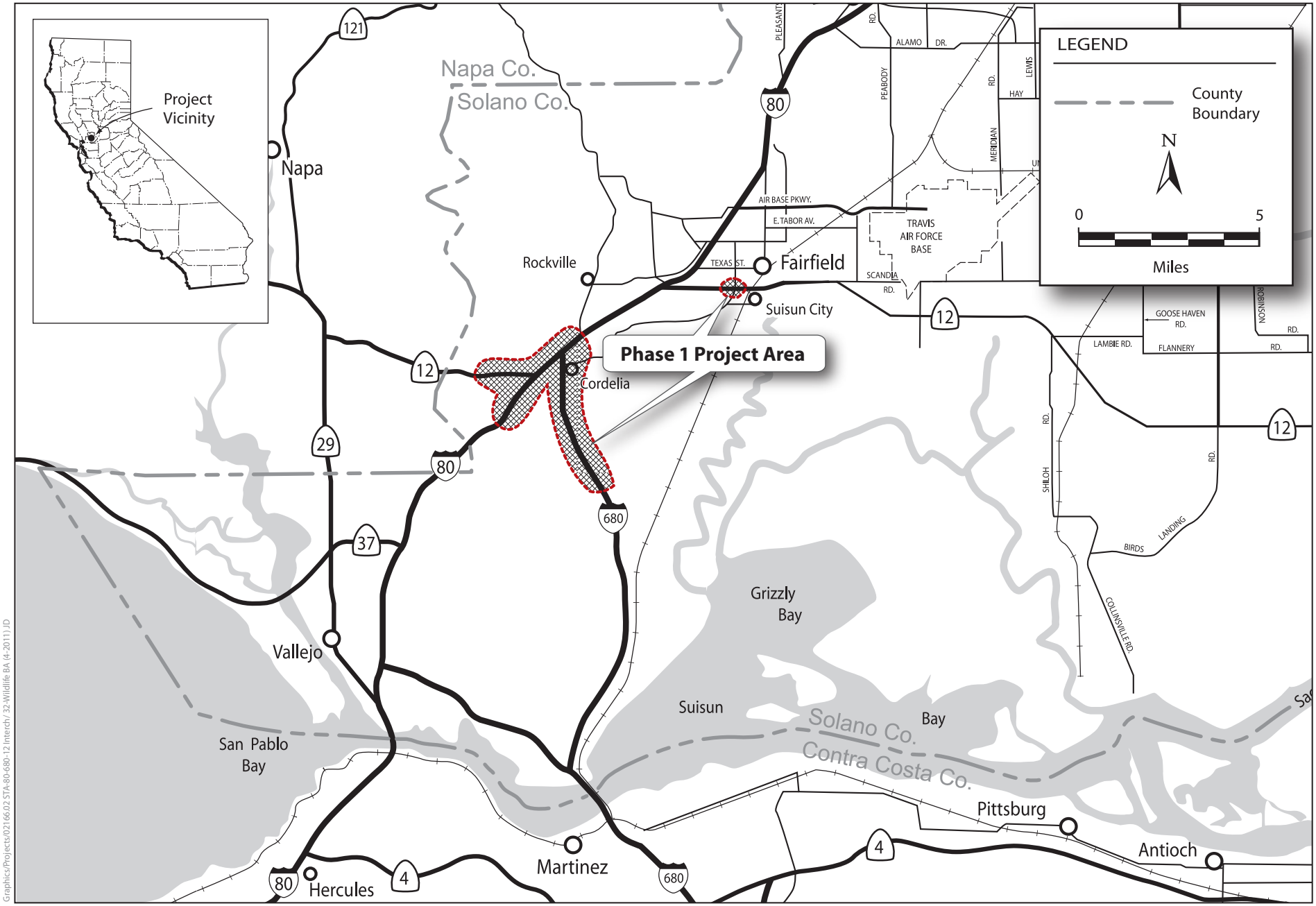
the interchange was located in a relatively rural setting immediately surrounded by agricultural lands with mountains to the north and the Suisun Marsh to the south.

Since the 1960s, Northern California and the Bay Area have experienced rapid population growth. The Bay Area's population has grown by more than 85% during this time and Solano County's population has more than tripled. This growth has resulted in substantial increases in regional traffic passing through the interchange area as well as substantial changes in the land uses immediately surrounding the interchange.

Westbound and eastbound regional truck scale facilities, known as the Cordelia truck scales, are also located within the I-80/I-680/SR 12 interchange. The location of the truck scales is ideal for monitoring and enforcing truck weight and safety requirements because it provides one location that can monitor truck traffic on I-80, I-680, and SR 12. The Solano Transportation Authority (STA) completed a truck scales relocation study in 2005 in partnership with Caltrans and the California Highway Patrol. The study concluded that the truck scales would need to remain in or near their current location on I-80 between the I-680 junction to the west and the SR 12 E junction to the east. The volume of trucks that need to be weighed and inspected has increased dramatically since the 1960s. Trucks must exit then reenter the freeway within the I-80/I-680/SR 12 interchange area after inspection at the truck scales facility. The exiting and entering of a large volume of trucks creates a severe weaving problem, which is made worse by the size, limited maneuverability, and lower speeds of large trucks.

The full-build project is intended to address numerous existing and future traffic-related problems while minimizing and avoiding environmental effects on sensitive resources in its vicinity. Specifically, the purpose of the full-build project is to achieve the following.

- Reduce congestion through the I-80/I-680/SR 12 interchange complex.
- Reduce the amount of cut-through traffic on local roads.
- Encourage the use of high-occupancy vehicle (HOV) lanes and ridesharing.
- Improve safety conditions within the project limits.
- Accommodate current and future truck volumes on highways.




Graphics:/Projects/02166.02 STA-80-680-12 Interch / 32-Wildlife BA (4-2011) JD

**Figure 1-1**
**Phase 1 Project Vicinity**

- Facilitate adequate inspection and enforcement at truck scales.

Phase 1, which is the proposed project or federal action described in this BA, would address all these needs to some extent, with the exception of facilitating adequate inspection and enforcement at truck scales. The full-build project, which is expected to be completed beyond 2035, would address all these needs.

## 1.2 Project Description

### 1.2.1 Project Footprint, Action Area, and Biological Study Area

The project footprint, action area, and biological study area (BSA) (shown in Figure 1-2) are defined and distinguished in the following subsections. Detailed layouts would be submitted to USFWS should reinitiation of consultation be required.

#### 1.2.1.1 Project Footprint

The project footprint is defined as the areas that would be directly affected by the proposed project. It is the maximum extent of ground-disturbing activities from the various construction actions (i.e., both temporary and permanent impacts) (Figure 1-2).

#### 1.2.1.2 Action Area

The project action area includes both directly affected areas (i.e., the project footprint) and indirectly affected areas. Indirect impacts are those impacts that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur (50 CFR 402.02).

#### 1.2.1.3 Biological Study Area

The BSA is the area evaluated for potential impacts on natural resources resulting from the proposed project (Figure 1-2).

## 1.3 Project Features

The proposed project addressed in this BA involves comprehensive improvements to the I-80/I-680/SR 12 interchange complex to meet the future traffic demand over the 20-year planning horizon (Figure 1-3). Phase 1 is the subject of evaluation under the National Environmental Policy Act (NEPA) and the action for which a record of decision (ROD) will be issued. Phase 1 comprises the components listed below.

- Improving the I-80/I-680/SR 12 West (SR 12W) interchange.
- Realigning I-680.
- Constructing a new interchange at I-680 and Red Top Road.
- Constructing a new road connecting the I-80/Red Top Road interchange to Business Center Drive.
- Constructing a new interchange at SR 12W and the new Red Top Road alignment.
- Constructing an improved interchange at I-80 and Green Valley Road.
- Constructing new bridges over Green Valley Creek; widening I-80.
- Constructing a new lane on eastbound SR 12 East (SR 12E).
- Widening a bridge over Ledgewood Creek (Figure 1-3).

The proposed project is described in more detail below.

### 1.3.1 Western Segment

#### 1.3.1.1 Mainline Improvements

Westbound I-80 would be realigned between a point west of Suisun Valley Road to just west of the I-680/SR 12W interchange by constructing a new six-lane highway alignment north of the existing highway alignment (Figure 1-3). The realignment would create space in the median to construct direct HOV connector ramps between I-80 and I-680, as well as future widening of the eastbound lanes. The realigned westbound I-80 would have six lanes, including an HOV lane and an auxiliary lane matching the existing cross section at the existing Suisun Valley Road

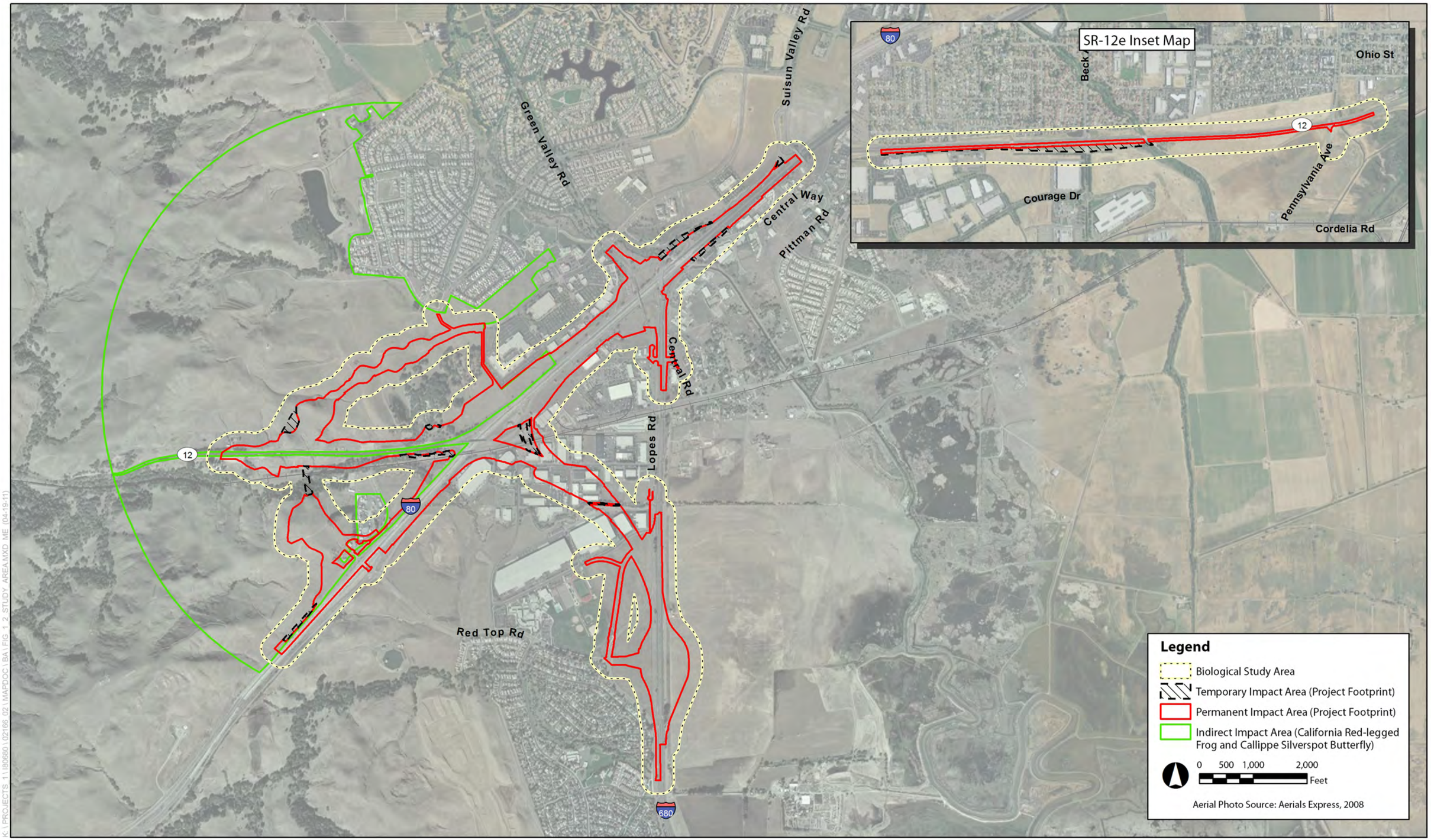
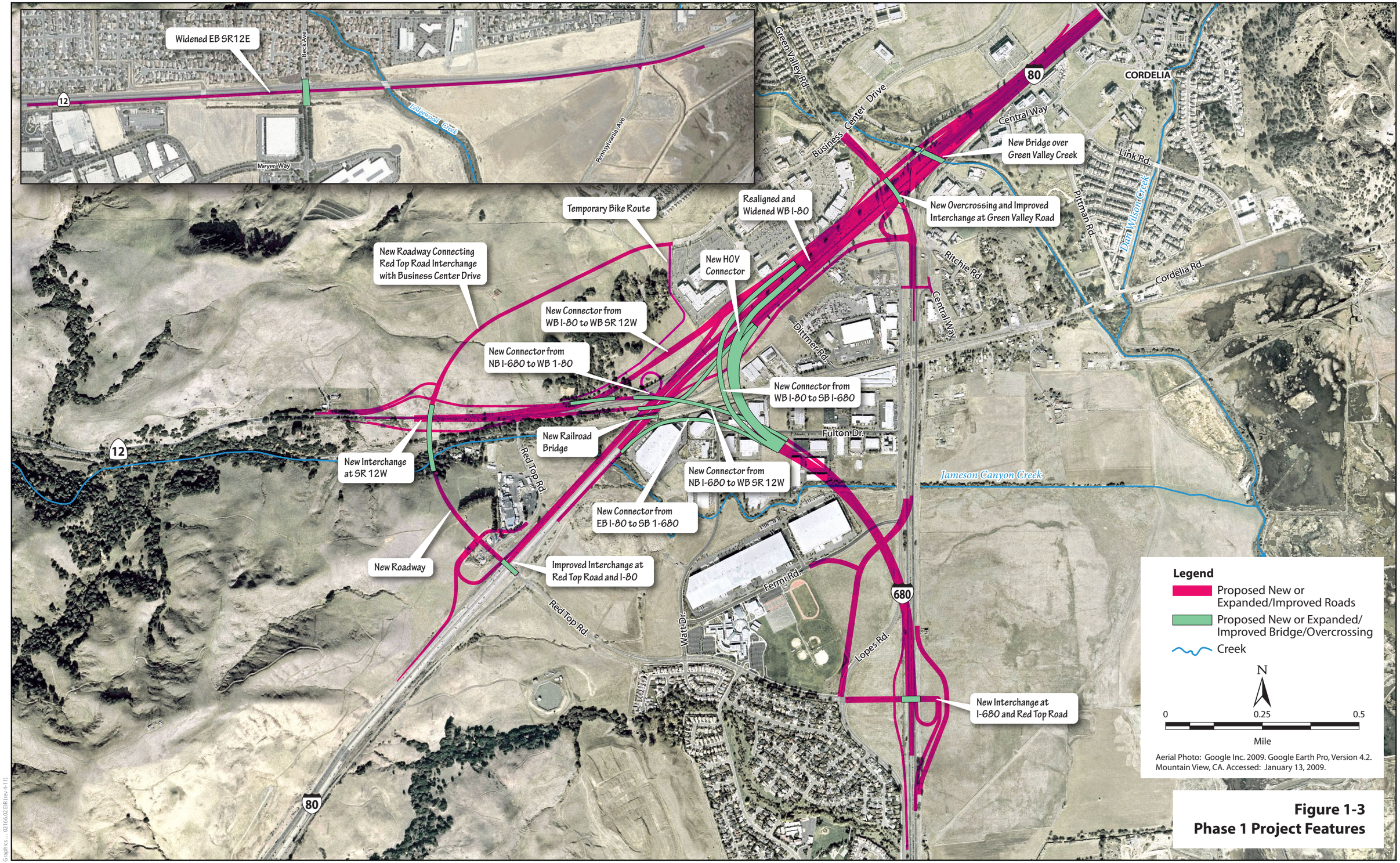



**Figure 1-2**
**Project Action Area**




Aerial Photo: Google Inc. 2009. Google Earth Pro, Version 4.2. Mountain View, CA. Accessed: January 13, 2009.

**Figure 1-3**
**Phase 1 Project Features**

overcrossing. Immediately west of the Suisun Valley Road overcrossing, a seventh lane would be added, as well as an eighth lane with the on-ramp from Suisun Valley Road. A ninth lane would be added immediately west of the Green Valley Road overcrossing. The four right lanes would exit from I-80 to connect to westbound SR 12W and southbound I-680. There would be a left exit from the HOV lane to an HOV connector to southbound I-680. A wider, single-span bridge would replace the existing bridge over Green Valley Creek (Figure 1-3). The existing loop on-ramp from northbound I-680 to westbound I-80 would be removed. The direct connection from northbound I-680 to westbound SR 12W would be constructed to replace this movement. The segment of I-680 north of Red Top Road would be realigned.

#### 1.3.1.2 Freeway-to-Freeway Interchange Improvements

New connector ramps from westbound I-80 to westbound SR 12W and southbound I-680 would be constructed. The proposed westbound I-80 to southbound I-680 connector would cross over I-80, the eastbound SR 12W connector to eastbound I-80, the Union Pacific Railroad (UPRR) tracks, Fulton Drive, and the realigned Lopes Road, which is a local road (Figure 1-3). A loop ramp off the I-680 to SR 12W connector would provide access from northbound I-680 to westbound I-80. Access from westbound I-80 to westbound SR 12W would be braided with (cross over) the Green Valley Road on-ramp to westbound I-80. A separate direct connector structure would be built to carry the HOV lanes in both directions between I-680 and I-80 east of the I-80/I-680/SR 12 interchange, and an elevated connector would carry traffic from eastbound I-80 to southbound I-680. A box culvert would carry Jameson Canyon Creek through the approach to the I-80/I-680 elevated direct connectors.

From SR 12W to southbound I-680, traffic would use Red Top Road from the new SR 12W/Red Top Road interchange to the new I-680/Red Top Road interchange.

#### 1.3.1.3 Interchange Improvements

The I-80/Green Valley Road interchange would have a tight diamond configuration westbound and a partial cloverleaf (loop on-ramp) configuration eastbound. The same interchange and overcrossing would provide access to the existing alignment of I-680, which would be relinquished as a local arterial.

The connection from eastbound SR 12W and eastbound I-80 to southbound I-680 would be removed, with traffic expected to use Red Top Road from the new SR 12W/Red Top Road interchange to the new I-680/Red Top Road interchange. A reconfigured on-ramp at Green Valley Road would provide access to the new westbound I-80 alignment.

The I-80/Red Top Road interchange would be modified to have a westbound exit loop. Red Top Road between I-80 and SR 12W would be realigned to connect this interchange on I-80 with a new SR 12W/Red Top Road interchange. A new interchange would be constructed at I-680/Red Top Road.

#### 1.3.1.4 Local Road Improvements

During the initial construction of Phase 1, a bicycle path would be relocated along the western boundary of the business park at the west end of the existing Business Center Drive, and along the north side of the new connector from westbound I-80 to westbound SR 12W to maintain access between the existing bicycle path along Jameson Canyon Road (SR 12W) and Business Center Drive (Figure 1-3). This path would be removed when Business Center Drive is extended to the SR 12W/Red Top Road interchange because bicyclists would be able to utilize the extension of Business Center Drive to reach Red Top Road and points west.

The extension of Business Center Drive is actually part of the local North Connector Road project. Although this a local road, STA has requested that Caltrans include the Business Center Drive Extension (BCDE) as part of the proposed project improvements to the state highway system. STA previously cleared the North Connector Project under the California Environmental Quality Act (CEQA). However, under this project, the proposed alignment of the BCDE has been shifted to the northwest and is accordingly addressed in this BA.

The existing Green Valley Road overcrossing at I-80 would be removed, and a new one would be constructed on a different alignment (Figure 1-3). The overcrossing would consist of the western four lanes of the ultimate seven-lane structure.

### 1.3.2 Eastern Segment

#### 1.3.2.1 Mainline Improvements

A third lane would be added to eastbound SR 12E. This lane would connect (start) at the eastbound SR 12E/Chadbourne Road interchange and would extend east, connecting (ending) at the eastbound SR 12E/Webster Street exit (Figure 1-3).

### 1.3.3 Utilities

As part of the proposed project, utilities within the project footprint would be relocated, realigned, or extended as necessary to accommodate project construction and operation. The maximum extent of disturbance from utilities falls within the project footprint (Figure 1-2). Utilities that would be affected are water, electrical, gas, cable/fiber, and telephone lines. Actions affecting these utilities would be coordinated with the respective operators. Caltrans would submit detailed descriptions of utility relocations should the area of disturbance exceed the limits of the project footprint shown in Figure 1-2.

Utility relocations would be accommodated within new and existing local road rights-of-way (ROWs) and existing utility easements wherever possible. In some cases, relocated utilities might be routed immediately adjacent to and outside the proposed freeway ROW. Locations of new utility poles for the realignment of overhead electrical lines have been identified and addressed in the environmental documents listed in Section 1.4. Environmentally sensitive areas would be avoided to the extent practicable. All utility relocation areas have not yet been established; however, it is anticipated that these relocations would occur within the current project described in this BA.

Water lines in the project footprint include those owned by the Cities of Fairfield, Vallejo, and Benicia. Irrigation and non-potable water and agricultural drains owned by the Solano Irrigation District are located within the project footprint. These water facilities, as well as sewer facilities owned by the Cities of Fairfield and Suisun City and by the Fairfield-Suisun Sewer District would be realigned or extended, as necessary.

PG&E-owned electrical and gas lines within the project footprint would be affected by construction and operation. One 115-kilovolt (kV) electrical transmission line that crosses I-680 between Fermi and Fulton Drives would be realigned, and towers would be relocated. The Vaca–Suisun–Jameson tower line crosses I-680 and Green Valley Road near the eastbound I-80 ramps intersection. The line would be raised by 45 feet to accommodate the project. Additionally, to accommodate the proposed connectors, one tower would be relocated and the line height raised by 90 feet between Dittmer Road and the Jameson substation on Watt Court. Several other overhead distribution or transmission lines would be realigned, as would a 12-kilovolt (kV) underground line that crosses I-80 just east of the existing Green Valley Road overcrossing. Additionally, PG&E gas lines, primarily in the vicinity of the I-80/Green Valley Road and SR 12E/Pennsylvania Avenue interchanges, would be modified or realigned, and it may be necessary to acquire new utility easements.

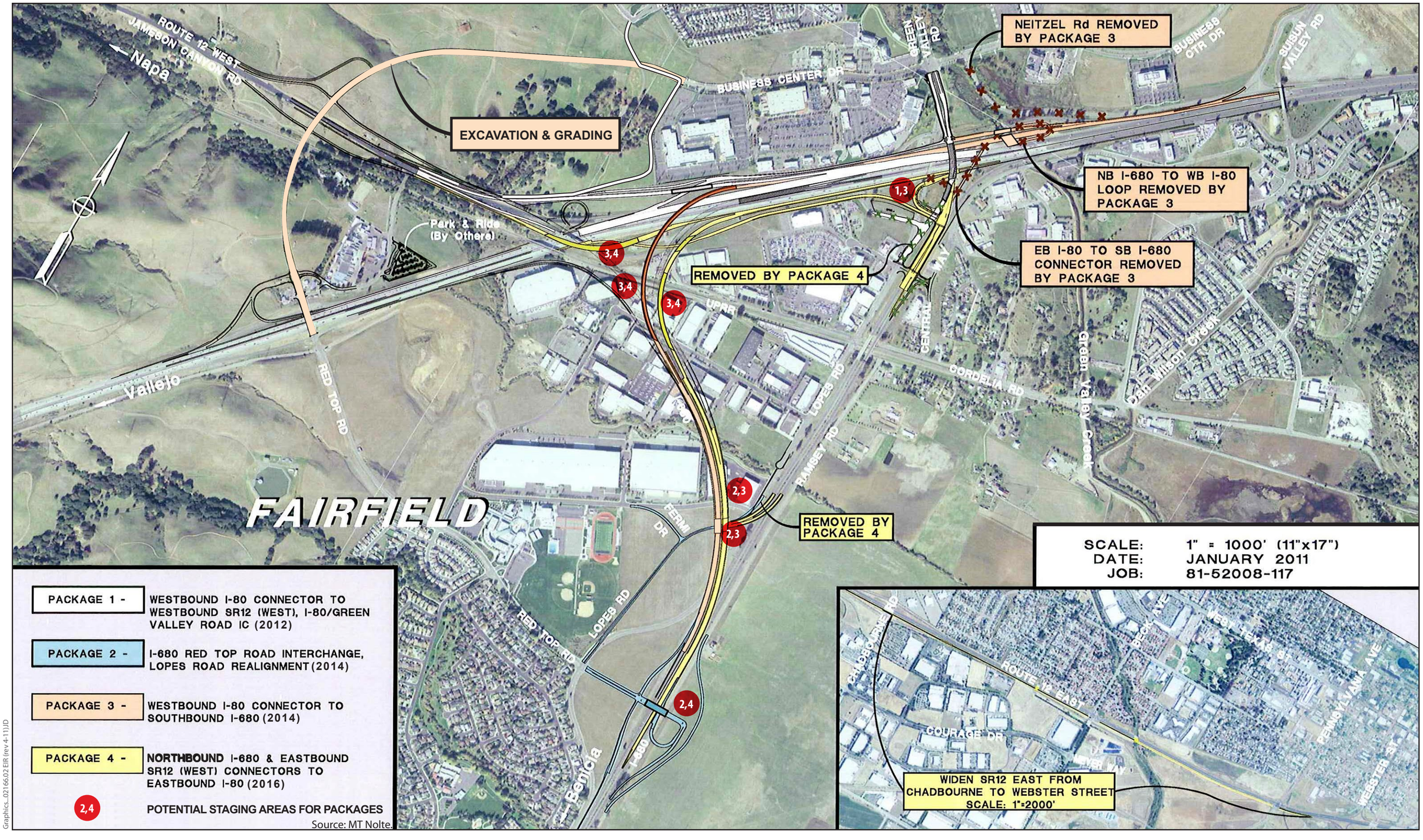
PG&E gas transmission facilities currently located in the footprint of the I-80/I-680 interchange and at Green Valley and Lopes Roads would need to be relocated. It may be necessary to acquire a parcel adjacent to I-680, just south of the I-80/I-680 interchange, to house a gas transmission valve lot.

Cable lines belonging to Comcast and located within local roads would be relocated where necessary. Qwest Communications fiber conduit mounted on the UPRR bridge over I-80 would be relocated along the new bridge.

Telephone and telecommunication facilities within the project area include local, long-distance, and data services lines owned by AT&T. These lines include both overhead and underground lines and conduit. These lines would be relocated where they conflict with the proposed project. These locations are not yet known. Caltrans and STA anticipate that AT&T would conduct its own line relocation.

### 1.3.4 Construction Packages

The proposed project is planned to be constructed in a series of seven discrete Construction Packages over a period of 8 years, as funding becomes available (Figures 1-4 and 1-5). A summary of the anticipated construction packages and their sequencing is shown in Table 1-1.




SCALE: 1" = 1000' (11"x17")
DATE: JANUARY 2011
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| | |
|---|---|
| PACKAGE 1 - | WESTBOUND I-80 CONNECTOR TO WESTBOUND SR12 (WEST), I-80/GREEN VALLEY ROAD IC (2012) |
| PACKAGE 2 - | I-680 RED TOP ROAD INTERCHANGE, LOPES ROAD REALIGNMENT (2014) |
| PACKAGE 3 - | WESTBOUND I-80 CONNECTOR TO SOUTHBOUND I-680 (2014) |
| PACKAGE 4 - | NORTHBOUND I-680 & EASTBOUND SR12 (WEST) CONNECTORS TO EASTBOUND I-80 (2016) |
| 2,4 | POTENTIAL STAGING AREAS FOR PACKAGES |

Source: MT Nolte.

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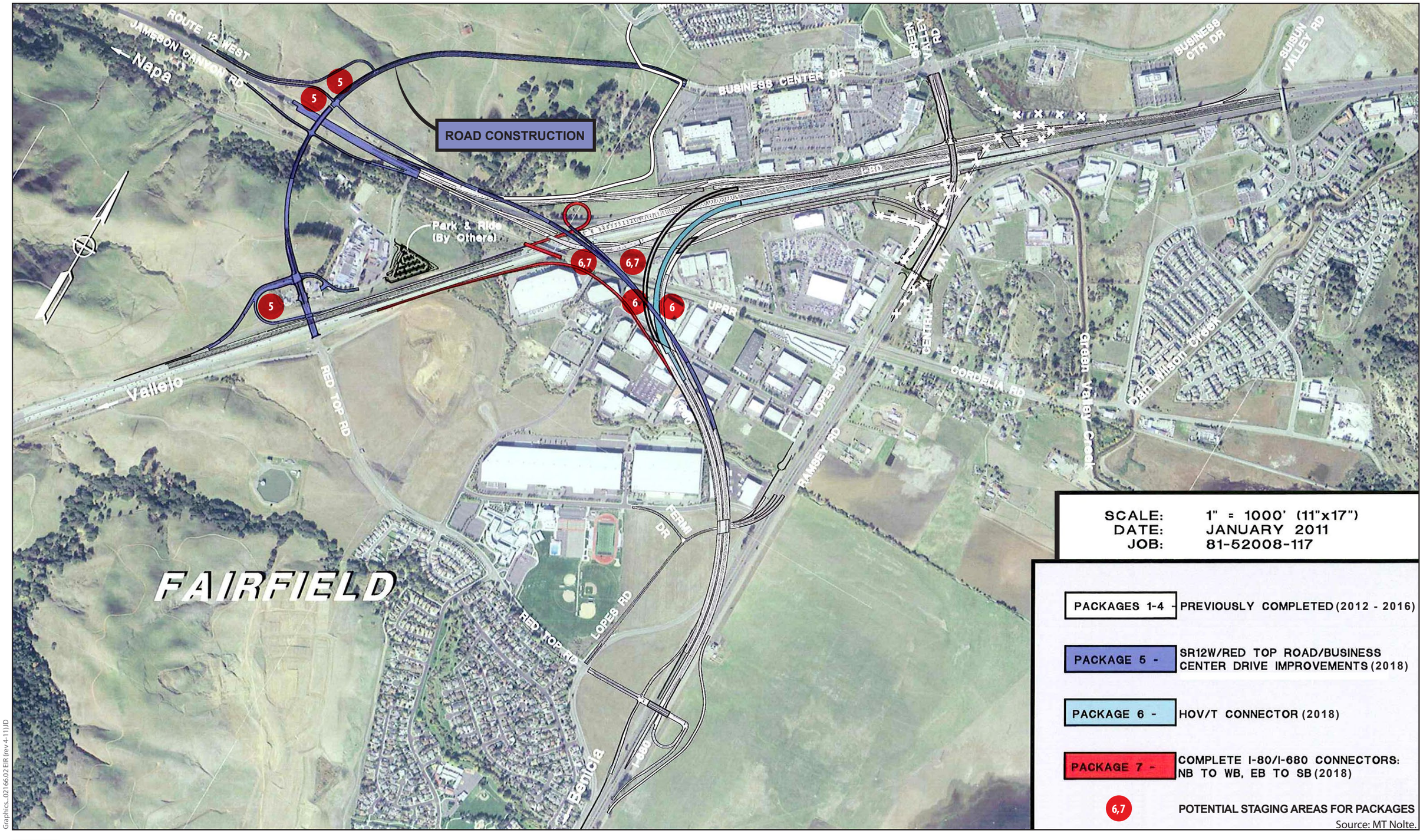
**Figure 1-4**
**Phase 1 Construction Packages 1-4**




Source: MT Nolte.

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**Figure 1-5**
**Phase 1 Construction Packages 5-7**

**Table 1-1. Construction Packages**

| Construction Package Number | Main Elements | Estimated Construction Timing |
|---|---|---|
| 1 | – Construct the WB I-80 to WB SR12W (Jameson Canyon) connector<br>– Widen WB I-80 between the existing I-80/I-680 separation and SR 12W<br>– Reconstruct the west half of the I-80 Green Valley Road interchange | Anticipated construction start 2012; approximately 2-yr construction duration. |
| 2 | – Construct the I-680/Red Top Road interchange<br>– Realign Lopes Road and Fermi Road<br>– Realign Ramsey Road around the proposed I-680/ Red Top Road interchange | Anticipated construction start 2014; approximately 1.5-yr construction duration. |
| 3 | – Construct the WB I-80 to SB I-680 connector<br>– Widen WB I-80 between the I-80/Suisun Valley Road and the I-80/ Green Valley Road interchanges<br>– Reconstruct the WB I-80 bridge over Green Valley Creek<br>– Construct a new WB on-ramp from I-80 at Suisun Valley Road<br>– Construct a new WB off-ramp from I-80 to Green Valley Road<br>– Construct new bridge over Green Valley Creek carrying WB off-ramp to Green Valley Road<br>– Remove the existing I-80/ I-680 connector bridges over I-80 and Green Valley Creek<br>– Remove Neitzel Road<br>– Remove EB I-80 to SB I-680 connector | Anticipated construction start 2014; approximately 2-yr construction duration. |
| 4 | – Construct the NB I-680 to EB I-80 connector<br>– Reconstruct the EB SR12W connector to EB I-80<br>– Reconstruct the EB I-80 off-ramp to Green Valley Road<br>– Reconstruct Green Valley Road on-ramp to EB I-80<br>– Realign both Lopes Road and Green Valley Road to connect to the original I-680 alignment<br>– Widen SR 12E one lane to the south, including widening the culvert for Ledgewood Creek | Anticipated construction start 2016; approximately 2-yr construction duration. FHWA and Caltrans will need to adopt the full new alignment of I-680 and transfer the original alignment to local control |
| 5 | – Construct the NB I-680 to WB SR 12 W connector<br>– Reconstruct the I-80/Red Top interchange<br>– Construct a new SR 12W/Red Top Road interchange<br>– Construct the Red Top Road/Business Center Drive extension | Anticipated construction start 2018; approximately 2-yr construction duration. |
| 6 | – Construct the I-80/I-680 HOV connectors | Anticipated construction start 2018; approximately 2-yr construction duration. |
| 7 | – Construct the NB I-680/WB I-80 loop on-ramp<br>– Construct the EB I-80 connector to SB I-680<br>– Reconstruct the UPRR underpass | Anticipated construction start 2018; approximately 1.5-yr construction duration. Phase 1 complete. |

### 1.3.5 Construction Methods

This section provides an overview of construction methods and describes specifics of construction that could affect sensitive resources.

Work in drainages and wetlands would be restricted to the dry season (June 15–October 15). Work in drainages that support habitat for anadromous fish, such as Green Valley Creek and Ledgewood Creek, would be restricted to the time when fish are not as likely to be present (i.e., the dry season).

Construction may require heavy equipment such as cranes, pile drivers, vibratory and hydraulic hammers, excavators, bobcats, bulldozers, roadheaders,[1] hydraulic excavators or backhoes, scrapers, rubber-tired dump trucks, front-end loaders, load-haul-dumps (LHDs),[2] drill jumbos,[3] front-end loaders and motor graders, sheepsfoot[4] or drum rollers, and asphalt-paving machines.

#### 1.3.5.1 Staging Locations

Potential construction staging areas that will be available to construction contractors are shown in Figures 1-4 and 1-5 and have been considered in assessing potential effects on listed species. Should construction contractors determine that other staging areas within or outside the state ROW are necessary to complete work under the proposed project, the contractor will be required by Caltrans or STA to obtain all necessary environmental clearances associated with the alternative staging areas prior to their use for staging purposes. Staging locations will be used for temporary placement of the items listed below.

- Heavy construction equipment and vehicles.
- Construction materials such as shotcrete (a mixture of concrete, fine aggregate, and water blown pneumatically through a hose); gravel; road base; and rebar.
- Equipment maintenance shops.
- Field offices.
- Restrooms.

[1] A track-mounted unit equipped with a rotating cutter head affixed to a hydraulic boom. Excavated materials are gathered in an apron at the front of the unit and transported by conveyor to the rear of the machine.
[2] A low-profile rubber-tired loader equipped with an oversize bucket.
[3] A self-propelled unit equipped with two or three drills and a man-basket, each mounted on a hydraulic boom.
[4] A hollow steel drum with projecting feet (club-shaped or tapered). The dead weight is provided by placing water or wet sand inside the drum. It is generally used as a towed assembly (although self-propelled units are available) with the drums mounted singly or in pairs.

Access roads linking staging areas to the various work areas would be cleared and graded using equipment such as excavators, bobcats, and bulldozers. Upon project completion, and to the extent practicable, staging location and access roads would be returned to their preproject conditions.

#### 1.3.5.2 Highway and Road Construction

Highway construction for Phase 1 would consist of widening I-80 to the north for approximately 1 mile between a point west of Suisun Valley Road and SR 12W, realignment of I-680, and realignment of the connector between westbound I-80 and SR 12W (Figure 1-3). It would be necessary to acquire additional ROWs to accommodate this project. All additional ROWs would be acquired within the project footprint. Some highway construction would take place in all seven Construction Packages.

Generally, highway construction would consist of cutting and filling to create a roadbed, grading to a maximum depth of 3.3 feet, paving or repaving, and striping or restriping. Highway sections would be constructed or altered to encourage drainage to the sides of the highway (i.e., away from the median).

Roadway excavation would be conducted using equipment such as scrapers, front-end loaders, and motor graders to excavate the area and haul material to construct the embankments necessary to support the proposed roadways. Surplus excavated material may be hauled offsite to an approved commercial disposal site using dump trucks. The location(s) of material borrow and location and type of material disposal would be determined by the contractor. The contractor would be required to obtain any necessary environmental clearances associated with obtaining a material borrow site, or with the disposal or reuse of surplus materials. Once the roadbed has been excavated, the soil would be rolled and vibrated with a sheepsfoot or drum roller to 95% relative compaction.

##### *Structural Section*

The layers making up the structural section of the roadway (other than Portland Cement Concrete pavement) would be placed in short lifts of less than 6 inches. The material would be hauled in, dumped, spread with a motor grader or asphalt-paving machine, and compacted.

### *Fill Walls*

Fill retaining walls would be either Caltrans standard reinforced concrete Type 1 or Type 5 walls with spread footings (no piles) or mechanically stabilized embankment (MSE). Fill walls would be constructed in Construction Packages 1, 3, 4, and 7. Short walls (less than 8 feet tall) are likely to be standard Type 1 or Type 5 walls. Footing excavation would be performed using a backhoe or bobcat. MSE walls are likely to be used for walls taller than 8 feet. An MSE wall consists of reinforced fabric mats placed on compacted soil in roughly 2-foot (vertical) increments. The reinforced mats extend to the edge of the embankment and connect to precast concrete panels.

### *SR 12E Widening*

A third eastbound lane and standard shoulder would be constructed along SR 12E from I-80 east to connect to the existing Webster Street off-ramp immediately east of the SR 12/Pennsylvania Avenue intersection in Construction Package 4 (Figure 1-4). Construction of the lane and shoulder would utilize retaining walls to minimize temporary and permanent disturbance south of SR 12E, and the existing right-of-way fence would remain in place, as shown in Appendix A. Drainage improvements along SR 12E would maintain existing drainage areas and patterns.

### *Red Top Road Extension*

Construction of the extension of Red Top Road to Business Center Drive in Construction Package 5 (Figure 1-5) would include excavation to a maximum depth of 95 feet in some areas prior to grading and paving. A culvert measuring approximately 14 by 14 feet would be constructed northeast of the unnamed drainage labeled OW-161 adjacent to an existing farm road.

#### 1.3.5.3 Culverts and Bridge/Box Culvert Construction

The project would require the expansion and construction of a number of culverts. Tables 1-2 and 1-3 provide information about existing culverts in the project footprint and information about extending some of these culverts as part of this project.

**Table 1-2. Existing Culverts and Proposed Extensions for Culverts less than 36 Inches in Diameter**

| Station | Existing Cross Culvert | | | Proposed Extension | | | Remarks |
|---|---|---|---|---|---|---|---|
| | Diam. (in) | Length (ft) | Material | Diam. (in) | Length | Mat'l | |
| **I-80** | | | | | | | |
| C-80-1 Line | | | | | | | |
| 135+20 | 18 | 250 | CSP | | | | Terminates in 60" CMP |
| 141+10 | 24 | 350 | CSP | | | | Terminates in 60" CMP |
| 146+70 | 18 | 200 | CMP | | | | No change |
| 160+40 | 18/24 | 320 | CSP | 24 | 350 | ACP | |
| **SR12W** | | | | | | | |
| JC 376+60 | 24 | 130 | APC | 24 | 450 | ACP | |
| JC 382+00 | 24 | 120 | CMP / APC | 24 | 500 | ACP | |
| JC 387+00 | 18 | 100 | CMP / APC | 18 | 220 | ACP | |
| CP1-12W Con2 155+00 | 24 | 200 | CMP | 24 | 300 | ACP | |
| **SR 12E** | | | | | | | |
| A 37+30 | 18 | 160 | APC | | | | No change – ties to 60" CIPP |
| A 45+30 | 18 | 160 | APC | | | | No change – ties to 60" CIPP |
| A 48+70 | 18 | 160 | APC | | | | No change – ties to 60" CIPP |
| A 61+25 | 18 | 230 | APC | | | | No change |
| A 72+54 | 18 | 180 | APC | | | | No change |
| A 76+50 | 18 | 180 | APC | | | | No change |
| A 85+00 | 18 | 135 | APC | | | | No change (retaining wall) |
| A 90+00 | 18 | 130 | APC | | | | No change (retaining wall) |
| A 95+00 | 18 | 130 | APC | | | | No change (retaining wall) |
| A 100+00 | 18 | 130 | APC | | | | No change (retaining wall) |
| A 105+50 | 18 | 130 | APC | | | | No change (retaining wall) |
| **I-680** | | | | | | | |

**Table 1-3. Existing Culverts and Proposed Extensions for Culverts at least 36 Inches in Diameter**

| Station | Existing Cross Culvert | | | Proposed Extension | | | Remarks |
|---|---|---|---|---|---|---|---|
| | Diam. (in) | Length (ft | Material | Diam. | Length | Material | |
| **I-80** | | | | | | | |
| C-80-1 Line | | | | | | | |
| 145+30 | 36 | 350 | CSP | | | | No change |
| 145+33 | 48 | 350 | CSP | | | | No change |
| 151+05 | 7ft x 8ft | 230 | RCB | 7ft x 8ft | 260 | RCB | Jameson Creek |
| CP1-80W Line | | | | | | | |
| 203+20 | Dbl 24" | 230 | CMP | 48 | 600 | ACP | |
| 218+50 | 4ft x 8ft | 300 | RCB | 4ft x 8ft | 420 | RCB | |
| 236+00 | 60 | 350 | RCP | | | | No change |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SR12W** | | | | | | | |
| JC 369+70 | 36 | 120 | APC | 36 | 250 | ACP | |
| JC 390+20 | 36 | 150 | APC | 36 | 400 | ACP | |
| **SR 12E** | | | | | | | |
| A 55+60 | 10ft x 11ft | 100 | RCB | 10ft x 11ft | 114 | RCB | |
| A 80+50 | 12ft x 17ft | 110 | RCB | 12ft x 17ft | 124 | RCB | |
| 12-E 186+00 | 5ft x 8ft | 145 | RCB | | | | No change – couldn't find As-Builts |
| **I-680** | | | | | | | |
| B-680 Line 300+00 | 12ft x 8ft | | RCB | | | | Dimensions are estimated–no as-builts– Jameson Creek |

Construction Packages 3 and 4 would require the construction and expansion of several bridges and culverts (Figures 1-3, 1-4, and 1-5). Two bridges cross over Green Valley Creek on I-80 (one supporting the westbound lanes of I-80 and one for the off-ramp to Green Valley Road) (Construction Package 3); the culvert under the realignment of I-680 supports Jameson Canyon Creek (Construction Packages 3 and 4); and the bridge/culvert under the widening of eastbound SR 12E crossing Ledgewood Creek (Construction Package 4). Other bridges are associated with the northbound I-680 to SR 12W connector, the westbound I-80 to southbound I-680 connector, and the westbound I-80 to southbound I-680 connector; this work would occur in Construction Packages 2, 3, and 4 (Figures 1-3, 1-3 and 1-5). These cross Jameson Canyon Creek, Green Valley Creek, and UPRR Bridge.

All ground-disturbing activities associated with bridge reconstruction at Green Valley Creek and culvert work on Jameson Canyon Creek and Ledgewood Creek would occur within the project footprint. Environmentally sensitive habitat areas outside the action area (including creek and riparian habitat) would be protected by installing exclusion fencing along the action area boundary.

### *Bridge Replacement Construction Activities*

The existing bridges over Green Valley Creek would be replaced with single-span structures. The existing Green Valley Creek Bridge on I-80 consists of two separate structures that were joined as part of an HOV lane project in 2007. The three-span bridge measures 80 feet long by 70 feet wide. The piers are pier wall–type support, and the abutments are strutted-type abutments

(low walls with a spread footing foundation). The piers and abutments are supported on spread footings with a seal course (a lean concrete fill, 1–2 feet thick, placed below the footing to seal out groundwater intrusion into the footing excavation during construction).

In Construction Package 3, the existing westbound bridge would be removed and replaced with a single-span structure measuring approximately 103 feet long and 133 feet wide. Additionally, a new single-span bridge carrying the off-ramp to Green Valley Road would be constructed over the creek. This bridge would measure approximately 180 feet long by 39 feet wide.

Construction of the bridge replacement would occur in two segments to accommodate the need to maintain traffic on I-80. The first segment would construct the outside (northernmost) five lanes, while maintaining traffic on the existing structure. The second segment would shift traffic to the new bridge. The work within the creek for each segment is expected to last approximately 4 months and would be scheduled from June 15 to October 15 of the given construction year. Bridge demolition would occur when Central Valley fall-run/late-fall-run Chinook salmon (*Oncorhynchus tshawytscha*) and central California coast steelhead (*Oncorhynchus mykiss*) are less likely to be present in the action area to minimize effects on these species. In-stream and bank work have been planned for a single construction season beginning no earlier than June 15 of the construction year and ending on or before October 15 of that year. Any work occurring before June 15 or after October 15 would be restricted to the road or bridge surface only, and all work in or adjacent to a creek would be done with water quality best management practices (BMPs) in place.

Construction equipment would access the construction site from the north side of I-80. A staging area would be located within the curve of the I-680 entrance to westbound I-80.

Construction of the bridge would involve the following activities.

- Bridge abutment locations would be scarified and then excavated to the bottom of the abutment or pile cap using backhoes or bobcats. In some cases, the area adjacent to the abutment would be overexcavated by several feet to ensure that low-expansion material is adjacent to the abutment and wing walls.

- Temporary cofferdams would be constructed both upstream and downstream from the bridge, and a water diversion system using pipes would be installed. The locations of the cofferdams would be at least 20 feet from the limit of the existing bridge.
- Pile driving would be necessary to construct new bridge abutments for both bridges over Green Valley Creek. Piles would be located at the top of the creek bank and are anticipated to be 12-inch-square piles driven to a depth of approximately 70 feet. A vibratory hammer would be used when feasible. The number of strikes would depend on the loading and soil characteristics. Pile driving equipment would be operated from behind the top bank.
- Concrete abutments or pile caps would be constructed above the piles.
- Wooden or steel falsework would be placed within the creek (banks and channel) once the abutments and columns have been constructed as necessary to support the construction of the cast-in-place concrete box girder structures.
- When the reinforcement is set, the concrete would be placed for the superstructure. Once the concrete for the superstructure has hardened the tendons would be tensioned.
- The last elements of major construction for the bridges would be bridge railings, approach slabs (placed on the embankment approaches to the bridge), and slope paving where required.
- To the extent practicable, disturbed portions of Green Valley Creek (bed and bank) would be restored to preproject conditions upon completion of construction. This may include grading and contouring the site, and seeding or planting with native plants as appropriate.

### *Culvert Construction Activities*

Culvert construction would take place at Ledgewood Creek in Construction Package 3 and at Jameson Canyon Creek in Construction Packages 3 and 4 (Figures 1-3, 1-4, and 1-5). Construction associated with the culverts is expected to last approximately 4 months and would be scheduled during the dry season (June 15–October 15).

Construction would involve the activities listed below.

- Temporary cofferdams (made of gravel, fabric, and pipe) would be constructed both upstream and downstream from the culvert; a water diversion system using pipes would be

installed to facilitate dewatering of the channel within the cofferdam during construction while bypassing creek flow. The cofferdams would be approximately 20 feet from the limit of the existing culvert.

- Temporary cofferdams would be constructed to facilitate excavation of existing footings. The cofferdams would be constructed of gravel wrapped in fabric and would be slightly larger than the footing plan dimensions.
- Vibratory equipment would be used to compact soil if feasible.
- Falsework would be placed within the creek (banks and channel) as necessary to support construction of the cast-in-place (poured) concrete box culvert.
- Falsework would be removed after concrete has set.
- The concrete invert slab (i.e., invert of the culvert) would be extended to the edge of the widened culvert.
- To the extent practicable, disturbed portions of Ledgwood Creek and Jameson Canyon Creek (bed and bank) would be restored to preproject conditions upon completion of construction. This may include grading and contouring the site, and seeding or planting with native plants as appropriate.

### *Ledgewood Creek Culvert*

In Construction Package 4, the culvert carrying Ledgewood Creek would be extended 15 feet to the south to accommodate an additional lane for SR 12E. The existing crossing of SR 12E over Ledgewood Creek is a series of five culverts, each measuring 16.5 feet wide and supported by wall piers.

Because Ledgewood Creek provides habitat for anadromous fish, it is necessary to restrict in-stream work to outside the season when Central Valley fall-run/late-fall-run Chinook salmon and central California coast steelhead are less likely to be present. Construction associated with the culvert is expected to last approximately 4 months and would be scheduled during the dry season (June 15–October 15) for ease of operation and to avoid potential effects on fish.

*Jameson Canyon Creek Culvert*

The culvert carrying Jameson Canyon Creek would be constructed under the new alignment of I-680. This culvert would be a two-box culvert, with each box measuring approximately 12 feet wide by 8 feet high.

Jameson Canyon Creek provides aquatic habitat for California red-legged frog (*Rana draytonii*) (CRLF) through connectivity to known breeding sites, but does not provide habitat for anadromous fish due to a downstream barrier. It is necessary to restrict in-stream work to the season when CRLF are less likely to be present. Construction associated with the culvert is expected to last approximately 4 months and would be scheduled during the dry season (June 15–October 15) for ease of operation and to avoid potential effects on CRLF.

### 1.3.6 Reasonable and Prudent Measures for Avoidance and Minimization of Effects

Caltrans will incorporate general avoidance and minimization measures and BMPs into project construction to avoid and minimize potential effects on listed species. These measures include, but are not limited to, those listed below. Species specific-avoidance and minimization measures are provided in Chapter 4.

1. *Seasonal work restrictions*. The Migratory Bird Treaty Act (MBTA) limits vegetation clearing throughout the proposed project area to the non-nesting season (September 1–January 31) to the extent possible. Vegetation removal work outside this window requires preconstruction nest clearance surveys. Other work windows are described in Chapter 4.

2. *Minimize nighttime work*. To the extent practicable, nighttime construction will be minimized to avoid effects on nocturnally active listed species, especially for those areas adjacent to habitat potentially supporting federally listed species. When nocturnal work is to be conducted in areas adjacent to potential habitat, all lighting will face away from potential habitat.

3. *Provide environmental awareness training*. Before the onset of construction activities, a qualified biologist will conduct an education program for all construction personnel. The training will include a description of special-status species and their habitats, the occurrence of these species within the action area, an explanation of the status of these species and

protection under FESA, the measures to conserve listed species and their habitats as they relate to the work site, and boundaries within which construction may occur. A fact sheet conveying this information will be prepared and distributed to all construction crews. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all the avoidance and minimization measures and implications of FESA.

4. *Environmentally sensitive area fencing.* Prior to the start of construction, specific project locations that are associated with listed species will be identified and designated as environmentally sensitive areas (ESAs) and shown on project design plans. A qualified biologist will conduct preconstruction surveys of these areas, including any temporary work areas where federally listed species could occur. Prior to construction in these areas, the ESAs will be delineated with high-visibility orange fencing and signed for avoidance. Temporary work areas include the active construction site and all areas providing support for the project such as areas used for vehicle parking, equipment and material storage and staging, and access roads. The ESAs will be monitored during construction and the ESA fencing will remain in place throughout the duration of the project-related activities in that area. The bid solicitation package Special Provisions will clearly describe acceptable fencing material and prohibited construction-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs. In addition, hydrological features (e.g., topographic depressions, drainage ditches, culverts) outside the project footprint will not be manipulated (e.g., rerouted, dredged, filled, graded). This will avoid potential effects on wetlands and waters outside the project footprint that are hydrologically connected to wetland features within the project footprint.

5. *Wildlife exclusion fencing.* Prior to the start of construction, specific areas associated with federally listed species that require exclusion fencing will be identified by a USFWS-approved biologist and shown on the project design plans. The installation of the wildlife exclusion fencing (WEF) will be directed by the qualified biologist and the Resident Engineer based on habitat suitability. The bid solicitation package Special Provisions will clearly describe acceptable fencing material and proper WEF installation and maintenance. The WEF will remain in place throughout the duration of construction activities and will be regularly inspected and fully maintained. The WEF will be completely removed upon

completion of project-related activities within these areas and the areas returned to preconstruction condition or better.

6. *Implementation of BMPs*. Stormwater pollution prevention plans (SWPPPs) and erosion control BMPs will be developed and implemented to minimize any wind- or water-related erosion and will be in compliance with the requirements of the Regional Water Quality Control Board. The design staff will include provisions in construction contracts for measures to protect sensitive areas and prevent and minimize stormwater and non-stormwater discharges. Protective measures will include, at a minimum, those listed below.

    a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or watercourses.

    b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet from watercourses, except at established commercial gas stations or established vehicle maintenance facilities.

    c. Concrete wastes will be collected in washouts and water from curing operations will be collected and disposed of. Neither will be allowed into watercourses.

    d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

    e. Dust control measures will include use of water trucks and organic tackifiers to control dust in excavation-and-fill areas, covering temporary access road entrances and exits with rock (rocking), and covering of temporary stockpiles when weather conditions require.

    f. Where necessary, coir rolls or straw wattles will be installed along or at the base of slopes during construction to capture sediment. Chapter 4 provides greater detail on measures to prevent take of listed species that may get caught in plastic netting or erosion control matting.

7. *Construction site management practices*. The following site restrictions will be implemented to avoid or minimize effects on listed species and their habitats.

a. A speed limit of 20 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.

b. Construction access, staging, storage, and parking areas will be located within the Caltrans project ROW or temporary easements and outside of any designated ESA. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.

c. For onsite storage of pipes and conduits and other materials that could provide shelter for listed animals, an open-top trailer will be used to elevate the materials above ground. This will reduce the potential for animals to climb into the conduits and other materials.

d. All food and food-related trash items will be enclosed in sealed trash containers and removed completely from the site at the end of each day.

e. No pets of project personnel will be allowed anywhere in the action area during construction.

f. No firearms will be allowed on the project site except for those carried by authorized security personnel or local, state, or federal law enforcement officials.

8. All equipment will be maintained such that there will be no leaks of automotive fluids such as gasoline, oils, or solvents, and a Spill Response Plan will be prepared.

9. *Avoidance of entrapment*. To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered at the close of each working day with plywood or other suitable material, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled they must be thoroughly inspected for trapped animals. All replacement pipes, culverts, or similar structures stored in the action area overnight will be inspected before they are subsequently moved, capped, or buried. If at any time a listed species is discovered, the Resident Engineer and USFWS-approved biologist will be immediately informed. The animal will be allowed to move out of the area on its own volition.

10. *Vegetation removal.* Vegetation will be cleared only where necessary and will be cut approximately 4 inches above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. All clearing and grubbing of woody vegetation will be done using hand tools, small mechanical tools, or backhoes and excavators. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site.

11. *Biological monitor*. A USFWS-approved biologist will be present during all construction-related activities in sensitive habitats. If special-status species are discovered during these activities, the USFWS-approved biologist, through the Resident Engineer, will halt all work within 50 feet of the animal and contact USFWS to determine how to proceed.

12. *Restoration of disturbed areas.* All slopes or unpaved areas temporarily disturbed by construction activities will be reseeded with native grasses and shrubs to stabilize and prevent erosion at least 3 days prior to a forecasted rain event. The temporarily disturbed areas will be restored to preproject conditions to the maximum extent practicable. Where disturbance includes the removal of trees, native species will be replanted.

13. *Reduce spread of invasive species.* To reduce the spread of invasive, nonnative plant species and minimize the potential decrease of palatable vegetation for wildlife species, Caltrans will comply with Executive Order 13112. This order is intended to prevent the introduction of invasive species and provide for their control to minimize adverse economic, ecological, and human health effects. In the event that noxious weeds are disturbed or removed during construction-related activities, the contractor will be required to contain the plant material associated with these noxious weeds and dispose of them in a manner that will not promote the spread of the species. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the area of disturbance should be covered to the extent practicable with heavy black plastic solarization material until the end of project construction.

The fundamental duty of a federal lead agency under FESA Section 7 is to ensure that federal actions do not jeopardize the continued existence of listed species. As noted on page 4-53 of the *Endangered Species Consultation Handbook*, "Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take" (U.S. Fish and Wildlife Service and National Marine Fisheries Service 2008). Although not required under Section 7 of the ESA, Caltrans or STA may provide compensatory mitigation as part of its project description pursuant to other state and federal statutory authorities, policies, or regulations.

Any proposed compensatory mitigation for impacts on listed species under the proposed project will be provided before or concurrent with project effects for each of the seven Construction Packages. The timing of the avoidance, minimization, and compensatory mitigation measures for all but the first Construction Package are subject to change and would be based on construction phasing and access to properties. Caltrans or STA[5] will demonstrate measurable progress in providing the described compensatory mitigation for effects on listed species as described in Chapter 4 for habitat loss associated with each Construction Package prior to or concurrent with ground disturbance for that Construction Package.

## 1.4 Summary of Consultation to Date

Prior to 2009, Caltrans, as the federal lead agency, in coordination with STA and ICF International (ICF), requested technical assistance from USFWS. Requests for technical assistance led to recommendations by USFWS that Caltrans initiate formal consultation pursuant to FESA.

**March 20, 2008.** Ms. Stephanie Myers contacted USFWS biologist Peter Johnsen to initiate coordination concerning the potential for effects on federally listed species in the project vicinity. Mr. Johnsen requested a project description and stated that he would be Caltrans' contact for Section 7 coordination and consultation. Ms. Myers emailed him a copy of the project description on March 25, 2008.

[5] STA is the project sponsor and as such may be responsible for implementation of compensatory mitigation discussed in this BA or that may be included in the BO issued by USFWS.

**November 19, 2009.** Ms. Lisa Webber, Ms. Myers, and Ms. Shahira Ashkar of ICF met with Caltrans biologist Mr. Ahmad Hashemi and USFWS biologist John Cleckler to review the interchange project, discuss the approach to analysis for the BA, and discuss listed species issues including but not limited to CRLF, its critical habitat, and callippe silverspot butterfly (*Speyeria callippe callippe*).

**March 26, 2010.** ICF obtained a species list from the USFWS website of all federally proposed and listed endangered and threatened species and critical habitat that could occur in the project vicinity.

**June 28, 2010.** Mr. Hashemi, Stuart Kirkham, and Howell Chan from Caltrans; Dale Dennis and Janet Adams from STA; Stephanie Myers and Shahira Ashkar from ICF; Scott Steinwert from CirclePoint; Mike Lohman from Mark Thomas Company; and John Cleckler from USFWS met to discuss the project schedule and alternatives, Phase 1 as the project for consultation under Section 7, listed species that would be addressed in the BA, potential project effects on listed species, and potential conservation measures.

**July 15, 2010.** An email from USFWS (Cleckler pers. comm.) to Ms. Myers and forwarded to Mr. Hashemi summarized their review of the CRLF site assessment. Mr. Cleckler stated that USFWS would consider the project area north of I-80 to be potential aquatic and upland CRLF habitat and would likely limit the consideration of potential CRLF habitat on the south side of I-80 to where the project intersects Jameson Canyon Creek. He further noted that much of this area is within or adjacent to designated critical habitat (Units SOL-2 and SOL-3). USFWS adviseds STA and Caltrans to incorporate frog-friendly undercrossings (not just hydrologically connected) in the design of the new road through the Mangels property to minimize the effects of road mortality and population fragmentation

**September 13, 2010.** Email from USFWS (Cleckler pers. comm.) provided information and photographs of tunnels and directional fencing constructed in a new roadway in Livermore, California, to allow safe crossing by California tiger salamanders (*Ambystoma californiense*) (CTSs). Mr. Cleckler recommended considering this application for CRLF crossings on the new roadway that will connect Red Top Road and Business Center Drive.

**October 18, 2010.** USFWS provided comments, prepared by Cay Goude, Assistant Field Supervisor, on the draft EIR/EIS. The following comments are relevant to the BA.

- USFWS stated that it concurs with the draft EIR/EIS that vernal pool fairy shrimp, vernal pool tadpole shrimp, callippe silverspot butterfly, valley elderberry longhorn beetle (VELB), and California red-legged frog may be affected by the project. However, they did not concur that implementation of avoidance, minimization, and/or mitigation measures identified will "ensure" that the project will not result in adverse effects in all cases stated in the draft EIR/EIS. Therefore, USFWS recommends that Caltrans obtain authorization for incidental take of the appropriate listed species prior to certification of the final EIR/EIS.
- USFWS does not concur that the project area is outside the range of CTS and recommends that a site assessment and, if appropriate, a survey for this species be completed.
- USFWS stated that the 2004 larval host plant surveys for callippe silverspot are only good for 2 years, are outdated, and should be conducted for the BA. Caltrans should also include an assessment of hilltop and ridgeline breeding habitat.

**November 18, 2010.** A field visit was conducted by Ms. Myers and Ms. Webber from ICF; Mr. Hashemi from Caltrans; and John Cleckler and Chris Nagano from USFWS to view potential CTS, Contra Costa goldfields (CCG), and branchiopod habitat within the project impact area south of SR 12E. The site visit also included an examination of callippe silverspot butterfly and CRLF habitat near Business Center Drive and SR 12W.

Caltrans completed informal consultation with the National Marine Fisheries Service (NMFS) in 2010.

## 1.5 Document Preparation History

This BA is based on the best available scientific and commercial data and the most current design data, including the following technical reports prepared for the Interstate 80/Interstate 680/State Route 12 Interchange Project.

- *Interstate 80/Interstate 680/State Route 12 Interchange Natural Environmental Study* (ICF Jones & Stokes 2010a).

- *Interstate 80/Interstate 680/State Route 12 Interchange Draft EIR/EIS* (ICF Jones & Stokes 2010b).
- *Site Assessment for California Red-legged Frog for the Interstate 80/Interstate 680/State Route 12 Interchange Project*, submitted to the U.S. Fish and Wildlife Service on March 3, 2009, for review (ICF Jones & Stokes 2009a).
- *Preliminary Delineation of Waters of the United States for the Interstate 80/Interstate 680/State Route 12 Interchange Project* (ICF Jones & Stokes 2008); field verified in January 2009, final verification on July 9, 2009.
- *I-80/I-680/SR 12 Interchange Project Fish Passage Assessment for Green Valley, Ledgewood, and Suisun Creeks, Solano County, California* (ICF Jones & Stokes 2009b).

# Chapter 2 Study Methods

## 2.1 Impact Area and Study Area Definitions

The project footprint, action area, and BSA are defined as follows: (1) project footprint—the area directly affected by the proposed action; (2) action area—the area directly or indirectly affected by the proposed action and evaluated pursuant to FESA (3) BSA—the area evaluated for potential impacts on natural resources from the proposed roadway project that were studied by the biologist(s). These terms are discussed in depth in the following sections.

### 2.1.1 Project Footprint

The project footprint is the area that will be directly affected (permanently and temporarily) by the proposed project—i.e., impacts caused immediately and locally by the proposed project (Figure 1-2). It includes the limit of excavation and fill plus all access roads and areas required for operating, storing, and refueling construction equipment. It is the maximum extent of ground-disturbing activities from the various construction actions. Impacts associated with the proposed project include but are not limited to soil disturbances such as vegetation clearing and the removal of habitat through installation and removal of hardscape.

### 2.1.2 Action Area

The project action area includes both directly affected areas (i.e., the project footprint) and indirectly affected areas (Figure 1-2). Indirect impacts are those impacts that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur (50 CFR, 402.02).

Indirect effects will largely be avoided through the implementation of design strategies or avoidance and minimization measures including those for water quality, erosion control, species protection, and construction site BMPs. With implementation of these avoidance and minimization measures, indirect effects will largely be discountable or immeasurable.

