
Section 4-4

Biological Resources

This section provides information on biological resources located in the study area. A discussion of federal, state, and local laws, policies, and regulations that influence biological resources is also presented in this section. Impacts on biological resources that may result from the Proposed Project are identified, and mitigation measures to avoid, minimize, and compensate for significant impacts on biological resources are described.

4-4.1 STUDY METHODS

Methods used to identify and evaluate biological resources in the study area consisted of a review of existing documentation and multiple field surveys.

4-4.1.1 Study Area Defined

For the purposes of this EIR, the biological study area consists of two separate project sites—the Alamo site and the Ulatis Creek site, collectively referred to as Project sites. The study area for evaluating biological resources encompasses the entire Project sites and includes: up to an additional 100 feet from the Project sites to look for elderberry shrubs (*Sambucus* sp.) host plant for the federally threatened valley elderberry longhorn beetle [*Desmocerus californicus dimorphus*]; up to 250 feet from the Project sites to look for seasonal wetlands that could provide habitat for federally listed vernal pool branchiopods (i.e., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]); and to the edge of the ordinary high water mark (OHWM) for Alamo and Ulatis Creeks.

4-4.1.2 Resources Reviewed

Prior to conducting field surveys, available information regarding biological resources on or near the study area was gathered and reviewed, including information on special-status plant and wildlife species known to occur or with potential to occur on the Alamo and Ulatis sites. The following is a list of data sources reviewed, including several technical documents prepared for the Proposed Project (on file at the City's Public Works Department).

- California Natural Diversity Database (CNDDDB) records for the Mt. Vaca and Fairfield North USGS 7.5-minute quadrangles (CNDDDB 2009);
- Federally threatened or endangered species list from the USFWS website (USFWS 2008, Appendix G),
- Species list from NMFS of federally listed species and designated and proposed critical habitat occurring downstream from the study area (NMFS 2009, Appendix G);

- California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2008, Appendix G);
- California Cooperative Anadromous Fish and Habitat Data Program - Steelhead Distribution Database for California (DFG 2007)
- Aerial photographs and topographic maps of the study area;
- Preliminary Biological Resources Memorandum, Three Detention Basin Projects (Sites A, B, and C), City of Vacaville, Solano County, California (NRM Environmental Consulting 2007);
- Solano County Water Agency Solano Multispecies Habitat Conservation Plan, Version 2.2 Final Administrative Draft (LSA 2007);
- California Red-Legged Frog Site Assessment, Alamo Creek Detention Basin, Vacaville, California, FEMA 1628-DR-CA, HMGP # 1628-31-14 (FEMA 2008);
- California Red-Legged Frog Survey Report, Alamo Creek Detention Basin, Vacaville, California, FEMA 1628-DR-CA, HMGP # 1628-31-14 (FEMA 2009a);
- Alamo Creek Detention Basin Project - Elderberry Shrub Stem Count Letter Report, FEMA 1628-DR-CA, HMGP # 1628-31-14 (FEMA 2009b);
- Elderberry Shrub Survey for the Ulatis Creek Detention Basin Project, Solano County, California (Area West Environmental [AWE] 2009);
- Biological Assessment for USFWS, Alamo Creek Detention Basin, FEMA 1628-DR-CA HMGP # 1628-31-14 (FEMA 2009c);
- Response letter from Susan Moore (USFWS Field Supervisor, Sacramento Fish and Wildlife Office) regarding FEMA's October 13, 2009 request to initiate formal Section 7 consultation on the Alamo Creek Detention Basin (hereinafter referred to as USFWS Biological Opinion) (USFWS 2010);
- Biological Assessment for NMFS, Alamo Creek Detention Basin, FEMA 1628-DR-CA HMGP #1628-31-14 (FEMA 2010); and
- Response letter from Rodney McInnis (NMFS Regional Administrator, Southwest Region) regarding FEMA's January 22, 2010 request to initiate formal consultation for the Alamo Detention Basin. August 18, 2010 (NMFS 2010).

4-4.1.3 Field Surveys

Biological surveys were conducted within the study area in 2008 and 2009 by AWE. Additionally, URS conducted surveys at the Alamo site in 2008. A list of surveys performed including dates, location, and personnel are presented below in Table 4-4.1.

The purpose of the biological resources field surveys was to:

- characterize biological communities and their associated wildlife habitat uses;
- document common and special-status plant and wildlife species;
- identify potentially jurisdictional waters of the U.S., including wetlands, that could be subject to state and federal regulations; and
- identify native and heritage trees.

Lists of plant and wildlife species observed at the Alamo and Ulatis sites during the 2008 and 2009 field surveys are provided in Appendix F. Methods used to document special-status species and waters of the U.S., including wetlands, are described below.

Table 4-4.1. Biological Resource Surveys Conducted in the Study Area

Survey Dates	Type of Survey	Area Surveyed	Personnel
April 15 and 16, 2008	California red-legged frog site assessment	Within 1 mile of Alamo site	Melissa Newman, Michael Carbiener, and Gilda Barboza (URS)
May 6–August 13, 2008	California red-legged frog protocol surveys	Alamo site and suitable habitat within 1 mile (which includes the Ulatis site)	Melissa Newman, Michael Carbiener, Gilda Barboza, Jonathan Stead, Derek Jansen, Matthew Bettelheim, Jolie Henricks, and Lorena Solorzano-Vincent (URS)
April 24–25, May 19–20, and June 11, 2008	Botanical surveys for federally protected plant species	Alamo site	Julie Garren and Melissa Newman (URS)
June 10–11, July 3, and October 15–16, 2008	Elderberry shrub stem count surveys	Alamo site	Katherine Caldwell, Julie Garren, Ling He, Justin Witfield, Melissa Newman, and Mark Wilson (URS)
October 22, 2008	Reconnaissance-level survey	Alamo and Ulatis sites	Becky Rozumowicz, Angela Alcalá, and Mary Bailey (AWE)
October 22, 2008	Wetland delineation	Alamo and Ulatis sites	Mary Bailey (AWE)
October 22, 2008	Botanical survey	Alamo and Ulatis sites	Mary Bailey (AWE)
April 13, 2009	Botanical survey	Alamo and Ulatis sites	Mary Bailey (AWE)
April 13, 2009	Fish habitat assessment	Ulatis site	Angela Alcalá (AWE)
April 27 and 29, and May 7, 2009	Elderberry shrub stem count surveys	Ulatis site	Angela Alcalá, Mary Bailey, and Leslie Peacock (AWE)
April 29, 2009	Data points for wetland delineation—requested by Corps	Ulatis site	Mary Bailey (AWE)
May 7, 2009	Field review with Corps	Alamo and Ulatis sites	Becky Rozumowicz and Brent Helm (AWE); Mike Finan and Krystal Bell (Corps)

4-4.1.3.1 Special-Status Plant Surveys

Within the study area, several protocol-level botanical surveys were conducted at the Alamo and Ulatis sites. Table 4-4.1 lists the survey dates, personnel, and location for each type of survey conducted. At the Alamo site, botanical surveys were conducted by URS on April 24–25, May 19–20, and June 11, 2008, to look for federally listed plant species. On October 22, 2008 and April 13, 2009, AWE botanist Mary Bailey conducted additional botanical surveys at the Alamo site to look for all special-status plants. Ms. Bailey also conducted botanical surveys for special-status plants at the Ulatis site on October 22, 2008 and April 13, 2009. ~~within the entire study area to document special-status plant species on both the Alamo and Ulatis sites.~~ During the AWE surveys, Ms. Bailey walked meandering transects through the study area and all plants were identified to the level necessary to determine whether they qualified as special-status plants or were plant species with unusual or significant range extensions.

4-4.1.3.2 Special-Status Wildlife Surveys

On October 22, 2008, AWE wildlife biologist Angela Alcala conducted a habitat-based field assessment to determine the presence, distribution, and amount of habitat capable of supporting special-status wildlife species with potential to occur in the study area. During the survey, each habitat type was noted and evaluated for its potential to support special-status species. No focused searches for nests of migratory birds and raptors were conducted during the survey; however, the biologist identified areas suitable for nesting that would require preconstruction surveys.

In addition to the reconnaissance-level survey, several species-focused surveys and habitat assessments have been conducted within the study area for California red-legged frog, valley elderberry longhorn beetle, and special-status fish. Table 4-4.1 lists the survey dates, location, and personnel who conducted the survey. A brief description of survey methods is provided below for each species.

California Red-Legged Frog

Surveys for federally protected species were conducted by URS (FEMA's consultant) for the Alamo site. URS conducted a protocol-level site assessment and surveys for the federally threatened California red-legged frog within the Alamo site and within a 1-mile radius of the site. The site assessment and surveys were conducted in accordance with the protocol described in the USFWS' *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005). The California red-legged frog site assessment determined that suitable California red-legged frog breeding and upland habitat was present within the Alamo site and within a 1-mile radius of the site. A site assessment report was prepared by URS and submitted to USFWS by FEMA on September 24, 2008 (FEMA 2008). Based on the presence of suitable habitat, URS conducted a total of five night surveys and three day surveys for California red-legged frog between May 6, 2008, and August 13, 2008 (Table 4-4.1), within all potential breeding habitats identified in the site assessment. These areas included eight creek sections within portions of Alamo Creek, Ulatis Creek, Encinosa Creek, and their tributaries, and one reservoir. A detailed description of survey methods (including survey locations) is provided in a letter report submitted to USFWS by FEMA on March 9, 2009 (FEMA 2009a, report on file at the City of Vacaville Public Works office). Although the California red-legged frog site assessment and surveys were specific to the Alamo site, the survey areas for both the site assessment and protocol surveys overlapped with the entire Ulatis Creek site.

Valley Elderberry Longhorn Beetle

Additional wildlife surveys conducted to support FEMA funding included an elderberry shrub stem count survey to locate potential habitat for the federally threatened valley elderberry longhorn beetle within the Alamo site and within 100 feet of the site. Elderberry shrub surveys were conducted by URS between June 10 and October 16, 2008 (Table 4-4.1), in accordance with the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). A detailed description of survey methods for the elderberry shrub surveys is provided in a letter report submitted to USFWS by FEMA on May 14, 2009 (FEMA 2009b, report on file at the City of Vacaville Public Works office).

Elderberry shrub surveys were also conducted for the Ulatis site by AWE biologists between April 27 and May 7, 2009. These surveys were conducted in accordance with the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). A detailed description of survey methods for the elderberry shrub surveys is presented in a letter report submitted to the City on June 8, 2009 (AWE 2009, report on file at the City of Vacaville Public Works office).

Special-Status Fish

During species focused surveys (described above for California red-legged frog and valley elderberry longhorn beetle) of the Alamo site and vicinity, URS (FEMA's consultant) also evaluated the general habitat characteristics of the study area to determine if Alamo Creek could provide habitat for special-status fish under the jurisdiction of NMFS. On February 5, 2009, a site visit was conducted on the Alamo site to evaluate potential project effects to special-status fish under the jurisdiction of NMFS. In attendance were URS biologists Lorena Solorzano-Vincent and Melissa Newman, Madelyn Martinez and Rick Bush (NMFS), and James Loomis, Deborah Faaborg, and Tawnia Skow (City).

To document current habitat conditions within Ulatis Creek at the Ulatis site, Ms. Alcalá conducted a site visit on April 13, 2009. In addition to the site visit, available fisheries data for Ulatis Creek and Alamo Creek was obtained for the Central Valley steelhead and Central Valley Chinook salmon from the Solano County Water Agency, who is preparing the Solano County Multi-Species Conservation Plan, and from NMFS and DFG websites.

4-4.1.3.3 Waters of the U.S., including Wetlands

A delineation of waters of the U.S., including wetlands, was conducted by AWE biologists, Mary Bailey and Becky Rozumowicz, at the Alamo and Ulatis sites. The Project sites were investigated by all-terrain vehicle (ATV) and on foot. The purpose of the field investigations was to gather data on the vegetation, soils, and hydrology within the Project sites to determine what areas meet the Corps' three mandatory technical criteria for a wetland (i.e., exhibited positive indicators of wetland vegetation, soils, and hydrology), or would qualify as other waters of the U.S.

Wetlands were delineated using the 1987 *Corps of Engineers' Wetland Delineation Manual* (Environmental Laboratory 1987). An area must meet the criteria for hydrophytic vegetation, hydric soils, and wetland hydrology to be identified as a potential wetland under Corps jurisdiction. Other waters of the U.S. were delineated based on the location of the OHWM.

On May 7, 2009, Mike Finan and Krystal Bell with the Corps conducted a field review with AWE biologists Becky Rozumowicz and Brent Helm at both the Alamo and Ulatis sites. The Corps concurred with the location and extent of waters of the U.S., including wetlands, in a preliminary jurisdictional determination letter dated June 11, 2009.

4-4.2 ENVIRONMENTAL SETTING

This section describes the regional setting and existing conditions related to biological resources in the study area including a description of biological community types found at each of the Project sites.

4-4.2.1 Regional Setting

Regionally, the study area is situated within the northern portion of the Vaca Valley just northwest of the City's urban boundaries. This region is characterized as a topographically low area bordered by the Vaca Mountains to the west and English Hills to the east. The Vaca Valley supports primarily agriculture (orchards, vineyards, and row crops) interspersed with small ranches. Several seasonal and perennial drainages flow through this region including Alamo Creek and Ulatis Creek.

4-4.2.2 Existing Biological Conditions in the Study Area

The study area is located within an agricultural setting. An abandoned orchard occupies the majority of the Alamo site. A small area of non-native annual grassland is present in the northwest corner of the Alamo site. Alamo Creek, a seasonal drainage, flows west to east along the southern border of the Alamo site and supports mature riparian woodland. An area adjacent to Alamo Creek at the southeastern corner of the site is disturbed and supports ornamental trees, remnants of old equipment, and debris piles.

The Ulatis Creek site supports predominantly non-native annual grassland. Ulatis Creek, a seasonal drainage, flows west to east along the northern boundary of the site and supports mature riparian woodland. Three existing electrical towers are present on the Ulatis site, two in the central portion of the site and one at the southwest corner of the site.

Aquatic features delineated in the study area include Alamo Creek, Ulatis Creek and three drainages associated with Ulatis Creek, and one seasonal wetland along Ulatis Creek. No other aquatic features that could qualify as waters of the U.S. or state were identified within the study area. Numerous elderberry shrubs, host plant for the federally threatened valley elderberry longhorn beetle, are present along Alamo Creek and Ulatis Creek in the study area.

Upland habitat types, aquatic features, and elderberry shrubs within the study area are shown on Figures 4-4.1 and 4-4.2 and described separately below for the Alamo site and for the Ulatis site. Representative photographs of the Alamo site and Ulatis site are provided as Figures 4-4.3, 4-4.4, 4-4.5, and 4-4.6 respectively.

4-4.2.2.1 Alamo Site

Five biological community types are present within the Alamo site: non-native annual grassland, orchard, developed, riparian, and seasonal drainage. Each of these community types is described below.

Non-Native Annual Grassland

Non-native annual grassland habitat occurs in the northwestern portion of the Alamo site. Non-native grasses also occur within the understory of riparian habitat associated with Alamo Creek and within the onsite orchard. Vegetation within this community type consists primarily of annual grasses and herbaceous plant species. These include, but are not limited to, hare barley (*Hordeum murinum* ssp. *leporinum*), wild oats (*Avena* sp.), filaree (*Erodium* spp.), red brome (*Bromus madritensis* ssp. *rubens*), field mustard (*Brassica rapa* ssp. *syvestris*), soft chess (*Bromus hordeaceus*), Italian rye (*Lolium multiflorum*), bur clover (*Medicago polymorpha*), willowherb (*Epilobium brachycarpum*), Spanish lotus (*Lotus purshianus*), rose clover (*Trifolium hirtum*), vetch (*Vicia* sp.), yellow star-thistle (*Centaurea solstitialis*), narrow-leaved milkweed (*Asclepias fascicularis*), bindweed (*Convolvulus arvensis*), salsify (*Tragopogon porrifolius*), wild radish (*Raphanus sativus*), and prickly lettuce (*Lactuca serriola*).

Although non-native annual grassland habitat in the Alamo site has been subject to past agricultural disturbances, this area provides habitat for several wildlife species. Birds such as western meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*), lesser goldfinch (*Carduelis psaltria*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), and other common species forage and breed in grasslands. Raptor species including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), Swainson's hawk (*Buteo swainsoni*), northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), American kestrel (*Falco sparverius*), and great horned owl (*Bubo virginianus*) may utilize open grasslands in the study area for foraging. Common reptiles that

could utilize these areas include western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), southern alligator lizard (*Gerrhonotus multicarinatus*), and common garter snake (*Thamnophis sirtalis*). Common mammals such as California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), broad-footed mole (*Scapanus latimanus*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), black-tailed jackrabbit (*Lepus californicus*), California vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), and deer mouse (*Peromyscus maniculatus*) may also utilize annual grassland communities.

Orchard

A majority of the Alamo site is planted as a mixed fruit tree orchard and is currently untended. Fruit trees include apricot (*Prunus armeniaca*), cherry plum (*Prunus cerasifera*), and European plum (*Prunus domestica*). A row of non-native walnut trees (*Juglans* sp.) occurs between the orchard and the non-native annual grassland to the north and east. Vegetation within the understory of the orchard consists of annual grasses and herbaceous plant species, typical of the non-native annual grassland community type described above. In general, orchards are heavily maintained and do not provide high-quality habitat for wildlife. Since the purchase of the property, the City has continued to disk under the orchard trees and along the project boundary for fire hazard reduction. Orchard trees can provide perching sites, resting areas, and forage opportunities for many wildlife species that breed or migrate through the adjacent annual grassland and riparian communities. Because the orchard trees onsite are untended, they may also provide potential nesting sites for birds and raptors.

Developed

Three developed areas are present along the western boundary and at the southeast corner of the Alamo site. These areas supported farm buildings and equipment but are currently vacant and disturbed with minimal ground vegetation. Several trees are present within these areas including native valley oaks (*Quercus lobata*), non-native walnut, and tree of heaven (*Alianthus altissima*).

Developed areas generally provide limited value for wildlife because of disturbances from human activity; however, several large trees are present within the developed areas at the Alamo site, which could provide nesting and perching sites for migratory birds and raptors.

Riparian

Riparian habitat on the Alamo site consists of mature riparian trees and shrubs along the banks of Alamo Creek along the southern boundary of the site. The upper story is composed of typical riparian woody trees such as California walnut (*Juglans californica*), valley oak, edible fig (*Ficus carica*), bigleaf maple (*Acer macrophyllum*), box alder (*Acer negundo*), white alder (*Alnus rhombifolia*), Fremont's cottonwood (*Populus fremontii*), red willow (*Salix laevigata*), and arroyo willow (*Salix lasiolepis*). In the ecotone between the riparian corridor and non-native annual grassland, additional woody species include tree of heaven, California buckeye (*Aesculus californica*), California bay (*Umbellularia californica*), blue elderberry (*Sambucus mexicana*), and interior live oak (*Quercus wislizenii* var. *wislizenii*).

