

APPENDIX D

Plant Community and Special-status Species Descriptions

Plant Communities in the Project Area

The Los Vaqueros Watershed (Watershed) encompasses 18,535 acres of land and includes 20 distinct vegetation series (ESA, 2004; Sawyer and Keeler-Wolf, 1995). The following subsections describe plant communities both within and outside the Watershed. The analysis presents NCCP Plant Community / Habitat Type designations with Sawyer and Keeler-Wolf equivalent vegetation series in parentheses. Section 4.6 Biological Resources, Table 4.6-1, and Figure 4.6-2 of the Draft EIS/EIR describe the distribution and extent of these plant communities in the Watershed.

Lacustrine (Open Water/Tidal Perennial Aquatic)

Description

Lacustrine habitat includes permanent deep-water bodies that do not support emergent vegetation and are not subject to tidal exchange, and tidal perennial aquatic that includes deepwater aquatic (greater than 3 meters deep), shallow aquatic (less than or equal to 3 meters deep), and unvegetated intertidal zones of estuarine bays, river channels, and sloughs (CALFED Bay-Delta Program, 2000a). Such features include lakes, ponds, oxbows, gravel pits, and flooded islands. Lacustrine habitat includes areas defined as tidal and nontidal perennial aquatic habitat. Submerged and floating aquatic plant species associated with lacustrine habitats include water lilies, pondweed, duckweed, and plankton.

This habitat type is commonly used by a wide variety of birds, mammals, reptiles, and amphibians for reproduction, food, water, and cover (CALFED Bay-Delta Program, 2000a).

Historical and Current Distribution

Lacustrine habitat occurs in some low-lying areas of the Bay-Delta estuary. Historically, most wetlands in the Bay-Delta estuary were subject to tidal influence, and nontidal perennial aquatic habitats were uncommon. Naturally formed perennial aquatic habitat included isolated oxbows, and drainages that were subjected to minor tidal action. Much of the nontidal perennial aquatic habitat in the Delta was created by dike and levee construction. Once isolated, these former aquatic habitats were converted for alternate land uses, including agriculture and urban

development. Converted perennial aquatic habitats mainly occur in large agricultural drains, farm and industrial ponds, wildlife and waterfowl ponds, and flooded in-stream islands (created by accidental and deliberate levee breaches) (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Lacustrine habitat in the project area is typified by the Los Vaqueros Reservoir. This reservoir is a created water body within a stream system that is controlled by the dam and pumping facilities. Seasonal operations of the reservoir for water supply storage/release cause wide variations in surface water elevation barren shoreline areas. Lacustrine habitat occurs in Los Vaqueros Reservoir and in perennial ponds in the Los Vaqueros Watershed and along the Delta-Transfer and Transfer-Bethany pipelines.

Tidal Freshwater Emergent (Bulrush-Cattail Series)

Description

Tidal freshwater emergent habitat includes portions of the intertidal zones of the Delta that support emergent wetland plant species that are not tolerant of saline or brackish conditions. Tidal freshwater emergent habitat includes fresh emergent wetland tidal and Delta sloughs, and mid-channel islands and shoals habitats (CALFED Bay-Delta Program, 2000a). Dominant plant species in tidal freshwater emergent habitat include cattails (*Typha* spp.), tules (*Scripus* spp.), and common reedgrass (*Phragmites australis*).

Historical and Current Distribution

The extensive network of rivers and water channels commonly caused vast areas of the Sacramento-San Joaquin Valley to flood in winter by a slow-moving layer of silt-laden water. Flood control measures and land settlements around the turn of the century led to the creation of leveed Delta islands. The construction of numerous levees in addition to land use conversion resulted in the loss of fresh emergent wetlands in the Delta. Today, there are less than 15,000 acres of this habitat remaining (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Tidal freshwater emergent habitat occurs in interrupted patches along the shoreline of Old River in the project area for the Old River Intake and Pump Station. The banks of Old River adjacent to the pump station have isolated patches of freshwater marsh dominated by common tule. The east side of Old River, outside of the project area, also supports a large expanse of diverse marsh vegetation.