Indirect impacts could occur on CRLFs dispersing within 1 mile of the breeding pond on the Mangels property that will be directly affected by the proposed project. Callippe silverspot butterflies are known to disperse more than 1 mile from larval host plants (Johnny jump-ups [*Viola pedunculata*]). Larval host plants and nectar source plants have been located on Mangels property. Therefore, the potential action area encompasses a 1-mile radius from this area.

### 2.1.3 Biological Study Area

The BSA is the approximately 574-acre area evaluated to assess the natural environment and biological diversity in the project vicinity (Figure 1-2). The BSA encompasses the project footprint plus an additional area 250 feet from the project footprint. The area 250-foot buffer was physically surveyed by biologists.

The BSA contains riparian habitat, wetlands, and vernal pools. Where seasonal wetlands are bisected by the 250-foot buffer, the entire wetland area has been included in the BSA. The USFWS Sacramento field office has asserted that temporary effects, for the purpose of Section 7 consultations, are defined as effects on potential habitat that is returned to baseline or better conditions within a year following the disturbance and where there would be no ongoing disturbance such as mowing or herbicide spraying. This definition has not been codified in regulations or in FESA itself, nor is there any written guidance from USFWS in using such a definition. As defined, any physical areas that are currently affected by Caltrans maintenance activities should be quantified and removed from the effects analysis because the definition describes the area as non-viable habitat.

The characterization of whether an effect is permanent or temporary is more complex and cannot be assessed using only a metric of time. Whether an effect is permanent or temporary is a function of the following: (1) the specific resource and its sensitivity to disturbances; (2) the intensity, duration, and nature of the effects; (3) the likelihood the affected species would altogether abandon an area and not utilize it for dispersal, foraging, breeding, and other essential life functions; (4) the manner and timing as to when the disturbed areas would be returned to baseline conditions; (5) the ability for listed species to utilize the areas postconstruction; and (6) the frequency, manner, and timing of postconstruction maintenance activities.

## 2.2 Listed or Proposed Species Potentially Occurring in the Biological Study Area

Table 2-1 provides the species, federal and state listing status, habitat and species presence / absence, and comments describing the plant and wildlife species with potential to occur in the project action area based on USFWS (U.S. Fish and Wildlife Service 2010) and California Natural Diversity Database (CNDDB) (2009) species lists (Figure 2-1, Figures 2-2a and 2-2b, and Appendices B and C).

## 2.3 Studies Required

Potential biological resources associated with the proposed project were identified through agency coordination, review of existing information, and field surveys. The following information was reviewed during preparation of this BA.

- USFWS (2010) list of listed, proposed, and candidate species for the Sears Point, Denverton, Honker Bay, Cuttings Wharf, Dozier, Napa, Fairfield South, Fairfield North, Benicia, Mt. Vaca, Mt. George, Mare Island, Cordelia, Elmira, Vine Hill, Birds Landing, and Allendale U.S. Geological Survey (USGS) 7.5-minute quadrangles (Appendix B ).
- CNDDB (2011) records search for the Sears Point, Denverton, Honker Bay, Cuttings Wharf, Dozier, Napa, Fairfield South, Fairfield North, Benicia, Mt. Vaca, Mt. George, Mare Island, Cordelia, Elmira, Vine Hill, Birds Landing, and Allendale USGS 7.5-minute quadrangles (Figures 2-2a and 2-2b and Appendix C).
- The California Native Plant Society's (CNPS's) *Inventory of Rare and Endangered Plants of California* (2010 records search for the Sears Point, Denverton, Honker Bay, Cuttings Wharf, Dozier, Napa, Fairfield South, Fairfield North, Benicia, Mt. Vaca, Mt. George, Mare Island, Cordelia, Elmira, Vine Hill, Birds Landing, and Allendale USGS 7.5-minute quadrangles (Appendix C).
- *Soil Survey of Solano County, California* (Bates 1977).
- North Connector Project floristic and wildlife surveys, BA prepared for Solano County (Monk and Associates 2004).

- Jameson Canyon rare plant survey report, prepared for Caltrans (California Department of Transportation 2011).
- Jameson Canyon branchiopod survey report, prepared for Caltrans (California Department of Transportation 2010).
- Field surveys conducted by ICF biologists (Table 2-2).
- *Callippe Silverspot Butterfly (*Speyeria callippe callippe*) 5-Year Review: Summary and Evaluation* (U.S. Fish and Wildlife Service 2009b).
- *Final Administrative Draft Solano Multi-Species Habitat Conservation Plan* (LSA 2009).
- *California Tiger Salamander Habitat Study and Conceptual Conservation Plan* (Vollmar Consulting 2010).

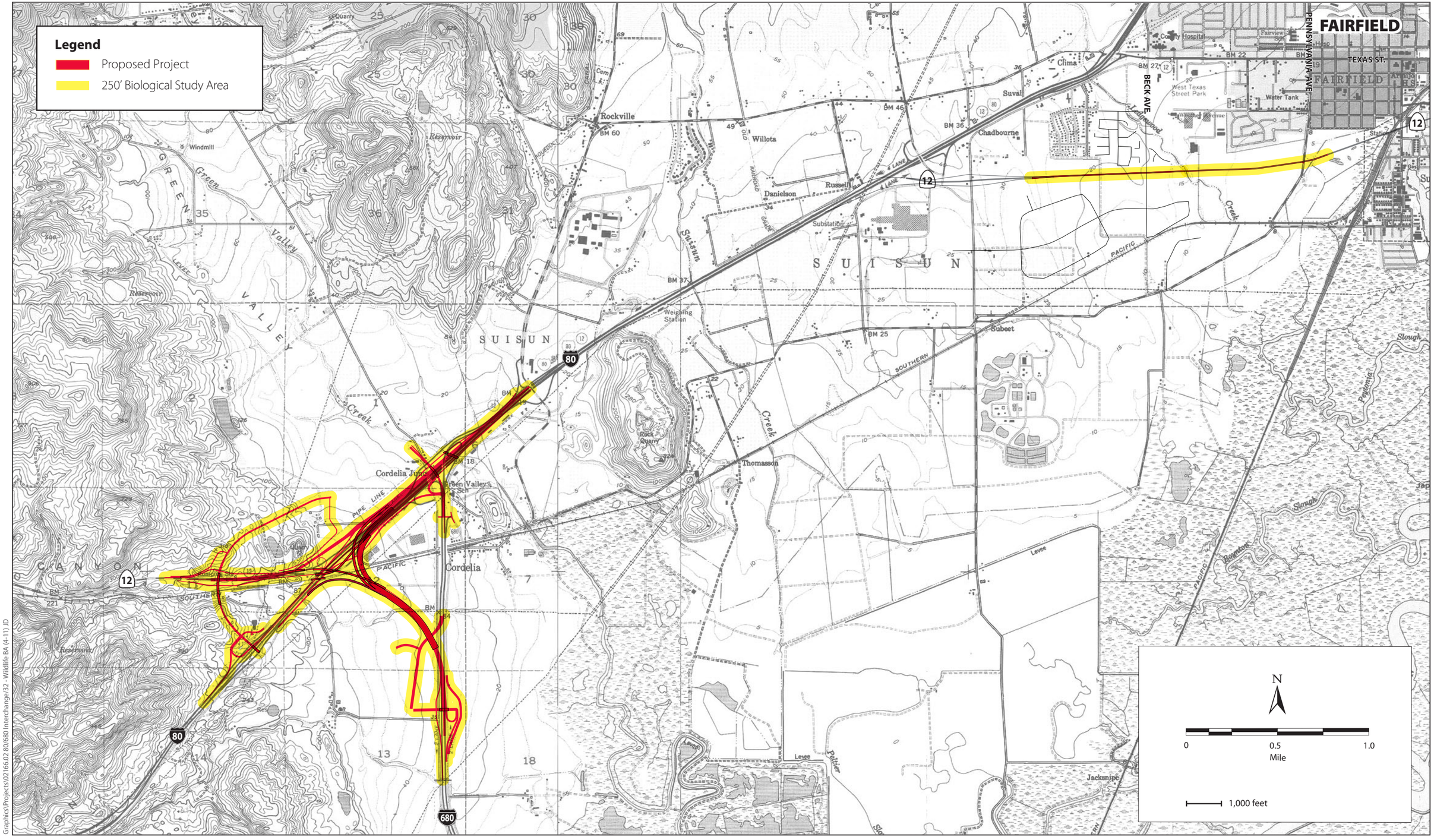


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**Figure 2-1**
**Phase 1 Biological Study Area**

# Figure 2-2a
# Distribution of Federally Listed Plant Species Within The Project Vicinity

## Legend

- Phase 1 Project Footprint
- Phase 1 Biological Study Area (BSA) (250' Radius Around Project Footprint)
- Phase 1 Project Footprint 5-mile Radius

**CNDDB - Federally Listed Species**

- Plants

Contra Costa goldfields 7
Contra Costa goldfields 28
showy rancheria clover 13
Contra Costa goldfields 22
Contra Costa goldfields 19
Contra Costa goldfields 3
Contra Costa goldfields 42
soft bird's-beak 19
soft bird's-beak 21
Suisun thistle 1
Contra Costa goldfields 33
Suisun thistle 7
Contra Costa goldfields 20
soft bird's-beak 29
Suisun thistle 5
soft bird's-beak 16
soft bird's-beak 22
Suisun thistle 4
showy rancheria clover 23
Tiburon paintbrush 5

Source: CNDDB Sept 2010, ESRI 2011

0 0.5 1 2
Miles

Project Vicinity

K:\PROJECTS_1\180680\02166_02\MAPDOC\BA\FIG_2_2A_CNDDB_PLANTS_20110201.MXD ME (02-02-11)

# Figure 2-2b
# Distribution of Federally Listed Animal Species Within The Project Vicinity

## Legend

- Phase 1 Project Footprint
- Phase 1 Biological Study Area (BSA) (250' Radius Around Project Footprint)
- Phase 1 Project Footprint 5-mile Radius

**CNDDB - Federally Listed Species**

- Animals

**Solano Multi-Species HCP**

- Callippe Silverspot Butterfly[1] (8 total)

1 = No CNDDB Occurences
Sources: CNDDB Sept 2009, ESRI 2011

0 0.5 1 2
Miles

Project Vicinity

valley elderberry longhorn beetle 93
valley elderberry longhorn beetle 92
valley elderberry longhorn beetle 192
vernal pool tadpole shrimp 158
vernal pool fairy shrimp 331
vernal pool fairy shrimp 399
salt-marsh harvest mouse 167
salt-marsh harvest mouse 112
salt-marsh harvest mouse 71
salt-marsh harvest mouse 114
vernal pool fairy shrimp 184
valley elderberry longhorn beetle 211
California red-legged frog 820
salt-marsh harvest mouse 121
vernal pool tadpole shrimp 97
California clapper rail 95
California clapper rail 94
vernal pool tadpole shrimp 111
salt-marsh harvest mouse 153
salt-marsh harvest mouse 166
salt-marsh harvest mouse 142
California tiger salamander 485
California red-legged frog 1062
California red-legged frog 660
California clapper rail 80
California clapper rail 96
California red-legged frog 896
salt-marsh harvest mouse 143
California red-legged frog 402
California clapper rail 67
Sacramento splittail 4
salt-marsh harvest mouse 122
salt-marsh harvest mouse 179
California clapper rail 97
California red-legged frog 228
California red-legged frog 403
California red-legged frog 77
salt-marsh harvest mouse 111
salt-marsh harvest mouse 149
salt-marsh harvest mouse 13
California red-legged frog 416
California red-legged frog 290
California red-legged frog 237
California clapper rail 86
California red-legged frog 289
California red-legged frog 917
California red-legged frog 857
California red-legged frog 306
Sacramento splittail 5
California clapper rail 98
California red-legged frog 950
American peregrine falcon 29

K:\ PROJECTS_1 \ 80680 \ 02166_02 \ MAPDOC \ BA \ FIG_2_2B_CNDDB_ANIMALS_20101229.MXD ME (12-29-10)

**Table 2-1. Federally Listed Plants and Wildlife Identified as Having Potential to Occur in the Action Area**

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| **Plants** | | | | | | |
| Baker's stickyseed (*Blennosperma bakeri*) | E/E | Endemic to Sonoma County. | Vernal pools, mesic valley and foothill grassland; 33–380 feet. | Yes | No | BSA is outside the species range. Species occurs only in Sonoma County (Inner Coast Ranges) and was not observed during blooming-period surveys. |
| Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*) | E/T | San Francisco Bay Area. Marin, Napa, and Santa Clara Counties. | Serpentine grasslands, 200–1,300 feet. | No | No | No suitable vegetation communities or soils are present in the BSA. |
| Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*) | E/– | Suisun Marsh. Solano County. | Salt marsh, 0–3 feet. | No | No | No suitable vegetation communities are present in the BSA. |
| Soft birds-beak (*Cordylanthus mollis* ssp. *mollis*) | E/R | San Francisco Bay region and Suisun Marsh. Contra Costa, Marin, Napa, Solano, Sacramento, and Sonoma Counties. | Tidal salt marsh, 0–10 feet. | No | No | No suitable vegetation communities or hydrologic conditions are present in the BSA. |
| Contra Costa goldfields (*Lasthenia conjugens*) | E/– | Contra Costa, Napa and Solano Counties. | Alkaline or saline vernal pools and swales, below 1,550 feet. | Yes | Yes | Suitable vegetation communities and soils are present, and the species is present in the BSA, south of SR 12E, west and east of Pennsylvania Avenue. Species is not present in the project footprint. |
| Contra Costa goldfields (*Lasthenia conjugens*) Critical habitat | CH – (Unit #5B) | Contra Costa, Napa and Solano Counties. | Alkaline or saline vernal pools and swales, below 1,550 feet. | Yes | Yes | Project footprint will be limited to areas that do not contain the Constituent Elements for CCGF critical habitat. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| Colusa grass (*Neostapfia colusana*) | T/E | Central Valley. Colusa, Glenn, Merced, Solano, Stanislaus, and Yolo Counties. | Adobe soils of vernal pools generally below 660 feet. | No | No | Potentially suitable habitat is present in seasonal wetlands in the BSA, and heavy clay soils may occur in the BSA, but species was not observed during blooming-period surveys. |
| Antioch Dunes evening-primrose (*Oenothera deltoides* ssp. *howellii*) | E/E | Northeast San Francisco Bay region, known from three native occurrences; Contra Costa and Sacramento Counties. | Inland dunes generally below 100 feet. | No | No | No suitable vegetation communities or soils are present in the BSA. |
| San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*) | T/E | Scattered locations along east edge of the San Joaquin Valley and adjacent foothills, from Stanislaus County to Tulare County. | Vernal pools, 30–2,500 feet. | Yes | No | Potentially suitable habitat is present in nonnative annual grasslands in the BSA, but species was not observed during blooming-period surveys. |
| Keck's checker-mallow (*Sidalcea keckii*) | E/– | Colusa, Fresno, Merced, Napa, Solano, Tulare, and Yolo Counties. | Serpentine clay soils in cismontane woodland, valley and foothill grassland; 400–1,400 feet. | No | No | No suitable soils are present in the BSA. |
| Showy Indian clover (*Trifolium amoenum*) | E/– | Coast Range foothills in the San Francisco Bay region, currently known from Marin County. | Low elevation grasslands, including swales and disturbed areas, sometimes on serpentinite soils; 13–1,360 feet. | Yes | No | An area of suitable habitat is present in the BSA, but species was not observed there during surveys conducted in 2003. This area was not accessible for recent surveys. (Monk & Associates 2004). |
| Solano grass (*Tuctoria mucronata*) | E/R | Scattered distribution along eastern Central Valley and foothills from Shasta County to Tulare County. | Dry vernal pools; 100–3,510 feet. | Yes | No | Potentially suitable habitat is present in seasonal wetlands in the BSA, but species was not observed during blooming-period surveys. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| **Invertebrates** | | | | | | |
| Callippe silverspot butterfly (*Speyeria callippe callippe*) | E/– | USFWS currently recognizes two populations of callippe silverspot butterfly, one in San Bruno Mountain, San Mateo County; and a second in Cordelia Hills, Solano County | Adult silverspot occurs in hilly terrain with a mixture of topographic relief, where adults can congregate on prominent hilltops in search of potential mates. The adult lays its eggs where Johnny jump-ups (*Viola pedunculata*) grow. Larvae feed on Johnny jump-up plants, whereas adults feed on native mints, California buckeye, and nonnative thistles. | Yes | No | There is suitable larval habitat and adult nectar plants near the BSA (see Figure 3-1). Two distinct populations of Johnny jump-up plants were located within the BSA during March 2004 floristic surveys (Monk & Associates 2004) (see Figure 3-1). |
| Myrtle silverspot butterfly (*Speyeria zerene myrtleae*) | E/– | Known from Marin and Sonoma Counties. Southernmost population in San Mateo County possibly extirpated. | Coastal grassland and vegetated dunes with sufficient wildlfowers for adult feeding, including mints, seaside daisy, gumplant, sand verbena and nonnative bull thistle, Larvae feed on plants in the Viola genus, typically Viola adunca. Usually found less than 3 miles from the coast in wind-sheltered areas below 820 feet. | No | No | BSA is outside the species geographic range. |
| Delta green ground beetle (*Elaphrus viridus*) | T/– | Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve in central Solano County. | Sparsely vegetated edges of vernal lakes and pools, occurring up to 250 feet from pools. | No | No | BSA is outside the species geographic range. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) | T/– | Streamside habitats below 3,000 feet throughout the Central Valley. | Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant. | Yes | Yes | Fifteen elderberry shrubs are present in the BSA, with viable stem diameters 10 will be directly affected by the project, two will be indirectly affected and three will have no effect due to the fact that they are 100 feet outside of the action area. . |
| Conservancy fairy shrimp (*Branchinecta conservatio*) | E/– | Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties. | Large, deep vernal pools in annual grasslands. | No | No | —no large, deep vernal pool habitat was identified in BSA during habitat assessment surveys. |
| Vernal pool fairy shrimp *(Branchinecta lynchi)* | T/– | Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also in Riverside County. | Common in vernal pools; also found in sandstone rock outcrop pools. | Yes | No | Habitat is present in the BSA. Vernal Pool Critical Habitat Units 12A and 12B are located in Napa County, approximately 6 miles west of the BSA and ~2 miles east of known occurrences at Travis Airbase area. During surveys no species were identified within the BSA (see Table 2-2) |
| Vernal pool tadpole shrimp *(Lepidurus packardi)* | E/– | Shasta County south to Merced County. | Vernal pools and ephemeral stock ponds. | Yes | No | Same as above |
| California freshwater shrimp (*Syncaris pacifica*) | E/E | Endemic to Marin, Napa, and Sonoma Counties. Extant populations in Lagunitas Creek in Marin County; Huichica Creek in Napa County; and Franz, East Austin, Sonoma, and Salmon Creeks in Sonoma County. | Pool areas of low-elevation, low-gradient, permanent streams; among live tree roots of undercut banks; and under overhanging woody debris or vegetation. | No | No | The BSA is outside the species geographic range. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| **Amphibians** | | | | | | |
| California red-legged frog (*Rana draytonii*) | T/SSC | Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County. | Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods. | Yes | Yes | Known occurrences are within the BSA and suitable habitat is present. |
| California red-legged frog (*Rana draytonii)* Critical Habitat | CH – units Sol-2 & Sol-3 | North and South of SR12W and west of I-80 | List CE's | Yes | Yes | Mangels property located in the southeast portion of Sol-2 will have modification to CH due to proximity to breeding, foraging and dispersal habitat. These effects will be minimized through design and identified reasonable & prudent measures (Figure 4-3). |
| California tiger salamander (*Ambystoma californiense*) | T/T | California tiger salamanders occur at elevations from sea level in the Central Valley, to approximately 3,900 feet in the Coast Ranges, and to approximately 1,600 feet in the Sierra Nevada | Valley floor grasslands or where lowland aquatic sites like large vernal pools, playa pools, sag ponds, and stock ponds are available for breeding. Upland habitat consists of small mammal burrows within approximately 2,200 feet of breeding habitat. | Yes | No | A historic population was extirpated approximately 1.2 miles to the NE of the SR12E site at Penn. Ave. Dip net surveys were conducted by Mr. Brent Helms for the Gentry Suisun project in 1999 & 2000 resulting in a negative finding. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| **Reptiles** | | | | | | |
| Alameda whipsnake (*Masticophis lateralis euryxanthus*) | T/T | East of San Francisco Bay in interior coast range. Five isolated communities in Contra Costa and Alameda Counties, with reported occurrence in San Joaquin and Santa Clara Counties. Prefers eastern, southern and southwestern slopes. | Scrub and chaparral with rocky outcroppings for refuge and lizard prey base. Will also prey on birds, snakes and frogs. May move up to 500 feet outside central habitat into neighboring grassland or oak savanna communities. | No | No | BSA is outside the species geographic range. |
| Giant garter snake (*Thamnophis gigas*) | T/T | Central Valley from the vicinity of Burrel in Fresno County to near Chico in Butte County. Extirpated from areas south of Fresno. | Sloughs, canals, low-gradient streams, and freshwater marshes where there is a prey base of small fish and amphibians. Also irrigation ditches and rice fields. Requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter. | No | No | BSA is on the edge of the species' range. No suitable habitat (perennial marsh and slough) that is hydrologically connected to GGS populations is present in the BSA. |
| **Birds** | | | | | | |
| California clapper rail (*Rallus longirostris oboletus*) | E/FP | Marshes around San Francisco Bay and east through the Sacramento River–San Joaquin River Delta to Suisun Marsh. | Restricted to salt marshes and tidal sloughs. Usually associated with heavy growth of pickleweed. Feeds on mollusks removed from the mud in sloughs. | No | No | No suitable habitat (marsh and slough) is present in the BSA. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| California least tern (*Sterna antillarum*) | E/– | Nests on beaches along San Francisco Bay and along the southern California coast from southern San Luis Obispo County to San Diego County. | Nests on sandy, upper ocean beaches, and occasionally uses mudflats. Forages on adjacent surf line, estuaries, or the open ocean. | No | No | No suitable habitat (sandy beaches and mudflats) is present in the BSA. |
| Northern spotted owl (*Strix occidentalis caurina*) | T/ | Scattered populations from southwestern British Columbia south through western Coast Ranges and Cascades to Marin County, California. Southeastern extent of range is Pit River area of Shasta County. | Mature and old growth forest characterized by complex structure and diverse elements such as snags, decaying trees, occasional openings. Generally relies on prey base of northern flying squirrel and woodrat; may also take other small mammals, birds and insects. | No | No | BSA is outside the species range. |
| Western Snowy plover (*Charadrius alexandrines nivosus*) | T/SSC | Population defined as those birds that nest adjacent to or near tidal waters, including all nests along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries. Twenty breeding sites are known in California from Del Norte to Diego County. | Coastal beaches above the normal high tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent. | No | No | No suitable habitat (sandy beaches) present in the BSA. |

| Common and Scientific Names | Status[a] Federal/State | Geographic Distribution | Habitat Requirements | Habitat Present in BSA? | Species Present in BSA? | Comments and Limitations |
|---|---|---|---|---|---|---|
| **Mammals** | | | | | | |
| Salt marsh harvest mouse (*Reithrodontomys raviventris*) | E/E,FP | Vicinity of San Francisco, San Pablo, and Suisun Bays and the Sacramento River–San Joaquin River Delta. | Salt marshes with a dense plant cover of pickleweed and fat hen. Adjacent to an upland site. | No | No | No suitable habitat (salt marsh) is present in the BSA based on survey by Phil Leitner (Appendix D). |
| **Fish** | | | | | | |
| Delta smelt (*Hypomesus transpacificus*) | T/E | Sacramento River–San Joaquin River Delta. | Euryhaline estuary channels. | No | No | Ledgewood Creek in the action area connects to Peytonia Slough which does not support delta smelt (Schroeter et. al. 2006). |
| Tidewater goby (*Eucyclogobius newberryi*) | E/– | Potentially discrete populations along coast from Tillas Slough in Del Norte County south to Agua Hedionda Lagoon in San Diego County. | Shallow (<3 feet), lightly flowing, brackish coastal waters including estuaries, marshes and coastal lagoons where salinity remains below 12 ppt. Has been recorded at higher salinities but avoids marine environments. Ideal breeding substrate is sand but species may also use rock and silt. | No | No | No suitable habitat in the BSA. |

[a] Status:
**Federal**
E = listed as endangered under ESA.
T = listed as threatened under ESA.
**State**
E = listed as endangered under the California Endangered Species Act (CESA).
T = listed as threatened under CESA.
R = listed as rare under CESA (plant species only).
SSC = California species of special concern.
FP = fully protected.
– = no state status.

## 2.4 Personnel and Survey Dates

Biological surveys and assessments that are referenced in this BA were conducted in 2003 through 2010 as shown in Table 2-2. Appendix I includes tables that list the parcels that are in the BSA and the surveys performed.

**Table 2-2. Biological Resource Survey Dates**

| Species | Date | Location | Project/Surveyor | Observations |
|---|---|---|---|---|
| Callippe silverspot butterfly— larval host plant surveys | March 2004 | BSA between Business Center Drive and SR 12-W | Northwest Connector/Geoff Monk & Associates | Located two populations of larval host plants. |
| Callippe silverspot butterfly—habitat assessment | November 18, 2010 | BSA between Business Center Drive and I-80 | 80/680 Interchange/ Site visit with ICF biologists Lisa Webber and Stephanie Myers, Caltrans biologist Ahmad Hashemi, and USFWS biologists John Cleckler and Chris Nagano | Identified potential adult hilltop habitat. |
| VELB— elderberry shrub survey | July 26, 2007 | Throughout the BSA | 80/680 Interchange /ICF invertebrate specialist Patrick Stone | Twelve elderberry shrubs observed within 100 feet of the project footprint. |
| VELB— elderberry shrub survey | September 24, 2009 | BSA between Business Center Drive and I-80 (proposed bike path) | 80/680 Interchange /ICF biologist Stephanie Myers | No shrubs observed within 100 feet of the proposed bikepath. |
| VPFS/VPTS – protocol-level surveys | Winter 1999; spring 2000 (37 sites) 2002: dry season survey (24 sites) 2005: dry season survey (61 sites) | BSA and action area south of SR 12E and east of Ledgewood Creek | Gentry Suisun project/May Consulting Service, Brent Helm, invertebrate specialist | No listed shrimp species found. Winter 1999–2000 was a low water year. |
| VPFS/VPTS— protocol-level surveys | Dry season: 2006; wet season: 2007 and 2009 wet and dry | Jameson Canyon SR 12-W, with some overlap with our project area | Brent Helm, invertebrate specialist | No listed shrimp species found. Surveyed sites W-13, W-14, W-15, and W-149. No limitations. |
| VPFS/VPTS— habitat assessment | April 4, 2007 | Throughout BSA along SR 12E | 80/680 Interchange /ICF invertebrate specialist Patrick Stone | Identified suitable shrimp habitat within the BSA. |
| VPFS/VPTS— habitat assessment | July 27, 2007 | Throughout BSA, except SR 12E | 80/680 Interchange /ICF invertebrate specialist Patrick Stone | Identified suitable shrimp habitat within 250 feet of the project footprint. |

| Species | Date | Location | Project/Surveyor | Observations |
|---|---|---|---|---|
| VPFS/VPTS—habitat assessment | September 24, 2009 | BSA between Business Center Drive and I-80 (proposed bike path) | 80/680 Interchange /ICF biologist Stephanie Myers | No suitable shrimp habitat observed. No limitations. |
| CRLF—protocol-level surveys | May 2003; May and March 2004 | BSA between Business Center Drive and SR 12W; Jameson Canyon, Dan Wilson, and Suisun Creeks. | Northwest Connector/Geoff Monk & Associates | Found tadpoles in Mangels pond and an adult and juvenile CRLF (Figure 3-1, number W-177). |
| CRLF—site assessment | July 5 and October 5, 2007 | Throughout BSA, including a 1-mile buffer from project footprint. | 80/680 Interchange /Stephanie Myers, wildlife biologist with federal permit for CRLF | Potential breeding, dispersal, and upland habitat observed. Did not have access to all potential habitat sites within 1-mile radius and relied on aerial photo interpretation. |
| CRLF—habitat assessment for placement of exclusion fence and undercrossings | November 18, 2010 | BSA between Business Center Drive and I-80 | 80/680 Interchange / site visit with ICF biologists Lisa Webber and Stephanie Myers, Caltrans biologist Ahmad Hashemi, and USFWS biologists John Cleckler and Chris Nagano | Identified locations for fence construction and undercrossing placements. |
| California tiger salamander—aquatic survey | Winter 1999;Spring 2000 | BSA and action area south of SR 12E and east of Ledgewood Creek | Gentry Suisun Project / May Consulting Service, Brent Helm, invertebrate specialist and wildlife biologist conducted dip net surveys | No CTS larvae observed. Low-water winter and spring. |
| California tiger salamander—habitat assessment | November 18, 2010 | BSA and action area south of SR 12E and east of Ledgewood Creek | 80/680 Interchange / Site visit with ICF biologists Lisa Webber and Stephanie Myers (with federal CTS permit), Caltrans biologist Ahmad Hashemi, and USFWS biologists John Cleckler and Chris Nagano | Identified potential breeding and upland habitat for CTS. |
| Salt marsh harvest mouse—habitat assessment | August 31, 2007 | BSA south of SR 12E and east of Ledgewood Creek | 80/680 Interchange / Dr. Phil Leitner, species expert | Habitat not suitable |

| Species | Date | Location | Project/Surveyor | Observations |
|---|---|---|---|---|
| Contra Costa goldfields—habitat assessment | November 18, 2010 | BSA and action area south of SR 12E and east of Ledgewood Creek | 80/680 Interchange / Site visit with ICF biologists Lisa Webber and Stephanie Myers, Caltrans biologist Ahmad Hashemi, and USFWS biologists John Cleckler and Chris Nagano | No federally listed plants observed. |
| Rare plant surveys | May 3–4 and August 15, 2000; late April and early May, 2001 and 2002; April 6, 7, 8, 11, 12, 13, and 15 and June 2005 | BSA south of SR 12E, between Ledgewood Creek and eastern end of the BSA | Gentry-Suisun Project / Vollmar Consulting | Contra Costa goldfields observed (Figure 3-1). No limitations. |
| Rare plant surveys | March 17, April 13, and May 12, 2004 | BSA between Business Center Drive and SR 12W | Northwest Connector / Geoff Monk & Associates | No federally listed plant species observed. |
| Rare plant surveys | April 17 and 18, June 3, and July 7, 2003 | BSA between Business Center Drive and SR 12W | Northwest Connector/GANDA and CH2M Hill | No federally listed plant species observed. No limitations. |
| Rare plant surveys | May 2004 | BSA, except the area between Business Center Drive and SR 12W and the area along SR 12E | 80/680/12 Interchange / ICF | No federally listed plant species observed. No surveys of the Mangel's property north of SR 12W or the part of the BSA along SR 12E. For the remainder of the BSA, no limitations. |
| Rare plant surveys | April 26–27, April 29, May 2–4, May 26, and May 31, 2005; July 30–31 and August 1–3, 2007; April 20–24, 2009 | BSA, except the area between Business Center Drive and SR 12W | 80/680/12 Interchange / ICF | No federally listed plant species observed. No surveys of the Mangel's property north of SR 12W, and only observations from the fenceline for one parcel east of I-680 near Red Top Road. For the remainder of the BSA, no limitations. |
| Rare plant—habitat assessment | September 24, 2009 | BSA between Business Center Drive and I-80 (proposed bike path) | 80/680/12 Interchange / ICF | This was a habitat assessment only, no federally listed plants observed. Survey conducted outside of growing season or identification period for special-status species with potential to occur in the region. |

Field survey methods involved with documenting federally listed or proposed plants, wildlife, and fish species are described below.

### 2.4.1 Botanical Surveys

Caltrans and STA have relied on floristic surveys that were conducted specifically for Phase I of the proposed project, as well as surveys conducted for other projects that fall within or adjacent to the BSA. Floristic surveys of the BSA were conducted in accordance with *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants* (U.S. Fish and Wildlife Service 1996). All potential habitat for listed plant species in the BSA was surveyed over a period of several years. The most recent surveys of the BSA were conducted in 2009.

Surveys of the BSA were conducted under conditions that allowed identification of all target species. ICF botanists walked meandering transects of the entire BSA, with the exception of the parcels associated with the Mangels property north of SR 12W and the parcel east of I-680 at the Redtop Road location, to ensure complete coverage of the BSA. Access to the following parcels has been restricted (assessor's parcel numbers [APNs] 01-4826-0010, 01-4826-0020, 01-4827-0010, 01-48270340, and 00-605-0180. However, in 2003 and 2004 Monk and Associates surveyed the Mangels property for STA as part of the North Connector project.

During the floristic surveys, all plant species observed were recorded. Nearly all plants were identified to the species, subspecies, or variety level; but every species was identified to the taxonomic level necessary to determine whether it was a special-status species. A complete list of all species observed is provided in Appendix E .

The occupied habitat for CCG was surveyed in 2000–2002, 2005, and 2009. Other areas of potential habitat for listed plant species were surveyed in 2003, 2004, 2005, and 2007–2009, as described below, but no other listed plants were found.

ICF botanists conducted botanical surveys of the BSA to identify plant communities and species and to locate all special-status plant species in May 2004, April 2005, May 2005, July 2007, August 2007, September 2008, and April 2009. The survey area for the 2005, 2007, and 2009 studies included the area along SR 12E from post mile (PM) 2.75 to PM 4.25 east of Pennsylvania Avenue.

ICF wildlife biologists Lisa Webber and Stephanie Myers, along with Ahmad Hashemi from Caltrans and Chris Nagano and John Cleckler from USFWS, conducted a limited habitat assessment for CCG on November 18, 2010, in the vicinity of SR 12E.

As part of the Gentry-Suisun project, surveys of the area south of SR 12E where CCG were found were conducted by Vollmar Consulting. The Gentry-Suisun surveys were conducted May 3–4 and August 15, 2000; late April and early May 2001 and 2002; and April 6, 7, 8, 11, 12, 13, and 15 and June 2005. Botanical surveys of the Mangels property north of SR 12W were conducted by Monk & Associates as part of the North Connector project on April 17 and 18, June 3, and July 7, 2003.

On July 26, 2007, Mr. Patrick Stone conducted surveys for VELB host plants (i.e., elderberry [*Sambucus mexicana*]) in the area of I-80 and I-680 and identified 12 elderberry plants that have the potential to support VELB. On September 24, 2009, Ms. Stephanie Myers conducted surveys for VELB host plants within the BSA between Business Center Drive and I-80 along the proposed bike path route.

### 2.4.2 Wildlife Surveys

Caltrans and STA have relied on wildlife surveys that were conducted specifically for Phase I of the proposed project, as well as surveys conducted for other projects that are within or near the BSA.

ICF wildlife biologists Angela Alcala and Stephanie Myers conducted reconnaissance-level field surveys and a CRLF site assessment of the BSA on July 5 and October 5, 2007, and submitted the site assessment report to USFWS on March 3, 2009. These surveys focused on identifying and evaluating biological communities in the BSA and determining their suitability for CRLF. The CRLF site assessment was conducted in accordance with *Revised Guidance on Site Assessment and Field Surveys for California Red-Legged Frogs* (U.S. Fish and Wildlife Service 2005).

Invertebrate ecologist Patrick Stone surveyed for and mapped all elderberry shrubs (the host plant of VELB) within 100 feet of the edge of the project footprint on July 26, 2007. ICF

biologist Stephanie Myers also conducted a VELB survey on September 24, 2009, within the BSA between Business Center Drive and I-80 along the proposed bike path route.

Mr. Stone also conducted a habitat assessment for vernal pool crustaceans—Conservancy fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp—within 250 feet of the project footprint on July 27, 2007. Mr. Stone evaluated an additional area along SR 12E on February 24, 2009. Protocol-level branchiopod surveys were conducted for Caltrans' Jameson Canyon project, which overlaps a portion of the SR 12W area. In 2006–2007 and 2009, Helm Biological Consulting (HBC) conducted wet- and dry-season surveys of pools 94 (W-13), 1 (W-15), and 2 (W-149) and other adjacent basins in the vicinity (Helm 2009).

In 1999–2000, HBC conducted dip net surveys for CTS in the two large pools south of SR 12E adjacent to Pennsylvania Avenue for the Gentry-Suisun project (Vollmar 2000).

In 2003–2004 Monk and Associates conducted plant surveys and larval host plant surveys for callippe silverspot butterfly for the North Connector project for STA. Jeff Monk identified and mapped two populations of Johnny jump-ups, the species' larval host plant (Solano Transportation Authority 2004).

In 2007 through 2009, LSA conducted studies relating to callippe silverspot butterfly to establish the baseline data for the Solano County HCP (LSA 2009).

ICF biologists Lisa Webber and Stephanie Myers, along with Ahmad Hashemi from Caltrans and Chris Nagano and John Cleckler from USFWS, conducted a field visit for CTS on November 18, 2010, in the vicinity of SR 12E and for callippe silverspot butterfly and CRLF near Business Center Drive and SR 12-W.

Dr. Phil Leitner conducted a habitat assessment for salt marsh harvest mouse (federally listed as endangered and a fully protected species) on August 31, 2007 (Appendix D). The primary survey area was south of SR 12E between Ledgewood Creek and Suisun City. To get a perspective on the condition of adjoining habitat, Dr. Leitner also inspected the area north of SR 12E that is within the project footprint, and areas to the south as far as Cordelia Road.

On September 24, 2008, Ms. Myers surveyed the portion of the BSA between I-80 and Business Center Drive that had not been included in previous surveys for potential sensitive wildlife species habitat, including that for CRLF, VELB, and vernal pool crustaceans.

## 2.5 Limitations That May Influence Results

This BA relies, in part, on surveys and assessments conducted for projects within or adjacent to the BSA between 1999 and 2010. Caltrans and STA's consultant biologist supplemented these data by conducting habitat assessments and surveys from 2007 to the present. Recent access to the Mangels property, which is part of the area north of SR 12W, has been limited. The Mangels property is the location for Construction Package 5, which includes the proposed roadway connecting the Red Top Road interchange with Business Center Drive (formerly the North Connector project) (Figure 1-2). Access to the following parcels, which include the Mangels property, was not available: 01-4826-0010, 01-4826-0020, 01-4827-0010, 01-4827-0340, and the parcel east of I-680 at Red Top Road, 00-605-0180. Caltrans and STA propose to conduct additional protocol-level and preconstruction surveys to address this constraint.

# Chapter 3 Results: Environmental Setting

## 3.1 Description of Existing Biological and Physical Conditions

### 3.1.1 Biological Study Area and Action Area

Caltrans and STA have evaluated the existing biological and physical conditions within the BSA that support federally listed or proposed species as well as the direct and indirect effects on federally listed or proposed species.

The BSA is the 573.83-acre area evaluated to determine both the direct (permanent and temporary) and indirect effects of the proposed project on listed species (Figure 3-1). The BSA encompasses the project footprint plus an additional area 250 feet around it. The federal action area is the combined area of direct (temporary and permanent) and indirect effects on species federally listed as threatened or endangered that would result from the proposed Phase I project. The action area is within the BSA, but does not occupy the entire BSA. Indirect effects, as defined by FESA, are those effects that are caused by or would result from the proposed action and, although they occur later in time, are still reasonably certain to occur [50 CFR Section 402.02]. The direct effects from construction actions would be limited to the project footprint. Additional indirect effects were assessed by using desktop surveys of aerial imagery extending 1 mile and 1.24 miles from the project footprint for CRLF and CTS, respectively.

### 3.1.2 Physical Conditions

The BSA is located in the Sacramento Valley geographic subdivision of the Great Central Valley (Hickman 1993). Topography in the BSA generally transitions from the base of hills in American Canyon in the east to the relatively level Fairfield area. Elevations range from approximately 5 to 300 feet above mean sea level.

According to the *Soil Survey of Solano County, California* (Bates 1977; U.S. Soil Conservation Service 1992), the BSA is contained within 28 soil mapping units (Appendix G). Land use is primarily agricultural ranch lands, light industry, and limited residential development. The area

is associated with high-volume traffic corridors. In most of the project area the soil profile has already been disturbed by the construction of existing roads. The soils are undisturbed in a couple of locations where new roads will be constructed, with large amounts of cut and fill both east and west of SR 12W.

The BSA is within the Suisun Bay hydrologic unit, and the creeks ultimately drain to Suisun Slough and Grizzly Bay via seasonal and perennial drainages. The creeks in the BSA qualify as other waters of the United States. The watersheds in the project area are American Canyon, Jameson Creek, Green Valley and Ledgewood. Annual precipitation averages 23.4 inches in the project vicinity (Bates 1977; Natural Resource Conservation Service 2007).

### 3.1.3 Biological Conditions

Natural communities in the BSA were identified and mapped as 13 distinct vegetation community types and two unvegetated community types (perennial drainage and seasonal drainage). The total acreage of each community type within the portions that will be affected by the project is listed in Table 3-1. Figure 3-1 (Sheets 1–35) shows the locations of natural communities and other biological resources in the BSA.

**Table 3-1. Total Area of Vegetation Communities and Drainages in the BSA**

| Community Type | Acreage in BSA |
|---|---|
| Riparian woodland | 4.16 |
| Upland scrub | 10.48 |
| Valley oak woodland | 0.16 |
| Live oak woodland | 36.79 |
| Other woodland | 0.65 |
| Eucalyptus grove | 6.18 |
| Nonnative annual grassland | 374.27 |
| Ruderal | 36.56 |
| Row crops | 51.23 |
| Orchard | 2.48 |
| Landscaped | 11.81 |
| Perennial drainage | 1.99 |
| Seasonal drainage | 6.75 |
| Perennial marsh | 16.37 |
| Alkali seasonal marsh | 1.25 |
| Seasonal wetland | 12.70 |
| **Total**[a] | **573.83** |

[a] Total acreage does not include approximately 334.14 acres of developed land in the BSA.

# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California


## Legend

- Permanent Impact Area (Project Footprint)
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- Biological Study Area
- North Connector 2003 Survey Area

- Alkali Seasonal Marsh
- Blue Oak Woodland
- Developed/Graded
- Eucalyptus
- Landscaped
- Live Oak Woodland
- Non-native Annual Grassland
- Open Water
- Orchard/Vineyard
- Other Woodland
- Perennial Drainage
- Perennial Marsh
- Riparian Woodland
- Row Crops
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Upland Scrub
- Valley Oak Woodland

Note: Culverts are denoted by dashed lines.

- Native Tree
- Culvert

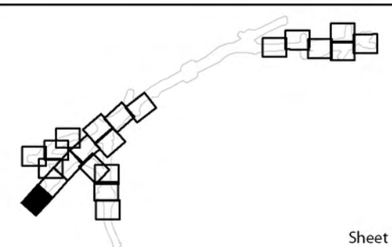
## Special-Status Species Occurrences

- California Red-legged Frog
- Contra Costa Goldfields
- Elderberry Shrub
- Johnny Jump-Ups
- Callippe Silverspot Butterfly Habitat
- CA Tiger Salamander Habitat
- Vernal Pool Shrimp Habitat

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2010 i-cubed)

Note: All biological resources are shown within the temporary and permanent impact areas. However, the zone between the impact areas and the biological study area boundary includes mapping only for special status species occurrences.



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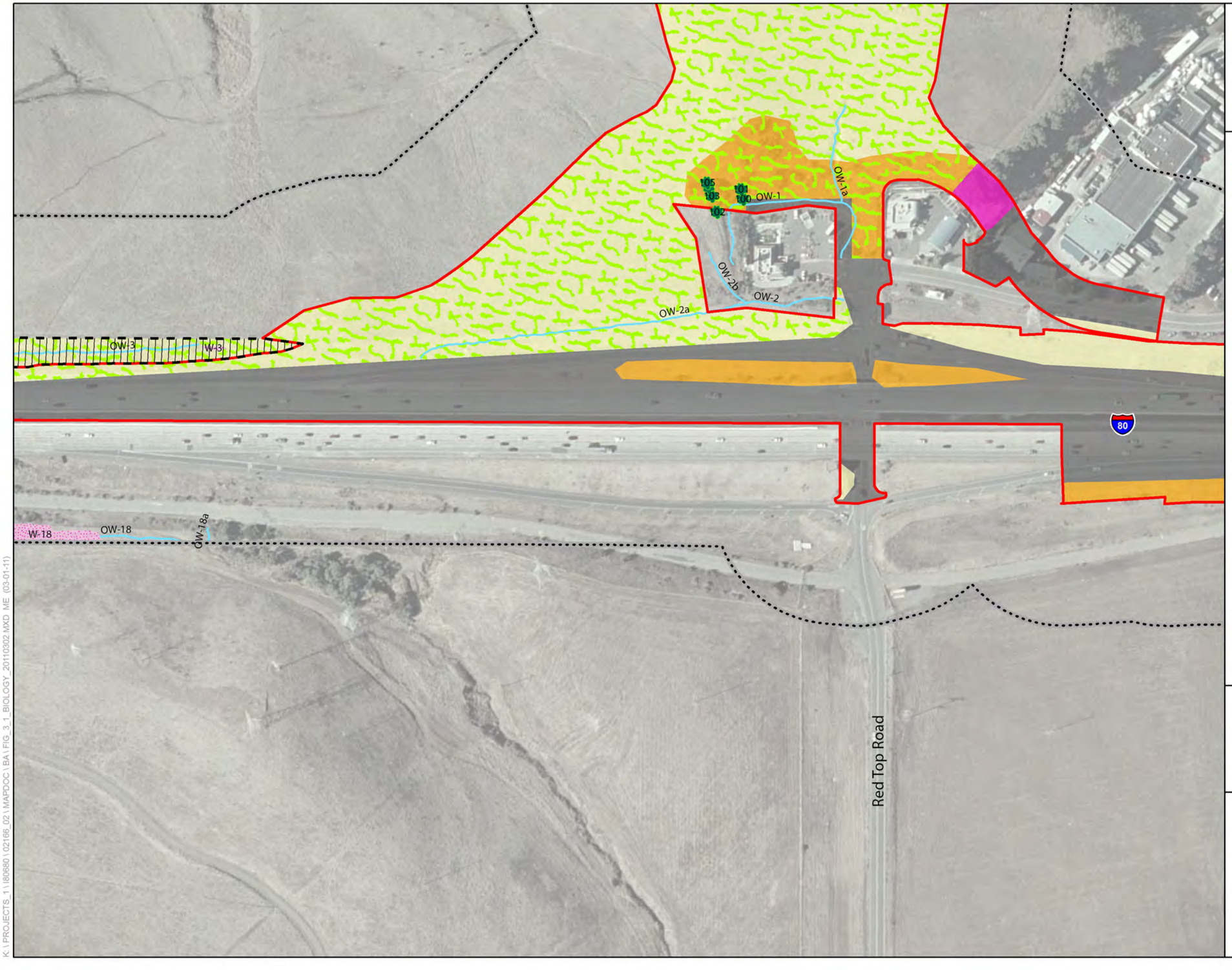
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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Feet
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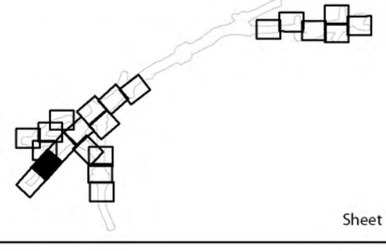



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# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

OW-13
OW-8d
W-8d
OW-8e
OW-8b
OW-8a
W-156
Jameson Canyon Creek
Red Top Road
OW-1a
OW-1
OW-2
101
105
80

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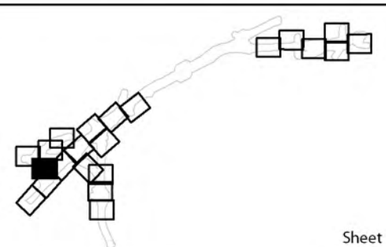



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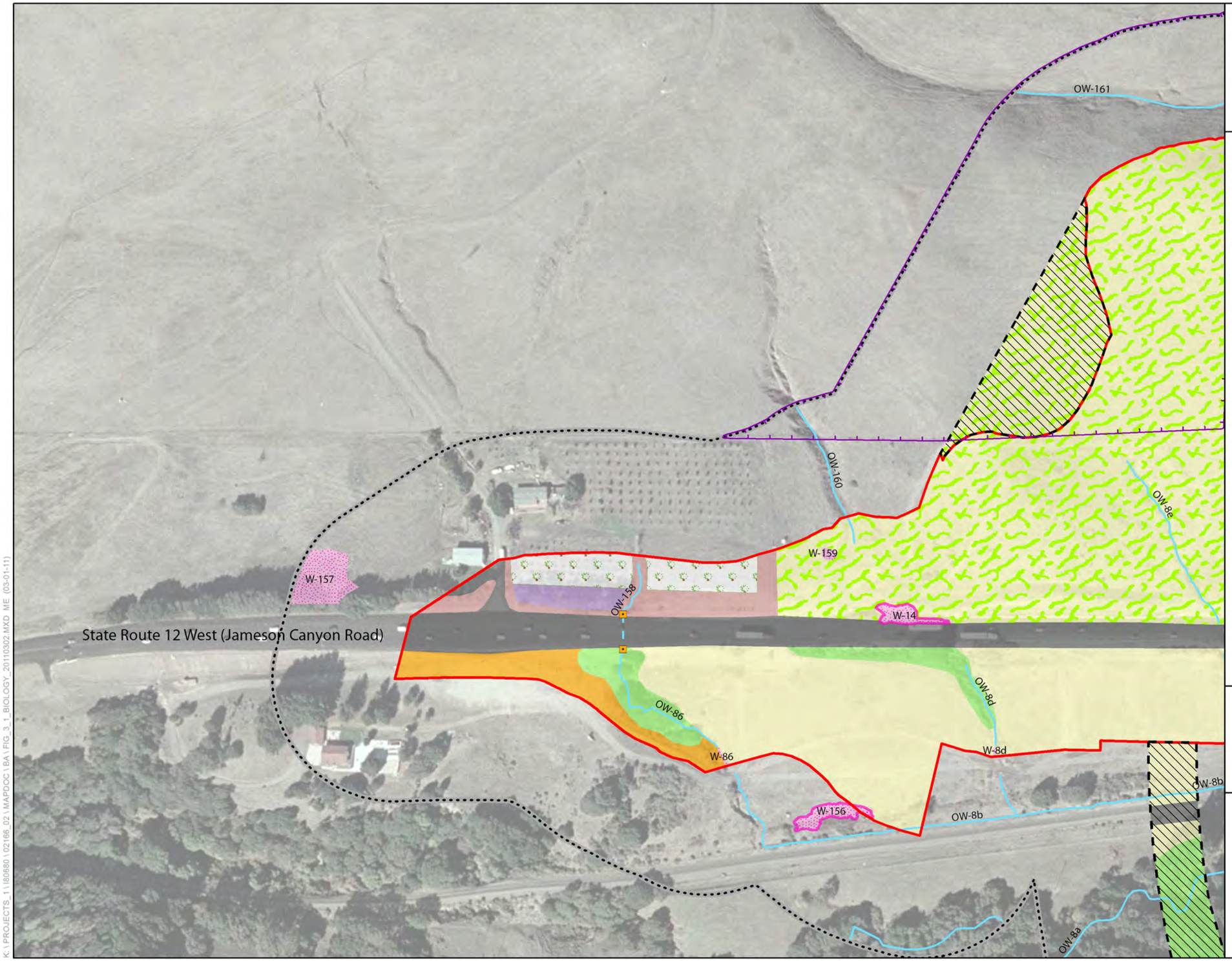


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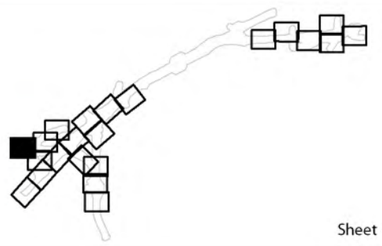



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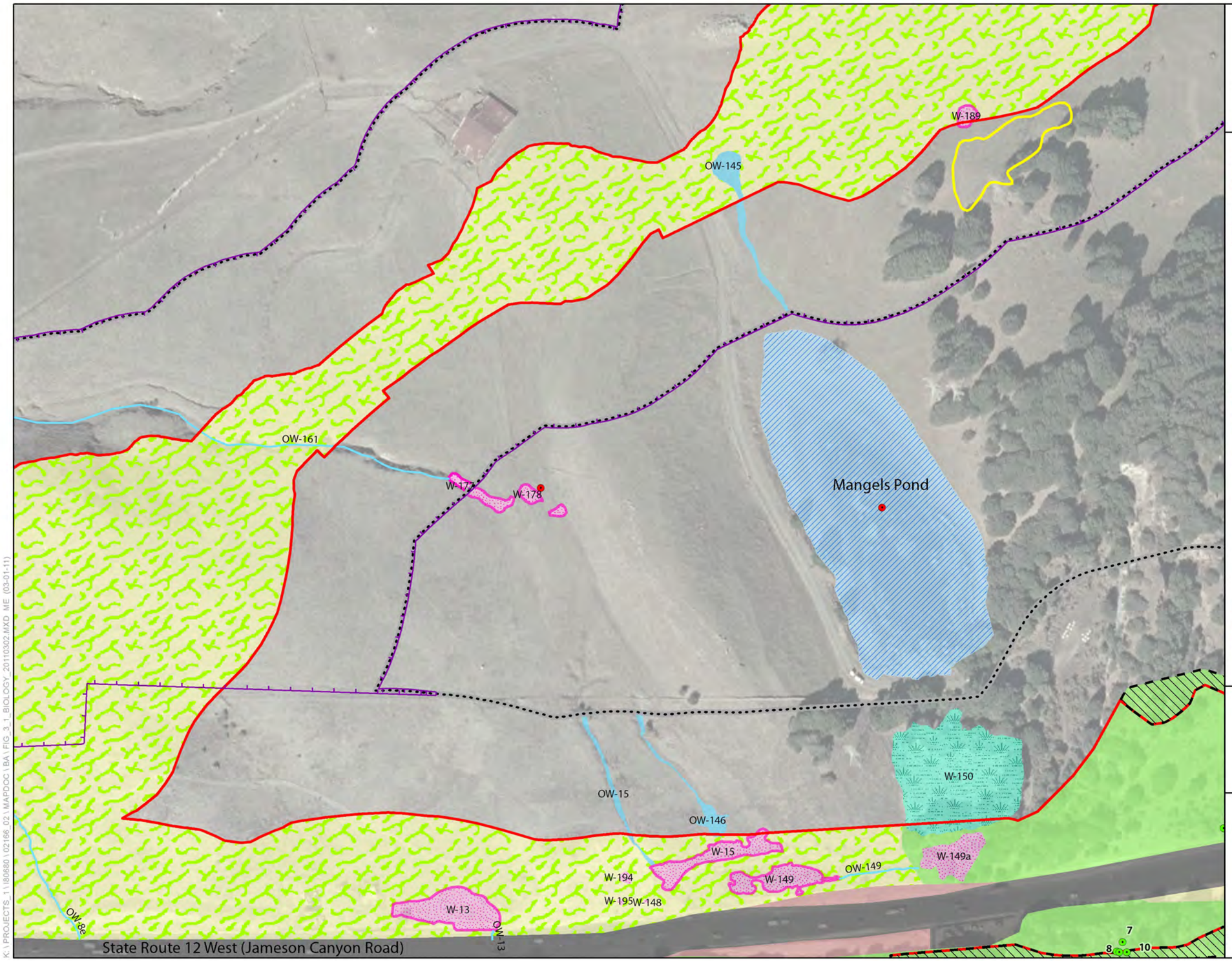


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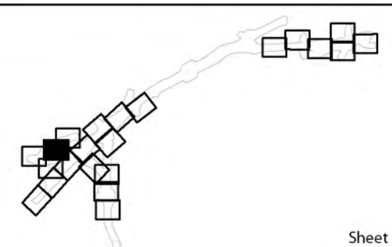



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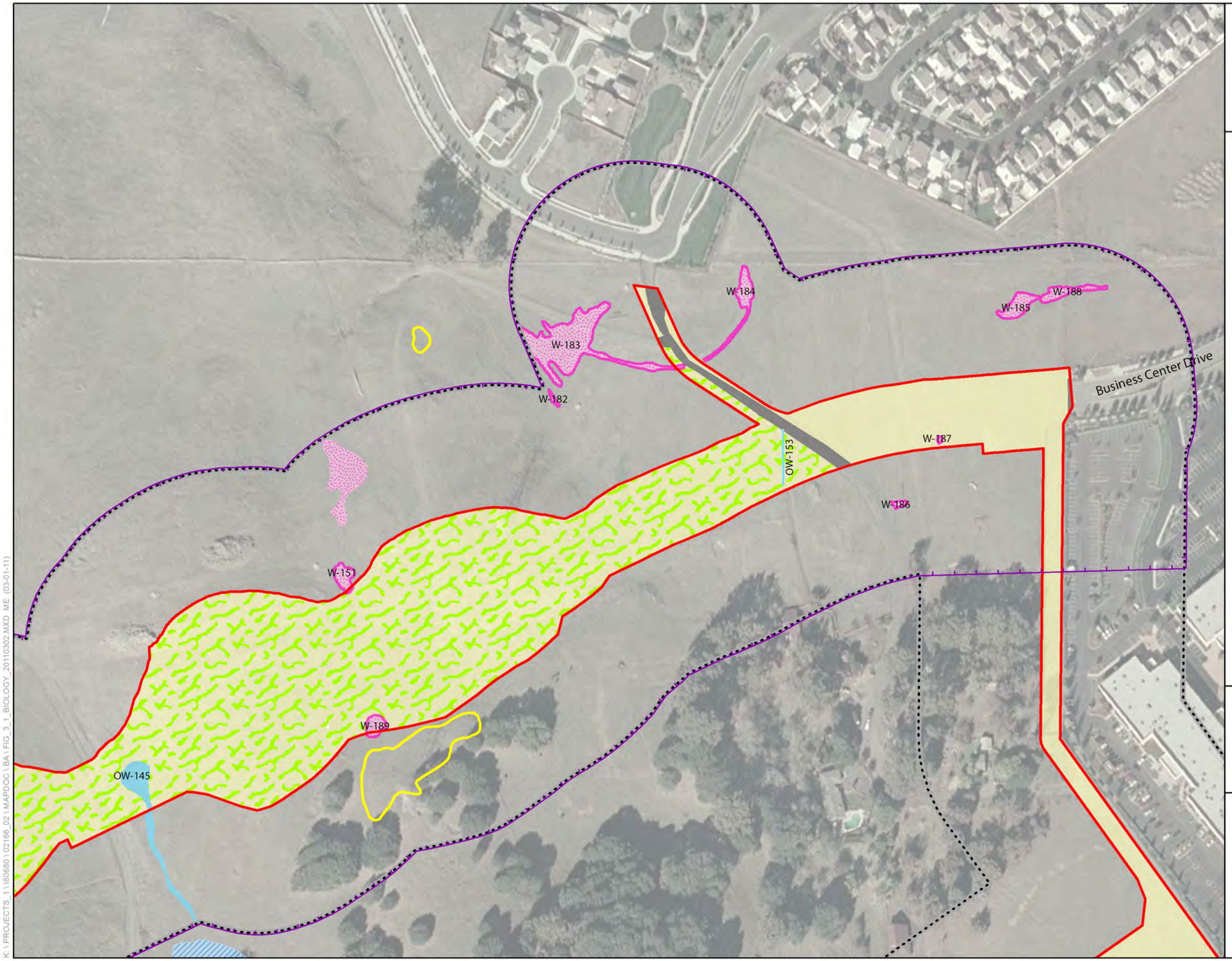


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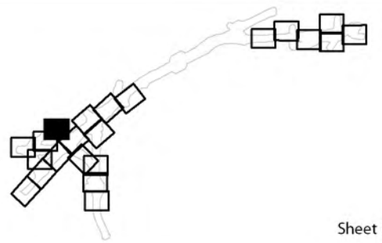

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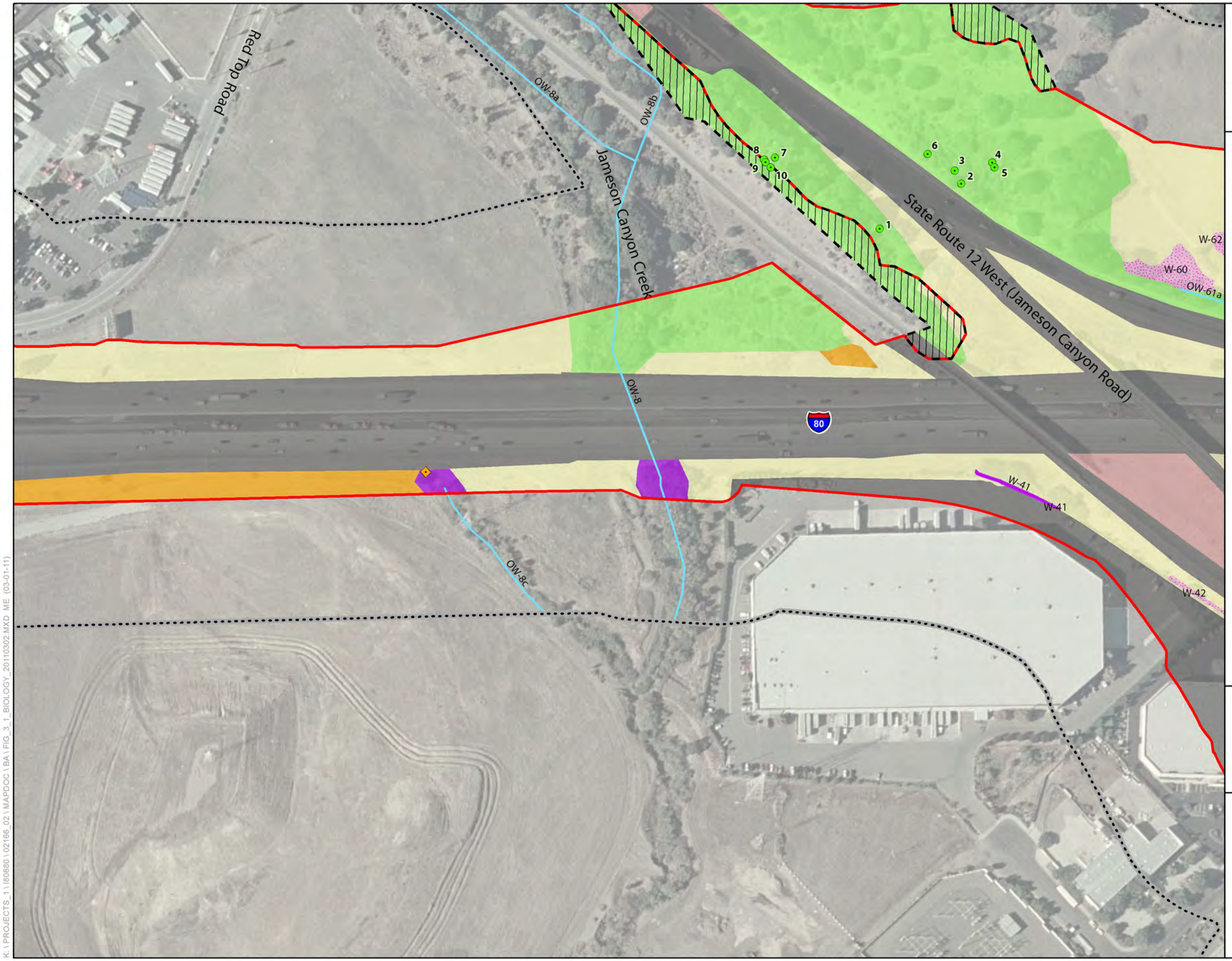


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Feet
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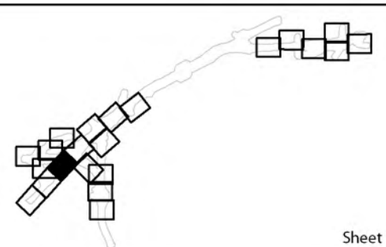



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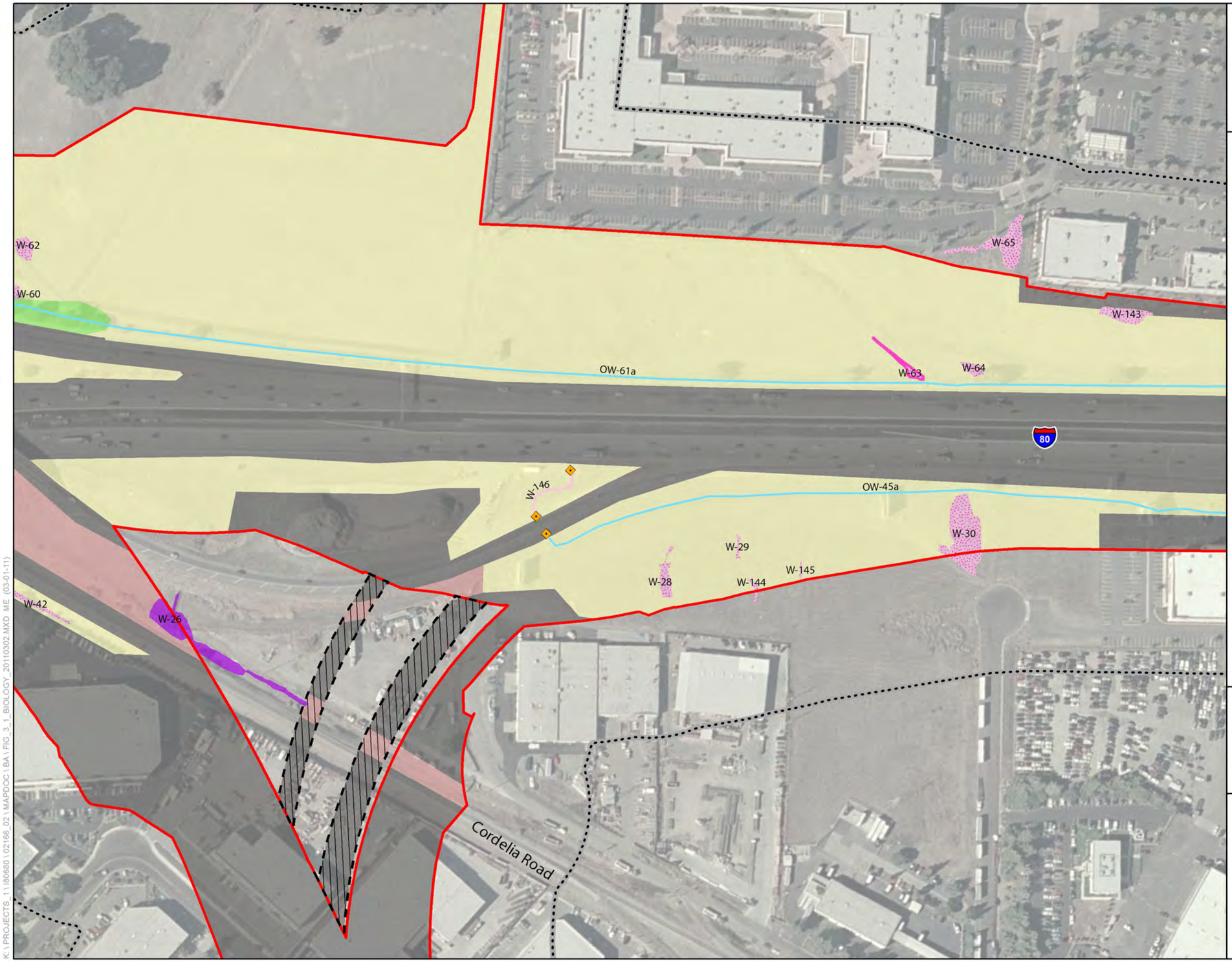


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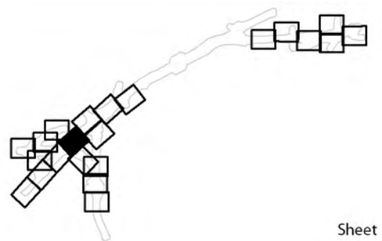
## Special-Status Species Occurrences

- California Red-legged Frog
- Contra Costa Goldfields
- Elderberry Shrub
- Johnny Jump-Ups
- Callippe Silverspot Butterfly Habitat
- CA Tiger Salamander Habitat
- Vernal Pool Shrimp Habitat

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2010 i-cubed)

Note: All biological resources are shown within the temporary and permanent impact areas. However, the zone between the impact areas and the biological study area boundary includes mapping only for special status species occurrences.