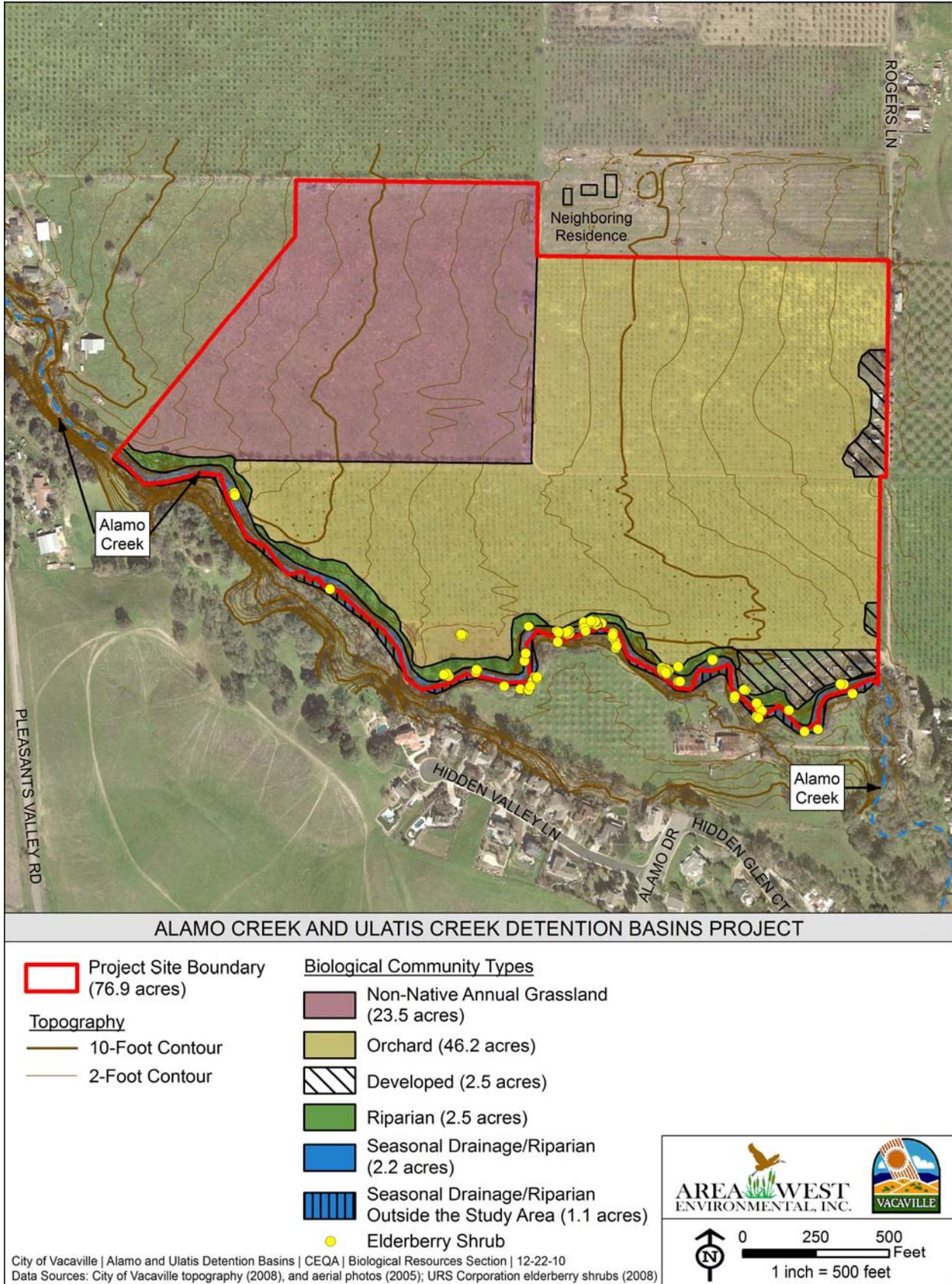
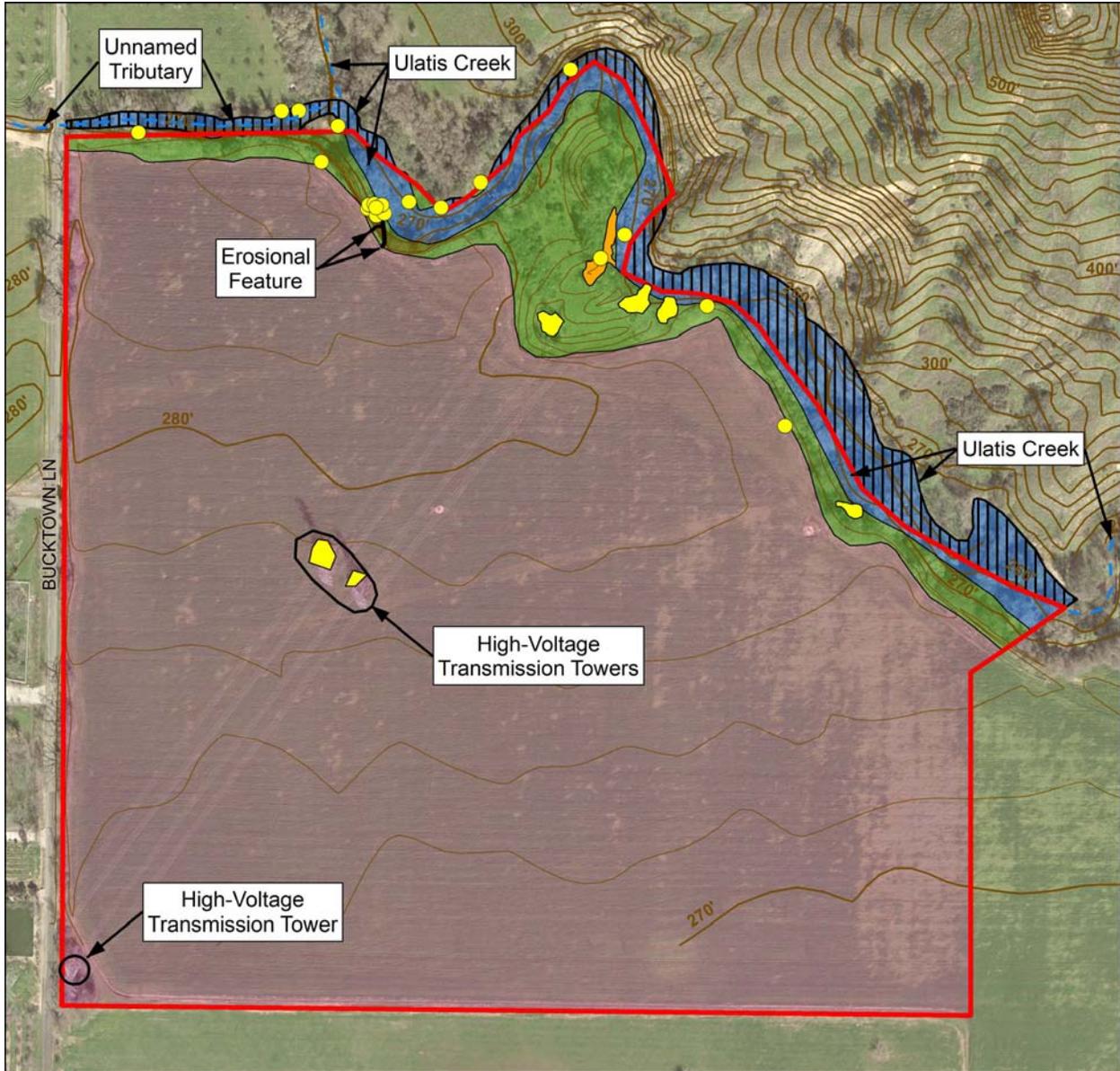


Figure 4-4.1. Biological Community Types within the Alamo Site



ALAMO CREEK AND ULATIS CREEK DETENTION BASINS PROJECT

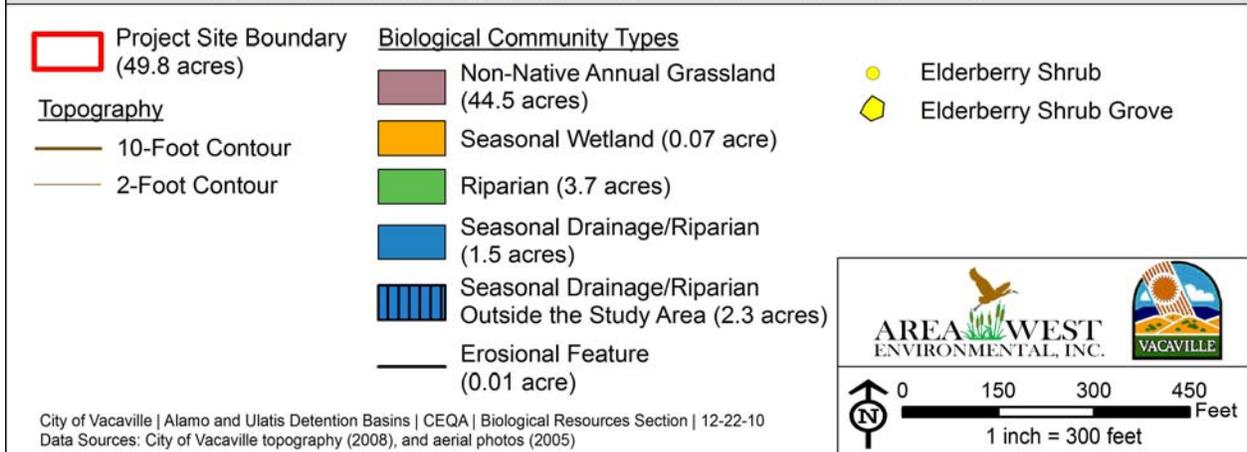


Figure 4-4.2. Biological Community Types within the Ulatis Site



Photo 1. Fallow orchard



Photo 2. Non-native annual grassland

Figure 4-4.3 Alamo Site Representative Photographs



Photo 3. Riparian habitat along Alamo Creek (in background)



Photo 4. Alamo Creek channel

Figure 4-4.4 Alamo Site Representative Photographs



Photo 1. Non-native annual grassland

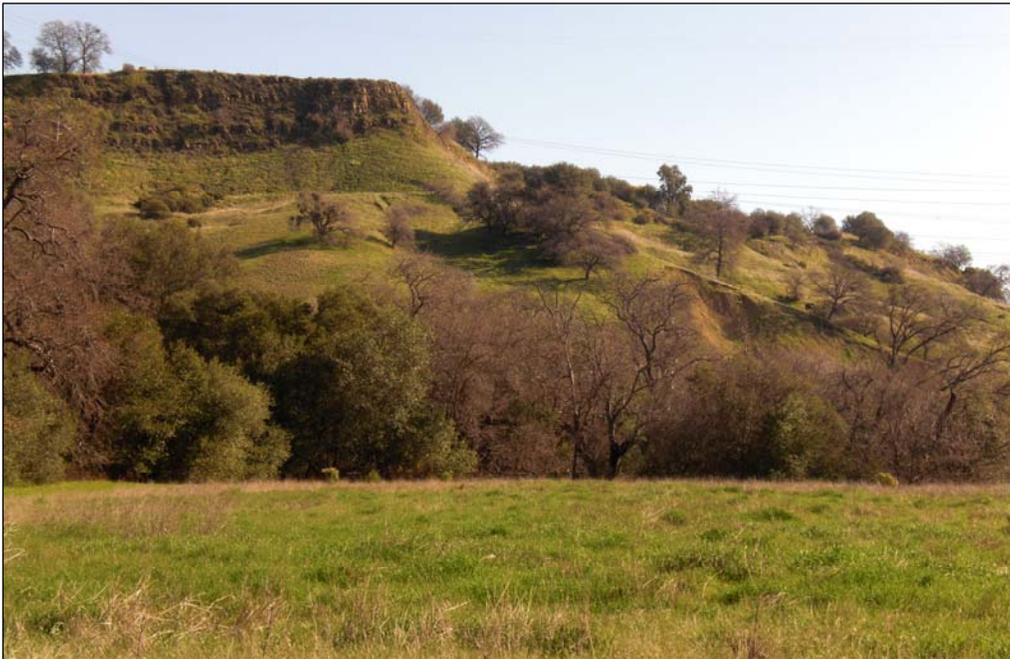


Photo 2. Riparian habitat along Ulatis Creek (in background)

Figure 4-4.5 Ulatis Site Representative Photographs



Photo 3. Ulatis Creek channel



Photo 4. Beaver dam and in-channel pool

Figure 4-4.6 Ulatis Site Representative Photographs

Canopy cover approaches or exceeds 100% throughout much of the riparian habitat. The woody understory includes California rose (*Rosa californica*), coyote brush (*Baccharis pilularis*), and poison-oak (*Toxicodendron diversilobum*). Himalayan blackberries (*Rubus discolor*) form dense groundcover in some portions of the riparian habitat and California wild grape (*Vitis californica*) occurs sporadically throughout. Ground-level vegetation is dominated by upland plant species and includes grasses such as hare barley, wild oats, ripgut brome (*Bromus diandrus*), dogtail grass (*Cynosurus echinatus*), soft chess, and smilgrass (*Piptatherum miliaceum*). Herbaceous understory species include sweet fennel (*Foeniculum vulgare*), mugwort (*Artemisia douglasiana*), bull thistle (*Cirsium vulgare*), horsetweed (*Conyza sp.*), horehound (*Marrubium vulgare*), pitcher sage (*Lepechinia calycina*), cocklebur (*Xanthium strumarium*), and Indian hemp (*Apocynum cannabinum*).

Because the vegetation is diverse and well developed, riparian communities provide high-value habitat for many wildlife species. The multilayered riparian community provides escape cover, forage, and nesting opportunities for wildlife. Common wildlife species normally found in riparian communities include acorn woodpecker (*Melanerpes formicivorus*), downy woodpecker (*Picoides pubescens*), oak titmouse (*Baeolophus inornatus*), bushtit (*Psaltriparus minimus*), spotted towhee (*Pipilo maculatus*), black phoebe (*Sayornis nigricans*), American robin (*Turdus migratorius*), American goldfinch (*Carduelis tristis*), northern mockingbird (*Turdus migratorius*), red-tailed hawk, great horned owl, red-shouldered hawk, and American kestrel.

Portions of the riparian woodland in the study area would be considered a jurisdictional wetland by the Corps and the RWQCB, as well as jurisdictional under Section 1600 of the Fish and Game Code by the DFG.

Seasonal Drainage

Alamo Creek is a seasonal drainage that flows west to east along the southern boundary of the Alamo site. Alamo Creek flows during winter and spring months. There is a low-lying area within the creek channel that may hold water into summer approximately midway through the site. Substrate within the creek channel consists of sand/gravel. A distinct OHWM is present within the “V”-shaped creek channel.

Vegetation within Alamo Creek varies from none at the bottom of the channel to denser areas of vegetation above the channel bed and includes vine species such as Himalayan blackberry and periwinkle (*Vinca major*), and herbaceous species such as prickly lettuce, nutsedge (*Cyperus eragrostis*), and bulrush (*Scirpus microcarpus*).

Seasonal drainages provide habitat for a variety of wildlife. Vegetation growing along the edges of creeks provides foraging and refuge habitat for amphibians, reptiles, and mammals occupying the open-water and adjacent grassland habitats. Birds such as herons and belted kingfishers (*Ceryle alcyon*) forage in these communities, primarily along the water’s edge. Many species of insectivorous birds, including white-throated swift (*Aeronautes saxatalis*), barn swallow (*Hirundo rustica*), cliff swallow (*Petrochelidon pyrrhonota*), black phoebe (*Sayornis nigricans*), and ash-throated flycatcher (*Myiarchus cinerascens*), catch their prey over open water.

On the Alamo site, 3.294 acres of seasonal drainage habitat (Alamo Creek) were determined to be potentially jurisdictional by the Corps. Alamo Creek in the study area would also be considered jurisdictional by RWQCB and would be regulated under Section 1600 of the Fish and Game Code by DFG.

4-4.2.2.2 Ulatis Creek Site

Four biological community types are present within the Ulatis Creek site: non-native annual grassland, riparian, seasonal drainage, and seasonal wetlands. Each of these community types is described below.

Non-Native Annual Grassland

A majority of the Ulatis Creek site supports non-native annual grassland. Non-native grasses also occur within the understory of riparian habitat associated with Ulatis Creek. Vegetation within this community type consists primarily of annual grasses and herbaceous plant species. Dominant plant species include hare barley, wild oats, filaree, field mustard, soft chess, Italian rye, bur clover, willowherb, Spanish lotus, rose clover, vetch, bindweed, wild radish, bristly oxtongue (*Picris echioides*), cultivated wheat (*Triticum aestivum*), prickly lettuce, yellow star-thistle, chicory (*Cichorium intybus*), and fluellin (*Kicksia elatine*). A row of native and non-native trees, including valley oak, Oregon ash (*Fraxinus latifolia*), and non-native walnut, borders the annual grassland habitat along the western boundary of the Ulatis site adjacent to Bucktown Lane.

Wildlife species associated with non-native annual grassland habitat within the Ulatis site are similar to those described above for the Alamo site.

Riparian

Riparian habitat on the Ulatis Creek site consists of mature riparian trees and shrubs along the banks of Ulatis Creek, which flows along the northern boundary of the site. The upper story is composed of typical riparian woody trees such as California walnut, valley oak, Oregon ash, box alder, Fremont's cottonwood, red willow, and arroyo willow. In the ecotone between the riparian corridor and non-native annual grassland, additional woody species include California buckeye, edible fig, California bay, and ornamental pistachio (*Pistachia chinensis*). Canopy cover approaches or exceeds 100% throughout much of the riparian habitat. The woody understory includes California rose, coyote brush, and poison oak. Himalayan blackberries or periwinkle form dense groundcover in some portions of the riparian habitat, and California wild grape occurs sporadically throughout.

Ground-level vegetation is dominated by upland plant species that includes grasses such as hare barley, wild oats, ripgut brome, dogtail grass, soft chess, and smilgrass. Herbaceous species include sweet fennel, mugwort, bull thistle, Canadian horseweed, cocklebur, petty spurge (*Euphorbia peplus*), poison hemlock (*Conium maculatum*), California pipevine (*Aristolochia californica*), fragrant cudweed (*Gnaphalium canescens* ssp. *beneolens*), and horsetail.

Wildlife species associated with riparian habitat in the Ulatis site are similar to those described above for the Alamo site.

Portions of the riparian woodland in the study area would be considered a jurisdictional wetland by the Corps and RWQCB, as well as jurisdictional under Section 1600 of the Fish and Game Code by DFG.

Seasonal Drainage

Four seasonal drainages occur on the Ulatis site—Ulatis Creek, an unnamed tributary to Ulatis Creek, and two erosional features that drain agricultural field runoff into Ulatis Creek.

Ulatis Creek is a seasonal drainage that flows following storm events and flows for a minimum of 3 months during normal rainfall years; however, several portions of the drainage may hold water year round. An unnamed tributary enters Ulatis Creek from the east and flows from the Ulatis site boundary at

Bucktown Lane toward the east for approximately 500 feet before entering Ulatis Creek. Vegetation within Ulatis Creek and the unnamed tributary varies from none within the low-flow channel to dense above the low-flow channel and includes vine species such as Himalayan blackberry and periwinkle, and herbaceous species such as hard-stemmed tule rush (*Scirpus acutus*), bitter-cress (*Cardamine oligosperma*), sneezeweed (*Helenium puberulum*), spearmint (*Mentha spicata*), deer grass (*Muhlenbergia rigens*), rabbits-foot grass (*Polypogon monspeliensis*), giant reed grass (*Arundo donax*), nutsedge, bulrush, cocklebur, short rush (*Juncus effusus* var. *exiguus*), and mosquito fern (*Azolla filiculoides*).

The two erosional features are adjacent to Ulatis Creek in the western half of the Ulatis site. These drainages carry seasonal stormwater runoff downslope to Ulatis Creek from the adjacent annual grassland and are limited to flows of short duration. Vegetation within the two erosional features consists of upland species dominated by hare barley, wild oats, and ripgut brome.

Wildlife species associated with seasonal drainage habitat in the Ulatis site are similar to those described above for the Alamo site.

