

Section 3.3

Biological Resources

This section describes the biological resources that are present, or have the potential to be present, in the project region. For the purpose of this PEA, biological resources include vegetation, wildlife, and waters of the United States, including wetlands. The project area does not contain suitable aquatic habitat for fish species; therefore, fish are not addressed in this section.

As described in Chapter 2, Jones & Stokes biologists identified potential sensitive biological resources along each of the alternative pipeline routes and other project components during Spring 2005. The biological team then worked closely with Lodi Gas Storage to design a pipeline route and locate facilities in areas that would minimize direct and indirect impacts on sensitive biological resources (e.g., seasonal wetlands, drainages, and associated habitat for special-status species). The result of this coordinated design effort is a project that results in minimal short-term impacts and avoids long-term impacts on biological resources.

Potential impacts on biological resources that are associated with each of the project components are described, and mitigation measures to avoid, minimize, or compensate for potential significant impacts on biological resources are identified.

Environmental Setting

Methods

The methods used to identify biological resources in the study area are described below. The biological resources study area is described, followed by a description of the prefield investigation and field surveys that were conducted to support this PEA.

Biological Resources Study Area

The “study area” evaluated for biological resources is shown in Figure 3.3-1. The biological study area varied for each of the project components and was

determined based on property access, habitat types present in the area, and level of existing disturbance (e.g., the survey corridor was wider [300 feet] in non-native annual grasslands than in tilled or planted agricultural fields [100 feet]).

Prefield Investigation

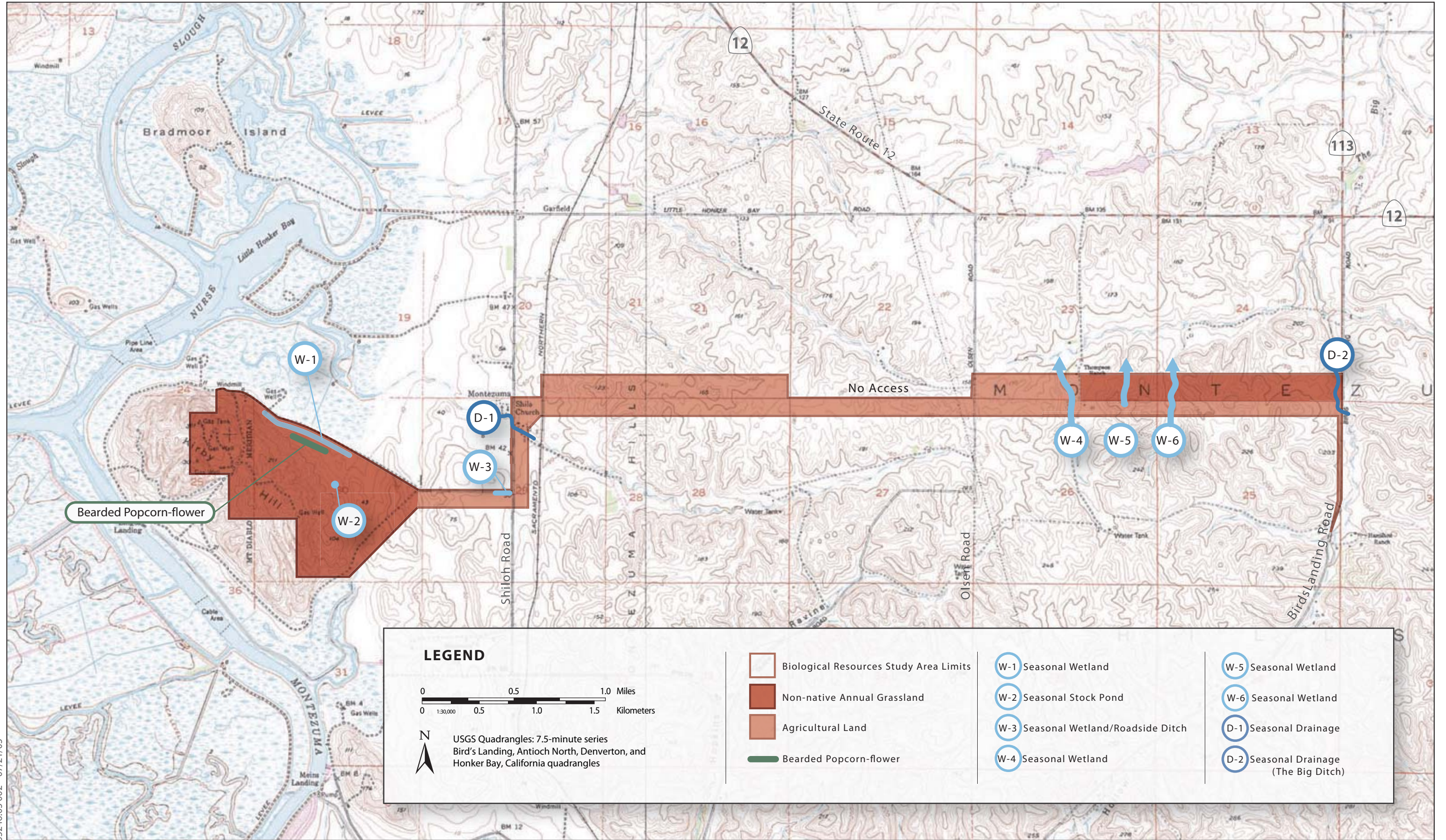
A prefield investigation was conducted to review existing information and to prepare lists of special-status plant and wildlife species known to occur or with potential to occur in the project region. A Jones & Stokes botanist and wildlife biologist reviewed the following existing information to develop lists of special-status species that could occur in the project region:

- A record search of the Birds Landing and Antioch North 7.5-minute U.S. Geological Survey (USGS) quadrangle maps (quads) and surrounding quads from the California Department of Fish and Game's (DFG's) California Natural Diversity Data Base (CNDDB) (2005);
- California Native Plant Society's (CNPS's) 6th Edition Inventory of Rare and Endangered Plants of California (2001);
- U.S. Fish and Wildlife Service's (USFWS's) lists of endangered and threatened species for selected USGS 7.5-minute quadrangles (2004);
- Previous environmental documents prepared for other projects in the region (i.e., the High Winds Environmental Impact Report [EIR] [Solano County 2001], Shiloh I EIR [Solano County 2005], and the Sacramento Municipal Utility District (SMUD) Wind Farm EIR [2001]);
- Knowledgeable individuals (Dr. Ron Kelley, pers. comm.); and
- Jones & Stokes file information.

Additional information on species' habitat requirements, blooming periods, and field-identifying characteristics was obtained from various botanical sources (Munz and Keck 1973, Hickman 1993, CNPS 2001). This information was summarized and used to develop lists of special-status species that could occur in the project region (Tables 3.3-1 and 3.3-2 [at the end of this section]).

Field Surveys

The biological team, consisting of a wildlife biologist and a botanist/wetlands ecologist, conducted field surveys on May 5, 6, 10, and 15, and on June 22, 2005. Jones & Stokes biologists also conducted previous surveys in the project area for the Shiloh I Wind Plant Project (this proposed wind farm encompasses a portion of the gas pipeline system between Shiloh Road and Olsen Road). The team conducted these previous surveys in April, May, June, and August 2004.



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Figure 3.3-1
Biological Resources Located in the Study Area

In general, the purposes of the 2005 biological field surveys conducted for the proposed project were to:

- Characterize biological communities and their associated wildlife habitat uses,
- Determine whether suitable habitat exists for common and special-status wildlife species,
- Determine whether the study area contains suitable habitat for early- and late-blooming special-status plants,
- Locate special-status plant occurrences, and
- Identify areas that may qualify as potential waters of the United States.

Jones & Stokes conducted reconnaissance-level surveys along the three alternative project pipeline alignments and the metering station during the early May field surveys (see Figure 2-3 in Chapter 2). The purpose of this field effort was to identify sensitive biological resources (e.g., wetlands and special-status species habitat). Additional surveys were not conducted along the pipeline alternatives because several sensitive biological resource areas were identified along the alignments. Lodi Gas Storage eliminated these alternatives from further consideration because of the extent of these sensitive resources and the cost and timing implications for constructing in these areas.

Methods used to document special-status species and waters of the United States, including wetlands, within the proposed project study area are described below.

Special-Status Species

Special-status species are plant and animal species that are legally protected under the federal Endangered Species Act (ESA), California Endangered Species Act (CESA), or other regulations—as well as species considered sufficiently rare by the scientific community to qualify for such listing. Special-status species include:

- Species listed or proposed for listing as threatened or endangered under the ESA (50 Code of Federal Regulations [CFR] 17.12 [listed plants]; 50 CFR 17.11 [listed animals]; and various notices in the Federal Register [FR] [proposed species]);
- Species that are candidates for possible future listing as threatened or endangered under the ESA (69 FR 24876, May 4, 2004);
- Species listed or proposed for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations [CCR] 670.5);

- Species that meet the definitions of rare or endangered under the California Environmental Quality Act (CEQA) (State CEQA Guidelines Section 15380);
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.);
- Plants considered by CNPS to be “rare, threatened, or endangered in California” (Lists 1B and 2 [CNPS 2001]);
- Plants listed by CNPS as plants about which more information is needed to determine their status, and plants of limited distribution (Lists 3 and 4 [CNPS 2001]), which may be included as special-status species on the basis of local significance or recent biological information;
- Animal species of special concern to the DFG (Remsen 1978 [birds], Williams 1986 [mammals], Jennings and Hayes 1994 [amphibians and reptiles]); and
- Animals fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], and 5050 [amphibians and reptiles]).

Special-Status Wildlife

A Jones & Stokes wildlife biologist conducted surveys in April and June 2005 to identify and characterize habitat for special-status wildlife species known to occur in the project region (see Table 3.3-1). No protocol-level surveys (i.e., formal surveys conducted to DFG and/or USFWS standards) were conducted as part of this study. These surveys typically take longer than the timeframe allotted for this type of study (e.g., multiple years of surveys are required for some special-status invertebrate and amphibian species). In addition, Lodi Gas Storage is committed to designing the project in a manner that would avoid habitat for these species; therefore protocol-level surveys are generally not required. For these reasons, a habitat assessment for species identified during the pre-field investigation as having the potential to occur in the project area was conducted instead of a protocol-level survey.