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# Figure 3-1
## Biological Resources
## I-80 / I-680 / SR-12 Interchange Project
## Solano County, California

### Legend

- Permanent Impact Area (Project Footprint)
- Temorary Impact Area (Project Footprint)
- Biological Study Area
- North Connector 2003 Survey Area

- Alkali Seasonal Marsh
- Blue Oak Woodland
- Developed/Graded
- Eucalyptus
- Landscaped
- Live Oak Woodland
- Non-native Annual Grassland
- Open Water
- Orchard/Vineyard
- Other Woodland
- Perennial Drainage
- Perennial Marsh
- Riparian Woodland
- Row Crops
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Upland Scrub
- Valley Oak Woodland

Note: Culverts are denoted by dashed lines.

- Native Tree
- Culvert

### Special-Status Species Occurrences

- California Red-legged Frog
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Feet
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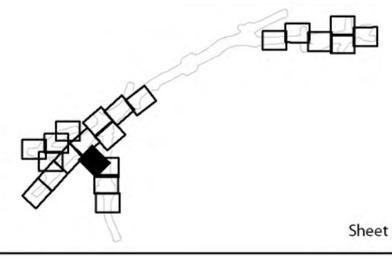

# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California


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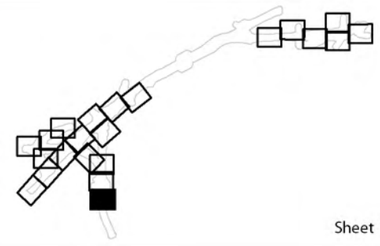

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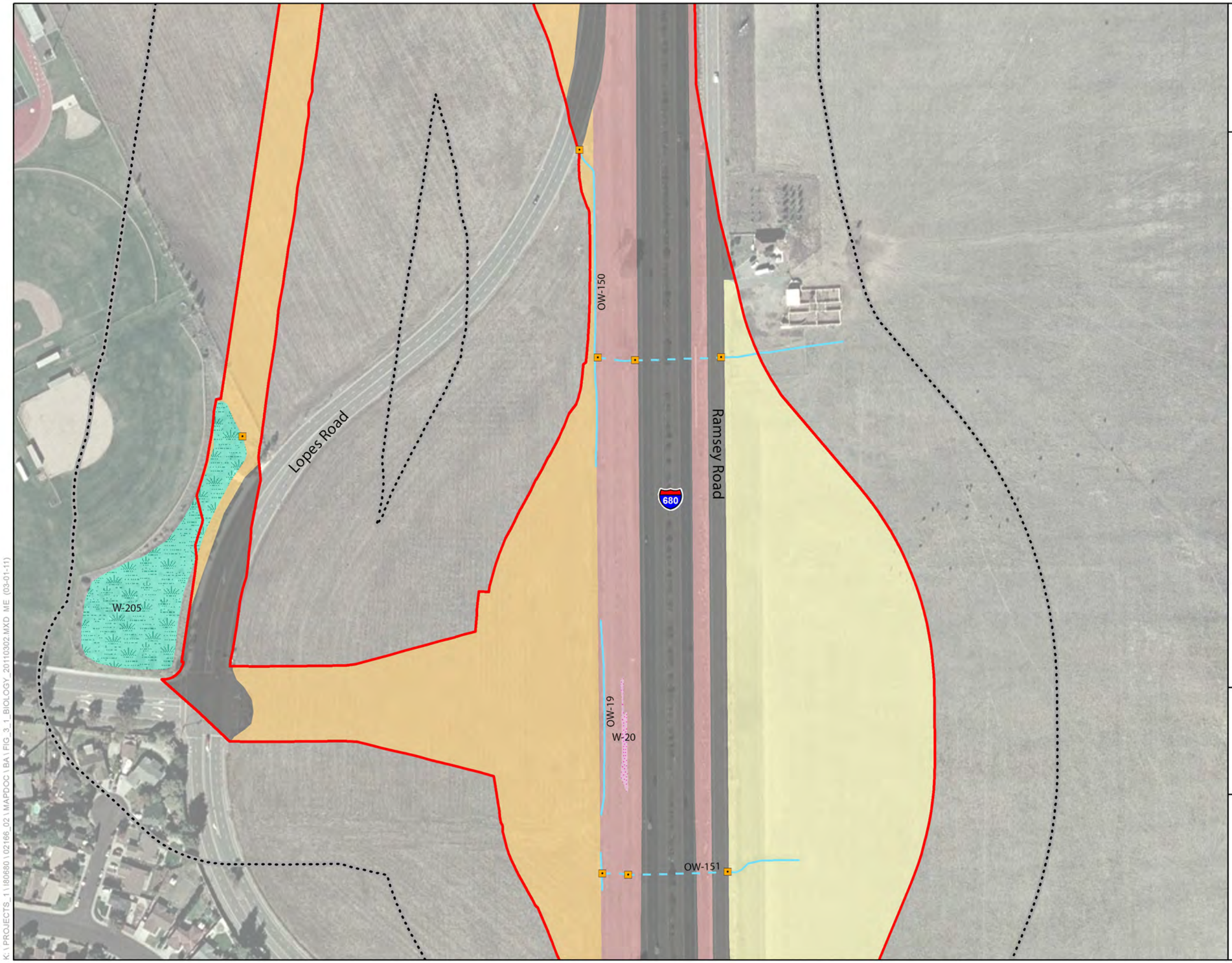
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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Feet
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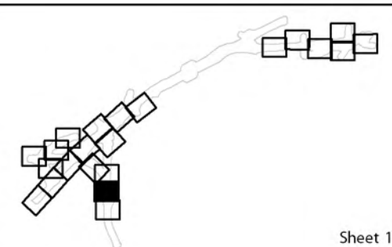



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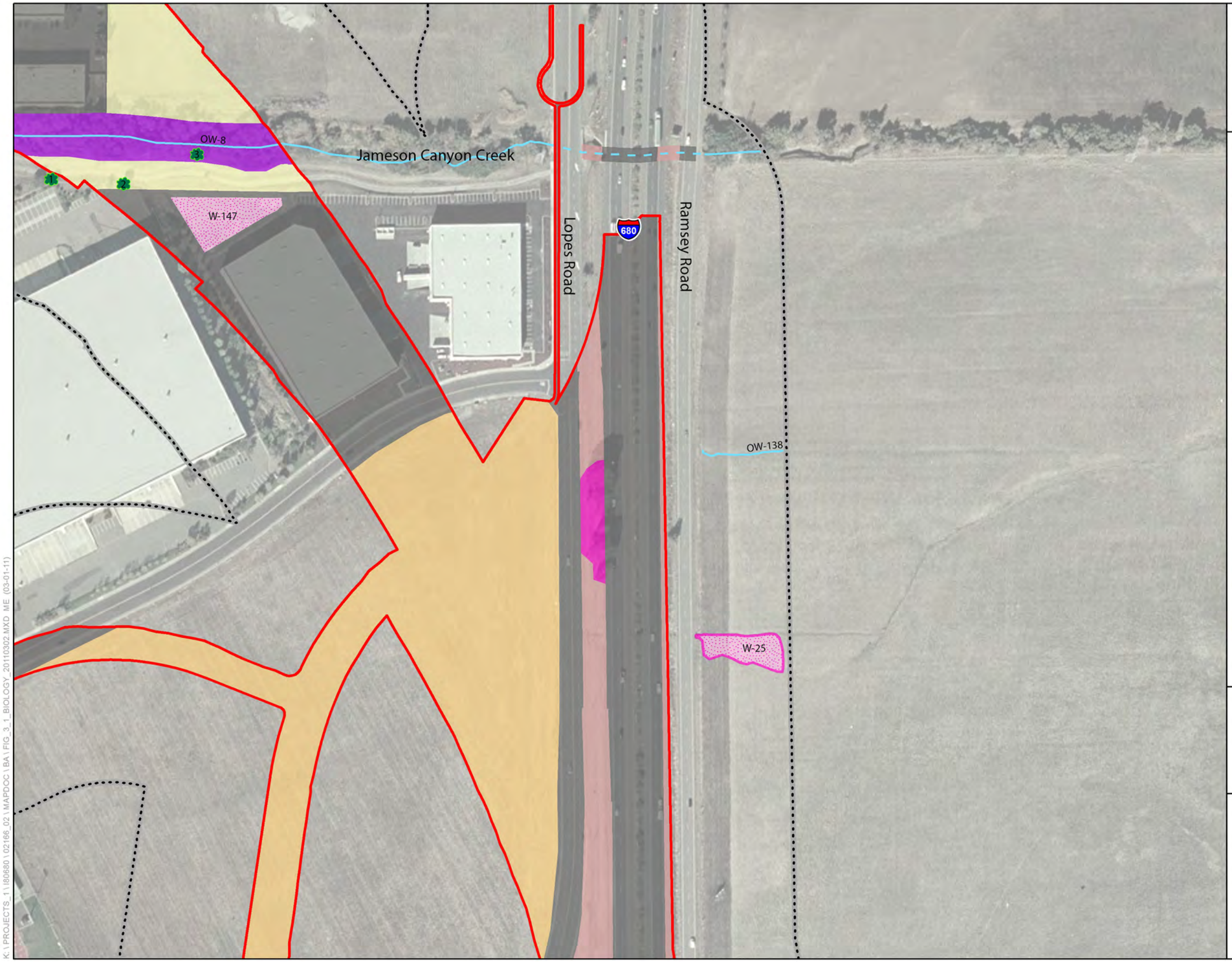
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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Aerial Photo Source: Aerials Express 2008 (© 2010 i-cubed)

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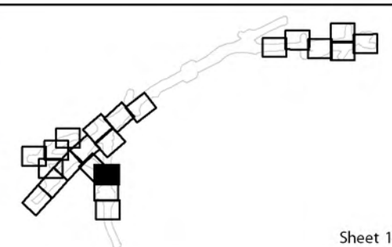



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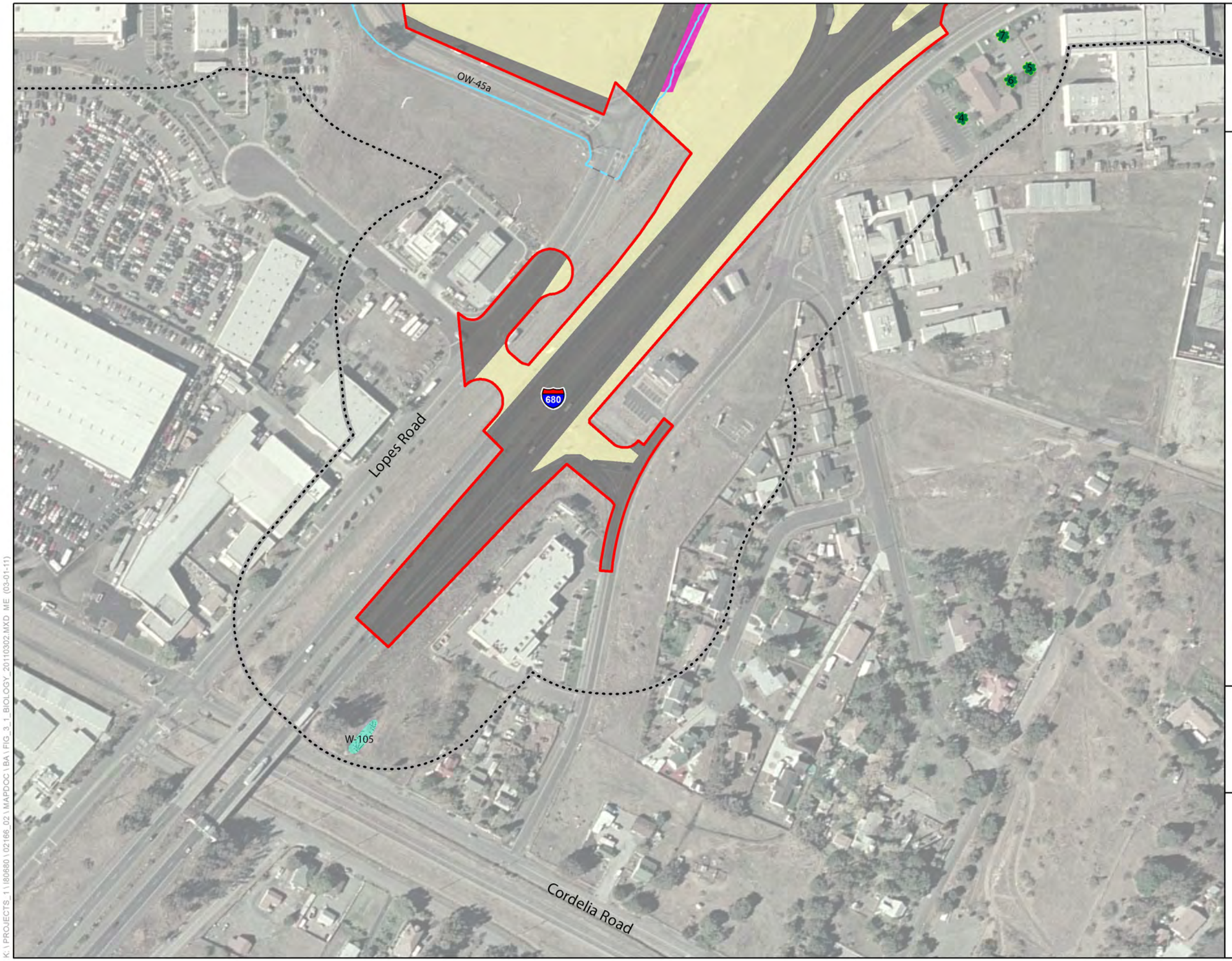
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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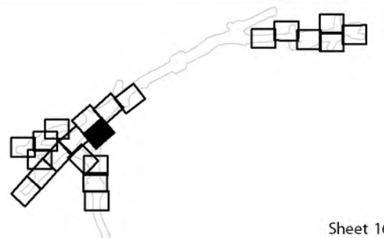

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# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California


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Feet
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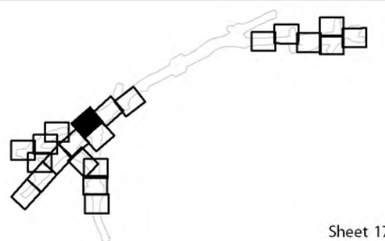

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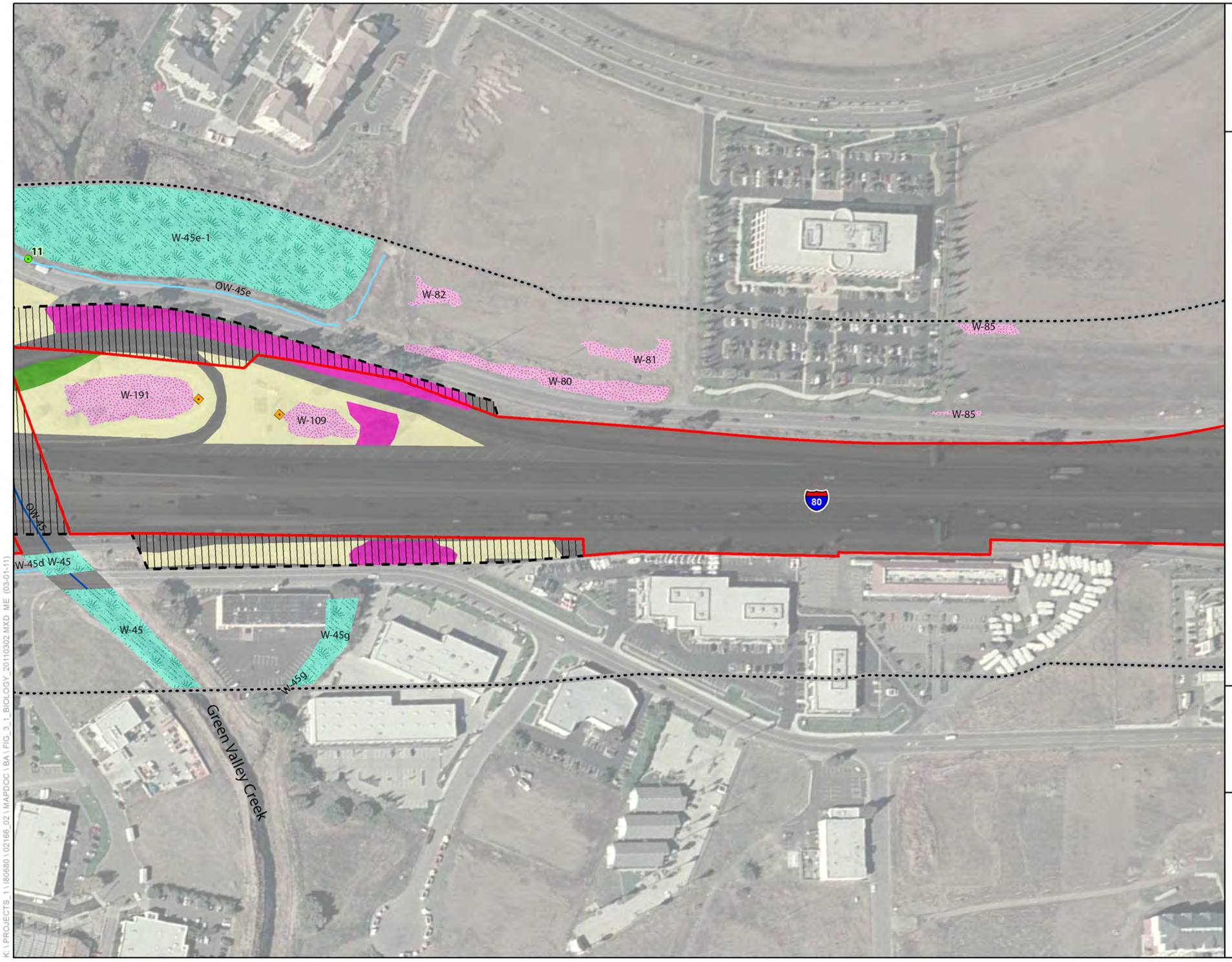
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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Feet
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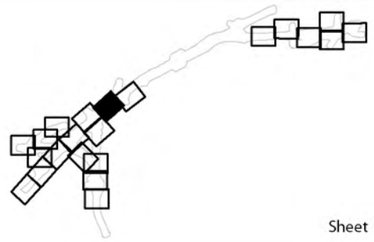

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# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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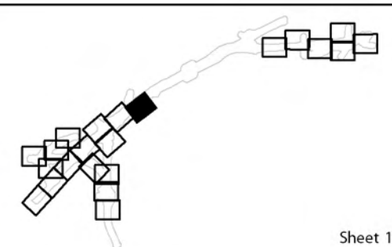


# Figure 3-1
## Biological Resources
## I-80 / I-680 / SR-12 Interchange Project
## Solano County, California

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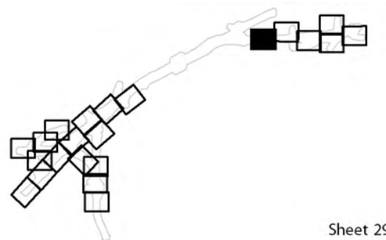



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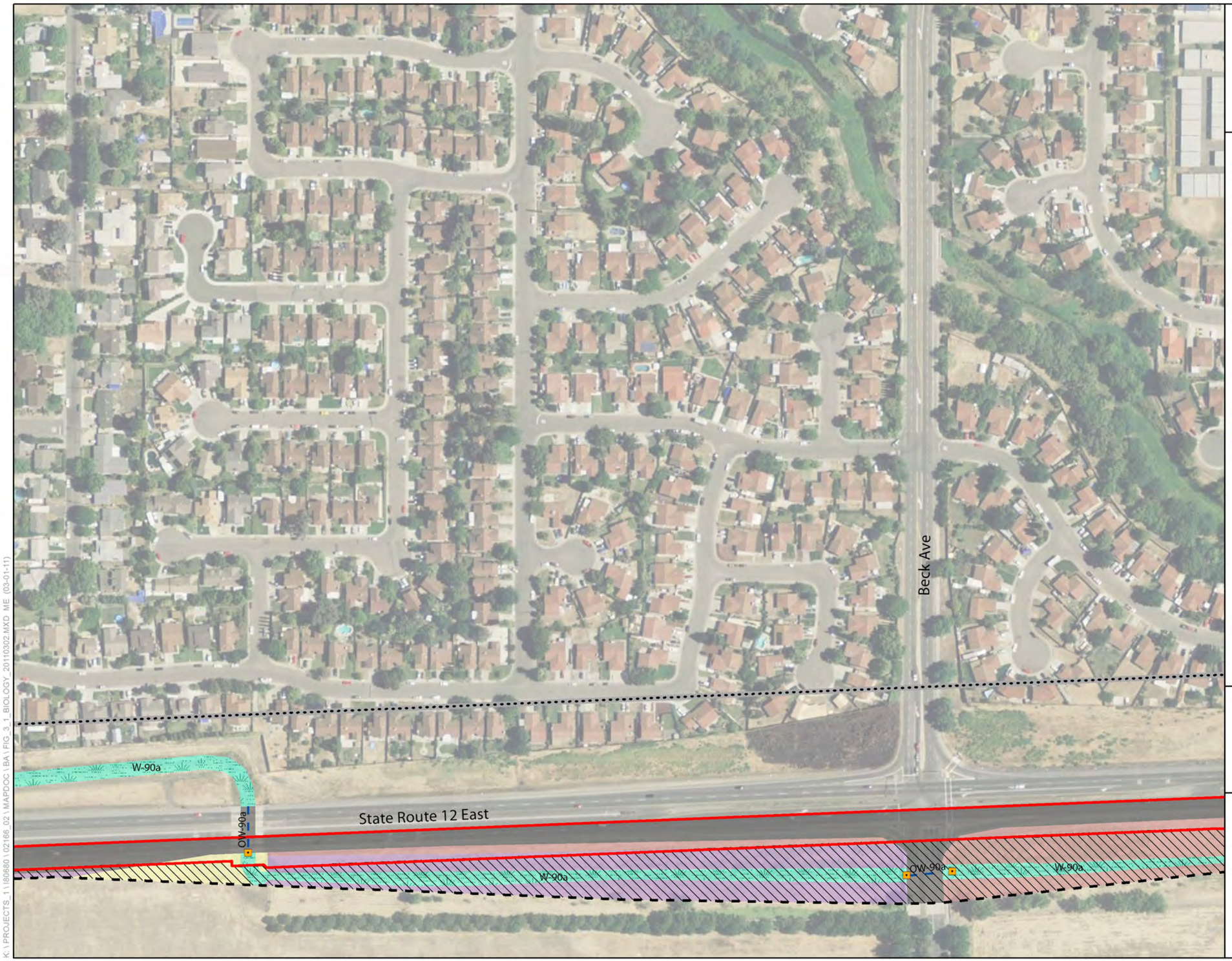
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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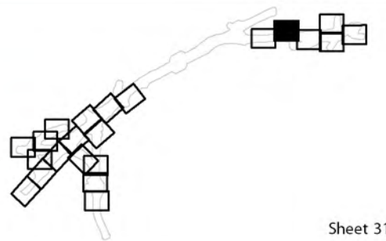

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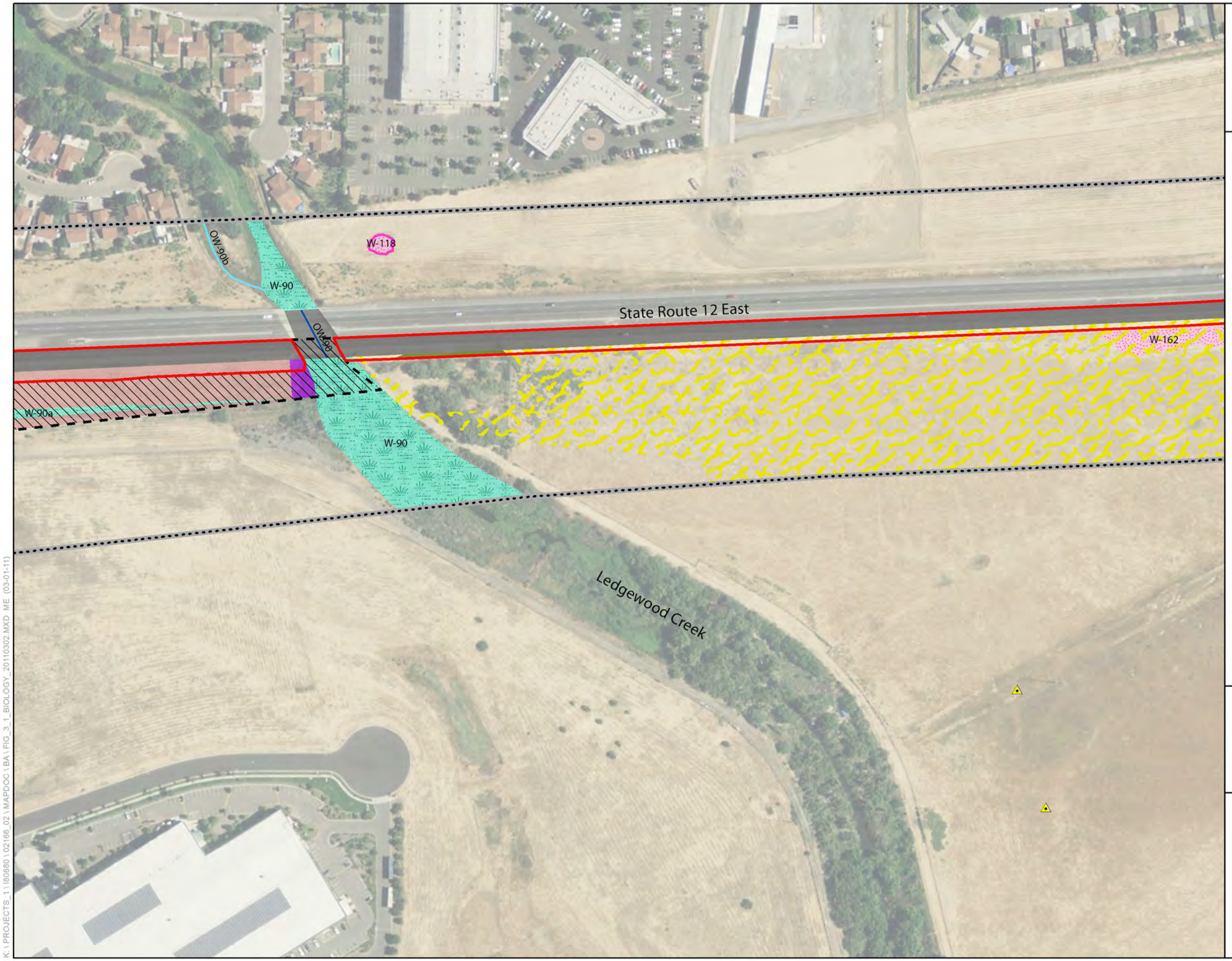
K:\PROJECTS_1\80680\02166_02\MAPDOC\BA\FIG_3_1_BIOLOGY_20110302.MXD ME (03-01-11)

# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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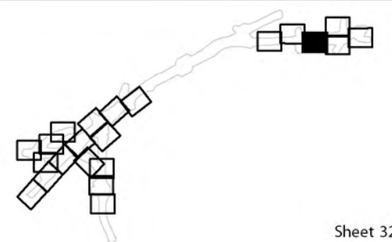

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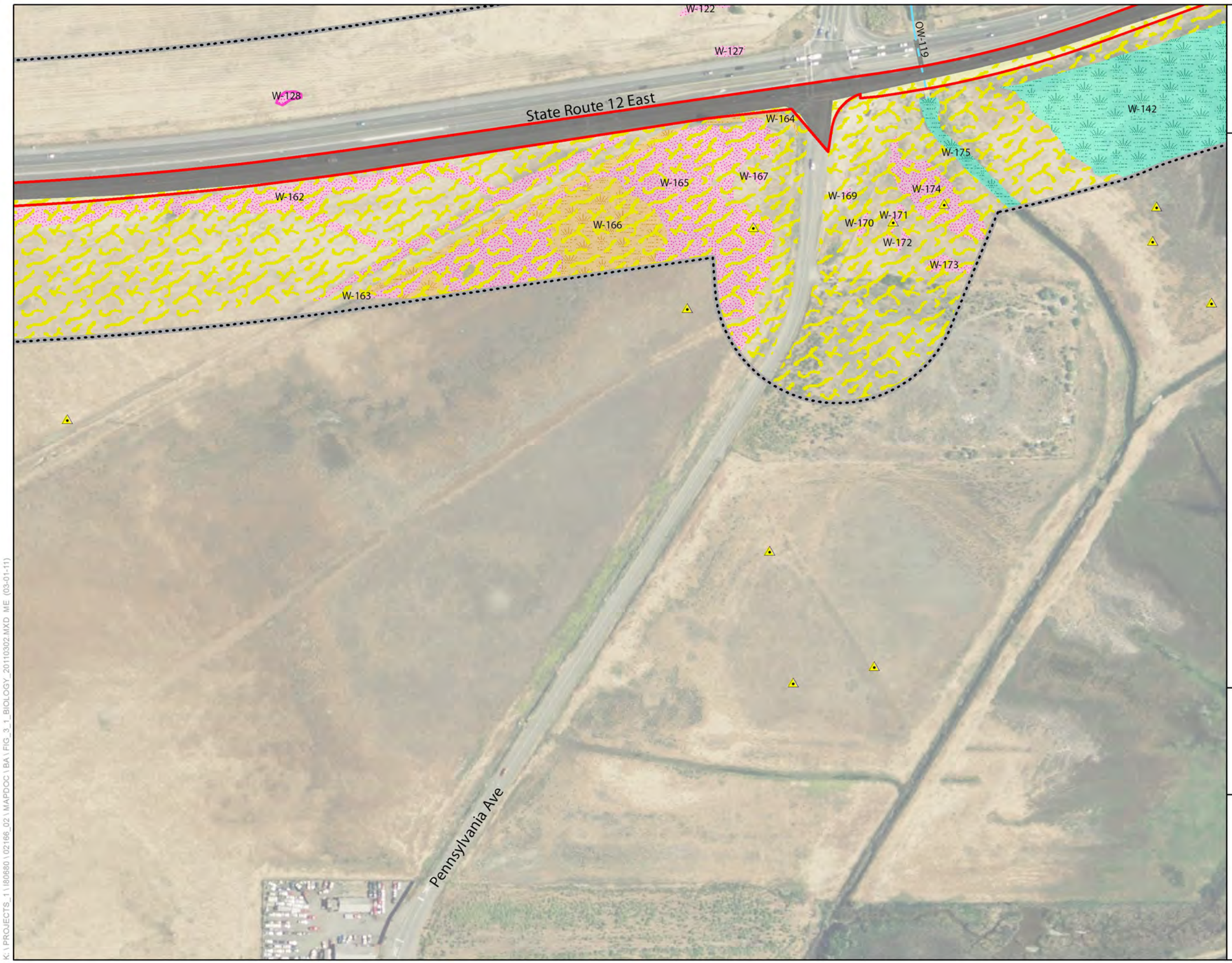
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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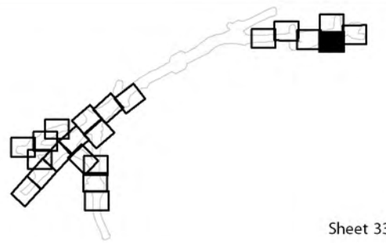
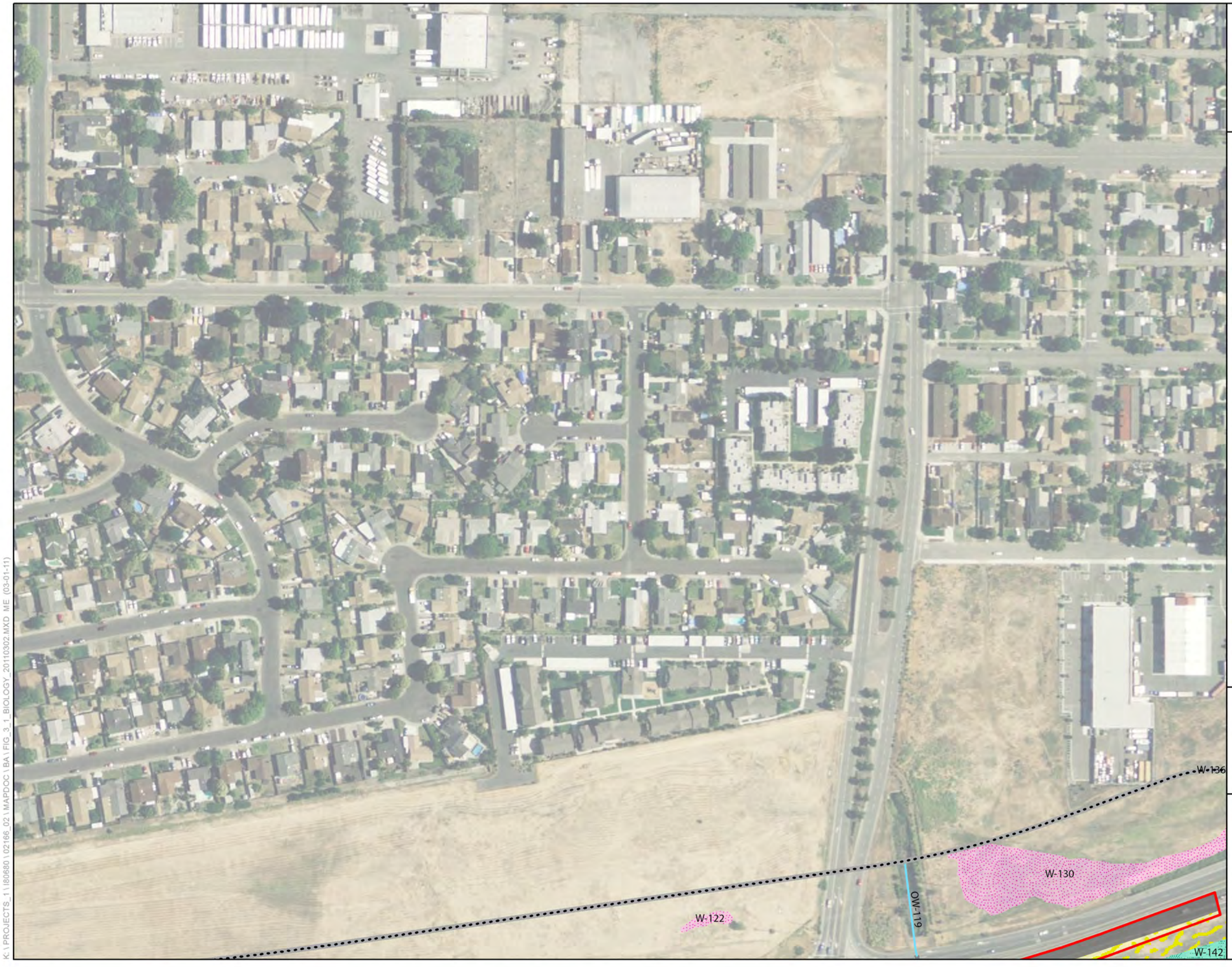


# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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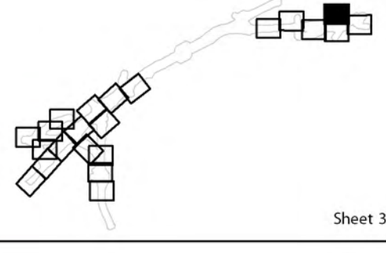
- Contra Costa Goldfields
- Elderberry Shrub
- Johnny Jump-Ups
- Callippe Silverspot Butterfly Habitat
- CA Tiger Salamander Habitat
- Vernal Pool Shrimp Habitat

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2010 i-cubed)

Note: All biological resources are shown within the temporary and permanent impact areas. However, the zone between the impact areas and the biological study area boundary includes mapping only for special status species occurrences.



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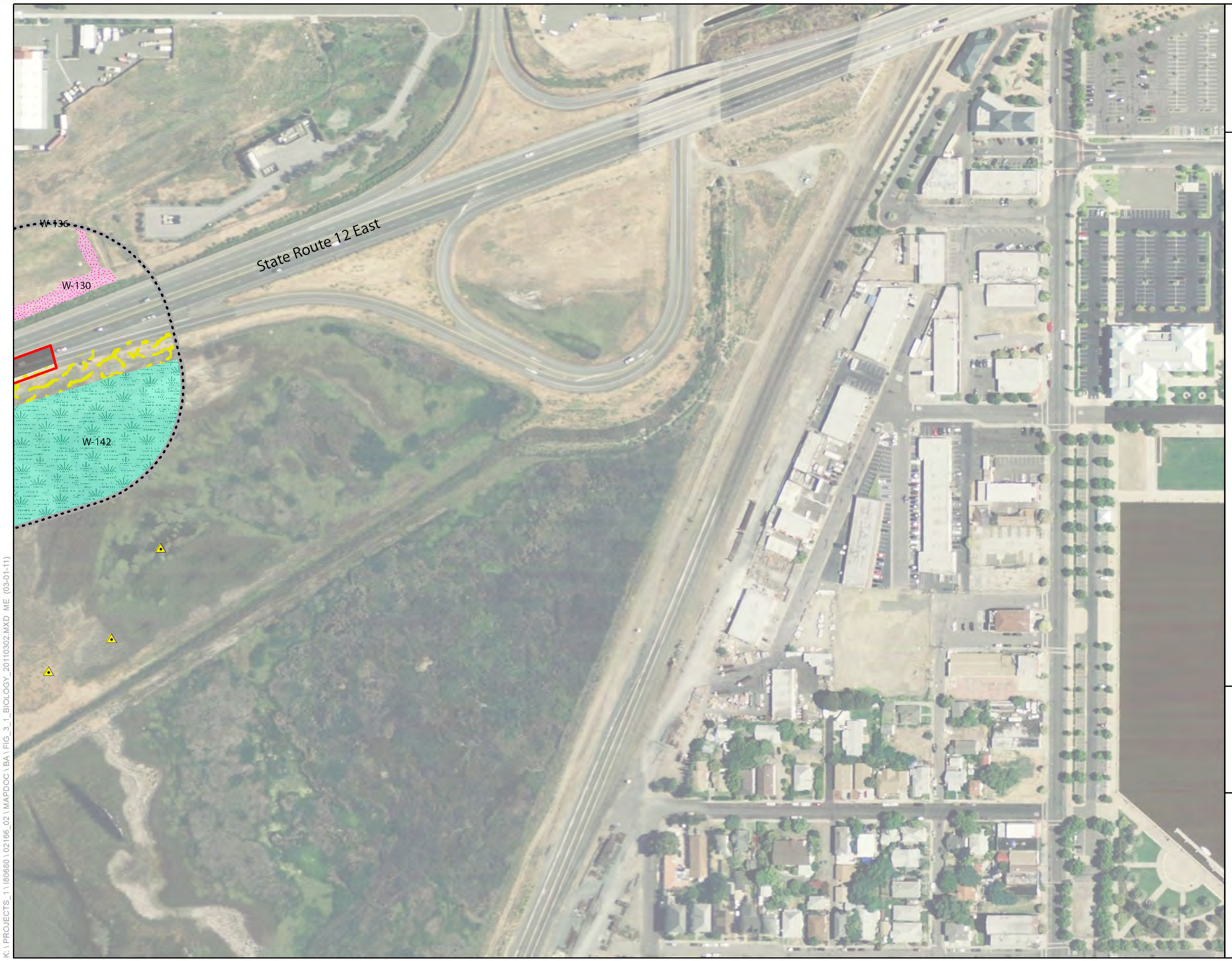
# Figure 3-1
# Biological Resources
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California




## Legend

- Permanent Impact Area (Project Footprint)
- Temorary Impact Area (Project Footprint)
- Biological Study Area
- North Connector 2003 Survey Area

- Alkali Seasonal Marsh
- Blue Oak Woodland
- Developed/Graded
- Eucalyptus
- Landscaped
- Live Oak Woodland
- Non-native Annual Grassland
- Open Water
- Orchard/Vineyard
- Other Woodland
- Perennial Drainage
- Perennial Marsh
- Riparian Woodland
- Row Crops
- Ruderal
- Seasonal Drainage
- Seasonal Wetland
- Upland Scrub
- Valley Oak Woodland

Note: Culverts are denoted by dashed lines.

- Native Tree
- Culvert

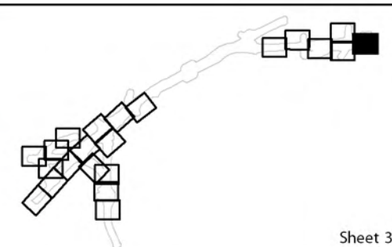
## Special-Status Species Occurrences

- California Red-legged Frog
- Contra Costa Goldfields
- Elderberry Shrub
- Johnny Jump-Ups
- Callippe Silverspot Butterfly Habitat
- CA Tiger Salamander Habitat
- Vernal Pool Shrimp Habitat

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2010 i-cubed)

Note: All biological resources are shown within the temporary and permanent impact areas. However, the zone between the impact areas and the biological study area boundary includes mapping only for special status species occurrences.



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The BSA supports both common natural communities and natural communities of special concern. Common natural communities are habitats with low species diversity that are widespread, reestablish naturally after disturbance, or support primarily nonnative species. These communities are not generally protected by state and federal resource and regulatory agencies unless the specific site is habitat for or supports special-status species (e.g., raptor foraging or nesting habitat, upland habitat in a wetland watershed). The common natural communities are upland scrub, other woodland, eucalyptus grove, orchard, nonnative annual grassland, ruderal, row crops, and landscaped.

Natural communities of special concern are habitats considered sensitive because of their high species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and federal agencies consider these habitats important. The CNDDB contains a current list of rare natural communities throughout the state. USFWS considers certain habitats, such as wetlands and riparian communities, important to wildlife. The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) consider wetland habitats important for water quality and wildlife. The natural communities of special concern are riparian woodland, live oak woodland, valley oak woodland, perennial drainage, seasonal drainage, perennial marsh, alkali seasonal marsh, and seasonal wetland.

The locations of dominant plant species and wildlife species found in natural communities and developed areas within the BSA are described in the following sections. The percentages of each community described below do not include the developed portions, which constitute less than half (41.8%) of the total BSA.

#### 3.1.3.1 Riparian Woodland

Riparian woodland occurs at Jameson Canyon Creek at I-680 (OW-8) and Ledgewood Creek at SR 12E (W-90) and in a small wetland between Cordelia Road and I-80 (W-26). This community type constitutes approximately 0.7% of the BSA. The observed dominant plant species that characterize this riparian woodland are valley oak (*Quercus lobata*), coast live oak (*Q. agrifolia*), willow (*Salix* sp.), white alder (*Alnus rhombifolia*), California buckeye (*Aesculus californica*), California bay (*Umbellularia californica*), Fremont's cottonwood (*Populus fremontii*), and box elder (*Acer negundo*). Shrubs include Himalayan blackberry (*Rubus*

*armeniacus* [*discolor*]), California wild rose (*Rosa californica*), poison-oak (*Toxicodendron diversilobum*), and California wild grape (*Vitis californica*). Riparian woodland also supports elderberry shrubs along both the north and south sides of SR 12W in the vicinity of Jameson Canyon Creek. Herbaceous groundcover consists of nonnative grasses, sedge species, mugwort (*Artemisia douglasiana*), and Bermuda grass (*Cynodon dactylon*).

Riparian vegetation typically provides a variety of functions, such as bank stabilization, erosion control, and wildlife habitat. If vegetation is diverse and well developed, riparian communities can provide high-value habitat for many wildlife species. In general, the multilayered riparian community provides escape cover, forage, and nesting opportunities for wildlife. This habitat may support abundant aquatic and terrestrial invertebrates that may provide prey for numerous amphibians as well as insectivorous birds and small mammals. Raptors nest in large riparian trees, while cavity-dependent birds and mammals require mature tree stands. Larger mammals forage in riparian habitats and use them for cover and travel.

#### 3.1.3.2 Upland Scrub

Upland scrub constitutes approximately 1.8% of the BSA between roadways at the I-80/Red Top Road interchange and west of this area. The upland scrub in the BSA is generally a transitional community surrounded by nonnative annual grassland or between riparian woodland and nonnative annual grassland. The observed dominant vegetation in this community type is coyote brush (*Baccharis pilularis*) with a nonnative annual herbaceous species understory and scattered poison-oak shrubs.

Most of the upland scrub is highly disturbed due to the proximity of major highways and roadways and therefore supports few wildlife species.

#### 3.1.3.3 Valley Oak Woodland

A small area of valley oak woodland makes up approximately 0.3% of the BSA. This stand is located within the I-80 west on-ramp loop at the I-80/I-680 interchange. This community includes valley oak trees, and the understory is open and grassy.

Valley oak woodlands provide food and cover for many species of wildlife.

Local and state agencies recognize native oak woodlands as sensitive natural communities. State agencies protect valley oak woodlands under Senate Concurrent Resolution 17 (SCR 17).

#### 3.1.3.4 Live Oak Woodland

Live oak woodland occurs along the north and south sides of SR 12W makes up approximately 6.4 percent of the BSA. This community type is dominated by interior live oak (*Quercus wislizenii*) with elderberry and poison-oak shrubs and an understory of nonnative annual grasses, creeping wildrye (*Leymus triticoides*), and purple needlegrass (*Nassella pulchra*).

The dominant wildlife species present but not necessarily observed during field visits in this community type are similar to those that occur in valley oak woodland, except that live oaks do not typically provide suitable nesting substrates for raptors. However, raptors are still likely to frequent these communities.

Local and state agencies recognize native oak woodlands as sensitive natural communities. Interior live oak woodland is not regulated under SCR 17.

#### 3.1.3.5 Other Woodland

Other woodland makes up approximately 0.1% of the BSA and occurs south of SR 12E adjacent to Ledgewood Creek. This community type was used to characterize areas dominated by nonnative annual grasses and planted trees along roads.

Wildlife species in this community type are similar to those that occur in valley oak woodland, but the diversity in these communities is likely to be much lower because the communities are mostly small patches of woodland close to development.

#### 3.1.3.6 Eucalyptus Grove

Small groves of eucalyptus (*Eucalyptus* sp.) and individual eucalyptus trees have been planted along the I-80 corridor west of the Suisun Valley Road exit and along the I-680 corridor. This area constitutes approximately 1.1% of the BSA. A windbreak of eucalyptus also occurs north of the Red Top Road exit from I-80. Many of these trees are large, mature specimens.

Eucalyptus trees are often used for nesting by common raptors, include red-tailed hawks (*Buteo jamaicensis*), great horned owls (*Bubo virginianus*), and barn owls (*Tyto alba*). Great egrets (*Ardea alba*) and great blue herons (*Ardea herodias*) also use eucalyptus for nest sites.

#### 3.1.3.7 Nonnative Annual Grassland

Nonnative annual grassland is a common community throughout the BSA, consisting of annual grasses and a variety of native and nonnative annual forbs. This community makes up approximately 65.2% of the BSA. It occurs in patches of undeveloped land and is differentiated from communities mapped as ruderal by the dominance of annual grasses and the presence of some native forbs. Dominant plant species in these areas include wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), blue wildrye (*Elymus glaucus*), and Italian ryegrass (*Lolium multiflorum*). Other characteristic species include yellow star-thistle (*Centaurea solstitialis*), hare barley (*Hordeum murinum* ssp. *leporinum*), medusa-head grass (*Taeniatherum caput-medusae*), mustards (*Brassica* spp.), filarees (*Erodium* spp.), and California poppy (*Eschscholzia californica*). Some areas of nonnative annual grassland also support scattered native trees, but the extent of the tree canopy in these areas is too small to be considered woodland. A large extent of nonnative annual grassland occurs north of SR 12W (Figure 3-1, Sheets 4–6) and includes seasonal wetlands and drainages. A large pond, perennial marsh, and live oak woodland are surrounded by this grassland area.

Grasslands occur throughout the BSA, generally in relatively small patches along roadways and in developed portions of Fairfield. Noise and disturbance associated with these areas reduce the quality of the habitat for wildlife and decrease the number of species expected to occur there. Grasslands within developed areas typically support common species of insects, reptiles, and small rodents that are food sources for birds and raptors. However, the large extent of nonnative annual grassland north of SR 12W provides wildlife habitat for special-status raptors and upland habitat for western pond turtle (*Actinemys marmorata*) and CRLF.

#### 3.1.3.8 Ruderal

The BSA contains numerous ruderal (or disturbed) areas along the roadsides of I-80, I-680, and SR 12. The BSA is approximately 6.4% ruderal areas. These ruderal habitats are characterized by species, particularly nonnative invasive species, whose life history enables them to quickly

establish in areas where disturbance has recently occurred. Typical dominant vegetation in these areas includes winter vetch (*Vicia villosa*), Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum marinum*), filarees, and prickly sow-thistle (*Sonchus asper*). Other representative species include ripgut brome, wild radish (*Raphanus sativus*), mustard, bur-clover (*Medicago polymorpha*), and horseweed (*Conyza canadensis*).

Because ruderal areas are typically disturbed on a regular basis by human activity, they provide low-quality habitat for wildlife. Wildlife species commonly found in ruderal and disturbed areas, but not necessarily observed during field visits, include western meadowlark (*Sturnella neglecta*), Brewer's blackbird (*Euphagus cyanocelphalus*), American goldfinch (*Carduelis tristis*), mourning dove (*Zenaida macroura*), Virginia opossum (*Didelphis virginiana*), and black-tailed jackrabbit (*Lepus californicus*). American kestrels (*Falco sparverius*) and red-tailed hawks frequently forage in this habitat. Swainson's hawks (*Buteo swainsoni*) may also forage in ruderal habitat.

#### 3.1.3.9 Row Crops

Limited areas of row crops are still present between Lopes Road and I-680, at the east end of Red Top Road. This community makes up approximately 8.9% of the BSA. Row crop fields may be disked or left fallow for part of the year. Ruderal or invasive species may occur in these areas along edges of fields and when an area has not been recently plowed.

In general, agricultural land is established on fertile soils that historically supported abundant wildlife. The diversity of wildlife greatly diminishes when row crops are planted. The understory in agricultural lands consists of low-growing grasses or soil sprayed with herbicides to prevent the growth of herbaceous vegetation. Many species of rodents and birds have adapted to agricultural lands but are controlled by fencing, trapping, and poisoning to prevent excessive crop losses.

#### 3.1.3.10 Orchard

Orchard habitat is present in the BSA north of SR 12W and west of Red Top Road. This community makes up approximately 0.4% of the BSA. Orchards are generally monotypic, tree-dominated habitats that are typically sprinkler irrigated and intensively managed. The understory

is either bare soil or a periodically mowed herbaceous layer of nonnative annual grasses and forbs. Invasive plants, such as Bermuda grass (*Cynodon dactylon*) and Johnson grass (*Sorghum halapense*), may be present in moist areas.

Orchards may provide habitat for common wildlife species such as raccoon (*Procyon lotor*), Virginia opossum, California vole (*Microtus californicus*), Brewer's blackbird, American crow (*Corvus brachyrhynchos*), and yellow-billed magpie (*Pica nuttalli*).

#### 3.1.3.11 Landscaped Areas

Landscaped areas occur throughout the BSA and are interspersed with residential and commercial development. Rhis community type constitutes approximately 2.1% of the BSA. Landscaped areas contain ornamental trees, shrubs, and forbs and typically have low habitat value for wildlife because they are disturbed on a regular basis by human activity.

The landscape vegetation around buildings and in parks provides nesting and foraging habitat and cover for common bird species. Mammals adapted to urban environments are commonly found in this habitat.

#### 3.1.3.12 Perennial Drainages

Perennial drainages in the study area are unvegetated and carry flow year-round or nearly year-round. This community constitutes approximately 0.3% of the BSA. Perennial drainages in the BSA are listed below.

- The downstream reach of American Canyon Creek (OW-23) (Figure 3-1, Sheet 12).
- The bridged part of Green Valley Creek (OW-45) (Figure 3-1, Sheets 17 and 18).
- Culverted parts of Ledgewood Creek (OW-90) (Sheet 32) and its tributary (OW-90a) (Figure 3-1, Sheet 31).

Perennial drainages that are densely vegetated are discussed separately from the unvegetated perennial drainages in this section. See Section 3.1.3.14, *Perennial Marsh*, for descriptions of vegetated perennial drainages. Green Valley Creek is also discussed in Section 3.1.3.14 because much of the creek is vegetated. Under the I-80 bridge, Green Valley Creek has a cement-lined

bed and bank with sediment deposits built up in portions of the creekbed. Although these sediment "islands" support some emergent vegetation, including willow and cattail, this vegetation is transient and can be scoured during high flows. Therefore, the part of the creek under the I-80 bridge is mapped as perennial drainage.

### 3.1.3.13 Seasonal Drainages

Seasonal drainages make up 1.2% of the BSA. This community type primarily carries water after storm events and during the wet season. This category includes both natural seasonal drainages and constructed seasonal drainages, both of which provide habitat for wildlife.

#### *Natural Seasonal Drainage*

Natural seasonal drainages in the BSA are listed below.

- Jameson Canyon Creek (OW-8) and its tributaries (other waters OW-8a, OW-8b, OW-8d, OW8e, OW-86, and OW-158).
- Drainages north and south of SR 12W (OW-13, OW-15, OW-145, OW-146, OW-149, OW-153, OW-160, and OW-161).
- Drainage north of I-80 and Red Top Road (OW-1a).
- Drainages west of I-680 (OW-150 and OW-151).

#### *Constructed Seasonal Drainages*

Constructed seasonal drainages occur throughout the BSA and include ditches excavated in upland areas along roadsides, railroads, and agricultural fields or around developments. Some ditches are concrete lined.

### 3.1.3.14 Perennial Marsh

Perennial marsh includes areas mapped in the wetland delineation (ICF Jones & Stokes 2008) as perennial wetland drainages, as well as areas mapped as perennial marsh. They make up approximately 2.9% of the BSA. Perennial marsh occurs within drainages in Green Valley Creek (W-45), the downstream reach of Ledgewood Creek that crosses SR 12E (W-90), and an unnamed constructed tributary of Ledgewood Creek (W-90a).

Dominant plant species observed in perennial wetland drainages include narrow-leaved cattail (*Typha angustifolia*), bulrush (*Scirpus acutus*), Himalayan blackberry, watercress (*Rorippa nasturtium-aquaticum*), water-milfoil (*Myriophyllum* sp.), and Goodding's willow (*Salix gooddingii*). Water is present year-round, or nearly year-round, in these areas.

Perennial marsh wetlands that are outside of drainages occur in a pond north of SR 12W (W-150) and a drainage basin between Rodriquez High School and Lopes Road (W-149). One perennial marsh within a mitigation area (W-45e-1) is located adjacent to the project footprint east of Green Valley Creek. Dominant plant species observed in perennial marsh wetlands include those found in the perennial wetland drainages, as well as California blackberry (*Rubus ursinus*), Harding grass (*Phalaris aquatica*), curly dock (*Rumex crispus*), and soft rush (*Juncus effusus*). This community type is inundated or saturated year-round.

Perennial marshes provide habitat for a variety of wildlife. Riparian and ruderal vegetation along the edges of marshes provides nesting habitat for an assemblage of bird species similar to that listed for riparian woodland communities, as well as foraging and refuge habitat for amphibians, reptiles, and mammals occupying open water and adjacent grassland habitats. Birds such as egrets, herons, and belted kingfishers (*Ceryle alcyon*) forage in these communities, primarily along the water's edge. The perennial marsh on the north side of SR 12W (W-150) supports dense marsh vegetation surrounded by oak woodland and nonnative annual grassland, which provides high-quality habitat (e.g., breeding, cover, foraging) for a variety of listed and nonlisted wildlife. CRLFs and western pond turtles (a state species of special concern) have been observed in the marsh and pond north of it. In addition, tricolored blackbirds (*Agelaius tricolor*) (a state species of special concern) nest in perennial marshes. The abundant wetland vegetation, along with open water, provides cover, foraging, and nesting habitat for a variety of wildlife species, including amphibians, birds, reptiles, and a few mammals.

#### 3.1.3.15 Alkali Seasonal Marsh

Alkali seasonal marsh was mapped only in the area south of SR 12E at the eastern end of the BSA, making up approximately 0.22% of the BSA. This habitat is within the BSA but outside the project footprint. This area is surrounded by seasonal wetland and nonnative annual grassland. Alkali seasonal marsh is seasonally inundated or saturated and is distinguished from

seasonal wetland habitat by the presence of saline soils and salt-tolerant species, including curved sicklegrass (*Parapholis incurva*), alkali weed (*Cressa truxillensis*), alkali heath (*Frankenia salina*) and, in low areas, pickleweed (*Salicornia virginica*).

Wildlife species found in alkali seasonal marsh include California vole, herons, mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferous*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), greater yellowlegs (*Tringa melanoleuca*), and Wilson's snipe (*Gallinago delicata*).

#### 3.1.3.16 Seasonal Wetland

Numerous seasonal wetlands were mapped in the BSA, mostly in or adjacent to areas disturbed by development and agriculture. This community makes up approximately 2.2% of the BSA. Many seasonal wetlands are near roadways and receive runoff from the roads. The vegetation in these wetlands is correspondingly degraded, often dominated by nonnative annual grasses and nonnative forbs. Dominant species observed in this wetland type typically include Italian ryegrass, Mediterranean barley (*Hordeum marinum* var. *gussoneanum*), Harding grass, rabbits-foot grass (*Polypogon monspeliensis*), creeping wildrye, creeping spikerush (*Eleocharis macrostachya*), curly dock, iris-leaved rush (*Juncus xiphioides*), toad rush (*Juncus bufonius*), prickly ox-tongue (*Picris echioides*), birds-foot trefoil (*Lotus corniculatus*), and alkali mallow (*Malvella leprosa*).

This habitat type also includes features south of SR 12E and west of Pennsylvania Avenue that were more specifically identified as "seasonally saturated annual grassland" in the wetland delineation conducted for another project in that area (Huffman-Broadway Group 2007). These areas are dominated by Italian ryegrass, Mediterranean barley, alkali weed, and alkali heath. One seasonal wetland (W-165) south of SR 12E (Figure 3-1, Sheet 33) supports CCG in a part of the wetland approximately 200 feet outside the BSA (see Section 4.1.1.1 for more detailed information). While this wetland was not categorized separately from the other seasonal wetlands, it is larger and supports more native species, including three plants listed by the California Native Plant Society (alkali milk-vetch [*Astragalus tener* var. *tener*], pappose tarplant [*Centromadia parryi* ssp. *parryi*], and saline clover [*Trifolium depauperatum* var. *hydrophilum*]),

than the other seasonal wetlands in the BSA. Where water persists long enough it provides suitable habitat for listed shrimp species.

### 3.1.3.17 Developed Areas

The developed cover type occurs throughout the BSA in the form of roads, bridges, and graded areas along and adjacent to I-80, I-680, and SR 12. While only the unvegetated areas have been mapped as developed, these areas are frequently associated with a mixture of landscaped ornamentals, including oleander (*Nerium oleander*), eucalyptus, and ruderal species that typically colonize recently disturbed or graded areas.

Because of high levels of noise disturbance and human activity, developed/graded portions of the BSA provide low-habitat value for wildlife species. However, bridges can provide nesting habitat for swallows and swifts and roosting habitat for bats. A number of bird species have been observed nesting on bridges and nearby vegetation in the project vicinity during preconstruction nest surveys for the I-80 HOV project; these include Anna's hummingbird (*Calypte anna),* cliff swallow (*Hirundo pyrrhonota*), northern rough-winged swallow (*Stelgidopteryx serripennis),*white-throated swift (*Aeronautes saxatalis*), spotted towhee (*Pipilo maculatus*), northern mockingbird (*Mimus polyglottos*), wrentit (*Chamaea fasciata*), bushtit (*Psaltriparus minimus*), and black phoebe (*Sayornis phoebe*).

### 3.1.3.18 Invasive Species

Invasive plant species include species designated as federal noxious weeds by the U.S. Department of Agriculture (USDA), species listed by the California Department of Food and Agriculture (CDFA), and other invasive plants designated by the California Invasive Plant Council (Cal-IPC). Roads, highways, and related construction projects are some of the principal dispersal pathways for invasive plant species. The introduction and spread of invasive plants adversely affect natural plant communities by displacing native plant species that provide shelter and forage for wildlife species.

# Chapter 4 Results: Biological Resources, Discussion of Impacts and Mitigation

Based on the species' distribution and habitat requirements, results of field surveys, and conversations with species experts and resource agency personnel, the wildlife species and plants listed below and their critical habitat were considered to have potential to occur in the action area and may be affected by the proposed project. Accordingly, the following wildlife species and plants and their critical habitats are addressed in this BA.

- Contra Costa goldfields (*Lasthenia conjugens*)—endangered.
- Contra Costa goldfields critical habitat.
- Showy Indian clover (*Trifolium amoenum*)—endangered.
- Callippe silverspot butterfly (*Speyeria callippe callippe*)—endangered.
- Vernal pool fairy shrimp (*Branchinecta lynchi*)—threatened.
- Vernal pool tadpole shrimp (*Lepidurus packardi*)—endangered.
- Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)—threatened.
- California red-legged frog (*Rana draytonii*)—threatened.
- California red-legged frog critical habitat.
- California tiger salamander (*Ambystoma californiense*)—threatened.