On the Ulatis site, 3.807 acres of seasonal drainages (consisting of Ulatis Creek, an unnamed tributary, and two erosional features) were determined to be potentially jurisdictional by the Corps. These seasonal drainages would also be considered jurisdictional by RWQCB and would may be regulated under Section 1600 of the Fish and Game Code by DFG.

Seasonal Wetland

One seasonal wetland is present within a heavily wooded area along the southern edge of Ulatis Creek in the central portion of the Ulatis site. This seasonal wetland had damp soil but did not contain standing water or saturated soils during an April 27, 2009, site visit. The dominant vegetation within this seasonal wetland was valley sedge (*Carex barbara*).

The seasonal wetland within the Ulatis site occurs along the edge of annual grassland and provides similar habitat value for wildlife as described above for non-native annual grassland.

On the Ulatis site, 0.066 acre of seasonal wetland was determined to be potentially jurisdictional by the Corps and would also be considered jurisdictional by RWQCB.

4-4.3 REGULATORY SETTING

This section summarizes the federal and state regulations that protect special-status species; waters of the U.S., including wetlands; and wetland habitats. This section also discusses pertinent City of Vacaville General Plan goals, ordinances, and policies relating to the protection and preservation of biological resources (City of Vacaville 1990).

4-4.3.1 Special-Status Species Protection

The following regulations pertain to special-status species or habitats in the study area.

4-4.3.1.1 Federal Endangered Species Act

Under ESA, the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 United States Code [USC] Section 1533[c]). Pursuant to the requirements of the ESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed threatened or endangered species may be present in the project area and determine whether the proposed project will result in “take” of any such species. In addition, the agency is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the ESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC Section 1536[3], [4]).

Section 7 of the ESA provides a means for authorizing incidental take of federally endangered or threatened species that result from federally conducted, permitted, or funded projects. Similarly, Section 10 authorizes incidental take of federally endangered or threatened species by non-federal agencies. FEMA, a federal agency, will provide funding for the Proposed Project; therefore, the Proposed Project would be subject to Section 7.

Three federally threatened species, California red-legged frog, valley elderberry longhorn beetle, and Central Valley steelhead, have the potential to occur in the study area and are addressed in this EIR.

4-4.3.1.2 Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (16 USC, Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, bird nests, and eggs. The Migratory Bird Treaty Act is administered by USFWS and special permits from the agency are generally required for the take of any migratory birds. This act applies to all persons and agencies in the U.S., including federal agencies. Habitats in the study area have the potential to support nesting migratory birds. Potential impacts and recommended measures to avoid take of migratory birds are addressed in this EIR.

4-4.3.1.3 California Endangered Species Act

Under the California Endangered Species Act (CESA), DFG has the responsibility for maintaining a list of threatened and endangered species designated under state law (California Fish and Game Code Section 2070). DFG also maintains lists of species of special concern, which serve as “watch lists.” Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project area and determine whether the proposed project will result in take of any such species. Under CESA, “take” is defined as the action of or attempt to “pursue, hunt, shoot, capture, collect, or kill.” Section 2081 of CESA authorizes the incidental take of state-listed species. One state listed species (Swainson’s hawk) has the potential to occur in the study area and is addressed in this EIR.

4-4.3.1.4 California Fish and Game Code

The California Fish and Game Code provides protection from take for common and special-status avian species. The California Fish and Game Code defines “take” as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Eggs and nests of all birds are protected under Section 3503 of the California Fish and Game Code. Nesting birds (including raptors) are protected under Sections 3503.5 and 3513, and all birds are fully protected under Section 3511. Migratory nongame birds

are protected under Section 3800. Except for take related to scientific research, all take of fully protected species is prohibited. White-tailed kite is the only fully protected species that has the potential to occur in the study area and is addressed in this EIR.

4-4.3.1.5 CEQA Guidelines Section 15380

Although threatened and endangered species are protected by specific federal and state statutes, CEQA Guidelines Section 15380(d) provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. These criteria have been modeled after the definition in the ESA and the section of the California Fish and Game Code dealing with rare or endangered plants and animals. CEQA Section 15380(d) allows a public agency to undertake a review to determine whether a significant effect on species that have not yet been listed by either USFWS or DFG (e.g., candidate species, species of special concern) would occur; therefore, CEQA provides an agency with the ability to protect a species from a project's potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted. Several wildlife species that would qualify as "endangered" or "rare" under CEQA Section 15380 have the potential to occur in the study area and are addressed in this EIR.

4-4.3.2 Regulation of Activities in Waters of the U.S. and State

The following federal and state regulations pertain to waters of the U.S., including wetlands, found in the study area.

4-4.3.2.1 Federal Regulation

The U.S. Army Corps of Engineers has primary federal responsibility for administering regulations that concern waters of the U.S., including wetlands and drainages. The Corps acts under two statutory authorities: the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters of the U.S.," and the CWA (Section 404), which governs specified activities in waters of the U.S. The Corps requires that a permit be obtained if a project proposes placing structures within, over, or under navigable waters and/or discharging dredged or fill material into waters of the U.S., including wetlands. The EPA, USFWS, NMFS, and several other agencies provide comment on Corps permit applications. Within the study area, Alamo Creek, Ulatis Creek, the unnamed tributary to Ulatis Creek, and two erosional features adjacent to Ulatis Creek are considered waters of the U.S. and are under the jurisdiction of the Sacramento District of the Corps.

4-4.3.2.2 State Regulation

The state's authority in regulating activities in waters of the U.S., including wetlands, resides primarily with the SWRCB. SWRCB, acting through RWQCB, must certify that a Corps permit action meets state water quality objectives under Section 401 of the CWA. Within the study area, Alamo Creek, Ulatis Creek, the unnamed tributary to Ulatis Creek, and two erosional features adjacent to Ulatis Creek are considered waters of the State. The Proposed Project would also be subject to California Fish and Game Code Sections 1600–1607. Under the Code, DFG may develop mitigation measures and enter into Streambed Alteration Agreements with applicants who propose projects that would obstruct the flow of, or alter the bed, channel, or bank of, a river, stream, or lake in which there is a fish or wildlife resource, including seasonal drainages.

4-4.3.3 Local Plans and Policies

The following local planning documents contain plans and policies applicable to biological resources in the study area.

4-4.3.3.1 Solano County General Plan

The Solano County General Plan (Solano County 2008) contains various policies and programs to maintain, protect, and preserve biological resources in the County. Biological resources with a high priority for conservation within the County include, but are not limited to, oak woodlands, marshlands, vernal pool areas, and core habitat areas for state and federally listed species. The study area does not overlap with any areas designated as Priority Habitat Areas within the County; however, the study area is generally within an area identified as a wildlife corridor linking open space in the northern portion of the County to open-space habitat in the eastern portion of the County.

The Solano County General Plan policies and implementing programs relevant to biological resources within the study area are listed below:

Policies

- RS.P-1 Protect and enhance the county's natural habitats and diverse plant and animal communities, particularly occurrences of special-status species, wetlands, sensitive natural communities, and habitat connections.
- RS.P-2 Manage the habitat found in natural areas and ensure its ecological health and ability to sustain diverse flora and fauna.
- RS.P-3 Focus conservation and protection efforts on high-priority habitat areas depicted in Figure RS-1 of the Solano County General Plan.
- RS.P-4 Together with property owners and federal and state agencies, identify feasible and economically viable methods of protecting and enhancing natural habitats and biological resources.
- RS.P-5 Protect and enhance wildlife movement corridors to ensure the health and long-term survival of local animal and plant populations. Preserve contiguous habitat areas to increase habitat value and to lower land management costs.
- RS.P-6 Protect oak woodlands and heritage trees and encourage the planting of native tree species in new developments and along road rights-of-way.

Implementation Programs

- RS.I-11 Together with landowners, land trusts, and agencies, explore habitat preservation alternatives, such as:
 - voluntary acquisition of development rights or conservation easements;
 - developing mitigation banks, especially within Resource Conservation Overlay areas;

- providing outreach to landowners within the Resource Conservation Overlay regarding benefits of conservation easements;
- promoting agricultural practices compatible with habitat protection;
- allowing income-generating uses on agricultural lands that can support farmers who protect habitat lands; and
- promoting eco-tourism to generate revenues to support habitat protection and keep agriculture viable.

4-4.3.3.2 City of Vacaville General Plan

The City of Vacaville General Plan (City of Vacaville 1990) policies and implementing policies relevant to biological resources for the Proposed Project include the following policies:

Guiding Policies

- 2.1-G 9 Preserve scenic features and the feel of a city surrounded by open space, and preserve view corridors to the hills, and other significant natural areas.
- 8.1-G 4 Preserve and protect water resource areas, including the Alamo, Encinosa, Gibson and Ulatis Creek watersheds.
- 8.2-G 1 Protect natural environments in recognition of their importance as wildlife habitats and visual amenities.

Implementing Policies

- 8.2-I 1 Require preservation or, where preservation is not possible, replacement of riparian vegetation.
- 8.2-I 7 Work with the Solano County Water Agency and federal and state agencies to implement a Habitat Conservation Plan to identify and protect species on federal and state endangered and threatened species lists.

4-4.3.3.3 Solano Multi-Species Habitat Conservation Plan

In ~~April 2009~~ February 2007, SCWA issued a final administrative draft ~~Working Draft 2.2~~ of the Solano Multi-Species Habitat Conservation Plan. The HCP establishes a framework for complying with federal and state regulations for endangered species while accommodating future urban growth, development of infrastructure, and ongoing operations and maintenance activities associated with flood control, irrigation facilities, and other public infrastructure undertaken by or under the permitting authority/control of the HCP participants within the plan area. The City is a HCP participant.

Although the HCP has not yet been adopted, the Proposed Project is generally consistent with the conservation strategies and mitigation requirements outlined in the HCP for covered species including, Swainson's hawk, burrowing owl, and California red-legged frog.

4-4.4 POTENTIALLY OCCURRING SPECIAL-STATUS SPECIES

Special-status species are generally defined as species that are assigned a status designation indicating possible risk to the species. These designations are assigned by state and federal resource agencies (e.g., DFG, USFWS) or by private research or conservation groups (e.g., National Audubon Society, CNPS). Assignment to a special-status designation is typically done on the basis of a declining or potentially declining population, locally, regionally, or nationally. To what extent a species or population is at risk usually determines the status designation. The factors that determine risk to a species or population generally fall into one of several categories, such as habitat loss or modification affecting the distribution and abundance of a species; environmental contaminants affecting the reproductive potential of a species; or a variety of mortality factors such as hunting or fishing, interference with human-made objects (e.g., collision, electrocution), invasive species, or toxins.

For purposes of this EIR, special-status plant species are generally defined as follows:

- Plants listed or proposed for listing as threatened or endangered under the federal ESA.
- Plants that are candidates for possible future listing as threatened or endangered under the federal ESA (72 FR 69034-69105, December 6, 2007).
- Plants that meet the definitions of rare or endangered species under CEQA (CEQA Guidelines, Section 15380).
- Plants considered by the CNPS to be “rare, threatened, or endangered” in California (Lists 1A, 1B and 2 [CNPS 2008]).
- Plants listed by CNPS as plants for which more information is needed and plants of limited distribution (Lists 3 and 4, respectively [CNPS 2008]).
- Plants listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations [CCR] 670.5).
- Plants listed under the California Native Plant Protection Act (California Fish and Game Code 1900 et seq.).
- Plants considered sensitive by other federal agencies (i.e., U.S. Forest Service, Bureau of Land Management) or state and local agencies or jurisdictions.
- Plants considered sensitive or unique by the scientific community or occurring at the limits of its natural range (CEQA Guidelines).

For purposes of environmental review, special-status wildlife species are generally defined as follows:

- Wildlife species that are listed or proposed for listing as threatened or endangered under the federal ESA.
- Wildlife species that are candidates for possible future listing as threatened or endangered under the federal ESA (72 FR 69034-69105, December 6, 2007).
- Wildlife species that are listed or proposed for listing under CESA (California Fish and Game Code 1992 Sections 2050 et seq.; 14 CCR Sections 670.1 et seq.).
- Wildlife species that are designated as Species of Special Concern by DFG.

- Wildlife species that are designated as Fully Protected by DFG (California Fish and Game Code, Section 3511, 4700, 5050, and 5515).
- Wildlife species that meet the definition of rare or endangered under CEQA (14 CCR Section 15380).

Lists of regionally occurring special-status plant and wildlife species were compiled based on a review of pertinent literature, observations made during the biological field surveys, review of a species list obtained from USFWS (USFWS 2008), a CNPS database query (CNPS 2008), and the results of a CNDDDB query for all reported occurrences of special-status species within a 5-mile radius of the study area (CNDDDB 2009). These lists were used to target the special-status species with potential to occur in the study area. Tables 4-4.2 and 4-4.3 provide the legal status, geographic distribution, habitat requirements, and likelihood for occurrence in the study area for each species.

Habitat requirements for each special-status species listed in Tables 4-4.2 and 4-4.3 were assessed and compared to the habitats occurring within the study area. Based on the review of regionally occurring special-status species, 56 special-status plant species and 17 special-status wildlife species have the potential to occur in the study area. Special-status plants and special-status wildlife are discussed below.

4-4.4.1 Special-Status Plants

Fifty-six special-status plant species have the potential to occur in the study area (Table 4-4.2). None of the species listed in Table 4-4.2 have been previously documented within or adjacent to the study area (CNDDDB 2009, CNPS 2008). For the Alamo site, the botanical surveys conducted by URS and AWE (April 24–25, 2008; May 19–20, 2008; June 11, 2008; October 22, 2008; and April 13, 2009) coincided with the identification period for 55 of the 56 special-status plant species listed in Table 4-4.2. The remaining plant species, Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), occurs within saline marshes and swamps, which do not occur within the study area; therefore, none of the 56 species listed in Table 4-4.2 are expected to occur on the Alamo site.

For the Ulatis site, the October 22, 2008, and April 13, 2009, botanical surveys conducted by AWE coincided with the identification period for 38 of the 56 special-status plant species listed in Table 4-4.2. The remaining 18 species would not have been identifiable at the time of the October and April botanical surveys; however, suitable habitat for these species is not present on the Ulatis site (including chaparral, cismontane woodland, coniferous forest, brackish marsh, swamp, meadows, seeps, playa, coastal prairie, coastal scrub, alkaline soils, serpentinite soils, mesic grasslands, and vernal pools). Therefore, none of the species listed in Table 4-4.2 are expected to occur on the Ulatis site.

4-4.4.2 Special-Status Wildlife

Based on a review of available information (including the CNDDDB and USFWS species lists), 27 special-status wildlife species have the potential to occur in the study area (Table 4-4.3). Of these 27 wildlife species, 18 species would not occur in the study area because suitable habitat conditions are not present or the study area does not occur within the current range of the species. Based on the results of the field surveys, nine special-status wildlife species—valley elderberry longhorn beetle, California red-legged frog, foothill yellow-legged frog (*Rana Boylii*), western pond turtle (*Actinemys marmorata*), burrowing owl (*Athene cunicularia*), Swainson's hawk, white-tailed kite, loggerhead shrike (*Lanius ludovicianus*), and Central Valley steelhead (*Oncorhynchus mykiss*)—were determined to have potential to occur within the study area. These species are discussed below.

4-4.4.2.1 Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle is federally listed as threatened under the ESA (45 FR 52803). 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. Valley elderberry longhorn beetle is closely associated with blue elderberry, an obligate host for beetle larvae. Blue elderberry is considered a typical riparian shrub (Roberts et al. 1977; Katibah et al. 1984; Warner 1984) in California. The closest CNDDDB record for valley elderberry longhorn beetle occurs approximately 6 miles south of the study area (CNDDDB 2009).

Within the Alamo site, URS biologists identified and mapped 63 elderberry shrubs with stems measuring at least 1 inch in diameter at ground level (suitable habitat for valley elderberry longhorn beetle). An additional 28 elderberry shrubs were mapped by URS within a 100-foot radius of the Alamo site boundaries. All of the elderberry shrubs mapped by URS occur within or adjacent to the Alamo Creek riparian corridor at the southern boundary of the Alamo site (Figure 4-4.1). Detailed results of the elderberry shrub surveys conducted by URS for the Alamo site including, number and size of stems for each shrub, presence or absence of exit holes, habitat associations, photographs, and detailed maps showing the location of each shrub identification number are provided in a letter report sent to USFWS from FEMA on May 14, 2009 (FEMA 2009b).

Within the Ulatis site, AWE biologists identified and mapped 20 elderberry shrubs or grove of shrubs (hereinafter referred to as elderberry shrubs) with stems measuring at least 1 inch in diameter at ground level. An additional six elderberry shrubs were mapped within a 100-ft radius of the Ulatis site boundaries. Of the 26 elderberry shrubs mapped by AWE on the Ulatis site (Figure 4-4.2), 24 of the shrubs occur within or along the Ulatis Creek riparian corridor at the northern boundary of the Ulatis site. The remaining two elderberry shrubs occur under the two high-voltage electrical towers located in annual grassland habitat in the central portion of the Ulatis site. Detailed results of the elderberry shrub surveys conducted by AWE for the Ulatis site including number and size of stems for each shrub, presence or absence of exit holes, habitat associations, photographs, and a detailed map showing the location of each shrub identification number are provided in an Elderberry Shrub Survey Report (AWE 2009).

4-4.4.2.2 California Red-Legged Frog

The California red-legged frog is federally listed as threatened under the ESA (61 FR 25813) and is designated as a species of special concern by DFG. Historically, California red-legged frogs were 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 County to Ventura County. California red-legged frogs breed in lowland and foothill streams and wetlands, including livestock ponds (Jennings and Hayes 1994). California red-legged frogs may also be found in upland habitats near breeding areas and along intermittent drainages connecting wetlands. Adults may take refuge during dry periods in rodent holes or leaf litter in riparian habitats. Although California red-legged frogs 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 (USFWS 2005).