Special-Status Plants

Jones & Stokes botanists conducted floristic surveys in May and June 2005 to identify special-status plants and their habitats in the study area. As stated under “Methods,” Jones & Stokes also conducted surveys in a portion of the study area in 2004. The 2005 survey timing was determined using the identification periods of plants listed in Table 3.3-2, habitats known to be present in the study area, and Jones & Stokes botanists’ observations on other projects in the region (Jones & Stokes has been conducting surveys for several large transportation, development, and energy projects in Solano County). Because this year has been a high rainfall year with cooler temperatures, plants have been flowering and fruiting later than normal. For this reason, the appropriate time to initiate the

field surveys was determined to be early May. Because most of the seasonal wetlands contained ponded water during the early-May survey, the botanists conducted return surveys in the deeper seasonal wetlands in mid-May.

The botanical surveys employed floristic methods recommended by DFG (2000) and CNPS (2001) guidelines. The guidelines specify that all plants be identified to the level necessary to determine whether they qualify as special-status plants or plant species with unusual or significant range extensions. Floristic surveys were conducted to ensure that special-status plant species were not inadvertently overlooked merely because they were not expected in the region. Depending on the terrain and habitat type, surveys included random meandering and intuitive-controlled transects in areas that contained suitable habitat for special-status plants. Survey intensity varied depending on species richness, habitat type and quality, and the probability that special-status plants would occur in a particular habitat type. The general purposes of the floristic surveys were to locate and map occurrences of special-status plants and to characterize biological communities.

Waters of the United States, Including Wetlands

For the purposes of this document, the term *waters of the United States* is an encompassing term used by the U.S. Army Corps of Engineers (Corps) for areas that would qualify for federal regulation under the federal Clean Water Act (CWA) Section 404. Waters of the United States are categorized as *wetlands* or *other waters of the United States*. Each of these categories is described below.

Wetlands. The Corps defines wetlands as areas that are inundated or saturated by surface water or groundwater at a frequency and duration that are sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3[b]; 40 CFR 230.3). For a wetland to qualify as a jurisdictional aquatic site, and therefore be subject to regulation under CWA Section 404, it must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology.

On January 9, 2001, a federal court ruling in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* (121 S.Ct. 675, 2001) (the SWANCC ruling) resulted in a determination that isolated wetlands (e.g., vernal pools and other types of seasonal wetlands) are no longer regulated by the Corps under CWA Section 404. Counsel for the U.S. Environmental Protection Agency (EPA) and the Corps published guidance on “[n]on-navigable, isolated [and] intrastate waters” on January 19, 2001, in response to the ruling. The guidance essentially resulted in a determination that the Corps does not regulate non-navigable, isolated waters.

Other Waters of the United States. Other waters of the United States are sites that typically lack one or more of the three wetland indicators identified above. The only type of other waters of the United States that occurs in the study area is drainage. Two drainages cross through the study area. One crosses under Shiloh

Road, and the other occurs at the eastern end of the study area, near Birds Landing Road.

Jones & Stokes identified potential waters of the United States and non-jurisdictional wetlands for the purpose of assisting Lodi Gas Storage in designing the project to avoid these waters. A formal wetland delineation using the methods outlined in the *Corps 1987 Wetlands Delineation Manual* (Environmental Laboratory 1987) was not conducted in the project area as part of this study. Instead, Jones & Stokes identified areas that may be considered wetlands by the Corps, DFG, and USFWS. These wetlands were identified based on the presence of observable wetland indicators (i.e., wetland vegetation and/or wetland hydrology). An effort was made to be as conservative as possible when assessing whether a particular area would be considered a wetland. Potential jurisdictional wetlands were mapped on aerial photographs at a scale of 1 inch = 500 feet. Other waters of the United States (i.e., drainages) were identified based on the presence of perennially open and unvegetated water or the presence of a well-defined bed and bank and an observable ordinary high-water mark (OHWM).

Biological Communities

The biological communities present in the project study area are described below, followed by a discussion of special-status species known or with potential to occur in the area. Results of detailed field surveys for special-status species are also provided. A complete list of plant and wildlife species observed in the biological study area is on file at Jones & Stokes.

The distribution of the major communities and associated wildlife habitats present in the biological resources study area is shown in Figure 3.3-1.

Regional Setting

The project area lies in the Sacramento Valley geographic subregion of the California Floristic Province (Hickman 1993). The project area encompasses rolling hills, with elevations ranging from approximately 50 to 300 feet. The rolling hills are bordered by the Sacramento River to the south and Suisun Marsh to the west and north (north of the Kirby Hills portion of the project area). The climate is hot and subhumid, with a mean annual precipitation of 16–20 inches falling entirely as rain during winter and spring months.

The general region has been transformed from a native landscape to the current altered landscape, where wildlife abundance and diversity are somewhat limited in the Montezuma Hills. The landscape is generally monotypic (i.e., dryland farming), is mostly treeless, consists of several windfarm operations, and exhibits limited occurrence of wetlands or other distinctive biological communities.

Agricultural Land

Two major types of agricultural uses in the study area are dryland farming (i.e., wheat) and livestock grazing. As of the preparation of this report, over 75 percent of the project site is in wheat production or preparation for wheat production, with the remainder being utilized as grazing lands. The farmers in the Montezuma Hills typically use a 1- to 3-year crop rotation cycle, where grazing and fallow years follow planting and harvesting.

Depending on the crop pattern and their proximity to native habitats, agricultural lands (particularly fallow croplands) can provide relatively high-value foraging habitat for wildlife. Raptor species such as red-tailed hawk, red-shouldered hawk, American kestrel, ferruginous hawk, barn owl, and great horned owl use agricultural lands for foraging because rodents often congregate in these fields. Ground-feeding granivorous passerines such as savannah sparrow, western meadowlark, Brewer's blackbird, and red-winged blackbird also forage in the stubble and disked crop fields.

Non-Native Annual Grassland

Non-native annual grasslands are the most common community in the project area, occurring at or nearly all project components. The species composition of the non-native annual grasslands varies with grazing intensity, aspect, soil disturbance, and soil type. In general, the annual grassland is characterized by a mix of annual grasses and weedy forbs, including medusa-head, soft chess, hare barley, slender wild oat, ripgut brome, yellow star-thistle, red-stem filaree, tarweed, several species of brodiaea, and dove weed. Native grasses are sparse but include purple needlegrass, and fescues. The non-native annual grasslands in the study area (particularly the Kirby Hills) are grazed by cattle for a portion of the year.

The study area provides suitable foraging habitat and cover for some wildlife species, particularly small rodents such as ground squirrels and pocket gophers, grassland-associated passerines such as horned larks, and raptors. Wide-ranging animals, such as turkey vultures, red-tailed hawks, and coyotes, occur in the area. Species observed in grasslands during surveys of the project site include western meadowlark, western kingbird, red-tailed hawk, savannah sparrow, house finch, northern harrier, American kestrel, gopher snake, and western fence lizard.

Seasonal Wetlands

Seasonal wetland communities occur primarily in the western portion of the study area (east of Olsen Road) and along the Kirby Hills access road (identified as W-1, W-3, W-4, W-5, and W-6 in Figure 3.3-1). In the study area, seasonal wetlands usually pond or are saturated for short periods and do not remain inundated for very long into the growing season. The species composition in

seasonal wetlands in the study area is variable depending on the depth and length of inundation, position on the landscape, soil type, and previous disturbance factors. Dominant species found in seasonal wetlands in the study area include varying associations of Italian ryegrass, coyote thistle, downingia, goldfields, popcorn flower, and woolly marbles. During summer, the seasonal wetlands were dominated by tufted hairgrass, Mediterranean barley, turkey mullein, and curly dock.

Several wildlife species use seasonal wetlands. When wetlands are ponding, waterbirds such as mallard, killdeer, black-necked stilt, American avocet, greater yellowlegs, and long-billed curlew commonly forage on floating and emergent vegetation and invertebrates in the wetlands. Some seasonal wetlands in the study area could also provide habitat for special-status invertebrates and California tiger salamander.

Most of the seasonal wetlands have a hydrologic connection to the Suisun Marsh and would therefore most likely be considered jurisdictional wetlands by the Corps and regulated under Section 404 of the Clean Water Act. They also would be considered wetlands by USFWS and DFG.

Seasonal Drainage

Two seasonal drainages occur in the study area. One unnamed seasonal drainage crosses under Shiloh Road (D-1 in Figure 3.3-1); the other drainage is referred to as “The Big Ditch” and crosses under Birds Landing Road (D-2 in Figure 3.3-1). These drainages are blue-line streams that contain a well-defined bed and bank and support seasonal wetland vegetation below their OHWMs. Drainage D-1 is approximately 15 feet wide and conveys water westerly into the Suisun Marsh. Drainage D-2 is approximately 12 feet wide and conveys water into Lucol Hollow Creek.

The seasonal drainages that occur in the study area have moderate wildlife value because streamside vegetation provides nesting habitat for several bird species and foraging and refuge habitat for amphibians, reptiles, and mammals occupying the open water and adjacent grassland habitats. Birds such as herons and belted kingfishers forage in these communities, primarily along the water’s edge. Many species of insectivorous birds, including white-throated swift, barn swallow, cliff swallow, black phoebe, and ash-throated flycatcher, catch their prey over open water.

Because the seasonal drainages eventually connect to the Suisun Marsh, they are considered as waters of the United States under Section 404 of the CWA.

Stock Pond

One seasonal stock pond occurs in the study area and is found in the Kirby Hills, just north of the compressor station site (W-2 in Figure 3.3-1). The pond is an

artificially created feature that was excavated in an upland area and is sustained by seasonal rainfall. The vegetation cover is very sparse and consists of scattered seasonal wetland species (described above).

The stock pond could provide seasonal habitat for several amphibian species that depend on these temporary waterbodies for successful reproduction, including the federally listed California tiger salamander and the western spadefoot, a federal species of concern.

The stock pond is isolated and does not have a hydrologic connection to any waters of the United States. Therefore, it is not likely to be considered as waters of the United States or regulated by the Corps. However, the pond likely would be considered a wetland by DFG and USFWS.

Special-Status Species

Special-Status Wildlife

Based on a review of DFG's CNDDDB (2005), species lists for the project region, and biological communities present in the project area, a total of 29 special-status wildlife species were identified as potentially occurring within the project region (Table 3.3-1). None of the wildlife species listed in Table 3.3-1 has been previously documented in the project area (CNDDDB 2005); however, much of the project area has probably not been surveyed for special-status wildlife.