Direct (temporary and permanent) and indirect project effects are described below for each of the seven Construction Packages under Phase 1. Direct effects will occur concurrent with project construction and result from construction activities. Indirect effects are those effects that are reasonably certain to occur but that will occur later in time as a result of the proposed project.

## 4.1 Federally Listed or Proposed Plant Species

Jan C. Knight, USFWS Deputy Field Supervisor, has clarified the limitations protecting federally listed species under FESA in *The Federal Endangered Species Act and Rare Plant Protection* (Bartel et al. 2001). Section 9 of the Endangered Species Act prohibits *take* of federally listed wildlife species. *Take* is defined as to harass, harm (which includes significant habitat modification or degradation), pursue, hunt, shoot, wound, kill, trap, capture, or attempt to engage in any such conduct. Plants are not protected against take. Instead, plants are protected from harm in two particular circumstances. Section 9 prohibits (1) the removal and reduction to possession (i.e., collection) of endangered plants from lands under federal jurisdiction, and (2) the removal, cutting, digging, damage, or destruction of endangered plants on any other area in knowing violation of a state law or regulation (Bartel et al. 2001).

A recent Ninth Circuit Court of Appeals decision (filed August 25, 2010) in Northern California, River Watch v. Carl Wilcox, clarified the term *federal jurisdiction* as it relates to the regulation of listed plants under FESA. For now, the Court held that "areas under federal jurisdiction" include land under the control of the federal government through ownership, leasehold-estates or conservation easement, but not wetlands adjacent to navigable waters.

Because there are no prohibitions for take of listed plants, there is no requirement to authorize incidental take of listed plants under FESA and consequently no terms and conditions. While there are no prohibitions on take of listed plants, a federal lead agency with discretionary authority over an action has a fundamental duty pursuant to FESA Section 7 to avoid jeopardizing the continued existence of, or adversely modifying or destroying the critical habitat of any federally listed plant. Moreover, a federal lead agency should implement measures to minimize and avoid harm to listed plants, when such measures are consistent with the minor change rule.

The following 11 federally listed plant species are included on the USFWS list in Table 2-1.

- Baker's stickyseed (*Blennosperma bakeri*).
- Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*)
- Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*)

- Soft birds-beak (*Cordylanthus mollis* ssp. *mollis*)
- Contra Costa goldfields(*Lasthenia conjugens*)
- Colusa grass (*Neostapfia colusana*)
- San Joaquin Valley Orcutt grass(*Orcuttia inaequalis*)
- Antioch Dunes evening-primrose (*Oenothera deltoides* ssp. *howellii*)
- Keck's checker-mallow (*Sidalcea keckii*)
- Showy Indian clover (*Trifolium amoenum*)
- Solano grass (*Tuctoria mucronata*)

Figure 2-2a shows the CNDDB occurrences of federally listed plants occurring within a 5-mile radius of the BSA. Results of the literature review and database queries determined that only two of these 11 species, CCG and showy Indian clover, could potentially occur within the BSA. However, neither of these plants are on land under federal jurisdiction or are protected under state law or regulation. CCG occurs south of SR 12E (Figure 3-1, Sheets 32, 33, and 35), but this species was not observed within the BSA by the ICF biologist. However, historic occurrences of CCG have been found within the BSA during surveys for other projects. Showy Indian clover was also not observed within the BSA. Because ICF did not have access during field surveys in 2009 to the Mangels property where there is an area of potential habitat for showy Indian clover in nonnative annual grassland north of SR 12W (Figure 3-1, Sheets 4–6), it is included in the BA. For additional details, see the discussion of these species in Sections 4.1.1 and 4.1.2.

Although potential habitat for four of the nine remaining listed species—Baker's stickeyseed, Colusa grass, San Joaquin Valley Orcutt grass, and Solano grass—is present in seasonal wetland habitat, none of these species was observed during surveys conducted in seasonal wetlands in the BSA. There is potential for these three species to occur in potential habitat in areas where the ICF surveyors did not have access on the Mangels property. However, none of these four plants was observed on the property when Monk & Associates conducted surveys for the North Connector project in 2003 or 2004. Nevertheless, none of the potential habitat for these four plants would be directly or indirectly affected by the proposed project. Baker's stickyseed, which

occurs in vernal pools and wet grasslands, is known only from the valleys in the inner Coast Ranges of Sonoma County and has no known occurrences outside the county or in the Sacramento Valley geographic subregion.

Specific microhabitat conditions for Colusa grass, San Joaquin Valley Orcutt grass, and Solano grass, including depth of wetlands and soils, may be lacking in seasonal wetlands on the Mangels property. The CNDDB (2010) and the CNPS Inventory (2010) were reviewed to determine the nearest documented extant occurrences for these species, with the following results.

- A total of 59 occurrences of Colusa grass are recorded in the CNDDB (2010). Colusa grass is historically known from Colusa County, but is extant primarily in Stanislaus and Merced Counties, with two occurrences in Solano County and two occurrences in Yolo County. In Solano County, Colusa grass occurs at Olcott Lake and in a large wetland southwest of the lake on Solano Land Trust property, approximately 9 miles northeast of the BSA. In Yolo County, Colusa grass occurs in alkaline playa pools on the Davis Air Force Communications facility. Colusa grass occurs in large, deep pools on adobe clay soils. The seasonal wetlands on the Mangels property are not alkaline, and soils on the Mangels property are mapped as loams or clay loams that are moderately well drained to well drained and would not be considered adobe clay soils. Wetland and soil conditions on the Mangels property, therefore, do not fit the criteria for potential Colusa grass habitat.
- San Joaquin Valley Orcutt grass is known almost exclusively from the San Joaquin Valley in Merced, Stanislaus, Tulare, Fresno, and Madera Counties. A total of 47 occurrences of San Joaquin Orcutt grass are recorded in the CNDDB (2010), and only one occurrence is in Solano County. San Joaquin Valley Orcutt grass occurs in an alkaline playa pool east of Travis Air Force Base, approximately 8 miles northeast of the BSA and 13 miles northeast of the Mangels property. This species has been found in a wide variety of vernal pool and soil types and usually occurs in large vernal pools (more than 1,500 square feet) (70 FR 46925). Because it is known primarily from the San Joaquin Valley and was never previously seen in the region of the Mangels property, this species is highly unlikely to occur on the property. As described above for Colusa grass, the wetlands on the Mangels property are not alkaline.

- Solano grass is known only from Solano and Yolo counties at the same occurrences as the Colusa grass. A total of three occurrences of Solano grass are recorded in the CNDDB (2010). Solano grass occurs southwest of Olcott Lake on private land, approximately 9 miles northeast of the BSA. Solano grass occurs in large, deep pools on adobe clay soils. As described above for Colusa grass, the wetlands and soils on the Mangels property do not fit these criteria.

No potential habitat for the five remaining listed plant species—serpentine soils in grassland and woodland (Tiburon paintbrush and Keck's checker-mallow), salt marsh habitat (Suisun thistle and soft birds-beak), and inland sand dunes (Antioch Dunes evening primrose)—occurs within the BSA.

## 4.2 Contra Costa Goldfields

CCG was federally listed as endangered on July 18, 1997 (62 FR 33029–33038). USFWS designated final critical habitat for CCG on February 10, 2006 (71 FR 28:7217–7266). This species is included in the 2005 recovery plan for vernal pool species (U.S. Fish and Wildlife Service 2005). CCG has no state listing status, but it is on CNPS's List 1B.1 (rare, threatened, or endangered in California and elsewhere; seriously endangered in California—more than 80% of occurrences threatened/high degree and immediacy of threat). CCG is known historically from coastal valleys in central California (from Mendocino to Santa Barbara Counties) and from the western edge of the Sacramento Valley north of Suisun Marsh.

CCG is an annual herb in the sunflower family (*Asteraceae*). It can bloom from March to June but is usually at its peak bloom in Solano County in late April and early May. CCG inhabits neutral to alkaline or saline vernal pools and adjacent seasonally moist grassy areas at elevations below 1,500 feet. It is dependent on continuous, high soil moisture content and appears to occupy deep pools that dry out later in the growing season, rather than very shallow, "flashy" pools (Ornduff 1966; Rajakaruna 2003). Saturated, low-salinity soils appear to provide optimum conditions for germination and growth of CCG (Collinge et al. 2003). CCG requires insect pollinators for reproduction. Ground-nesting solitary bees (*Andrenidae*) that nest in the uplands around vernal pools are important pollinators of the goldfields genus (Thorp and Leong 1998).

The primary threats to the species have been historical habitat loss, commercial and residential development, grazing, and competition from invasive nonnative plants (California Native Plant Society 2010).

### 4.2.1 Survey Results

The CNDDB lists 32 occurrences of CCG in Alameda, Contra Costa, Marin, Mendocino, Monterey, Napa, and Solano Counties (California Natural Diversity Database 2010). The largest known concentration of CCG is in Solano County in the City of Fairfield. Twelve of the 32 occurrences are in Solano County, of which eight are found within 5 miles of the BSA (Figure 2-2a). These are occurrences 3, 7, 19, 20, 22, 28, 33, and 42. Occurrences 3 and 19 are near activities associated with Construction Package 4; occurrence 19 is within the BSA, but approximately 200 feet from the project footprint, south of SR 12 E on the east and west side of Pennsylvania Avenue. This occurrence is described in detail below.

ICF biologists identified 12 seasonal wetlands (W-162, W-163, and W-165 through W-174) within the BSA that provide potential habitat for CCG (Figure 3-1, Sheet 33). These lands are under private ownership. These seasonal wetlands provide the primary constituent elements (PCEs) of critical habitat for CCG. They are adjacent to the project footprint but do not extend into it (Figure 3-1, Sheets 32 and 33).

Vollmar Consulting conducted surveys for the Gentry-Suisun project south of SR 12E in May 2000, April 2001, April and May 2002, and April 2005. Based on these 2000–2005 surveys, Vollmar observed several occurrences of CCG both within and outside the BSA, but not within the project footprint. Although no CCG were found in the project footprint, occurrence 19 includes one plant each in two separate seasonal wetlands located approximately 200 feet and 225 feet outside the project footprint east of Pennsylvania Avenue, and a total of 29 plants in two stands within a part of seasonal wetland W-165 that is nearly 200 feet outside the project footprint (Figure 3-1, Sheet 33). Eleven additional stands (Figure 3-1, Sheets 33 and 35) totaling 419 plants were mapped at a distance of approximately 75–550 feet from the BSA in 2005 (Vollmar Consulting 2005).

ICF conducted floristic surveys of the BSA in 2009, including surveys for CCG. During the 2009 surveys, ICF did not observe any CCG plants within W-165 or within several hundred feet of the BSA.

Because CCG is an annual species, the numbers of plants that grow in an area can vary widely from year to year depending on rainfall, disturbance regime, and other factors that affect seed germination and plant survival (U.S. Fish and Wildlife Service 2005). The area has not been visibly disturbed since 2005, and the seed bank for CCG would likely be present in the area where the plants were observed in 2005. Below-average rainfall and varied temperature patterns in 2008 and 2009 may have affected germination and growth of this species in spring 2009, causing the lack of mature plants during the 2009 surveys. For the purposes of this analysis, the extent of occupied habitat and numbers of plants is based on the data collected during 2005 surveys conducted for the Gentry-Suisun project. Based on the above assessment, it is likely the CCG population is extant at the location described above.

The BSA south of SR 12E is fairly flat, with a gradual slope to the south, and the wetland depressions are shallow and difficult to discern. W-165, W-171, and W-174 are annual grassland habitats that are not located in depressions, but remain saturated during the wet season, providing potential habitat for CCG. Due to the lack of landscape depressions to hold the water, the seasonal saturation is likely due to a high water table or perching of rainwater and sheet flow over a shallow hardpan soil. A shallow roadside swale is located south of SR 12E and west of Pennsylvania Avenue at the base of the road prism. The hydrologic connection between this swale and the wetlands located south of the ROW fence line was assessed utilizing topographic surveys and an onsite qualitative evaluation. It is likely this roadside swale contributes flow directly into wetlands W-162 and W-163. These seasonal wetlands occur at the base of a berm that extends southwest of the swale. The swale may also contribute sheet flow to the annual grassland south of SR 12E in the area where the CCG were found. The SR 12E roadway has been assessed to identify sections of the road that drain to the south and contribute runoff into this roadside swale (Appendix A). As shown in the cross sections, part of SR 12E slopes slightly toward the south (Sections A-A, B-B, and C-C on Sheets 1 and 2 and Section G-G on Sheets 5 and 6). The swale drains east toward Pennsylvania Avenue, as indicated by elevation points shown on these figures. As shown on Sheet 5 in Appendix A, the contour slopes slightly

southward from the road, and water would therefore flow from the swale toward the wetland areas. A portion of the flow from the swale is likely intercepted by the low-lying wetlands along the alignment of the power line berm, reducing the amount of sheet flow that could continue east and south to reach the CCG population. The part of the road shown in Section G-G is not blocked by any barriers and could drain toward W-165. A detailed hydrologic analysis will be performed as part of the drainage design to ensure that the current velocity and volume of roadside runoff will not be significantly altered by the new road construction or affect the down-gradient conditions.

### 4.2.2 Critical Habitat

USFWS designated 14,730 acres of critical habitat for CCG in 2006 (71 FR 28:7118–7316). The area immediately south of SR 12E between Beck Avenue and Pennsylvania Avenue includes the northern edge of vernal pool critical habitat Unit 5B, which encompasses 736.72 acres and is designated for CCG (71 FR 28:7217–7266) (Figure 4-1).

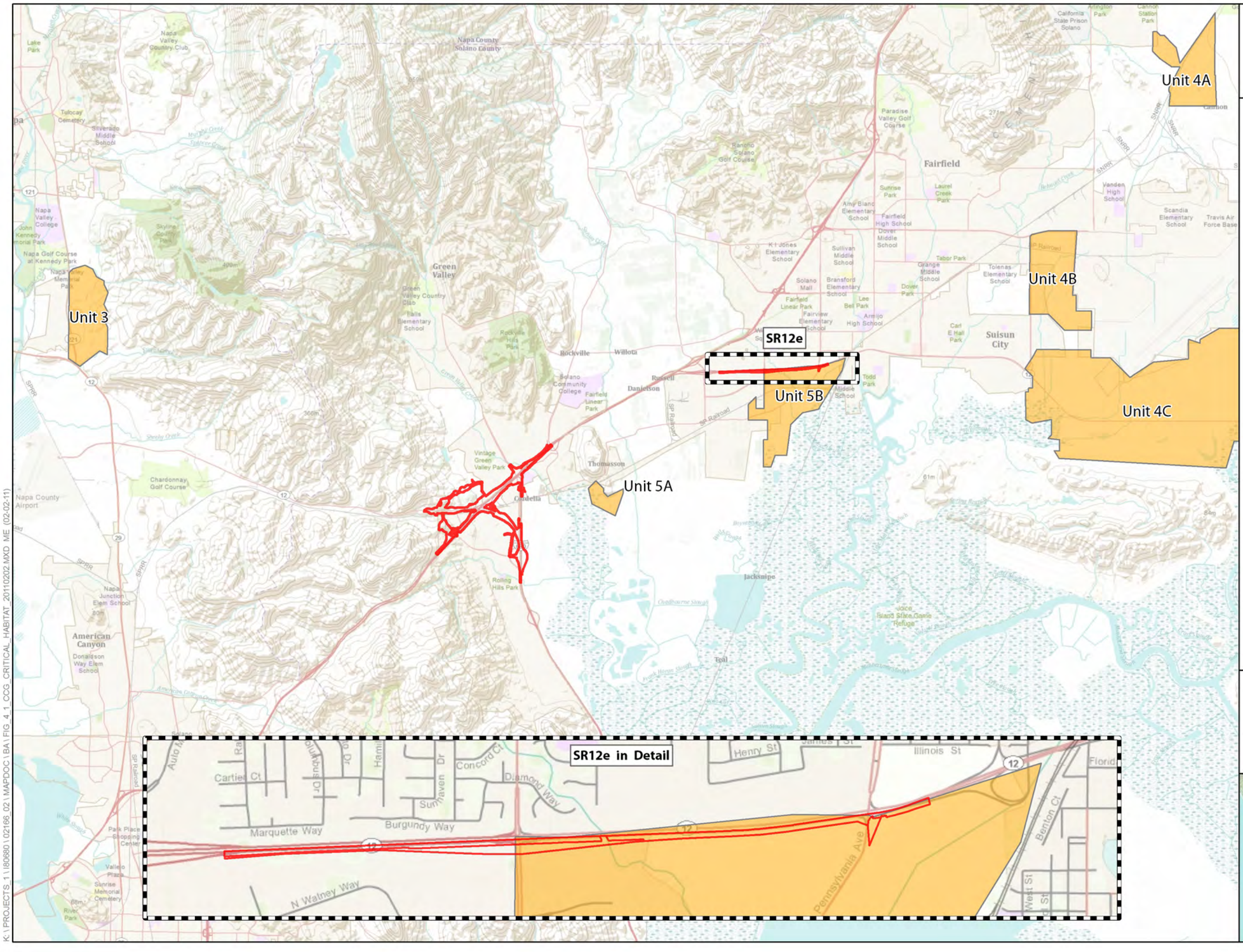
The designation of critical habitat requires federal agencies to consult with USFWS regarding any action that could destroy or adversely modify critical habitat. Activities that may destroy or adversely modify critical habitat are those that alter the PCEs and appreciably diminish the value of the habitat for both the survival and recovery of the species.

The PCEs of critical habitat for CCG are the habitat components that provide the characteristics below.

(i) Topographic features characterized by isolated mound and intermound complex within a matrix of surrounding uplands that result in continuously, or intermittently, flowing surface water in the depressional features including swales connecting the pools described below in paragraph (ii), providing for dispersal and promoting hydro periods of adequate length in the pools.

(ii) Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water or whose soils are saturated for a period long enough to promote germination, flowering, and seed production of predominantly annual native wetland species and typically exclude both native and nonnative upland plant species in all but the driest years. As these features are inundated

# Figure 4-1
# Contra Costa Goldfields Critical Habitat




## Legend

- Project Footprint
- Contra Costa Goldfields Critical Habitat

Source: USFWS 2011, ESRI 2011

0 0.5 1 2
Miles

on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands.

Within the BSA, seasonal wetlands W-162, W-163, and W-165 through W-174 provide the PCEs of critical habitat for CCG based on the PCE (ii) description. These wetlands are located within the BSA, but outside the project footprint, south of the state ROW fence, on the south side of SR 12E. On the west side of Pennsylvania Avenue, the area between the fence and the roadway is vegetated and has a swale-like ditch that parallels the road and carries runoff from the road toward Pennsylvania Avenue. The ditch might intercept the ends of two parallel wetlands that extend on either side of a utility pole alignment south of SR 12E (W-162 and W-163), and it could transport water to the wetlands.

A preliminary hydrologic analysis of where the runoff from SR 12E drains to the ditch can be made based on the slope of the road as viewed in cross section (Appendix A) and surveyed topographic features. Refer to the description in Section 4.2.1, S*urvey Results*.

### 4.2.3 Avoidance and Minimization Efforts

As required by the FESA, Caltrans and STA will implement measures to minimize and avoid potential effects on individual CCG, potential CCG habitat, and designated CCG critical habitat. Implementation of the general avoidance and minimization measures described in Section 1.3.6, along with species-specific avoidance and minimization measures identified below will avoid or minimize potential incidental take of individual CCGF and potential effects to potential CCG habitat and CCG critical habitat. Measures also include those required to comply with CWA Sections 401—Water Quality and Storm Water Treatment; Section 402—Caltrans BMPs; and Section 404—Mitigation for Impacts on Wetlands and Waters. Exotic species control is being proposed pursuant to Executive Order 13112 (National Archives and Records Administration 1999).

- A low retaining wall system will be constructed as part of Construction Package 4 adjacent to and south of SR 12 E between Ledgewood Creek and Suisun City. This design feature will reduce the overall footprint and the southern expansion of the highway into potential CCG habitat and CCG critical habitat.

- Orange ESA construction barrier fencing at least 4 feet in height will be installed to protect ESAs. A USFWS-approved biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so the areas to be fenced can be included in the contract plans and specifications.
- A USFWS-approved biologist will identify potential CCG habitat prior to ground-disturbing activities, and a protective silt fence, described in the Caltrans Standard BMPs, will be installed to protect down-gradient areas from being affected by sediment loading. This fencing will prevent direct impacts on wetlands south of SR 12E between Ledgewood Creek and the eastern end of the construction area.
- A USFWS-approved biologist will develop and conduct environmental education training for construction employees working on ground-disturbing activities. The program will include the following: a description of CCG and its habitat needs, photographs of the plant species, an explanation of its legal status and protection under FESA, and a list of the measures that will be implemented to minimize and avoid potential effects on CCG.
- A USFWS-approved biologist will conduct construction monitoring in and adjacent to all sensitive special-status plant populations. Construction monitoring frequency will range from daily to weekly depending on the biological resource and the construction activities.
- A USFWS-approved biologist will coordinate with the Resident Engineer (RE) to ensure that the contractor maintains the staked, fenced, and flagged perimeters of the construction area and staging areas adjacent to sensitive biological resources, including potential CCG habitat.
- A USFWS-approved biologist will be present during all ground-disturbing activities occurring within 250 feet of potential CCG habitat to ensure that CCG habitat is avoided.
- Construction activities conducted within the area between Ledgewood Creek and Suisun City will be confined to the dry season (May 15–October 15) to protect down-gradient CCG habitat.
- Vegetation removal within 250 feet of potential CCG habitat will be limited to the minimum necessary.

- To the maximum extent practicable, Caltrans and STA will install bio-swales and bio-filtration in the area adjacent to the highway to avoid and minimize sediment loading and point source pollutants.
- Dust control will be managed through Caltrans standard water quality control BMPs through the utilization of an organic tackifier and water trucks.

### 4.2.4 Project Effects

The action area is defined as the area of direct (permanent and temporary) and indirect effects. Direct effects may include construction dust, clearing and grubbing of vegetation, staging of equipment and materials, excavation and grading, and installation of hardscape and drainage facilities. Indirect effects are those that are reasonably certain to occur, but later in time as a result of the proposed federal action.

The location of CCG occurrence 19 has been well documented; it is approximately 200 feet outside the project footprint. Consequently, based on the results of the ICF 2007 and 2009 plant surveys and the Vollmer 2000–2005 plant surveys, there will be no direct effects on CCG from construction activities.

Construction Package 4 has the potential to indirectly affect potential CCG habitat and the known adjacent population through the alteration of hydrology. The proposed project may also introduce incremental amounts of point source pollutants from the addition of impervious surfaces on the new roadway. These potential effects would be limited to the down-gradient seasonal wetlands on the south side of the BSA along SR 12E that is hydrologically connected to the drainage swale adjacent to SR 12E.

Construction Package 4 involves widening SR 12E to the south. Caltrans and STA have incorporated design features to avoid and minimize the potential for direct and indirect effects on CCG and its potential habitat. Caltrans and STA have modified this portion of the project to include a retaining wall that would minimize the footprint or prism of the roadway and avoid potential direct effects on CCG. The indirect effects associated with potentially reduced reproductive capacity due to dust accumulation on CCG plants in bloom or seed set will be

avoided by the seasonal work restriction, which will allow the plants to bloom and set seed before groundbreaking occurs.

Based on the proposed design modification and the implementation of the full suite of avoidance and minimization measures, the potential indirect effects have been reduced and effectively mitigated to a level that would be immeasurable and discountable.

#### 4.2.4.1 Critical Habitat

The action area is within the vernal pool (CCG) critical habitat Unit 5B. Unit 5B encompasses 736.72 acres. The northern boundary for this unit is SR 12E between Beck Avenue and Pennsylvania Avenue (Figure 4-1). Construction Package 4 would not result in direct effects on critical habitat, because all disturbance would occur in developed or graded areas that do not contain the PCEs as outlined in the federal register (71 FR 28:7217–7266). Construction Package 4 would temporarily affect approximately 2.52 acres and permanently affect approximately 1.31 acres of ruderal roadside shoulder and nonnative annual grassland. The combined area of disturbance is approximately 3.83 acres. Of the 736.72 total acres that make up critical habitat Unit 5B, the proposed federal action would affect less than 1% (approximately 0.52%) of the total unit. Moreover, all the identified effects are within habitats that do not support CCG, including nonnative annual grassland (upland), other woodland, perennial drainage, perennial marsh, riparian woodland, ruderal, and seasonal drainage. There will be no direct temporary or permanent effects on the PCEs of CCG critical habitat in this area.

Adjacent seasonal wetlands provide the PCEs of critical habitat for CCG. These wetlands are within the BSA, but outside the project footprint (Figure 3-1, Sheets 32 and 33). Due to the potential for indirect effects, the proposed Phase 1 could potentially alter approximately 25 acres of seasonal wetland habitat that contain the PCEs. However, project design features and implementation of the general avoidance and minimization measures in Section 1.3.6 and the species-specific avoidance and minimization measures described in Section 4.1.1.3 would avoid and minimize the potential effects on critical habitat Unit 5B.

#### 4.2.4.2 Determination

The proposed Phase 1 will have no direct effects on CCG due to the temporary and permanent construction activities. However, there is the potential for indirect effects on seasonal wetlands that are known to support CCG. Potential indirect effects on seasonal wetlands could result from hydrologic alteration, soil compaction, point source pollutants, and dust. These indirect effects would be avoided and minimized through the implementation of the general avoidance and minimization measures described in Section 1.3.6. and the species-specific avoidance and minimization measures for CCG. Based on the best available commercial and scientific data and the impact assessment for CCG, Caltrans has determined that the proposed Phase 1 **may affect,** but is **not likely to adversely affect** Contra Costa goldfields.

Although the proposed Phase 1 would result in a loss of approximately 3.83 acres (approximately 0.52%) of critical habitat Unit 5B, these effects would be on non-PCE habitat. As described above, project design features and implementation of the avoidance and minimization measures described in Section 1.3.6 and the species-specific measures in Section 4.2.3 will avoid and minimize potential adverse effects on critical habitat Unit 5B.Therefore, the proposed Phase 1 would not result in the direct loss of PCEs or have an adverse indirect effect on PCEs that would appreciably diminish the value of critical habitat for both the survival and recovery of CCG. Based on the impact assessment for CCG critical habitat, Caltrans has determined that the proposed Phase 1 **may affect,** but **will not adversely modify** designated CCG critical habitat.

### 4.2.5 Compensatory Mitigation

The fundamental duty of a federal lead agency under Section 7 of the Federal Endangered Species Act is to ensure that federal actions do not jeopardize the continued existence of listed species. As noted on page 4-53 of the *Endangered Species Consultation Handbook* (U.S. Fish and Wildlife Service 1998), "Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take." Nevertheless, Caltrans, as a state and federal lead agency, must determine whether any other state or federal statutory authority, policy, or regulation requires or compels the provision of compensatory mitigation to address the potential effects on CCG under the specific circumstances and impacts of the federal action.

The proposed Phase 1 would have no direct effects on individual CCG, and potential indirect effects on individual CCG have been avoided and minimized through project design features and the implementation of avoidance and minimization measures t. Furthermore, the proposed project would not adversely affect potential habitat for CCG. Consequently, no compensatory mitigation is proposed or required for CCG pursuant to any other state or federal statutory authority.

## 4.3 Showy Indian Clover

Showy Indian clover, also known as showy rancheria clover, was federally listed as endangered on October 22, 1997 (62 FR 55791–55808). No critical habitat has been designated because it would not confer any additional benefit to the listing and would increase the degree of threat to the species. Showy Indian clover has no state listing status, but is on the CNPS List 1B.1 (rare, threatened, or endangered in California and elsewhere; seriously endangered in California—more than 80% of occurrences threatened/high degree and immediacy of threat). Showy Indian clover occurred historically from the western edge of the Sacramento Valley in Solano County to Marin and Sonoma Counties, and also in Santa Clara County.

Showy Indian clover was considered extinct until its rediscovery at a site in Sonoma County in 1993. It was later extirpated from this site, but in 1996 another location was found on private land in Marin County. This population comprises approximately 200 plants and is the only known extant natural population. A reintroduction project in 2006 entailed planting showy Indian clover seed at a site at Point Reyes National Seashore. Monitoring of the site in 2008 indicated that 77 plants survived, and 76 of those produced flowers and were in the process of setting seed at the last monitoring visit that year (U.S. Fish and Wildlife Service 2009a).

Showy Indian clover is an annual herb in the clover family (*Fabaceae*) that blooms from April to June. This species was known to occur in several habitats, including low-lying, wet swales and grasslands, sometimes on hillsides, at elevations below 1,020 feet. It can occur on serpentine soils, but was typically found in moist, heavy soils. The sites found in 1993 and 1996 are on a roadside and an eroding cliff face, respectively (California Natural Diversity Database 2011).

The primary threats to showy Indian clover have been urban and agricultural development. Overgrazing may have caused the elimination of the clover from some locations (62 FR 55800–55801), and competition with weedy invasive species may have also extirpated populations (62 FR 55803).

### 4.3.1 Survey Results

The CNDDB lists 26 occurrences of showy Indian clover, all but two of which are historic sightings from 1969 and earlier (California Natural Diversity Database 2011). Three of these historic occurrences are in Solano County in the Elmira and Fairfield North 7.5-minute USGS quadrangles. The nearest occurrence (23), last seen in 1952, is approximately 5 miles southwest of the BSA in an area north of American Canyon. The other two occurrences in Solano County were last seen in 1892 in Vacaville (11) and in 1909 in Elmira (13). The other 23 occurrences are in Sonoma, Marin, Napa, and Santa Clara Counties. The population in Marin County (26), the only extant natural population known, is located on a site in the Valley Ford USGS 7.5-minute quadrangle. The specific location is not publicly available, but the vicinity is approximately 45 miles northwest of the BSA.

Given the limited distribution of known occurrences of showy Indian clover, it is highly unlikely to be found within the BSA. No showy Indian clover was observed in the BSA during the 2004–2009 surveys conducted by ICF. Parcels associated with Mangels property (APNs 01-4826-0010, 01-4826-0020, 01-4827-0010, and 01-4827-0340) north of SR 12W were not accessible. However, the Mangels property was surveyed by Monk & Associates for STA as part of the North Connector project in 2003 and 2004; the surveyors did not observe any showy Indian clover or other federally listed plant species in the BSA on the Mangels property. During the 2009 and 2010 plant survey season, CH2MHill surveyed a 250-foot buffer along the north and south sides of SR 12W for the Jameson Canyon project with negative findings for showy Indian clover. Surveys within the BSA did find nonnative annual grassland on hillsides and swale-like seasonal wetlands in low areas; these areas could provide potential habitat for showy Indian clover on the Mangels property.

### 4.3.2 Critical Habitat

Critical habitat has not been designated for showy Indian clover.

### 4.3.3 Avoidance and Minimization Efforts

As required by FESA, Caltrans and STA will implement measures to minimize and avoid incidental take of federally listed plant species, as described below. Implementation of general avoidance and minimization measures described in Section 1.3.6 along with the following species-specific avoidance and minimization measures would ensure that proposed Phase 1 avoids any direct and indirect effects on showy Indian clover. Measures also include those required to comply with CWA Sections 401—Water Quality and Storm Water Treatment; Section 402—Caltrans BMPs; and Section 404—Mitigation for Impacts on Wetlands and Waters. Exotic species control is being proposed pursuant to Executive Order 13112 (National Archives and Records Administration 1999).

- Prior to groundbreaking for Construction Package 5, protocol-level surveys of the inaccessible parcels on the Mangels property north of SR 12W will be conducted for showy Indian clover in accordance with the USFWS protocol (U.S. Fish and Wildlife Service 1996; Cypher 2002).
- If protocol-level surveys identify showy Indian clover plants within 250 feet of the project footprint, the project footprint will be fenced and flagged to ensure that construction equipment and construction activities are confined and completely avoid any potential direct or indirect effects on individual showy Indian clover plants during construction. In the event of a positive survey finding, Caltrans will implement the following specific measures.
  - Orange ESA construction barrier fencing at least 4 feet in height will be installed to protect ESAs. A USFWS-approved biologist will identify sensitive biological resources adjacent to the construction area; the ESAs to be fenced will be included in the contract plans and specifications.
  - A USFWS-approved biologist will identify potential showy Indian clover habitat, and a protective silt fence, described in the Caltrans Standard BMPs, will be installed to protect down-gradient habitat for showy Indian clover from being affected by sediment loading.

- Construction activities conducted within the area of potential showy Indian clover habitat will be confined to the dry season (June 1–October 15) to protect down-gradient, showy Indian clover habitat and minimize potential indirect dust effects on identified flowering showy Indian clover plants.
- A USFWS-approved biologist will be present during all ground-disturbing activities occurring within 250 feet of occupied showy Indian clover habitat to ensure that showy Indian clover habitat is avoided.
- Vegetation removal within 250 feet of occupied showy Indian clover habitat will be limited to the maximum extent practicable.
- A USFWS-approved biologist will develop and conduct environmental education training for construction employees working on ground-disturbing activities. The program will include the following: a description of showy Indian clover and its habitat needs, photographs of the plant species, an explanation of its legal status and protection under FESA, and a list of the measures that will be implemented to minimize and avoid potential effects on showy Indian clover.
- The biological monitor will coordinate with the Resident Engineer to ensure that the contractor maintains the staked, fenced, and flagged perimeters of the construction area and staging areas adjacent to sensitive biological resources, including occupied or potential showy Indian clover habitat.
- To the maximum extent practicable, Caltrans or STA will install bio-swales and bio-filtration in the area adjacent to the highway to avoid and minimize sediment loading and point source pollutants.
- Dust control will be managed through Caltrans standard water quality control BMPs through the utilization of an organic tackifier and water trucks.

In the highly unlikely event that showy Indian clover plants are found within the action area during preconstruction surveys, Caltrans will reinitiate Section 7 consultation with USFWS. As appropriate, Caltrans would work with USFWS to develop additional measures to ensure that the proposed Phase 1 would avoid direct and indirect effects on showy Indian clover.

### 4.3.4 Project Effects

The proposed Phase 1 would not result in direct (temporary or permanent) or indirect effects on showy Indian clover. Based on these survey results and the known population distribution, the presence of showy Indian clover within the action area is highly unlikely. No showy Indian clover plants were observed by ICF in the BSA or project footprint during the surveys conducted in 2004, 2005, 2007, and 2009. The Mangels property north of SR 12W was surveyed in 2003 and 2004 by Monk & Associates for STA's North Connector project, and no showy Indian clover was found. During the 2009 and 2010 plant survey season, CH2MHill surveyed a 250-foot buffer along the north and south sides of SR 12W for the Jameson Canyon project with negative findings for showy Indian clover.

Indirect effects on potential habitat are not anticipated to result from the alteration of hydrology, soil compaction, or dispersion of dust associated with project construction. Any potential indirect effects on showy Indian clover will be avoided through the identified general and species-specific avoidance and minimization measures.

#### 4.3.4.1 Critical Habitat

No critical habitat is designated for showy Indian clover.

#### 4.3.4.2 Determination

The presence of showy Indian clover is highly unlikely because the species was not found within the BSA during the botanical surveys for the North Connector, Jameson Canyon, or the proposed Phase 1 project. The nearest known historic occurrence, last observed in 1952 is north of American Canyon, approximately 5 miles from the BSA. The nearest known extant occurrence is approximately 45 miles from the BSA in Marin County. Nevertheless, Caltrans or STA will conduct preconstruction protocol-level plant surveys for the previously inaccessible parcels on the Mangels property.

Based on the best available commercial and scientific data and the impact assessment for showy Indian clover, Caltrans has determined the proposed project will have **no effect** on showy Indian clover.

### 4.3.5 Compensatory Mitigation

The fundamental duty of a federal lead agency under Section 7 of the federal Endangered Species Act is to ensure that federal actions do not jeopardize the continued existence of listed species. As noted on page 4-53 of the *Endangered Species Consultation Handbook* (U.S. Fish and Wildlife Service 1998), "Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take." Nevertheless, Caltrans, as a state and federal lead agency, must determine whether any other state or federal statutory authority, policy, or regulation requires or compels the provision of compensatory mitigation to address the potential effects on showy Indian clover under the specific circumstances and impacts of the federal action.

The proposed Phase 1 will have no direct or indirect effects on showy Indian clover because the species is not present within the BSA or the project footprint. Implementation of the general and species-specific avoidance and minimization measures would ensure that direct and indirect effects on showy Indian clover are avoided. No compensatory mitigation is proposed or required for showy Indian clover pursuant to any other state or federal statutory authority.

## 4.4 Callippe Silverspot Butterfly

Callippe silverspot butterfly (CSB) was listed as endangered in 1997 (FR 62:64306) and has no state listing. In August 2009, USFWS published a 5-year review recommending that the species retain its endangered status (U.S. Fish and Wildlife Service 2009b). There is no designated critical habitat for the species.

The CSB has a wingspan of 2–2.5 inches, with upper wings that are a dull yellowish-brown with sooty coloration at their base and extensive black spots and lines. The underside of the wings are brown, orange-brown, and tan with black lines and distinctive black and silver spots (LSA 2009).

Historically, CSB occupied much of the Bay Area, from Vallejo and southeastern Napa and Sonoma Counties to northwestern Contra Costa County, south to the Castro Valley area, east to the Livermore–Pleasanton–Sunol area, and from San Francisco south to the vicinity of La Honda in San Mateo County. Currently, USFWS recognizes only two existing populations: one in the

San Bruno Mountain in San Mateo County and a second in the Cordelia Hills in Solano County. The population in the Cordelia Hills on the King–Swett Ranches Solano Land Trust property has been observed as recently as spring 2009 (Wickham pers. comm.). While the CSB is found within the fog-influenced zone surrounding San Francisco Bay at a regional level, it appears that the distribution of the butterfly at a local, site-specific level may be limited by the avoidance of fog during the flight season. For example, the distribution of adult CSB on San Bruno Mountain shows a clear boundary of adult presence on the sunny side of the summer persistent fog line.

Female CSB lay their eggs on or near the dried remains of their host plant, *Viola pedunculata*, and within a week the larvae hatch and eat their egg shells, wander a short distance, and spin a silk pad upon which they pass the summer and winter in diapause (an inactive period). Upon ending diapause the following spring, the larvae search for food plants, spend the next few months feeding, pupate after completing their larval development, and emerge as adults about 2 weeks after pupating. The adult flight season is about 6–8 weeks from mid-May through early to mid-July, but timing and length of the flight season varies depending on annual weather conditions. Warmer weather accelerates the blooming period of nectar plants and tends to shorten the adult flight season, while cooler weather tends to extend the blooming period and flight season. The average lifespan of the adult CSB was determined to be about 5 days for males and 7 days for females (Arnold 1981).

Adults of the *Speyeria* genus are known to be strong fliers and can disperse several miles during the adult life span. Adult CSBs have been documented to disperse up to 0.8 mile between breeding colonies at San Bruno Mountain (Thomas Reid Associates 1981; Arnold 2004). In the Cordelia Hills, near the BSA, nectar plants are not in close proximity to larval host plants, requiring the adults to fly more than 1 mile for food gathering (Arnold pers. comm.).

Habitat requirements (Arnold 1981) are listed below.

- Grasslands with proper topography in the San Francisco Bay area.
- Sufficient larval host plants.
- Adequate nectar sources.
- Hilltops for mate location.

- Shelter from coastal winds.

**Grasslands:** The topography of the grassland is an important factor influencing larval host plant growth and survival. Researchers have demonstrated that the best grassland habitat for CSB, based on the distribution of adults, includes cool north- and east-facing hill slopes with fairly dense occurrences of both the larval host plant and nectar source plants (U.S. Fish and Wildlife Service 2009b). Also important are large areas of continuous grassland that support a variety of nectar sources since the CSB is a large and vagile butterfly that can have a home range encompassing hundreds of acres of grassland habitat.

**Larval host plant:** Johnny jump-ups in the San Francisco Bay Area are associated with clay soils that have established grass cover. They may bloom anywhere from January through April, depending on weather conditions (Arnold pers. comm.). Although the plant is a perennial, all aboveground growth dies back annually, with only its roots and rhizomes surviving year-round. Annual precipitation seems to influence the annual bloom, with fewer blooming individuals and area of cover in dry years and larger numbers and area in wet years. Thus, plant density fluctuates annually. The distribution of viola patches, as well as density of any particular patch, contributes to the successful completion of the butterfly's life cycle. Low-density patches of viola near other, denser patches can also support CSB, but not as many.

**Nectar plants:** A variety of flowering plants provide nectar sources used by adult CSB. Nectar sources include California buckeye, native coyote mint (*Monardella villosa*), Alameda County thistle (*Cirsium quercetorum)*, blessed milk thistle (*Silybum marianum*), and nonnative thistles (*Carduus* spp.) (Arnold 2006).

**Hilltops:** Hilltops that have connectivity with grasslands containing nectar sources and larval host plants are vital to the hill-topping behavior of CSB. Hill-topping allows the congregation of males and females, which promotes mate selection. Sites that support larval and adult food plants do not always coincide with areas where mate location and other behaviors occur, and Arnold (2004) observed adults gathering nectar at locations more than 1 mile from the nearest patches of the larval host plant.

These habitat components need to be relatively close to each other to support the species. The larval host plants presumably need to be in relatively high-density patches interspersed within grasslands, typically along steep hill slopes, such as are found in places in Solano County.

Threats to CSB that were identified when the butterfly was listed and still persist today include the loss to urbanization and fragmentation of potential habitat in the San Francisco Bay area, poaching by insect collectors, indiscriminate use of herbicides, inappropriate grazing regimes, elimination of larval host plants by competition from invasive plants, fire-suppression policies resulting in hotter wildfires, and the negative effects of small and geographically isolated populations. Threats that were defined after listing during the 5-year review (U.S. Fish and Wildlife Service 2009) include road mortalities, increased interactions with humans, deposition of nitrogen from local traffic that encourages invasive plants, nonnative predators, and global climate change. Apparently, there is no documented evidence that some of these additional threats have caused the demise of any populations (Arnold pers. comm.). While afforded some protection by preserved areas of potential habitat on Solano Land Trust properties, the butterfly population in the Cordelia Hills is threatened by grazing management practices that do not favor the butterfly and by habitat fragmentation, degradation, and loss caused by a series of local development projects.

The current number of individual butterflies in each of the known populations (Cordelia Hills and San Bruno Mountain) remains unknown (U.S. Fish and Wildlife Service 2009b).

### 4.4.1 Survey Results

There are no known CNDDB (2011) occurrences of CSB within the BSA or project footprint. However, the draft Solano County HCP (BUGGY database, as cited in LSA 2009) lists eight records ranging from 1 to 5 miles from the western portion of the project BSA, all to the southwest near the Cordelia Hills (Figure 4-2). Richard Arnold observed an adult butterfly and several stands of larval host plants in 1993 at the nearest known occurrence approximately 1 mile from the BSA (LSA 2008). In support of the draft EIR for the Fieldcrest Development project, LSA (2008) conducted follow-up surveys at this location for larval host plants in 2007 and found two stands of host plants. In previous years, surveys had recorded seven distinct stands.

# Figure 4-2
# Known Locations and Approximate Range of Callippe Silverspot Butterfly

## Legend

- Phase 1 Project Footprint
- Phase 1 Biological Study Area
- Approximate Range for Callippe Silverspot Butterfly

**Solano Multi-Species HCP**

- Callippe Silverspot Butterfly (8 total)

Note: The approximate range is based on historical records and personal observations from Richard Arnold, PhD. It should be noted that the absence of records within or closer to the project site does not necessarily mean that the silverspot is absent there; rather that because of private property and access, entomologists have not been able to survey.

Sources: Solano Multispecies Habitat Conservation Plan 2009, ESRI 2011

0 0.5 1 2
Miles

Project Vicinity

K:\ PROJECTS_1 \ 80680 \ 02166_02 \ MAPDOC \ BA \ FIG_4_2_SILVERSPOT_20110419.MXD ME (04-19-11)

Areas of the BSA that have potential CSB habitat are generally located in the western portion of the BSA between the BCDE on the Mangels property and I-80 (Figure 3-1). No surveys for adult CSB or host plants were conducted within the BSA by ICF for this project due to access limitations on the Mangels property. However, in 2004, Monk & Associates surveyed a portion of the BSA on the Mangels property north of SR 12W for presence/absence of larval host plants for STA's North Connector project (Monk & Associates 2006). The 2004 survey identified two populations of the host plant, Johnny jump-ups, but did not record density of the populations. The BA that was prepared for the North Connector project (Monk & Associates 2006) concluded that because the North Connector project would completely avoid these host plant populations, there would be no effect on CSB. However, the BA for this portion of the North Connector project was never submitted to USFWS because the area with larval host plants was removed from the North Connector project. The 2004 survey acknowledged the importance of adult nectar sources, grassland conditions, and hilltops; however, none of the documents for the North Connector project (NES, EIR, or BA[1]) provided an analysis of these habitat components.

Two other nearby projects, the Jameson Canyon Road Widening project and the Red Top Road Truck Climbing project, completed Section 7 consultations with USFWS and obtained biological opinions. Neither of the biological opinions addressed CSB because Caltrans and USFWS did not believe they were present and/or the projects did not directly or indirectly affect potential habitat.

While there have been no surveys for adult CSB or host/nectar plants completed by ICF for this project, based on the topography of the BSA and the presence of grasslands with nectar plants, there is potential CSB habitat within the BSA in the area between the BCDE and I-80 (Figure 3-1, Sheets 4–6). Some, and possibly all, of the essential habitat features identified by USFWS in its 5-year review (U.S. Fish and Wildlife Service 2009b) have historically been present or may currently be present within the BSA.

**Grasslands:** Areas of the BSA located between I-80 and the BCDE include continuous grassland habitat with north- and east-facing slopes, though the grasslands are bounded by

[1]The BA for the North Connector project was completed in 2006, but STA subsequently defederalized the project and FHWA withdrew the BA and rescinded Section 7 consultation with USFWS. STA later requested that the BCDE of the North Connector project be included in the proposed Phase 1 project described in this BA.

potentially significant barriers including I-80 and SR 12W, trees, and light industrial development. Some of these grassland habitat areas are currently grazed.

**Larval host plant:** Monk & Associates identified two stands of larval host plants, both less than 1 acre, on the Mangels property in 2004 (Monk & Associates 2004). No larval host plant surveys were conducted in the area between I-80 and SR 12W, and access to the Mangels property has been restricted since 2004. Consequently, there are no recent surveys documenting the current condition of the Johnny jump-ups identified by Monk & Associates.

**Nectar sources:** A variety of the preferred nectar sources for adults occur at and within 1 mile of the BSA and project footprint (e.g., California buckeye, Italian thistle [*Carduus pycnocephalus*], bull thistle, and blessed milk thistle).

**Coastal fog:** Based on the BSA's proximity to the Cordelia Hills where CSB are known to occur, it is likely the BSA shares a similar fog pattern to that in the Cordelia Hills.

**Hilltops:** There are suitable hilltops with both north- and east-facing slopes within the BSA. In addition to the hilltops between Business Center Drive and SR 12W, the hilly terrain between SR 12W and I-80 provides potential hilltop habitat where adults can congregate on prominent hilltops in search of potential mates. Both of these hilltop locations are approximately 1 mile from a known adult butterfly occurrence in the Cordelia Hills. However, there are potentially significant highway barriers between this known occurrence and suitable hilltops within the BSA.

The nearest documented occurrence of CSB is approximately 1 mile from the BSA, identified in 1993 by Richard Arnold. However, there are potentially significant barriers to dispersal within the BSA or project footprint. USFWS in the 5-year review for CSB describes I-80 and SR 12W as substantial barriers (U.S. Fish and Wildlife Service 2009). LSA also identifies wide areas of pavement as impediments to dispersal in the draft HCP (LSA 2009). Both highways separate the 1993 occurrence from potential CSB habitat in the BSA and project footprint. I-80 is an eight-lane highway and SR 12W is a four-lane highway.

There are various opinions as to the extent to which multi-lane highways, development, and tree (windrow) create barriers to CSB dispersal. USFWS in its 5-year review and the LSA analysis for the draft Solano County HCP suggest that these features do create significant barriers to dispersing CSB. LSA noted: "The Callipe silverspot butterfly is a strong flyer, nevertheless, wide areas of pavement or forested areas, or rows of trees, pose an impediment to the dispersal of CSB. Callipe silverspot butterflies rarely cross areas that are not habitat." On the other hand, entomologist Richard Arnold has first-hand observations suggesting that the barriers may be more porous and "may act more like a filter rather than a major or absolute barricade to dispersal of the butterfly" than considered in various publications. I-80 and SR 12W may affect dispersal of butterfly populations. While there could potentially be direct collisions between vehicles and CSBs attempting to disperse across I-80 and SR 12W, CSB's strong flying capabilities could allow butterflies dispersing across I-80 and SR 12W to fly at sufficient heights to avoid mortality, so that some individuals may successfully cross the roads during periods of lighter traffic (Arnold pers. comm.). Unfortunately, there are no existing data or published studies on road mortality effects on this species. Moreover, documenting vehicle related mortalities of CSB would be difficult.

### 4.4.2 Critical Habitat

USFWS has not designated critical habitat for CSB.

### 4.4.3 Avoidance and Minimization Efforts

As required by FESA, Caltrans and STA will implement a number of measures to minimize and avoid incidental take of CSB and potential CSB habitat. Implementation of the general avoidance and minimization efforts described in Section 1.3.6, along with the species-specific measures described below would reduce potential effects on CSB and potential CSB habitat.

There are no known occurrences of CSB in the BSA or project footprint. However, host larval plants were observed in 2004 by Monk & Associates. Since that time potential CSB habitat has not been surveyed due to restricted access to the Mangels property. Measures will be taken to avoid and minimize potential direct and indirect effects on CSB, potential CSB habitat, and its

larval host plant. In addition, Caltrans or STA will conduct surveys of the area that contains potential habitat prior to construction. These surveys would include larval host plant surveys, larval surveys, and adult surveys. If the surveys find occurrences of CSB larvae or adults within the action area, Caltrans will reinitiate formal Section 7 consultation with the USFWS. As appropriate, Caltrans would work with USFWS to develop additional measures to ensure that the proposed Phase 1 would minimize and avoid direct and indirect effects on CSB.

Species-specific avoidance and minimization efforts for CSB and its habitat (in the event of positive surveys) would include the following.

- To the extent practicable, design modifications would be incorporated to avoid direct permanent effects on potential CSB habitat, particularly larval host plants.
- All core breeding areas will be avoided to the maximum extent practicable. Core breeding habitat is defined in the Solano County Draft HCP (LSA 2009) as a patch or series of small patches comprising 0.25 acre in size with *Viola pedunculata* density of at least 10%. 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 1% of the total cover. Core breeding habitat will be determined based on a minimum of 1 year of field surveys/mapping at a site.
- Indirect impacts on breeding habitat will be avoided through the establishment of appropriate open space buffers (minimum 300-foot buffer from incompatible uses). Direct loss of breeding habitat will be limited to no more than 20% of any breeding habitat area.
- In temporary work areas and to the extent practicable, potential CSB habitat will be avoided during construction activities. All potential CSB habitat not directly affected will be designated as an ESA and protected with appropriate fencing (including hard fencing around larval host plants) and signage. All ESAs will be shown on the final construction drawings.
- Short-term construction or other incompatible land use activities within 300 feet of core larval host plants stands and adult nectar sources, as well as in corridor areas will be conducted between August 1 and April 1, to the extent practicable, when CSB is not active (flying, feeding, mating, laying eggs).

- Topography will be restored by grading to preconstruction conditions in temporarily affected areas that provide potential habitat for CSB. Following all grading and earthwork, these areas will be either be replanted or reseeded with the appropriate plant species, if determined necessary, or monitored following construction, to determine that vegetation and hydrology comparable to the preconstruction condition have been restored.

### 4.4.4 Project Effects

Potential habitat for CSB occurs in the western portion of the BSA, including hilltops, grassland, nectar plants, and possibly larval host plants. However, the nearest known occurrence of CSB dates to 1993, is slightly more than 1 mile south of the BSA, with significant intervening barriers that are recognized as such by USFWS. Moreover, the area of the occurrence appears to have since been graded (as evidenced by aerial photographs available online). The remaining seven known occurrences in Solano County are more than 2 miles away— likely too far for adult CSBs to disperse from the action area. The current condition of the potential CSB habitat within the BSA and project footprint, particularly the status of the larval host plants, is not known. Effects on potential CSB habitat, such as hilltops and grasslands, would occur during activities associated with Construction Packages 1, 3, and 5.

#### 4.4.4.1 Direct Effects

Caltrans and STA do not anticipate that the proposed Phase 1 will have any direct effects on CSB and the known populations of larval host plants. Based on the best available commercial and scientific data, there is no reasonable certainty the proposed project would result in the direct take of a CSB. In the event adult CSB or larvae are observed within the action area during preconstruction surveys, Caltrans would reinitiate Section 7 consultation with USFWS.

#### 4.4.4.2 Indirect Effects

According to USFWS, indirect effects are “those that are caused by the proposed action and are later in time, but are still reasonably certain to occur” (50 CFR 402.02). Potential indirect effects on CSB are listed below.

- Potential mortality due to vehicle strikes of adult CSBs that may be dispersing across the BCDE. Construction of the BCDE could potentially affect dispersal of CSBs should they actually be present in the action area. Roadways pose a known, but likely porous, barrier to adult CSB movements. Adults CSB are strong fliers than can fly at a height above moving traffic. However, there have been no studies on the traffic mortality of the species and there are no known occurrences of CSB within the BSA or project footprint.
- Dust related to construction activities that could affect the development of larval host plants. Caltrans and STA will implement standard construction BMPs, which include dust abatement measures.

#### 4.4.4.3 Determination

Beneficial effects are contemporaneous positive effects without any adverse effects on the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur (National Archives and Records Administration 2002).

While potential habitat does exist within the project BSA, there have been no documented occurrences of the listed species within the BSA or project footprint. The nearest documented occurrence is approximately 1 mile from the BSA, identified in 1993 by Richard Arnold. I-80 and SR 12W have been described as significant barriers by USFWS in the 5-year review (U.S. Fish and Wildlife Service 2009) and in the draft Solano County HCP (LSA 2009). Both highways separate the 1993 occurrence from Construction Packages 1, 3, and 5. There are varying opinions as to the extent of the barrier effect caused by multilane highways, development, and tree (windrow) barriers. USFWS in its 5-year review and the LSA analysis for the Solano County HCP suggest that these features do create significant barriers to dispersing CSB. On the other hand, entomologist Richard Arnold has unpublished information and first-hand observations suggesting that the barriers may be more porous and “may act more like a filter rather than a major or absolute barricade to dispersal of the butterfly” than considered in the various publications.

The conclusion "may affect, not likely to adversely affect" is appropriate when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Based on the best available commercial and scientific data and the impact assessment for CSB, Caltrans has determined that the proposed Phase 1 **may affect,** but is **not likely to adversely affect** callippe silverspot butterfly.

### 4.4.5 Compensatory Mitigation

The fundamental duty of a federal lead agency under Section 7 of the Federal Endangered Species Act is to ensure that federal actions do not jeopardize the continued existence of listed species. As noted on page 4-53 of the *Endangered Species Consultation Handbook* (U.S. Fish and Wildlife Service 1998), "Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take." Nevertheless, Caltrans, as a state and federal lead agency, must determine whether any other state or federal statutory authority, policy, or regulation requires or compels the provision of compensatory mitigation to address the potential effects on CSB under the specific circumstances and impacts of the federal action.

There are no known occurrences of CSB within the BSA or the project footprint, although potential habitat is present within the BSA. The potential for CSB to disperse from known occurrences to the action area is limited due to potentially significant barriers such as I-80 and SR 12W.

Caltrans and STA will implement preconstruction surveys prior to construction to obtain more timely and accurate data on the potential presence and distribution of larval host plants, CSB larvae, and adult CSB within the BSA and project footprint. Based on the best available commercial and scientific data, there is no reasonable certainty the proposed Phase 1 would result in the direct take of CSB. However, the project could affect potential CSB habitat. Based on this analysis, no compensatory mitigation is required or proposed at this time.

Caltrans and STA will provide compensatory mitigation for permanent impacts on CRLF upland habitat, which overlaps with potential callipe silverspot grassland and hilltop habitat, at a USFWS-approved mitigation site. This mitigation site for impacts on CRLF upland habitat will

likely be similar to the potential CSB habitat that may be permanently affected by the proposed Phase 1 and would be within Solano County, thereby providing potential habitat benefits to CSB.

## 4.5 Vernal Pool Fairy Shrimp/Vernal Pool Tadpole Shrimp

Vernal pool fairy shrimp is federally listed as threatened (59 FR 48136) and has no state status. USFWS designated final critical habitat for vernal pool fairy shrimp on February 10, 2006 (71 FR 28:7117–7316). This species is included in the 2005 recovery plan for vernal pool species (U.S. Fish and Wildlife Service 2005).

Vernal pool fairy shrimp is a small aquatic crustacean ranging in length from 0.5 inch to 1 inch. The species is found in a variety of vernal pool habitats in the Central Valley from Tehama County to Madera County and in the eastern margin of the central and south Coast Ranges from San Benito County to Ventura County. A disjunct population is located in Riverside County (Eng et al. 1990). Most known locations are in the Sacramento and San Joaquin Valleys and along the eastern margin of the central Coast Ranges (Eng et al. 1990). Vernal pool fairy shrimp feed on algae, bacteria, protozoa, rotifers, and detritus.

Vernal pool tadpole shrimp was federally listed as endangered (59 FR 48136) and has no state listing. USFWS designated final critical habitat for vernal pool tadpole shrimp on February 10, 2006 (71 FR 28:7117–7316). This species is included in the 2005 recovery plan for vernal pool species (U.S. Fish and Wildlife Service 2005).

Vernal pool tadpole shrimp occurs in the California Central Valley from Shasta County in the north to Merced County in the south, and a disjunct population occurs in western Alameda County (Rogers 2001).

Vernal pool fairy shrimp and vernal pool tadpole shrimp are restricted to seasonal wetland habitats (e.g., vernal pools, wet swales) in California that provide environmental conditions necessary for the species' survival. These species produce cysts (eggs) that lie dormant in the soil during summer and hatch when pools fill during the winter rainy season. To complete their life cycle, vernal pool fairy shrimp and vernal pool tadpole shrimp require an annual cycle of inundation during cold and wet winter months when the water temperature is cool and oxygen

concentration is high, contrasted by dry soil conditions during the summer months (Helm 1998; Eriksen & Belk 1999).

Vernal pool tadpole shrimp require seasonally aquatic habitats that are wet for at least 7 weeks. The species occurs in a variety of natural and artificial seasonally inundated habitats including vernal pools, seasonal wetlands, alkaline pools, clay flats, vernal swales, stock ponds, railroad ROW pools, roadside ditches, and road rut pools resulting from vehicular activity. Occupied pools and wetlands typically have highly turbid waters or aquatic vegetation that may provide shelter from predators. Tadpole shrimp has also been observed in clear waters.

Vernal pool fairy shrimp and vernal pool tadpole shrimp are not known to occur in shallow seasonal wetlands that lack a defined basin and do not provide a water column of sufficient depth (greater than 1 inch) and duration (3–4 weeks), because such conditions are necessary for reproduction. Both species can be found in pools ranging in size from 0.1 acre to 0.5 acre. Similarly, these species do not occur in wetlands that remain wet or damp throughout most of the year (such as seasonal marsh and perennial wetlands) or permanent bodies of water (such as riverine and marine habitats), because these conditions do not allow egg cysts to properly dry and cure (59 FR 48136–48153).

### 4.5.1 Survey Results

There are no known occurrences of vernal pool fairy shrimp or vernal pool tadpole shrimp (both species are part of the listed branchiopods group, which includes a number of species) within the BSA or the project footprint. The nearest recorded occurrence of vernal pool fairy shrimp (CNDDB occurrence 331, dated 2001, 2002) is 2.6 miles away in Tolenas (Fairfield) in a seasonal wetland created by a railroad borrow pit and surrounded by development and the railroad. The nearest recorded occurrence of vernal pool tadpole shrimp (CNDDB occurrence 158, dated 2002) is approximately 3.75 miles away in an isolated vernal pool in a grazed grassland on the Parker Ranch, 2.5 miles west of Travis Field. Within Solano County, there are 23 records of vernal pool fairy shrimp and 30 records of vernal pool tadpole shrimp, most reported near Jepson Prairie Preserve, northeast of the BSA. Table 4-1 provides information on the recorded occurrences closest to the BSA.

**Table 4-1. Occurrences of Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp within 5 Miles of the BSA**

| Species | Occurrence number | Approximate Distance from BSA (miles) | Date Observed | Observer |
|---|---|---|---|---|
| Vernal pool fairy shrimp | 184 | 4 | 1/7/2010<br>1/22/1996 | Laura Belt, LSA Assoc.<br>Timothy Lacy, RMI |
| | 331 | 2.6 | 5/2002<br>1/24/2002 | Jonathan Stead, URS Corp<br>Jonathan Stead, URS Corp |
| | 399 | 4.5 | 2/2/2005<br>1/27/2005 | Russell Huddleston, CH2M Hill<br>Russell Huddleston, CH2M Hill |
| Vernal pool tadpole shrimp | 97 | 4.5 | 3/9/1999<br>1996<br>1993 | Brent Helm, May & Assoc.<br>USFWS<br>Sugnet & Assoc. |
| | 111 | 4.75 | 3/16/2000<br>2/26/1996 | Timothy Lacy, LSA Assoc.<br>Timothy Lacy, LSA Assoc. |
| | 158 | 3.75 | 4/2002<br>5/2002<br>4/15/2000 | Jonathan Stead, URS Corp<br>Jonathan Stead, URS Corp<br>Lance Medley & Glen Holstein |

While habitat assessments for vernal pool fairy shrimp and vernal pool tadpole shrimp were conducted by ICF for the proposed Phase 1, ICF did not conduct protocol-level surveys for this BA because of access restrictions and the long timeline for this project. However, Brent Helms conducted protocol-level surveys of a 250-foot buffer along SR 12 W as part of the Jameson Canyon project.

Portions of Phase 1 affecting potential vernal pool fairy shrimp or vernal pool tadpole shrimp habitat will not be constructed until 2018. Results of surveys conducted before 2013 that verify absence of vernal pool fairy shrimp and vernal pool tadpole shrimp would expire. Caltrans or STA will conduct preconstruction protocol-level surveys of potential vernal pool tadpole shrimp and vernal pool fairy shrimp habitats at appropriate dates (see Section 4.5.3, *Avoidance and Minimization Efforts*).

This BA includes results of habitat assessments completed for the proposed Phase 1 and, additionally, references the results of protocol-level surveys conducted within and adjacent to the BSA for other development projects (Table 2-2). In the larger western portion of the BSA, there are 14 wetland features that may provide potential habitat for vernal pool fairy shrimp or vernal pool tadpole shrimp. These features are found along the north and south sides of SR 12W west of I-80 and on the north side of I-80 (Figure 3-1). HBC conducted protocol-level wet- and dry-season surveys of W-13, W-14, W-15, and W-149 as well as other adjacent basins in the vicinity

as part of the Jameson Canyon Road Widening project BA and found no branchiopods or cysts (Helm 2009). Based on the negative results of the surveys in these features, they are not discussed further.

HBC performed wet- (2000) and dry-season (2002, 2005) protocol-level surveys for listed branchiopods as part of the Gentry-Suisun project BA (Vollmar 2006) in the area adjacent to SR 12E. This area is included in the proposed Phase 1 BSA. HBC did not find vernal pool fairy shrimp or vernal pool tadpole shrimp and no branchiopod cysts were observed. The area south of SR 12E contains wetland habitat that was historically tidal marsh habitat (SFEI Wetland Tracker 2011) and therefore subject to daily inundation of brackish to saline water. Today, the site supports emergent wetlands (SFEI Wetland Tracker 2011) and seasonally wet grasslands (Vollmar 2006). Huffman (2006) references the large pool on the east side of the Gentry property as an artificial pool, but no date is provided for when it was constructed.

### 4.5.2 Critical Habitat

No designated critical habitat for either vernal pool fairy shrimp or vernal pool tadpole shrimp (71 FR 7117) occurs in the BSA. Vernal pool critical habitat Units 12A and 12B are located in Napa County, approximately 6 miles west of the BSA.

### 4.5.3 Avoidance and Minimization Efforts

Pursuant to FESA, Caltrans and STA will implement measures to minimize and avoid incidental take of vernal pool fairy shrimp and vernal pool tadpole shrimp and potential habitat. Implementation of the general avoidance and minimization measures in Section 1.3.6, along with the species-specific avoidance and minimization measures identified below, will minimize and avoid potential incidental take of vernal pool fairy shrimp and vernal pool tadpole shrimp and their potential habitat. Measures also include those required to comply with CWA Sections 401—Water Quality and Storm water Treatment; Section 402—Construction BMPs; and Section 404—Mitigation for Impacts to Wetlands and Waters. Additionally, exotics control is being proposed pursuant to Executive Order 13112 (National Archives and Records Administration 1999).