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Alkali milkvetch <i>Astragalus tener</i> var. <i>tener</i>	--/--/1B	Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, San Francisco, San Joaquin, Santa Clara, Solano, Sonoma, Stanislaus, and Yolo Counties. Has been located in the Fairfield North quadrangle.	Alkali playa, adobe clay in valley and foothill grassland, and vernal pools.	March-June	No suitable microhabitat conditions present. Not identified during April 2009 survey by AWE.	No suitable microhabitat conditions present. Not identified during April 2009 survey by AWE.
Heartscale <i>Atriplex cordulata</i>	--/--/1B	Western Central Valley and adjacent foothill valleys.	Sandy soils in alkali grassland, alkali meadows and seeps, and alkali/chenopod scrub.	April-October	No suitable microhabitat conditions present. Not identified during October 2008 and April 2009 surveys by AWE.	No suitable microhabitat conditions present. Not identified during October 2008 and April 2009 surveys by AWE.
Crownscale <i>Atriplex coronata</i> var. <i>coronata</i>	--/--/4	Sacramento Valley and San Joaquin Valley.	Alkaline soils in chenopod scrub, valley and foothill grassland, and vernal pools.	March-October	No suitable microhabitat conditions present. Not identified during October 2008 and April 2009 surveys by AWE.	No suitable microhabitat conditions present. Not identified during October 2008 and April 2009 surveys by AWE.
Brittlescale <i>Atriplex depressa</i>	--/--/1B	Western Central Valley and adjacent foothill valleys.	Alkali grassland, alkali meadows and seeps, alkali scrub, chenopod scrub, playas, and vernal pools in valley and foothill grasslands on alkaline or clay soils.	April-October	No suitable microhabitat conditions present. Not identified during October 2008 and April 2009 surveys by AWE.	No suitable microhabitat conditions present. Not identified during October 2008 and April 2009 surveys by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
San Joaquin spearscale <i>Atriplex joaquiniana</i>	--/--/1B	Western Central Valley and adjacent foothill valleys. It is currently believed to be extirpated from Santa Clara, San Joaquin, and Tulare counties. Has been located in Fairfield North quadrangle.	Chenopod scrub, alkali or saline meadows or seeps, and valley and foothill grassland.	April-October	No suitable microhabitat conditions (alkali or saline) present. Not identified during October 2008 and April 2009 surveys by AWE.	No suitable microhabitat conditions (alkali or saline) present. Not identified during October 2008 and April 2009 surveys by AWE.
Vernal pool smallscale <i>Atriplex persistens</i>	--/--/1B	Western Central Valley, in Glenn, Madera, Merced, Solano, Stanislaus, and Tulare counties.	Alkaline vernal pools.	June-October	No suitable habitat present. Not identified during October 2008 survey by AWE.	No suitable habitat present. Not identified during October 2008 survey by AWE.
Bigscale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	--/--/1B	Alameda, Butte, Colusa, El Dorado, Lake, Mariposa, Napa, Placer, Santa Clara, Solano, Sonoma, and Tehama counties.	Chaparral, Cismontane woodland, valley and foothill grassland/sometimes serpentinite.	March-June	No suitable microhabitat conditions (serpentinite) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat conditions (serpentinite) present. Not identified during April 2009 survey by AWE.
Narrow-anthered California brodiaea <i>Brodiaea californica</i> var. <i>leptandra</i>	--/--/1B	Lake, Napa, and Sonoma counties. Nearest occurrence is in Napa County, over 15 miles west of the project sites.	Broad-leaved upland forest, chaparral, and lower montane coniferous forest.	May-July	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Round-leaved filaree <i>California macrophylla</i>	--/--/1B	Has been located from Baja California to Oregon, and in 29 California counties, all west of the Sierra Nevada Range.	Clay soils in cismontane woodland and valley and foothill grassland.	March-May	No suitable habitat (clay soils) present. Not identified during April 2009 survey by AWE.	No suitable habitat (clay soils) present. Not identified during April 2009 survey by AWE.
Mt. Diablo fairy-lantern <i>Calochortus pulchellus</i>	--/--/1B	Alameda, Contra Costa, and Solano Counties. Has been located in the Mt. Vaca quadrangle.	Chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland.	April-June	Suitable habitat is present within riparian woodland. Not identified during April 2009 survey by AWE.	Suitable habitat is present within riparian woodland. Not identified during April 2009 survey by AWE.
Tiburon paintbrush <i>Castilleja affinis</i> ssp. <i>neglecta</i>	E/T/1B	Marin, Napa, and Santa Clara counties. Nearest occurrence approximately 18 miles to the southwest of Alamo Creek.	Valley and foothill grassland, often in serpentinite soils.	April-June	Marginal habitat is present onsite. Not identified during April, May, and June 2008 surveys by URS and April 2009 survey by AWE.	Marginal habitat is present onsite. Not identified during April 2009 survey by AWE.
Holly-leaved ceanothus <i>Ceanothus purpureus</i>	--/--/1B	Napa, Solano, and Sonoma counties.	Rocky soils in chaparral, cismontane woodland.	February-June	No suitable habitat present. Not identified during April 2009 survey by AWE.	No suitable habitat present. Not identified during April 2009 survey by AWE.
Pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>	--/--/1B	Reported to occur in six counties in the Sacramento Valley and inner North Coast Ranges: Solano, Napa, Sonoma, Lake, Glenn, and Butte Counties. Has been located in Fairfield North quadrangle.	Coastal prairie, meadows and seeps, coastal salt marsh, vernal mesic valley, and foothill grassland.	May-November	No suitable microhabitat conditions present. Not identified during October 2008 survey by AWE.	No suitable microhabitat conditions present. Not identified during October 2008 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/ CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Parry's red tarplant <i>Centromadia parryi</i> ssp. <i>rudis</i>	--/--/4	Butte, Colusa, Glenn, Lake, Merced, Sacramento, San Joaquin, Solano, Sutter, and Yolo Counties.	Vernal pools, vernal mesic valley and foothill grassland, seeps, and sometimes roadsides.	May-October	No suitable microhabitat conditions present. Not identified during October 2008 survey by AWE.	No suitable microhabitat conditions present. Not identified during October 2008 survey by AWE.
Suisun thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	E/--/1B	Solano County. Nearest occurrence is at least 8 miles south of Alamo Creek.	Saline marshes and swamps.	July-September	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Hispid bird's-beak <i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	--/--/1B	Central Valley within Alameda, Fresno, Kern, Merced, Placer, and Solano Counties.	Meadows, grassland, seeps, and playa on alkaline soils below 500 feet above sea level.	June-September	No suitable microhabitat conditions (alkaline soils) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable microhabitat conditions (Alkaline soils) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Soft bird's-beak <i>Cordylanthus mollis</i> ssp. <i>mollis</i>	E/R/1B	Contra Costa, Marin, Napa, Sacramento, Solano, and Sonoma Counties.	Coastal salt marshes and swamps.	July-November	No suitable habitat present. Not identified during October 2008 survey by AWE.	No suitable habitat present. Not identified during October 2008 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Serpentine cryptantha <i>Cryptantha clevelandii</i> var. <i>dissita</i>	--/--/1B	Lake, Mendocino, Napa, and Sonoma Counties.	Chaparral, sometimes serpentine.	April-June	No suitable habitat present. Not identified during April 2009 survey by AWE.	No suitable habitat present. Not identified during April 2009 survey by AWE.
Subalpine cryptantha <i>Cryptantha crymophila</i>	--/--/1B	Alpine, Mono, and Tuolumne Counties.	Subalpine coniferous forest.	July-August	No suitable habitat (coniferous forest) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat (coniferous forest) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Recurved larkspur <i>Delphinium recurvatum</i>	--/--/1B	San Joaquin Valley and Central Valley of the south Coast Ranges, Contra Costa County to Kern County.	Alkaline soils in annual grassland, chenopod scrub, cismontane woodland, and vernal pools.	March-May	No suitable microhabitat conditions (Alkaline soils) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat conditions (Alkaline soils) present. Not identified during April 2009 survey by AWE.
Dwarf downingia <i>Downingia pusilla</i>	--/--/2	Fresno, Merced, Napa, Placer, Sacramento, San Joaquin, Solano, Sonoma, Stanislaus, Tehama, and Yuba Counties.	Valley and foothill grasslands (mesic), vernal pools.	March-May	No suitable microhabitat conditions present. Not identified during April 2009 survey by AWE.	No suitable microhabitat conditions present. Not identified during April 2009 survey by AWE.
Streamside daisy <i>Erigeron biolettii</i>	--/--/3	Humboldt, Mendocino, Marin, Napa, Solano, and Sonoma Counties.	Broad-leaf upland forest, cismontane woodland, North Coast coniferous forest, and Rocky areas.	June-October	No suitable habitat present. Not identified during October 2008 survey by AWE.	No suitable habitat present. Not identified during October 2008 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Greene's narrow-leaved daisy <i>Erigeron greenei</i>	--/--/1B	Lake, Napa, and Sonoma Counties.	Chaparral.	May-September	No suitable habitat (chaparral) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat (chaparral) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Tiburon buckwheat <i>Eriogonum luteolum</i> var. <i>caninum</i>	--/--/1B	Alameda, Contra Costa, Marin, and Sonoma Counties.	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland; sandy or gravelly serpentinite soils.	May-September	No suitable microhabitat (serpentinite) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable microhabitat (serpentinite) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Mt. Diablo buckwheat <i>Eriogonum truncatum</i>	--/--/1B	Alameda, Contra Costa, and Solano Counties.	Chaparral, coastal scrub, sandy soils in valley and foothill grassland.	April-September	No suitable microhabitat (sandy soils) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat (sandy soils) present. Not identified during April 2009 survey by AWE.
Adobe lily <i>Fritillaria pluriflora</i>	--/--/1B	Inner North Coast Ranges, Sierra Nevada Foothills, and the edges of Sacramento Valley. Two populations in Solano County may be extirpated.	Chaparral, cismontane woodland, foothill grassland; found in heavy clay soils.	February-April	No suitable microhabitat (clay soils) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat (clay soils) present. Not identified during April 2009 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Woolly-headed gilia <i>Gilia capitata</i> <i>ssp. tomentosa</i>	--/--/1B	Marin and Sonoma Counties. Populations in Napa and Solano Counties extirpated.	Rocky coastal bluff scrub.	May-July	No suitable habitat (coastal scrub) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat (coastal scrub) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Hogwallow starfish <i>Hesperevax caulescens</i>	--/--/4	Sacramento Valley and San Joaquin Valley.	Mesic valley and foothill grassland, shallow vernal pools, and clay soils.	March-June	No suitable microhabitat present. Not identified during April 2009 survey by AWE.	No suitable microhabitat present. Not identified during April 2009 survey by AWE.
Two-carpellate western flax <i>Hesperolinon bicarpellatum</i>	--/--/1B	Lake, Napa, and Sonoma Counties.	Chaparral, serpentinite soils.	May-July	No suitable habitat (chaparral) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat (chaparral) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Brewer's western flax <i>Hesperolinon breweri</i>	--/--/1B	Contra Costa, Napa, and Solano Counties. Occurrence in Mt. Vaca quadrangle.	Chaparral, cismontane woodland, valley and foothill grassland, usually on serpentinite.	May-July	No suitable microhabitat (serpentinite) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable microhabitat (serpentinite) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Napa western flax <i>Hesperolinon serpentinum</i>	--/--/1B	Alameda, Lake, Napa, and Stanislaus Counties.	Serpentine soils in chaparral.	May-July	No suitable habitat (chaparral) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat (chaparral) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Carquinez goldenbush <i>Isocoma arguta</i>	--/--/1B	Sacramento Valley and Suisun Slough in Contra Costa and Solano Counties.	Annual grassland on alkaline soils and flats generally below 70 feet above sea level.	August-December	No suitable microhabitat (alkaline) present. Not identified during October 2008 survey by AWE.	No suitable microhabitat (alkaline) present. Not identified during October 2008 survey by AWE.
Northern California black walnut <i>Juglans hindsii</i>	-/--/1B	Contra Costa and Napa counties. Native stands questionable or extirpated in Sacramento, Solano, and Yolo Counties. As of 2003, only one confirmed native stand remains viable.	Riparian scrub and riparian woodland.	Year-round	No native stands of Northern California black walnuts were located onsite.	No native stands of Northern California black walnuts were located onsite.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Contra Costa goldfields <i>Lasthenia conjugens</i>	E/--/1B	Currently, known from about 15 populations. The largest concentration and number of populations occur in the Fairfield-Suisun area in Solano County. Closest occurrence is approximately 4.4 miles southeast of the Alamo Creek site.	Mesic conditions, Valley and foothill grassland or cismontane woodland. Vernal pools; extirpated from most of its range.	March-June	No suitable microhabitat present. Not identified during April 2009 survey by AWE.	No suitable microhabitat present. Not identified during April 2009 survey by AWE.
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	--/--/1B	Contra Costa, Napa, Sacramento, San Joaquin, Solano, and Sonoma Counties.	Freshwater and brackish marshes and swamps at elevations between 0 and 4 meters.	May-September	No suitable habitat (marsh/swamp) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat (marsh/swamp) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Colusa layia <i>Layia septentrionalis</i>	--/--/1B	Colusa, Glenn, Lake, Mendocino, Napa, Sonoma, Sutter, Tehama, and Sutter Counties.	Chaparral, cismontane woodland, valley and foothill woodland on sandy or serpentinite soils.	April-May	No suitable microhabitat (serpentinite) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat (serpentinite) present. Not identified during April 2009 survey by AWE.
Legenere <i>Legenere limosa</i>	--/--/1B	Alameda, Lake, Napa, Placer, Sacramento, San Joaquin, San Mateo, Santa Clara, Solano, Sonoma, Shasta, Stanislaus, Tehama, and Yuba Counties.	Vernal pools; many historical occurrences are extirpated.	April-June	No suitable habitat (vernal pools) present. Not identified during April 2009 survey by AWE.	No suitable habitat (vernal pools) present. Not identified during April 2009 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Jepson's leptosiphon <i>Leptosiphon jepsonii</i>	--/--/1B	West of the Central Valley in Lake, Napa, and Sonoma Counties.	Chaparral, cismontane woodland.	April-May	No suitable habitat present. Not identified during April 2009 survey by AWE.	No suitable habitat present. Not identified during April 2009 survey by AWE.
Woolly-headed lessingia <i>Lessingia hololeuca</i>	--/--/3	Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo Counties.	Chaparral, valley and foothill grassland, usually on serpentinite, often at roadsides.	June-October	No suitable microhabitat (serpentinite) present. Not identified during October 2008 survey by AWE.	No suitable microhabitat (serpentinite) present. Not identified during October 2008 survey by AWE.
Mason's lilaepsis <i>Lilaepsis masonii</i>	--/--/1B	Alameda, Contra Costa, Napa, Sacramento, San Joaquin, and Solano Counties.	Marshes and swamps (brackish or freshwater); occurs at elevations below 10 meters.	April-November	No suitable habitat (marsh/swamp) present. Not identified during October 2008 and April 2009 surveys by AWE.	No suitable habitat (marsh/swamp) present. Not identified during October 2008 and April 2009 surveys by AWE.
Mt. Diablo cottonweed <i>Micropus amphibolus</i>	--/--/3	West of the Central and San Joaquin Valleys in Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, San Joaquin, San Luis Obispo, Santa Clara, Santa Cruz, Solano, and Sonoma Counties.	Rocky areas in broad-leaved upland forest, chaparral, cismontane woodland, valley and foothill grassland.	March-May	No suitable habitat present. Not identified during April 2009 survey by AWE.	No suitable habitat present. Not identified during April 2009 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Robust monardella <i>Monardella villosa</i> ssp. <i>globosa</i>	--/--/1B	Alameda, Contra Costa, Humboldt, Lake, Mendocino, Napa, San Mateo, and Sonoma Counties. Has been located in the Fairfield North quadrangle.	Openings in broad-leaved upland forest, chaparral, cismontane woodland, and coastal scrub.	June-July	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Sylvan microseris <i>Microseris sylvatica</i>	--/--/4	Central and eastern California from Lassen to Kern Counties.	Chaparral, cismontane woodland, Great Basin scrub, Pinyon and juniper woodland, and valley and foothill grassland. Sometimes on serpentinite.	March-June	No suitable microhabitat (serpentinite) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat (serpentinite) present. Not identified during April 2009 survey by AWE.
Cotula navarretia <i>Navarretia cotulifolia</i>	--/--/4	Portions of the Central Valley west into Mendocino, Napa, and Marin Counties.	Chaparral, cismontane woodland, valley and foothill grassland. Adobe soils.	May-June	No suitable microhabitat (adobe soils) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable microhabitat (adobe soils) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	--/--/1B	Colusa, Glenn, Lake, Mendocino, Marin, Napa, Solano, Sonoma, Sutter, Tehama, and Yolo Counties.	Cismontane woodland, meadows and seeps, vernal pools, mesic valley and foothill grasslands, and lower montane coniferous forest.	June-September	No suitable microhabitat (mesic soils) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable microhabitat (mesic soils) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Few-flowered navarretia <i>Navarretia leucocephala</i> ssp. <i>pauciflora</i>	T/E/1B	Lake and Napa Counties.	Vernal pools.	May-June	No suitable habitat (vernal pools) present. Not identified during May and June 2008 surveys by URS.	No suitable habitat (vernal pools) present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
San Joaquin Valley orcutt grass <i>Orcuttia inaequalis</i>	T/E/1B	Scattered locations along east edge of the San Joaquin Valley and adjacent foothills, from Stanislaus County to Tulare County.	Vernal pools.	April-September	No suitable habitat (vernal pools) present. Not identified during April, May, and June 2008 surveys by URS and April 2009 survey by AWE.	No suitable habitat (vernal pools) present. Not identified during April 2009 survey by AWE.
Gairdner's yampah <i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	--/--/4	Coastal counties from Del Norte to San Diego.	Broad-leaved upland forest, chaparral, coastal prairie, valley and foothill grassland, vernal pools and vernal mesic areas.	June-October	No suitable microhabitat present. Not identified during October 2008 survey by AWE.	No suitable microhabitat present. Not identified during October 2008 survey by AWE.
Bearded popcorn-flower <i>Plagiobothrys hystriculus</i>	--/--/1B	Endemic to Solano County. Known only from the Montezuma Hills. Last recorded occurrence was documented in 1892; rediscovered in 2005.	Mesic grasslands and margins of vernal pools. Occasionally in vernal swales.	April-May	No suitable microhabitat present. Not identified during April 2009 survey by AWE.	No suitable microhabitat present. Not identified during April 2009 survey by AWE.
Lobb's aquatic buttercup <i>Ranunculus lobbii</i>	--/--/4	Santa Clara County north to Mendocino County, and east to Sacramento County.	Cismontane woodland, north coast coniferous forest, valley and foothill grassland (mesic), vernal pools.	February-May	No suitable microhabitat present. Not identified during April 2009 survey by AWE.	No suitable microhabitat present. Not identified during April 2009 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
California beaked-rush <i>Rhynchospora californica</i>	--/--/1B	Butte, Marin, Napa, and Sonoma Counties.	Bogs and fens, lower montane coniferous forest, meadows and seeps, freshwater marshes and swamps.	May-July	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Marin checkerbloom <i>Sidalcea hickmanii</i> ssp. <i>viridis</i>	--/--/1B	West of the Central Valley, north of San Francisco Bay area and south of Mendocino County in Lake (may be a new taxon), Marin, Napa, and Sonoma Counties.	Chaparral, on serpentinite.	May-June	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.
Suisun Marsh aster <i>Symphotrichum lentum</i>	--/--/1B	Contra Costa, Napa, Sacramento, San Joaquin, and Solano Counties.	Marshes and swamps, brackish and fresh; elevation 0 to 3 meters.	May-November	No suitable habitat (marsh/swamp) present. Not identified during October 2008 survey by AWE.	No suitable habitat (marsh/swamp) present. Not identified during October 2008 survey by AWE.
Showy Indian clover <i>Trifolium amoenum</i>	E/--/1B	North Coast Ranges, Central Coast, and the San Francisco Bay Area.	Valley and foothill grassland and coastal bluff scrub, sometimes on serpentinite.	April-June	No suitable microhabitat (serpentinite) present. Not identified during April 2009 survey by AWE.	No suitable microhabitat (serpentinite) present. Not identified during April 2009 survey by AWE.

Table 4-4.2. Special-Status Plants with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Identification Period	Alamo Site	Ulatis Site
	Federal/State/CNPS				Likelihood of Occurrence: Survey Results	Likelihood of Occurrence: Survey Results
Saline clover <i>Trifolium depauperatum</i> var. <i>hydrophilum</i>	--/--/1B	West Central California to coastal counties north of Monterey County and south of Mendocino and Lake Counties. Has been located in Fairfield North quadrangle.	Marshes and swamps, valley and foothill grasslands (mesic), and vernal pools. Alkaline soils.	April-June	No suitable microhabitat present. Not identified during April 2009 survey by AWE.	No suitable microhabitat present. Not identified during April 2009 survey by AWE.
Oval-leaved viburnum <i>Viburnum ellipticum</i>	--/--/2	Contra Costa, El Dorado, Fresno, Glenn, Humboldt, Mendocino, Napa, Placer, Shasta, Sonoma, and Tehama Counties. Oregon and Washington States.	Chaparral, Cismontane woodland, lower montane coniferous forest.	May-June	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.	No suitable habitat present. Surveys were not conducted during identification period. Due to lack of habitat onsite, no presence is anticipated.

¹ **Status explanations:**

-- = No listing.