Of the 29 special-status wildlife species listed in Table 3.3-1, 14 species (Conservancy fairy shrimp, valley elderberry longhorn beetle, Delta green ground beetle, California red-legged frog, western spadefoot, California horned lizard, giant garter snake, black rail, Suisun song sparrow, California clapper rail, California least tern, riparian woodrat, salt marsh harvest mouse, and Suisun ornate shrew) were eliminated from further consideration because suitable habitat for these species is not present in the study area or because the species range does not extend into the study area. A brief explanation for the absence of these species and their habitats is provided in Table 3.3-1. Although the study area provides foraging habitat for five species of birds, including Cooper's hawk, tricolored blackbird, golden eagle, ferruginous hawk, and white-tailed kite, these species do not breed in the study area and would not be affected by the proposed project. These species are not discussed further.

The remaining 10 species listed in Table 3.3-1 are known to occur or potentially occur in the study area and are discussed below.

Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp (VPFS) is federally listed as threatened. The species occurs throughout the Central Valley and the eastern margin of the Coast Ranges. VPFS is not common where it is found and is always outnumbered by other fairy shrimp with which it occurs (Eriksen and Belk 1999). VPFS occurs in neutral to slightly alkaline vernal pools, seasonal wetlands, and rock outcrop pools with water temperatures ranging from 4.5 to 23 °C (Eriksen and Belk 1999). The species has an abbreviated life cycle, hatching when rains first inundate the pool, maturing to adult in as little as 6 days, mating, shedding cysts (eggs), and dying. Resting cysts lay in the soil crust through summer, hatching with the next season's rains. The cysts can lie dormant for decades before hatching.

Within the study area, suitable habitat for VPFS is present within seasonal wetlands and a stock pond located in the Kirby Hills (areas identified as W-1 and W-2 in Figure 3.3-1). No occurrences of VPFS are known from the project area (CNDDDB 2005); however, it is unlikely that protocol-level surveys for the species have been previously conducted in the project area. The closest reported sighting of VPFS occurs approximately 3 miles north from the project area. Because suitable aquatic habitat is present and the species is known to occur near the project area (CNDDDB 2005), there is a moderate potential for VPFS and other special-status invertebrate species to occur in the project area.

Vernal Pool Tadpole Shrimp

The vernal pool tadpole shrimp (VPTS) is listed as endangered under ESA. VPTS are found in scattered Central Valley locations from Tehama County south to Merced County. A disjunct population also occurs in Alameda County. The species inhabits vernal pools that fill during winter and spring rains then dry in summer and fall. After the pools fill, VPTS emerge from cysts that have lain dormant in the soil since the pool last dried. After hatching, VPTS reach sexual maturity quickly (in as little as 3–4 weeks).

Within the study area, suitable habitat for VPTS is present within seasonal wetlands and a stock pond located in the Kirby Hills (W-1 and W-2 shown in Figure 3.3-1). No occurrences of VPTS are known from the study area (CNDDDB 2005); however, it is unlikely that protocol-level surveys for the species have been previously conducted in the project area. The closest reported sighting of VPTS occurs approximately 5 miles south from the project area. Because suitable aquatic habitat is present and the species is known to occur near the study area (CNDDDB 2005), there is a moderate potential for VPTS and other special-status invertebrate species to occur in the study area.

California Tiger Salamander

The California tiger salamander is listed as threatened under ESA and is a state species of special concern. California tiger salamanders are terrestrial and spend most of their time underground in small burrows, emerging for only brief periods to breed in aquatic habitats. California tiger salamander breeding and aestivation habitat includes vernal pools, seasonal and perennial ponds, and surrounding upland areas in grassland and oak savannah plant communities from sea level to about 3,600 feet (50 CFR 47212, August 4, 2004). The historical range of the California tiger salamander extends from Butte County in the north to Santa Barbara County in the south (Stebbins 1985).

Adult California tiger salamanders move from subterranean burrow sites to breeding pools during November–February after warm winter and spring rains (Jennings and Hayes 1994). Adult California tiger salamander may migrate up to 1 mile from upland sites to a breeding pond (68 FR 28647, May 23, 2003). California tiger salamander eggs hatch in 10–14 days, and larvae generally metamorphose in 3–6 months (68 FR 28647, May 23, 2003). The species also requires dry-season refuge sites in uplands in the vicinity of breeding sites. The majority of adult and juvenile salamanders breeding at nearby Jepson Prairie were found to reside in upland habitat within 2,100 feet from the breeding pond (50 CFR 47212, August 4, 2004). Dry-season refuge sites include ground squirrel burrows, other rodent burrows, or crevices in the soil (Loredo et al. 1996).

The study area is located within the current range of the California tiger salamander (50 CFR 47212, August 4, 2004). However, there are no known occurrences in the Montezuma or Kirby Hills (CNDDDB 2005). The nearest CNDDDB (2005) records for California tiger salamander are located near Jepson Prairie (approximately 6 miles north from the project area) and in the Potrero Hills (approximately 4.5 miles west from the study area).

Much of the study area occurs within an active agricultural area currently used for dryland farming and grazing. In general, stock ponds and deep seasonal wetlands, which provide suitable breeding habitat for California tiger salamander, are uncommon in the Montezuma Hills region and the study area.

In the study area, marginal habitat is found in a stock pond (W-2 in Figure 3.3-1) and a seasonal wetland/roadside ditch (W-3 in Figure 3.3-1). These two wetlands may provide sufficient ponding (at least 3 months) to support California tiger salamander breeding and larvae metamorphosis. These wetlands will be avoided by the gas and flow line pipelines.

Northwestern Pond Turtle

The northwestern pond turtle (pond turtle) is a federal species of concern and a state species of special concern. Pond turtles inhabit aquatic habitats such as ponds, marshes, or streams with rocky or muddy bottoms and vegetative cover.

They will occasionally leave the water to bask, and females leave the water from May through July to lay eggs. These turtles can often be found sunning on emergent logs or rocks near the pond's edge but will quickly retreat to the water when disturbed (Stebbins 1954).

Two seasonal drainages occur in the study area and provide potential movement corridors for pond turtles; however, the project area does not support a year-round water source, and it is unlikely for pond turtles to breed in the project area. Overall, the potential for pond turtles to occur in the project area is low. Because the seasonal drainages will be avoided, the proposed project will not affect pond turtles moving through the study area.

Western Burrowing Owl

The western burrowing owl (burrowing owl) is a federal species of concern and a state species of special concern. Western burrowing owl is found throughout much of California in annual and perennial grassland, desert, and arid scrubland (DFG 1995). It can also be found in vacant lots in residential areas, along railroad ballast, along dirt roads, and on canal levees. The critical requirement for western burrowing owl habitat is the presence of burrows. The species uses burrows excavated by ground squirrels and badgers, as well as artificial burrows such as cement culverts, debris piles, or openings under roads (DFG 1995). Its breeding season extends from March through August, peaking in April and May (Zeiner et al. 1990).

No burrowing owls were observed in the study area during the April and June 2005 field surveys, and no CNDDDB (2005) records for the species are known from the study area. Several (10+) records of nesting burrowing owls have been previously documented within the project region in similar grassland and agricultural habitats that are present in the project area. The nearest reported sighting occurred approximately 3 miles east from the project area. Intensive agriculture and the significant reduction of California ground squirrel populations from the study area have reduced the availability of burrows used by burrowing owls as breeding and wintering sites. Although no burrowing owls were observed in the biological study area during the reconnaissance-level field surveys, these surveys were not adequate (according to DFG protocol) to conclude that burrowing owls are absent from the study area. Because there are known occurrences near the study area and suitable nesting habitat (annual grasslands) is present, the potential for burrowing owls to occur within the project area is considered moderate.

Swainson's Hawk

Swainson's hawk is state listed as threatened under CESA. Swainson's hawk migrates annually from wintering areas in South America to breeding locations in northwestern Canada, the western United States, and Mexico. In California, Swainson's hawk nests throughout the Central Valley in large trees in riparian

corridors and in isolated trees located in or adjacent to agricultural fields. Its breeding season extends from late March through late August, with peak activity from late May through July (England et al. 1997). In the Central Valley, Swainson's hawk forages in large, open agricultural habitats, including alfalfa and hay fields (DFG 1994). The breeding population in California has declined by an estimated 91 percent since 1900; this is attributed to the loss of riparian nesting habitats and the conversion of native grassland and woodland habitats to agriculture and urban development (DFG 1994).

No Swainson's hawks were observed in the study area during the April and June 2005 field surveys; however, Swainson's hawks were observed foraging in annual grasslands approximately 6 miles north from the study area. No historical nest sites have been previously recorded in the study area or in the surrounding Montezuma Hills area (CNDDDB 2005). The nearest Swainson's hawk nest sites (reported in the CNDDDB) are located more than 9 miles from the study area. Within and near the study area, suitable Swainson's hawk nesting habitat is present within large eucalyptus trees located along Shiloh Road. Because Swainson's hawk were not observed in or near the study area during two separate field surveys conducted during the breeding season and because Swainson's hawk have not been reported to nest in the vicinity of the study area, there is a low potential for Swainson's hawk to nest in the study area.

Northern Harrier

Northern harrier is designated as a state species of special concern. The breeding range includes most of the Central Valley, the Sacramento–San Joaquin Delta, the Suisun Marsh, and portions of San Francisco Bay (Zeiner et al. 1990). Northern harriers use tall grasses and forbs in wetlands and field borders for cover (Zeiner et al. 1990). They roost and nest on the ground in shrubby vegetation, often near a marsh edge (Brown and Amadon 1968). The species' breeding season is between April and September, with peak activity in June and July. Northern harriers feed mainly on voles and other small mammals, birds, small reptiles, crustaceans, and insects.

A northern harrier was observed foraging in the study area during the April 2005 field survey. Although no marsh habitat (preferred nesting substrate) is present in the study area, northern harriers could also nest in tall grasslands and agricultural lands that are left undisturbed during the breeding season (generally March 1 through August 15); these are present in the study area. Because northern harrier was documented during field surveys, there is a high potential for the species to nest in the study area.

California Horned Lark and Grasshopper Sparrow

California horned lark and grasshopper sparrow are designated as state species of special concern. The California horned lark is a subspecies of the horned lark found throughout much of the state. In California, the grasshopper sparrow is

restricted to coastal areas and in portions of western Sacramento Valley and along the western edge of the Sierra Nevada foothills (Vickery 1996). Both the California horned lark and grasshopper sparrow are ground-nesting birds, preferring open grasslands and prairies with short vegetation or bare ground and little to no shrub or tree cover (Beason 1995, Vickery 1996). California horned larks and grasshopper sparrows may also occupy the edges of agricultural fields or row crop stubble.