Non-tidal Freshwater Permanent Emergent (Bulrush-Cattail Series and Spikerush Series)

Description

Nontidal freshwater permanent emergent includes permanent (natural and managed) wetlands and meadows dominated by wetland plant species that are not tolerant of saline or brackish conditions. Nontidal freshwater permanent emergent habitat includes fresh emergent wetland (nontidal) and nontidal perennial aquatic habitats (CALFED Bay-Delta Program, 2000a). These marshes are dominated, to varying degrees, by common tule, American tule (*Scirpus americanus*), big bulrush (*Scirpus robustus*), and cattail. Wildlife species that are associated with this habitat include black-crowned night heron (*Nycticorax nycticorax*), green heron (*Butorides virescens*), and various waterfowl. Special-status species supported by nontidal freshwater permanent emergent include California red-legged frog (*Rana draytonii*), tri-colored blackbird (*Agelaius tricolor*), and western pond turtle (*Actinemys marmorata*).

Historical and Current Distribution

During the previous 150 years, greater than 300,000 acres of fresh emergent wetlands have been lost in the Sacramento-San Joaquin Delta Ecological Management Zone. Vast areas of fresh emergent habitat occurred throughout the Central Valley prior to the mid-1800s, especially in the Delta. An intricate network of rivers, sloughs, and channels linked low-lying islands and basins that supported highly varied freshwater emergent vegetation. This freshwater emergent vegetation supported a diversity of fish and wildlife species and ecological functions (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Within the Los Vaqueros Watershed, nontidal freshwater permanent emergent marsh is limited to the margins of perennial stock ponds and shallow, low-gradient sections of upper Kellogg Creek along the edge of the reservoir. These marshes are dominated, to varying degrees, by common tule, American tule, big bulrush, broad-leaved cattail (*Typha latifolia*), and narrow-leaved cattail. Commonly encountered smaller emergent monocots include sedges (*Carex* spp.), spikerush (*Eleocharis* spp.), rushes, and nutsedge (*Cyperus eragrostis*). Additional freshwater marsh occurs in small ponds and creek segments along the Delta-Transfer Pipeline.

Natural Seasonal Wetland (Northern Claypan Vernal Pool, Bush Seepweed Series and Salt Grass Series)

Description

Natural seasonal wetland habitat includes vernal pools and other non-managed seasonal wetlands with natural hydrologic conditions that are dominated by herbaceous vegetation and that annually pond surface water or maintain saturated soils at the ground surface for enough of the year to support facultative or obligate wetland plant species. Alkaline and saline seasonal wetlands that

were not historically part of a tidal regime are included in natural seasonal wetlands. Natural seasonal wetland habitat includes vernal pool habitat (CALFED Bay-Delta Program, 2000a). Dominant natural seasonal wetland vegetation includes various sedges, rushes, and nutgrass. This habitat type supports several special-status species including alkali milk-vetch (*Astragalus tener* var. *tener*), heartscale (*Atriplex cordulata*), brittlescale (*Atriplex depressa*), recurved larkspur (*Delphinium recurvatum*), and vernal pool fairy shrimp (*Branchinecta lynchi*).

Historical and Current Distribution

Seasonal wetlands were once prevalent throughout the Central Valley. Their extent and function have substantially declined due to cumulative impacts of land use practices (e.g., disking, leveling, overgrazing, development), the use of herbicides, invasion by non-native species, flood control activities that reduce and restrict water movement onto river and stream floodplains, and lowered groundwater levels (CALFED Bay-Delta Program, 2000b).

Current wetland regulations have been in effect for decades, but development of wetlands is permitted if appropriate mitigation is provided. Compensatory compensation for loss of structure and function is typically required to offset loss of existing wetlands as a result of development. Large-scale restoration, creation, and preservation activities in areas such as the Suisun Marsh, Grasslands Resource Conservation District, Yolo Bypass, and Butte Sink have been successful in maintaining and enhancing seasonal wetlands (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Seasonal wetland habitats in the project area include northern claypan vernal pools, valley rock outcrop intermittent pools, alkali meadows, and alkali sink scrub. Within the Los Vaqueros Watershed, vernal pools are generally confined to valley bottoms and on lowland benches in the vicinity of intermittent and ephemeral creek channels. Valley rock outcrop pools occur in depressions in sandstone outcrops along ridge tops of the Los Vaqueros Watershed and adjacent foothills to the west. In addition, known and potential vernal pool and swale habitats occur along the Delta-Transfer and Transfer-Bethany Pipelines.