Federal

E = Listed as endangered under the federal Endangered Species Act.

T = Listed as threatened under the federal Endangered Species Act.

State

E = Listed as endangered under the California Endangered Species Act.

T = Listed as threatened under the California Endangered Species Act.

R = Listed as rare under the California Endangered Species Act.

California Native Plant Society

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.

2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere.

3 = List 3 species: need more information – a review list.

4 = List 4 species: limited distribution—a watch list.

Within the study area, Alamo Creek and Ulatis Creek provide potential breeding and dispersal habitat for California red-legged frogs. To satisfy FEMA requirements at the Alamo site, protocol-level surveys were conducted by URS according to USFWS' *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005). Five night surveys and three day surveys were conducted between May 8, 2008, and August 13, 2008. All accessible habitat within 1 mile of the Alamo site that was identified by URS as suitable for California red-legged frogs was surveyed. Surveyed areas included eight creek sections within portions of Alamo Creek, Ulatis Creek, Encinosa Creek, and their tributaries, and one reservoir. Detailed results of the California red-legged frog surveys were submitted to USFWS by FEMA on March 9, 2009 (FEMA 2009a, report on file at the City of Vacaville Department of Public Works office). Although the protocol surveys were conducted for the Alamo site, the survey area included the section of Ulatis Creek within the Ulatis site since this site occurs within the 1-mile radius of the Alamo site.

No California red-legged frogs were found within any of the surveyed areas (including Alamo Creek and Ulatis Creek in the study area) during the 2008 protocol-level surveys conducted by URS (FEMA 2009a). Many factors may attribute to the absence of California red-legged frogs in these waterways, including but not limited to, the presence of non-native predators (sunfish [*Lepomis* sp.], mosquitofish [*Gambusia affinis*], bullfrogs [*Rana catesbeiana*], and crayfish [*Procambarus* sp.]), agricultural practices (fertilizer and pesticide runoff), habitat modification (stream channelization and lack of backwater and floodplain pools), and urbanization (FEMA 2009a).

4-4.4.2.3 Foothill Yellow-Legged Frog

The foothill yellow-legged frog is designated as a species of special concern by DFG. In California, foothill yellow-legged frogs were historically distributed throughout the foothill portions of most drainages from the Oregon border to the San Gabriel River in southern California (Jennings and Hayes 1994). Foothill yellow-legged frogs are a stream-dwelling species that require shallow, flowing water in small-to-medium streams with at least some cobble-sized substrate (Hayes and Jennings 1988, Jennings 1988, Jennings and Hayes 1994). Foothill yellow-legged frogs in California generally breed between March and early June (Storer 1925, Wright and Wright 1949, Jennings and Hayes 1994). Masses of eggs are deposited on the downstream side of cobbles and boulders, which are also likely to provide refuge habitat for larvae and metamorphs (Jennings and Hayes 1994). After oviposition, a minimum of approximately 15 weeks is required to reach metamorphosis, which typically occurs between July and September (Storer 1925, Jennings 1988).

Alamo Creek and Ulatis Creek in the study area and vicinity are mostly shaded with run, glide, and low-gradient riffle habitat during much of the wet season. These areas provide potential habitat for foothill yellow-legged frogs. Within the study area, Alamo and Ulatis Creeks do not provide suitable breeding habitat for foothill yellow-legged frogs because these portions of the creek channels have experienced heavy sedimentation and are characterized by a mostly silt bottom. Rocky areas that are present are heavily covered with silt and would not provide good egg-laying substrate; however, suitable breeding conditions are present upstream of the study area and foothill yellow-legged frogs have been reported from 1.5 miles upstream on Alamo Creek and 3.0 miles upstream on Ulatis Creek (CNDDDB 2009). No foothill yellow-legged frogs were observed during protocol-level California red-legged frog surveys conducted by URS in 2008 along Alamo and Ulatis Creeks in the study area. Foothill yellow-legged frogs are not expected to breed in the study area but could disperse through the study area if the species occurs upstream or downstream.

4-4.4.2.4 Western Pond Turtle

The western pond turtle is designated as a species of special concern by DFG. Western pond turtles are thoroughly aquatic, preferring the quiet waters of ponds, reservoirs, and sluggish streams (Stebbins 1985). The species occurs in a wide range of both permanent and intermittent aquatic environments (Jennings et al. 1992). Western pond turtles spend considerable time basking on rocks, logs, emergent vegetation, mud or sand banks, or human-generated debris. They move up to 396 meters (1,300 feet) or more to upland areas adjacent to watercourses to deposit eggs and overwinter (Jennings and Hayes 1994). Western pond turtles typically become active in March and return to overwintering sites by October or November (Jennings et al. 1992). The closest CNDDDB record for western pond turtles occurs approximately 2.0 miles south of the Project site.

Pond turtles were observed at the Ulati site (FEMA 2009a). Alamo and Ulati Creeks in the study area provide suitable aquatic habitat for western pond turtles when water is present. Year-round water sources exist within and upstream of the study area along Alamo and Ulati Creeks. Annual grasslands in the study area also provide potential nesting and overwintering sites for pond turtles if they are present.

4-4.4.2.5 Central Valley Steelhead and Central Valley Fall-/Late-Fall-Run Chinook Salmon

Central Valley steelhead is a distinct population segment (DPS) of steelhead trout. This DPS was listed by the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) as a federally threatened species under the ESA on March 19, 1998, and was reaffirmed on January 5, 2006 (63 FR 13347). Steelhead are the anadromous form of rainbow trout (*Oncorhynchus mykiss*), a salmonid species indigenous to western North America. Steelhead are similar to some Pacific salmon species in their ecological requirements. They are born in fresh water, emigrate to the ocean where most of their growth occurs, and return to fresh water to spawn. Steelhead are iteroparous, capable of breeding or reproducing multiple times. Repeat spawning rates are generally low, however, and vary considerably among populations (McEwan 2001). Most steelhead in the County are likely “winter” run that migrate to fresh water in fall and winter, where they spawn within a few weeks or months (LSA 2007). Spawning and rearing habitat is usually characterized by perennial streams with clear, cool to cold, fast-flowing water with a high dissolved oxygen content and abundant gravels and riffles. Optimal water temperatures for steelhead are 46–52 degrees Fahrenheit for adult migration, 39–52 degrees Fahrenheit for spawning, 48 degrees Fahrenheit for incubation and emergence, 45–60 degrees Fahrenheit for fry and juvenile rearing, and below 57 degrees Fahrenheit for smoltification (LSA 2007).

The Central Valley fall-/late-fall-run Chinook salmon (*Oncorhynchus tshawytscha*) is an Evolutionary Significant Unit (ESU) that includes all naturally spawned fall-run Chinook salmon in the San Joaquin and Sacramento basins, east of Carquinez Strait, California. On September 16, 1999, NMFS determined that this ESU did not warrant listing but was identified as a candidate species (64 FR 50394). On April 15, 2004, NMFS transferred the Central Valley fall-/late-fall-run Chinook salmon ESU to a newly developed species of special concern list because of specific risk factors (69 FR 19975). Fall-run Chinook salmon tend to spawn in the mainstreams of rivers or large tributaries in areas of gravel and cobble substrate (LSA 2007), primarily at the head of riffles. The Chinook is also anadromous but, unlike steelhead, Chinook salmon are semelparous (they die following a single spawning event). Fall-run Chinook salmon migrate upstream between June and December and late-fall-run Chinook salmon migrate between October and April. Chinook salmon primarily spawn at depths between 10 and 40 inches and velocities of between 1.0 to 2.6 feet per second (LSA 2007). Optimal conditions for embryo survival include water temperatures between 41 and 55 degrees Fahrenheit and oxygen levels close to saturation (LSA 2007).

Within the study area, two seasonal drainages (Alamo Creek at the Alamo site and Ulatis Creek at the Ulatis site) provide potential habitat for Central Valley steelhead. A description of potential habitat within Alamo and Ulatis Creeks in the study area and available fisheries data for Alamo and Ulatis Creeks is provided below. Representative photographs of Alamo Creek and Ulatis Creek in the study area are provided in Figures 4-4.3 and 4-4.4.

Alamo Creek

Alamo Creek is a seasonal drainage. Alamo Creek in the study area typically holds areas of ponding water year round. During 2008 California red-legged frog surveys conducted by URS (FEMA 2009a), the majority of Alamo Creek at the Alamo site was wet and flowing gently in May, but by June, much of the stream had dried to shallow intermittent pools. By July, approximately 65% of the downstream portion of this section of the creek was dry. Similar to Ulatis Creek, beaver dams most likely contributed to the extent of ponding within this portion of Alamo Creek.

Alamo Creek supports shaded riverine aquatic (SRA) and riparian habitat characterized by a dense canopy (nearly closed) of California walnut, valley oak, edible fig, bigleaf maple, box alder, white alder, Fremont's cottonwood, red willow, and arroyo willow. SRA habitat is important for steelhead and Chinook salmon because this habitat structure provides shading and cooler temperatures required by these species.

Within the Alamo site, Alamo Creek varies between 20 and 60 feet wide, has a stream gradient of approximately 2%, and supports a mostly sandy and some gravelly substrate. Alamo Creek at the Alamo site does not appear to provide the physical or biological characteristics required for spawning due to the lack of suitable spawning gravels (FEMA 2010). Although spawning is unlikely, Alamo Creek could be used by juvenile steelhead or salmon for juvenile rearing and dispersal and by adult during migration. Similar to Ulatis Creek, Alamo Creek at the Alamo site contains several areas of deep (18– 36 inches) ponded water with downed logs and woody debris, which may provide suitable holding areas and juvenile rearing habitat for steelhead or salmon if these areas provide sufficient temperatures and dissolved oxygen content.

As part of a Salmonid Habitat Assessment conducted for the Solano County Water Agency (LSA 2008), the type and approximate location of potential fish passage barriers (PFPBs) were identified for streams within Solano County. Five PFPBs were identified within Alamo Creek including four barriers downstream of the Alamo site (i.e., irrigation diversion, culvert with a 2- to 3-foot drop, beaver dam, and flap gate) and one barrier (culvert with 4-foot drop) upstream of the Alamo site. In addition to the five PFPBs identified by LSA Associates, Inc., several beaver dams were observed by URS within Alamo Creek at the Alamo site during California red-legged frog surveys conducted in 2008 (FEMA 2009a), which may also impede fish passage.

Ulatis Creek

Ulatis Creek is a seasonal drainage that flows following storm events and flows for a minimum of 3 months during normal rainfall years; however, several portions of the creek channel may hold water year round. At the Ulatis site, the Ulatis Creek channel varies between 30 and 120 feet wide and is predominantly characterized by a stream gradient of less than 6%; however, a small section of the creek in this area has a gradient of between 6 and 12% (LSA 2008). Mean summer temperature (estimated for July) within this portion of Ulatis Creek is above 75.2 degrees Fahrenheit.

To document current habitat conditions within Ulatis Creek at the Ulatis site, AWE biologist Angela Alcalá conducted a site visit on April 13, 2009. Ulatis Creek in the study area supports SRA and riparian

habitat characterized by a dense canopy (nearly closed) of California walnut, valley oak, Oregon ash, box alder, Fremont's cottonwood, red willow, and arroyo willow. Within the Ulatis site, Ulatis Creek supports a predominantly silt/cobble substrate with some boulders. At the time of the April 13, 2009, site visit, water was present and flowing within Ulatis Creek. Water depths varied from just a few inches to 3–4 feet throughout this section of the creek and flows varied between a slow glide to slow riffles. In addition to gradient changes, another explanation for the variability in water depth and flow within this portion of Ulatis Creek is the presence of beaver dams (photo 4 in Figure 4-4.4).

No suitable spawning gravels for steelhead or salmon were observed within Ulatis Creek at the Ulatis site; however, several areas of deep (18–40 inches) ponded water with undercut banks, downed logs, and tree roots may provide suitable holding areas and juvenile rearing habitat for migrating steelhead or salmon if these areas provide sufficient temperatures and dissolved oxygen content.

As part of the Solano County Salmonid Habitat Assessment (LSA 2008), LSA Associates, Inc. identified five PFPBs within Ulatis Creek. PFPBs within Ulatis Creek include a debris dam and two water control structures with 6-foot drops downstream of the Ulatis site and two box culverts with 4- to 5-foot drops upstream of the Ulatis site. In addition to the five PFPBs identified by LSA Associates, Inc., three beaver dams were observed by an AWE biologist in Ulatis Creek at the Ulatis site during an April 13, 2009, site visit, which may also impede fish passage.

Available Fisheries Data for Alamo and Ulatis Creeks

According to the Solano Multispecies Habitat Conservation Plan, little historical information is available on steelhead and salmon distribution in Solano County and few detailed surveys have been conducted within the County. Steelhead and salmon can be expected to occur at least periodically in any of the perennial streams in Solano County including Ulatis, Alamo, Jameson Canyon, and Ledgewood Creeks and their tributaries. For most streams in Solano County, the lower stream reaches within major agricultural and urban areas would be used primarily as fish passage habitat. Summer stream temperatures are typically too high for steelhead within these areas. The upper reaches of the streams in the western portion of the County, however, may provide suitable spawning conditions. (LSA 2007)

According to a February 17, 2006, memorandum issued by NMFS Regional Administrator Rodney McInnis regarding Scientific Research Permit No. 1180-151422SWR2003SA8829, Thomas R. Payne and Associates conducted fish monitoring studies in 2001 and 2002 within the lower portions of Ulatis Creek and its tributaries (including Alamo, Sweeney, McCune, Horse, and Gibson Canyon Creeks) as part of the Ulatis Flood Control Project. No salmonids or sturgeons were captured during the 2001 or 2002 surveys. In addition to these surveys, the memorandum states that a City staff member reported a previous observation of four to six steelheads in a portion of Ulatis Creek within downtown Vacaville in 1997, a high flow year. The memorandum also states that fall-run Chinook salmon have been observed in the area in the past; however, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and North American green sturgeon are not expected to occur in the Ulatis Creek drainage system (including Alamo Creek) upstream of Cache Slough (NMFS 2006).

A recently available fisheries database provides known winter and summer Central Valley steelhead distribution data for the entire state and is available through DFG's California Cooperative Anadromous Fish and Habitat Data Program (CalFish) website (DFG 2007). This database indicates that anadromous steelheads were observed in Alamo and Ulatis Creeks in 2005. Currently, CalFish does not have any available data for Chinook salmon.

Although very little records are known for Central Valley Chinook salmon in Alamo and Ulatis Creeks, Central Valley fall-run Chinook salmon have been periodically observed in Ulatis Creek at Nut Tree

Road (approximately 6 miles downstream of the Project) by local fisheries expert Steve Foreman between the mid-1970s and the late 1990s (LSA 2008).

4-4.4.2.6 Burrowing Owl

The burrowing owl is designated as a species of special concern by DFG. The burrowing owl is a small (9 to 11 inches) subterranean-nesting owl, earth brown with white spots on back, wings, and crown, and a whitish belly with brown barring. Distinguishing characteristics of this species include a rounded head lacking ear tufts, whitish eyebrows and chin stripe, long legs, stubby tail, and yellow eyes. Burrowing owls were once a common, locally abundant species throughout much of California and Arizona. Breeding in central California has been reduced to only three isolated populations: the Central Valley, southern San Francisco Bay between Alameda and Redwood City, and near the Livermore area (DeSante et al. 1997).

Burrowing owls typically occupy the burrows created by California ground squirrels. They forage in grassland and agricultural habitats with low-growing vegetation. In general, three habitat attributes are required for a site to support burrowing owls: (1) open, well-drained terrain; (2) short, sparse vegetation, and, most importantly; (3) underground burrows. At sites where squirrels or natural burrows are absent, owls may use debris piles or other human-made structures (e.g., culverts, drainage pipes) for cover while dispersing or looking for more suitable habitat.

No burrowing owls or evidence of burrowing owl use (i.e., burrows or perching sites with white-wash, owl pellets, feathers, or eggshell fragments) was observed in the study area during the October 22, 2008, reconnaissance-level field survey. Overall, the study area has a low potential to support burrowing owls because of the high grass height (up to 3 feet high), which decreases overall visibility and foraging opportunities. The closest recorded observation of burrowing owls was 4 miles northeast of the study area (CNDDB 2009).

4-4.4.2.7 Swainson's Hawk

Swainson's hawk is a state-listed threatened species under the CESA. The Swainson's hawk is a medium-sized hawk with relatively long, pointed wings and a long, square tail. Swainson's hawks were once found throughout lowland California and were absent only from the Sierra Nevada, North Coast Ranges, Klamath Mountains, and portions of the desert regions of the state. Presently, Swainson's hawks are restricted to portions of the Central Valley and Great Basin regions where suitable nesting and foraging habitat is still available. Swainson's hawks nest in riparian forests, remnant oak woodlands, isolated trees, and roadside trees. They forage primarily in open agricultural habitats, particularly those that optimize availability of prey (e.g., alfalfa and other hay crops, some row and grain crops), but they also use irrigated pastures and annual grasslands (Estep 1989, England et al. 1997). In summer months, Swainson's hawks primarily eat insects, birds, and small mammals, occasionally taking reptiles, amphibians, and other invertebrates (Brown 1996). Swainson's hawks breed in the Central Valley, occurring in California only during the spring and summer breeding season (generally, March through August), and migrate to Mexico and portions of Central and South America during winter.

Within the Alamo site, suitable nesting habitat for Swainson's hawks is present within the riparian corridor along Alamo Creek and within large oak trees within a developed area along Rogers Lane. Swainson's hawks are not likely to nest in the orchard trees at the Alamo site. ~~Although Swainson's hawks have been known to nest in orchard trees (CNDDB 2009), the Alamo site provides alternative nesting opportunities within higher quality habitat (larger and more protected trees).~~

Within the Ulatis site, suitable nesting habitat for Swainson's hawks is present within the riparian corridor along Ulatis Creek and the unnamed tributary, and within large oak trees along Bucktown Road adjacent to the Ulatis site.

Presently, annual grasslands in the study area provide only marginal foraging habitat for Swainson's hawks because they are not regularly mowed and support high grasses (up to 3 feet), ~~decreases visibility and foraging opportunities~~ which reduces prey accessibility.

During field surveys, a Swainson's hawk was observed soaring approximately 1 mile south of the study area and one was observed over the Ulatis site. No Swainson's hawk nest sites have been previously reported from the study area. The closest known nest site is located approximately 2.5 miles south of the study area (CNDDDB 2009).

4-4.4.2.8 White-tailed Kite

White-tailed kite is designated as a species of special concern and fully protected species by DFG. In the Central Valley, white-tailed kites nest in riparian forests and woodlands, woodlots, and occasionally in isolated trees. They forage in agricultural fields, grasslands, and seasonal wetlands.

Within the study area, suitable nesting habitat for white-tailed kites is present within the riparian corridor along Alamo Creek, Ulatis Creek, and the unnamed tributary to Ulatis Creek. No historical white-tailed kite nest sites have been previously reported from the study area (CNDDDB 2009); however, white-tailed kites have been observed along nearby Sweeny and Encinosa Creeks during previous biological surveys conducted by AWE for other projects in the vicinity. Presently, annual grasslands in the study area provide only marginal foraging habitat because they are not mowed and support high grasses (up to 3 feet), which decreases visibility and foraging opportunities for white-tailed kites.

4-4.4.2.9 Loggerhead Shrike

Loggerhead shrike is designated as a species of special concern by DFG. It is a common year-round resident throughout California lowlands and foothills. Loggerhead shrikes prefer open habitats with shrubs, fences, utility line poles, or other perches. They tend to avoid urbanized areas but often frequent open croplands. Nests are usually hidden in densely foliated shrubs or trees. The breeding season is generally from March through August (Zeiner et al. 1990).