There are no known occurrences of listed branchiopods within the BSA or project footprint; however, only portions of the total potential habitat have been surveyed due to restricted access to private property and the protracted nature of the Phase 1 timeline. Measures will be taken to avoid or minimize potential effects on those basins that could not be surveyed, but that could provide potential habitat for federally listed branchiopods. In addition, Caltrans or STA will conduct protocol-level surveys of basins on parcels 01-4826-0010, 01-4826-0020, 01-4827-0010, and 01-4827-0340 prior to construction at appropriate times for detecting vernal pool fairy shrimp and vernal pool tadpole shrimp. If these surveys find occurrences of vernal pool fairy shrimp or vernal pool tadpole shrimp within the action area, Caltrans will reinitiate formal Section 7 consultation with USFWS. As appropriate, Caltrans would work with USFWS to develop additional measures to ensure the proposed Phase 1 would minimize and avoid direct and indirect effects on listed branchiopods.

Species-specific avoidance and minimization efforts to be implemented if listed branchiopods are present are described below.

- To the extent practicable, incorporate design modifications to avoid direct permanent effects on potential habitat for federally listed branchiopods.
- Avoid potential vernal pool fairy shrimp and vernal pool tadpole shrimp habitat, to the maximum extent practicable, during construction activities in temporary work areas. All potential vernal pool fairy shrimp and vernal pool tadpole shrimp habitat not directly affected will be designated as an ESA and protected with appropriate fencing and signage. All ESAs will be shown on the final construction drawings.
- Perform all work in accordance with a SWPPP. BMPs will be implemented and may include the use of silt fences, sandbags, detention basins, and other means as appropriate to prevent erosion into any identified or potential, but not surveyed, habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp.
- Restore to preconstruction conditions, to the extent practicable, the topography and grade of potential vernal pool fairy shrimp or vernal pool tadpole shrimp habitat that is temporarily affected. Following all grading and earthwork, these areas will either be replanted or reseeded with the appropriate plant species, if determined necessary, or monitored following

construction, to determine that vegetation and hydrology comparable to preconstruction conditions have been restored.

### 4.5.4 Project Effects

Potential habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp occurs in 14 basins located within the action area. These wetland features are shown in Figure 3-1 and are listed in Table 4-2. Potential project effects on vernal pool fairy shrimp and vernal pool tadpole shrimp would occur during activities associated with Construction Packages 1, 3, and 5.

**Table 4-2. Project Effects on Potential Vernal Pool Fairy and Vernal Pool Tadpole Shrimp Habitat**

| Wetland Feature ID | Direct | Indirect |
|---|---|---|
| W-45a-2 | 0.156 | |
| W-177 | | 0.065 |
| W-45-3 | | 0.020 |
| W-182 | | 0.005 |
| W-183 | 0.366 | |
| W-184 | | 0.060 |
| W-185 | | 0.052 |
| W-188 | | 0.041 |
| W-186 | | 0.007 |
| W-187 | 0.003 | |
| W-189 | 0.032 | |
| W-151 | 0.038 | |
| W-156 | 0.095 | |
| W-63 | 0.017 | |
| **Total** | **0.707** | **0.251** |

#### 4.5.4.1 Direct Effects

Caltrans and STA anticipate that construction of the proposed Phase 1 would directly affect a total of approximately 0.71 acre of seasonal wetland habitat that may provide potential habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp, but that has not been documented to be occupied by either species.

#### 4.5.4.2 Indirect Effects

According to USFWS, indirect effects are "those that are caused by the proposed action and are later in time, but are still reasonably certain to occur" (50 CFR 402.02). Potential indirect effects on branchiopods are listed below.

- Up to 0.25 acre of seasonal wetlands that could provide habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp may be affected by changes in hydrology resulting from the construction of the new roadway connecting Business Center Drive and SR 12W. Caltrans or STA will, to the extent practicable, restore the temporarily affected areas within the project footprint to preconstruction gradients to minimize and avoid potential indirect effects associated with altered hydrology.
- Construction activities associated with road construction in or adjacent to potential branchiopod habitat could result in indirect effects on water quality downstream from the construction work area. Increased sedimentation could reduce the suitability of branchiopod habitat downstream of the construction area. Hydrocarbon and heavy metal pollutants associated with roadside runoff also have the potential to enter the aquatic system, affecting water quality. Proposed Phase 1 will adhere to the terms of the Regional Water Quality Control Board Section 401 certification to treat nonpoint source pollutants associated with the increase in impervious surface area. Permanent treatment BMPs will be incorporated into each Construction Package, and Caltrans SWPPPs and erosion control BMPs will minimize potential indirect effects on downstream resources from sedimentation transport resulting from construction activities in the action area. Through the use of the existing systems and planned BMPs, there is no expected decrease in water quality that would directly or indirectly affect vernal pool fairy shrimp, vernal pool tadpole shrimp, or their potential habitat.

#### 4.5.4.3 Determination

While potential habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp is present within the BSA, recent surveys conducted within the BSA for other projects have found no branchiopods or branchiopod cysts. The likelihood that either vernal pool fairy shrimp or vernal pool tadpole shrimp may occur within the action area is very low. With the implementation of

the aforementioned measures to minimize and avoid direct and indirect effects on potential habitat for branchiopods and individual branchiopods, the effects of this project are expected to be discountable and insignificant.

Moreover, there is no reasonable certainty that the potential modifications to seasonal wetlands would actually result in the take of vernal pool fairy shrimp or vernal pool tadpole shrimp. Caltrans and STA are bound to consider the decision of the 9th Circuit Court of Appeals in the *Arizona Cattle Growers' Association vs. U.S. Fish and Wildlife*, which elaborated on when habitat modification constitutes harm. In this decision, the Court noted that habitat modification or degradation alone is not considered "taking" pursuant to section 9 of FESA. The modification or degradation must be significant, must significantly impair essential behavioral patterns, and must result in actual injury to a protected species. In this case, the modification of unoccupied potential branchiopod habitat does not rise to the level of take under FESA Section 9.

Based on the best available commercial and scientific data and the impact assessment for listed branchiopods, Caltrans has determined the proposed Phase 1 **may affect**, but is **not likely to adversely affect** vernal pool fairy shrimp and vernal pool tadpole shrimp.

### 4.5.5 Compensatory Mitigation

Based on the best available commercial and scientific data, Caltrans and STA do not anticipate any direct or indirect effects on listed branchiopods. Consequently, Caltrans and STA do not propose any compensatory mitigation for vernal pool fairy shrimp or vernal pool tadpole shrimp under FESA. However, approximately 3.88 acres of jurisdictional seasonal wetlands (including vernal pool habitat for federally listed branchiopods) that are regulated under the federal Clean Water Act would be filled. Of these 3.88 acres of jurisdictional seasonal wetlands, approximately 0.707 acre provides potential habitat for federally listed branchiopods. Caltrans or STA will mitigate at a 2:1 ratio to compensate for the loss of these jurisdictional wetlands to ensure no net loss pursuant to the CWA. The 2:1 mitigation ratio takes into account that Caltrans or STA will also implement a suite of measures to minimize and avoid impacts on seasonal wetlands. The 2:1 ratio also factors the potential temporal loss of seasonal wetlands. While Caltrans and STA do not anticipate direct or indirect effects on listed branchiopods, the compensatory mitigation for

seasonal wetlands under the CWA, as described below, would also provide potential habitat benefits for federally listed branchiopods.

**Compensate for Direct and Indirect Effects on Seasonal Wetlands**

Caltrans or STA will provide a total of 7.76 acres of compensatory mitigation under the CWA for potential permanent and temporary effects on jurisdictional seasonal wetlands (including vernal pools) that may serve as potential habitat for vernal pool fairy shrimp or vernal pool tadpole shrimp. Compensatory mitigation for seasonal wetlands would be accomplished in a manner that also provides potential habitat for listed branchiopods. This compensation could entail any of the options listed below.

- Purchase of seasonal wetland mitigation credits at an approved bank. The credits to be purchased would include at least 0.707 acre of potential habitat for vernal pool fairy shrimp and/or vernal pool tadpole shrimp.
- Purchase of conservation easements on land with seasonal wetlands and preservation of at least 0.707 acre of potential habitat for vernal pool fairy shrimp and/or vernal pool tadpole shrimp.
- Acquisition of land with seasonal wetlands in fee title and preservation of at least 0.707 acre of potential habitat for vernal pool fairy shrimp and/or vernal pool tadpole shrimp.
- A combination of two or more of these options.

## 4.6 Valley Elderberry Longhorn Beetle

VELB was listed as threatened on August 8, 1980 (45 FR 52803-52807) and has no state listing. On February 14, 2007, USFWS completed a 5-year review recommending the species be delisted. However, a delisting proposal has not yet been released. Critical habitat for the species was designated and published in 45 FR 52803.

This species was first described in 1921 from specimens collected in Sacramento (U.S. Fish and Wildlife Service 1984). The species' range extends throughout the associated foothills of the

Central Valley in California, from Kern County in the south to Shasta County in the north (Jones & Stokes Associates 1985, 1986, 1987).

VELB is closely associated with blue elderberry, an obligate host for its larvae. Blue elderberry is considered a typical riparian shrub in California (Roberts et al. 1977; Katibah et al. 1984; Warner 1984). In a study of Sacramento Valley riparian vegetation, Conard et al. (1977) found that blue elderberry grows mainly at an intermediate elevation in the floodplain, in association with box elder and buttonbush. Where a source of water exists, elderberry shrubs may grow in non-riparian habitats. However, most VELB occurrences are known from elderberry shrubs in or adjacent to riparian communities.

### 4.6.1 Survey Results

There are no known VELB occurrences within the BSA or the project footprint. The CNDDB lists four occurrences of VELB within 5 miles of the BSA (California Natural Diversity Database 2010). Occurrence 211 is approximately 2 miles northeast of the SR 12W/I-80/I-680 interchange. Occurrences 192, 92, and 93 are northwest of the City of Fairfield (Figure 2-2b). Field surveys conducted in 2007 by ICF invertebrate specialist Patrick Stone and in 2009 by ICF biologist Stephanie Myers identified a total of 15 elderberry shrubs at two locations within the BSA and project footprint. Ten elderberry shrubs, 1 through 10, were identified along the north and south sides of SR 12W, west of I-80 in the vicinity of Jameson Canyon Creek. These 10 shrubs are within the project footprint and would be directly affected by construction activities (Figure 3-1, Sheet 7). Two shrubs, 2 and 3, had evidence of VELB bore holes. Five shrubs, 11 through 15, were identified along Neitzel Road and the Green Valley Road intersection (Figure 3-1, Sheets 17 and 18). Two shrubs, 11 and 12, are outside the project footprint but are within a 100-foot construction buffer. These two plants have the potential of being indirectly affected by Phase 1, Construction Package 3. Shrubs 13, 14, and 15 would not be affected by construction activities as they are outside the 100-foot construction buffer. The number of stems, size of stems, and riparian habitat associated with each shrub are listed in Table 4-3.

**Table 4-3. Summary of Elderberry Shrub Effects in the BSA**

| Shrub | Presence of Exit Holes? | Riparian Habitat? | Number of Stems (by Diameter) | | | Effect on Shrub |
|---|---|---|---|---|---|---|
| | | | 1–3 inches | 3–5 inches | >5 inches | |
| 1 | No | No | 3 | 4 | 1 | Direct |
| 2 | Yes | No | 2 | 1 | 1 | Direct |
| 3 | Yes, old hole | No | 0 | 0 | 1 | Direct |
| 4 | No | No | 3 | 1 | 1 | Direct |
| 5 | No | No | 2 | 1 | 2 | Direct |
| 6 | No | No | 0 | 1 | 1 | Direct |
| 7 | No | Yes | 2 | 0 | 1 | Direct |
| 8 | No | Yes | 0 | 0 | 3 | Direct |
| 9 | No | Yes | 0 | 4 | 2 | Direct |
| 10 | No | Yes | 0 | 2 | 1 | Direct |
| 11 | No | Yes | 3 | 2 | 2 | Indirect |
| 12 | No | Yes | 15 | 0 | 0 | Indirect |
| 13 | No | Yes | NA | NA | NA | No effect |
| 14 | No | Yes | NA | NA | NA | No effect |
| 15 | No | Yes | NA | NA | NA | No effect |
| **Overall Total** | | | **30** | **16** | **16** | |

### 4.6.2 Critical Habitat

Two areas along the American River in the Sacramento area have been designated as critical habitat for VELB. No critical habitat is present in the BSA.

### 4.6.3 Avoidance and Minimization Efforts

The direct and indirect effects on VELB will be minimized by transplanting directly affected shrubs, as well as providing supplemental plantings to ensure there is an abundance of host plants for VELB. Caltrans and STA will work with the Solano County Resource Conservation District or a USFWS-approved bank to facilitate the removal and transplanting effort.

As required by FESA, Caltrans or STA will implement measures to minimize and avoid incidental take of VELB and direct and indirect effects on its host plant. Implementation of the general avoidance and minimization measures outlined in Section 1.3.6, along with the species-specific avoidance and minimization measures identified below, will minimize and reduce the potential incidental take of VELB and potential effects on its host plant.

- Install ESA fencing and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by USFWS, the fencing will provide a minimum 2-foot setback from the drip line of each elderberry plant.
- Provide contractors with training educating them on the status of VELB and its host plant and emphasizing the need to avoid damaging elderberry plants.
- Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.
- Restore, to the maximum extent practicable, any damage or disturbance to the buffer area (areas within 100 feet of elderberry plants) during construction. Provide erosion control and revegetate with appropriate native plants.
- Prohibit use of insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant in the buffer areas or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or more in diameter at ground level.

### 4.6.4 Project Effects

Twelve of the fifteen shrubs identified within the BSA and project footprint will be directly or indirectly affected by construction activities. Construction Package 1 would directly affect 10 elderberry shrubs along the north and south sides of SR 12W in the vicinity of Jameson Canyon Creek (Table 4-4). Construction Package 3 would indirectly affect shrubs 11 and 12 along Neitzel Road. No other Construction Packages would affect VELB and elderberry shrubs.

Implementation of the described avoidance and minimization measures and the proposed compensatory mitigation described below will reduce the potential direct and indirect effects on VELB and the known elderberry host plants.

#### 4.6.4.1 Determination

Proposed Phase 1, Construction Package 1, would directly affect 10 valley elderberry shrubs through removal or transplantation. Construction Package 3 would indirectly affect two elderberry shrubs within the 100-foot protective buffer. While there are no known occurrences of VELB within the BSA or project footprint, two of the host plants have signs of VELB bore holes, providing evidence that VELB is likely present within the action area. There would be no effects on three plants located within the BSA but outside the 100-foot buffer area near Green Valley Creek. With implementation of the avoidance and minimization measures described in Sections 1.3.6 and 4.6.5, potential effects on VELB will be minimized and reduced. Based on the best available commercial and scientific data and the impact assessment for VELB and its host plants, Caltrans has determined that Phase 1, Construction Package 1 and 3 **is likely to adversely affect**, but **will not jeopardize** the continued existence of VELB.

### 4.6.5 Compensatory Mitigation

The fundamental duty of a federal lead agency under Section 7 of the Federal Endangered Species Act is to ensure that federal actions do not jeopardize the continued existence of listed species. As noted on page 4-53 of the *Endangered Species Consultation Handbook* (U.S. Fish and Wildlife Service 1998), "Section 7 requires minimization of the level of take. It is not appropriate to require mitigation for the impacts of incidental take." Nevertheless, Caltrans, as a state and federal lead agency, must determine whether any other state or federal statutory authority, policy, or regulation requires or compels the provision of compensatory mitigation to address the potential effects on VELB and its host plant under the specific circumstances and impacts of the federal action.

Even with the identified avoidance and minimization measures, the proposed Phase 1 may have a significant effect on VELB as defined under CEQA. The proposed project would result in direct and indirect effects on 12 elderberry shrubs with a combined total of 62 stems of potential VELB habitat (Table 4-4). While there are no known occurrences of VELB within the BSA or project footprint, two of the host plants have signs of VELB bore holes, providing evidence that VELB is likely present within the action area. The loss of host plants may not necessarily reduce the range of VELB; however, such loss would likely result in the direct mortality of VELB, thereby

reducing the numbers of this federally listed beetle. While USFWS has recommended in its 5-year review that VELB be delisted, until it actually is delisted Caltrans must continue to afford VELB the protection of a listed species. Consequently, Caltrans and STA propose compensatory mitigation for VELB pursuant to CEQA.

**Compensation for Effects on Valley Elderberry Longhorn Beetle**

Compensatory mitigation for the loss of VELB host plants will occur prior to the beginning of ground-disturbing activities for Construction Packages 1 and 3. Compensation for effects on VELB may include replacement plantings of elderberry seedlings or cuttings and associated native plantings at a USFWS-approved conservation area or mitigation bank at a ratio between 1:1 and 8:1 (ratio = new plantings to affected stems), depending on the diameter of the stem at ground level, the presence or absence of exit holes, and whether the shrub is located in riparian habitat (Table 4-4).

Caltrans or STA will compensate for effects on VELB through a combination of the following.

- To the extent practicable, transplant all elderberry shrubs prior to ground-disturbing activities at a USFWS-approved conservation area. Transplanting will occur according to USFWS-approved procedures outlined in the VELB Guidelines (U.S. Fish and Wildlife Service 1999).

In addition to the above, one or more of the following measures will be implemented.

- Provide replacement plantings and associated native planting as described in Table 4-4 at an approved VELB conservation area.
- Purchase VELB credits from a USFWS-approved mitigation bank.
- Implement a combination of any of the three options noted above.

**Table 4-4. Affected Elderberry Plant Compensation Ratios Based on Location, Stem Diameter, and Presence of Exit Holes[a]**

| Location | Stems | Holes | Number of Stems | Elderberry Ratios (multiply number of stems by) | Elderberry Planting | Associated Native Planting | Native Ratios |
|---|---|---|---|---|---|---|---|
| Non-riparian | 1–3 | No | 8 | 1 | 8 | 8 | 1 |
| | | Yes | 2 | 2 | 4 | 8 | 2 |
| Non-riparian | 3–5 | No | 7 | 2 | 14 | 14 | 1 |
| | | Yes | 1 | 4 | 4 | 8 | 2 |
| Non-riparian | >5 | No | 5 | 3 | 15 | 15 | 1 |
| | | Yes | 2 | 6 | 12 | 24 | 2 |
| Riparian | 1–3 | No | 20 | 2 | 40 | 40 | 1 |
| | | Yes | 0 | 4 | 0 | 0 | 2 |
| Riparian | 3–5 | No | 8 | 3 | 24 | 24 | 1 |
| | | Yes | 0 | 6 | 0 | 0 | 2 |
| Riparian | >5 | No | 9 | 4 | 36 | 36 | 1 |
| | | Yes | 0 | 8 | 0 | 0 | 2 |
| **Totals** | | | **62** | | **157** | **177** | |
| **Total acres needed for compensation** | | | | **1.38** | | | |

[a] Compensation acreages were calculated using a template provided by USFWS and follow formulas found in USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle, July 9, 1999.

## 4.7 California Red-Legged Frog

CRLF is federally listed as threatened and is a California species of special concern. USFWS published a recovery plan in 2002 (U.S. Fish and Wildlife Service, 2002) and published a final rule to revise critical habitat for CRLF on March 17, 2010 (75 FR 12816). The BSA contains a portion of one recovery area, the Jameson Canyon-Lower Napa River Core Recovery Area, as well as portions two critical habitat Units (SOL-2 and SOL-3) (Figure 4-3).

Historically, CRLF was common from Redding to Baja California, including the Sierra Nevada and Coast Ranges. Its current range is much reduced, and most remaining populations are found in central California along the coast from Marin to Ventura Counties.

CRLFs breed in lowland and foothill streams and wetlands, including livestock ponds (Jennings and Hayes 1994). They may also be found in upland habitats near breeding areas and along intermittent drainages connecting aquatic sites. Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats. Although CRLFs typically remain near streams or ponds, recent studies in Santa Cruz suggest that they are capable of moving 1 mile or more in upland habitat or through ephemeral drainages (Bulger 1999).

# Figure 4-3
# California Red-Legged Frog Critical Habitat

## Legend

- Phase 1 Project Footprint
- California Red-Legged Frog Critical Habitat

Source: USFWS 2010, ESRI 2011

0 0.5 1 2
Miles

Project Vicinity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Although CRLFs are found in ephemeral streams and ponds, populations cannot be maintained where all surface water disappears (Jennings and Hayes 1994). CRLFs are infrequent or absent in habitats where introduced aquatic predators such as green sunfish (*Lepomis cyanellus*), Louisianan red-swamp crayfish (*Procambarus clarkii*), and bullfrogs (*Rana catesbeiana*) are present (Hayes and Jennings 1986, 1988), probably because larval stages are susceptible to predation (Jennings and Hayes 1994).

### 4.7.1 Survey Results

The CNDDB lists 16 records from 1993 to 2006 for CRLF within a 5-mile radius of the BSA (California Natural Diversity Database 2010) (Figure 2-2b). The 16 records were all associated with aquatic breeding and dispersal habitat and included adults, juveniles, and tadpoles. Two recent records in the CNDDB—occurrences 660 and 820—are on the Mangels property north of SR 12W. Occurrence 660 is associated with the intermittent drainage containing small plunge pools surrounded by grasslands adjacent to the BSA, and occurrence 820 is in the large perennial pond on the Mangels property. The remaining 14 records are from 2–5 miles west and south of the BSA at the SR 12/I-80/I-680 interchange (Figure 2-2b). These occurrences are 1602, 896, 228, 403, 402, 77, 290, 237, 416, 289, 917, 950, 857, and 306.

Monk & Associates (2003 and 2004) conducted site assessments and protocol-level surveys for CRLF in several locations within the current BSA. These assessments and surveys examined ponds, seasonal wetlands, and seasonal drainages on the Mangels property north of SR 12W, Jameson Canyon Creek, Dan Wilson Creek, and Suisun Creek. Monk & Associates found CRLF tadpoles in the pond just north of W-150 and a CRLF adult in an intermittent drainage (OW-161, which includes W-177 and W-178 on the Mangels property) (Figure 4-4, Sheet 5).

ICF conducted a CRLF site assessment in 2007 using aerial images and, where accessible, site visits within 1 mile of the construction footprint (ICF Jones & Stokes 2009a). The site assessment was submitted to USFWS for review on March 3, 2009. The biologists assessed habitat suitability at 17 sites within the BSA, including one creek and 14 ponds within the CRLF study area. No CRLFs were observed during the site assessment surveys.

Potential aquatic breeding habitat for CRLF is defined as still or slow-moving water more than 2.3 feet deep with emergent vegetation. The most suitable riparian vegetation is willow (*Salix* spp.), although cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) can also provide potential habitat (Jennings 1988). Potential upland habitat is defined to include all alkali seasonal marsh, woodlands, annual grassland, riparian woodland, upland scrub, and seasonal wetlands that are too shallow and ephemeral to provide aquatic habitat (Figure 4-4). Cultivated lands and developed lands do not provide potential CRLF upland habitat.

In an email dated July 15, 2010, USFWS contract biologist John Cleckler informed STA that USFWS considers all undeveloped habitat north of I-80 as potential CRLF habitat, comprising potential upland and aquatic (breeding and non-breeding) habitats. USFWS also stated they consider the Jameson Canyon Creek location south of I-80 (OW-8 on Figure 4-4, Sheet 9) as potential CRLF aquatic habitat. Mr. Cleckler stated that effects on CRLF aquatic and upland habitat at this location would likely be offset by the benefit to the species from bridging the creek. USFWS also stated that several areas considered not to be potential CRLF habitat in the 2007 CRLF site assessment conducted by ICF should be considered potential: Jameson Canyon Creek in two locations (OW-8a and OW-8) and upland habitat between the creek and I-80 (Figure 4-4, Sheets 3 and 7).

Potential aquatic habitat for CRLF occurs in the following locations of the BSA (Figure 4-4).

- Perennial marsh north of SR 12W (W-150, Sheet 5).
- Seasonal drainages south of SR 12W and tributary to Jameson Canyon Creek (OW-8b and OW-8d, Sheet 3).
- A seasonal drainage (OW-161, Sheet 5).
- Mangels pond (Sheet 5).
- Seasonal wetlands (W-177 and W-178, Sheet 5).
- Green Valley Creek (W-45, Sheets 17 and 18).
- Perennial marsh (W-45e-1, Sheets 17 and 18).

# FIGURE 4-4
# Resources for California Red-legged Frog
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California


## Legend

- Permanent Impact Area (Project Footprint)
- Temorary Impact Area (Project Footprint)
- California Red-legged Frog Occurrence (California Natural Diversity Database, Oct 2010)
- California Red-legged Frog Aquatic Habitat
- California Red-legged Frog Upland Habitat
- California Red-legged Frog Critical Habitat

Suitable Aquatic Habitat

- Open Water
- Perennial Marsh
- Seasonal Drainage
- Seasonal Wetland

Suitable Upland Habitat

- Eucalyptus
- Live Oak Woodland
- Non-native Annual Grassland
- Other Woodland
- Riparian Woodland
- Ruderal
- Upland Scrub
- Valley Oak Woodland
- Seasonal Drainage[1]
- Seasonal Wetland[1]

[1] too shallow and temporary to provide aquatic habitat

Non-Suitable Habitat

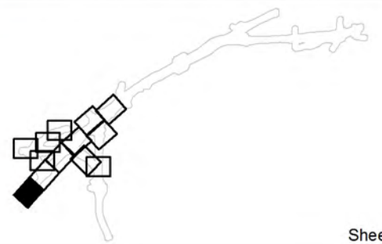
- Developed/Graded
- Landscaped
- Orchard/Vineyard
- Row Crops

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2008 i-cubed)

Note: Resource mapping represents existing conditions after the completion of the I-80 Eastbound Cordelia Truck Scales Relocation, Fairfield Corporate Commons, and recent development projects, which do not appear on the underlying aerial photography.

Only sheets containing Phase 1 elements and California Red-legged Frog habitat appear in this series. For reference, remaining sheets are available in Figure 3.1.



Sheet 1 of 35

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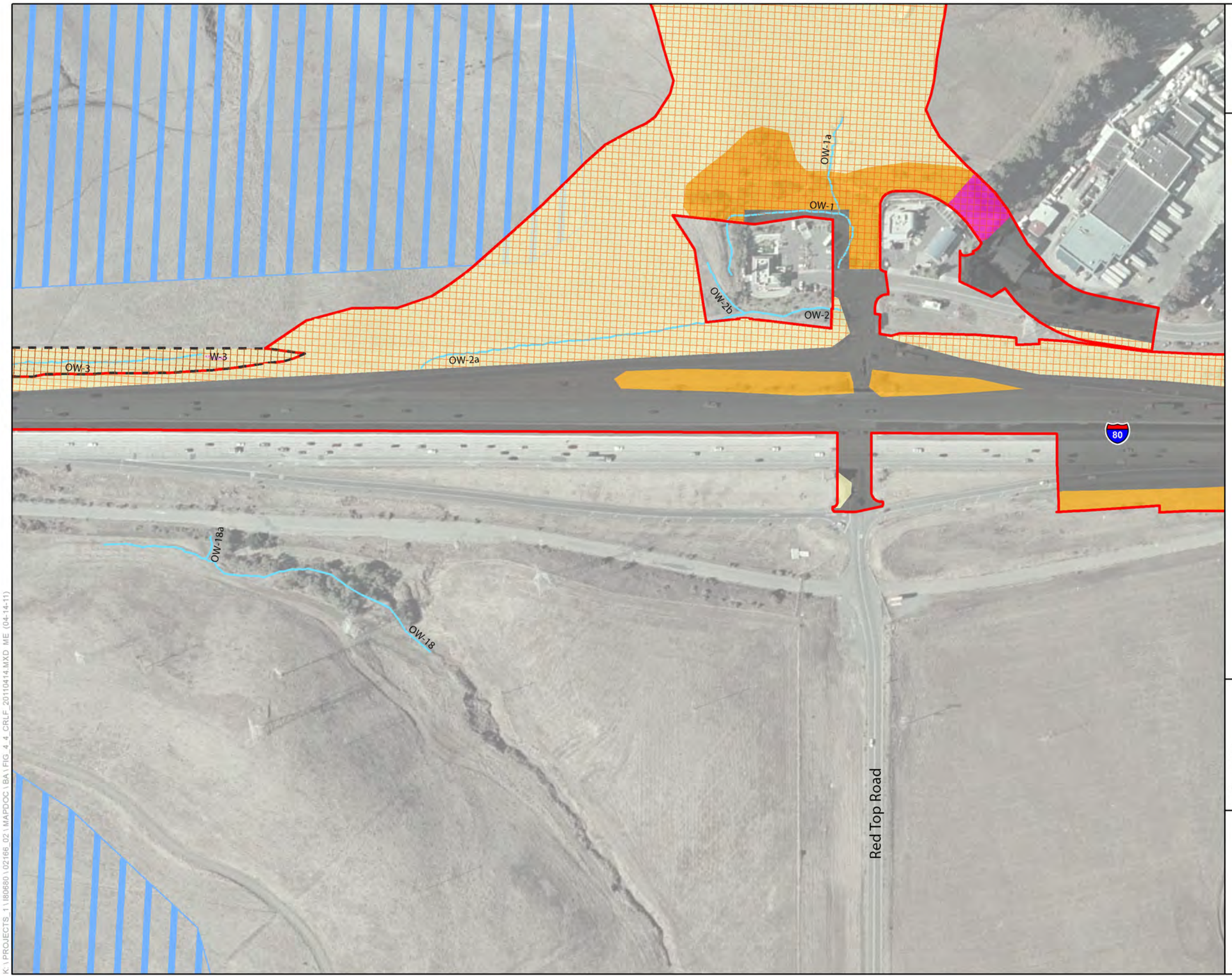
# FIGURE 4-4
# Resources for California Red-legged Frog
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California




## Legend

- Permanent Impact Area (Project Footprint)
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- California Red-legged Frog Occurrence (California Natural Diversity Database, Oct 2010)
- California Red-legged Frog Aquatic Habitat
- California Red-legged Frog Upland Habitat
- California Red-legged Frog Critical Habitat

Suitable Aquatic Habitat

- Open Water
- Perennial Marsh
- Seasonal Drainage
- Seasonal Wetland

Suitable Upland Habitat

- Eucalyptus
- Live Oak Woodland
- Non-native Annual Grassland
- Other Woodland
- Riparian Woodland
- Ruderal
- Upland Scrub
- Valley Oak Woodland
- Seasonal Drainage[1]
- Seasonal Wetland[1]

[1] too shallow and temporary to provide aquatic habitat

Non-Suitable Habitat

- Developed/Graded
- Landscaped
- Orchard/Vineyard
- Row Crops

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2008 i-cubed)

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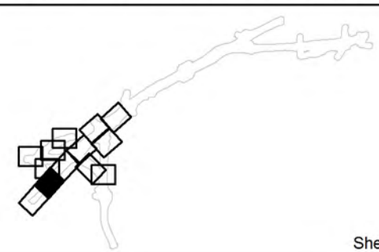



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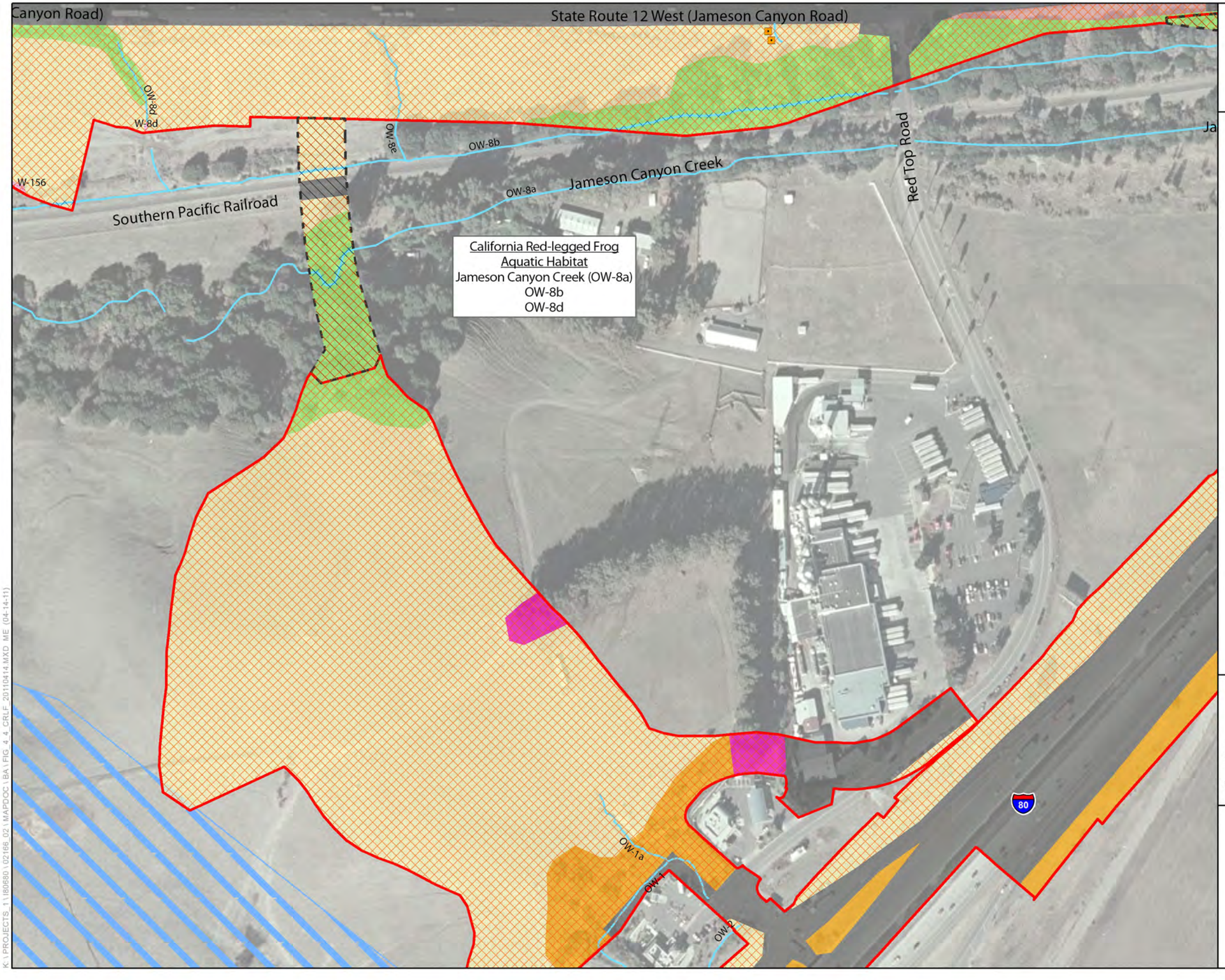
# FIGURE 4-4
# Resources for California Red-legged Frog
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California




## Legend

- Permanent Impact Area (Project Footprint)
- Temorary Impact Area (Project Footprint)
- California Red-legged Frog Occurrence (California Natural Diversity Database, Oct 2010)
- California Red-legged Frog Aquatic Habitat
- California Red-legged Frog Upland Habitat
- California Red-legged Frog Critical Habitat

**Suitable Aquatic Habitat**

- Open Water
- Perennial Marsh
- Seasonal Drainage
- Seasonal Wetland

**Suitable Upland Habitat**

- Eucalyptus
- Live Oak Woodland
- Non-native Annual Grassland
- Other Woodland
- Riparian Woodland
- Ruderal
- Upland Scrub
- Valley Oak Woodland
- Seasonal Drainage[1]
- Seasonal Wetland[1]

[1] too shallow and temporary to provide aquatic habitat

**Non-Suitable Habitat**

- Developed/Graded
- Landscaped
- Orchard/Vineyard
- Row Crops

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2008 i-cubed)

Note: Resource mapping represents existing conditions after the completion of the I-80 Eastbound Cordelia Truck Scales Relocation, Fairfield Corporate Commons, and recent development projects, which do not appear on the underlying aerial photography.

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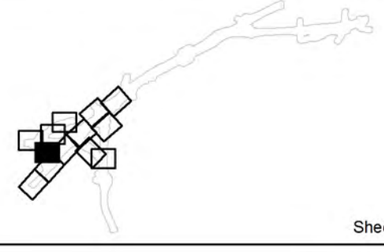



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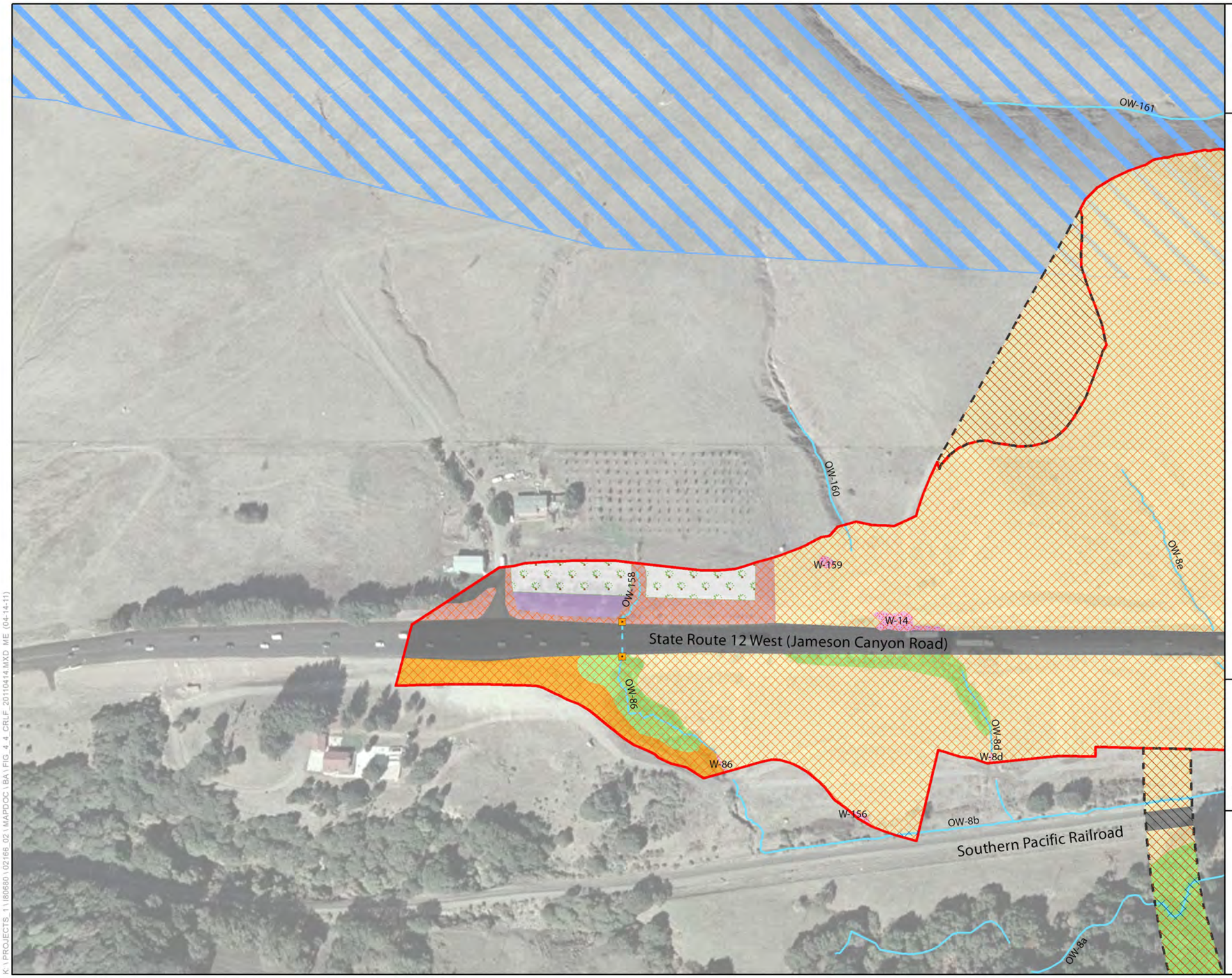
# FIGURE 4-4
# Resources for California Red-legged Frog
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California




## Legend

- Permanent Impact Area (Project Footprint)
- Temorary Impact Area (Project Footprint)
- California Red-legged Frog Occurrence (California Natural Diversity Database, Oct 2010)
- California Red-legged Frog Aquatic Habitat
- California Red-legged Frog Upland Habitat
- California Red-legged Frog Critical Habitat

Suitable Aquatic Habitat

- Open Water
- Perennial Marsh
- Seasonal Drainage
- Seasonal Wetland

Suitable Upland Habitat

- Eucalyptus
- Live Oak Woodland
- Non-native Annual Grassland
- Other Woodland
- Riparian Woodland
- Ruderal
- Upland Scrub
- Valley Oak Woodland
- Seasonal Drainage[1]
- Seasonal Wetland[1]

[1] too shallow and temporary to provide aquatic habitat

Non-Suitable Habitat

- Developed/Graded
- Landscaped
- Orchard/Vineyard
- Row Crops

Feet
200 100 0 200

Aerial Photo Source: Aerials Express 2008 (© 2008 i-cubed)

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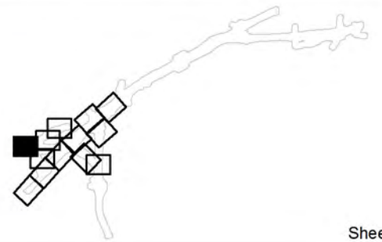



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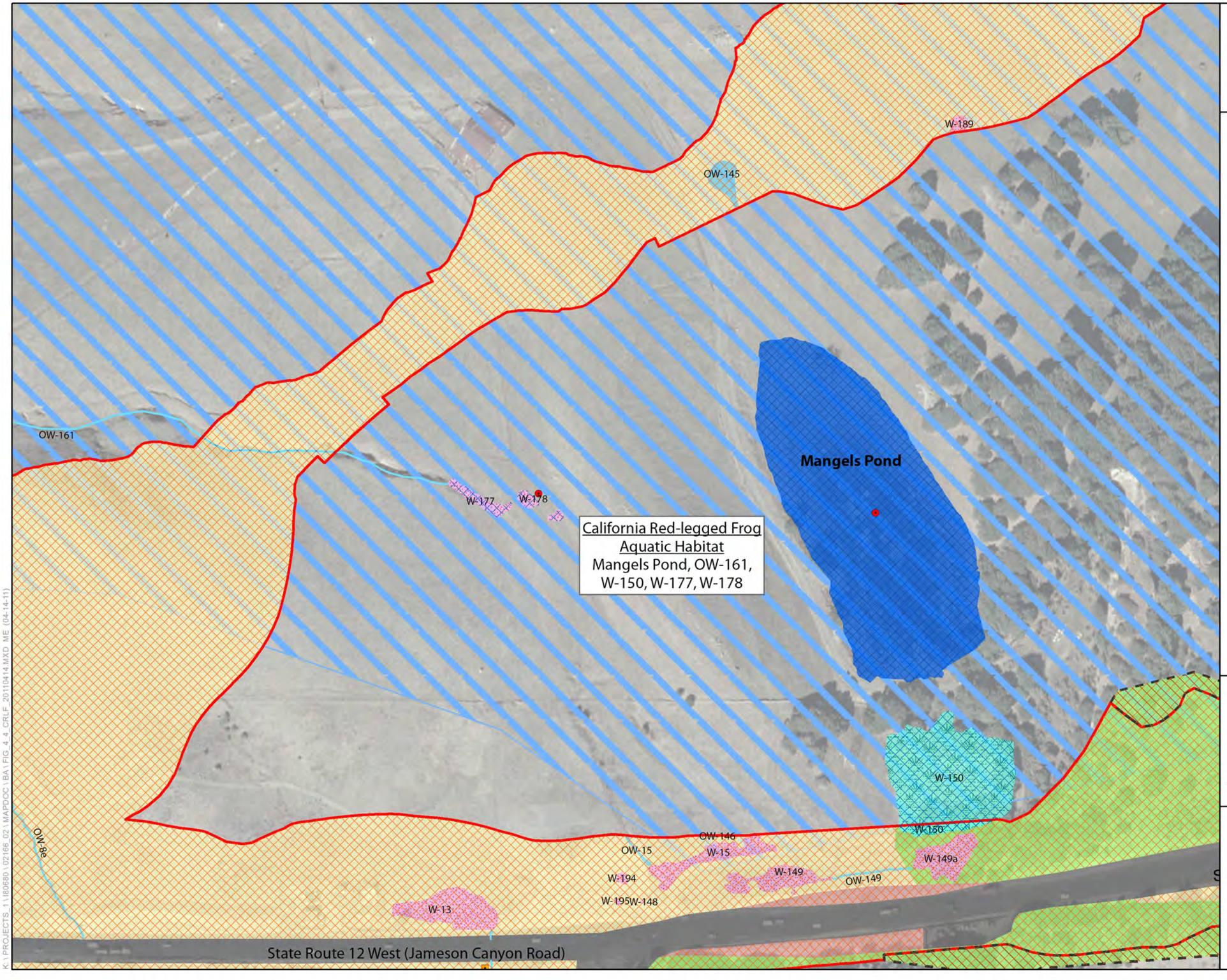
# FIGURE 4-4
# Resources for California Red-legged Frog
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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Feet
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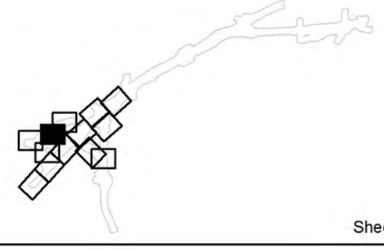

Sheet 5 of 35

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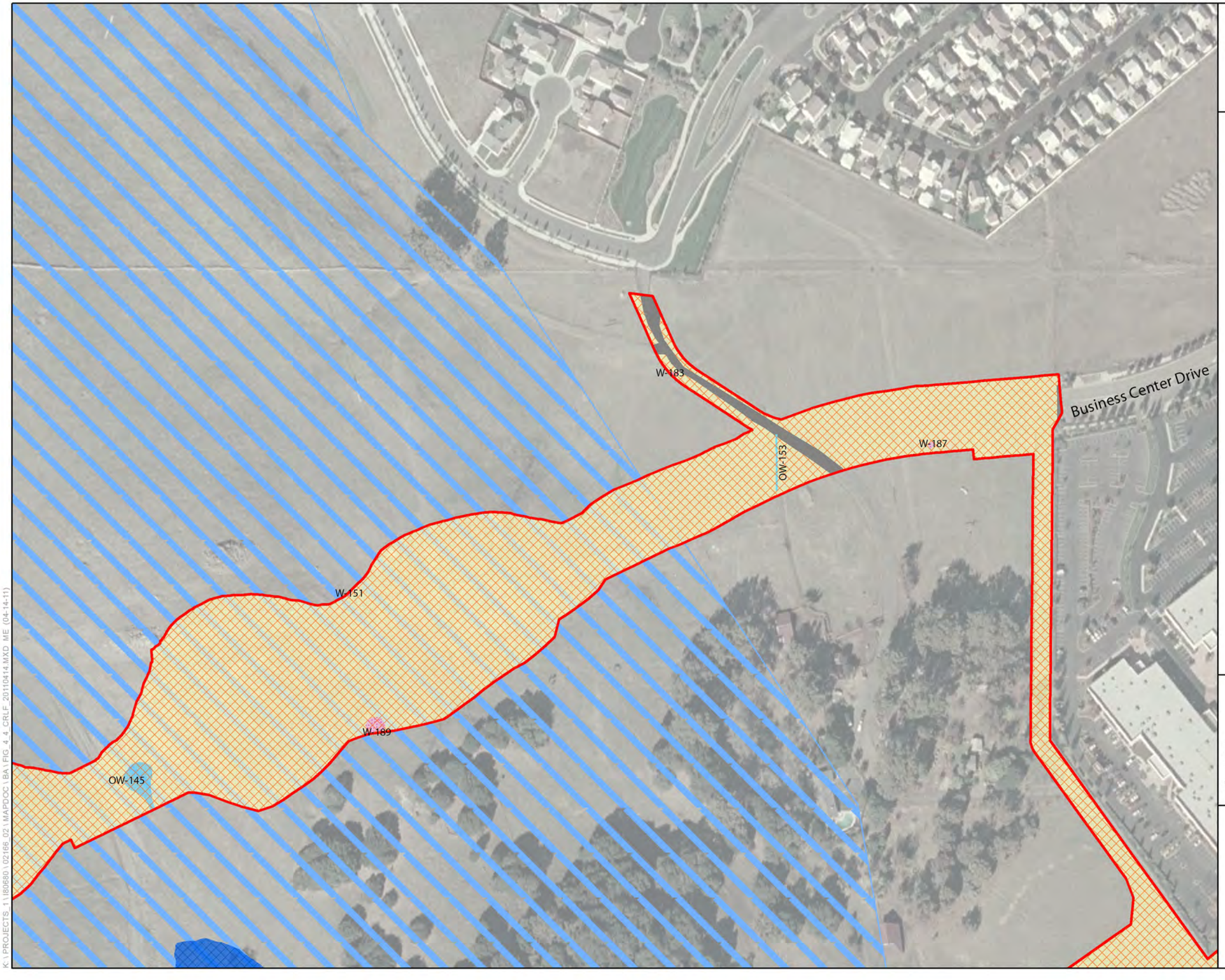
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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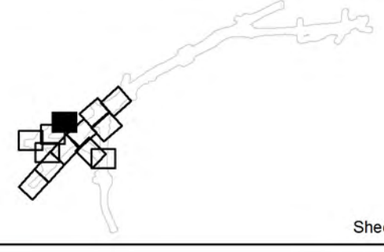

Sheet 6 of 35

K:\PROJECTS_1\I80680\02166_02\MAPDOC\BA\FIG_4_4_CRLF_20110414.MXD ME (04-14-11)

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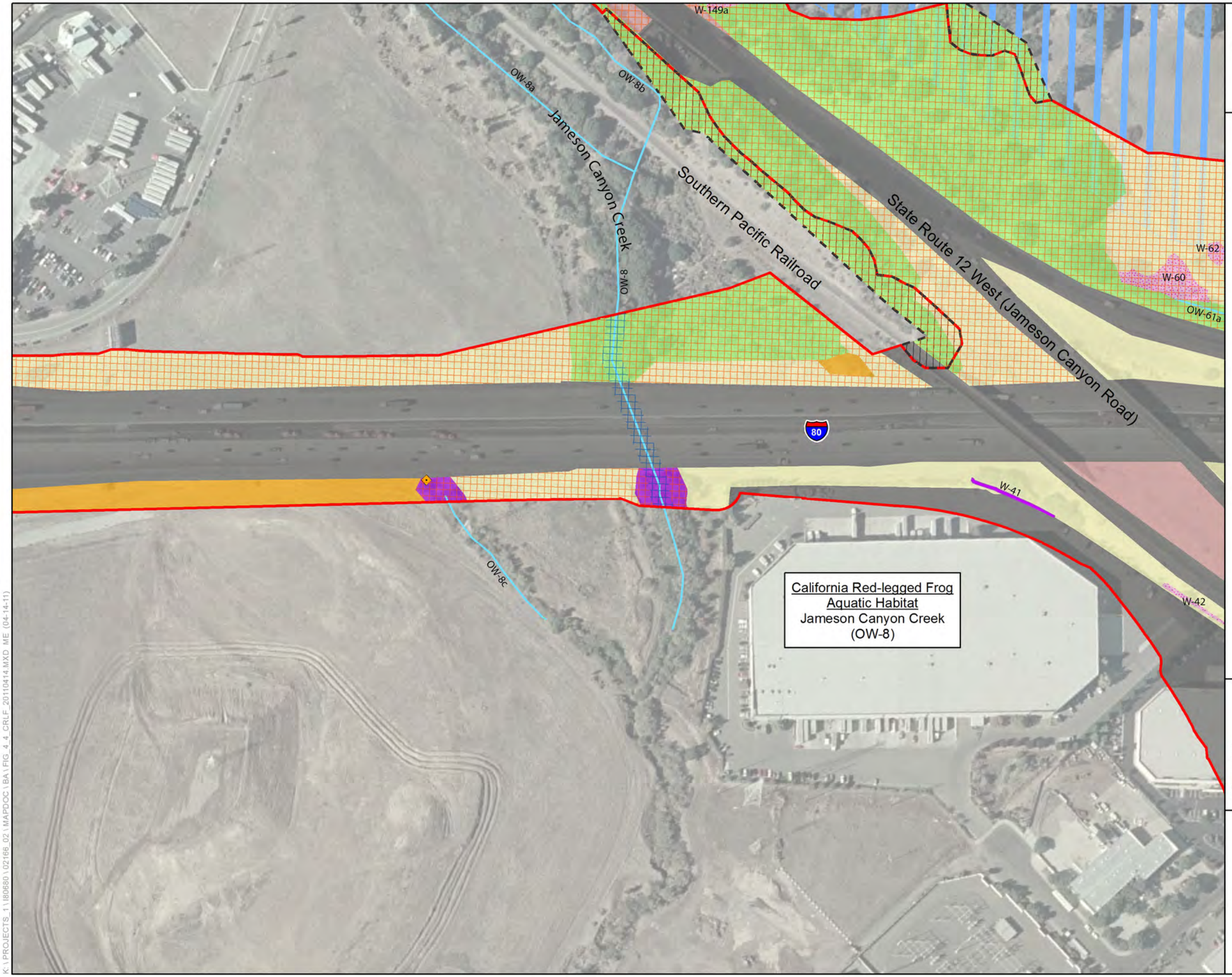


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Feet
200 100 0 200

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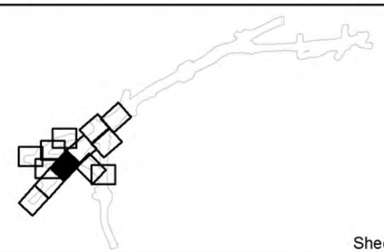



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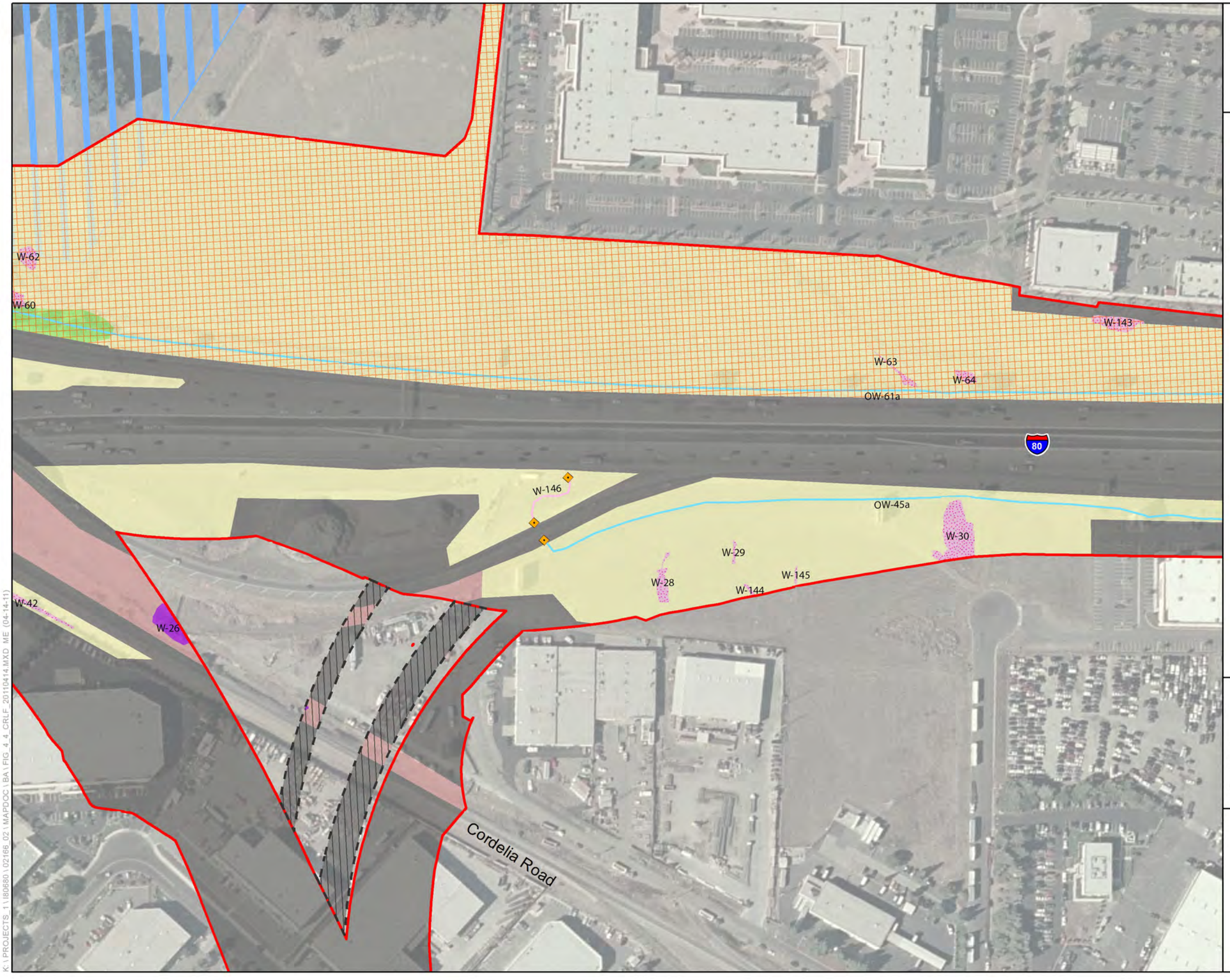


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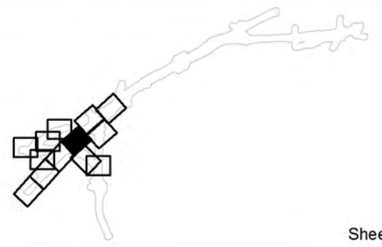



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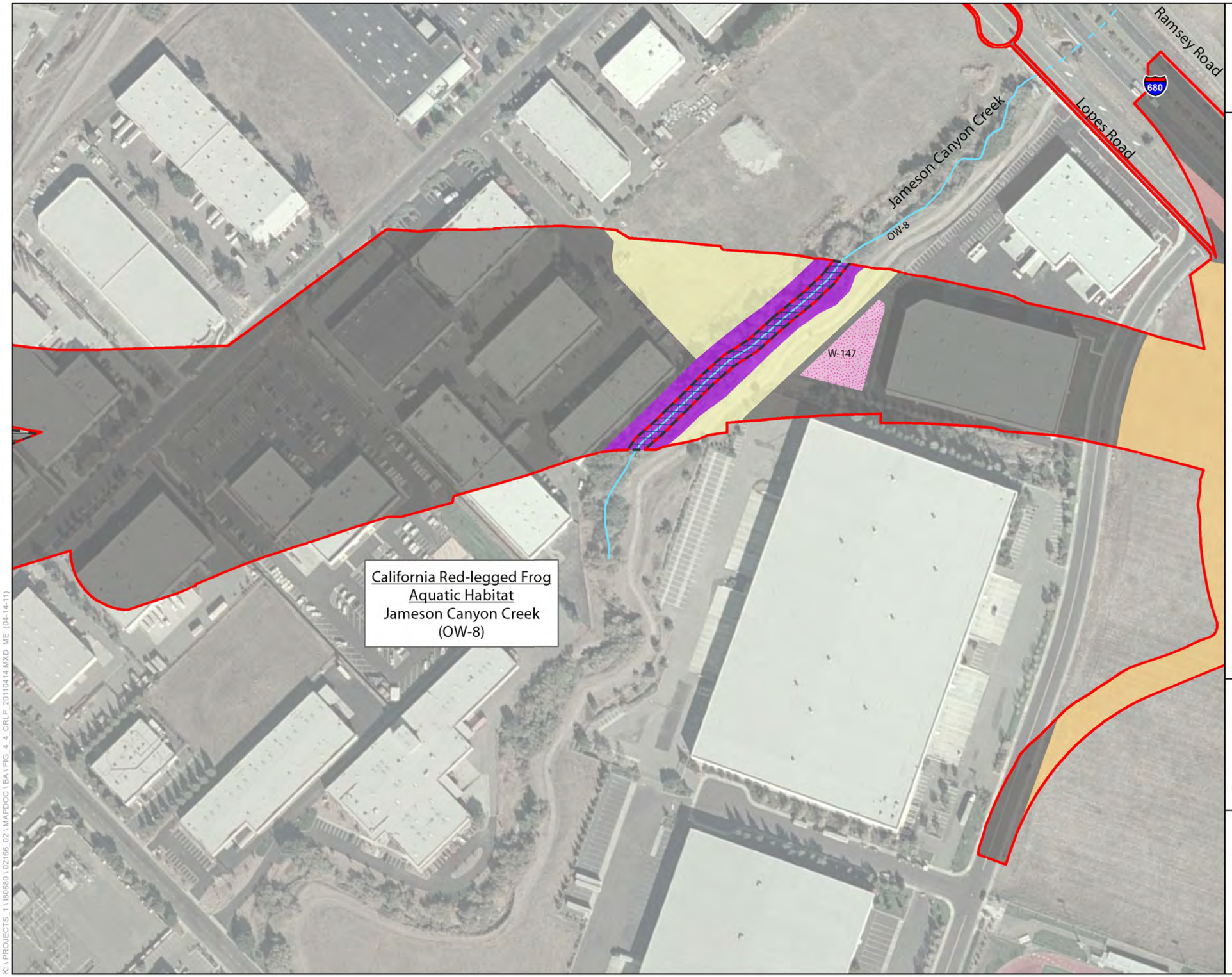
# I-80 / I-680 / SR-12 Interchange Project
# Solano County, California

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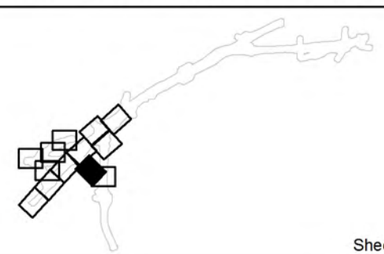

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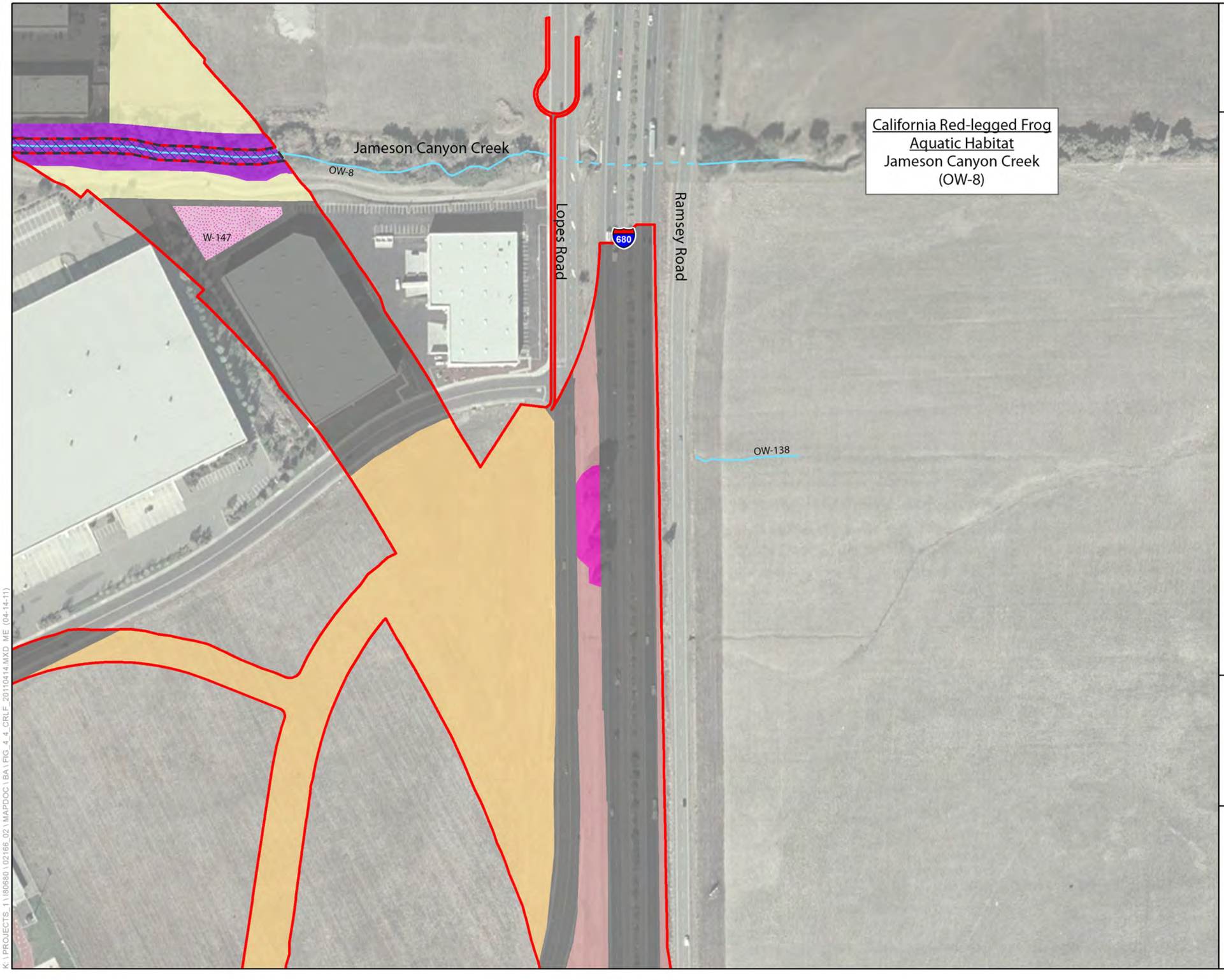