No grasshopper sparrows were observed during the April and June 2005 field surveys in the study area; however, several horned larks were observed foraging over annual grasslands near the study area. Within the study area, suitable nesting habitat for grasshopper sparrow and horned lark occurs within relatively undisturbed annual grasslands. The study area has a high potential to support nesting horned lark and grasshopper sparrow.

Loggerhead Shrike

Loggerhead shrike is designated as a state species of special concern. It is a common year-round resident throughout the lowlands and foothills of California. 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 from March through August (Zeiner et al. 1990).

Several loggerhead shrikes were observed foraging in annual grasslands in the study area during the April 2005 field survey. Trees and shrubs in the study area provide suitable nesting habitat for loggerhead shrike. Because loggerhead shrikes were observed in the study area, there is a high potential for the species to breed in the study area.

Other Non-Special-Status Migratory Birds and Raptors

Several non-special-status migratory birds (including waterfowl) and raptors could nest in and adjacent to the study area, based on the presence of suitable nesting habitat (seasonal wetlands and annual grasslands). The breeding season for most birds is generally from March 1 to August 15. The occupied nests and eggs of these birds are protected by federal and state laws, including the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Sections 3503 and 3503.5. DFG is responsible for overseeing compliance with the codes and makes recommendations on nesting bird and raptor protection.

A focused nest survey was not conducted during the April and June 2005 field surveys. Several migratory birds and raptors, including red-tailed hawk, American kestrel, killdeer, western meadowlark, northern mockingbird, red-winged blackbird, western kingbird, and mourning dove, were observed in the study area during the breeding season (March 1 to August 15). These generally common species are locally and regionally abundant.

The westernmost portion of the study area is surrounded by Suisun Marsh, which provides habitat for resident and wintering waterfowl (including mallard, pintail, cinnamon teal, ruddy duck, American wigeon, and northern shoveler). These species are most abundant during winter (October through January) and are actively hunted by the numerous duck clubs located within the Suisun Marsh management area. Although the study area does not provide suitable habitat for these species, they could fly over the study area during migration or during daily movements between foraging areas.

Special-Status Plants

Based on a review of CNDDDB (2005), 28 special-status plant species were identified as having the potential to occur in the project region (Table 3.3-2). Eleven of the species listed in Table 3.3-2 do not occur in the study area because they have extremely limited ranges (i.e., Antioch Dunes evening-primrose) or are limited to habitats that are not present in the project area (i.e., serpentine soils, brackish marsh, tidal salt marsh, or dunes).

Overall, most of the study area has relatively low potential to support special-status plants, particularly along the gas pipeline alignment between Shiloh and Olsen Roads. This portion of the alignment is primarily agricultural lands and heavily disturbed. The gas pipeline alignment between Olsen and Birds Landing Roads contains non-native annual grasslands and seasonal wetlands (primarily ryegrass swales) within the agricultural lands. These non-native annual grasslands and seasonal wetlands were identified as potential habitat for some of the special-status plants listed in Table 3.3-2 (including bearded popcorn-flower).

The seasonal wetlands and non-native annual grasslands located east of Shiloh Road and in the Kirby Hills were also identified as containing potential suitable habitat for special-status plants.

Bearded popcorn-flower (*Plagiobothrys hystriculus*) is the only special-status plant species located during the 2005 field surveys (see Figure 3.3-1). Bearded popcorn-flower is an annual member of the Borage Family (Boraginaceae). The plants are small, with stems less than 40 centimeters (16 inches) long that are erect to horizontally spreading. The flowering period is in May.

Bearded popcorn-flower was described in 1920, based on two collections from Solano County, the first by Katherine Brandegee from Elmira in 1882, and the second by Willis Jepson from the Montezuma Hills in 1892. Until recently, these were the only known collections; and the California Native Plant Society had listed the species as “presumed extinct” (List 1A). Because the species was presumed to be extinct, neither USFWS nor DFG had considered the species for listing as threatened or endangered. In May 2005, Jones & Stokes’ botanists rediscovered the species at two locations, one in the Montezuma Hills and one in the Kirby Hills. The extent and number of plants at these locations are relatively small (less than 50 plants in each population).

The Kirby Hills population is the only occurrence found in the study area. This population occurs along the south side of the existing access road, just upslope from the seasonal wetland that occurs immediately along the road (see Figure 3.3-1). As stated above, the population is small (less than 50 plants) and is dispersed through a 100-foot by 30-foot area. As described below in the “Impact Analysis” section, this population will not be directly or indirectly affected by the proposed project and will be fenced prior to construction to ensure that access road improvement activities do not affect the population.

Habitat for bearded popcorn-flower consists of low, moist areas in annual grassland, such as the upper margins of seasonal wetlands. Associated species include Italian ryegrass, coyote thistle, hyssop loosestrife, and harvest brodiaea. Because bearded popcorn-flower plants are small and tend to spread horizontally, they are very difficult to detect in areas of dense ryegrass, which may be one reason the species has been rarely encountered.

Regulatory Setting

Federal Regulations

Endangered Species Act

The ESA, enacted in 1973, protects fish and wildlife species and their habitats that have been identified by USFWS or the National Marine Fisheries Service (NOAA Fisheries) as threatened or endangered. *Endangered* refers to species, subspecies, or distinct population segments in danger of extinction through all or a significant portion of their range; *threatened* refers to those species likely to become endangered in the near future. The ESA is administered by USFWS and NOAA Fisheries. In general, NOAA Fisheries is responsible for protection of ESA-listed marine species and anadromous fish species, while other listed species are under USFWS jurisdiction.

The ESA Authorization Process for Federal Actions under Section 7 provides a means for authorizing take of threatened and endangered species by federal agencies. It applies to actions that are conducted, permitted, or funded by a federal agency. Under Section 7, the federal agency conducting, funding, or permitting an action (the lead agency) must consult with USFWS or NOAA Fisheries, as appropriate, to ensure that the proposed action will not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat.

Provisions of Sections 7 and 9 of the ESA may be relevant to this project. Lodi Gas Storage’s preliminary project design (specifically the pipelines) avoid direct and indirect effects on potential aquatic habitat for federally listed species (California tiger salamander and fairy shrimp species); however, the proposed

project is likely to result in direct effects to California tiger salamander if they occur in upland habitat within the construction area.

Migratory Bird Treaty Act

The MBTA (16 USC 703–711) prohibits the take of any migratory bird or any part, nest, or eggs of any such bird. Under the act, take is defined as the action of or attempt to “pursue, hunt, shoot, capture, collect, or kill.” This act applies to all persons and agencies in the United States, including federal agencies.

Executive Order 13186 for Conservation of Migratory Birds (January 11, 2001) requires that any project with federal involvement address the impacts of federal actions on migratory birds. The executive order is designed to assist federal agencies in their efforts to comply with the MBTA and does not constitute any legal authorization to take migratory birds. The order also requires federal agencies to work with USFWS to develop a memorandum of understanding (MOU). Protocols developed under the MOU must promote the conservation of migratory bird populations through the following means:

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance habitat of migratory birds, as practicable; and
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

Clean Water Act

As discussed in Section 3.7, “Hydrology and Water Quality,” the CWA serves as the primary federal law protecting the quality of the nation’s surface waters including lakes, rivers, and coastal wetlands. The following sections of the CWA are described in more detail in Section 3.7, “Hydrology and Water Quality.” Lodi Gas Storage’s preliminary project design avoids placement of fill material into potential waters of the United States (including wetlands). The relevant sections of the CWA are summarized below and in Section 3.7, “Hydrology and Water Quality,” of this PEA to support this regulatory discussion; however, Lodi Gas Storage is avoiding all waters of the United States as part of this proposed project.

- **Section 404: Permits for Fill Placement in Waters of the United States, Including Wetlands.** Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Waters of the United States refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands—including:
 - Areas within the OHWM of a stream, including nonperennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned; and

- Seasonal and perennial wetlands, including coastal wetlands.
- **Section 402: Permits for Stormwater Discharge.** Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program administered by EPA.
- **Section 401: Water Quality Certification.** Under Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate, or—if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects with a federal component that may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with Section 401.

State Regulations

California Endangered Species Act

CESA, administered by DFG, prohibits the take of endangered and threatened species; however, habitat destruction is not included in the state's definition of *take*. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery, and to promote conservation of these species. DFG administers the act and authorizes take through Section 2081 agreements (except for species designated as fully protected). Regarding rare plant species, CESA defers to the California Native Plant Protection Act of 1977, which prohibits importing rare and endangered plants into California, taking rare and endangered plants, and selling rare and endangered plants. State-listed plants are protected mainly in cases where state agencies are involved in projects under CEQA. In these cases, plants listed as rare under the California Native Plant Protection Act are not protected under CESA but can be protected under CEQA.

California Environmental Quality Act

CEQA is the regulatory framework by which California public agencies identify and mitigate significant environmental impacts. A project normally is considered to result in a significant environmental impact on biological resources if it would substantially affect a rare or endangered species or the habitat of that species; substantially interfere with the movement of resident or migratory fish or wildlife; or substantially diminish habitat for fish, wildlife, or plants. The State CEQA Guidelines define rare, threatened, or endangered species as those listed under CESA and ESA, as well as any other species that meets the criteria of the resource agencies or local agencies (e.g., DFG-designated species of special concern and CNPS-listed species). The State CEQA Guidelines state that the

lead agency preparing an EIR must consult with and receive written findings from DFG concerning project impacts on species listed as endangered or threatened. The effects of a proposed project on these resources are important in determining whether the project would result in significant environmental impacts under CEQA.

California Fish and Game Code

Fully Protected Species

The California Fish and Game Code provides protection from take for a variety of species, referred to as fully protected species. Section 5050 lists protected amphibians and reptiles. Section 3515 prohibits take of fully protected fish species. Eggs and nests of all birds are protected under Section 3503, nesting birds (including raptors and passerines) under Sections 3503.5 and 3513, birds of prey under Section 3503.5, and fully protected birds under Section 3511. Migratory non-game birds are protected under Section 3800. Mammals are protected under Section 4700. The California Fish and Game Code defines take as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” Except for take related to scientific research, all take of fully protected species is prohibited.

Sections 3503 and 3503.5

Section 3503 of the California Fish and Game Code prohibits the killing of birds or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests.

Section 1600: Streambed Alteration Agreements

A streambed alteration agreement is not expected for the proposed project because the only drainage that occurs in the project area will be avoided by boring. However, Lodi Gas Storage will contact a DFG biologist to confirm that a streambed alteration agreement is not required for boring under the seasonal drainage. A description of this California Fish and Game Code is provided in the “Impact Analysis” section, to give the reader an understanding of this code.