Although no loggerhead shrikes were observed during the October 22, 2008, field survey, they have been observed in similar habitats in the Vacaville area during previous biological surveys conducted by AWE for other projects in the vicinity. Trees and shrubs within the study area provide suitable nesting habitat for loggerhead shrikes, and non-native annual grasslands in the study area provide suitable foraging habitat.

4-4.4.3 Nesting Raptors, Migratory Birds, and Other Protected Species

Common raptors (birds of prey), migratory birds, and other native non-game birds not listed in Table 4-4.3 could also nest in trees, shrubs, and grasses in and adjacent to the study area. These species and their nests are protected from take pursuant to the California Fish and Game Code, Sections 3503, 3503.5, 3513, and 3800. Migratory birds are also protected under the Migratory Bird Treaty Act (MBTA).

Table 4-4.3. Special-Status Wildlife with Potential to Occur within the Alamo and Ulatis Sites

Common and Scientific Name	Legal Status ¹		Distribution	Habitat Association	Likelihood of Occurrence in the Study Areas
	Federal/State				
Invertebrates					
California freshwater shrimp <i>Syncaris pacifica</i>	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.	None: The study area is outside the known range (Marin, Napa, and Sonoma Counties).
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	E/-		Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, Placer, and Glenn Counties.	Large deep vernal pools in annual grasslands.	None: Suitable habitat (large, ponding seasonal wetlands) is not present in the study area; the closest CNDDDB (2009) record occurs 10 miles southeast of the study area.
Delta green ground beetle <i>Elaphrus viridis</i>	T/--		Restricted to central Solano County around the margins of vernal pools and in nearby bare areas along trails roads and ditches. Known from Olcott Lake and other vernal pools at Jepson Prairie Preserve.	Sparsely vegetated edges of vernal lakes and pools, and nearby bare areas.	None: The study area is outside the known range of the species. No occurrences are known from north of Interstate 80 in Solano County and no suitable habitat is present within the study area.
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T/--		Occurs only in the central valley of California below 1,500-foot elevations.	Prefers to lay eggs in elderberry shrubs 2-8 inches in diameter; can also use smaller elderberry shrubs as food source.	Moderate: Suitable habitat (elderberry shrubs) is present along Alamo Creek within the Alamo site and along Ulatis Creek and in the vicinity of existing electrical transmission towers within the Ulatis Creek site.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T/--		Central valley, central coast ranges, and south coast ranges.	Vernal pools and seasonal wetlands.	None: Suitable habitat (seasonal wetlands and seasonally ponded areas) is not present within the study area. Closest record occurs 3.5 miles east of the study area (CNDDDB 2009).
Vernal pool tadpole shrimp <i>Lepidurus packardi</i>	E/--		Shasta County south to Merced County.	Vernal pools, seasonal wetlands, and ephemeral stock ponds.	None: Suitable habitat (seasonal wetlands and seasonally ponded areas) is not present within the study area. Closest record occurs 2.5 miles east of the study area (CNDDDB 2009).

Table 4-4.3. Special-Status Wildlife with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Likelihood of Occurrence in the Study Areas
	Federal/State			
Amphibians				
California red-legged frog <i>Rana aurora draytonii</i>	T/SSC	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.	Found in permanent and semi-permanent aquatic habitats, such as creeks and ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods.	None: Alamo Creek and Ulatis Creek in the study area provide potential habitat; no California red-legged frogs were found during 2008 protocol-level surveys conducted by URS (FEMA 2009a) within Alamo Creek and Ulatis Creek in the study area.
California tiger salamander <i>Ambystoma californiense</i>	T/SSC	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet above sea level and coastal region from Butte County to northeastern San Luis Obispo County.	Valley floor grasslands or low foothill elevations 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 1.2 miles of breeding habitat.	None: Not known to occur north of Interstate 80 in Solano County; no suitable habitat (seasonal wetlands or ponds) is present in the study area. Closest record occurs 5.5 miles south of the study area (CNDDDB 2009).
Foothill yellow-legged frog <i>Rana boylei</i>	--/SSC	Originally found over most of California below 1,829 m (6,000 ft), west of the deserts and the Sierra-Cascade crest.	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats.	Moderate: Alamo Creek and Ulatis Creek in the study area provide potential habitat. Species has been identified in both creeks upstream from the study area (CNDDDB 2009). No foothill yellow-legged frogs were found during 2008 protocol-level surveys conducted for California red-legged frogs within Alamo Creek and Ulatis Creek.

Table 4-4.3. Special-Status Wildlife with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Likelihood of Occurrence in the Study Areas
	Federal/State			
Reptiles				
Giant garter snake <i>Thamnophis gigas</i>	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, freshwater marshes, irrigation ditches, and rice fields where there is a prey base of small fish and amphibians. Requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter.	None: No suitable aquatic habitat (perennial canals, streams, or ditches) is present within the study area; surveys were conducted by USGS biologists Glenn Wylie and Lisa Martin between 2004 and 2006 within suitable habitat in Solano County; no giant garter snakes were found (LSA 2007).
Western pond turtle <i>Actinemys marmorata</i>	--/SSC	Populations extend from southern British Columbia, Canada through Northern California.	Thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches with aquatic vegetation.	Moderate: Alamo Creek and Ulatis Creek in the study area provide suitable aquatic habitat. Observed at Ulatis site (FEMA 2009a). Closest record occurs 2.5 miles south of the study area (CNDDDB 2009).
Birds				
Burrowing owl <i>Athene cunicularia</i>	--/SSC	Widely distributed in proper habitat throughout the lowlands of the state, but rare along the coast north of Marin County and extremely rare east of the Sierra Nevada crest.	Burrow sites are in open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation.	Low: None observed during field surveys. Potential wintering and breeding areas (annual grassland with mammal burrows) are present within the study area but provides only low-quality habitat due to the tall height of grasses. Closest record occurs 4 miles northeast of the study area (CNDDDB 2009).
California black rail <i>Laterallus jamaicensis coturniculus</i>	--/T	Tidal marshlands of the northern San Francisco Bay estuary, Bodega Bay, Tomales Bay, Bolinas Lagoon, Sacramento-San Joaquin Delta, coastal southern California at Morro Bay and a few other locations, the Salton Sea, and lower Colorado River area.	Occur in fresh, brackish, and pickleweed-dominated salt marshes. In freshwater marshes, they are usually found in bulrushes and cattails.	None: No suitable habitat (marshes) is present within the study area. The closest known occurrences are in the Suisun Bay, approximately 10 miles south of the study area (CNDDDB 2009).
California clapper rail <i>Rallus longirostris obsoletus</i>	E/-	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.	None: No suitable habitat (salt marsh and tidal slough) is present within the study area.

Table 4-4.3. Special-Status Wildlife with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Likelihood of Occurrence in the Study Areas
	Federal/State			
Birds (continued)				
California least tern <i>Sterna antillarum</i>	E/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.	None: No suitable habitat (sandy beaches) is present within the study area.
Loggerhead shrike <i>Lanius ludovicianus</i>	--/SSC	Resident and winter visitor in lowlands and foothills throughout California. Rare on coastal slope north of Mendocino County, occurring only in winter.	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches.	Moderate: None observed during field surveys. Potential nesting habitat is present within orchard trees at the Alamo site and riparian trees and shrubs within the Alamo and Ulatis study areas and annual grasslands at both sites provide foraging areas for this species.
Northern spotted owl <i>Strix occidentalis caurina</i>	T/SSC	Northwestern California south to Marin County.	Coniferous forests with a multi-layered, multi-species canopy with moderate to high canopy closure; large snags (standing dead trees); an abundance of large, dead wood on the ground; and open space within and below the upper canopy to fly.	None: No suitable habitat (coniferous forests) is present within the study area.
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	--/SSC	Subspecies is endemic to Suisun Bay.	Restricted to Suisun Marsh utilizing intermixed stands of bulrush and cattail.	None: Study area is not within the range of the subspecies and no suitable marsh habitat is present within the study area.
Swainson's hawk <i>Buteo swainsoni</i>	--/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley.	Nests in large trees such as oaks, or cottonwoods, willows, or eucalyptus in or near riparian habitats or in lone trees near agricultural fields; forages in grasslands, irrigated pastures, and grain fields.	Moderate: Potential nesting habitat (riparian trees) and foraging habitat (annual grasslands) is present in the study area. Closest record occurs 2.5 miles south of the study area (CNDDDB 2009).
Yellow-breasted chat <i>Icteria virens</i>	--/SSC	Breeds throughout the state with exception of higher mountains and coastal islands.	Require dense riparian thickets of willows, vine tangles, and dense brush associated with streams, swampy ground and the borders of small ponds	None: Although the species may occur in the study area as a transient, riparian woodlands in the study area do not provide the dense habitat requirements for nesting. Closest record occurs 6.5 miles north of the study area (CNDDDB 2009).

Table 4-4.3. Special-Status Wildlife with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Likelihood of Occurrence in the Study Areas
	Federal/State			
Mammals				
Suisun shrew <i>Sorex ornatus sinuosus</i>	--/SSC	Tidal marshes of the northern shores of San Pablo and Suisun Bays.	Typically inhabit tidal and brackish marshes with dense, low lying cover where invertebrates are abundant	None: No suitable habitat (marsh) is present within the study area.
Fish				
Delta smelt <i>Hypomesus transpacificus</i>	T/T	Sacramento River – San Joaquin River Delta.	Euryhaline (fresh and brackish water) estuary channels. Spawning habitats consist of side channels and sloughs in the middle reaches of the Delta.	None: Alamo Creek and Ulatis Creek do not provide suitable habitat. The closest spawning areas occur in Suisun Bay/Suisun Marsh sloughs south of Vacaville and approximately 10 miles south of the study area.
California Central Valley Steelhead DPS <i>Oncorhynchus mykiss</i>	T/-	The Sacramento and San Joaquin Rivers and their tributaries, excluding San Francisco and San Pablo Bays and their tributaries, and coastal marine waters off California.	Central Valley rivers and streams.	Moderate: Alamo Creek and Ulatis Creek are considered occupied habitat but were excluded from critical habitat designation (70 FR 52488). Within lower reaches of Alamo and Ulatis Creeks, spawning is unlikely but they could provide migration habitat (LSA 2008).
Central Valley fall/late fall-run Chinook salmon <i>Oncorhynchus tshawytscha</i>	SC/SSC	San Joaquin and Sacramento Basins, east of Carquinez Strait, California.	Central Valley rivers and streams.	Low: Chinook salmon are known to have historically occurred in Putah Creek downstream from the study area. Alamo Creek and Ulatis Creek are not considered occupied habitat for this species (70 FR 52488); however, incidental sightings have occurred in Ulatis Creek (LSA 2008).
Central Valley spring-run Chinook salmon <i>Oncorhynchus tshawytscha</i>	T/T	Tributaries to the upper Sacramento River, primarily Butte, Big Chico, Deer, and Mill Creeks, and coastal marine waters off California.	Central Valley rivers and streams.	None: Spring-run Chinook salmon are not expected to occur in the Ulatis Creek drainage system (including Alamo Creek) upstream of Cache Slough (NMFS 2006).

Table 4-4.3. Special-Status Wildlife with Potential to Occur within the Alamo and Ulatis Sites (continued)

Common and Scientific Name	Legal Status ¹	Distribution	Habitat Association	Likelihood of Occurrence in the Study Areas
<i>Fish (continued)</i>				
Sacramento River winter-run Chinook salmon <i>Oncorhynchus tshawytscha</i>	E/E	Upper mainstem Sacramento River, Sacramento River–San Joaquin River Delta (juveniles), and coastal marine waters off California.	Spring-fed headwaters to the Sacramento River.	None: Winter-run Chinook salmon are not expected to occur in the Ulatis Creek drainage system (including Alamo Creek) upstream of Cache Slough (NMFS 2006).

Status explanations:

-- = No listing.

Federal

- E = Listed as endangered under the federal Endangered Species Act.
- T = Listed as threatened under the federal Endangered Species Act.

State

- E = Listed as endangered under the California Endangered Species Act.
- T = Listed as threatened under the California Endangered Species Act.
- SSC = State species of special concern.
- FP = State fully protected.

4-4.5 SIGNIFICANCE CRITERIA

Based on Appendix G of the 2008 CEQA Statutes and Guidelines, the Proposed Project would result in a significant impact on biological resources if they would:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS;
- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by DFG or USFWS;
- have a substantial adverse effect on federally protected waters of the U.S., including wetlands, as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- conflict with the provisions of an adopted HCP; natural community conservation plan; or other approved local, regional, or state HCP.

No impacts have been identified for the following criteria:

- **Conflict with any Local Policies or Ordinances Protecting Biological Resources, Such as a Tree Preservation Policy or Ordinance.**

The Proposed Project is within Solano County, just west of the City limits. The Proposed Project is consistent with the Solano County General Plan policies (listed above in Section 4-4.3.3.1) established to protect the County's natural habitats, including habitat for special-status species, wetlands, sensitive natural communities, and wildlife movement corridors. The Solano County General Plan states that the County will develop and adopt an ordinance to protect oak woodlands and heritage oak trees (Policy RS.I-3). The Solano County General Plan defines heritage oak trees as: (a) trees with a trunk diameter of 15 inches or more measured at 54 inches above natural grade; (b) any oak tree native to California with a diameter of 10 inches above natural grade; or (c) any tree or group of trees specifically designated by the County for protection because of its historical significance, special character, or community benefit. Several native oak trees that would qualify as heritage trees by the County are present on the Alamo and Ulatis sites. Tree removal would be limited to the minimum necessary for construction of the basins; however, some native oak trees will most likely be removed. Solano County has not adopted an oak tree ordinance; therefore, there would be no impact associated with this criteria.

- **Conflict with the Provisions of an Adopted HCP; Natural Community Conservation Plan; or other Approved Local, Regional, or State HCP.**

In ~~April 2009~~ February 2007, SCWA issued ~~Working Draft 2.2~~ a final administrative draft of the Solano Multispecies HCP. Although the HCP has not been adopted, the Proposed Project is generally consistent with the conservation strategies and mitigation requirements outlined in the

HCP for Swainson's hawk and burrowing owl; therefore, there would be no impact associated with this criteria.

4-4.6 IMPACTS AND MITIGATION MEASURES OF THE PROPOSED PROJECT

For purposes of assessing impacts on biological resources within the study area, this section includes an analysis of impacts associated with the Alamo and Ulatis sites. This impact analysis assumes that biological resources could be directly or indirectly affected by excavation of the detention basins, construction of inlet weirs/and outfall pipes, maintenance of the detention basin facility, recreational use of the basins, and potential agricultural use. Mitigation measures identified in this section are consistent with the Solano Multispecies Conservation Plan (Version 2.2 Final Administrative Draft) (LSA 2007).

Although construction and implementation of the detention basins could result in potential impacts on biological resources, the Proposed Project will result in an overall benefit to these resources. The basin sites will be managed as open space and will support either annual grassland (mowed) or agriculture (hay crop) that will provide potential wildlife foraging, resting, and nesting habitat. The dense and mature riparian habitat along drainages within the Alamo and Ulatis sites will be protected in perpetuity and will continue to provide important stream functions (i.e., regulate water temperature, bank stability, minimize sediment runoff) and provide important wildlife habitat and movement corridors, where it might otherwise be affected by routine agricultural practices on these sites

4-4.6.1 Potential to Adversely Affect Candidate, Sensitive, or Special-Status Species, as Identified in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The Proposed Project would result in the conversion of orchard, non-native annual grassland (formerly cultivated grain crop), and developed lands to one or more of the following community types: annual grassland, seasonal wetland, and/or hay crop (oat or alfalfa). The Alamo and Ulatis sites have undergone high levels of disturbance from past agricultural activities, contain a high proportion of non-native plant species, and generally have a low likelihood of supporting special-status species. Most plant and wildlife species that would most likely occur within these existing habitat types are common; however, both sites are bordered by seasonal drainages. Alamo Creek borders the southern boundary of the Alamo site and Ulatis Creek and tributary borders the northern boundary of the Ulatis site. These drainages and their associated riparian habitat provide high habitat value and have the potential to support special-status wildlife species including valley elderberry longhorn beetle, western pond turtle, and nesting migratory birds and raptors (including Swainson's hawk, white-tailed kite, and loggerhead shrike). Adjacent grasslands could be used by western pond turtles for nesting and as foraging habitat for migratory birds and raptors. Based on the Proposed Project's design, the majority of riparian habitat in the study area will not be disturbed. A small amount of riparian habitat will need to be removed to construct an inlet spillway and outlet pipe for each of the basins. The approximate location of the spillway and outlet pipe for each basin is shown on Figures 3-4.3 and 3-4.4.

Construction of the detention basins would remove the existing orchard and non-native annual grassland; however, the detention basin berms would support annual grasses and the basin floor would be planted with seasonal wetland vegetation or a cultivated hay crop (dependent on the presence and amount of groundwater). Although these future habitat conditions may reduce potential nesting sites for western

pond turtle, they would not significantly alter the habitat value for foraging migratory birds and raptors. Overall foraging habitat value would be increased by the Proposed Project because annual grasslands along berms would be mowed and a cultivated hay crop would be harvested annually, providing increased visibility of prey. If seasonal wetlands are created, they will provide increased invertebrate prey for many birds and raptors.

Based on the results of botanical surveys conducted at the Alamo and Ulatis sites, no special-status plants were found and suitable habitat was not present for most of the special-status plants listed in Table 4-4.2. The Proposed Project is not expected to adversely affect any candidate, sensitive, or special-status plants.

Removal of riparian vegetation and ground disturbance associated with construction of the Proposed Project could significantly affect several special-status wildlife species including, valley elderberry longhorn beetle, foothill yellow-legged frog, western pond turtle, central valley steelhead, Swainson's hawk, white-tailed kite, loggerhead shrike, and other migratory birds and raptors that could be present at the Alamo and Ulatis sites. Based on negative results of California red-legged frog protocol surveys conducted by URS in 2008, California red-legged frog is not expected to occur within the study area and no impacts on California red-legged frog from construction of the Proposed Project is anticipated. Potential impacts on special-status wildlife species are described below.

IMPACT 4-1: DISTURBANCE OR LOSS OF VALLEY ELDERBERRY LONGHORN BEETLE AT THE ALAMO SITE AND ULATIS SITE

Numerous elderberry shrubs that provide habitat for the federally threatened valley elderberry longhorn beetle occur within the Alamo and Ulatis sites (Figures 4-4.1 and 4-4.2). Elderberry shrubs are present within the riparian corridor that borders the proposed southern berm of the Alamo detention basin and the northern berm of the Ulatis Creek detention basin. Several elderberry shrubs are located at or near the proposed locations of the inlet structure and outlet pipe for both basins. In addition, two large groupings of elderberry shrubs are present under the high-voltage transmission towers located in the central portion of the Ulatis site. Ground disturbance associated with the Proposed Project could directly or indirectly affect valley elderberry longhorn beetle through the removal or disturbance of suitable habitat (elderberry shrubs). This impact is considered *significant*; implementation of Mitigation Measures 4-1a, 4-1b, and 4-1c would reduce potential impacts on valley elderberry longhorn beetle to a *less-than-significant* level.

To comply with the ESA, any potential direct or indirect effects on the federally threatened valley elderberry longhorn beetle will be addressed through Section 7 consultation between FEMA (the federal lead agency for the Proposed Project) and USFWS. Formal Section 7 consultation for the Alamo site has been completed and USFWS issued a Biological Opinion on September 28, 2010 (USFWS 2010). Mitigation Measures 4-1a, 4-1b, and 4-1c are consistent with the Reasonable and Prudent Measures and Terms and Conditions identified in the USFWS Biological Opinion for the Alamo site. Additional mitigation may be identified as the result of the Section 7 consultation for the Ulatis Creek Detention Basin. If any conflict between the following measures and the Ulatis Section 7 consultation is identified, the City shall implement the measures in the Ulatis Section 7 consultation at the Ulatis site.