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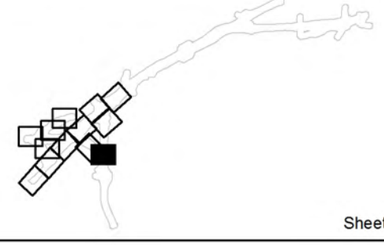



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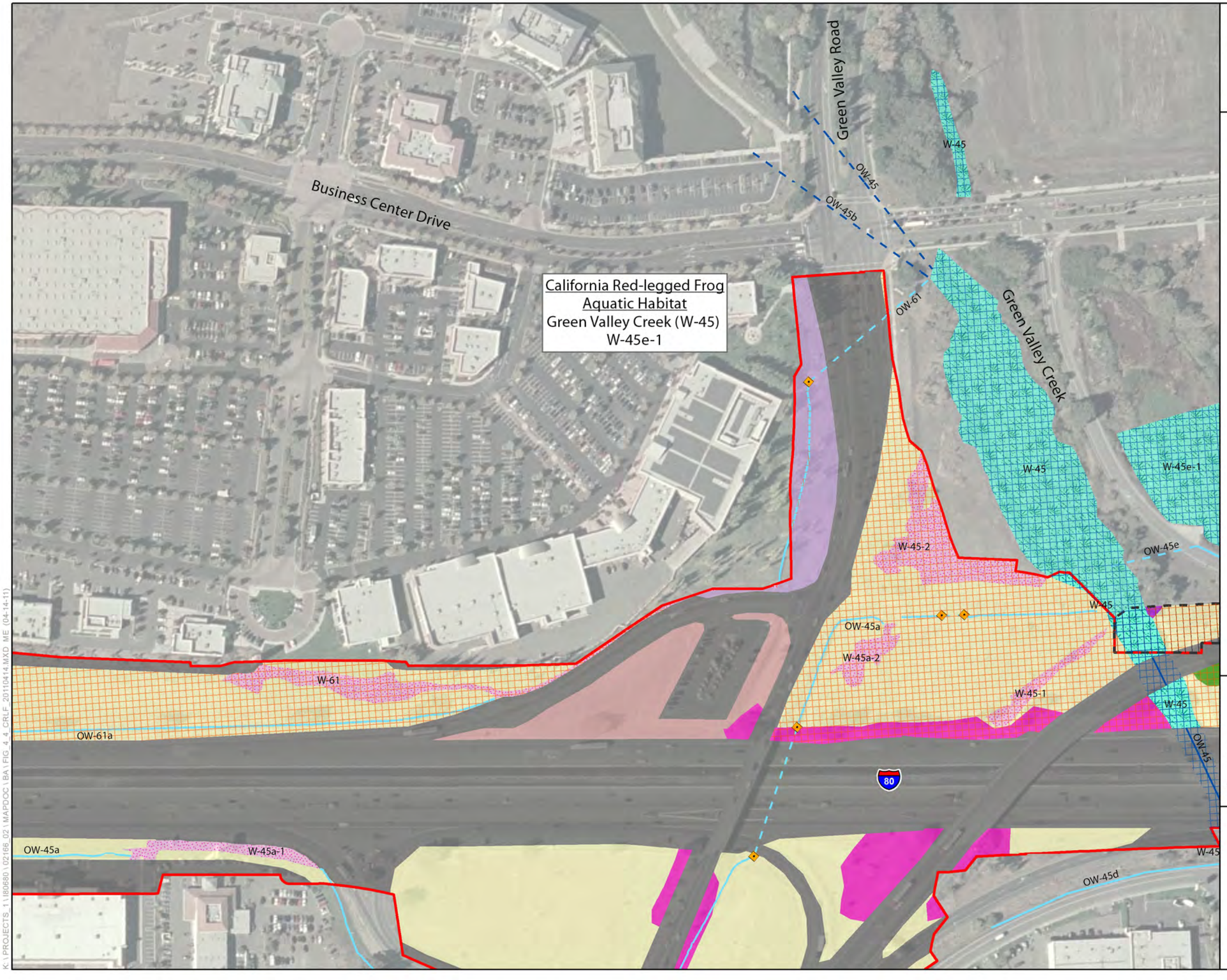


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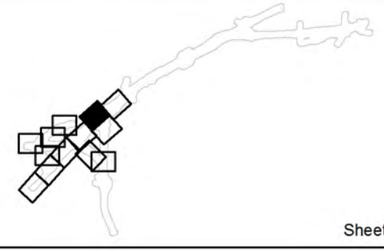



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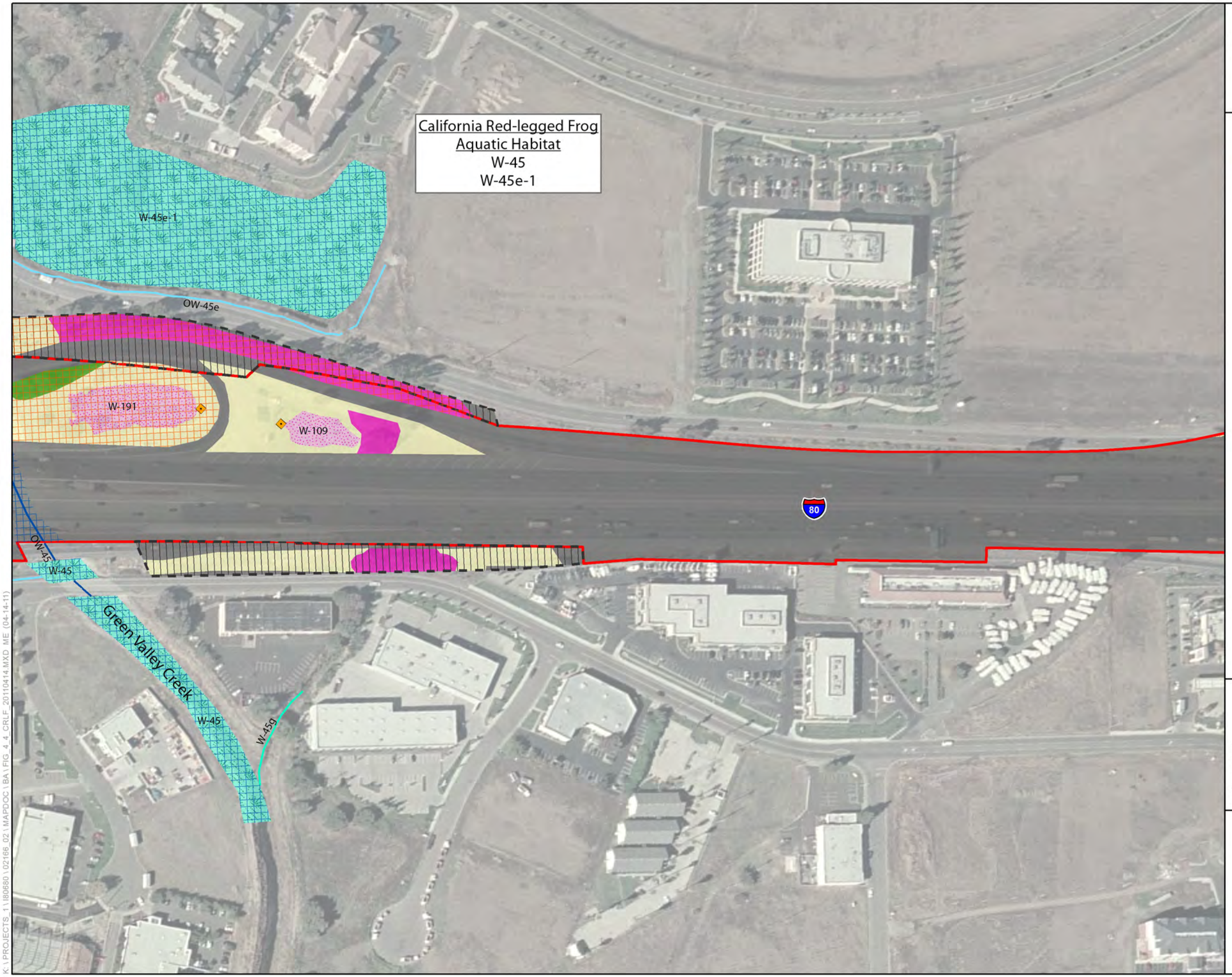


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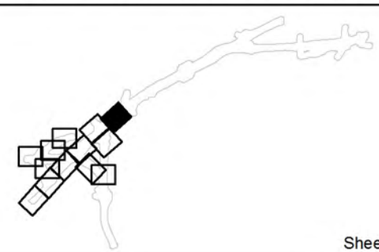



K:_PROJECTS_1\I80680\02166_02\MAPDOC\BA\FIG_4_4_CRLF_20110414.MXD ME (04-14-11)

- Jameson Canyon Creek in three locations: upstream from Red Top Road (OW-8a, Sheet 4); at I-80 (OW-8, Sheet 7); and upstream from I-680 (OW-8, Sheet 9).

Of the noted aquatic locations, the perennial marshes (W-150 and W-45e-1) and the Mangels pond provide potential breeding habitat based on the water depth and duration sufficient to support CRLF breeding. There is potential for CRLFs to occur in potential upland habitat sites within 1 mile of known breeding habitats. CRLF habitat is identified on Figure 4-4. Caltrans and STA were denied access to four parcels within the BSA on the Mangels property: APNs 01-4826-0010, 01-4826-0020, 01-4827-0010, and 01-4827-0340. These parcels contain aquatic breeding, aquatic non-breeding, upland dispersal, and aestivation habitat as documented by Monk & Associates.

The area immediately north of SR 12W, including the four parcels identified above, are within the southern edge of critical habitat Unit SOL-2, and the area near Red Top Road includes a portion of Unit SOL-3, which was designated for CRLF on March 17, 2010 (75 FR 12816). Unit SOL-1 borders I-80 near the BSA but would not be affected by the proposed project (Figures 4-3 and 4-4).

Activities that may adversely modify critical habitat are those that alter the PCEs and appreciably diminish the value of the habitat. USFWS identified the following four PCEs for CRLF.

- PCE 1: Aquatic breeding habitat that becomes inundated with winter rains and holds water for a minimum of 20 weeks.
- PCE 2: Non-breeding aquatic habitat similar to breeding habitat but may not hold water long enough for successful breeding.
- PCE 3: Upland habitat surrounding breeding and non-breeding aquatic habitat and riparian habitat up to a distance of 1 mile in most cases.
- PCE 4: Dispersal habitat within designated critical habitat units and between occupied locations within a minimum of 1 mile of each other and that allows for movement between sites.

### 4.7.2 Critical Habitat

Portions of the action area are within critical habitat Units SOL-2 and SOL-3. SOL-2 is 1,360 acres and SOL-3 is 1,861 acres, for a total combined acreage of 3,221 acres. These two units are separated by SR 12W. I-80 separates Sol-3 from SOL-1, which is just south of the action area. All four of the PCEs for CRLF are present within the BSA and occur in critical habitat Units SOL-2 and SOL-3 (Figure 4-3 and Figure 4-4, Sheets 2–6).

### 4.7.3 Avoidance and Minimization Efforts

As required by FESA, Caltrans and STA will implement reasonable and prudent measures to minimize and avoid incidental take of CRLF and potential CRLF habitat. Implementation of the general avoidance and minimization efforts described in Section 1.3.6, along with species-specific avoidance and minimization measures identified below, will minimize and reduce the potential incidental take of CRLF and potential effects on potential CRLF habitat.

**Design Features**

Caltrans and STA will provide several design features that will facilitate habitat connectivity and passage for CRLFs dispersing west from the Mangels pond over the BCDE and out into designated critical habitat. These design features are listed below.

- A large 12- by 8-foot concrete box culvert at Jameson Canyon Creek crossing of OW-8 located at I-80.
- At Green Valley Creek, the creek will be bridged and the concrete lining removed.
- A free span bridge over Jameson Canyon Creek at OW-8a, OW-8b, and the SPRR west of the Red Top Road intersection.
- An oversized culvert (60 inches in diameter) for OW-161, with a natural substrate (dirt or gravel) over which wildlife can travel. At least two large span style undercrossings along the BCDE in the vicinity of the seasonal drainage (OW-145) north of Mangels pond, and near W-187, suitable for cattle and farm vehicles to cross under the BCDE that connects the I-80/Red Top Road interchange to Business Center Drive.

- Approximately 2.5 miles of directional fencing (Figure 4-5) to guide CRLF to the undercrossing locations along the BCDE. The fencing will consist of hard plastic or a combination of permanent hardware cloth and flashing with a lip on it, or similar material and design. Directional fencing will be attached to the newly installed ROW fence on both sides of the new highway constructed between Business Center Drive and I-80 (Figure 4-5). The fence will be constructed along Business Center Drive, which is a local road off the state highway system, and its long-term maintenance will be the responsibility of STA.

**Biological Monitoring and Construction Measures**

1. USFWS-approved biologist(s) will be onsite during all activities that may result in take of a CRLF. The qualifications of the biologist(s) will be presented to USFWS for review and written approval prior to groundbreaking at the project site where the project could reasonably affect CRLF. The Resident Engineer will stop work at the request of the USFWS-approved biologist(s) if activities are identified that may result in take of a CRLF. Should the biologist(s) or Resident Engineer exercise this authority, USFWS will be notified by telephone and email within 1 working day. The USFWS contact will be the Coast-Bay Branch Chief in the Sacramento Fish and Wildlife Office at (916) 414-6600
2. The Resident Engineer will halt work immediately and contact the USFWS-approved project biologist and the USFWS in the event that a CRLF is found within the construction zone. The Resident Engineer will suspend all construction activities in the immediate construction zone until the animal leaves the site voluntarily or is removed by the biologist to a release site using USFWS-approved transportation techniques.
3. A USFWS-approved biologist will conduct environmental education training for all construction employees working on ground-disturbing activities. The program will include the following: a description of CRLF and its habitat needs, photographs of the species, an explanation of its legal status and protection under FESA, and a list of the measures that will be implemented to minimize and avoid potential effects on CRLF.
4. Project employees will be provided with written guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

5. Project-related vehicles will observe a 20 mph speed limit within construction areas, except on county roads and state and federal highways; this is particularly important at night when CRLFs are most active.
6. To the maximum extent practicable, nighttime construction will be minimized.
7. To eliminate attracting predators of CRLF, all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a day from the entire project site.
8. To avoid injury or death of CRLFs, no firearms will be allowed on the project site except for those carried by authorized security personnel or local, state, or federal law enforcement officials.
9. To prevent harassment, injury, or mortality of CRLFs or destruction of their cover sites by dogs or cats, no canine or feline pets will be permitted in the active construction area.
10. To the extent practicable, initial ground-disturbing activities will be avoided between November 1 and March 31 to avoid the period when CRLFs are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31, daily monitoring will occur for CRLF.
11. Exclusionary fencing will be placed at the edge of active construction areas (cleared by biological surveys) to restrict wildlife access from the adjacent upland and riparian habitat. The fencing will consist of taut silt fabric: 24 inches high, stacked at 10-foot intervals, with the bottom buried 6 inches below grade. Exclusion fencing will be maintained such that it is intact during rain events and 24 hours after any rain event.
12. The active construction area will be delineated with high-visibility temporary fencing at least 4 feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment outside the described project footprint. Such fencing will be inspected and maintained daily by the onsite biologist until completion of the project. The fencing will be removed from areas only after all construction equipment is removed. No project activities will occur outside the delineated project construction area.
13. If requested through the Resident Engineer or Construction Inspector before, during, or upon completion of groundbreaking and construction activities, Caltrans will ensure that USFWS

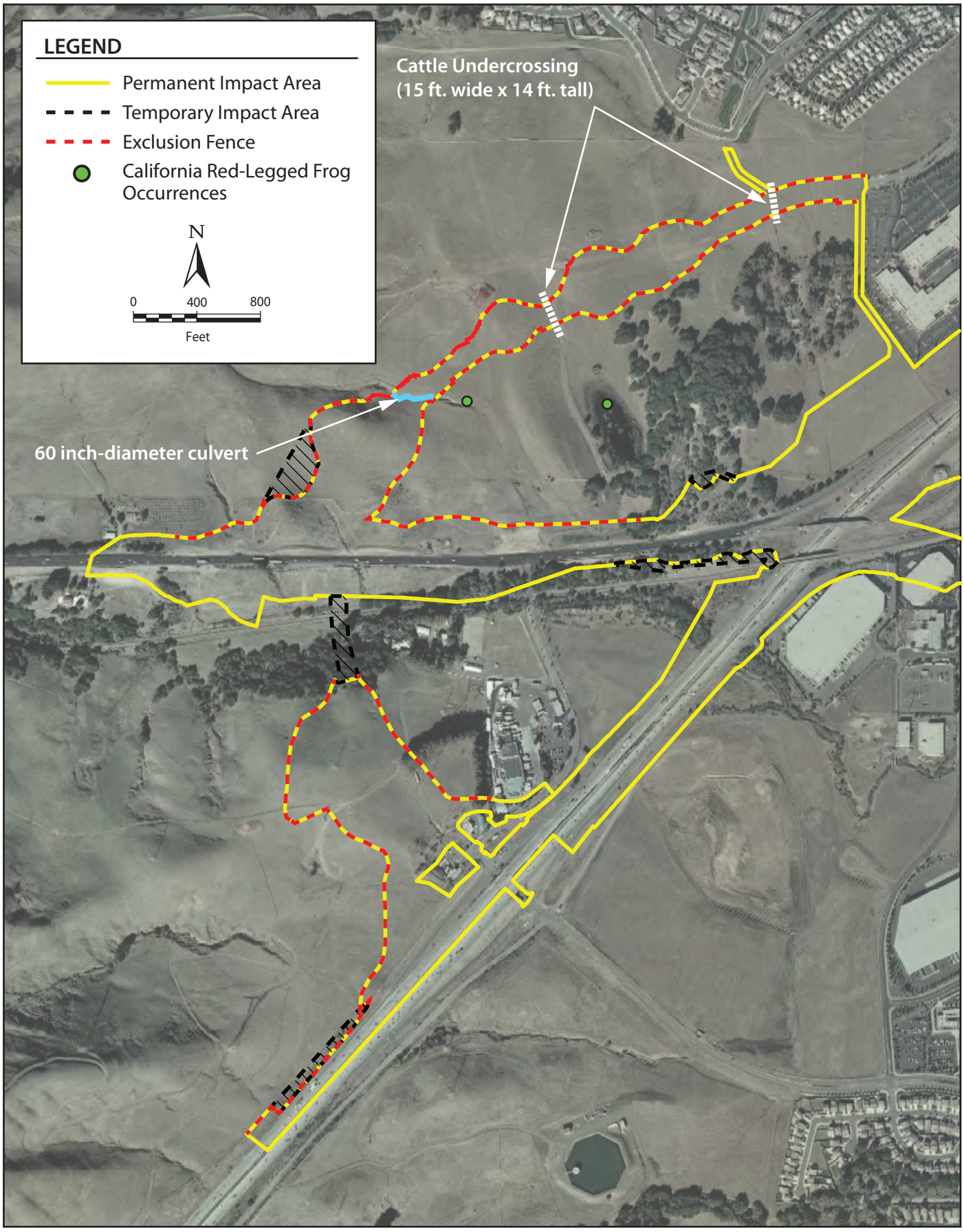


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**Figure 4-5**
**Proposed Locations for California Red-Legged Frog Permanent Exclusion Fence and Undercrossings**

and/or its designated agents can, immediately and without delay, access and inspect the project site for compliance with the proposed project description, conservation measures, and terms and conditions of the BO, and to evaluate project effects on CRLF and their habitat.

14. No more than 20 working days prior to any ground disturbance that could reasonably affect CRLF, preconstruction CRLF surveys will be conducted by a USFWS-approved biologist. These surveys will consist of walking surveys of the project limits and adjacent areas accessible to the public to determine presence of the species. The USFWS-approved biologists will investigate potential CRLF cover sites. This includes full investigation of mammal burrows. The entrances will be collapsed following investigation.

15. Any CRLFs found will be relocated outside the ESA/silt fence within the same riparian area or watershed by the approved biological monitor. If relocation of the CRLF outside the fence is not feasible (i.e., there are too many frogs observed per day), the approved biological monitor will relocate frogs to a preapproved location determined by Caltrans and USFWS. Prior to construction, Caltrans will obtain approval of the relocation protocol from USFWS in the event that CRLFs are encountered and need to be relocated away from the immediate project area (Caltrans 2007b).

16. To prevent inadvertent entrapment of CRLFs during construction, all excavated, steep-walled holes or trenches more than 2 feet deep will be covered at the close of each working day with plywood or similar material, or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped listed animal is discovered, the onsite biologist will immediately place escape ramps or other appropriate structures to allow the animal to escape, or USFWS will be contacted by telephone for guidance. USFWS will be notified of the incident by telephone and email within 1 working day.

17. Plastic monofilament netting (erosion control matting) or similar material will not be used at the project site because CRLFs may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

18. Injured CRLFs will be cared for by a licensed veterinarian or other qualified person such as the onsite biologist; dead individuals of any listed species will be preserved according to standard museum techniques and held in a secure location. USFWS will be notified within 1

working day of the discovery of death or injury to a listed species that results from project-related activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the finding of a dead or injured animal clearly indicated on a USGS 7.5-minute quadrangle and other maps at a finer scale, as requested by USFWS, and any other pertinent information. Dead individual animals will be placed in a sealed plastic bag with a piece of paper containing information on where and when the animal was found along with the name of the person who found it, the bag will be frozen in a freezer located in a secure location until instructions are received from USFWS regarding the disposition of the specimen or USFWS takes custody of the specimen. The USFWS contacts are the Division Chief of the Endangered Species Program in the Sacramento Fish and Wildlife Office at (916) 414-6600 and the Resident Agent-in-Charge of USFWS's Law Enforcement Division at (916) 414-6660.

19. Materials left onsite overnight will be inspected for CRLF. All construction pipes, culverts, or similar structures; construction equipment; or construction debris left overnight in areas that may be occupied by CRLF will be inspected by the USFWS-approved biological monitor prior to the beginning of each day's activities.
20. Use of rodenticides and herbicides will be utilized in such a manner to prevent primary or secondary poisoning of listed species and depletion of prey populations on which they depend. All uses of such compounds will observe label and other restrictions mandated by EPA, the California Department of Pesticide Regulation, and other appropriate state and federal regulations, as well as additional project-related restrictions deemed necessary by USFWS or the California Department of Fish and Game.
21. Following construction, temporarily disturbed areas will be restored to preproject conditions or enhanced to compensate for the removal of vegetation.

### 4.7.4 Project Effects

#### 4.7.4.1 Direct Effects

Direct effects, both temporary and permanent, are those that occur immediately as a result of construction activities.

The action area for CRLF is approximately 1,082 acres. Direct temporary and permanent effects on approximately 137.73 acres of potential CRLF habitat would occur as a result of the proposed Phase 1. Direct temporary effects would be associated with construction access and construction staging of materials and equipment. Direct permanent effects would be associated with grading, paving, excavating, extension and installation of cross culverts, installation of structural hardscape, and installation and relocation of utilities. Figure 4-4 depicts the areas of direct temporary and permanent effects within the action area.

Caltrans and STA anticipate that the proposed Phase 1 would have direct permanent effects on approximately 0.08 acre of potential aquatic breeding habitat, 2.78 acres of potential aquatic non-breeding habitat, and 128.51 acres of potential upland dispersal habitat within the action area. Based on the current design details, Caltrans and STA do not anticipate any direct temporary disturbance to potential CRLF aquatic breeding or non-breeding habitat. However, there would be approximately 6.36 acres of temporary disturbance of potential CRLF upland dispersal habitat within the action area.

**Table 4-5. Area of Direct Effect on Potential CRLF Habitat**

| Habitat Type | Area of Direct Effects in Acres | |
|---|---|---|
| | Permanent | Temporary |
| Potential breeding habitat | 0.08 | 0.00 |
| Potential aquatic non-breeding habitat | 2.78 | 0.00 |
| Potential upland dispersal and aestivation habitat | 128.51 | 6.36 |
| **Total potential habitat** | **131.37** | **6.36** |

Construction activities may also cause disruption to the normal behavior of CRLFs that occupy or are associated with the Mangels pond population. Breeding, foraging, dispersal, and aestivation behavior may be altered during construction activities due to the installation of temporary exclusion fencing. Construction of the BCDE may also create a barrier impeding the north and west dispersal of CRLFs from the Mangels pond. The BCDE is a local road proposed by STA and included in Phase 1 of the proposed state highway improvements. The BCDE was formerly part of STA´s North Connector Road project.

Degradation and loss of aestivation habitat is also anticipated to result from the removal of vegetative cover and collapsing of burrows. The disruption of the listed behaviors should be

temporary due to the restoration of vegetative cover, implementation of directional fencing, and installation of the oversized culvert at OW-161 and clear span undercrossings at OW-145 and OW-187 as part of the design for the BCDE.

#### 4.7.4.2 Indirect Effects

According to USFWS, indirect effects exist as "those that are caused by the proposed action and are later in time, but are still reasonably certain to occur" (50 CFR 402.02). Potential indirect effects on CRLF are degradation of water quality from the installation of additional impervious surfaces, increased vehicle-related mortality, isolation of the aquatic breeding site at the Mangels property from upland dispersal and aestivation habitat, and hydrologic modification to the water source feeding the Mangels pond and perennial marsh (OW-150). These indirect effects are discussed below.

- Construction activities associated with road construction and bridge widening in potential CRLF habitat could result in indirect effects on water quality downstream from the construction work area. Increased sedimentation could reduce the suitability of CRLF habitat downstream of the construction area by filling in pools and smothering eggs. Accidental spills of toxic fluids also could result in the subsequent take of CRLF if these materials enter the aquatic system from the construction area. Hydrocarbon and heavy metal pollutants associated with roadside runoff also have the potential to enter the aquatic system, affecting water quality and CRLF.

  The proposed Phase 1 is not expected to degrade water quality in the action area. The proposed project will adhere to the provisions of the California Regional Water Quality Control Board 401 Certification and Basin Plan to treat nonpoint source pollutants associated with the increase in impervious surface area. Permanent treatment BMPs (such as biostrips and bioswales) will be incorporated into the project, along with a SWPPP and erosion control BMPs to minimize any potential indirect effects on downstream resources from sedimentation transport or point source pollutants resulting from construction activities in the action area. Through the use of the Caltrans standard BMPs, there will be no anticipated degradation in water quality that would indirectly affect CRLF or potential CRLF habitat.

- Roads are known to affect amphibian populations through population isolation, habitat fragmentation, and vehicle mortality. Most of the effects of the proposed project on CRLF would occur through the modification of potential CRLF upland habitat adjacent to existing highways due to grade modification related to cut-and-fill limits. Caltrans and STA will revegetate these locations adjacent to the highway with the appropriate plant/seed mix to facilitate use by CRLF post construction. However, the proposed BCDE (Figure 4-4, Sheets 2–8) crosses through critical habitat Units SOL-2 and SOL-3 (Figure 4-3) and may isolate an existing CRLF breeding pond on the Mangels property from upland dispersal habitat and designated critical habitat. While all areas, except those specifically converted to local roadway use, would still be available to CRLF, the placement of the local road at this site may result in the impediment to CRLFs dispersing northwest–southeast to and from the Mangels breeding pond.

  Highways that support in excess of 26 vehicles per hour from 10 p.m. to 4 a.m. have been found to constitute barriers to the dispersal of other amphibian species (U.S. Fish and Wildlife Service 2002). Traffic counts on the new local road would likely exceed 26 vehicles per hour from 10 p.m. to 4 a.m. based on traffic studies. CRLFs are likely to disperse to potential habitat west of the Mangels pond (Figure 4-4, Sheet 5), potentially resulting in increased mortality if frogs attempt to disperse across the proposed BCDE. Construction of the new road would likely present a barrier to CRLF dispersal, with indirect effects due to increased vehicle-related mortality and habitat fragmentation.

  As a measure to minimize and avoid indirect effects and potential incidental take of CRLF, Caltrans and STA have designed the BCDE to include an oversized culvert, two large span undercrossings, and approximately 2.5 miles of directional fencing (Figure 4-5) to guide CRLFs to the undercrossing locations. These features are intended to facilitate dispersal of CRLFs under the BCDE and to minimize mortality of CRLFs attempting to disperse across the road. Because this area of Mangels property is somewhat hilly and will have large cuts and fills, additional culverts are not a practical solution.

- The proposed BCDE will require large areas of earth moving to accommodate the cut-and-fill requirements for this local road. The BCDE can be described in general terms as up-gradient from the Mangels pond. Large-scale earth movement could potentially modify the

water table and groundwater depth in this vicinity. Caltrans and STA will ensure that the water source for this CRLF breeding pond is not altered. Caltrans and STA will conduct a hydrologic analysis of the Mangels property and the surrounding watershed to confirm the Mangels pond is fed by surface runoff and that the project will not significantly affect water quality and hydrology of the pond.

STA has proposed utilizing the excess barrow material from the BCDE from Construction Package 5 as fill material for Construction Package 1. Construction Package 1 is scheduled for 2012–2014, while Construction Package 5 is scheduled for 2018–2020. There will be a period of approximately 5 years that excavated areas will be idle before construction of the roadway for BCDE actually occurs. Currently, Caltrans and STA are considering all the area within the cut-and-fill lines at the location of the BCDE as permanent effects. Consequently, the impact analysis will not change.

Implementation of the general avoidance and minimization efforts described in Section 1.3.6 and the species-specific avoidance and minimization measures for CRLF in Section 4.7.2 would avoid and minimize potential effects of soil erosion and water quality degradation on potential CRLF habitat and minimize incidental take of CRLF.

#### 4.7.4.3 Determination

With implementation of the design features and avoidance and minimization measures described above, Caltrans and STA would reduce the potential adverse effects on CRLF. Nevertheless, the proposed federal action may result in the incidental take of CRLF by harming or killing individual frogs. Based on the best available commercial and scientific data and the impact assessment for CRLF, Caltrans has determined the proposed Phase 1 is **likely to adversely affect,** but **will not jeopardize** the continued existence of CRLF.

Caltrans and STA anticipate that Construction Package 1 would temporarily affect approximately 0.34 acre and permanently affect approximately 3.50 acres of designated critical habitat that contains the PCEs. Construction Packages 3, 4, 5, and 7 would temporarily affect approximately 0.13 acre and permanently affect approximately 18.88 acres of designated critical habitat that contains the PCEs.

**Table 4-6. Area of Direct Effect on CRLF Critical Habitat**

| Critical Habitat Type | Area of Direct Effects in Acres | | | |
|---|---|---|---|---|
| | Permanent | | Temporary | |
| | SOL 2 | SOL 3 | SOL 2 | SOL 3 |
| PCE 1 Breeding | 0.01 | 0.00 | 0.00 | 0.00 |
| PCE 2 non-breeding | 0.02 | 0.00 | 0.00 | 0.00 |
| PCE 3 upland | 21.89 | 0.46 | 0.47 | 0.00 |
| PCE 4 dispersal | 0.00 | 0.00 | 0.00 | 0.00 |
| **Total Critical Habitat** | **22.38** | | **0.47** | |

Construction of the BCDE (Figure 4-3 and Figure 4-4, Sheets 4–6) may have a potential adverse affect on designated critical habitat by disrupting CRLF dispersal patterns and potentially isolating a known breeding pond in occupied critical habitat. The identified avoidance and minimization measures, which include a porous design with large undercrossings and directional fencing to direct CRLFs across the gradient, will allow access to the PCEs, reducing the potential adverse effects on designated critical habitat.

With implementation of the avoidance and minimization measures, including the specific design features described above, Caltrans and STA would ensure the proposed federal action will not appreciably diminish the value of the designated critical habitat for CRLF and rise to the level of adverse modification of the critical habitat. Consequently, Caltrans and STA have determined that the proposed federal action **may affect**, but is **not likely to adversely modify** designated CRLF critical habitat.

### 4.7.5 Compensatory Mitigation

California red-legged frogs are documented to be present within the action area. There are two known occurrences of CRLF on the Mangels property, which contains a CRLF breeding pond. There are 14 other known occurrences of CRLF within the dispersal range of the BSA from documented breeding locations near the proposed Phase 1. The action area also contains portions of two critical habitat Units—SOL 2 and SOL 3—located north and south of SR 12W. Caltrans and STA anticipate the proposed Phase 1 would have direct effects on CRLF by modifying or converting approximately 134.87 acres of upland habitat, 2.78 acres of aquatic non-breeding habitat, and 0.08 acre of aquatic breeding habitat. Of the 134.87 acres of upland habitat, it is anticipated that 6.36 acres would be temporarily affected by the proposed project.

Construction of the BCDE will create a potential barrier to the dispersal of CRLF from a breeding pond on the Mangels property to upland habitat and designated critical habitat for CRLF. Additionally, the project would modify approximately 22.85 acres of designated critical habitat. As required by FESA, Caltrans and STA have minimized direct effects on CRLF and designated critical habitat through project design features and the implementation of general avoidance and minimization measures described in Section 1.3.6 and species-specific avoidance and minimization measures in Section 4.7.2.

The potential extent of indirect effects on CRLF is the area of CRLF habitat that could be fragmented by the BCDE and thus potentially unavailable to CRLFs dispersing from the breeding pond on the Mangels property. This area of potential indirect effects has been measured as approximately 1 mile from the breeding pond and is estimated to encompass approximately 944.27 acres.

Other potential indirect effects on CRLF may occur as a result of degradation of water quality, hydrologic modification, and vehicle mortality. As required by FESA, Caltrans and STA have minimized indirect effects on CRLF through project design features that provide for dispersal and the implementation of the general and species-specific avoidance and minimization measures.

Even with the identified avoidance and minimization measures, the proposed Phase 1 would have a significant adverse effect on CRLF as defined under CEQA. The proposed Phase 1 would result in the loss of and/or reduced access to potential aquatic breeding, aquatic non-breeding, upland, and designated critical habitat for CRLF. These combined effects could potentially restrict the local range of CRLF and reduce the numbers of CRLF. Consequently, STA proposes compensatory mitigation for these impacts pursuant to CEQA.

**Compensate for Loss and Disturbance of California Red-Legged Frog Habitat**

Caltrans or STA proposes to mitigate the potential direct effects on CRLF as defined by permanent and temporary disturbance to potential CRLF aquatic breeding, aquatic non-breeding, upland, and designated critical habitat in the action area. Caltrans or STA will conserve approximately 128.51 acres at a ratio of 1:1 to compensate for permanent effects on CRLF

upland habitat and 2.86 acres at a ratio of 3:1 to compensate for permanent effects on CRLF aquatic habitat. The proposed mitigation ratio takes into account that Caltrans and STA will implement a suite of measures to minimize and avoid take of CRLF as well as the temporary loss of CRLF habitat. Caltrans or STA will also restore approximately 6.36 acres of upland dispersal habitat onsite to address the temporary effects on upland dispersal habitat.

STA will provide 137.09 acres of compensatory mitigation for the permanent effects on CRLF habitat. This would be accomplished through one or more of the following.

- Purchase of CRLF mitigation credits at an approved bank.
- Preservation of land with CRLF habitat through conservation easements.
- Acquisition and preservation of land with CRLF habitat in fee title.
- A combination of two or more of these options.

## 4.8 California Tiger Salamander

The central population of CTS was federally listed as threatened on August 4, 2004 (69 FR 47212–47248). Distinct population segments in Santa Barbara and Sonoma Counties are federally listed as endangered (U.S. Fish and Wildlife Service 2005). CTS is also listed as threatened under the California Endangered Species Act.

The species is endemic to the San Joaquin–Sacramento River valleys, bordering foothills, and coastal valleys of central California (Barry and Shaffer 1994). The species' range is from Sonoma County and the Colusa-Yolo County line south to Santa Barbara County in the Coast Ranges, and from southern Sacramento County south to Tulare County in the Central Valley (Jennings and Hayes 1994).

CTS is a lowland species restricted to grasslands and low foothill regions where its breeding habitat occurs. CTSs inhabit both aquatic and terrestrial habitats at different stages in their life cycle. Although the larval salamanders develop in vernal pools and ponds in which they were born, they are otherwise terrestrial and spend most of their lives in widely dispersed underground retreats (Trenham et al. 2001). Juveniles and adults spend the dry summer and fall months of the

year in burrows of small mammals, such as California ground squirrels and pocket gophers; they may also use leaf litter or desiccation cracks in soil as refugia (Storer 1925; Loredo and Van Duren 1996; Loredo et al. 1996; Alvarez pers. comm.).

Adults move from subterranean burrow sites to breeding pools from November through February, after warm winter and spring rains (Jennings and Hayes 1994). Breeding habitat consists of temporary ponds or pools, slower portions of streams, and some permanent waters (Stebbins 2003). Permanent aquatic sites are unlikely to be used for breeding unless they lack fish predators (Jennings and Hayes 1994). Typically, 3–6 months are needed to complete development through metamorphosis (Petranka 1998).

CTSs are known to travel large distances from breeding ponds into upland habitats. They have been observed in upland habitat approximately 0.75 mile from the nearest breeding pond (Ibis Environmental 2007). Although CTSs can travel relatively long distances, they are typically found closer to breeding ponds.

In studies at Olcott Lake and through population modeling, Trenham and Shaffer (2005) suggested a minimum protected upland area of at least 2,100 feet around a single breeding site, or approximately 328 acres. The results of this study showed increased potential for local extirpations with increasing upland loss because of reduced salamander abundance (e.g., individuals lost to the potential breeding population inhabiting lost uplands). It is also important to note that CTSs disperse in straight lines and so any barriers within the uplands surrounding potential breeding habitat can effectively eliminate the upland habitat beyond the barrier as available to the salamanders (Shaffer and Searcy 2007).

### 4.8.1 Survey Results

There are no known occurrences of CTS within the BSA or project footprint. There is one historic record approximately 1 mile northeast of the BSA on the north side of SR 12E and Suisun City (Figure 4-6). Dr. Arthur Shapiro, professor at U.C. Davis, observed CTS larvae in aquatic habitat at this location. Dr. Shapiro does not remember the year, but estimates it to have been from the late 1970s or early 1980s (Searcy pers. comm.). This sighting was not recorded in the CNDDB. Dr. Brad Shaffer and Mr. Searcy (Searcy pers. comm.) subsequently visited the site

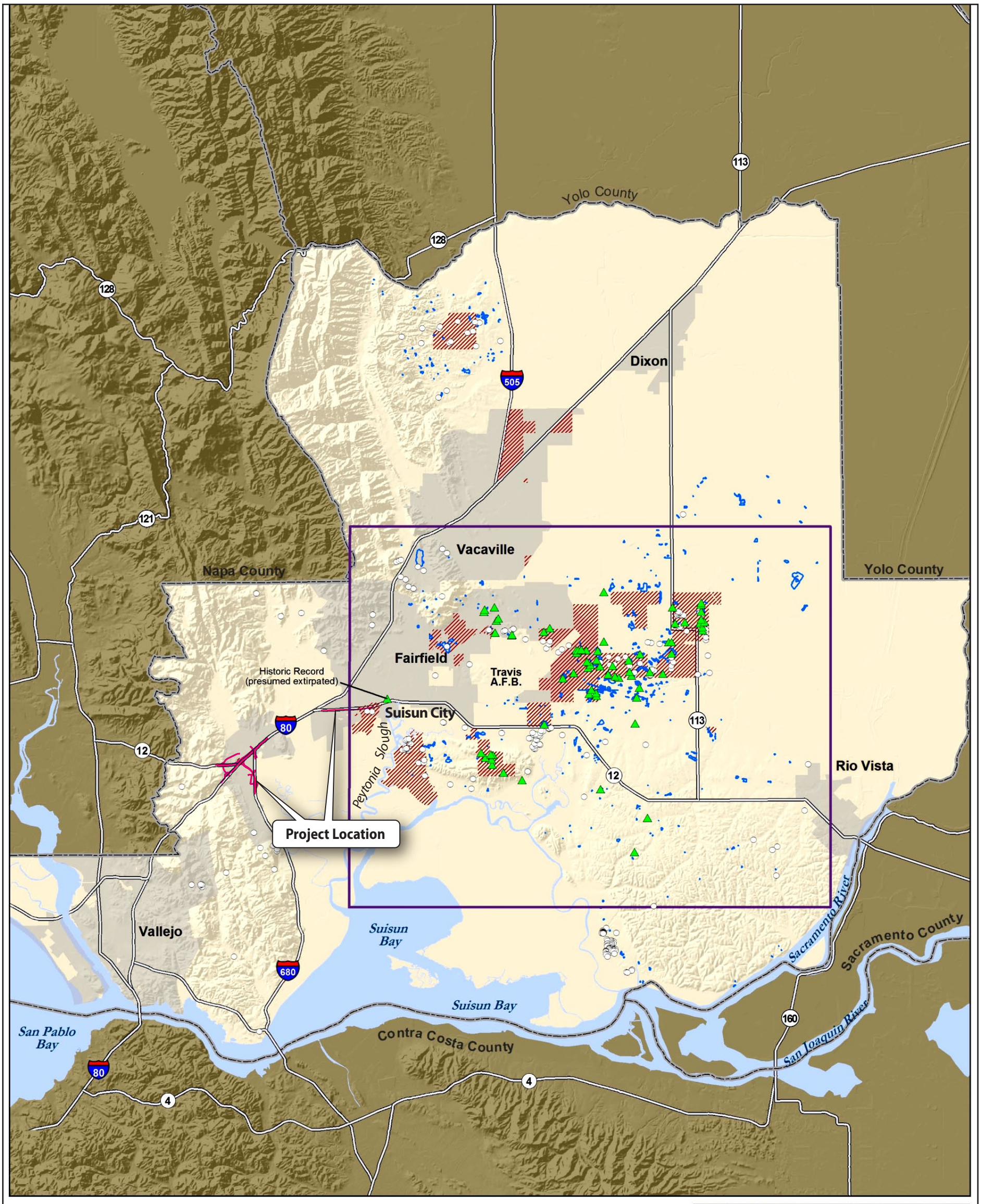


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**Figure 4-6**
**Surveyed Areas and Documented Occurrences of California Tiger Salamander**

in 2008 and believed CTS to be extirpated at this location because the breeding site is no longer extant.

The nearest known occupied habitat is approximately 5 miles southeast of the BSA where there are several records for CTS from 1999 to 2006 in the Potrero Hills (California Natural Diversity Database 2011). As reported in the Vollmar study (Vollmar Consulting 2010), the Potrero Hills area is one of four areas that represent geographically distinct concentrations of documented CTS breeding occurrences that are both sufficiently isolated to limit breeding exchange and are also separated by apparent movement barriers or restrictions that would limit regular breeding exchange. Dispersal between the BSA and the nearest occupied CTS habitat in the Potrero Hills area is completely blocked by SR 12E, Peytonia Slough, Suisun Marsh, and Suisun City (Figures 4-6 and 4-7).

There are two types of barriers that inhibit CTS from accessing the action area: (1) major barriers, which include the four-lane SR 12E, development in Suisun City and the City of Fairfield, and Suisun Marsh and Peytonia Slough; and (2) minor barriers, which include local two-lane roads and the Union and Southern Pacific Railroads (Figures 4-6 and 4-7). The major barriers are likely fairly impenetrable to CTS movement from occupied habitat to the southeast.

Prior to the expansion of SR 12E, which occurred in 1988, and before the build out of the city of Fairfield, it is possible that CTSs from the northeast (near Travis Air Force Base) had limited potential access to the action area. Prior to 1988, the two-lane highway would likely have been a minor barrier, and CTSs may have been able to cross to both sides of the highway.

The Gentry-Suisun BA (Vollmar 2006) referred to the large pool west of Pennsylvania Avenue on the Gentry property south of SR 12E as artificially created, but it did not supply a date for that creation. If the pool was created more recently than the 1988 SR 12E expansion, it would not have been available to dispersing CTS.

No protocol-level surveys for CTS have been performed for proposed Phase 1 by Caltrans or STA's consultant ICF. FESA requires a federal lead agency to use the best available commercial and scientific data. Accordingly, Caltrans and ICF have evaluated the available data from studies and surveys conducted for nearby projects including the proposed Gentry-Suisun project. The

BSA borders the north edge of the Gentry-Suisun project site (Figure 4-7). The Gentry-Suisun project site included Pennsylvania Avenue, which traverses the project site in a nearly north-south direction, and is bounded by Cordelia Road to the south, SR 12 to the north, Ledgewood Creek to the west, and the Southern Pacific Railroad to the east. The UPRR is located along the southern border of the eastern portion of the project site and bisects the southern tip of the western portion of the project site (Figure 4-7).

In 2000, prior to the October 2003 established USFWS guidelines for CTS protocol surveys, Brent Helms (May Consulting Services) performed dip-net surveys for CTS in the vernal pools south of the BSA adjacent to SR 12E as part of the Gentry-Suisun project BA (Vollmar 2006). He found no adult or larval CTSs. Dip-net surveys included checking for larvae and egg masses. Surveys were conducted during the rainy period when breeding CTSs are most likely to be observed migrating to breeding sites; survey results were negative. Potential breeding and upland habitat with multiple burrows were identified in the Gentry-Suisun project area, but no occurrences of CTS were documented. The Gentry-Suisun project was never constructed

On November 18, 2010, a technical assistance field meeting was held with USFWS biologists John Cleckler and Chris Nagano, Caltrans biologist Ahmad Hashemi, and ICF biologist Stephanie Myers. During this meeting, Mr. Cleckler and Mr. Nagano stated that the seasonal wetlands/vernal pools on the east side of Pennsylvania Avenue would be too saline for CTS breeding, while the large vernal pool west of Pennsylvania Avenue and within 400 feet of the BSA could provide potential breeding habitat (Figure 4-7). No evidence or data that the pool was actually occupied by CTS or actually used for breeding was provided, simply the anecdotal observations from Pennsylvania Avenue. This is the same pool that Vollmar identified as artificial and surveyed with negative results in 2000 for the Gentry-Suisun project (Vollmar 2006). ICF identified additional seasonal wetlands and drainages in the area that CTS could potentially use during dispersal periods, but these sites do not provide potential breeding habitat due to the short duration of ponding.

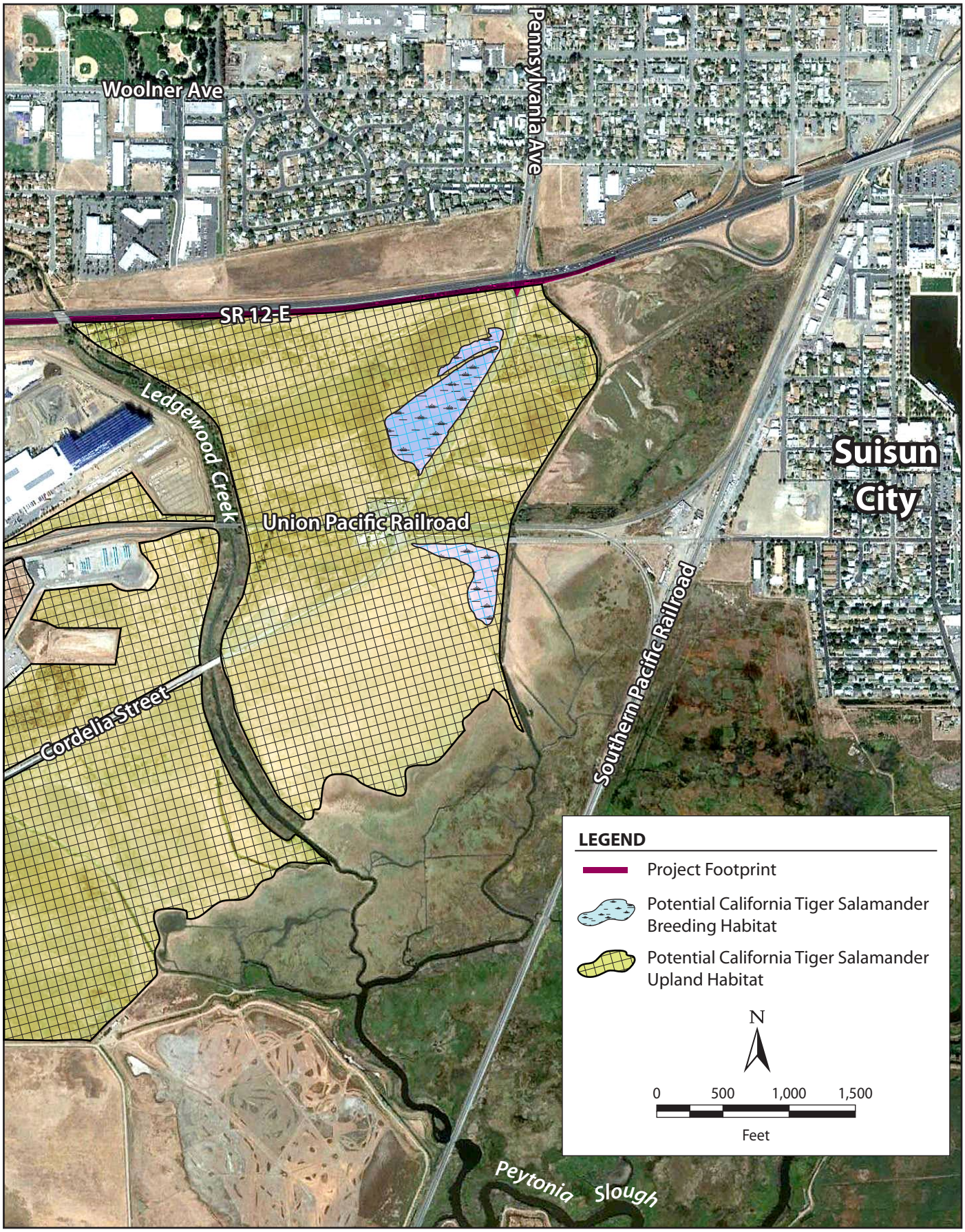


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**Figure 4-7**
**Potential California Tiger Salamander Breeding and Upland Habitat**

### 4.8.2 Critical Habitat

Designated critical habitat for CTS does not occur within the BSA. Critical habitat was finalized for the central population of CTS on August 23, 2005 (70 FR 49380-49458). USFWS divided the current range of the central population into four regions: (1) Central Valley, (2) Southern San Joaquin Valley, (3) East Bay, and (4) Central Coast. The Central Valley Geographic Region critical habitat Unit 2 is the nearest critical habitat, approximately 12 miles east of the action area.

### 4.8.3 Avoidance and Minimization Measures

As required by FESA, Caltrans and STA will implement measures to minimize and avoid incidental take of CTS and effects to potential CTS habitat. Implementation of the general avoidance and minimization measures described in Section 1.3.6, along with the species-specific measures for CTS identified below, will avoid the potential take of CTS and minimize effects to potential CTS habitat. Measures also include those required for compliance with CWA Sections 401— Water Quality and Stormwater Treatment; Section 402—Construction BMPs; and Section 404—Mitigation for Impacts to Wetlands and Waters. Additionally, exotics and invasive species control is being proposed pursuant to Executive Order 13112 (National Archives and Records Administration 1999).

There are no known occurrences of federally listed CTS within the BSA or the project footprint. Measures will be taken to avoid and minimize effects on potential CTS upland and seasonal wetland habitat. Caltrans or STA will survey the seasonal wetland / pools south of the BSA located between SR 12E, Pennsylvania Avenue, Ledgewood Creek, and the SPRR rail line for CTS prior to construction. Should these surveys find occurrences of CTS within the action area, Caltrans and STA will reinitiate formal Section 7 consultation with USFWS. As appropriate, Caltrans would work with USFWS to develop additional measures to ensure the proposed Phase 1 would minimize and avoid direct and indirect effects on CTS and potential CTS habitat.

Species-specific avoidance and minimization efforts are listed below.

- A USFWS-approved biologist will develop and conduct environmental education training for construction employees working on ground-disturbing activities. The program will include

the following: a description of CTS and its habitat needs, photographs of the species, an explanation of its legal status and protection under FESA, and a list of the measures that will be implemented to minimize and avoid potential effects on CTS and its potential habitat.

- A low retaining wall system will be installed between Ledgewood Creek and Pennsylvania Avenue to minimize and reduce the southern expansion of the roadway. Temporary construction access will be minimized by the construction of the retaining wall structure.
- A high-visibility ESA/exclusion fencing will be installed to protect potential CTS habitat adjacent to the defined project footprint. The ESA/exclusion fencing will be shown on the final construction plans.
- All work will be performed in accordance with a SWPPP. BMPs will be implemented and may include the use of silt fences, sandbags, detention basins, and other means as appropriate to prevent sedimentation and degradation of water quality down-gradient from the proposed project.
- To the maximum extent practicable, affected potential CTS upland habitat will be restored to preconstruction conditions. Following construction, affected upland areas will be replanted with the appropriate plant palette comprised of native grasses, forbs, and small shrubs.

### 4.8.4 Project Effects

#### 4.8.4.1 Direct Effects

Construction Package 4 would not result in the direct take of individual CTSs as they are not known to be present in the BSA or project footprint and there are significant barriers to their dispersal into the BSA or project footprint from areas of known occurrences. Construction Package 4 would not affect potential CTS aquatic habitat, but would directly affect approximately 0.76 acre of potential upland habitat for CTS through excavation and road construction. No other portion of the proposed Phase 1 would affect CTS.

#### 4.8.4.2 Indirect Effects

Indirect effects on potential CTS habitat that could result from Construction Package 4 include altered hydrology, soil compaction, and degradation of water quality from increased sediment

loading and point source pollutants. Proper design and installation of the grading and hydrologic design will ensure that velocity and runoff volumes are maintained in the current condition. Installation of bio-swales and bio-filtration systems included in the project description as standard water quality BMPs will minimize and avoid potential indirect effects on potential CTS habitat.

#### 4.8.4.3 Determination

While potential habitat for CTS occurs within the BSA (associated with Phase 1, Construction Package 4), particularly in the eastern portion near SR 12E and Pennsylvania Avenue, recent surveys conducted for other projects have found no CTS larvae or adults and there are significant barriers to dispersal from the known occurrences to the BSA and project footprint. Consequently, it is highly unlikely that CTS occurs in the action area. With the implementation of the aforementioned reasonable and prudent measures to minimize and avoid direct and indirect effects on potential CTS habitat, effects are expected to be discountable and insignificant.

Moreover, there is no reasonable certainty that the potential minor modifications to potential CTS upland and aestivation habitat would actually result in take of CTS. Caltrans and STA are bound to consider the decision of the 9$^{th}$ Circuit Court of Appeals in the *Arizona Cattle Growers' Association vs. U.S. Fish and Wildlife*, which elaborated on when habitat modification constitutes harm. In this decision, the Court noted that habitat modification or degradation alone is not considered "taking" pursuant to section 9 of FESA. The modification or degradation must be significant, must significantly impair essential behavioral patterns, and must result in actual injury to a protected species. In this case, the modification of unoccupied potential CTS upland and aestivation habitat does not rise to the level of take under FESA Section 9.Therefore, based on the best available commercial and scientific data and the impact assessment for CTS, Caltrans has determined the proposed Phase 1 **may affect,** but is **not likely to adversely affect** CTS.

### 4.8.5 Compensatory Mitigation

Caltrans and STA do not propose any compensatory mitigation for the discountable effects on potential CTS upland and aestivation habitat. The design features, general avoidance and

minimization measures outlined in Section 1.3.6, and the species-specific measures for CTS outlined in Section 4.8.3 will minimize and avoid potential direct and indirect effects on CTS.

## 4.9 Cumulative Effects

Cumulative effects are those caused by future state or private activities that are reasonably certain to occur within the area of the federal action subject to consultation (50 CFR 402.02). This definition applies only to analysis under FESA Section 7, and should not be confused with the broader use of this term in the NEPA and CEQA process.

There are 10 projects in the vicinity of the Phase 1 action area. Seven of these local projects are in previously developed areas with low or no potential to affect listed species, and three are located on Business Center Drive just east of Green Valley Creek. This is an area adjacent to VELB and potential CRLF habitat (Figure 4-4, Sheet 17). The three identified projects are Green Valley Corporation Park Professional Building III, Green Valley Corporation Park Professional Building IV, and Northbay Health Care Corporate Headquarters. These proposed developments are adjacent to the proposed Phase 1 project but are separate and distinct. In addition, these projects have completed the environmental process and have already mitigated potential effects on VELB and CRLF.

Based on the above, there will be no anticipated cumulative effects on federal listed species due to future state or private activities that are reasonably certain to occur within the vicinity of the proposed federal action as described above.

# Chapter 5 Conclusions and Determination

## 5.1 Conclusions

Many surveys have been conducted throughout the BSA during 2000, 2001, 2002, 2004, 2005, 2009, and 2010. However, from 2004 to date, ROW access has been restricted on what is referred to as the Mangels property north of SR 12W. The inaccessible parcels are 01-4826-0010, 01-4826-0020, 01-4827-0010, and 01-4827-0340). One additional parcel east of I-680 (APN 00-4605-0180) characterized by cultivated agriculture land was also inaccessible during the ICF surveys. Potential habitat for several federally listed plant species described in Chapter 4 could occur in areas surveyed in 2004 within the proposed project footprint on SR 12W and SR 12E. Phase 1 Construction Packages will be designed and constructed over an 8-year period, leaving a time gap in survey data of up to 10 years. Caltrans and STA have proposed preconstruction surveys within the various portions of the BSA that provide potential suitable habitat to ensure that all areas have been thoroughly evaluated for the presence / absence of all listed species. These preconstruction surveys will be conducted in accordance with all state and federal protocols to the maximum extent practicable. Should surveys result in a new or unanticipated positive occurrence, Caltrans and STA will reinitiate Section 7 consultation.

## 5.2 Determinations

Based on the best available commercial and scientific data, the proposed project would have the effects described in the following sections.

### 5.2.1 Contra Costa Goldfields

There will be no direct temporary or permanent effects on CCG from project construction. Potential indirect effects on CCG and its habitat associated with hydrologic alteration, soil compaction, point source pollutants and dust would be minimized through construction of the retaining wall described in Chapter 4 and implementation of avoidance and minimization measures, including a proposed work window restriction, described in Chapter 4. Through implementation of these measures the proposed project would not result in a detectable adverse

change to habitat or harm to CCG. Therefore, the proposed project **may affect** but **is not likely to adversely affect** Contra Costa goldfields.

### 5.2.2 Contra Costa Goldfields Critical Habitat

Package 4 would result in the loss of a minor amount (approximately 0.52%) of critical habitat Unit 5B—approximately 3.83 acres of non-PCE habitats. Implementation of the avoidance and minimization measures described in Chapter 4, Section 4.2.3 would prevent direct and indirect effects on critical habitat. The project would not result in the loss of PCEs for CCG habitat, nor would it have direct or indirect effects that would appreciably diminish the value of critical habitat for the survival and recovery of CCG. Therefore, the proposed project **may affect,** but **will not adversely modify** designated CCG critical habitat.

### 5.2.3 Showy Indian Clover

There would be no effects from Phase 1, Construction Packages 1–7, on showy Indian clover. The presence of showy Indian clover is highly unlikely because the species was not found onsite or in adjacent areas in surveys for the North Connector project or the Jameson Canyon project or in surveys conducted on accessible parcels for the proposed Phase 1. The nearest known historic occurrence, last seen in 1952, is 5 miles from the BSA, and the nearest known extant occurrence is approximately 45 miles from the BSA. The project footprint and surrounding BSA will be surveyed again prior to project construction in accordance with the USFWS protocol (U.S. Fish and Wildlife Service 1996; Cypher 2002). Using the best available commercial and scientific data, Caltrans has determined that the Phase 1 project would have **no effect** on showy Indian clover.

### 5.2.4 Callippe Silverspot Butterfly

While suitable habitat does exist within the BSA, there have been no documented occurrences of callippe silverspot butterfly within the BSA. The nearest documented occurrence is 1 mile from the BSA, identified in 1993 by Richard Arnold. I-80 and SR12W have been described as substantial barriers by USFWS in the 5-year review (U.S. Fish and Wildlife Service 2009) and in

the draft HCP (LSA 2009). Both highways separate the 1993 occurrence from Construction Package 1. There are conflicting opinions as to the barrier effect caused by multi-lane highways, development, and tree (windrow) barriers. USFWS in its 5-year review and the LSA analysis for the Solano County HCP suggest that these features do create significant barriers to dispersing callippe silverspot butterflies. On the other hand, entomologist Richard Arnold has unpublished information and first-hand observations suggesting that the barriers may be more porous and "may act more like a filter rather than a major or absolute barricade to dispersal of the butterfly" than considered in various publications. The conclusion "may affect, not likely to adversely affect" is appropriate when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Caltrans and STA have determined that the proposed federal action **may affect,** but is **not likely to adversely affect** callippe silverspot butterfly.

Should preconstruction surveys result in the discovery of callippe silverspot butterflies within the BSA and project footprint , or should other information regarding the callippe silverspot become available prior to construction, Caltrans and STA will reinitiate consultation with USFWS and, if necessary, secure an incidental take statement pursuant to Section 9.

### 5.2.5 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

While suitable habitat for vernal pool fairy shrimp and vernal pool tadpole shrimp is present within the BSA, recent surveys conducted within the BSA for the North Connector, Jameson Canyon, and Gentry-Suisun projects have found no branchiopods or branchiopod cysts. The likelihood that either vernal pool fairy shrimp or vernal pool tadpole shrimp may occur within the action area is low. With implementation of the reasonable and prudent measures to minimize and avoid effects on potential vernal pool fairy shrimp and vernal pool tadpole shrimp habitat and individuals, effects would be discountable and insignificant. Accordingly, the proposed Phase I project **may affect,** but is **not likely to adversely affect** vernal pool fairy shrimp and vernal pool tadpole shrimp. Should preconstruction wet- and dry-season protocol-level surveys result in determining presence of either species within the action area, Caltrans and STA will reinitiate formal Section 7consultation with USFWS.

### 5.2.6 Valley Elderberry Longhorn Beetle

Construction Package 1 would directly affect 10 valley elderberry shrubs through removal or transplantation. Construction Package 3 would indirectly affect two elderberry shrubs by entailing construction activities within the 100-foot protective buffer. There would be no effects on three plants within the BSA but outside the 100-foot buffer area near Green Valley Creek. With implementation of the avoidance and minimization measures described in Sections 1.3.6 and 4.6.5, adverse effects on VELB will be minimized and reduced. Based on the presence of 12 elderberry shrubs within the project footprint and the 100-foot buffer inside the BSA, Phase 1, Construction Package 1 and 3 **is likely to adversely affect** VELB, but **will not jeopardize** the continued existence of the species.

### 5.2.7 California Red-Legged Frog

The action area is it pertains to CRLF is approximately 1,082 acres. Direct temporary and permanent effects on approximately 137.73 acres of suitable CRLF habitat would occur as a result of the proposed Phase I. Direct temporary effects would be associated with construction access and construction staging of materials and equipment. Direct permanent effects would be associated with grading, paving, excavating, extension and installation of cross culverts, installation of structural hardscape, and installation and relocation of utilities.

Caltrans and STA anticipate that the proposed Phase I project would have direct permanent effects on approximately 0.08 acre of suitable aquatic breeding habitat, 2.78 acres of suitable aquatic non-breeding habitat, and 128.51 acres of suitable upland dispersal habitat within the action area. Based on the current level of design detail, Caltrans and STA do not anticipate any direct temporary disturbance to suitable CRLF aquatic breeding or non-breeding habitat. However, there would be approximately 6.36 acres of temporary disturbance to suitable CRLF upland dispersal habitat within the action area. Potential indirect effects on CRLF are degradation of water quality from the installation of additional impervious surfaces, increased vehicle-related mortality, isolation of the aquatic breeding site at the Mangels property from upland dispersal and aestivation habitat, and hydrologic modification to the water source feeding the Mangels pond and perennial marsh (OW-150).