DFG has jurisdictional authority over wetland resources associated with rivers, streams, and lakes under Sections 1600–1607. DFG has the authority to regulate all work under the jurisdiction of the State of California that would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed.

In practice, DFG marks its jurisdictional limit at the top of the stream or lake bank or at the outer edge of the riparian vegetation, where present, and sometimes extends its jurisdiction to the edge of the 100-year floodplain. Because riparian habitats do not always support wetland hydrology or hydric soils, wetland boundaries (as defined by CWA Section 404) sometimes include only portions of the riparian habitat adjacent to a river, stream, or lake. Therefore, jurisdictional boundaries under Section 1600 may encompass a greater area than those regulated under CWA Section 404.

DFG enters into a streambed alteration agreement with an applicant and can impose conditions on the agreement to ensure that no net loss of wetland values or acreage will be incurred. The streambed or lakebed alteration agreement is not a permit but a mutual agreement between DFG and the applicant.

Local Regulations

In addition to federal and state jurisdictions, impacts on biological resources are subject to the policies and regulations of Solano County. The Resource Conservation and Open Space and Land Use and Circulation Elements of the Solano County General Plan established policies for the protection of marsh and wetland habitat. These policies are further discussed in Section 3.7, “Hydrology and Water Quality.”

Impact Analysis

Methodology and Assumptions

This impact analysis is based on the project information and BMPs provided in Chapter 2 and information gathered during Jones & Stokes field surveys.

Construction and future operation-related activities associated with the proposed project could result in temporary or permanent impacts on biological resources. In assessing the magnitude of possible effects, the following assumptions were made regarding project-related impacts on biological resources.

- As described in Chapter 2 of this PEA, pipeline construction activities will occur only within the designated 75-foot-wide corridor. Future maintenance activities will occur within a 30-foot-wide easement.
- Installation of the communications tower and aboveground electrical lines (in the Kirby Hills and along Birds Landing Road) will result in only minimal disturbance. All material and equipment laydown areas will be immediately adjacent to these facilities and will occur only in non-sensitive areas within the biological resources study area.

Therefore, it was determined that the electrical transmission lines will not affect sensitive biological resources.

- Construction of the proposed project will result in the disturbance of common natural communities (e.g., non-native annual grassland and agricultural fields). While the loss or disturbance of these communities may affect special-status wildlife, potential impacts are not considered significant from a botanical perspective; therefore, botanical-related impacts on these communities are not discussed in this section. Impacts on special-status wildlife species associated with these habitats are discussed in this section.
- The proposed gas pipeline along Shiloh Road will cross an unnamed seasonal drainage that would be considered as waters of the United States by the Corps. Installation of the pipeline will use a bore construction method to cross under the drainage bed and bank. Therefore, this analysis assumes that no significant impacts on the drainage will result. Additionally, as described in Chapter 2, Lodi Gas Storage will develop and implement a horizontal bore plan that includes measures for avoiding impacts on the drainage.
- The Big Ditch that occurs along Birds Landing Road will not be directly or indirectly affected by construction of the metering station or the electrical transmission line. Therefore, potential impacts on this drainage and associated habitat are not addressed in this section.
- The proposed project has been designed to avoid direct impacts on wetlands and associated habitat for VPFS, VPTS, and California tiger salamander. However, if final design plans indicate that construction of the pipelines or associated gas storage structures will affect these species, Lodi Gas Storage will initiate consultation with USFWS to compensate for direct effects on a listed species (under Section 10 of the Federal ESA if no other federal permits are required).
- All staging areas and access roads will be located in disturbed areas that do not contain sensitive biological resources. If Lodi Gas Storage determines that additional staging areas and/or access roads are required, these areas will be surveyed and cleared by a biologist before they are used.

Impact Mechanisms

Biological resources could be directly or indirectly affected during construction activities associated with the proposed project. Impacts on biological resources were considered temporary, short term, and long term, as described below:

- A *temporary* impact would occur only during construction.
- A *short-term* impact would last from the time construction ceases to 3 years after construction.

- A *long-term* impact would last longer than 3 years after construction and typically would be associated with facilities construction and future maintenance activities. In some cases, a long-term impact could be considered a permanent impact.

The following types of activities could affect biological resources:

- Trenching activities during pipeline installation;
- Temporary stockpiling and sidecasting of soil, construction materials, or other construction wastes;
- Soil compaction, dust, and water runoff from the construction site;
- Increased short-term construction-related noise and road mortality (from equipment); and
- Degradation of water quality in adjacent wetlands and waterways resulting from construction runoff containing petroleum products.

The impact mechanisms described above were used to assess project-related impacts on biological resources in the project area.

Criteria for Determining Significance

Criteria for determining the significance of biological resources impacts were developed based on questions contained in the environmental checklist form in Appendix G of the State CEQA Guidelines. Based on the checklist questions, a project may have a significant effect on the environment if it would:

- Have a substantial adverse effect, either directly or through habitat modification, 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 federally protected wetlands, as defined by CWA Section 404 (including marsh, vernal pool, and coastal wetlands) 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 habitat conservation plan (HCP); natural communities conservation plan (NCCP); or other approved local, regional, or state habitat conservation plan.

Impacts

IMPACT 3.3-1: POTENTIAL INADVERTENT EFFECTS ON POTENTIAL HABITAT FOR VERNAL POOL FAIRY SHRIMP AND VERNAL POOL TADPOLE SHRIMP DURING CONSTRUCTION OF THE GAS PIPELINE AND KIRBY HILLS ACCESS ROAD IMPROVEMENTS

To the extent possible, Lodi Gas Storage has designed the proposed project to avoid VPFS and VPTS habitat (seasonal wetlands along the Kirby Hills access road and the stock pond). The design features include constructing during the dry season, confining construction activities to a designated work area, and limiting access road improvement activities to existing road rights-of-way. Current project design maps indicate that construction of the proposed project will not result in direct loss (filling or degradation) of potential VPFS and VPTS habitat. However, the potential exists for the contractor to inadvertently affect suitable habitat. Potential effects on VPFS and VPTS habitat are considered significant. To reduce this impact to a less-than-significant level, Lodi Gas Storage will implement Mitigation Measure BIO-1 to ensure that the habitat is avoided.

IMPACT 3.3-2: POTENTIAL EFFECTS ON CALIFORNIA TIGER SALAMANDER AQUATIC AND UPLAND HABITAT AND POTENTIAL MORTALITY OF CALIFORNIA TIGER SALAMANDER ADULTS, LARVAE, OR EGGS DURING CONSTRUCTION OF THE GAS AND FLOW LINE PIPELINES

Lodi Gas Storage has designed the proposed project to avoid and minimize direct and indirect effects on California tiger salamander breeding habitat (the Kirby Hills stock pond and W-3) and upland habitat (non-native annual grassland). Within the construction area, current project design maps indicate that construction activities associated with the proposed project will not directly affect (placement of fill) California tiger salamander breeding habitat (i.e., seasonal wetland and stock pond habitats). In addition to avoiding direct effects on California tiger salamander breeding habitat, Lodi Gas Storage has committed to avoiding indirect effects (i.e., sedimentation runoff and changes in hydrology) on breeding habitat by implementing a variety of BMPs as part of the proposed project (described in Chapter 2 “Project Description”).

Although effects on California tiger salamander breeding habitat would be avoided, the proposed project could temporarily affect upland habitat (non-native annual grasslands) located up to 2,100 feet from potential nearby breeding habitat. In upland areas, burrows containing salamanders could be crushed by construction equipment; or salamanders could be displaced from burrows, exposing them to predators and desiccation.

The pipelines would not result in permanent loss of habitat because the pipelines will be constructed between 4 and 10 feet beneath the ground surface. These pipelines will not act as a permanent barrier to California tiger salamander movement.

Potential effects on California tiger salamander habitat are considered significant. To reduce this impact to a less-than-significant level, Lodi Gas Storage will implement BMPs (described in Chapter 2 “Project Description”) and Mitigation Measures BIO-1, BIO-2, and BIO-3, as necessary.

IMPACT 3.3-3: POTENTIAL LOSS OR DISTURBANCE OF BREEDING OR WINTERING BURROWING OWL DURING CONSTRUCTION OF THE PROJECT FACILITIES

Construction of the proposed project would result in the permanent removal of up to 16 acres of non-native annual grassland associated with the construction of the compressor station and metering station. Construction activities also would result in short-term and temporary disturbance of up to 13 acres of non-native annual grasslands and of agricultural lands that provide potential burrowing owl nesting and foraging habitat. If burrowing owls are nesting within the construction area, grading and excavation activities could result in removal of an occupied burrowing owl breeding or wintering burrow site and loss of burrowing owl adults, young, or eggs. As stated in the *Staff Report on Burrowing Owl Mitigation*, published by DFG (1995), a site is considered occupied if at least one burrowing owl has been observed occupying a burrow within the last 3 years.

Currently, there appear to be no burrowing owls occupying the study area. Because burrowing owls have been documented within the vicinity of the study area and the study area provides suitable habitat for burrowing owls, the potential exists for burrowing owls to occupy the study area prior to project construction.

Impacts on nesting burrowing owls are considered significant. To reduce potential impacts to a less-than-significant level, Lodi Gas Storage will implement Mitigation Measures BIO-1 and BIO-4. Implementation of these measures also will ensure compliance with the MBTA and the California Fish and Game Code.

IMPACT 3.3-4: POTENTIAL LOSS OR DISTURBANCE OF SWAINSON’S HAWK, NORTHERN HARRIER, LOGGERHEAD SHRIKE, GRASSHOPPER SPARROW, HORNED LARK, AND OTHER NON-SPECIAL-STATUS TREE-, SHRUB-, AND GROUND-NESTING MIGRATORY BIRDS AND RAPTORS DURING CONSTRUCTION OF THE GAS PIPELINE

Gas pipeline construction could result in removal or disturbance (e.g., trimming) of trees and shrubs that provide potential nesting habitat for sensitive birds and raptors, such as the Swainson’s hawk (listed as threatened by the State) and

northern harrier, loggerhead shrike, grasshopper sparrow, and horned lark (all listed as species of special concern by the State). Trees and shrubs in the study area also can provide nesting habitat for a number of common migratory birds and raptors, including western bluebird, lesser goldfinch, American goldfinch, tree swallow, acorn woodpecker, American kestrel, red-shouldered hawk, red-tailed hawk, and great horned owl. In addition, annual grasslands and agricultural lands in the study area provide potential nesting habitat for ground-nesting birds, such as the northern harrier, grasshopper sparrow, and horned lark (all designated by the State as species of special concern). Construction activities (e.g., tree and shrub removal, excavation, and grading) in the study area that occur during the breeding season (generally between March 1 and August 15) could disturb or remove occupied nests of special-status and non-listed migratory birds and raptors. This disturbance could cause nest abandonment and subsequent loss of eggs or developing young at active nests located in or near the study area. All migratory birds and raptors are protected under the MBTA and California Fish and Game Code Sections 3503 and 3503.5.