MITIGATION MEASURE 4-1A: AVOID AND MINIMIZE IMPACTS ON VALLEY ELDERBERRY LONGHORN BEETLE HABITAT

The following measures will be implemented by the City to avoid and minimize effects to the Valley elderberry longhorn beetle:

1. Before any work occurs at the Project sites, including grading and equipment staging, the City shall require all construction personnel to participate in an environmental awareness training regarding special-status species (including valley elderberry longhorn beetle) and habitats present at the Proposed Project site. If new construction personnel are added to the Proposed Project, the City shall require the contractor to ensure that the personnel receive the mandatory training before starting work. As part of the training, an environmental awareness handout will be provided to all personnel that describes and illustrates sensitive resources that will be avoided during Project construction and identifies all relevant permit conditions and protection measures related to those resources.
2. All areas to be avoided during construction will be fenced and flagged. In areas where encroachment occurs within a 100-foot buffer of protected elderberry shrub, a buffer of at least 20 feet from the dripline of each elderberry shrub will be established. The fencing and flagging will be clearly marked and an “environmentally sensitive area”. If project work occurs within 20 feet of the dripline of the avoided elderberry shrubs, the on-site City Public Works Inspector, working with the project biologist, will cease project work and notify FEMA that reinitiation of consultation with the Service is necessary.
3. Signs will be erected every 50 feet along the edge of the avoidance areas with the following information: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. The Endangered Species Act of 1973, as amended, protects this species. Violators are subject to prosecution, fines, and imprisonment”. The signs will be clearly readable from a distance of 20 feet, and will be maintained for the duration of construction.
4. Dust control procedures, such as regular watering of disturbed soils and soil piles, the covering of soil piles, and the establishment of vehicle speed limits will be used throughout the construction period.

The City will ensure restoration and maintenance of disturbed areas within 100 feet of elderberry shrubs be accomplished by implementation of the following measures:

5. Any habitat disturbance within the 100-foot buffer area will be restored. Restoration will include erosion control and re-vegetate with appropriate native plants.
6. No insecticides, herbicides, fertilizer, or other chemicals that might harm the beetle or its host plant will be used in the buffer areas, or within 100 feet of any shrubs with one or more stems measuring one inch or greater in diameter at ground level during construction or maintenance of the Proposed Project.
7. The City will provide a written description to USFWS on how the buffer areas are to be restored, protected, and maintained after construction is completed.

MITIGATION MEASURE 4-1B: TRANSPLANT ELDERBERRY SHRUBS THAT CANNOT BE AVOIDED

1. The City shall ensure that all elderberry shrubs with stems measuring 1 in or more in diameter and that cannot be avoided during construction will be transplanted onsite (along Alamo or Ulati Creek) or to an offsite conservation area in accordance with the Conservation Guidelines for Valley Elderberry Longhorn Beetle (USFWS 1999) and the USFWS Biological Opinion for the

Alamo site (USFWS 2010). Transplantation guidelines include but are not limited to the following.

- a. Elderberry shrubs will be transplanted during the dormant period of the shrubs (November through the first 2 weeks of February), or as approved by the USFWS, by a licensed arborist.
- b. In the event that an elderberry shrub is unlikely to survive transplantation because of poor condition or location, the shrub may be exempted from transplantation at the discretion of USFWS.
- c. The location of the onsite or offsite conservation area shall be approved by USFWS before removal (transplanting) of the shrubs.

MITIGATION MEASURE 4-1C: COMPENSATE FOR DIRECT IMPACTS ON VALLEY

ELDERBERRY LONGHORN BEETLE HABITAT

1. The City shall compensate for direct impacts on all elderberry shrubs with stems measuring 1 inch or more at ground level in accordance with the Conservation Guidelines for Valley Elderberry Longhorn Beetle (Guidelines) (USFWS 1999) and the USFWS Biological Opinion obtained for the Alamo site (USFWS 2010). Additional compensation requirements may be required by USFWS as part of Section 7 consultation for the Ulatis Creek Detention Basin. Compensation requirements for direct effects on valley elderberry longhorn beetle include but are not limited to the following:
 - a. Replacement plantings at a ratio between 1:1 and 8:1 (new plantings to affected stems), depending on the diameter of the stem at ground level, presence or absence of exit holes, and whether the shrub is located in riparian habitat.
 - b. Replacement plantings of elderberry seedlings or cuttings and associated native plantings at an onsite or offsite USFWS-approved conservation area.

IMPACT 4-2: DISTURBANCE OR LOSS OF FOOTHILL YELLOW-LEGGED FROG AT THE ALAMO SITE AND ULATIS SITE

Foothill yellow-legged frogs are unlikely to breed at the Proposed Project sites because of lack of suitable substrate; however, they may disperse through Alamo Creek at the Alamo site and through Ulatis Creek and onsite tributary at the Ulatis site. If foothill yellow-legged frogs are present within proposed work areas during construction, the movement of equipment and placement of rock-slope protection within the creek channel could crush foothill yellow-legged frogs. This impact is considered *significant*; implementation of items 1 and 2 of Mitigation Measure 4-1a, ~~and Mitigation Measure 4-2~~, and item 3 of Mitigation Measure 4-4 would reduce potential impacts on foothill yellow-legged frog to a *less-than-significant* level.

**MITIGATION MEASURE 4-2: CONDUCT A PRECONSTRUCTION SURVEY FOR FOOTHILL
YELLOW-LEGGED FROG**

1. A qualified biologist shall conduct a preconstruction clearance survey for foothill yellow-legged frogs ~~immediately before any ground disturbance~~ within 48 hours prior to construction within or adjacent to Alamo Creek at the Alamo site and within or adjacent to Ulatis Creek and onsite tributary at the Ulatis site. The survey shall focus on the construction areas of the proposed outlet pipes and the inlet structures.
2. Any foothill yellow-legged frogs or other special-status amphibians found at the Proposed Project site shall be allowed to voluntarily move out of the work area or shall be captured and held for the minimum amount of time necessary to release them in suitable habitat outside the construction work area. If a foothill yellow-legged frog or other special-status amphibian species is observed during the preconstruction survey, DFG and/or USFWS, as applicable to the species, will be contacted to determine if additional avoidance measures are necessary.

**IMPACT 4-3: DISTURBANCE OR LOSS OF WESTERN POND TURTLE AT THE ALAMO
SITE AND ULATIS SITE**

Potential aquatic and upland habitat for western pond turtle is present at both the Alamo and Ulatis sites. If western pond turtles are present within proposed work areas during construction, the movement of equipment within uplands and placement of rock-slope protection within the creek channel could crush pond turtles or nests containing eggs or young.

Although the Proposed Project may result in short-term disturbance of western pond turtles, construction of the detention basins would also provide a beneficial effect on pond turtles by creating additional aquatic habitat. Conversion of the existing habitat from orchard and non-native annual grassland to annual grassland, seasonal wetland, and/or hay crop would not significantly alter the quality and suitability of the habitat for nesting pond turtles.

Disturbance or loss of western pond turtles is considered *significant*; implementation of items 1 and 2 of Mitigation Measure 4-1a, ~~and Mitigation Measure 4-3,~~ and item 3 of Mitigation Measure 4-4 would reduce potential impacts on western pond turtle to a *less-than-significant* level.

**MITIGATION MEASURE 4-3: CONDUCT PRECONSTRUCTION SURVEYS FOR WESTERN
POND TURTLE AND ESTABLISH NO-DISTURBANCE BUFFERS, IF NECESSARY**

1. In conjunction with the foothill yellow-legged frog clearance survey, a qualified biologist shall conduct a preconstruction clearance survey for western pond turtles ~~immediately~~ within 48 hours prior to any ground disturbance within or adjacent to Alamo Creek at the Alamo site and within or adjacent to Ulatis Creek and the onsite tributary at the Ulatis site. Surveys shall focus on the construction areas of the proposed outlet pipes and the inlet structures.
2. Any western pond turtles found at the Proposed Project site shall be allowed to voluntarily move out of the work area or shall be captured and held for the minimum amount of time necessary to release them in suitable habitat outside the construction work area. If a western pond turtle is

observed during the preconstruction survey, DFG will be contacted to determine if additional avoidance measures are necessary.

3. Preconstruction surveys for western pond turtle shall also be conducted no more than 48 hours before the start of construction activities within upland habitat 1,300 feet north of Alamo Creek at the Alamo site and 1,300 feet south of Ulatis Creek at the Ulatis site. These surveys shall include searching for adult pond turtles in addition to nests containing pond turtle hatchlings and eggs.
4. If an adult western pond turtle is located within upland habitat in the designated construction work area, the biologist shall move the turtle to a suitable aquatic site, outside the construction area. If an active pond turtle nest containing either pond turtle hatchlings or eggs is found, DFG shall be consulted to determine and implement appropriate avoidance measures, which may include a “no-disturbance” buffer around the nest site until the hatchlings have moved to a nearby aquatic site.

IMPACT 4-4: DISTURBANCE OR LOSS OF CENTRAL VALLEY STEELHEAD AND CENTRAL VALLEY FALL/LATE-FALL-RUN CHINOOK SALMON AT THE ALAMO SITE AND ULATIS SITE

The Proposed Project could result in disturbance, injury, and/or mortality of migrating or rearing steelhead or salmon during construction, operation, and/or maintenance of the proposed project. Potential direct and indirect effects to habitat for steelhead and salmon include disturbance of riparian vegetation and decreased water quality from erosion, sedimentation, and petrochemical spills. A detailed discussion of potential effects to the federally threatened Central Valley steelhead is included in a Biological Assessment report prepared for the Alamo site and submitted to NMFS (FEMA 2010). Potential effects on Central Valley steelhead within Ulatis Creek at the Ulatis site would be similar to those discussed in the Biological Assessment for the Alamo site based on similar habitat characteristics.

Overall, there is a low potential for Central Valley steelhead and Central Valley Chinook salmon to occur at the Proposed Project sites because the population of these species within the Alamo Creek and Ulatis Creek watersheds is expected to be very small (due to high water temperatures, the presence of PFPBs, and low water quality); however, ground disturbance within and adjacent to the creek channels has the potential to affect water quality downstream of the Alamo and Ulatis Project sites. This impact is considered *significant*; implementation of Mitigation Measure 4-4 would reduce potential impacts on Central Valley steelhead and Central Valley Chinook salmon downstream of the Project sites to a *less-than-significant* level.

To comply with the ESA, any potential direct or indirect effects on the federally threatened Central Valley steelhead will be addressed through Section 7 consultation between FEMA (the federal lead agency for the Proposed Project) and NMFS. For the Alamo site, a formal consultation request was sent by FEMA to NMFS on January 22, 2010, accompanied by a Biological Assessment report prepared for NMFS regarding the Alamo site (FEMA 2010). On August 18, 2010, NMFS sent a response letter to FEMA concluding that construction activity proposed at the Alamo site may affect, but ~~are~~ is not likely to adversely affect Central Valley steelhead with implementation of avoidance and minimization measures (NMFS 2010). A follow-up letter from NMFS was received by the City for the Alamo site on December 21, 2010 amending the August 18, 2010 letter with timing restrictions for work adjacent to Alamo Creek that would allow preconstruction archaeological mitigation to occur earlier in the year. Additional consultation between FEMA and NMFS will be required for the Ulatis site and a similar response from

NMFS is expected for Ulatis Creek. The avoidance measures listed under Mitigation Measure 4-4 are consistent with the measures identified by NMFS in their August 18, 2010 letter to avoid effects on Central Valley steelhead at the Alamo site. The City will also implement these measures at the Ulatis site to avoid potential effects to steelhead and salmon within Ulatis Creek.

**MITIGATION MEASURE 4-4: AVOID AND MINIMIZE IMPACT TO CENTRAL VALLEY
STEELHEAD AND CENTRAL VALLEY FALL/LATE-FALL-RUN CHINOOK
SALMON**

1. Limit construction activities within the banks and riparian zone of Alamo Creek and Ulatis Creek to June 15 to October 15, which is the period when Central Valley steelhead and Chinook salmon are least likely to be within Alamo Creek and Ulatis Creek. The exception to this timing and location restriction would be for archaeological investigations that could occur adjacent to the creek banks and within the riparian zone between April 15 and October 15, consistent with the avoidance measures listed-timing conditions identified in the response letters from NMFS for the Alamo site.
2. Provide a NMFS-approved biologist to conduct training sessions familiarizing all construction personnel with identification of Central Valley steelhead and Chinook salmon, and their habitats, as well as the general provisions and protections afforded by the Endangered Species Act to raise awareness of potential factors that might degrade habitat during construction in order to avoid them.
3. Provide a NMFS-approved biologist to monitor all construction activities in, or adjacent to the active stream channel of Alamo and Ulatis Creeks to ensure compliance with best management practices outlined in Section 5 of the Biological Assessment prepared for the Alamo site (FEMA 2010). The monitoring biologist will also be familiar with the identification of reptiles and amphibians in the event that a special-status reptile (i.e., western pond turtle) or amphibian (i.e., foothill yellow-legged frog, California red-legged frog) is observed during monitoring. If a special-status fish, reptile, or amphibian is observed within the construction area, the biologist will have the authority to stop construction until the animal voluntarily moves out of the construction area or the biologist relocates the animal to suitable habitat outside the construction area. The monitor will notify the City immediately of the animal's presence within the construction area. If a steelhead or salmon is observed, the City will contact NMFS to determine if additional avoidance measures are necessary. If a special-status reptile or amphibian is found within the construction area, the City will contact DFG and/or USFWS as appropriate for the species observed.
4. Remove debris that accumulates within the detention basins (during flooding events) at a time when the area is dry and steelhead and salmon would not be present (i.e., June through September) unless waiting for the dry season would create undue safety concerns.
5. Ensure that all demolition and removal, of structures in the course of completing the project conforms to all applicable hazardous materials safety guidelines.
6. Ensure that all areas that are particularly susceptible to erosion from flooding events (e.g., the intake and spillway) have been appropriately hardened against scour.

7. Avoid entrapment of steelhead and salmon within the detention basins through the installation of a 42-inch-diameter reinforced-concrete pipe outlet at the lowest elevation within the basins.

IMPACT 4-5: DISTURBANCE OR LOSS OF WINTERING AND NESTING BURROWING OWL AT THE ALAMO SITE AND ULATIS SITE

Non-native annual grasslands on the Alamo and Ulatis sites provide only marginal foraging and nesting habitat for burrowing owls because of the high vegetation height (greater than 3 feet) and lack of ground squirrel activity or suitable burrows that could be used by burrowing owls. Although no burrowing owls or potential burrows were found on either of the Project sites during field surveys, changes in the current vegetation conditions and increased small-mammal use could encourage burrowing owls to nest onsite. If burrowing owls are wintering or nesting within or adjacent to the construction area, ground-disturbing activities could disturb nesting burrowing owls or remove active burrowing owl burrows containing eggs, young, or adults.

Although the Proposed Project could result in short-term disturbance to burrowing owls, construction of the detention basins would increase the suitability of the habitat for burrowing owls by improving foraging conditions (lower vegetation height) and by providing potential perching and nesting areas along the detention basin berms.

Disturbance or loss of wintering or nesting burrowing owls is considered *significant*; implementation of Mitigation Measure 4-5 would reduce potential impacts on burrowing owl to a *less-than-significant* level and would avoid violation of the California Fish and Game Code and the MBTA.

MITIGATION MEASURE 4-5: CONDUCT A PRECONSTRUCTION BURROWING OWL SURVEY AND IMPLEMENT DEPARTMENT OF FISH AND GAME GUIDANCE ON AVOIDING ACTIVE BURROWS OR RELOCATING WINTERING OWLS

1. The City shall retain a qualified biologist to conduct a preconstruction survey to locate any burrowing owl burrows on the Project sites and within a 500-foot-wide buffer around the site. The preconstruction survey shall be conducted in accordance with guidelines provided in DFG's Staff Report on Burrowing Owl Mitigation (DFG 1995) and no more than 30 days before the start of construction activities (including grading and equipment staging). If no burrowing owls are detected, no further mitigation is required.
2. If active burrowing owls are detected in the survey area, the following measures shall be implemented.
 - a. Occupied burrows shall not be disturbed during the nesting season (generally February 1–August 30).
 - b. When destruction of occupied burrows is unavoidable during the non-breeding season (September 1–January 31), the City shall coordinate with DFG and unsuitable burrows shall be enhanced (enlarged or cleared of debris) or new burrows created (installing artificial burrows) at a ratio of 2:1 on protected areas within or adjacent to the Project boundaries. Newly created burrows shall follow guidelines established by DFG.

- c. If owls must be moved away from the Project sites during the non-breeding season, passive relocation techniques (e.g., installing one-way doors at burrow entrances) shall be used instead of trapping. At least 1 week shall be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows.

IMPACT 4-6: DISTURBANCE OR LOSS OF NESTING SWAINSON'S HAWK AT THE ALAMO SITE AND ULATIS SITE

The Project sites provide suitable nesting and marginal foraging habitat for Swainson's hawks. The highest quality nesting habitat at the Alamo and Ulatis sites is located within the riparian corridor along Alamo and Ulatis Creeks (respectively). A Swainson's hawk was observed ~~soaring over foraging at~~ the Ulatis site in April 2009. The proposed detention basins have been sited to avoid and minimize riparian habitat loss and disturbance. Based on preliminary design, the Proposed Project will remove riparian habitat only at the location of the inlet weirs and outlet pipe (Figures 3-4.3 and 3-4.4). Potential nest sites for Swainson's hawk also occur within large native oak trees adjacent to Rogers Lane at the Alamo site and adjacent to Bucktown Lane at the Ulatis site and some of these trees may need to be removed as part of Project construction or access. In addition to tree removal, noise associated with construction activities that occurs during the breeding season (generally between March 1 and August 31) could disturb Swainson's hawks nesting at or near the Project sites (within a 0.25-mile radius). These disturbances could cause nest abandonment and death of young or loss of reproductive potential at active nests. Removal of trees containing an active Swainson's hawk nest with eggs or young or disturbance of nesting Swainson's hawks that results in the abandonment of an active nest with eggs or young would violate California Fish and Game Codes 3503.5 and 2080, CESA, and MBTA.

Construction of the Proposed Project will convert orchard and unmaintained non-native annual grassland (summer height excess of 3 feet) to short annual grassland (~~along berms mowed~~), seasonal wetland (within ~~low-lying portions of the basin floor a portion or the entire basin floor~~), and/or hay crop (~~oat or alfalfa~~ planted on the basin floor). Creation of annual grassland (~~mowed or grazed~~), seasonal wetland, and/or ~~alfalfa~~ hay would result in ~~an increase a no-net-loss~~ of potential foraging habitat for Swainson's hawks because these habitat types would ~~have be maintained at a low height by grazing, mowing, or cultivating~~. ~~Low vegetation height increases visibility of prey and provides a higher habitat value for Swainson's hawks. If oat hay is planted on the basin floor, this habitat will function similarly or better habitat value compared to the existing orchard and non-native annual grassland, with exception of the basin berms, which will be maintained by mowing and will provide access to prey moving into and out of the basins. Overall, the Proposed Project will have a net increase in potential foraging habitat for Swainson's hawks. This is considered a beneficial result of the Proposed Project.~~

Disturbance or loss of Swainson's hawks is considered *significant*; implementation of Mitigation Measure 4-6 would reduce potential impacts on Swainson's hawk to a *less-than-significant* level and would avoid violation of the CESA, California Fish and Game Code, and MBTA.