With implementation of the design features and avoidance and minimization measures described above, Caltrans and STA would reduce the potential adverse effects on CRLF. Nevertheless, the proposed federal action may result in the incidental take of CRLF by harming or killing individual frogs. Consequently, Caltrans and STA have determined the proposed project **is likely to adversely affect**, but **will not jeopardize** the continued existence of CRLF.

### 5.2.8 California Red-Legged Frog Critical Habitat

Portions of the action area are within critical habitat Units SOL-2 and SOL-3. SOL-2 is 1,360 acres and SOL-3 is 1,861 acres, for a total combined acreage of 3,221 acres. These two units are separated by SR 12W. I-80 separates Sol-3 from SOL-1, which is just south of the action area. All four of the PCEs for CRLF are present within the BSA and occur in critical habitat Units SOL-2 and SOL-3.

Caltrans and STA anticipate that Construction Package 1 would temporarily affect approximately 0.34 acre and permanently affect approximately 3.50 acres of designated critical habitat that contains the PCEs. Construction Packages 3, 4, 5, and 7 would temporarily affect approximately 0.13 acre and permanently affect approximately 18.88 acres of designated critical habitat that contains the PCEs.

The combined permanent and temporary effects (22.85 acres) on designated CRLF critical habitat represents less than 1% of the total combined (3,221 acres) for SOL-2 and SOL-3. There are approximately 65 acres between I-80, SR-12W, and the BCDE that would be potentially isolated by constructing the BCDE. This area includes breeding and non-breeding aquatic and upland CRLF habitat.

Construction of the BCDE may have a potential adverse affect on designated critical habitat by affecting CRLF dispersal and potentially isolating a known breeding pond in occupied critical habitat. The identified avoidance and minimization measures, which include a porous design with large undercrossings and directional fencing to direct CRLFs across the gradient, will allow access to the PCEs, reducing the potential adverse effects on designated critical habitat.

With implementation of the avoidance and minimization measures, including the specific design features described above, Caltrans and STA would ensure that the proposed federal action will not appreciably diminish the value of the designated critical habitat for CRLF and rise to the level of adverse modification of the critical habitat. Consequently, Caltrans and STA have determined that the proposed federal action **may affect,** but **will not adversely modify** designated CRLF critical habitat.

### 5.2.9 California Tiger Salamander

While potential habitat for CTS occurs within the BSA (associated with Phase 1, Construction Package 4), particularly in the eastern portion near SR 12E and Pennsylvania Avenue, recent surveys conducted for other projects have found no CTS larvae or adults. The there is little likelihood that CTS occurs in the action area. With the implementation of the aforementioned reasonable and prudent measures to minimize and avoid direct and indirect effects on potential CTS habitat, effects are expected to be discountable and insignificant. Moreover, there is no reasonable certainty that the potential minor modifications to potential CTS upland and aestivation habitat would actually result in take of CTS. Therefore, Caltrans and STA have determined the proposed Phase I project, Construction Package 4 **may affect,** but is **not likely to adversely affect** CTS.

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## 6.2 Personal Communications

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Arnold, Dick (Richard A.) Ph.D., Entomological Consulting Services, Ltd. Email February 9, 2011, bugdctr@comcast.net

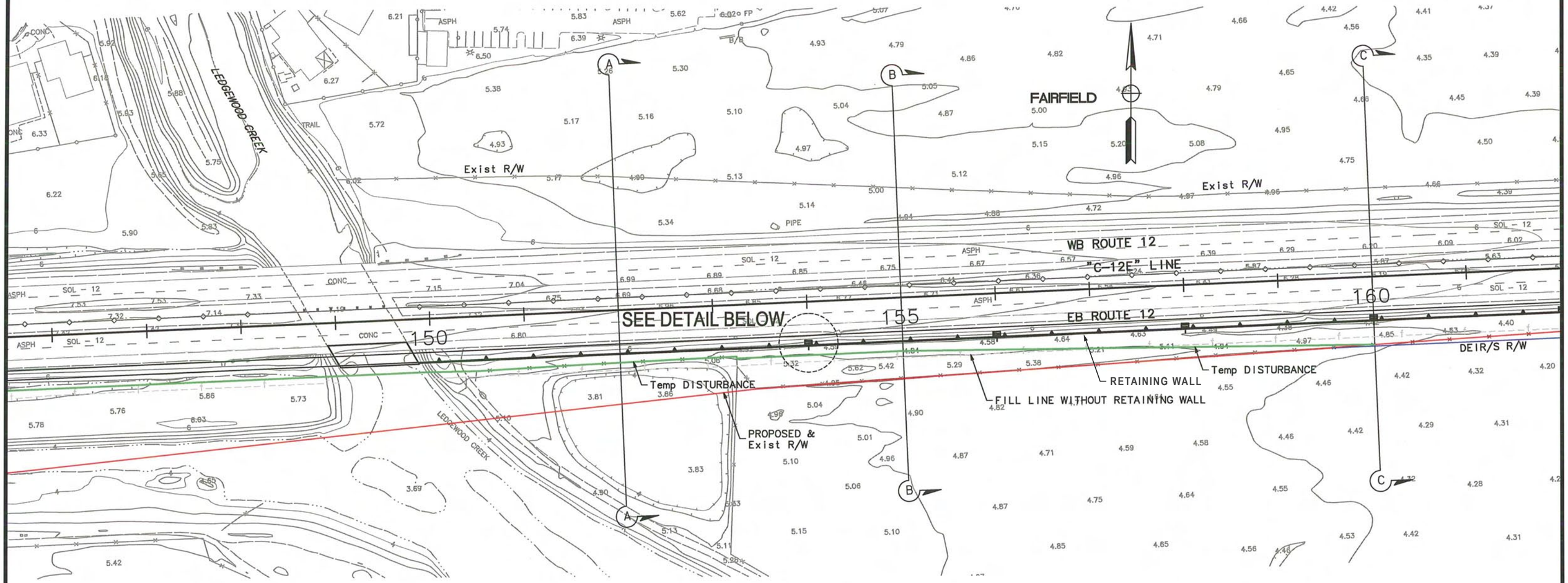
Cleckler, John. Wildlife Biologist. Coast Bay Branch, U.S. Fish and Wildlife Service Sacramento Fish and Wildlife Office. Sacramento, California. Numerous meetings, telephone conversations, and emails November 2009 through February 2011.

Escaron, Melissa. Staff Environmental Scientist. California Department of Fish and Game. June 30, 2010 email message; November 9, 2010 email message and telephone conversation. mescaron@dfg.ca.gov.

Searcy, Christopher. Graduate Student at U.C. Davis working with California tiger salamanders in Dr. Brad Shaffer's lab. February 20 and 22, 2011—email.

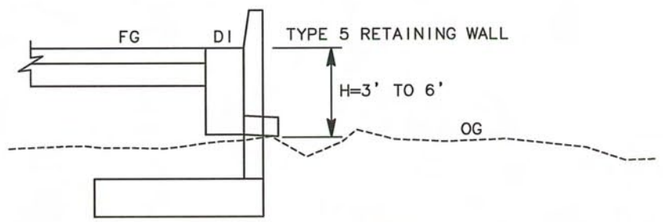
Wickham, Sue. Project Coordinator. Solano Land Trust. March 12, 2008—Telephone conversation with Lisa Webber regarding potential for project mitigation planting on Solano Land Trust property; October 13, 2008—email; July, 19, 2010—field meeting; November.

# Appendix A State Route 12 East Retaining Wall Cross-Sections




**LEGEND**

- PROPOSED & Exist R/W
- DEIR/S R/W
- LIMITS OF TEMPORARY DISTURBANCE




TYPICAL DRAIN DETAIL AT 200' SPACING

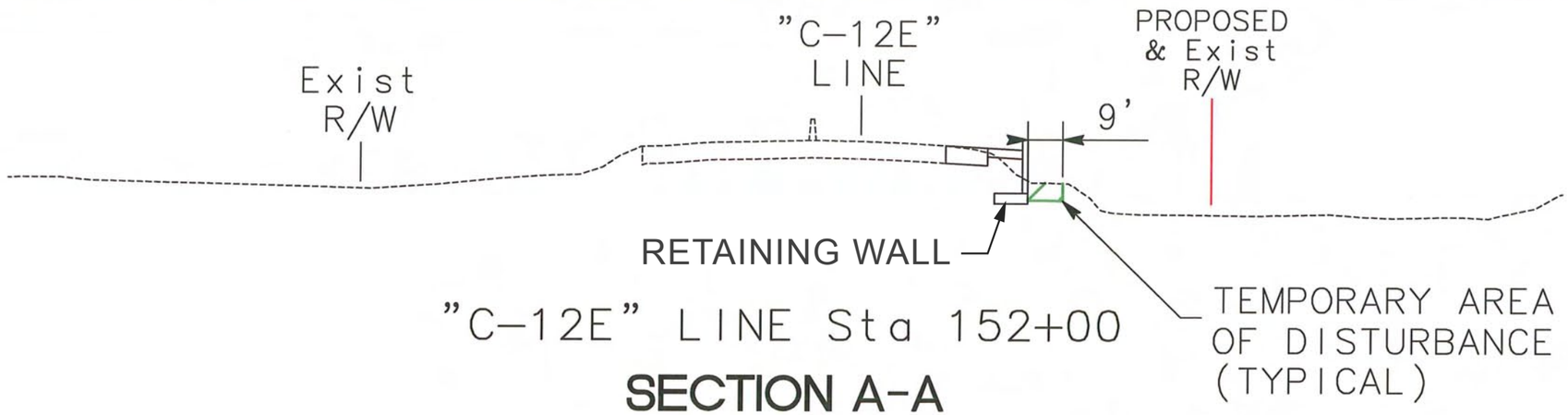
TOPOGRAPHY SHOWN IS BEFORE MEDIAN BARRIER WAS INSTALLED
PLANIMETRIC ELEVATIONS ARE IN METERS

| | |
|---|---|
| SCALE: | 1" = 50' • 22x34 |
| EXHIBIT DATE: | NOVEMBER 2010 |
| JOB: | 81-52008-121 |
| SHEET #: | 1 OF 6 |

# ROUTE 12 EAST - OPT 1 CROSS SECTIONS (C-1)

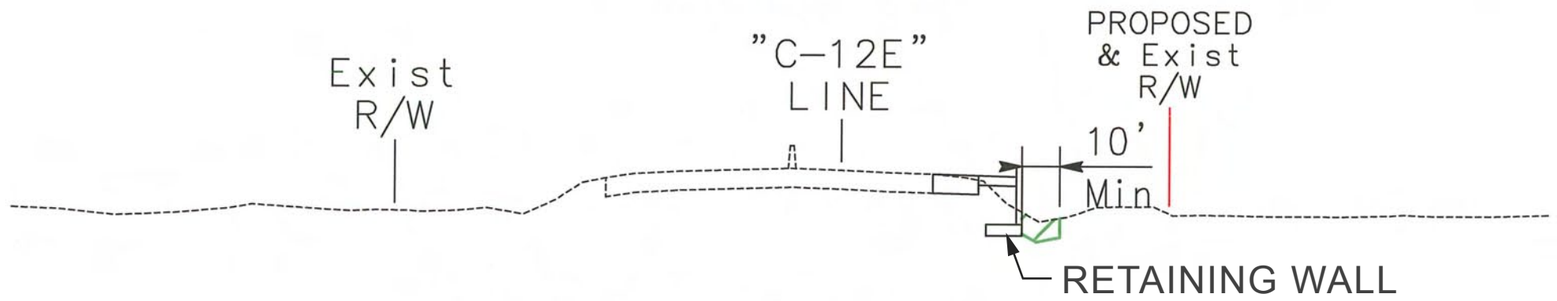
## I-80 / I-680 / SR-12 INTERCHANGE PROJECT

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services
1243 ALPINE ROAD, SUITE 222
WALNUT CREEK, CA 94596



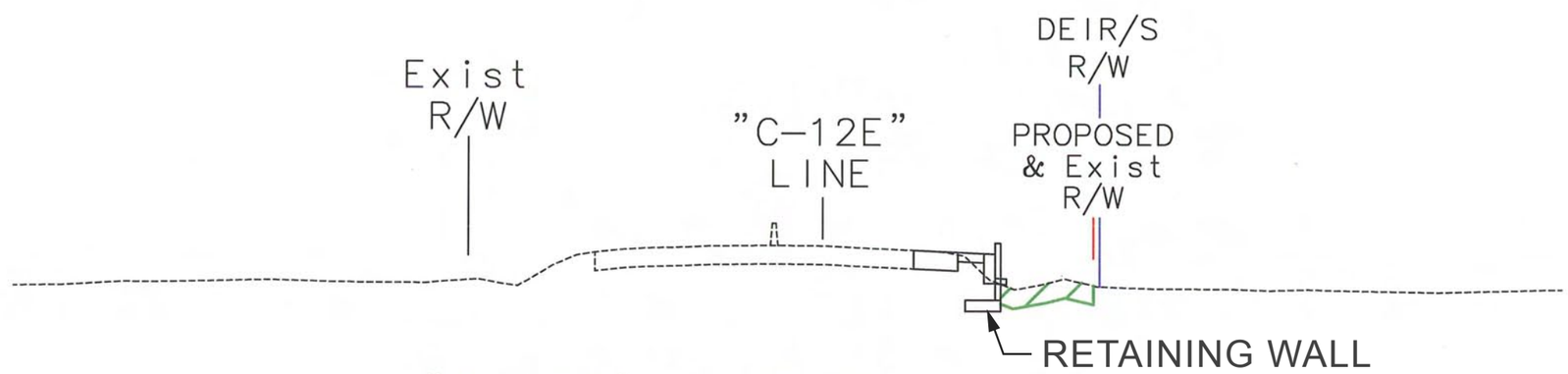

"C–12E" LINE Sta 152+00

## SECTION A-A




"C–12E" LINE Sta 155+00

## SECTION B-B




"C–12E" LINE Sta 160+00

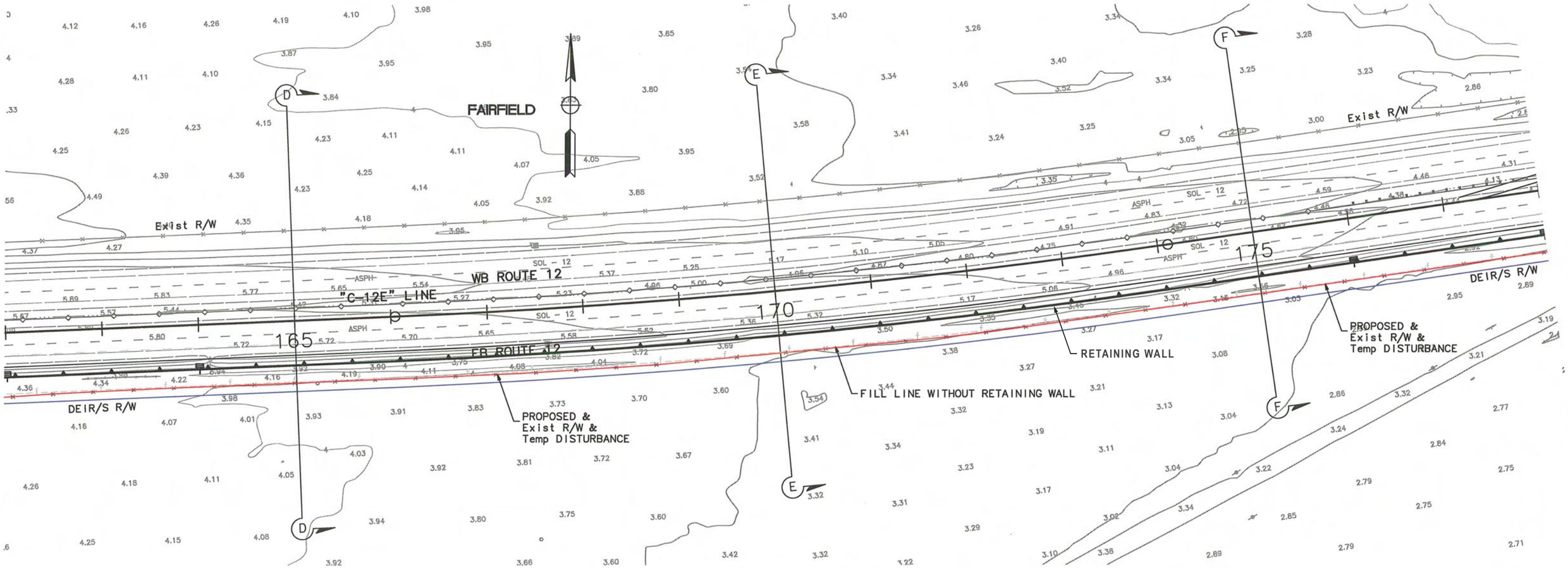
## SECTION C-C

| | |
|---|---|
| SCALE: | H: 1" = 20' • 22x34<br>V: 1" = 10' |
| EXHIBIT DATE: | NOVEMBER 2010 |
| JOB: | 81-52008-121 |
| SHEET #: | 2 OF 6 |

*ROUTE 12 EAST - OPT 1 CROSS SECTIONS (C-1)*

*I-80 / I-680 / SR-12 INTERCHANGE PROJECT*

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services



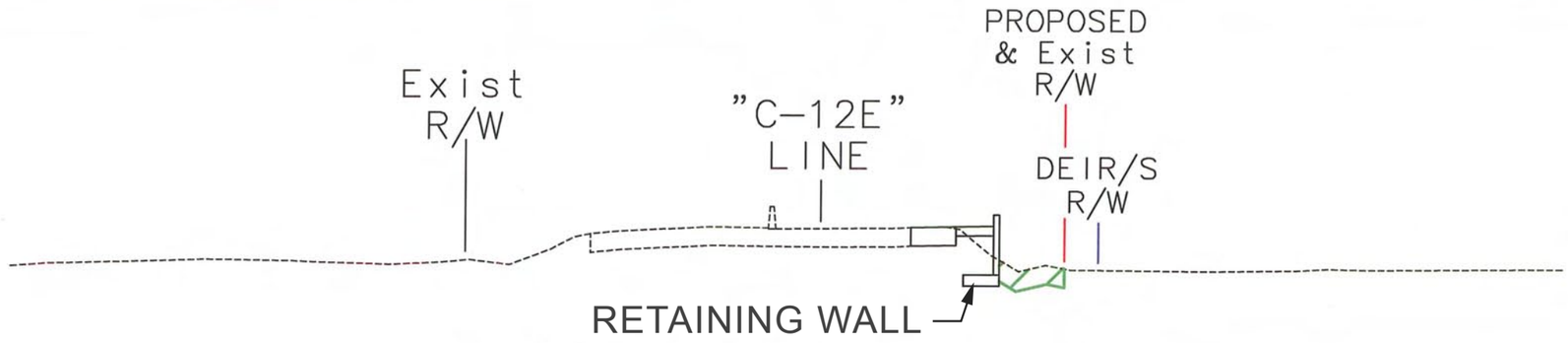

TOPOGRAPHY SHOWN IS BEFORE MEDIAN BARRIER WAS INSTALLED
PLANIMETRIC ELEVATIONS ARE IN METERS

| | |
|---|---|
| SCALE: | 1" = 50' • 22x34 |
| EXHIBIT DATE: | NOVEMBER 2010 |
| JOB: | 81-52008-121 |
| SHEET #: | 3 OF 6 |

# ROUTE 12 EAST - OPT 1 CROSS SECTIONS (C-1)

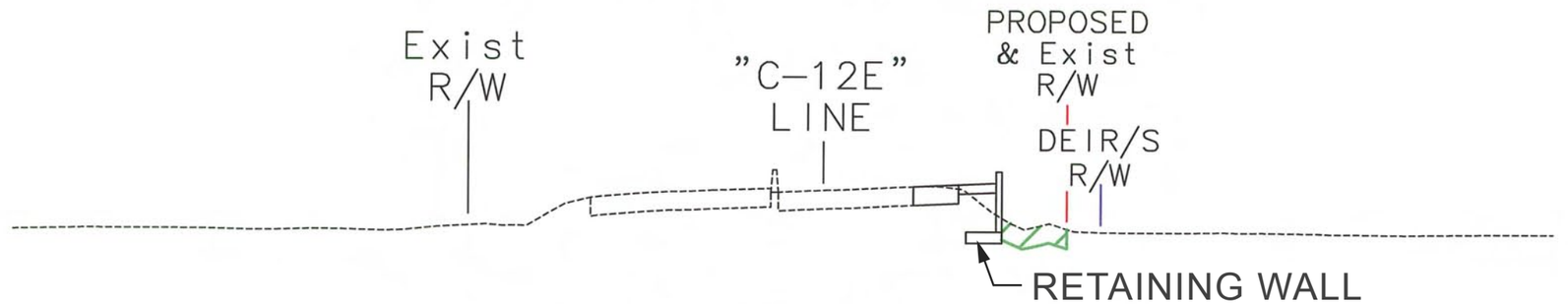
## I-80 / I-680 / SR-12 INTERCHANGE PROJECT

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services



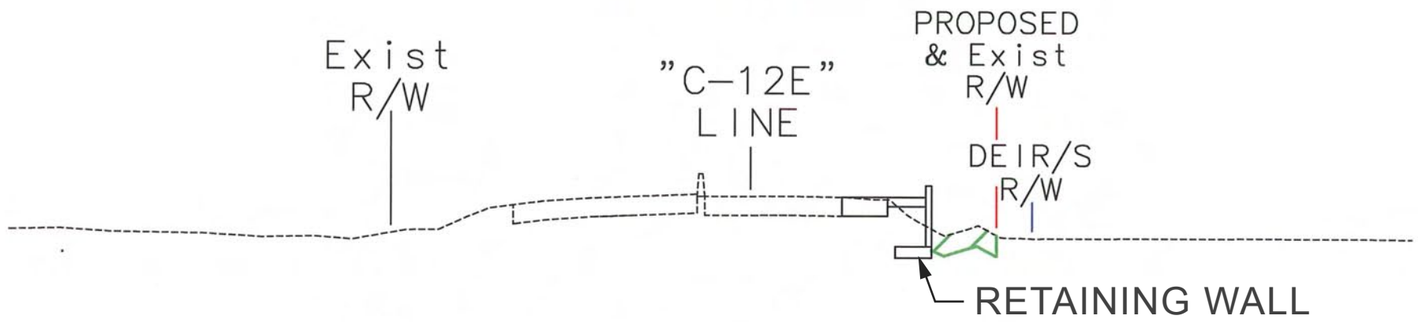

"C-12E" LINE Sta 165+00

## SECTION D-D




"C-12E" LINE Sta 170+00

## SECTION E-E




"C-12E" LINE Sta 175+00

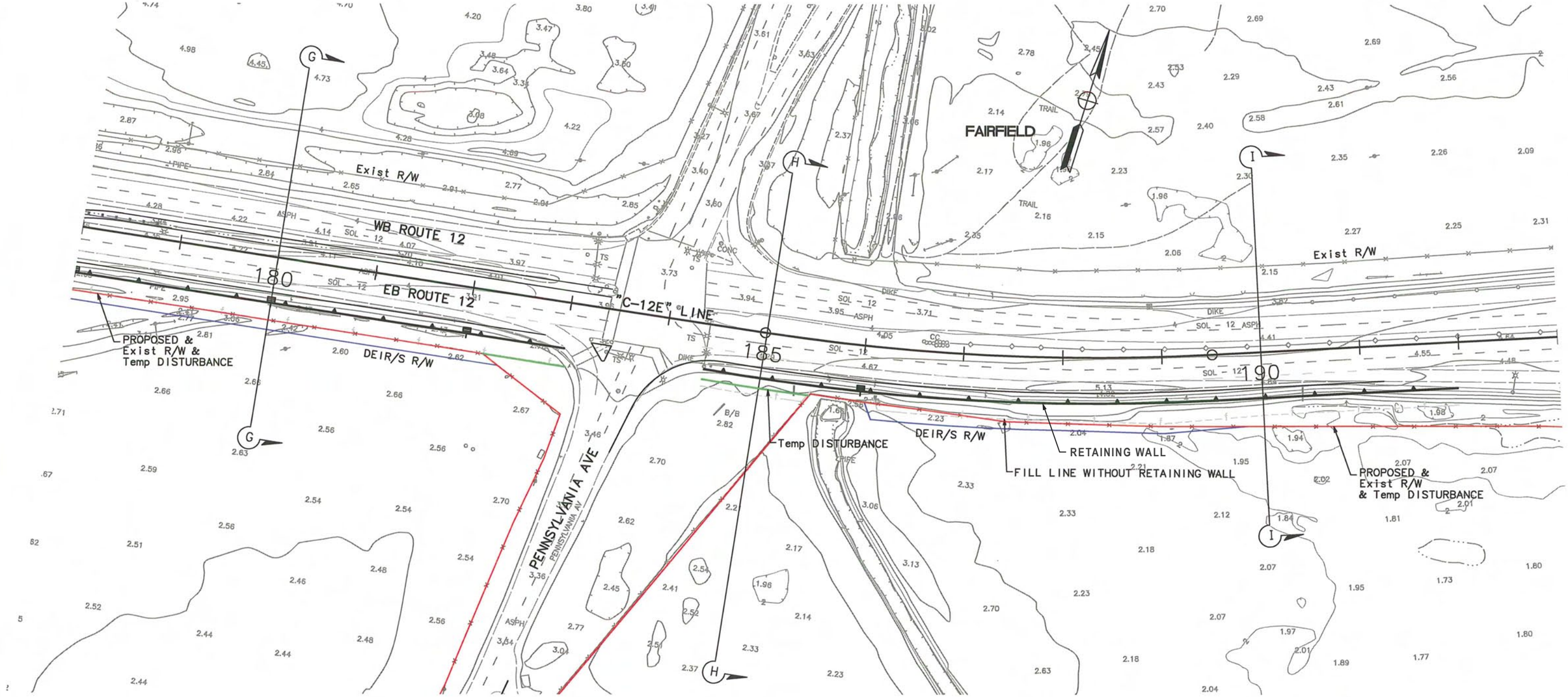
## SECTION F-F

| | |
|---|---|
| SCALE: | H: 1" = 20' • 22x34<br>V: 1" = 10' |
| EXHIBIT DATE: | NOVEMBER 2010 |
| JOB: | 81-52008-121 |
| SHEET #: | 4 OF 6 |

*ROUTE 12 EAST - OPT 1 CROSS SECTIONS (C-1)*

*I-80 / I-680 / SR-12 INTERCHANGE PROJECT*

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services



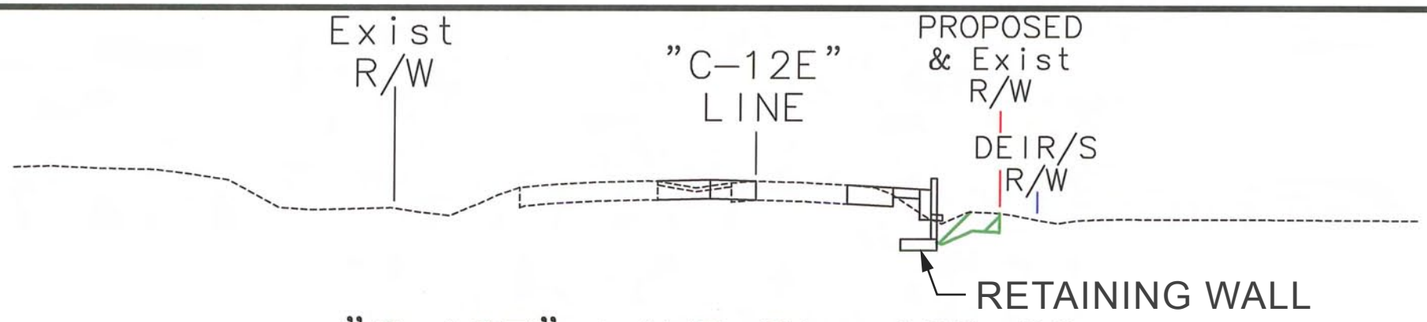

TOPOGRAPHY SHOWN IS BEFORE MEDIAN BARRIER WAS INSTALLED
PLANIMETRIC ELEVATIONS ARE IN METERS

SCALE: 1" = 50' • 22x34
EXHIBIT DATE: NOVEMBER 2010
JOB: 81-52008-121
SHEET #: 5 OF 6

# ROUTE 12 EAST - OPT 1 CROSS SECTIONS (C-1)

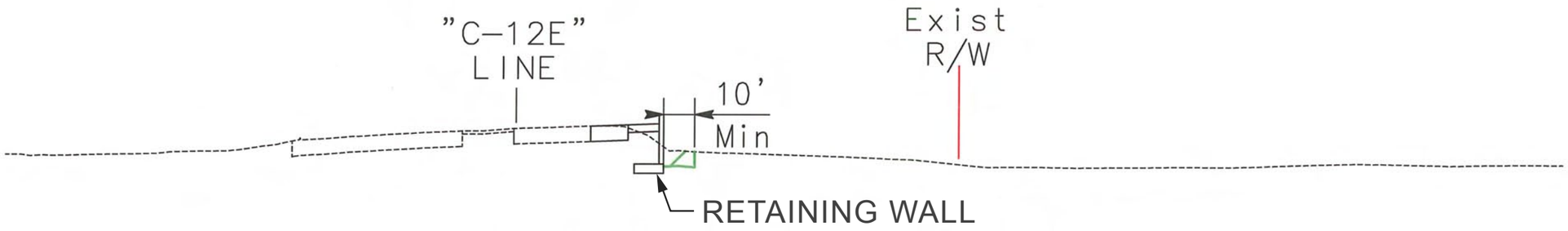
## I-80 / I-680 / SR-12 INTERCHANGE PROJECT

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services



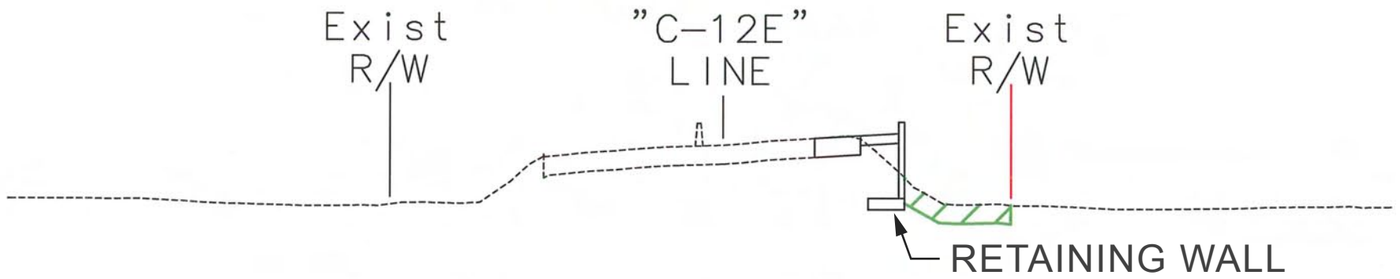

"C-12E" LINE Sta 180+00

## SECTION G-G




"C-12E" LINE Sta 185+00

## SECTION H-H




"C-12E" LINE Sta 190+00

## SECTION I-I

| | |
|---|---|
| SCALE: | H: 1" = 20' • 22x34<br>V: 1" = 10' |
| EXHIBIT DATE: | NOVEMBER 2010 |
| JOB: | 81-52008-121 |
| SHEET #: | 6 OF 6 |

*ROUTE 12 EAST - OPT 1 CROSS SECTIONS (C-1)*

*I-80 / I-680 / SR-12 INTERCHANGE PROJECT*

MARK THOMAS & COMPANY, INC.
Providing Engineering, Surveying and Planning Services

# Appendix B USFWS Species List

**United States Department of the Interior**

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

March 26, 2010

Document Number: 100326104404

Stephanie Myers
ICF International
630 K Street
Suite 400
Sacramento, CA 95814

Subject: Species List for Interstate 80/Interstate 680/State Route 12 Interchange Project

Dear: Ms. Myers

We are sending this official species list in response to your March 26, 2010 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 24, 2010.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

# U.S. Fish & Wildlife Service

# Sacramento Fish & Wildlife Office

## Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 100326104404

Database Last Updated: December 1, 2009

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## Quad Lists

### Listed Species

#### Invertebrates

*Branchinecta conservatio*

Conservancy fairy shrimp (E)

Critical habitat, Conservancy fairy shrimp (X)

*Branchinecta lynchi*

Critical habitat, vernal pool fairy shrimp (X)

vernal pool fairy shrimp (T)

*Desmocerus californicus dimorphus*

valley elderberry longhorn beetle (T)

*Elaphrus viridis*

Critical habitat, delta green ground beetle (X)

delta green ground beetle (T)

*Lepidurus packardi*

Critical habitat, vernal pool tadpole shrimp (X)

vernal pool tadpole shrimp (E)

*Speyeria callippe callippe*

callippe silverspot butterfly (E)

*Speyeria zerene myrtleae*

Myrtle's silverspot butterfly (E)

*Syncaris pacifica*

California freshwater shrimp (E)

#### Fish

*Acipenser medirostris*

green sturgeon (T) (NMFS)

*Eucyclogobius newberryi*

tidewater goby (E)

*Hypomesus transpacificus*

Critical habitat, delta smelt (X)

delta smelt (T)

*Oncorhynchus kisutch*

coho salmon - central CA coast (E) (NMFS)

*Oncorhynchus mykiss*

Central California Coastal steelhead (T) (NMFS)

Central Valley steelhead (T) (NMFS)
Critical habitat, Central California coastal steelhead (X) (NMFS)
Critical habitat, Central Valley steelhead (X) (NMFS)

*Oncorhynchus tshawytscha*
Central Valley spring-run chinook salmon (T) (NMFS)
Critical Habitat, Central Valley spring-run chinook (X) (NMFS)
Critical habitat, winter-run chinook salmon (X) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

## Amphibians

*Ambystoma californiense*
California tiger salamander, central population (T)
Critical habitat, CA tiger salamander, central population (X)

*Rana aurora draytonii*
California red-legged frog (T)
Critical habitat, California red-legged frog (X)

## Reptiles

*Masticophis lateralis euryxanthus*
Alameda whipsnake [=striped racer] (T)
Critical habitat, Alameda whipsnake (X)

*Thamnophis gigas*
giant garter snake (T)

## Birds

*Charadrius alexandrinus nivosus*
western snowy plover (T)

*Pelecanus occidentalis californicus*
California brown pelican (E)

*Rallus longirostris obsoletus*
California clapper rail (E)

*Sternula antillarum (=Sterna, =albifrons) browni*
California least tern (E)

*Strix occidentalis caurina*
northern spotted owl (T)

## Mammals

*Reithrodontomys raviventris*
salt marsh harvest mouse (E)

## Plants

*Blennosperma bakeri*
Baker's stickyseed [=Sonoma Sunshine] (E)

*Castilleja affinis ssp. neglecta*
Tiburon paintbrush (E)

*Cirsium hydrophilum var. hydrophilum*
Suisun thistle (E)

*Cordylanthus mollis ssp. mollis*
soft bird's-beak (E)

*Lasthenia conjugens*

Contra Costa goldfields (E)
Critical habitat, Contra Costa goldfields (X)

*Neostapfia colusana*
Colusa grass (T)

*Oenothera deltoides ssp. howellii*
Antioch Dunes evening-primrose (E)

*Orcuttia inaequalis*
San Joaquin Valley Orcutt grass (T)

*Sidalcea keckii*
Keck's checker-mallow (=checkerbloom) (E)

*Tuctoria mucronata*
Solano grass (=Crampton's tuctoria) (E)

## Proposed Species

### Amphibians

*Rana aurora draytonii*
Critical habitat, California red-legged frog (PX)

### Plants

*Cirsium hydrophilum var. hydrophilum*
Critical habitat, Suisun thistle (PX)

*Cordylanthus mollis ssp. mollis*
Critical habitat, soft bird's-beak (PX)

## Quads Containing Listed, Proposed or Candidate Species:

BIRDS LANDING (481A)
DENVERTON (481B)
HONKER BAY (481C)
FAIRFIELD SOUTH (482A)
CORDELIA (482B)
BENICIA (482C)
VINE HILL (482D)
CUTTINGS WHARF (483A)
SEARS POINT (483B)
MARE ISLAND (483D)
ALLENDALE (498B)
ELMIRA (498C)
DOZIER (498D)
MT. VACA (499A)
MT. GEORGE (499C)
FAIRFIELD NORTH (499D)

---

## County Lists

No county species lists requested.

## Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

*Critical Habitat* - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

## Important Information About Your Species List

### How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

### Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

### Surveying

Some of the species on your list may not be affected by your project. A trained biologist and/or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. See our Protocol and Recovery Permits pages.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

### Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding,

feeding, or shelter (50 CFR §17.3).

### Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

### Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our Map Room page.

### Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

### Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

### Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined

by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

## Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be June 24, 2010.

# Appendix C CNDDB and CNPS Database Results

| | Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|---|---|---|---|---|---|---|
| 1 | ***Accipiter cooperii***<br>Cooper's hawk | ABNKC12040 | | | G5 | S3 | |
| 2 | ***Actinemys marmorata***<br>western pond turtle | ARAAD02030 | | | G3G4 | S3 | SC |
| 3 | ***Adela oplerella***<br>Opler's longhorn moth | IILEE0G040 | | | G2G3 | S2S3 | |
| 4 | ***Agelaius tricolor***<br>tricolored blackbird | ABPBXB0020 | | | G2G3 | S2 | SC |
| 5 | ***Ambystoma californiense***<br>California tiger salamander | AAAAA01180 | Threatened | unknown code... | G2G3 | S2S3 | SC |
| 6 | ***Andrena blennospermatis***<br>Blennosperma vernal pool andrenid bee | IIHYM35030 | | | G2 | S2 | |
| 7 | ***Antrozous pallidus***<br>pallid bat | AMACC10010 | | | G5 | S3 | SC |
| 8 | ***Aquila chrysaetos***<br>golden eagle | ABNKC22010 | | | G5 | S3 | |
| 9 | ***Ardea alba***<br>great egret | ABNGA04040 | | | G5 | S4 | |
| 10 | ***Ardea herodias***<br>great blue heron | ABNGA04010 | | | G5 | S4 | |
| 11 | ***Asio flammeus***<br>short-eared owl | ABNSB13040 | | | G5 | S3 | SC |
| 12 | ***Astragalus tener var. ferrisiae***<br>Ferris' milk-vetch | PDFAB0F8R3 | | | G1T1 | S1.1 | 1B.1 |
| 13 | ***Astragalus tener var. tener***<br>alkali milk-vetch | PDFAB0F8R1 | | | G1T1 | S1.1 | 1B.2 |
| 14 | ***Athene cunicularia***<br>burrowing owl | ABNSB10010 | | | G4 | S2 | SC |
| 15 | ***Atriplex cordulata***<br>heartscale | PDCHE040B0 | | | G2? | S2.2? | 1B.2 |
| 16 | ***Atriplex depressa***<br>brittlescale | PDCHE042L0 | | | G2Q | S2.2 | 1B.2 |
| 17 | ***Atriplex joaquiniana***<br>San Joaquin spearscale | PDCHE041F3 | | | G2 | S2 | 1B.2 |
| 18 | ***Atriplex persistens***<br>vernal pool smallscale | PDCHE042P0 | | | G2 | S2.2 | 1B.2 |
| 19 | ***Balsamorhiza macrolepis var. macrolepis***<br>big-scale balsamroot | PDAST11061 | | | G3G4T2 | S2.2 | 1B.2 |
| 20 | ***Blennosperma bakeri***<br>Sonoma sunshine | PDAST1A010 | Endangered | Endangered | G1 | S1.2 | 1B.1 |
| 21 | ***Blepharizonia plumosa***<br>big tarplant | PDAST1C011 | | | G1 | S1.1 | 1B.1 |
| 22 | ***Branchinecta conservatio***<br>Conservancy fairy shrimp | ICBRA03010 | Endangered | | G1 | S1 | |
| 23 | ***Branchinecta lynchi***<br>vernal pool fairy shrimp | ICBRA03030 | Threatened | | G3 | S2S3 | |
| 24 | ***Branchinecta mesovallensis***<br>midvalley fairy shrimp | ICBRA03150 | | | G2 | S2 | |

| | Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|---|---|---|---|---|---|---|
| 25 | ***Brodiaea californica var. leptandra***<br>narrow-anthered California brodiaea | PMLIL0C022 | | | G4?T2T3 | S2S3.2 | 1B.2 |
| 26 | ***Buteo regalis***<br>ferruginous hawk | ABNKC19120 | | | G4 | S3S4 | |
| 27 | ***Buteo swainsoni***<br>Swainson's hawk | ABNKC19070 | | Threatened | G5 | S2 | |
| 28 | ***Calasellus californicus***<br>An isopod | ICMAL34010 | | | G2 | S2 | |
| 29 | ***Calochortus pulchellus***<br>Mt. Diablo fairy-lantern | PMLIL0D160 | | | G2 | S2.1 | 1B.2 |
| 30 | ***Castilleja affinis ssp. neglecta***<br>Tiburon paintbrush | PDSCR0D013 | Endangered | Threatened | G4G5T1 | S1.2 | 1B.2 |
| 31 | ***Ceanothus purpureus***<br>holly-leaved ceanothus | PDRHA04160 | | | G2 | S2.2 | 1B.2 |
| 32 | ***Centromadia parryi ssp. congdonii***<br>Congdon's tarplant | PDAST4R0P1 | | | G4T3 | S3.2 | 1B.2 |
| 33 | ***Centromadia parryi ssp. parryi***<br>pappose tarplant | PDAST4R0P2 | | | G4T2 | S2.2 | 1B.2 |
| 34 | ***Charadrius alexandrinus nivosus***<br>western snowy plover | ABNNB03031 | Threatened | | G4T3 | S2 | SC |
| 35 | ***Charadrius montanus***<br>mountain plover | ABNNB03100 | | | G2 | S2? | SC |
| 36 | ***Cicuta maculata var. bolanderi***<br>Bolander's water-hemlock | PDAPI0M051 | | | G5T3T4 | S2 | 2.1 |
| 37 | ***Circus cyaneus***<br>northern harrier | ABNKC11010 | | | G5 | S3 | SC |
| 38 | ***Cirsium hydrophilum var. hydrophilum***<br>Suisun thistle | PDAST2E1G1 | Endangered | | G1T1 | S1.1 | 1B.1 |
| 39 | ***Cordylanthus mollis ssp. hispidus***<br>hispid bird's-beak | PDSCR0J0D1 | | | G2T2 | S2.1 | 1B.1 |
| 40 | ***Cordylanthus mollis ssp. mollis***<br>soft bird's-beak | PDSCR0J0D2 | Endangered | Rare | G2T1 | S1.1 | 1B.2 |
| 41 | ***Danaus plexippus***<br>monarch butterfly | IILEPP2010 | | | G5 | S3 | |
| 42 | ***Delphinium recurvatum***<br>recurved larkspur | PDRAN0B1J0 | | | G2 | S2.2 | 1B.2 |
| 43 | ***Desmocerus californicus dimorphus***<br>valley elderberry longhorn beetle | IICOL48011 | Threatened | | G3T2 | S2 | |
| 44 | ***Dirca occidentalis***<br>western leatherwood | PDTHY03010 | | | G2G3 | S2S3 | 1B.2 |
| 45 | ***Downingia pusilla***<br>dwarf downingia | PDCAM060C0 | | | G3 | S3.1 | 2.2 |
| 46 | ***Dumontia oregonensis***<br>hairy water flea | ICBRA23010 | | | G1G3 | S1 | |
| 47 | ***Elanus leucurus***<br>white-tailed kite | ABNKC06010 | | | G5 | S3 | |
| 48 | ***Elaphrus viridis***<br>Delta green ground beetle | IICOL36010 | Threatened | | G1 | S1 | |

| | Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|---|---|---|---|---|---|---|
| 49 | ***Erigeron greenei***<br>Greene's narrow-leaved daisy | PDAST3M5G0 | | | G2 | S2 | 1B.2 |
| 50 | ***Eriogonum truncatum***<br>Mt. Diablo buckwheat | PDPGN085Z0 | | | G1 | S1.1 | 1B.1 |
| 51 | ***Falco peregrinus anatum***<br>American peregrine falcon | ABNKD06071 | Delisted | unknown code... | G4T3 | S2 | |
| 52 | ***Fritillaria liliacea***<br>fragrant fritillary | PMLIL0V0C0 | | | G2 | S2.2 | 1B.2 |
| 53 | ***Fritillaria pluriflora***<br>adobe-lily | PMLIL0V0F0 | | | G3 | S3 | 1B.2 |
| 54 | ***Geothlypis trichas sinuosa***<br>saltmarsh common yellowthroat | ABPBX1201A | | | G5T2 | S2 | SC |
| 55 | ***Gratiola heterosepala***<br>Boggs Lake hedge-hyssop | PDSCR0R060 | | Endangered | G3 | S3.1 | 1B.2 |
| 56 | ***Helianthella castanea***<br>Diablo helianthella | PDAST4M020 | | | G3 | S3.2 | 1B.2 |
| 57 | ***Helminthoglypta nickliniana bridgesi***<br>Bridges' coast range shoulderband | IMGASC2362 | | | G2T1 | S1 | |
| 58 | ***Hesperolinon breweri***<br>Brewer's western flax | PDLIN01030 | | | G2 | S2.2 | 1B.2 |
| 59 | ***Hesperolinon sp. nov. "serpentinum"***<br>Napa western flax | PDLIN010D0 | | | G2 | S2.1 | 1B.1 |
| 60 | ***Hydrochara ricksecker***<br>Ricksecker's water scavenger beetle | IICOL5V010 | | | G1G2 | S1S2 | |
| 61 | ***Hydroprogne caspia***<br>Caspian tern | ABNNM08020 | | | G5 | S4 | |
| 62 | ***Hypomesus transpacificus***<br>Delta smelt | AFCHB01040 | Threatened | Threatened | G1 | S1 | |
| 63 | ***Icteria virens***<br>yellow-breasted chat | ABPBX24010 | | | G5 | S3 | SC |
| 64 | ***Isocoma arguta***<br>Carquinez goldenbush | PDAST57050 | | | G1 | S1.1 | 1B.1 |
| 65 | ***Juglans hindsii***<br>Northern California black walnut | PDJUG02040 | | | G1 | S1.1 | 1B.1 |
| 66 | ***Lasiurus blossevillii***<br>western red bat | AMACC05060 | | | G5 | S3? | SC |
| 67 | ***Lasiurus cinereus***<br>hoary bat | AMACC05030 | | | G5 | S4? | |
| 68 | ***Lasthenia conjugens***<br>Contra Costa goldfields | PDAST5L040 | Endangered | | G1 | S1.1 | 1B.1 |
| 69 | ***Laterallus jamaicensis coturniculus***<br>California black rail | ABNME03041 | | Threatened | G4T1 | S1 | |
| 70 | ***Lathyrus jepsonii var. jepsonii***<br>Delta tule pea | PDFAB250D2 | | | G5T2 | S2.2 | 1B.2 |
| 71 | ***Legenere limosa***<br>legenere | PDCAM0C010 | | | G2 | S2.2 | 1B.1 |
| 72 | ***Lepidium latipes var. heckardii***<br>Heckard's pepper-grass | PDBRA1M0K1 | | | G4T1 | S1.2 | 1B.2 |

| | Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|---|---|---|---|---|---|---|
| 73 | ***Lepidurus packardi***<br>vernal pool tadpole shrimp | ICBRA10010 | Endangered | | G3 | S2S3 | |
| 74 | ***Lilaeopsis masonii***<br>Mason's lilaeopsis | PDAPI19030 | | Rare | G3 | S3.1 | 1B.1 |
| 75 | ***Limnanthes vinculans***<br>Sebastopol meadowfoam | PDLIM02090 | Endangered | Endangered | G2 | S2.1 | 1B.1 |
| 76 | ***Limosella subulata***<br>Delta mudwort | PDSCR10050 | | | G4?Q | S2.1 | 2.1 |
| 77 | ***Linderiella occidentalis***<br>California linderiella | ICBRA06010 | | | G3 | S2S3 | |
| 78 | ***Masticophis lateralis euryxanthus***<br>Alameda whipsnake | ARADB21031 | Threatened | Threatened | G4T2 | S2 | |
| 79 | ***Melospiza melodia maxillaris***<br>Suisun song sparrow | ABPBXA301K | | | G5T2 | S2 | SC |
| 80 | ***Melospiza melodia samuelis***<br>San Pablo song sparrow | ABPBXA301W | | | G5T2? | S2? | SC |
| 81 | ***Monardella villosa ssp. globosa***<br>robust monardella | PDLAM180P7 | | | G5T2 | S2.2 | 1B.2 |
| 82 | ***Navarretia leucocephala ssp. bakeri***<br>Baker's navarretia | PDPLM0C0E1 | | | G4T2 | S2.1 | 1B.1 |
| 83 | ***Neostapfia colusana***<br>Colusa grass | PMPOA4C010 | Threatened | Endangered | G3 | S3.1 | 1B.1 |
| 84 | ***Nyctinomops macrotis***<br>big free-tailed bat | AMACD04020 | | | G5 | S2 | SC |
| 85 | ***Oenothera deltoides ssp. howellii***<br>Antioch Dunes evening-primrose | PDONA0C0B4 | Endangered | Endangered | G5T1 | S1.1 | 1B.1 |
| 86 | ***Oncorhynchus mykiss irideus***<br>steelhead - central California coast ESU | AFCHA0209G | Threatened | | G5T2Q | S2 | |
| 87 | ***Orcuttia inaequalis***<br>San Joaquin Valley Orcutt grass | PMPOA4G060 | Threatened | Endangered | G2 | S2.1 | 1B.1 |
| 88 | ***Pandion haliaetus***<br>osprey | ABNKC01010 | | | G5 | S3 | |
| 89 | ***Perognathus inornatus inornatus***<br>San Joaquin pocket mouse | AMAFD01061 | | | G4T2T3 | S2S3 | |
| 90 | ***Plagiobothrys hystriculus***<br>bearded popcorn-flower | PDBOR0V0H0 | | | G1 | S1.1 | 1B.1 |
| 91 | ***Pogonichthys macrolepidotus***<br>Sacramento splittail | AFCJB34020 | | | G2 | S2 | SC |
| 92 | ***Polygonum marinense***<br>Marin knotweed | PDPGN0L1C0 | | | G1Q | S1.1 | 3.1 |
| 93 | ***Potamogeton filiformis***<br>slender-leaved pondweed | PMPOT03090 | | | G5 | S1S2 | 2.2 |
| 94 | ***Rallus longirostris obsoletus***<br>California clapper rail | ABNME05016 | Endangered | Endangered | G5T1 | S1 | |
| 95 | ***Rana boylii***<br>foothill yellow-legged frog | AAABH01050 | | | G3 | S2S3 | SC |
| 96 | ***Rana draytonii***<br>California red-legged frog | AAABH01022 | Threatened | | G4T2T3 | S2S3 | SC |

| | Scientific Name/Common Name | Element Code | Federal Status | State Status | GRank | SRank | CDFG or CNPS |
|---|---|---|---|---|---|---|---|
| 97 | ***Reithrodontomys raviventris***<br>salt-marsh harvest mouse | AMAFF02040 | Endangered | Endangered | G1G2 | S1S2 | |
| 98 | ***Rhynchospora californica***<br>California beaked-rush | PMCYP0N060 | | | G1 | S1.1 | 1B.1 |
| 99 | ***Saldula usingeri***<br>Wilbur Springs shorebug | IIHEM07010 | | | G1 | S1 | |
| 100 | ***Senecio aphanactis***<br>chaparral ragwort | PDAST8H060 | | | G3? | S1.2 | 2.2 |
| 101 | ***Sidalcea hickmanii ssp. napensis***<br>Napa checkerbloom | PDMAL110A6 | | | G1 | S1 | 1B.1 |
| 102 | ***Sidalcea keckii***<br>Keck's checkerbloom | PDMAL110D0 | Endangered | | G1 | S1.1 | 1B.1 |
| 103 | ***Sorex ornatus sinuosus***<br>Suisun shrew | AMABA01103 | | | G5T1 | S1 | SC |
| 104 | ***Speyeria zerene myrtleae***<br>Myrtle's silverspot | IILEPJ6089 | Endangered | | G5T1 | S1 | |
| 105 | ***Sternula antillarum browni***<br>California least tern | ABNNM08103 | Endangered | Endangered | G4T2T3Q | S2S3 | |
| 106 | ***Symphyotrichum lentum***<br>Suisun Marsh aster | PDASTE8470 | | | G2 | S2 | 1B.2 |
| 107 | ***Syncaris pacifica***<br>California freshwater shrimp | ICMAL27010 | Endangered | Endangered | G1 | S1 | |
| 108 | ***Taxidea taxus***<br>American badger | AMAJF04010 | | | G5 | S4 | SC |
| 109 | ***Trichostema ruygtii***<br>Napa bluecurls | PDLAM220H0 | | | G2 | S2 | 1B.2 |
| 110 | ***Trifolium amoenum***<br>showy rancheria clover | PDFAB40040 | Endangered | | G1 | S1.1 | 1B.1 |
| 111 | ***Trifolium depauperatum var. hydrophilum***<br>saline clover | PDFAB400R5 | | | G5T2? | S2.2? | 1B.2 |
| 112 | ***Tuctoria mucronata***<br>Crampton's tuctoria or Solano grass | PMPOA6N020 | Endangered | Endangered | G1 | S1.1 | 1B.1 |
| 113 | ***Viburnum ellipticum***<br>oval-leaved viburnum | PDCPR07080 | | | G5 | S2.3 | 2.3 |
| 114 | ***Xanthocephalus xanthocephalus***<br>yellow-headed blackbird | ABPBXB3010 | | | G5 | S3S4 | SC |

# CNPS Inventory of Rare and Endangered Plants

**Status:** Plant Press Manager window with 67 items - Sat, Aug. 28, 2010 17:33 c

- During each visit, we provide you with an empty "Plant Press" for collecting items of interest.
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Reformat list as: Standard List - with Plant Press controls

DELETE unchecked items | check all | check none

| open | save | scientific | common | family | CNPS |
|---|---|---|---|---|---|
| | ☑ | **Astragalus tener var. ferrisiae** | Ferris' milk-vetch | Fabaceae | List 1B.1 |
| | ☑ | **Astragalus tener var. tener** | alkali milk-vetch | Fabaceae | List 1B.2 |
| | ☑ | **Atriplex cordulata** | heartscale | Chenopodiaceae | List 1B.2 |
| | ☑ | **Atriplex depressa** | brittlescale | Chenopodiaceae | List 1B.2 |
| | ☑ | **Atriplex joaquiniana** | San Joaquin spearscale | Chenopodiaceae | List 1B.2 |
| | ☑ | **Atriplex persistens** | vernal pool smallscale | Chenopodiaceae | List 1B.2 |
| | ☑ | **Balsamorhiza macrolepis var. macrolepis** | big-scale balsamroot | Asteraceae | List 1B.2 |
| | ☑ | **Blennosperma bakeri** | Sonoma sunshine | Asteraceae | List 1B.1 |
| | ☑ | **Blepharizonia plumosa** | big tarplant | Asteraceae | List 1B.1 |
| | ☑ | **Brodiaea californica var. leptandra** | narrow-anthered California brodiaea | Liliaceae | List 1B.2 |
| | ☑ | **Calochortus pulchellus** | Mt. Diablo fairy-lantern | Liliaceae | List 1B.2 |
| | ☑ | **Castilleja affinis ssp. neglecta** | Tiburon paintbrush | Scrophulariaceae | List 1B.2 |
| | ☑ | **Ceanothus purpureus** | holly-leaved ceanothus | Rhamnaceae | List 1B.2 |

| | | | | | |
|---|---|---|---|---|---|
| | ☑ | **Centromadia parryi ssp. congdonii** | Congdon's tarplant | Asteraceae | List 1B.2 |
| | ☑ | **Centromadia parryi ssp. parryi** | pappose tarplant | Asteraceae | List 1B.2 |
| | ☑ | **Cicuta maculata var. bolanderi** | Bolander's water-hemlock | Apiaceae | List 2.1 |
| | ☑ | **Cirsium hydrophilum var. hydrophilum** | Suisun thistle | Asteraceae | List 1B.1 |
| | ☑ | **Cordylanthus mollis ssp. hispidus** | hispid bird's-beak | Scrophulariaceae | List 1B.1 |
| | ☑ | **Cordylanthus mollis ssp. mollis** | soft bird's-beak | Scrophulariaceae | List 1B.2 |
| | ☑ | **Cryptantha crymophila** | subalpine cryptantha | Boraginaceae | List 1B.3 |
| | ☑ | **Delphinium recurvatum** | recurved larkspur | Ranunculaceae | List 1B.2 |
| | ☑ | **Dirca occidentalis** | western leatherwood | Thymelaeaceae | List 1B.2 |
| | ☑ | **Downingia pusilla** | dwarf downingia | Campanulaceae | List 2.2 |
| | ☑ | **Erigeron biolettii** | streamside daisy | Asteraceae | List 3 |
| | ☑ | **Erigeron greenei** | Greene's narrow-leaved daisy | Asteraceae | List 1B.2 |
| | ☑ | **Eriogonum luteolum var. caninum** | Tiburon buckwheat | Polygonaceae | List 1B.2 |
| | ☑ | **Eriogonum truncatum** | Mt. Diablo buckwheat | Polygonaceae | List 1B.1 |
| | ☑ | **Fritillaria liliacea** | fragrant fritillary | Liliaceae | List 1B.2 |
| | ☑ | **Fritillaria pluriflora** | adobe-lily | Liliaceae | List 1B.2 |
| | ☑ | **Gilia capitata ssp. tomentosa** | woolly-headed gilia | Polemoniaceae | List 1B.1 |
| | ☑ | **Gratiola heterosepala** | Boggs Lake hedge-hyssop | Scrophulariaceae | List 1B.2 |
| | ☑ | **Helianthella castanea** | Diablo helianthella | Asteraceae | List 1B.2 |
| | ☑ | **Hemizonia congesta ssp. congesta** | pale yellow hayfield tarplant | Asteraceae | List 1B.2 |

| | | | | | |
|---|---|---|---|---|---|
| | ☑ | **Hesperolinon breweri** | Brewer's western flax | Linaceae | List 1B.2 |
| | ☑ | **Hesperolinon serpentinum** | Napa western flax | Linaceae | List 1B.1 |
| | ☑ | **Holocarpha macradenia** | Santa Cruz tarplant | Asteraceae | List 1B.1 |
| | ☑ | **Isocoma arguta** | Carquinez goldenbush | Asteraceae | List 1B.1 |
| | ☑ | **Juglans hindsii** | Northern California black walnut | Juglandaceae | List 1B.1 |
| | ☑ | **Lasthenia conjugens** | Contra Costa goldfields | Asteraceae | List 1B.1 |
| | ☑ | **Lathyrus jepsonii var. jepsonii** | Delta tule pea | Fabaceae | List 1B.2 |
| | ☑ | **Legenere limosa** | legenere | Campanulaceae | List 1B.1 |
| | ☑ | **Lepidium latipes var. heckardii** | Heckard's pepper-grass | Brassicaceae | List 1B.2 |
| | ☑ | **Leptosiphon jepsonii** | Jepson's leptosiphon | Polemoniaceae | List 1B.2 |
| | ☑ | **Lessingia hololeuca** | woolly-headed lessingia | Asteraceae | List 3 |
| | ☑ | **Lilaeopsis masonii** | Mason's lilaeopsis | Apiaceae | List 1B.1 |
| | ☑ | **Limnanthes vinculans** | Sebastopol meadowfoam | Limnanthaceae | List 1B.1 |
| | ☑ | **Limosella subulata** | Delta mudwort | Scrophulariaceae | List 2.1 |
| | ☑ | **Micropus amphibolus** | Mt. Diablo cottonweed | Asteraceae | List 3.2 |
| | ☑ | **Monardella villosa ssp. globosa** | robust monardella | Lamiaceae | List 1B.2 |
| | ☑ | **Myosurus minimus ssp. apus** | little mousetail | Ranunculaceae | List 3.1 |
| | ☑ | **Navarretia leucocephala ssp. bakeri** | Baker's navarretia | Polemoniaceae | List 1B.1 |
| | ☑ | **Neostapfia colusana** | Colusa grass | Poaceae | List 1B.1 |

| | | | | | |
|---|---|---|---|---|---|
| | ☑ | **Oenothera deltoides ssp. howellii** | Antioch Dunes evening-primrose | Onagraceae | List 1B.1 |
| | ☑ | **Orcuttia inaequalis** | San Joaquin Valley Orcutt grass | Poaceae | List 1B.1 |
| | ☑ | **Plagiobothrys hystriculus** | bearded popcorn-flower | Boraginaceae | List 1B.1 |
| | ☑ | **Polygonum marinense** | Marin knotweed | Polygonaceae | List 3.1 |
| | ☑ | **Potamogeton filiformis** | slender-leaved pondweed | Potamogetonaceae | List 2.2 |
| | ☑ | **Rhynchospora californica** | California beaked-rush | Cyperaceae | List 1B.1 |
| | ☑ | **Senecio aphanactis** | chaparral ragwort | Asteraceae | List 2.2 |
| | ☑ | **Sidalcea hickmanii ssp. napensis** | Napa checkerbloom | Malvaceae | List 1B.1 |
| | ☑ | **Sidalcea hickmanii ssp. viridis** | Marin checkerbloom | Malvaceae | List 1B.3 |
| | ☑ | **Sidalcea keckii** | Keck's checkerbloom | Malvaceae | List 1B.1 |
| | ☑ | **Symphyotrichum lentum** | Suisun Marsh aster | Asteraceae | List 1B.2 |
| | ☑ | **Trichostema ruygtii** | Napa bluecurls | Lamiaceae | List 1B.2 |
| | ☑ | **Trifolium amoenum** | two-fork clover | Fabaceae | List 1B.1 |
| | ☑ | **Trifolium depauperatum var. hydrophilum** | saline clover | Fabaceae | List 1B.2 |
| | ☑ | **Viburnum ellipticum** | oval-leaved viburnum | Adoxaceae | List 2.3 |

DELETE unchecked items | check all | check none

# Appendix D Salt Marsh Harvest Mouse Letter Report

September 2, 2007

Ms. Stephanie Myers
Jones & Stokes
2600 V Street
Sacramento, CA 95818

RE: Caltrans / FHWA I-80 / I-680 / SR 12 Interchange Project

Dear Ms. Myers:

Thank you for giving me the opportunity to conduct a field visit to the above-referenced project site on Aug. 31, 2007. I surveyed the site to determine habitat suitability and potential for the salt marsh harvest mouse to be present in the area outlined on the map you provided. The primary survey area was south of State Route 12 between Ledgewood Creek and Suisun City. In order to get a perspective on the condition of adjoining habitat, I also inspected the area to the north of SR 12 that is within the project footprint and areas to the south as far as Cordelia Road (Figure 1). I was able to inspect the entire area described above by car and on foot. I particularly noted the type of vegetation present, soil conditions, drainage, and land uses. The salt marsh harvest mouse is restricted to habitat dominated by tall, dense stands of pickleweed, which provide cover and forage for this species

As you pointed out, there is a CNDDB occurrence record (#114) for salt marsh harvest mouse for the site south of SR 12 between Pennsylvania Avenue and the railroad tracks just west of Suisun City. This record reported a total of 10 salt marsh harvest mice captured during trapping from Sept. 8-Oct. 4, 1986. At the time of trapping, most of the site was dominated by pickleweed. Soon after the trapping session, the owner disked the majority of the site and planted grasses.

The area south of SR 12 between Ledgewood Creek and Pennsylvania Avenue is annual grassland, with a few isolated patches of low density pickleweed (Figure 2). The patches are very small (<200 $ft^2$) and do not provide adequate cover. The habitat in this area does not constitute suitable habitat for the salt marsh harvest mouse and there is no suitable habitat to the south toward the railroad embankment.

The portion of the project site north of SR 12 and west of Pennsylvania Avenue is disturbed and supports annual grasses and weedy vegetation. I did not observe pickleweed here. This area is not suitable habitat for the salt marsh harvest mouse.

The strip of land north of SR 12 and east of Pennsylvania Avenue has some commercial buildings surrounded by annual grassland and weedy vegetation. There has been considerable disturbance here, including grading and regular mowing. The eastern end of this strip has a small wetland with cattails and other freshwater vegetation. At the southwest corner (near the intersection of SR 12 and Pennsylvania Avenue) there is a narrow drainage with permanent water and freshwater marsh vegetation. There is also a

small seasonal wetland where water ponds in the winter. Less than 1 acre here supports some short, low-density pickleweed interspersed with weedy vegetation. This habitat is not suitable for the salt marsh harvest mouse because of its small extent and lack of adequate pickleweed cover.