Impacts on nesting Swainson's hawk, northern harrier, loggerhead shrike, grasshopper sparrow, horned lark, and other non-special-status tree-, shrub-, and ground-nesting migratory birds and raptors are considered significant. To reduce potential impacts to a less-than-significant level, Lodi Gas Storage will implement Mitigation Measures BIO-1 and BIO-5. Implementation of these measures also will ensure compliance with the MBTA and the California Fish and Game Code.

IMPACT 3.3-5: POTENTIAL DISTURBANCE OF MIGRATING AND WINTERING WATERFOWL DURING CONSTRUCTION OF THE KIRBY HILLS PROJECT FACILITIES

Construction of the Kirby Hills facilities is not expected to displace resident or wintering waterfowl, or permanently disrupt established migration corridors. Construction noise associated with grading and excavation activities in the Kirby Hills could temporarily disrupt normal movement patterns of resident waterfowl flying through the study area because birds might avoid flying through an active construction area; however, flight patterns are expected to revert back to normal after construction has been completed. Because the proposed project will be constructed during late spring and summer months (described in Chapter 2, "Project Description"), construction activities will not affect migrating waterfowl during the winter season (generally October through February). This impact is considered less than significant. No mitigation is required.

IMPACT 3.3-6: POTENTIAL DISTURBANCE OF THE BEARDED POPCORN-FLOWER POPULATION DURING KIRBY HILLS ACCESS ROAD IMPROVEMENT ACTIVITIES

As described in the "Environmental Setting," one population of bearded popcorn-flower was located south of the Kirby Hills access road (see Figure 3.3-1). This population would not be directly affected by access road improvement activities

but could be indirectly or inadvertently affected by vehicle parking or other equipment during road improvement or construction activities.

Because this population is relatively small and currently there are only two populations of this species documented in the Montezuma Hills, impacts on this special-status plant population could result in a substantial reduction in local population size, lowered reproductive success, or habitat fragmentation. This impact is considered significant. Implementation of Mitigation Measure BIO-1 will reduce this impact to a less-than-significant level and ensure that the population is protected and avoided during construction of the Kirby Hills facilities.

Mitigation Measures

MM BIO-1: INSTALL TEMPORARY CONSTRUCTION BARRIER FENCING TO PROTECT SENSITIVE BIOLOGICAL RESOURCES ADJACENT TO THE CONSTRUCTION ZONE

The construction specifications will require that a qualified biologist identify sensitive biological habitat onsite and identify areas to avoid during construction. Sensitive communities in the area that generally would be required for construction, including staging and access, will be fenced off to avoid disturbance in these areas. The Lodi Gas Storage's contractor will install orange construction barrier fencing to identify environmentally sensitive areas. Sensitive resources that occur in and adjacent to the construction area include the following areas:

- Seasonal wetland communities and associated special-status species (VPFS and VPTS) habitat located along the access roads in the Kirby Hills and east of Olsen Road (see Figure 3.3-1).
- The stock pond that occurs in the Kirby Hills and provides potential habitat for VPFS, VPTS, and California tiger salamander.
- The unnamed seasonal drainage that crosses Shiloh Road.
- Occupied burrowing owl habitat (identified during preconstruction surveys).
- Occupied raptor nests.
- The population of bearded popcorn-flower located along the Kirby Hills access road. The fencing will be installed at least 20 feet from the edge of the population. Prior to construction, Lodi Gas Storage will retain a botanist to conduct a survey in April (or May, depending on rainfall levels in 2006). The botanist will flag the outer extent of the populations and identify the fencing location.

Before construction, the contractor will coordinate with a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected area will be designated an environmentally sensitive area and clearly identified on the construction specifications. The fencing will be installed before construction activities are initiated and will be maintained throughout the construction period. The following paragraph will be included in the construction specifications:

The Contractor's attention is directed to the areas designated as "environmentally sensitive areas." These areas are protected, and no entry by the Contractor for any purpose will be allowed unless specifically authorized in writing by the CPUC. The Contractor will take measures to ensure that Contractor's forces do not enter or disturb these areas, including giving written notice to employees and subcontractors.

Temporary fences around the environmentally sensitive areas will be installed as the first order of work. Temporary fences will be furnished, constructed, maintained, and removed as shown on the plans, as specified in the special provisions, and as directed by Lodi Gas Storage.

MM BIO-2: MINIMIZE GROUND-DISTURBING ACTIVITIES IN CALIFORNIA TIGER SALAMANDER UPLAND HABITAT

To minimize disturbance and mortality of adult and juvenile California tiger salamander within underground burrows, Lodi Gas Storage or its contractor will minimize the extent of ground-disturbing activities within upland habitat (grasslands within 2,100 feet of suitable breeding habitat) by limiting the work area to the minimum area necessary for construction.

MM BIO-3: MONITOR CONSTRUCTION ACTIVITIES WITHIN CALIFORNIA TIGER SALAMANDER UPLAND HABITAT AND, IF FOUND, CEASE CONSTRUCTION ACTIVITIES UNTIL THE SALAMANDER HAS BEEN REMOVED

A qualified wildlife biologist will monitor all construction activities within California tiger salamander upland habitat. The biologist will look for California tiger salamander during grading, excavation, and vegetation removal activities. If a California tiger salamander is discovered, construction activities will cease until the salamander has moved out of the construction work unassisted or a qualified biologist removes the salamander from the construction area and releases the animal near a suitable burrow at least 300 feet away from the construction area.

Prior to the start of daily construction activities, the biological monitor will inspect open trenches to look for trapped California tiger salamanders. If a salamander is found, the monitor will remove the salamander from the trench and

release the animal into a suitable burrow at least 300 feet away from the construction area.

Handling of California tiger salamanders can be conducted only by a USFWS-approved biologist or as permitted under a biological opinion or project-specific authorization by USFWS.

MM BIO-4 CONDUCT PRECONSTRUCTION SURVEYS FOR ACTIVE BURROWING OWL BURROWS AND IMPLEMENT THE DFG GUIDELINES FOR BURROWING OWL MITIGATION, IF BURROWS ARE DETECTED IN THE SURVEY AREA

The *Staff Report on Burrowing Owl Mitigation*, published by DFG (1995), recommends that preconstruction surveys be conducted to locate active burrowing owl burrows in the construction area and in a 250-foot-wide buffer zone around the construction area. Lodi Gas Storage or its contractor will retain a qualified wildlife biologist to conduct preconstruction surveys for active burrows according to DFG guidelines. The preconstruction surveys will include a nesting season survey and a wintering season survey conducted in the winter and spring/summer prior to construction of the proposed project. If no burrowing owls are detected, then no further mitigation is required. If active burrowing owls are detected in the survey area, the following measures will be implemented.

1. Occupied burrows will not be disturbed during the nesting season (February 1–August 31). Whenever avoidance is feasible, no disturbance should occur within 160 feet of occupied burrows during the non-breeding season (September 1–January 31) or within 250 feet during the breeding season (February 1–August 31).
2. When destruction of occupied burrows is unavoidable during the non-nesting season (September 1–January 31), unsuitable burrows will be enhanced (enlarged or cleared of debris) or new burrows created (installing artificial burrows) at a ratio of 2:1 on nearby protected lands approved by DFG. Newly created burrows will follow the guidelines established by DFG.
3. If owls must be moved away from the construction area, passive relocation techniques (e.g., installing one-way doors at burrow entrances) will be used instead of trapping. At least 1 week will be necessary to accomplish passive relocation and allow owls to acclimate to alternate burrows.
4. If owls must be moved away from the construction area, the project proponent or its contractor will acquire and permanently protect a minimum of 6.5 acres of foraging habitat per occupied burrow identified in the construction area. The protected lands should be located adjacent to the occupied burrowing owl habitat in the study area or at another occupied site near the study area. The location of the protected lands will be determined in coordination with DFG. Lodi Gas Storage also will prepare a monitoring plan, and provide long-term management and monitoring of the protected

lands. The monitoring plan will specify success criteria, identify remedial measures, and require an annual report to be submitted DFG.

MM BIO-5

AVOID DISTURBANCE OF ACTIVE NESTS OF SWAINSON'S HAWK, NORTHERN HARRIER, LOGGERHEAD SHRIKE, GRASSHOPPER SPARROW, HORNED LARK, AND OTHER NON-SPECIAL-STATUS TREE-, SHRUB-, AND GROUND-NESTING MIGRATORY BIRDS AND RAPTORS

Causing the abandonment or removing active nests (with eggs or young) of Swainson's hawk, northern harrier, loggerhead shrike, grasshopper sparrow, horned lark, and many other non-special-status migratory birds and raptors violates the State Fish and Game Code and the federal MBTA. To avoid this impact, Lodi Gas Storage or its contractor will implement one of the following two options as part of the proposed project.

1. Conduct all construction activity (including vegetation pruning or removal) during the non-breeding season (generally between August 16 and February 28) for most special-status and non-special-status migratory birds; or
2. If construction activities are scheduled to occur during the breeding season for these species (generally between March 1 and August 15), retain a qualified wildlife biologist to conduct the following focused nesting surveys within the appropriate habitat:
 - ❑ Tree- and shrub-nesting surveys within and adjacent to the construction work area to look for Swainson's hawk, northern harrier, loggerhead shrike, and other non-listed migratory birds and raptors.
 - ❑ Ground-nesting surveys in annual grasslands within and adjacent to the construction work area to look for northern harrier, grasshopper sparrow, horned lark, and other non-listed migratory birds.

The surveys will be conducted within 1 week prior to initiation of construction activities and at any time between March 1 and August 15. If no active nests are detected during surveys, then no additional mitigation is required.

If surveys indicate that special-status or non-special-status migratory bird nests are found in the survey area and could be affected by construction activities, a no-disturbance buffer will be established around the site to avoid disturbance or destruction of the nest site until after the breeding season or after a qualified wildlife biologist determines that the young have fledged (generally late June to mid-July). The extent of these buffers will be determined by the biologist (coordinating with DFG) and will depend on the 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. These factors will be analyzed in order to make an appropriate decision on buffer distances.

If construction activities are scheduled to occur within an area that supports an active nest site or within an established no-disturbance buffer, then construction would be delayed until after the breeding season or until the young have fledged (as determined by the biologist).