**MITIGATION MEASURE 4-6: CONDUCT A PRECONSTRUCTION NESTING BIRD AND
RAPTOR SURVEY AND ESTABLISH NO-DISTURBANCE BUFFERS, IF
NECESSARY**

1. If construction (including equipment staging and tree removal) will occur during the breeding season for migratory birds and raptors (generally between March 1 and August 30), the City shall retain a qualified biologist to conduct a preconstruction nesting bird and raptor survey before the onset of construction activities.
2. The preconstruction nesting bird and raptor surveys shall be conducted between March 1 and August 30 within suitable habitat at the Project sites. Surveys for raptors nests should also extend ¼-mi from the Project sites to ensure that nesting raptors are not indirectly affected by construction noise. The survey shall be conducted no more than 1 week before the initiation of construction activities. If no active nests are detected during the survey, no additional mitigation is required and construction can proceed.
3. If migratory birds or raptors are found to be nesting in or adjacent to the Project sites, a no-disturbance buffer shall be established around the nest to avoid disturbance of the nest site and to avoid take. The buffer will be maintained around the nest site until the end of the breeding season or until a qualified biologist determines that, the young have fledged and are foraging on their own. The extent of these buffers shall be determined by the biologist (coordinating with the DFG) and shall depend on the species identified, level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. If a Swainson's hawk nest is found within 0.25-mi from construction activities, the City will consult with DFG to determine if additional avoidance measures (i.e., nest monitoring) should be implemented during construction to "avoid" take.

**IMPACT 4-7: DISTURBANCE OR LOSS OF NESTING WHITE-TAILED KITE AT THE
ALAMO SITE AND ULATIS SITE**

The Project sites provide suitable nesting and marginal foraging habitat for white-tailed kites. Nesting habitat is present within the riparian corridor along Alamo Creek at the Alamo site and along Ulatis Creek at the Ulatis site. Potential Project impacts (including loss or disturbance of active nests) to white-tailed kite are similar to those described above for Swainson's hawk (Impact 4-4a).

Disturbance or loss of white-tailed kites is considered *significant*; implementation of Mitigation Measure 4-6 (Conduct a Preconstruction Nesting Bird and Raptor Survey and Establish No-Disturbance Buffers, if Necessary) would reduce potential impacts on white-tailed kite to a *less-than-significant* level and would avoid violation of the California Fish and Game Code and MBTA.

**IMPACT 4-8: DISTURBANCE OR LOSS OF LOGGERHEAD SHRIKE AT THE ALAMO SITE
AND ULATIS SITE**

Trees and shrubs at the Project sites provide potential nesting habitat for loggerhead shrikes. Construction of the detention basins requires the removal of numerous orchard trees at the Alamo site and

several other native and non-native trees and shrubs at both the Alamo and Ulatis sites. If construction occurs during the breeding season (generally March 1 through August 30), vegetation removal could remove an active nest containing loggerhead shrike eggs or young.

Disturbance or loss of loggerhead shrikes is considered *significant*; implementation of Mitigation Measure 4-6 (Conduct a Preconstruction Nesting Bird and Raptor Survey and Establish No-Disturbance Buffers, if Necessary) would reduce potential impacts on loggerhead shrike to a *less-than-significant* level and would avoid violation of the California Fish and Game Code and MBTA.

4-4.6.2 Potential to Adversely Affect Riparian Habitat or Other Sensitive Natural Community

Construction of the detention basins would result in the conversion of orchard and non-native annual grassland (formerly cultivated) to one or more of the following community types: annual grassland, seasonal wetland, and/or hay crop (oat or alfalfa). Orchard and non-native annual grassland are not considered sensitive habitats by resource agencies or local plans and ordinances, and their conversion would not be considered a significant impact; however, the Proposed Project will require removal of some riparian vegetation along Alamo Creek at the Alamo site and along Ulatis Creek at the Ulatis site. Riparian communities are considered a sensitive natural community.

IMPACT 4-9: PERMANENT AND TEMPORARY LOSS OF RIPARIAN HABITAT AT THE ALAMO SITE AND ULATIS SITE

The Proposed Project has been sited to minimize permanent and temporary impacts on riparian habitat. The only permanent impacts on riparian habitat will occur during construction of the detention basin inlet weirs on the north side of Alamo Creek at the southwest corner of the Alamo site (Figure 3-4.3) and on the south side of Ulatis Creek at the northwest corner of the Ulatis site (Figure 3-4.4). Additionally, installation of the outlet pipes into Alamo and Ulatis Creeks will require temporary disturbance of riparian habitat. According to preliminary basin designs, construction of the Alamo basin may permanently remove approximately 0.19 acre and temporarily remove approximately 0.03 acre of riparian habitat. Construction of the Ulatis basin may permanently remove approximately 0.10 acre and temporarily remove approximately 0.02 acre of riparian habitat. During the final design phase of the Project, the exact location of the inlet weirs and outlet pipes will be determined with the goal of minimizing riparian tree removal to the extent practicable.

Loss of riparian habitat is considered *significant*; implementation of Mitigation Measures 4-9a, 4-9b, and 4-9c would reduce permanent and temporary impacts on riparian habitat to a *less-than-significant* level.

MITIGATION MEASURE 4-9A: ESTABLISH A NO-DISTURBANCE BUFFER AROUND PROTECTED RIPARIAN HABITAT AND CONDUCT BIWEEKLY VISITS

1. Before any ground-disturbing activities (including grading and equipment staging), the City shall ensure that temporary exclusion area fencing (4-foot-high orange construction fencing or sediment fencing) is installed at the edge of riparian habitat that will be avoided during construction.

2. The extent of the riparian buffer and exclusion fencing shall be shown on the final construction plans for the Proposed Project. The purpose of the fencing is to alert construction personnel of this protected habitat and the need for avoidance. The fencing shall be checked and maintained throughout the construction period.
3. A City representative shall conduct biweekly site visits to monitor construction at the Project sites and ensure that the contractor maintains the temporary exclusion area fencing to avoid protected riparian habitat.

MITIGATION MEASURE 4-9B: RESTORE TEMPORARILY DISTURBED RIPARIAN HABITAT

Following installation of the outlet pipes on each basin, disturbed riparian habitat will be restored. These areas shall be revegetated with locally native riparian shrubs that establish quickly such as, California bay laurel, California rose, California grape, and mugwort. Trees will not be planted in this area because of the potential for their root systems to undermine the integrity of the outlet pipes. Plantings shall consist of cuttings taken from local plants, or plants grown from local material obtained within the Alamo Creek and Ulati Creek watershed. Because the proposed planting are hardy and fast-growing species, the replacement plantings would be planted in the fall following construction and monitored the following spring to ensure their survival. Any remedial measures (i.e., additional plantings) would be conducted in the following fall season.

MITIGATION MEASURE 4-9C: COMPENSATE FOR TEMPORARY AND PERMANENT LOSS OF RIPARIAN HABITAT

1. For purposes of determining appropriate riparian habitat compensation, temporary removal of riparian habitat associated with construction of the outlet pipes would be compensated at the same ratio as permanent riparian habitat removal because it is not be feasible to replant trees over or adjacent to the outlet pipe because of the potential for their root systems to undermine the integrity of the outlet pipes. To compensate for the temporary and permanent removal of riparian habitat trees and shrubs associated with the construction of the inlet weirs and outlet pipes, the City shall replant riparian trees and shrubs at a minimum 2:1-3:1 ratio (two-three trees/shrubs planted for every tree/shrub removed). The replacement plantings shall consist of a variety of native tree species such as valley oak, Fremont cottonwood, red willow, arroyo willow, and white alder; and native shrub species such as California Bay, California buckeye, and California rose.
2. The City shall accomplish riparian habitat compensation by implementing one of the following two options.
 - a. After completion of the final design for each basin, the City shall prepare a planting plan that identifies the location of the riparian mitigation plantings and the number, type, and size of plants. The planting plan shall also describe the irrigation and maintenance required to establish and monitor the planting area. Mitigation plantings will be done between October 15 and December 31 of the year immediately following when impacts occur. All mitigation plantings will be monitored for 5 years. All plantings will have a minimum of 80% survival goal at the end of 5 years. If the survival requirements are not meeting this goal, replacement plantings will be installed. Replacement plants shall be monitored with the same survival and growth requirements for 5 years after planting. The City will be responsible for planting,

replanting, watering, weeding, invasive exotic eradication, and any other practice needed to ensure this goal. An annual status report on the mitigation will be provided to DFG by December 31 of each year. The report will include the survival, percent cover, and height of both tree and shrub species. The number by species of plants and trees replaced, and overview of the revegetation effort, and the method used to assess these parameters will also be included. Photographs of the mitigation area will also be included. To ensure success of the mitigation plantings, the City shall prepare and implement an adaptive management plan that identifies specific monitoring tasks, success criteria, and reporting requirements.

or

- b. The City shall purchase mitigation credits at a DFG-approved riparian mitigation site at a 3:1 ratio (three trees/shrubs planted for every tree/shrub removed) that includes long-term management and monitoring.

4-4.6.3 Potential to Adversely Affect Federal Waters of the U.S. and State, Including Wetlands, under the Jurisdiction of the Clean Water Act CWA, Section 404 and the California Fish and Game Code

A wetland delineation was conducted that identified potential waters of the U.S., including wetlands, on the Proposed Project sites. The Alamo site supports 3.294 acres of seasonal drainage (Alamo Creek) and the Ulatis site supports 3.807 acres of seasonal drainage (Ulatis Creek, unnamed tributary, and two erosional features) and 0.066 acre of seasonal wetland habitat. These features were determined to be potentially jurisdictional under Section 404 of the CWA and/or the California Fish and Game Code (CFGC), Section 1600.

IMPACT 4-10: PERMANENT AND TEMPORARY FILL TO WATERS OF THE U.S. AND STATE AT THE ALAMO SITE AND ULATIS SITE

The Proposed Project has been designed to avoid and minimize impacts to waters of the U.S. and State, including wetlands, to the maximum extent practicable. Permanent and temporary impacts on potentially jurisdictional waters would result from construction of an inlet weir and outlet pipe on each of the two basins. Installation of the inlet weir would require the placement of articulated concrete revetment block, or a similar stabilization feature, within the creek bank along the north side of Alamo Creek and the south side of Ulatis Creek at the Project sites. Riprap would also be placed along the creek banks and in the bed of the creeks to serve as an energy dissipation area for the outlet pipes. These activities would result in permanent and temporary fill of waters of the U.S. (Alamo Creek and Ulatis Creek) and alteration of the stream bank, and would require CWA, Section 401, 402, and 404 Permits and a Streambed Alteration Agreement in compliance with CFGC, Section 1600. According to preliminary basin designs, construction of the inlet weir and outlet pipes at the Alamo site may permanently fill approximately 0.382 acre and temporarily fill approximately 0.048 acre of waters of the U.S. and State (Alamo Creek). Construction associated with the inlet weir and outlet pipes at the Ulatis site may permanently fill approximately 0.159 acre and temporarily fill approximately 0.087 acre of waters of the U.S. and State (Ulatis Creek).

Loss of waters of the U.S. is considered *significant*; installation of exclusion fencing along the riparian corridor (described above under Mitigation Measure 4-9a) and implementation of Mitigation Measures 4-10a, 4-10b, and 4-10c would reduce permanent and temporary impacts to waters of the U.S., including wetlands, to a *less-than-significant* level.

MITIGATION MEASURE 4-10A: RESTRICT WORK IN THE CREEK CHANNEL TO THE DRY-SEASON AND DEWATER THE CHANNEL, IF NECESSARY

1. Construction of the inlet weir and outlet piping shall occur only during the dry season or low-flow period. The construction window may be extended based on seasonal conditions with approval from a qualified biologist and at the discretion of permitting agencies.
2. Water is not anticipated in Alamo Creek during the proposed work period for construction of the inlet and outlet structures; however, Ulatis Creek may contain standing or running water during the proposed work period because of the presence of irrigation runoff upstream of the Ulatis site and beaver dams that detain water within the Ulatis site boundaries. If water is present in the creeks at the inlet and outlet structure locations, flow will be temporarily diverted around or, in the case of stagnant water, excluded from the worksites through the installation of cofferdams before construction of these features.
3. Any temporary cofferdams will be immediately removed upon completion of construction activities in the areas of the proposed inlet and outlet structures.

MITIGATION MEASURE 4-10B: COMPLY WITH THE CONDITIONS OF CLEAN WATER ACT, SECTION 401, 402, AND 404 PERMITS AND STREAMBED ALTERATION AGREEMENT OBTAINED FOR THE PROPOSED PROJECT

1. Before any ground-disturbing activities (including equipment staging), the City shall obtain and comply with the conditions of a CWA, Section 404 permit from the Corps; ~~and~~ a CWA, Section 401 water quality certification from RWQCB; and Streambed Alteration Agreement from DFG.
2. The City shall also obtain a General Permit for Discharges of Stormwater associated with construction activity from the SWRCB as required under Section 402 of the CWA. As part of this permit, the City shall prepare and implement a SWPPP that includes erosion control measures and construction-waste containment measures to ensure that waters of the State are protected during and after Project construction. The SWPPP shall include site design to minimize offsite stormwater runoff that might otherwise affect surrounding wetland habitat.

The SWPPP shall be prepared with the following objectives: (a) to identify pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from the construction of the project; (b) to identify BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the site during construction; (c) to outline and provide guidance for BMP monitoring; (d) to identify project discharge points and receiving waters; (e) to address post-construction BMP implementation and monitoring; and (f) to address sedimentation, siltation, turbidity, and non-visually detectable pollutant monitoring, and outline a sampling and analysis strategy.

The SWPPP shall include the following provisions:

- a. All excavated materials shall be deposited or stored in such a manner that the material cannot be washed into any watercourse, and excess supplies of certified weed-free straw bales and/or sedimentation fencing shall be available at the construction site for use as needed.
- b. No refueling, storage, servicing, or maintenance of equipment shall take place within 100 ft of wetland habitat. All machinery shall be properly maintained and cleaned to prevent spills and leaks. Any spills or leaks from construction equipment shall be cleaned up in accordance with applicable local, state, and/or federal regulations.
- c. Exposed soil shall be seeded with a native grassland seed mix.

MITIGATION MEASURE 4-10C: COMPENSATE FOR PERMANENT IMPACTS TO WATERS OF THE U.S. AND STATE

The Proposed Project appears to qualify for authorization under the Nationwide Permit Program. Specifically, the Proposed Project may qualify for authorization under a Nationwide Permit 43 for Stormwater Management Facilities. Additionally, DFG will require a Streambed Alteration Agreement with the City for project-related activities that impact waters of the State. Authorization of these activities by the Corps and DFG will require compensation for impacts on Corps and DFG jurisdictional features. To compensate for permanent impacts on jurisdictional waters, the City shall purchase waters of the U.S. and/or State credits from a Corps- and/or DFG-approved mitigation bank, or in-lieu fees shall be paid to a Corps- and/or DFG-approved fund at a 1:1 replacement ratio (1 acre of habitat replaced for every 1 acre filled).

4-4.6.4 Potential to Interfere with the Movement of Native, Resident, or Migratory Species, or with Established Wildlife Corridors or Native Wildlife Nursery Sites

The Project sites do not occur within any known established wildlife corridors or native wildlife nursery sites; however, the Project sites are within the Pacific Flyway and migratory birds were observed on the Alamo and Ulatis sites during the 2008 and 2009 field surveys.

IMPACT 4-11: DISTURBANCE OR LOSS OF MIGRATORY BIRDS AT THE ALAMO SITE AND ULATIS SITE

The Proposed Project would temporarily interfere with the movement of native, resident, and migratory wildlife species across the Alamo and Ulatis sites during construction of the detention basins; however, no permanent effects would occur since the detention basins would be left open and none of the permanent features proposed would restrict wildlife movement across the sites. Riparian, orchard, and other isolated trees on the Project sites provide suitable nesting habitat for migratory birds. Removal of trees containing active nests with eggs or young could result in take of migratory birds. This impact is considered *significant*. Implementation of Mitigation Measure 4-6 (Conduct a Preconstruction Nesting Bird and Raptor Survey and Establish No-Disturbance Buffers, if Necessary) would reduce potential impacts on nesting migratory birds to a *less-than-significant* level and would avoid violation of the California Fish and Game Code and MBTA.

4-4.6.5 Potential for Incidental Passive Public Use to Directly or Indirectly Impact Biological Resources

The Proposed Project includes an incidental passive public use component that would allow limited public access on the Alamo and Ulatis sites. Incidental passive public uses may include wildlife or habitat viewing and educational field trips and access would be limited by appointment or by a docent-led program administered directly through the City or through an agreement with the Solano Land Trust. This incidental passive public use would not require the construction of improvements such as restrooms, picnic tables, play fields, paved trails, or other constructed facilities. Fencing on the detention basin sites would be placed only as required to restrict public access to component use areas such as agricultural fields and sensitive habitat, and to protect neighboring properties from casual trespass.

The potential for limited incidental passive public use of the Alamo and Ulatis sites would not result in adverse impacts on biological resources because only passive public uses would be allowed and fencing would restrict access to non-sensitive areas. This would be a *less-than-significant* impact and no mitigation is required.

4-4.7 CUMULATIVE IMPACTS AND MITIGATION MEASURES

The cumulative context for biological resources is the unincorporated areas of Solano County. Implementation of the Solano County 2008 General Plan, in combination with potential future projects in Solano County, would convert approximately 21,971 acres of agricultural and natural open-space land into urban uses (Solano County 2008). This would result in the cumulative loss of sensitive natural communities and habitat for special-status plants and wildlife.

IMPACT 4-12: CUMULATIVE CONTRIBUTION TO THE LOSS OF SPECIAL-STATUS WILDLIFE SPECIES OR THEIR HABITATS IN SOLANO COUNTY

The Proposed Project would convert up to 68 acres of non-native annual grassland (23.5 acres for the Alamo site and 44.5 acres for the Ulatis site) and 46.2 acres of orchard (for the Alamo site) to a combination of vegetation community types including annual grassland, seasonal wetland, and/or hay crop. Conversion of the existing upland habitat to these vegetation community types would not significantly reduce the quality and suitability of the habitat for special-status wildlife species that have the potential to occur or forage in uplands on the Project sites including, western pond turtle, burrowing owl, Swainson's hawk, white-tailed kite, loggerhead shrike, and other migratory birds and raptors. Conversion of existing orchards to annual grassland, seasonal wetland, and/or hay crop would provide an overall increase in foraging opportunities for burrowing owl, Swainson's hawk, white-tailed kite, and many other migratory birds and raptors because these proposed community types would maintain low-vegetation height by routine mowing (for fire safety) or harvesting (alfalfa or grain crop). Therefore, the Proposed Project would not contribute incrementally to the loss of wildlife habitat in Solano County and this impact is considered *less-than-significant*.

IMPACT 4-13: CUMULATIVE CONTRIBUTION TO THE LOSS OF SENSITIVE NATURAL COMMUNITIES IN SOLANO COUNTY

In addition to conversion of orchard and non-native annual grassland, the Proposed Project will result in the temporary loss of approximately 0.05 acre and permanent loss of approximately 0.29 acre of riparian habitat (a sensitive natural community) along Alamo Creek and Ulatis Creek at the Project sites. Although the Proposed Project would add incrementally to riparian habitat loss, they would not result in a substantial reduction of riparian habitat in Solano County. Mitigation measures have been included in this EIR to mitigate potentially significant impacts on riparian habitat and would also mitigate the Project's contribution to cumulative impacts on riparian habitat this impact is considered *less-than-significant*.

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