Finally, the area south of SR 12 between Pennsylvania Avenue and the railroad tracks just west of Suisun City was carefully surveyed. The vegetation in the western portion of this strip (from Pennsylvania Avenue east for about 500 ft) is weedy annual grassland. A deep channel cuts through here, but there does not seem to be any tidal influence and there is no pickleweed. The eastern portion of the strip that would be impacted by the highway project does support some patches of pickleweed. The pickleweed patches are low (<8 inches) and the individual plants are separated, so there is no closed canopy of vegetation. There are extensive areas of bare ground and the pickleweed patches are bordered on the south and east by cattail marsh and saltgrass stands. The parcel is impacted by ongoing cattle grazing. The portion of this area that does support pickleweed does not constitute suitable habitat for the salt marsh harvest mouse. The pickleweed that is present is low in stature and does not provide adequate cover.
To the south, beyond the railroad and Cordelia Road, there does not appear to be any suitable habitat for some distance. Thus, this area is isolated from areas that may still contain viable salt marsh harvest mouse populations.

In my opinion, there is no suitable salt marsh harvest mouse habitat within the project footprint. The area did support this species over 20 years ago, but land use changes appear to have significantly reduced and degraded the pickleweed habitat. The small patches of pickleweed that remain do not have the structure and density required by the salt marsh harvest mouse.

If you have questions, please get in touch. I would be happy to discuss my findings and clarify any issues. I enclose an aerial photograph of the project site with pickleweed areas marked.

Sincerely,

Philip Leitner
2 Parkway Court
Orinda, CA 94563
(925) 253-8400
pleitner@pacbell.net

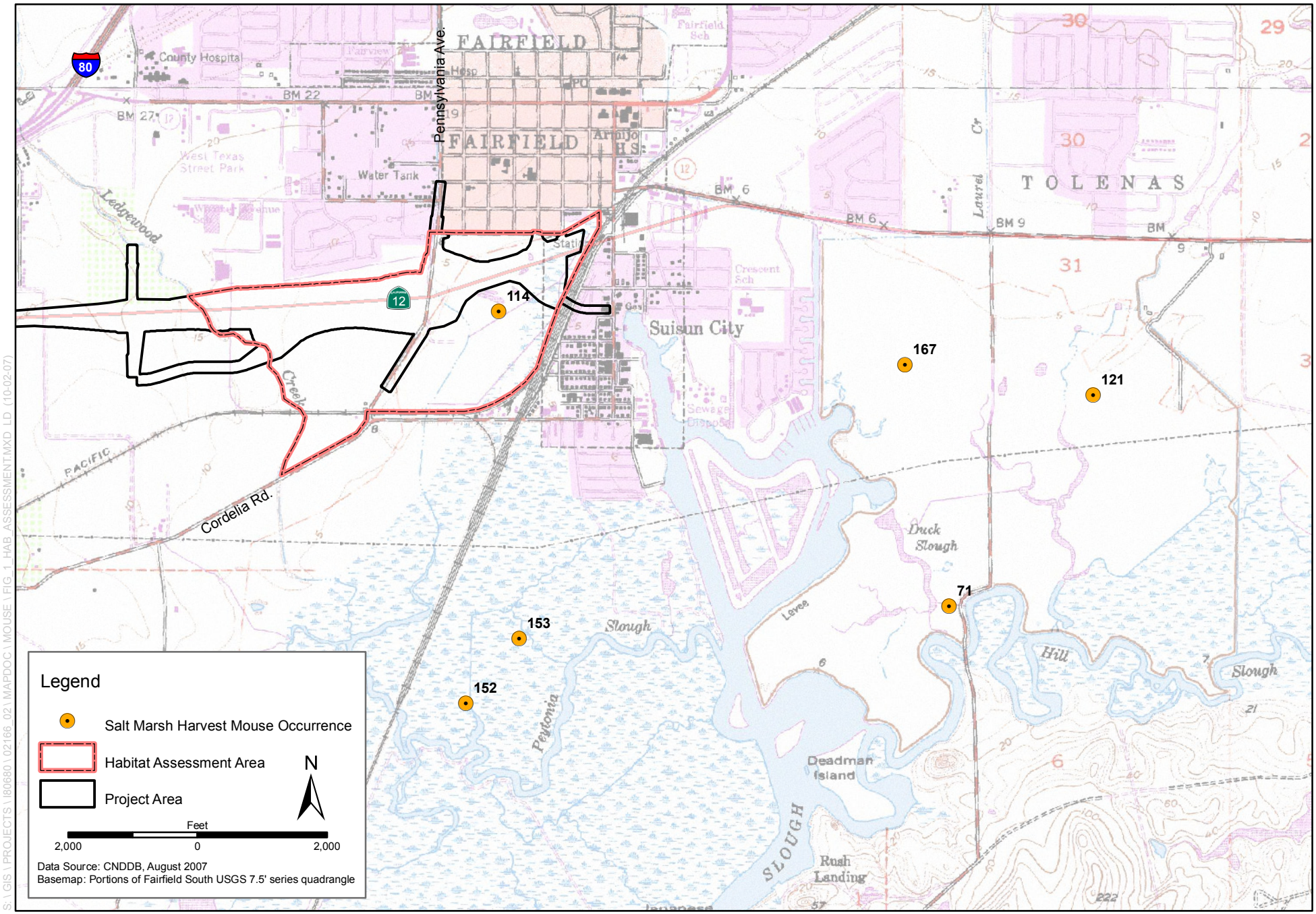


Figure 1
Location of Habitat Assessment for Salt Marsh Harvest Mouse and NDDB Occurrences on the Caltrans/FHWA I-80/I-680/SR12 Interchange Project

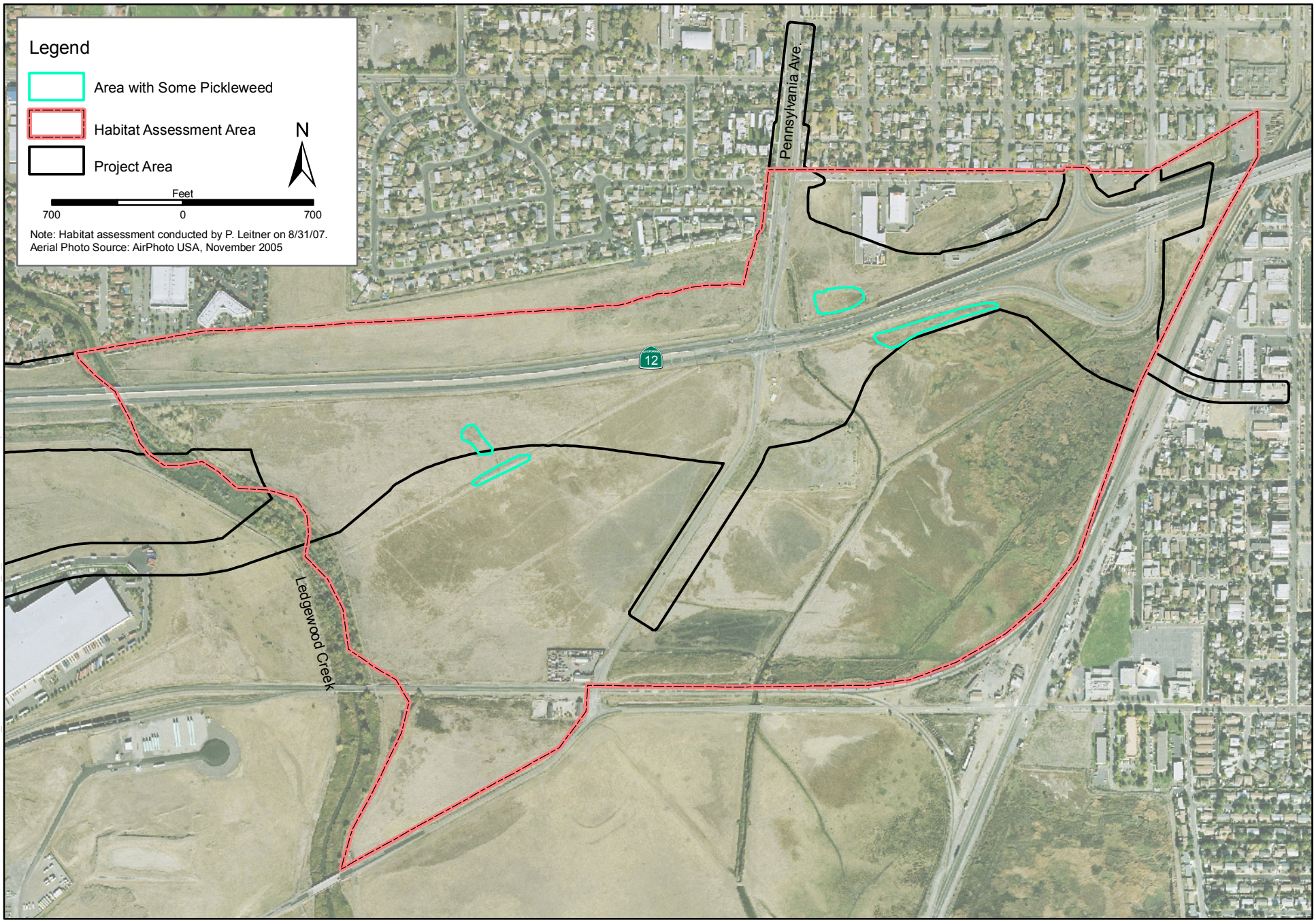


Figure 2
Locations of Pickleweed in the Habitat Assessment Area

# Appendix E Plant and Wildlife Species Observed during Field Surveys

# Appendix E Plant and Wildlife Species Observed during Field Surveys

**Table E-1. Plant Species**

| Common Name | *Scientific Name* |
|---|---|
| Bigleaf maple | *Acer macrophyllum* |
| Box elder | *Acer negundo* |
| Yarrow | *Achillea millefolium* |
| Blow-wives | *Achyrachaena mollis* |
| California buckeye | *Aesculus californica* |
| Silver hairgrass | *Aira caryophyllea* |
| Broad-leaf water plantain | *Alisma plantago-aquatica* |
| Creek alder | *Alnus incanus* |
| White alder | *Alnus rhombifolia* |
| Tumbleweed | *Amaranthus albus* |
| Western ragweed | *Ambrosia psilostachya* |
| Common fiddleneck | *Amsinckia menziesii* var. *intermedia* |
| Scarlet pimpernel | *Anagallis arvensis* |
| Celery | *Apium graveolens* |
| Madrone | *Arbutus menziesii* |
| Common manzanita | *Arctostaphylos manzanita* ssp. *manzanita* |
| Douglas' sagewort | *Artemisia douglasiana* |
| Giant reed | *Arundo donax* |
| Desert milkweed | *Asclepias erosa* |
| Narrow-leaf milkweed | *Asclepias fascicularis* |
| Alkali milk-vetch** | *Astragalus tener* var. *tener* |
| Slender wild oat | *Avena barbata* |
| Wild oat | *Avena fatua* |
| Azolla | *Azolla filiculoides* |
| Coyote brush | *Baccharis pilularis* |
| Mediterranean lineseed | *Bellardia trixago* |
| Sticktight | *Bidens frondosa* |
| Black mustard | *Brassica nigra* |
| Common mustard | *Brassica rapa* |
| Rattlesnake grass | *Briza maxima* |
| Little quaking grass | *Briza minor* |
| Harvest brodiaea | *Brodiaea elegans* |
| California brome | *Bromus carinatus* |
| Ripgut brome | *Bromus diandrus* |
| Soft brome | *Bromus hordeaceus* |
| Red brome | *Bromus madritensis* ssp. *rubens* |
| Shepherd's purse | *Capsella bursa-pastoris* |
| Italian thistle | *Carduus pycnocephalus* |
| Dense sedge | *Carex densa* |
| Ice plant | *Carpobrotus edulis* |
| Narrow-leaved owl's clover | *Castilleja attenuata* |
| Vernal pool Indian paintbrush | *Castilleja campestris* |

| Common Name | *Scientific Name* |
|---|---|
| Purple owl's-clover | *Castilleja exserta* |
| Cream sacs | *Castilleja rubicundula* ssp. *lithospermoides* |
| Cedar | *Cedrus* sp. |
| Purple star-thistle | *Centaurea calcitrapa* |
| Yellow star-thistle | *Centaurea solstitialis* |
| Monterey centaury | *Centaurium muehlenbergii* |
| Tarweed | *Centromadia fitchii* |
| Pappose spikeweed* | *Centromadia parryi ssp. parryi* |
| Mouse-ear chickweed | *Cerastium glomeratum* |
| Spotted spurge | *Chamaesyce maculata* |
| Pineapple weed | *Chamomilla suaveolens* |
| Lamb's quarters | *Chenopodium album* |
| California goosefoot | *Chenopodium californicum* |
| Soap plant | *Chlorogalum pomeridianum* |
| Chicory | *Cichorium intybus* |
| Bull thistle | *Cirsium vulgare* |
| Purple clarkia | *Clarkia purpurea ssp. quadrivulnera* |
| Miner's lettuce | *Claytonia perfoliata* |
| Poison hemlock | *Conium maculatum* |
| Bindweed | *Convolvulus arvensis* |
| Canada horseweed | *Conyza canadensis* |
| Western dogwood | *Cornus sericea ssp. occidentalis* |
| Pampas grass | *Cortaderia jubata* |
| Silverleaf cotoneaster | *Cotoneaster pannosa* |
| Brass buttons | *Cotula coronopifolia* |
| Pygmy weed | *Crassula connata* |
| Alkali weed | *Cressa truxillensis* |
| Swamp grass | *Crypsis schoenoides* |
| California dodder | *Cuscuta californica* |
| Artichoke thistle | *Cynara cardunculus* |
| Bermuda grass | *Cynodon dactylon* |
| Hedgehog dogtail | *Cynosurus echinatus* |
| Tall flatsedge | *Cyperus eragrostis* |
| Orchard grass | *Dactylis glomerata* |
| Wild carrot | *Daucus carota* |
| Hayfield tarweed | *Deinandra congesta ssp. luzulifolia [Hemizonia c. l.]* |
| Royal larkspur | *Delphinium variegatum ssp. variegatum* |
| Annual hairgrass | *Deschampsia danthonioides* |
| Blue dicks | *Dichelostemma capitatum ssp. capitatum* |
| Fork-toothed ookow | *Dichelostemma congestum* |
| Wild hyacinth | *Dichelostemma multiflorum* |
| Fuller's teasel | *Dipsacus sativus* |
| Saltgrass | *Distichlis spicata* |
| Toothed calicoflower | *Downingia cuspidata* |
| Flatface calicoflower | *Downingia pulchella* |
| Common spikerush | *Eleocharis macrostachya* |
| Blue wildrye | *Elymus glaucus* |
| Wheatgrass | *Elytrigia sp.* |

| Common Name | *Scientific Name* |
|---|---|
| Panicled willow herb | *Epilobium brachycarpum* |
| Willow herb | *Epilobium ciliatum* |
| Giant horsetail | *Equisetum telmateia ssp. braunii* |
| Turkey mullein | *Eremocarpus setigerus* |
| Golden fleece | *Ericameria arborescens* |
| Streamside daisy* | *Erigeron biolettii* |
| Yerba santa | *Eriodictyon californicum* |
| California buckwheat | *Eriogonum fasciculatum* |
| Wooly sunflower | *Eriophyllum lanatum var. achillaeoides* |
| Long-beaked filaree | *Erodium botrys* |
| Red-stemmed filaree | *Erodium cicutarium* |
| Filaree | *Erodium moschatum* |
| Jepson's button-celery | *Eryngium aristulatum var. aristulatum* |
| Great Valley button-celery | *Eryngium castrense* |
| California poppy | *Eschscholzia californica* |
| Eucalyptus | *Eucalyptus sp.* |
| Fig | *Ficus carica* |
| Herba impia | *Filago gallica* |
| Fennel | *Foeniculum vulgare* |
| Alkali heath | *Frankenia salina* |
| Oregon ash | *Fraxinus latifolia* |
| Common bedstraw | *Galium aparine* |
| Nuttall's bedstraw | *Galium porrigens* |
| Nit grass | *Gastridium ventricosum* |
| Wild geranium | *Geranium dissectum* |
| Woodland geranium | *Geranium molle* |
| Cudweed | *Gnaphalium luteo-album* |
| Sneezeweed | *Helenium puberulum* |
| Sunflower | *Helianthus annuus* |
| Heliotrope | *Heliotropium curassavicum* |
| Cow parsnip | *Heracleum lanatum* |
| Toyon | *Heteromeles arbutifolia* |
| Meadow barley | *Hordeum brachyantherum* |
| Mediterranean barley | *Hordeum marinum ssp. gussoneanum* |
| Hare barley | *Hordeum murinum spp. leporinum* |
| Klamathweed | *Hypericum perforatum* |
| Smooth cat's ear | *Hypochaeris glabra* |
| Northern California black walnut | *Juglans californica var. hindsii* |
| English walnut | *Juglans regia* |
| Baltic rush | *Juncus balticus* |
| Toad rush | *Juncus bufonius* |
| Leafy-bracted dwarf rush | *Juncus capitatus* |
| Bog rush | *Juncus effusus* |
| Three-stemmed rush | *Juncus ensifolius* |
| Iris-leaved rush | *Juncus xiphioides* |
| Fluellin | *Kickxia spuria* |
| Prickly lettuce | *Lactuca serriola* |
| Contra Costa goldfields** | *Lasthenia conjugens* |

| Common Name | *Scientific Name* |
|---|---|
| Fremont's goldfields | *Lasthenia fremontii* |
| Smooth goldfields | *Lasthenia glaberrima* |
| Angled pea | *Lathyrus angulatus* |
| Lesser hawkbit | *Leontodon taraxacoides* |
| Broad-leaved pepper-grass | *Lepidium latifolium* |
| Creeping wildrye | *Leymus triticoides* |
| Italian rye-grass | *Lolium multiflorum* |
| Hairy honeysuckle | *Lonicera hispidula* |
| Bird's-foot trefoil | *Lotus corniculatus* |
| Lotus | *Lotus purshianus* |
| Deerweed | *Lotus scoparius* |
| Water primrose | *Ludwigia peploides* |
| Yellow bush lupine | *Lupinus arboreus* |
| Miniature lupine | *Lupinus bicolor* |
| Summer lupine | *Lupinus formosus var. formosus* |
| Sky lupine | *Lupinus nanus* |
| Succulent lupine | *Lupinus succulentus* |
| Common loosestrife | *Lythrum californicum* |
| Hyssop loosestrife | *Lythrum hyssopifolium* |
| Bull mallow | *Malva nicaensis* |
| Alkali mallow | *Malvella leprosa* |
| Wild-cucumber | *Marah fabaceus* |
| White horehound | *Marrubium vulgare* |
| Hairy waterclover | *Marsilea vestita ssp. vestita* |
| Bur-clover | *Medicago polymorpha* |
| Alfalfa | *Medicago sativa* |
| California melic | *Melica californica* |
| Small-flowered melica | *Melica imperfecta* |
| White sweetclover | *Melilotus alba* |
| Sourclover | *Melilotus indica* |
| Field mint | *Mentha arvensis* |
| Pennyroyal | *Mentha pulegium* |
| Spearmint | *Mentha spicata* |
| Slender cottonweed | *Micropus californicus var. californicus* |
| Bush monkeyflower | *Mimulus aurantiacus* |
| Common yellow monkeyflower | *Mimulus guttatus* |
| Deer grass | *Muhlenbergia rigens* |
| Common muilla | *Muilla maritima* |
| Water-milfoil | *Myriophyllum sp.* |
| Purple needlegrass | *Nassella pulchra* |
| Oleander | *Nerium oleander* |
| Olive | *Olea europaea* |
| Witchgrass | *Panicum capillare* |
| Curved sicklegrass | *Parapholis incurva* |
| Dallisgrass | *Paspalum dilatatum* |
| Knot grass | *Paspalum distichum* |
| Goldback fern | *Pentagramma triangularis* |
| Windmill pink | *Petrorhagia dubia* |

| Common Name | *Scientific Name* |
|---|---|
| Harding grass | *Phalaris aquatica* |
| Reed canary grass | *Phalaris arundinacea* |
| Phalaris | *Phalaris paradoxa* |
| Pacific mistletoe | *Phoradendron villosum* |
| Lippia | *Phyla nodiflora* |
| Bristly ox-tongue | *Picris echioides* |
| Smilo grass | *Piptatherum miliaceum* |
| Stalked popcornflower | *Plagiobothrys stipitatus* |
| California plantain | *Plantago erecta* |
| Narrow-leaved plantain | *Plantago lanceolata* |
| Common plantain | *Plantago major* |
| Sycamore | *Platanus racemosa* |
| Annual bluegrass | *Poa annua* |
| One-sided blue grass | *Poa secunda ssp. secunda* |
| Semaphore grass | *Pleuropogon californicus* |
| Knotweed | *Polygonum arenastrum* |
| Water smartweed | *Polygonum punctatum* |
| Leather-leaf fern | *Polypodium scouleri* |
| Ditch beard grass | *Polypogon interruptus* |
| Rabbitfoot grass | *Polypogon monspeliensis* |
| Fremont's cottonwood | *Populus fremontii* |
| Common purslane | *Portulaca oleracea* |
| Woolly marbles | *Psilocarphus brevissimus var. brevissimus* |
| Firethorn | *Pyracantha angustifolia* |
| Pear | *Pyrus sp.* |
| Coast live oak | *Quercus agrifolia* |
| Blue oak | *Quercus douglasii* |
| Valley oak | *Quercus lobata* |
| Interior live oak | *Quercus wislizenii* |
| Spiny buttercup | *Ranunculus muricatus* |
| Western buttercup | *Ranunculus occidentalis* |
| Wild radish | *Raphanus raphanistrum* |
| Wild radish | *Raphanus sativus* |
| Coffee berry | *Rhamnus californica* |
| Hollyleaf redberry | *Rhamnus ilicifolia* |
| Hoary coffeeberry | *Rhamnus tomentella* |
| Black locust | *Robinia pseudoacacia* |
| Watercress | *Rorippa nasturtium-aquaticum* |
| California wild rose | *Rosa californica* |
| Himalayan blackberry | *Rubus discolor* |
| Pacific blackberry | *Rubus ursinus* |
| Sheep sorrel | *Rumex acetosella* |
| Curly dock | *Rumex crispus* |
| Fiddledock | *Rumex pulcher* |
| Pickleweed | *Salicornia virginica* |
| Weeping willow | *Salix babylonica* |
| Narrowleaf willow | *Salix exigua* |
| Goodding's willow | *Salix gooddingii* |

| Common Name | *Scientific Name* |
|---|---|
| Red willow | *Salix laevigata* |
| Arroyo willow | *Salix lasiolepis* |
| Dusky willow | *Salix melanopsis* |
| Russian thistle | *Salsola tragus* |
| Blue elderberry | *Sambucus mexicana* |
| Purple sanicle | *Sanicula bipinnatafida* |
| Pacific sanicle | *Sanicula crassicaulis* |
| Venus' needle | *Scandix pecten-veneris* |
| Common tule | *Scirpus acutus var. occidentalis* |
| California bulrush | *Scirpus californicus* |
| Three-square | *Scirpus pungens* |
| Big bulrush | *Scirpus robustus* |
| Bee plant | *Scrophularia californica* |
| Ragwort | *Senecio vulgaris* |
| Common catchfly | *Silene gallica* |
| Milk thistle | *Silybum marianum* |
| Charlock | *Sinapis arvensis* |
| Hedge mustard | *Sisymbrium officinale* |
| Blue-eyed grass | *Sisyrinchium bellum* |
| Large false solomon's seal | *Smilacina racemosa* |
| Prickly sow thistle | *Sonchus asper* |
| Johnsongrass | *Sorghum halapense* |
| Spanish broom | *Spartium junceum* |
| Wood-mint | *Stachys bullata* |
| Medusa-head grass | *Taeniatherum caput-medusae* |
| Saltcedar | *Tamarix ramosissima* |
| Hedgeparsley | *Torilis arvensis* |
| Poison oak | *Toxicodendron diversilobum* |
| Purple salsify | *Tragopogon porrifolius* |
| Puncture vine | *Tribulus terrestris* |
| Pale sack clover | *Trifolium depauperatum* |
| Saline clover* | *Trifolium depauperatum var. hydrophilum* |
| Strawberry clover | *Trifolium fragiferum* |
| Rose clover | *Trifolium hirtum* |
| Crimson clover | *Trifolium incarnatum* |
| Small-headed clover | *Trifolium microcephalum* |
| Red clover | *Trifolium pratense* |
| Subterranean clover | *Trifolium subterraneum* |
| Tomcat clover | *Trifolium willdenovii* |
| Wheat | *Triticum aestivum* |
| Narrowleaf cattail | *Typha angustifolia* |
| Broadleaf cattail | *Typha latifolia* |
| California bay | *Umbellularia californica* |
| Stinging nettle | *Urtica dioica* |
| Purslane speedwell | *Veronica peregrina ssp. xalapensis* |
| Purple vetch | *Vicia benghalensis* |
| Spring vetch | *Vicia sativa* |
| Hairy vetch | *Vicia villosa* |

| Common Name | *Scientific Name* |
|---|---|
| Periwinkle | *Vinca major* |
| California wild grape | *Vitis californica* |
| Brome fescue | *Vulpia bromoides* |
| Small fescue | *Vulpia microstachys var. pauciflora* |
| Foxtail fescue | *Vulpia myuros* |
| Whitehead mule-ears | *Wyethia helenioides* |
| Rough cocklebur | *Xanthium strumarium* |

* Special-status species observed during Jones & Stokes surveys.
** Special-status species observed only during Vollmar Consulting 2005 surveys.

**Table E-2. Wildlife Species**

| Common Name | *Scientific Name* |
|---|---|
| Western pond turtle | *Actinemys marmorata* |
| Common gopher snake | *Pituophis catenifer catenifer* |
| Western fence lizard | *Sceloporus occidentalis* |
| California red-legged frog | *Rana aurora draytonii* |
| Bullfrog | *Rana catesbeiana* |
| Great blue heron | *Ardea herodias* |
| Great egret | *Ardea alba* |
| Turkey vulture | *Cathartes aura* |
| White-tailed kite | *Elanus leucurus* |
| Northern harrier | *Circus cyaneus* |
| Red-shouldered hawk | *Buteo lineatus* |
| Swainson's hawk | *Buteo swainsonii* |
| Red-tailed hawk | *Buteo jamaicensis* |
| American kestrel | *Falco sparverius* |
| Merlin | *Falco columbarius* |
| Killdeer | *Charadrius vociferus* |
| Rock pigeon* | *Columba livia* |
| Mourning dove | *Zenaida macroura* |
| White-throated swift* | *Aeronautes saxatalis* |
| Anna's hummingbird* | *Calypte anna* |
| Belted kingfisher | *Ceryle alcyon* |
| Nuttall's woodpecker | *Picoides nuttallii* |
| Black phoebe* | *Sayornis nigricans* |
| Western kingbird | *Tyrannus verticalis* |
| Western scrub-jay | *Aphelocoma californica* |
| Yellow-billed magpie* | *Pica nuttalli* |
| American crow* | *Corvus brachyrhynchos* |
| Northern rough-winged swallow* | *Stelgidopteryx serripennis* |
| Cliff swallow* | *Petrochelidon pyrrhonota* |
| Barn swallow | *Hirundo rustica* |
| Bushtit* | *Psaltriparus minimus* |
| Wrentit* | *Chamaea fasciata* |

| **Common Name** | ***Scientific Name*** |
|---|---|
| Hermit thrush | *Catharus guttatus* |
| American robin* | *Turdus migratorius* |
| Northern mockingbird* | *Turdus migratorius* |
| European starling* | *Sturnus vulgaris* |
| Spotted towhee* | *Pipilo maculatus* |
| California towhee | *Pipilo crissalis* |
| Song sparrow* | *Melospiza melodia* |
| White-crowned sparrow | *Zonotrichia leucophrys* |
| Red-winged blackbird | *Agelaius phoeniceus* |
| Western meadowlark | *Sturnella neglecta* |
| Brewer's blackbird | *Euphagus cyanocephalus* |
| House finch* | *Carpodacus mexicanus* |
| American goldfinch | *Carduelis tristis* |
| House sparrow* | *Passer domesticus* |
| Raccoon | *Procyon lotor* |
| California ground squirrel | *Spermophilus beecheyi* |
| Brown rat | *Rattus norvegicus* |

# Appendix F Inferred Presence Determination for Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) and Vernal Pool Tadpole Shrimp (*Lepidurus packardi*)

March 2011

# Inferred Presence Determination
## for
## Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) and Vernal Pool Tadpole Shrimp (*Lepidurus packardi*).

Prepared by
Stephanie Myers, Wildlife Biologist, ICF International

**What kind of project?**

The full build project involves comprehensive improvements to the Interstate 80 (I-80)/Interstate 680 (I-680)/State Route 12 (SR 12) interchange complex to meet the future traffic demand over the 20-year planning horizon and includes the widening of I-680 and I-80 and the relocation, upgrade, and expansion of the westbound truck scales on I-80. The full scope of these improvements is not currently funded within the Metropolitan Transportation Commission's (MTC's) Regional Transportation Plan, 2035. As a result, a fundable first phase of the full-build project has been developed (referred to as Phase 1). For the purposes of this biological assessment (BA), Phase 1 is considered the proposed project. The proposed project consists of improvements to the I-80/I-680/SR 12 West (SR 12W) interchange; a realignment of I-680; a new interchange at I-680 and Red Top Road; a new road connecting the I-80/Red Top Road interchange to Business Center Drive; a new interchange at SR 12W and the new Red Top Road alignment; an improved interchange at I-80 and Green Valley Road; new bridges over Green Valley Creek; widened I-80; a new lane on eastbound SR 12 East (SR 12E); and a widened bridge over Ledgewood Creek.

Project construction for the proposed project would affect a total of 17 suitable habitat features. Nine of the features would be directly affected (1.15 acres) and 8 of the features would be indirectly affected (0.45 acres).

**What does this species require?**

Vernal pool fairy shrimp and vernal pool tadpole shrimp are restricted to seasonal wetland habitats (e.g., vernal pools and wet swales) in California that provide the environmental conditions necessary for the species' survival. Both species can be found in pools ranging in size from 0.1 acre to 0.5 acre.

**Can surveys be used to determine presence?**

The USFWS provides a standardized protocol to survey for vernal pool crustaceans titled *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* April 19, 1996. Implementation of this protocol assuming weather conditions are such that surveys are accepted (i.e., during good water years). Survey results indicating absence are good for 5 years.

**What do we know?**

- **Is suitable habitat is present?**

  Suitable habitat is present in vernal pools and other seasonal wetlands in the BSA.

- **Is the project within historic or current range of the species?**

  Yes, the BSA is within the current known range for vernal pool fairy shrimp and vernal pool tadpole shrimp.

- **Are there historic records of presence?**

  There are no historic records of presence within the BSA. The CNDDB (2010) includes three records for vernal pool fairy shrimp and three records for vernal pool tadpole shrimp s within 2 miles of the BSA..

- **Is the project area contiguous to known occupied habitat?**

  No, the BSA is not contiguous with known occupied habitat.

- **Is the BSA or the project study area continuous?**

  The nearest occurrences are near Travis AFB and south and west of the City of Fairfield. Vernal pool habitat is not contiguous, it is separated by urban dwellings and roads and highways.

- **What is the distance and direction to known, occupied habitat?**

  Approximately two miles south and east of the BSA.

- **Is the project area site accessible to species?**

  Yes, species cysts in soil could be introduced to the site through transmission by birds that forage in vernal pool and seasonal wetland habitat.

- **Is the BSA connected by, or within, a movement corridor?**

  Vernal pool fairy and tadpole shrimp do not migrate, but they (or their eggs/cysts) can be transferred from one pool to another by waterfowl or livestock.

- **Are there any barriers to species movement to the BSA or the project study area (i.e., is the project area physically accessible to the species from known occupied habitat)?**

  The BSA is crossed by major roads and highways and houses in various places that would act as barriers to distribution by overland water flow, but not to distribution by waterfowl.

- **Do agencies accept protocol surveys as evidence of absence, including consideration of drought, flooding, fires, or other unusual environmental conditions?**

  USFWS does accept absence results for five years as long as all survey protocols were followed. They may not accept aquatic survey results if it was a dry year, but would still accept egg surveys which would not be affected.

- **Are there access constraints such as extreme topography, necessary permits to enter and sample, landowner objections?**

  There was no access to 13 of the 19 potential habitat sites because the landowner would not allow access.

- Does the cost of surveys exceed cost of potential mitigation and would it not be a prudent use of public funds?

  Although the cost of conducting surveys for this species would not be prohibitive, the timing required to complete surveys, the length of time the surveys are considered acceptable, and the long construction window for the complete Phase 1 of the project could interfere with the implementation, permitting, and funding of this project.

**Why should we infer presence?**

The CNDDB (2010) has three records for both vernal pool fairy shrimp (occurrences 184, 331, and 399) and vernal pool tadpole shrimp (occurrences 97, 111, 158) within 2 miles of the BSA from 1999 - 2010. The timing required for surveys would cause serious delays in project funding. Because of the long timeline for this project, survey results that indicated absence would no longer be valid after 5 years and would need to be repeated..

**References**

California Natural Diversity Database. 2010. RareFind 3, Version 3.1.0 (February 2010 update). Records search of the Cordelia, Denverton, Elmira, Fairfield North, Fairfield South, Benicia, Napa, Cuttings Wharf, and Mt. George 7.5-minute quadrangles. California Department of Fish and Game. Sacramento, CA.

U.S. Fish and Wildlife Service. 1996. *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* April 19, 1996**.** Sacramento, Ca.

**Attachments**

CNDDB (2010) query printout

# Appendix G Soil Map Units in the Biological Study Area

# Appendix G Soil Map Units in the Biological Study Area

**Table G-1**

| Map Unit Symbol[a] | Map Unit Name | Drainage Type | Landform | Hydric Soils[a] | Hydric Criteria[b] |
|---|---|---|---|---|---|
| AcF2 | Altamont clay, 30% to 50% slopes, eroded | Well-drained | Dissected terraces | None | – |
| AmE2 | Altamont-Diablo clays, 9% to 30% slopes | Well-drained | Terraces | None | – |
| An | Alviso silty clay loam | Poorly drained | Tidal marsh | Alviso (component), Tamba (inclusion), Reyes (inclusion) | 2B3, 3, 4 |
| AoA | Antioch–San Ysidro complex, 0 to 2% slopes | Moderately well-drained | Terraces | None | – |
| AsA | Antioch–San Ysidro complex, thick surface, 0 to 2% slopes | Moderately well-drained | Terraces | None | – |
| Cc | Capay clay | Moderately well-drained | Basin floor | Clear Lake (inclusion), Omni (inclusion) | 2B3 |
| CeA | Clear Lake clay, 0 to 2% slopes | Poorly drained | Basins | Clear Lake (component), Sacramento (inclusion), Omni (inclusion) | 2B3 |
| CeB | Clear Lake clay, 2% to 5% slopes | Poorly drained | Basins | Clear Lake (component) | 2B3 |
| ClA | Clear Lake clay, saline, 0 to 2% slopes | Poorly drained | Basins, Tidal marsh | Clear Lake (component), Alviso (inclusion) | 2B3 |
| Co | Conejo gravelly loam | Well-drained | Alluvial fans | None | – |
| DbC | Dibble–Los Osos loams, 2% to 9% slopes | Well-drained | Ridge crests, north- and south-facing slopes | None | – |
| DbE | Dibble–Los Osos loams, 9% to 30% slopes | Well-drained | Ridge crests, north- and south-facing slopes | None | – |
| DbF2 | Dibble–Los Osos loams, 30% to 50% slopes, eroded | Well-drained | Ridge crests, north- and south-facing slopes | None | – |
| DlE | Dibble–Los Osos clay loams, 9% to 30% slopes | Well-drained | Ridge crests, north- and south-facing slopes | None | – |
| HaF | Hambright loam, 15% to 40% slopes | Well-drained | Mountainous uplands | None | – |
| Ma | Made land (filled areas, commonly over tidal marsh or saline sediments at a depth of 3 feet or more) | Well-drained to poorly drained | Alluvial fan | Valdez (inclusion) | 2B3 |
| MmG2 | Millsholm loam, 30% to 75% slopes, eroded | Well-drained | Mountains | None | – |

| Map Unit Symbol[a] | Map Unit Name | Drainage Type | Landform | Hydric Soils[a] | Hydric Criteria[b] |
|---|---|---|---|---|---|
| Pc | Pescadero clay loam | Somewhat poorly drained | Basins | Willows (inclusion) | 2B3 |
| Pe | Pescadero clay | Somewhat poorly drained | Basins and depressions | Pescadero (component) | 3 |
| QU | Quarry | – | – | – | – |
| RoA | Rincon clay loam, 0 to 2% slopes | Well-drained | Alluvial fans | None | – |
| RoC | Rincon clay loam 2% to 9% slopes | Well-drained | Alluvial fans | None | – |
| Sr | Sycamore silty clay loam | Somewhat poorly drained | Alluvial fans | None | – |
| Ss | Sycamore silty clay loam, drained | Somewhat poorly drained | Alluvial fans | None | – |
| St | Sycamore silty clay loam, saline | Somewhat poorly drained | Alluvial fans | Alviso (inclusion) | 2B3 |
| W | Water | – | – | – | – |
| Yr | Yolo loam, clay substratum | Well-drained | Alluvial fans | None | – |
| Ys | Yolo silty clay loam | Well-drained | Alluvial fans | None | – |

[a] Sources: Bates 1977; U.S. Soil Conservation Service 1992.

[b] The hydric soil criteria are defined as follows (from U.S. Soil Conservation Service 1992):

Hydric Criteria 2B3: 2. Soils in Aquic suborder, Aquic subgroups, Albolls suborder, Salorthids great group, Pell great groups of Verticols, Pachic subgroups, or Cumulic subgroups that are:

B. poorly drained or very poorly drained and have

3. a frequently occurring water table at less than 1.5 feet from the surface for a significant period (usually more than 2 weeks) during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches.

Hydric Criteria 3: Soils that are frequently ponded for long duration or very long duration during the growing season.

Hydric Criteria 4: Soils that are frequently flooded for long duration or very long duration during the growing season.

# Appendix H Inferred Presence Determination for California Tiger Salamander (*Ambystoma californiense*)

# Inferred Presence Determination
## for
## California Tiger Salamander (*Ambystoma californiense*)

Near the cities of Fairfield and Suisun City
Solano County, California
District 4-SOL-80 (PM 10.8/17.0); SOL-680 (PM 10.0/13.1); SOL-SR 12 (PM1.7/L2.8); and SOL-SR 12 (PM L1.8/4.8)

EA 0A5300

**March 2011**

**What kind of project?**

The full build project involves comprehensive improvements to the Interstate 80 (I-80)/Interstate 680 (I-680)/State Route 12 (SR 12) interchange complex to meet the future traffic demand over the 20-year planning horizon and includes the widening of I-680 and I-80 and the relocation, upgrade, and expansion of the westbound truck scales on I-80. The full scope of these improvements is not currently funded within the Metropolitan Transportation Commission's (MTC's) Regional Transportation Plan, 2035. As a result, a fundable first phase of the full-build project has been developed (referred to as Phase 1). For the purposes of this biological assessment (BA), Phase 1 is considered the proposed project. The proposed project consists of improvements to the I-80/I-680/SR 12 West (SR 12W) interchange; a realignment of I-680; a new interchange at I-680 and Red Top Road; a new road connecting the I-80/Red Top Road interchange to Business Center Drive; a new interchange at SR 12W and the new Red Top Road alignment; an improved interchange at I-80 and Green Valley Road; new bridges over Green Valley Creek; widened I-80; a new lane on eastbound SR 12 East (SR 12E); and a widened bridge over Ledgewood Creek.

Project construction for the proposed project would directly affect 0.76 acre of upland habitat and could indirectly affect upland and breeding habitat.

**What does this species require?**

CTS is a lowland species restricted to grasslands and low foothill regions where its breeding habitat occurs. The species inhabits both aquatic and terrestrial habitats at different stages in their life cycle. Although the larval salamanders develop in vernal pools and ponds in which they were born, they are otherwise terrestrial and spend most of their lives in widely dispersed underground retreats (Trenham et al. 2001). Juveniles and adults spend the dry summer and fall months of the year in burrows of small mammals, such as California ground squirrel and pocket gophers; they may also use leaf litter or desiccation cracks in soil as refugia. (USFWS 2003.)

Permanent aquatic sites are unlikely to be used for breeding unless they lack fish predators. Three to 6 months ponded duration in an aquatic site are needed to complete development through metamorphosis.

CTS are known to travel large distances from breeding ponds into upland habitats. CTS have been observed in upland habitat approximately 0.75 mile from the nearest breeding pond (Ibis Environmental 2007). Although CTS can travel relatively long distances, they typically are found closer to breeding ponds. Trenham and Schaffer (2005) found that juveniles in Solano County used upland habitats further from breeding ponds than did adults (2,297 feet maximum for juveniles versus 813 feet maximum for adults.

**Can surveys be used to determine presence?**

Yes, surveys can be used to determine presence or absence. The USFWS provides a standardized protocol to survey for California tiger salamanders titled *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander*, October 2003. Surveys consist of two spring-larval surveys with an intervening winter-survey for adults.

**What do we know?**

- **Is suitable habitat present?**

Suitable breeding habitat which holds water for at least 3 months (vernal pool shown in Figure 4-7) and upland habitat (annual grassland with multiple burrows) was identified during a site visit on November 18, 2010 with Caltrans biologist Ahmad Hashemi, ICF biologist Stephanie Myers, and USFWS biologists John Cleckler and Chris Nagano. Mr. Cleckler and Mr. Nagano stated that the seasonal wetlands/vernal pools on the east side of Pennsylvania Avenue would be too saline for CTS breeding, while the large vernal pool to

the west of Pennsylvania Avenue and within 400 feet of the BSA provides suitable breeding habitat (Figure 4-7).

While no USFWS protocol-level surveys have been conducted in this area, it was surveyed, though not according to USFWS protocol, in 1999-2000 for the Gentry-Suisun project (which includes our project site) by May Consulting Services (Raney Planning and Management, Inc. 2006). May Consulting Services conducted dip-net surveys in winter-spring 1999-2000 for CTS larvae concurrent with surveys for listed shrimp species. Dip-net surveys included checking for larvae and egg masses. Surveys corresponded with the rainy period when breeding CTS are most likely to be observed migrating to breeding sites. Survey results were negative. This project was never finalized and no Biological Opinion was obtained from USFWS. Our BSA borders the north edge of the Gentry-Suisun project site (Figure 4-7).

- **Is the project within historic or current range of the species?**

  The BSA is within the historic range and current potential range as identified in the Solano Multispecies Habitat Conservation Plan: Final Administrative Draft (2009) and shown in Figure 4-6.

- **Are there historic records of presence?**

  There is one historic record (from Dr. Arthur Shapiro at U.C. Davis, who observed a CTS larvae in aquatic habitat. Dr. Shaprio does not remember the year but estimates it to have been from the late 1970's or early 1980's) (Searcy pers. comm.),Dr. Brad Schaffer and Mr. Searcy (Searcy pers. comm.) visited the site in 2008 and believed CTS to be extinct at this location because the breeding site is no longer present. This occurrence is within 1 mile of the BSA on the north side and SR 12-E and Suisun City (Figure 4-6.)

- **Is the project area contiguous to known occupied habitat**?

  No, the BSA is not contiguous with known occupied habitat. Development from Suisun City and Fairfield, expansion of SR 12-E into a 4-lane highway (which occurred in 1988), Peytonia Slough and Suisun Marsh, and the Southern Pacific Railroad provide major barriers to CTS movement from known occupied habitat to the project area (Figures 4-6 and 4-7).

- **What is the distance and direction to known, occupied habitat?**

  The CNDDB (2011) includes several records for California tiger salamander from 1999 to 2006 in the Potrero Hills approximately 5 miles southeast of the BSA. Dispersal between the Potrero Hills and the BSA is completely blocked by development from Suisun City, SR 12-E, Suisun Marsh and Peytonia Slough (which are saline and full of predators).

- **Is the project area site accessible to species?**

  The project site is not accessible to the species from the nearest known, occupied location in Potrero Hills. However, as noted above there is an historical occurrence within 1 mile of the BSA so at least approximately 25-30 years ago CTS were present within the action area, and there is suitable breeding and upland habitat in and adjacent to the BSA.

- **Is the BSA connected by, or within, a movement corridor?**

  The BSA is connected to suitable, unoccupied habitat to the south (Figure 4-7). CTS do not move along corridors, but move through upland habitat in all directions as long as there are no major barriers that they cannot successfully cross. The BSA is not connected to known, occupied habitat (see discussion above of major barriers that would preclude any connection to occupied habitat). Minor barriers to CTS movement to the south of the BSA include barriers that CTS could navigate across but would still represent increased risks. These minor barriers include Pennsylvania Avenue and Cordelia Avenue/Road, and through culverts under Cordelia Road and the Union Pacific Railroad.

- **Are there any barriers to species movement to the BSA or the project study area (i.e., is the project area physically accessible to the species from known occupied habitat)?**

  The BSA is not physically accessible to CTS from known occupied habitat. There are two types of barriers to movement on the project site: major barriers (CTS could not successfully cross), which include the 4-lane SR 12-E, Suisun City and Fairfield City, Suisun Marsh and Peytonia Slough, and minor barriers (CTS could cross but with increased mortality risks from vehicles, mis-direction to unsuitable habitat, and increased predation). Minor barriers include local 2-lane roads and the Union and Southern Pacific Railroads (Figures 4-6 and 4-7). The major barriers would have been fairly impenetrable to CTS movement from occupied habitat to the southeast. Prior to the expansion of SR 12-E, which occurred in 1988, and before the build-out of the City of Fairfield, CTS from the northeast (near Travis Air Force Base) would have had physical access to the project site. Prior to 1988, the 2-lane highway would be considered a minor barrier, and based on the historical record (by Dr.

Shapiro, discussed above) of a CTS breeding site within less than 1 mile of the BSA (Figure 4-6), it is likely that CTS were present in the project action area.

- **Do agencies accept protocol surveys as evidence of absence, including consideration of drought, flooding, fires, or other unusual environmental conditions?**

  USFWS does accept absence results as long as all survey protocols were followed (which includes getting their concurrence before conducting surveys that they will accept negative results). They might not accept aquatic survey results if weather conditions were not suitable (i.e., not enough rainfall to support successful breeding by CTS).

- **Are there access constraints such as extreme topography, necessary permits to enter and sample, landowner objections?**

  The only constraint would be the presence of the federally endangered Contra Costa goldfields and wetlands in the action area. In order to conduct protocol-level surveys, it is necessary to dig a trench and install pitfall traps and a buried fence. This could have adverse effects on listed plants and wetlands.

- **Does the cost of surveys exceed cost of potential mitigation and would it not be a prudent use of public funds?**

  Comparing the cost of surveys, the presence of listed plants and wetlands, the timing required to complete surveys (two spring and one winter survey), and the small amount of habitat affected by the proposed action, the prudent use of public funds would be to infer presence.

**Why should we infer presence?**

There is an identified an historic CTS population (estimated to be from the late 1970's to mid-1980's) within 1 mile of the BSA (Searcy pers. comm.).. Although this location is no longer present, it does indicate the possibility for CTS presence within the BSA. Coupled with the presence of suitable breeding and upland habitat in the BSA, this evidence suggests inference is the correct approach.

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## Personal Communications

Searcy, Christopher. Graduate Student at U.C. Davis working with California tiger salamanders in Dr. Brad Shaffers lab. February 20 and 22, 2011__emails.

## Attachments

CNDDB (2011) query printout

# Appendix I Lists of Assessors Parcel Numbers in Biological Study Area during Plant and Animal Species Surveys

List of Assessors Parcel Numbers in Biological Study Area and Survey Dates

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0027260230 | | | X | X | X | X | | |
| 0028692420 | | | X | X | X | X | | |
| 0028750120 | | | X | X | X | X | | |
| 0028750130 | | | X | X | X | X | | |
| 0028750310 | | | X | X | X | X | | |
| 0028792110 | | | X | X | X | X | | |
| 0028792120 | | | X | X | X | X | | |
| 0028792130 | | | X | X | X | X | | |
| 0028792140 | | | X | X | X | X | | |
| 0028792100 | | | X | X | X | X | | |
| 0031301440 | | | X | X | X | X | | |
| 0032010300 | | | X | X | X | X | | |
| 0032010320 | | | X | X | X | X | | |
| 0032010340 | | | X | X | X | X | | |
| 0032010390 | | X | | | X | X | | X |
| 0032010460 | | | X | X | X | X | | |
| 0032010470 | | | X | X | X | X | | |
| 0032020140 | | X | | | X | X | | X |
| 0032020210 | | | X | X | X | X | | |
| 0032020250 | | | X | X | X | X | | |
| 0032020290 | | | X | X | X | X | | |

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0032010140 | | | X | X | X | X | | |
| 0032010170 | | | X | X | X | X | | |
| 0032010190 | | | X | X | X | X | | |
| 0032010230 | | | X | X | X | X | | |
| 0032010240 | | | X | X | X | X | | |
| 0032010280 | | | X | X | X | X | | |
| 0045310180 | | | X | X | X | X | | |
| 0045310390 | | | X | X | X | X | | |
| 0045310430 | | | X | X | X | X | | |
| 0045310580 | | | X | X | X | X | | |
| 0045310600 | | | X | X | X | X | | |
| 0045310650 | | | X | X | X | X | | |
| 0045310660 | | | X | X | X | X | | |
| 0045310860 | | | X | X | X | X | | |
| 0045081320 | | | X | X | X | X | | |
| 0045090120 | | | X | X | X | X | | |
| 0045090260 | | | X | X | X | X | | |
| 0045280010 | | | X | X | X | X | | |
| 0045280030 | | | X | X | X | X | | |
| 0045280050 | | | X | X | X | X | | |
| 0045280060 | | | X | X | X | X | | |
| 0045280070 | | | X | X | X | X | | |

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0045280160 | | | X | X | X | X | | |
| 0045280170 | | | X | X | X | X | | |
| 0045280280 | | | X | X | X | X | | |
| 0045280440 | | | X | X | X | X | | |
| 0045280450 | | | X | X | X | X | | |
| 0045280540 | | | X | X | X | X | | |
| 0045280550 | | | X | X | X | X | | |
| 0045280560 | | | X | X | X | X | | |
| 0045280570 | | | X | X | X | X | | |
| 0045280590 | | | X | X | X | X | | |
| 0045300080 | | | X | X | X | X | | |
| 0045300270 | | | X | X | X | X | | |
| 0045300280 | | | X | X | X | X | | |
| 0045300290 | | | X | X | X | X | | |
| 0045300340 | | | X | X | X | X | | |
| 0045300360 | | | X | X | X | X | | |
| 0045300370 | | | X | X | X | X | | |
| 0045310010 | | | X | X | X | X | | |
| 0045300010 | | | X | X | X | X | | |
| 0045300020 | | | X | X | X | X | | |
| 0045300030 | | | X | X | X | X | | |
| 0045300040 | | | X | X | X | X | | |

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0045300070 | | | X | X | X | X | | |
| 0046050180 | | | | | | | | |
| 0148260090 | X | | X | X | X | X | | |
| 0148270010 | X | | | | | | | |
| 0148270060 | | | X | X | X | X | X | |
| 0148270170 | | | X | X | X | X | | |
| 0148270220 | | | X | X | X | X | | |
| 0148270240 | X | | X | X | X | X | X (only along edge of parking lot) | |
| 0148270290 | | | X | X | X | X | | |
| 0148270300 | | | X | X | X | X | | |
| 0148270310 | | | X | X | X | X | | |
| 0148270320 | | | X | X | X | X | | |
| 0148260010 | X | | | | | | | |
| 0148260050 | | | X | X | X | X | | |
| 0148260060 | X | | X | X | X | X | | |
| 0148260070 | | | X | X | X | X | | |
| 0148260080 | X | | X | X | X | X | | |
| 0148270330 | | | X | X | X | X | | |
| 0148270340 | X | | X | X | X | X | | |
| 0148280120 | | | X | X | X | X | | |
| 0148280130 | | | X | X | X | X | | |

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0148280140 | | | X | X | X | X | | |
| 0148280150 | | | X | X | X | X | | |
| 0148280290 | | | X | X | X | X | | |
| 0180010010 | | | X | X | X | X | | |
| 0180010020 | | | X | X | X | X | | |
| 0180010050 | | | X | X | X | X | | |
| 0180010070 | | | X | X | X | X | | |
| 0180010080 | | | X | X | X | X | | |
| 0180010090 | | | X | X | X | X | | |
| 0180010100 | | | X | X | X | X | | |
| 0180010120 | | | X | X | X | X | | |
| 0180070060 | | | X | X | X | X | | |
| 0180070070 | | | X | X | X | X | | |
| 0180110010 | | | X | X | X | X | | |
| 0180110020 | | | X | X | X | X | | |
| 0180110030 | | | X | X | X | X | | |
| 0180110040 | | | X | X | X | X | | |
| 0180110050 | | | X | X | X | X | | |
| 0180110080 | | | X | X | X | X | | |
| 0180120010 | | | X | X | X | X | | |
| 0180120050 | | | X | X | X | X | | |
| 0180120060 | | | X | X | X | X | | |

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0180120070 | | | X | X | X | X | | |
| 0180120080 | | | X | X | X | X | | |
| 0180120150 | | | X | X | X | X | | |
| 0180130050 | | | X | X | X | X | | |
| 0180130060 | | | X | X | X | X | | |
| 0180130070 | | | X | X | X | X | | |
| 0180130080 | | | X | X | X | X | | |
| 0180130100 | | | X | X | X | X | | |
| 0180130110 | | | X | X | X | X | | |
| 0180140020 | | | X | X | X | X | | |
| 0180140030 | | | X | X | X | X | | |
| 0180140040 | | | X | X | X | X | | |
| 0180140050 | | | X | X | X | X | | |
| 0180140060 | | | X | X | X | X | | |
| 0180140170 | | | X | X | X | X | | |
| 0180140180 | | | X | X | X | X | | |
| 0180140190 | | | X | X | X | X | | |
| 0180140290 | | | X | X | X | X | | |
| 0180160010 | | | X | X | X | X | | |
| 0180160020 | | | X | X | X | X | | |
| 0180160070 | | | X | X | X | X | | |
| 0180160180 | | | X | X | X | X | | |

| APN | Surveyors/Dates | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Monk & Assoc./GANDA[a] | Vollmar[b] | ICF/May 2004 | ICF/April & May 2005 | ICF/July & August 2007 | ICF/April 2009 | ICF/September 2009 | ICF/November 2010 |
| 0180160200 | | | X | X | X | X | | |
| 0180160220 | | | X | X | X | X | | |

[a] Monk/GANDA surveys conducted on April 17-18, June 3, and July 7, 2003 and on March 17, April 13, and May12, 2004.

[b] Vollmar surveys conducted on May 3-4 and August 15, 2000; late April and early May, 2001 and 2002; and April 6-8, 11-13, and 15 and June, 2005 for the Gentry-Suisun project.

List of Assessors Parcel Numbers in Biological Study Area and Survey Dates for Wildlife Species

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **North Connector[a]** | **Gentry Suisun[b]** | **Jameson Canyon[c]** | **ICF/April 2007 (shrimp assessment SR 12-E)** | **ICF/July 2007 (shrimp assessment throughout BSA)** | **ICF/July 2007 (VELB survey** | **ICF/July and Oct 2007 (CRLF site assessment)** | **ICF/September 2009 (bikepath)** | **ICF/November 2010 (FWS site visit)** |
| 0027260230 | | | | | X | X | | | |
| 0028692420 | | | | | X | X | | | |
| 0028750120 | | | | | X | X | | | |
| 0028750130 | | | | | X | X | | | |
| 0028750310 | | | | | X | X | | | |
| 0028792110 | | | | | X | X | | | |
| 0028792120 | | | | | X | X | | | |
| 0028792130 | | | | | X | X | | | |
| 0028792140 | | | | | X | X | | | |
| 0028792100 | | | | | X | X | | | |
| 0031301440 | | | | | X | X | | | |
| 0032010300 | | | | | X | X | | | |
| 0032010320 | | | | X | | X | | | |
| 0032010340 | | | | | X | X | | | |
| 0032010390 | | X | X | X | | X | | | X |
| 0032010460 | | | | | X | X | | | |
| 0032010470 | | | | | X | X | | | |
| 0032020140 | | X | X | X | | X | | | X |
| 0032020210 | | | | | X | X | | | |
| 0032020250 | | | | | X | X | | | |

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | North Connector[a] | Gentry Suisun[b] | Jameson Canyon[c] | ICF/April 2007 (shrimp assessment SR 12-E) | ICF/July 2007 (shrimp assessment throughout BSA) | ICF/July 2007 (VELB survey | ICF/July and Oct 2007 (CRLF site assessment) | ICF/September 2009 (bikepath) | ICF/November 2010 (FWS site visit) |
| 0032020290 | | | | X | | X | | | |
| 0032010140 | | | | | X | X | | | |
| 0032010170 | | | | | X | X | | | |
| 0032010190 | | X | | | X | X | | | |
| 0032020100 | | | | X | | | | | X |
| 0032010230 | | | | | X | X | | | X |
| 0032010240 | | | | X | | X | | | |
| 0032010280 | | | | | X | X | | | |
| 0045310180 | | | | | X | X | | | |
| 0045310390 | | | | | X | X | | | |
| 0045310430 | | | | | X | X | | | |
| 0045310580 | | | | | X | X | | | |
| 0045310600 | | | | | X | X | | | |
| 0045310650 | | | | | X | X | | | |
| 0045310660 | | | | | X | X | | | |
| 0045310860 | | | | | X | X | | | |
| 0045081320 | | | | | X | X | | | |
| 0045090120 | | | | | X | X | | | |
| 0045090260 | | | | | X | X | | | |
| 0045280010 | | | | | X | X | | | |
| 0045280030 | | | | | X | X | | | |

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | North Connector[a] | Gentry Suisun[b] | Jameson Canyon[c] | ICF/April 2007 (shrimp assessment SR 12-E) | ICF/July 2007 (shrimp assessment throughout BSA) | ICF/July 2007 (VELB survey | ICF/July and Oct 2007 (CRLF site assessment) | ICF/September 2009 (bikepath) | ICF/November 2010 (FWS site visit) |
| 0045280050 | | | | | X | X | | | |
| 0045280060 | | | | | X | X | | | |
| 0045280070 | | | | | X | X | | | |
| 0045280160 | | | | | X | X | X | | |
| 0045280170 | | | | | X | X | X | | |
| 0045280280 | | | | | X | X | X | | |
| 0045280440 | | | | | X | X | | | |
| 0045280450 | | | | | X | X | X | | |
| 0045280540 | | | | | X | X | | | |
| 0045280550 | | | | | X | X | | | |
| 0045280560 | | | | | X | X | | | |
| 0045280570 | | | | | X | X | | | |
| 0045280590 | | | | | X | X | | | |
| 0045300080 | | | | | X | X | | | |
| 0045300270 | | | | | X | X | | | |
| 0045300280 | | | | | X | X | | | |
| 0045300290 | | | | | X | X | | | |
| 0045300340 | | | | | X | X | | | |
| 0045300360 | | | | | X | X | | | |
| 0045300370 | | | | | X | X | | | |
| 0045310010 | | | | | X | X | | | |

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **North Connector[a]** | **Gentry Suisun[b]** | **Jameson Canyon[c]** | **ICF/April 2007 (shrimp assessment SR 12-E)** | **ICF/July 2007 (shrimp assessment throughout BSA)** | **ICF/July 2007 (VELB survey** | **ICF/July and Oct 2007 (CRLF site assessment)** | **ICF/September 2009 (bikepath)** | **ICF/November 2010 (FWS site visit)** |
| 0045300010 | | | | | X | X | | | |
| 0045300020 | | | | | X | X | | | |
| 0045300030 | | | | | X | X | | | |
| 0045300040 | | | | | X | X | | | |
| 0045300070 | | | | | X | X | | | |
| 0046050180 | | | | | | | | | |
| 0148260090 | X | | X | | X | X | | | |
| 0148270010 | X | | | | | X | | | |
| 0148270060 | | | | | X | X | | X | |
| 0148270170 | | | | | X | X | | | |
| 0148270220 | | | | | X | X | | | |
| 0148270240 | X | | | | X | X | | X (only along edge of parking lot) | |
| 0148270290 | | | | | X | X | | | |
| 0148270300 | | | | | X | X | | | |
| 0148270310 | | | | | X | X | | | |
| 0148270320 | | | | | X | X | | | |
| 0148260010 | X | | | | | | | | |
| 0148260050 | | | | | X | X | X | | |
| 0148260060 | X | | | | X | X | X | | |
| 0148260070 | | | | | X | X | | | |

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | North Connector[a] | Gentry Suisun[b] | Jameson Canyon[c] | ICF/April 2007 (shrimp assessment SR 12-E) | ICF/July 2007 (shrimp assessment throughout BSA) | ICF/July 2007 (VELB survey | ICF/July and Oct 2007 (CRLF site assessment) | ICF/September 2009 (bikepath) | ICF/November 2010 (FWS site visit) |
| 0148260080 | X | | X | | X | X | X | | X |
| 0148270330 | | | | | X | X | | | |
| 0148270340 | X | | | | X | X | | | |
| 0148280120 | | | | | X | X | | | |
| 0148280130 | | | | | X | X | | | |
| 0148280140 | | | | | X | X | | | |
| 0148280150 | | | | | X | X | | | |
| 0148280290 | | | | | X | X | | | |
| 0180010010 | | | | | X | X | | | |
| 0180010020 | | | | | X | X | | | |
| 0180010050 | | | | | X | X | | | |
| 0180010070 | | | | | X | X | | | |
| 0180010080 | | | | | X | X | | | |
| 0180010090 | | | | | X | X | | | |
| 0180010100 | | | | | X | X | | | X |
| 0180010120 | | | | | X | X | X | | |
| 0180070060 | | | | | X | X | | | |
| 0180070070 | | | | | X | X | | | |
| 0180110010 | | | | | X | X | | | |
| 0180110020 | | | | | X | X | | | |
| 0180110030 | | | | | X | X | | | |

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | North Connector[a] | Gentry Suisun[b] | Jameson Canyon[c] | ICF/April 2007 (shrimp assessment SR 12-E) | ICF/July 2007 (shrimp assessment throughout BSA) | ICF/July 2007 (VELB survey | ICF/July and Oct 2007 (CRLF site assessment) | ICF/September 2009 (bikepath) | ICF/November 2010 (FWS site visit) |
| 0180110040 | | | | | X | X | | | |
| 0180110050 | | | | | X | X | | | |
| 0180110080 | | | | | X | X | | | |
| 0180120010 | | | | | X | X | | | |
| 0180120050 | | | | | X | X | | | |
| 0180120060 | | | | | X | X | | | |
| 0180120070 | | | | | X | X | | | |
| 0180120080 | | | | | X | X | | | |
| 0180120150 | | | | | X | X | | | |
| 0180130050 | | | | | X | X | | | |
| 0180130060 | | | | | X | X | | | |
| 0180130070 | | | | | X | X | | | |
| 0180130080 | | | | | X | X | | | |
| 0180130100 | | | | | X | X | | | |
| 0180130110 | | | | | X | X | | | |
| 0180140020 | | | | | X | X | | | |
| 0180140030 | | | | | X | X | | | |
| 0180140040 | | | | | X | X | | | |
| 0180140050 | | | | | X | X | | | |
| 0180140060 | | | | | X | X | | | |
| 0180140170 | | | | | X | X | | | |

| APN | Surveyors/Dates | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **North Connector[a]** | **Gentry Suisun[b]** | **Jameson Canyon[c]** | **ICF/April 2007 (shrimp assessment SR 12-E)** | **ICF/July 2007 (shrimp assessment throughout BSA)** | **ICF/July 2007 (VELB survey** | **ICF/July and Oct 2007 (CRLF site assessment)** | **ICF/September 2009 (bikepath)** | **ICF/November 2010 (FWS site visit)** |
| 0180140180 | | | | | X | X | | | |
| 0180140190 | | | | | X | X | | | |
| 0180140290 | | | | | X | X | | | |
| 0180160010 | | | | | X | X | | | |
| 0180160020 | | | | | X | X | | | |
| 0180160070 | | | | | X | X | X | | |
| 0180160180 | | | | | X | X | | | |
| 0180160200 | | | | | X | X | X | | |
| 0180160220 | | | | | X | X | | | |

[a] North Connector callippe larval host plant surveys conducted in March 2004, did not conduct surveys for hilltop habitat or adult nectar plants; CRLF protocol-level surveys conducted May 2003, and March and May 2004..

[b] Gentry Suisun project conducted protocol-levels surveys for fairy shrimp (1999, 2000, 2002, and 2005) and one season of aquatic dip net surveys for CTS larva (1999-2000).

c Jameson Canyon shrimp surveys conducted in W-13, W-14, W-15, and W-149 in 2006 (dry season) and 2006-2007 (wet season).