Table 3.3-1. Special-Status Wildlife Identified during the Prefield Evaluation as Having the Potential to Occur in the Project Region, Solano County

Common and Scientific Name	Legal Status ^a		Habitat Requirements	Potential Occurrence in the Study Area ^b
	Federal/State	Geographic Distribution		
Invertebrates				
Conservancy fairy shrimp <i>Branchinecta conservation</i>	E/—	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large, deep vernal pools in annual grasslands	None – seasonal wetlands in the study area are relatively shallow and do not pond water for long periods; these types of wetlands do not provide suitable habitat for Conservancy fairy shrimp
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T/—	Central Valley, central and south Coast Ranges from Tehama County to Santa Barbara County. Isolated populations also occur in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	Moderate – suitable habitat (seasonal wetlands) is present in the study area
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T/—	Streamside habitats below 3,000 feet throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberries are the host plant	None – no suitable habitat (i.e., elderberry shrubs) is present in the study area
Delta green ground beetle <i>Elaphrus viridus</i>	T/—	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve, Solano County	Sparsely vegetated edges of vernal lakes and pools; occur up to 250 feet from pools	None – study area is outside the known range; restricted to the Jepson Prairie and area immediately surrounding
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	E/—	Shasta County south to Merced County	Vernal pools and ephemeral stock ponds	Moderate – suitable habitat (seasonal wetlands) is present in the study area
Amphibians				
California tiger salamander <i>Ambystoma californiense</i> (= <i>A. tigrinum c.</i>)	T/SSC	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet, and coastal region from Butte County south to northeastern San Luis Obispo County	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	Moderate – potential habitat is present in the study area
California red-legged frog <i>Rana aurora draytoni</i>	T/SSC, P	Found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County	Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation. May aestivate in rodent burrows or cracks during dry periods	None – study area is outside the current range of the species; the closest reported occurrences occur more than 10 miles west from the study area (USFWS 2004)

Table 3.3-1. Continued

Common and Scientific Name	Legal Status ^a		Habitat Requirements	Potential Occurrence in the Study Area ^b
	Federal/State	Geographic Distribution		
Western spadefoot <i>Scaphiopus hammondi</i>	SC/SSC	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands	None – study area does not occur within the current range of the species; the species is not known to occur in Solano County (Jennings and Hayes 1994, CNDDDB 2005)
Reptiles				
Northwestern pond turtle <i>Clemmys marmorata marmorata</i>	SC/SSC	Occurs from the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	Low – a seasonal drainage within the study area provides a movement corridor; however, the study area does not support a year-round water source and therefore pond turtles are unlikely to breed in the study area
California horned lizard <i>Phrynosoma coronatum frontale</i>	SC/SSC	Sacramento Valley, including foothills, south to southern California; Coast Ranges south of Sonoma County; below 4,000 feet elevation in northern California	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging	None – study area does not occur within the current range of the species; the species is not known to occur in Solano County (Jennings and Hayes 1994, CNDDDB 2005)
Giant garter snake <i>Thamnophis couchi gigas</i>	T/T	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	None – study area does not occur within the current range of the species (USFWS 1999); no known or historic records are known from the Montezuma Hills area (CNDDDB 2005)
Birds				
Cooper’s hawk <i>Accipiter cooperii</i>	—/SSC	Throughout California except high altitudes in the Sierra Nevada. Winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range	Nests in a wide variety of habitat types, from riparian woodlands and digger pine-oak woodlands through mixed conifer forests	Low – could forage in or near the study area; however, no suitable nesting habitat (riparian forest) is present in the study area

Table 3.3-1. Continued

Common and Scientific Name	Legal Status ^a		Habitat Requirements	Potential Occurrence in the Study Area ^b
	Federal/State	Geographic Distribution		
Tricolored blackbird <i>Agelaius tricolor</i>	SC/SSC	Permanent resident in the Central Valley from Butte County to Kern County. Breeds at scattered coastal locations from Marin County south to San Diego County; and at scattered locations in Lake, Sonoma, and Solano Counties. Rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields. Habitat must be large enough to support 50 pairs. Probably requires water at or near the nesting colony	Low – could forage over grasslands in the study area; however, no suitable nesting habitat is present in the study area
Grasshopper sparrow <i>Ammodrammus savannarum</i>	—/SSC	Nests locally in grasslands along the coast and interior valleys throughout much of California	Nests and winters in grasslands	High – potential nesting and foraging habitat is present within annual grasslands in the study area
Golden eagle <i>Aquila chrysaetos</i>	SSC/FP	Foothills and mountains throughout California. Uncommon nonbreeding visitor to lowlands such as the Central Valley	Nest on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals	Low – could forage over grasslands in the study area; however, no suitable nesting habitat is present in the study area
Western burrowing owl <i>Athene cunicularia hypugea</i>	SC/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas. Rare along south coast	Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows	Moderate – none were observed during April and June 2005 surveys; potential foraging and nesting habitat is present in annual grassland and agricultural habitats in the study area
Ferruginous hawk <i>Buteo regalis</i>	SC/SSC	Does not nest in California; winter visitor along the coast from Sonoma County to San Diego County, eastward to the Sierra Nevada foothills and southeastern deserts, the Inyo-White Mountains, the plains east of the Cascade Range, and Siskiyou County	Open terrain in plains and foothills where ground squirrels and other prey are available	Moderate – could forage over grasslands in the study area; however, species does not breed in California

Table 3.3-1. Continued

Common and Scientific Name	Legal Status ^a		Habitat Requirements	Potential Occurrence in the Study Area ^b
	Federal/State	Geographic Distribution		
Swainson's hawk <i>Buteo swainsoni</i>	—/T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley. Highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats. Forages in grasslands, irrigated pastures, and grain fields	Low – none were observed in the study area during the April and June field surveys and no historic nest sites occur in or near the study area; suitable nesting habitat (eucalyptus trees) and foraging habitat (annual grassland and agricultural lands) are present in the study area
Northern harrier <i>Circus cyaneus</i>	—/SSC	Occurs throughout lowland California. Has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands	High – species was observed foraging in the study area during April 2005 surveys; potential nesting habitat is present within annual grasslands in the study area
White-tailed kite <i>Elanus leucurus</i>	—/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at the Mexico border	Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging	Moderate – could forage in or near the study area; however, no suitable nesting habitat (riparian forest) is present in the study area
California horned lark <i>Eremophila alpestris actia</i>	—/SSC	Found throughout much of the state; less common in mountainous areas of the north coast and in conifer and chaparral habitats	Common, abundant resident in a variety of open habitats, usually where large trees and shrubs are absent, ranging from low-elevation grasslands and deserts to dwarf shrub habitats above tree line	High – suitable foraging and nesting habitat is present within grasslands and agricultural lands in 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	High – species was observed foraging in the study area during April 2005 surveys; trees and shrubs in the study area provide suitable nesting habitat
Black rail <i>Laterallus jamaicensis coturniculus</i>	SC/T	Permanent resident in the San Francisco Bay and eastward through the Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties	Tidal salt marshes associated with heavy growth of pickleweed; also occurs in brackish marshes or freshwater marshes at low elevations	None – although this species is known to occur in the adjacent Suisun marsh area (CNDDDB 2005); no suitable habitat (salt marsh) is present in the study area

Table 3.3-1. Continued

Common and Scientific Name	Legal Status ^a		Habitat Requirements	Potential Occurrence in the Study Area ^b
	Federal/State	Geographic Distribution		
Suisun song sparrow <i>Melospiza melodia maxillaris</i>	SC/SSC	Restricted to the extreme western edge of the Sacramento–San Joaquin River Delta, between the cities of Vallejo and Pittsburg near Suisun Bay	Brackish and tidal marshes supporting cattails, tules, various sedges, and pickleweed	None – although this species is known to occur in the adjacent Suisun marsh area (CNDDDB 2005); no suitable habitat (brackish marsh) is present in the study area
California clapper rail <i>Rallus longirostris obsoletus</i>	E/E	Marshes around the San Francisco Bay and east through the Sacramento–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 – although this species is known to occur in the adjacent Suisun Marsh area (CNDDDB 2005); no suitable habitat (salt marsh) is present in the study area
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 south 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 beach and mudflats) is present in the study area
Mammals				
Riparian (San Joaquin Valley) woodrat <i>Neotoma fuscipes riparia</i>	E/SSC, FP	Historical distribution along the San Joaquin, Stanislaus, and Tuolumne Rivers and Caswell State Park in San Joaquin, Stanislaus, and Merced Counties; presently limited to San Joaquin County at Caswell State Park and a possible second population near Vernalis	Riparian habitats with dense shrub cover, willow thickets, and an oak overstory	None – study area does not occur within the current range of the species, and no suitable habitat is present in the study area
Salt marsh harvest mouse <i>Reithrodontomys raviventris</i>	E/E, FP	San Francisco, San Pablo, and Suisun Bays; the Sacramento–San Joaquin River Delta	Salt marshes with a dense plant cover of pickleweed and fat hen; adjacent to an upland site	None – although this species is known to occur in the adjacent Suisun marsh area (CNDDDB 2005); no suitable habitat (salt marsh) is present in the study area
Suisun ornate shrew <i>Sorex ornatus sinuosus</i>	SC/SSC	Restricted to San Pablo Bay and Suisun Bay, both in Solano County	Tidal, salt, and brackish marshes containing pickleweed, grindelia, bulrushes, or cattails; requires driftwood or other objects for nesting cover	None – although this species is known to occur in the adjacent Suisun marsh area (CNDDDB 2005); no suitable habitat (salt marsh) is present in the study area

^aStatus explanations:

Federal

- E = Listed as endangered under the federal Endangered Species Act (ESA).
- T = Listed as threatened under ESA.
- SC = Species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
- = No listing.

State

- E = Listed as endangered under the California Endangered Species Act (CESA).
- T = Listed as threatened under CESA.
- FP = Fully protected under the California Fish and Game Code.
- SSC = Species of special concern in California.
- = No listing.

^bPotential Occurrence in the Study Area

- High: Known occurrences of the species within the study area or California Natural Diversity Database (CNNDDB) or other documents; records of the occurrence of the species are within a 10-mile radius of the study area. Suitable habitat is present within the study area.
 - Moderate: CNNDDB or other documents record the known occurrence of the species within a 10-mile radius of the study area. Poor-quality suitable habitat is present within the study area.
 - Low: CNNDDB or other documents do not record the occurrence of the species within a 10-mile radius of the study area. Suitable habitat is present within the study area.
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Table 3.3-2. Special-Status Plants Identified during the Prefield Evaluation as Having the Potential to Occur in the Project Area, Solano County

Common and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Potential Occurrence in the Study Area ^b
Mt. Diablo manzanita <i>Arctostaphylos auriculata</i>	-/-/1B	Endemic to Contra Costa County, especially Mt Diablo area, San Francisco Bay Area	Chaparral in canyons and on slopes on sandstone, between 490 and 1,650 feet	January–March	None; no suitable habitat is present
Suisun Marsh aster <i>Aster lentus</i>	SC/-/1B	Sacramento-San Joaquin Delta; Suisun Marsh; Suisun Bay; Contra Costa, Napa, Sacramento, San Joaquin, and Solano Counties	Brackish and freshwater marsh, below 500 feet	August–November	None; no suitable habitat is present
Heartscale <i>Atriplex cordulata</i>	SC/-/1B	Western Central Valley and valleys of adjacent foothills	Alkali grassland, alkali meadow, alkali scrub, below 660 feet	May–October	None; no suitable habitat is present in the study area; however, suitable habitat is present in alkali wetlands located south of the study area
Brittlescale <i>Atriplex depressa</i>	-/-/1B	Sacramento Valley and valleys of adjacent foothills on west side of San Joaquin Valley	Alkali grassland, alkali meadow, alkali scrub, chenopod scrub, playas, valley and foothill grasslands on alkaline or clay soils, below 660 feet	May–October	None; no suitable habitat is present in the study area; however, suitable habitat is present in alkali wetlands located south of the study area
San Joaquin spearscale <i>Atriplex joaquiniana</i>	SC/-/1B	Western edge of Central Valley from Glenn County to Tulare County	Alkali grassland, alkali scrub, alkali meadows, saltbush scrub, below 1,000 feet	April–September	None; no suitable habitat is present in the study area; however, suitable habitat is present in alkali wetlands located south of the study area
Big tarplant <i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>	-/-/1B	Interior Coast Ranges foothills; Alameda, Contra Costa, San Joaquin, Stanislaus*, and Solano* Counties	Annual grassland, on dry hills and plains, between 50 and 1,500 feet	July–October	Low; habitat is present although there are no nearby occurrences
Suisun thistle <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	E/-/1B	Known only from the Suisun Marsh in Solano County	Salt marshes and swamps, below 3 feet	July–September	None; no suitable habitat is present

Common and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Potential Occurrence in the Study Area ^b
Hoover's cryptantha <i>Cryptantha hooveri</i>	-/-/1B	Northern and central San Joaquin Valley; Alameda, Contra Costa, Madera, Merced, San Joaquin, and Stanislaus Counties	Coarse, sandy soil in grassland	April–May	Low; habitat is present although there are no nearby occurrences
Dwarf downingia <i>Downingia pusilla</i>	-/-/2	California's Central Valley and South America	Vernal pools and mesic valley and foothill grasslands, 1,500 feet	March–May	Moderate; known to occur at Jepson Prairie; potential habitat occurs in vernal pools and other seasonal wetlands located in the region
Round-leaved filaree <i>Erodium macrophyllum</i>	-/-/2	Sacramento Valley, northern San Joaquin Valley, central western California, South Coast Ranges, and northern Channel Islands (Santa Cruz Island)	Open sites, dry grasslands, and shrublands below 4,000 feet	March–May	Low; habitat is present although there are no nearby occurrences
Contra Costa wallflower <i>Erysimum capitatum</i> ssp. <i>angustatum</i>	E/E/1B	Contra Costa County	Inland dunes	March–July	None; no suitable habitat is present
Diamond-petaled California poppy <i>Eschscholzia rhombipetala</i>	SC/-/1B	Interior foothills of South Coast Ranges from Contra Costa County to Stanislaus County, Carrizo Plain in San Luis Obispo County	Grassland, chenopod scrub, on clay soils, where grass cover is sparse enough to allow growth of low annuals	March–April	Low; habitat is present although there are no nearby occurrences
Fragrant fritillary <i>Fritillaria liliacea</i>	SC/-/1B	Coast Ranges from Marin County to San Benito County	Adobe soils of interior foothills, coastal prairie, coastal scrub, annual grassland, often on serpentinite, below 1,350 feet	February–April	Moderate; known to occur at Jepson Prairie
Brewer's western flax <i>Hesperolinon breweri</i>	SC/-/1B	Southern north inner coast; northeast San Francisco Bay region, especially Mt. Diablo; known only from Contra Costa, Napa, and Solano Counties	Serpentine slopes in chaparral, and grasslands, 100–2,300 feet	May–July	None; no suitable habitat is present

Common and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Potential Occurrence in the Study Area ^b
Carquinez goldenbush <i>Isocoma arguta</i>	SC/-/1B	Deltaic Sacramento Valley, Suisun Slough, Contra Costa and Solano Counties	Annual grassland on alkaline soils and flats, generally below 70 feet	August–December	Moderate; one population occurs north of the gas pipeline study area
Contra Costa goldfields <i>Lasthenia conjugens</i>	E/-/1B	Scattered occurrences in Coast Ranges valleys and southwest edge of Sacramento Valley; Alameda, Contra Costa, Mendocino, Napa, Santa Barbara*, Santa Clara*, and Solano Counties. Historically distributed through the North Coast, southern Sacramento Valley, San Francisco Bay region, and the South Coast.	Alkaline or saline vernal pools and swales, below 700 feet	March–June	Moderate; potential habitat occurs along the Kirby Hills access road
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	SC/-/1B	Central Valley, especially the San Francisco Bay region; Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara*, San Joaquin, and Solano Counties	Coastal and estuarine marshes, below 1,000 feet	May–September	None; no suitable habitat is present
Legenere <i>Legenere limosa</i>	SC/-/1B	Primarily located in the lower Sacramento Valley; also from North Coast Ranges, northern San Joaquin Valley, and the Santa Cruz Mountains	Deep, seasonally wet habitats such as vernal pools, ditches, marsh edges, and riverbanks, below 500 feet	May–June	Moderate; known to occur at Jepson Prairie
Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>	-/-/1B	Southern Sacramento Valley; Glenn, Solano, and Yolo Counties	Annual grassland on margins of alkali scalds, below 660 feet	April–May	Low; habitat is present although there are no nearby occurrences
Woolly-headed lessingia <i>Lessingia hololeuca</i>	-/-/3	Southern North Coast Ranges; southern Sacramento Valley; northern San Francisco Bay region; Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo Counties	Clay or serpentinite soils of coastal scrub, lower montane coniferous forest, valley and foothill grassland, below 1,000 feet	June–October	None; no suitable habitat is present

Common and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Potential Occurrence in the Study Area ^b
Mason's lilaepsis <i>Lilaeopsis masonii</i>	SC/R/1B	Southern Sacramento Valley; Sacramento–San Joaquin River Delta; northeast San Francisco Bay area; Alameda, Contra Costa, Marin*, Napa, Sacramento, San Joaquin, and Solano Counties	Freshwater and intertidal marshes, streambanks in riparian scrub, generally at sea level	April– November	None; no suitable habitat is present
Showy madia <i>Madia radiata</i>	–/–/1B	Scattered populations in the interior foothills of the South Coast Ranges; Contra Costa, Fresno, Kings, Kern, Monterey, Santa Barbara, San Benito, San Joaquin, and San Luis Obispo Counties	Oak woodland, grassland, slopes below 3,000 feet	March–May	Low; habitat is present although there are no nearby occurrences
Robust monardella <i>Monardella villosa</i> ssp. <i>globosa</i>	–/–/1B	North Coast Ranges and Eastern San Francisco Bay Area; Alameda, Contra Costa, Humboldt, Lake, Marin, Napa, San Mateo, and Sonoma Counties	Oak woodland and grassy openings in chaparral	June–July	None; no suitable habitat is present
Little mousetail <i>Myosurus minimus</i> ssp. <i>apus</i>	SC/–/3	Central Valley, San Francisco Bay region, outer Southern Coast Ranges, South Coast. Alameda, Butte, Contra Costa, Colusa, Kern, Riverside, San Bernardino, San Diego, Solano, and Stanislaus Counties	Alkaline vernal pools and marshes, below 5,000 feet	March–June	Low; habitat is present although there are no nearby occurrences
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>	–/–/1B	Inner North Coast Ranges, western Sacramento Valley; Colusa, Lake, Mendocino, Marin, Napa, Solano, Sonoma, and Tehama Counties	Vernal pools and swales in woodland, lower montane coniferous forest, mesic meadows, and grassland, generally below 5,600 feet	May–July	None; no suitable habitat is present
Antioch Dunes evening- primrose <i>Oenothera deltoides</i> ssp. <i>howellii</i>	E/E/1B	Northeast San Francisco Bay region, known from three native occurrences; Contra Costa and Sacramento Counties	Inland dunes generally below 330 feet	March– September	None; no suitable habitat is present

Common and Scientific Name	Legal Status ^a Federal/State/ CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Potential Occurrence in the Study Area ^b
Bearded popcorn-flower <i>Plagiobothrys hystriculus</i>	-/-/1A	Endemic to Solano* County, presumed extinct.	Mesic grassland, vernal pools	April–May	High; one population was located just south of the Kirby Hills access road
Blue skullcap <i>Scutellaria lateriflora</i>	-/-/2	Northern San Joaquin Valley; east of the Sierra Nevada; Inyo and San Joaquin Counties; New Mexico, Oregon	Mesic meadows, marshes and swamps, generally below 1,640 feet	July– September	None; no suitable habitat is present

^a Status explanations:

Federal

- E = listed as endangered under the federal Endangered Species Act.
- SC = species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking.
- = no listing.

State

- = no listing.

California Native Plant Society

- 1A = List 1A species: presumed extinct in California.
- 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: plants about which more information is needed to determine their status.
- = No listing.
- * = Known populations believed extirpated from that county.
- ? = Population location within county uncertain.

^bPotential Occurrence in the Study Area

High: Known occurrence of plant in region from California Natural Diversity Database (CNNDDB) or other documents in the vicinity of the project, or presence of suitable habitat conditions and suitable microhabitat conditions.

Moderate: Known occurrence of plant in region from CNNDDB or other documents in the vicinity of the project, or presence of suitable habitat conditions but suitable microhabitat conditions are not present.

Low: Plant not known to occur in the region from the CNNDDB or other documents in the vicinity of the project; or habitat conditions are of poor quality.

None: Plant not known to occur in the region from the CNNDDB or other documents in the vicinity of the project, or suitable habitat is not present in any condition.