Alkali meadow is a persistent emergent saline wetland that occurs on valley bottoms and alluvial slopes. This series is dominated by halophytes (salt tolerant species) including saltgrass (*Distichlis spicata*), saltbush (*Atriplex* spp.), bush seepweed (*Suaeda moquinii*), iodine bush (*Allenrolfea occidentalis*), and alkali heath (*Frankenia salina*). Other species associated with this series include pepperweed (*Lepidium* spp.), rushes (*Juncus* spp.), goldfields (*Lasthenia* spp.), and popcornflower (*Plagiobothrys* spp.). Alkali meadows occur within the northern region of the Los Vaqueros Watershed and along the Transfer-Bethany pipeline.

Alkali sink is a plant community dominated by halophytic species. This community occurs in low-lying areas with poorly drained alkaline soils that are typically supported by the occasional heavy winter rainfall that evaporates fairly quickly. Representative plants of this community include allscale saltbush (*Atriplex polycarpa*), big saltbush (*A. lentiformis*), bush seepweed, pickleweed (*Salicornia* spp.) and iodine bush. Alkali sink occurs in topographic depressions in

which salts have concentrated. Alkali sink habitat in the project vicinity generally occurs on the saline-alkaline soils of the Pescadero and Solano soil series. This habitat occurs in an isolated channel on the Delta-Transfer Pipeline.

Valley/Foothill Riparian (Fremont Cottonwood Series and Valley Oak Series)

Description

Valley/foothill riparian habitat includes all successional stages of woody vegetation, commonly dominated by willow (*Salix* spp.), Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), or sycamore (*Platanus* spp.), within the active and historical floodplains of low-gradient reaches of streams and rivers generally below an elevation of 300 feet. Valley/foothill riparian habitat includes portions of riparian and riverine aquatic habitat (CALFED Bay-Delta Program, 2000a).

Historical and Current Distribution

Historically, about 922,000 acres of riparian vegetation were present in the Central Valley basin in a watershed that extended over 40,000 square miles. Currently, the remaining riparian forests occur on 100,000 acres of the Valley floor, and about half of this riparian forest is significantly disturbed or degraded. The onset of riparian forest removal occurred from 1850 to the turn of the 20th century to provide fuel for ore mining and river navigation, and accommodate agricultural land development (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Riparian woodland, including Fremont cottonwood and valley oak woodland, grows along the banks of the perennial and larger intermittent creek channels within the Los Vaqueros Watershed. In this area, riparian woodland occurs along segments of Kellogg Creek and in small, sporadically distributed pockets along the largest, lowest-gradient streams and creeks. Riparian woodland also occurs along segments of Kellogg Creek paralleled by the Delta-Transfer Pipeline.

Grassland (California Annual Grassland Series and Purple Needlegrass Series)

Description

Grassland habitat includes upland vegetation communities dominated by introduced and native annual and perennial grasses and forbs, including non-irrigated and irrigated pasturelands. Grassland habitat includes all perennial grassland habitats and the much more extensive annual grassland vegetation. Annual grassland is dominated by nonnative Mediterranean annual grasses, native perennial bunch grasses, and an assemblage of native and non-native forbs. Scattered oak species may be present.

Historical and Current Distribution

Grasslands dominated by perennial species were once common throughout the Sacramento and San Joaquin valleys. Perennial grasslands and associated vernal pools historically were present at drier, higher elevations in the Delta. Mesic grasslands established in low-lying areas next to wetland and riparian habitats. Native grassland habitat has been substantially reduced due to development and the widespread establishment of non-native annual grasses. These annual grasses now dominate the majority of grasslands in the Central Valley. Existing perennial grassland in the Bay-Delta estuary are on the decline as this habitat continues to be converted for other land uses and displaced by non-native grasses and forbs. In addition, the suppression of fire has altered ecosystem processes upon which many perennial grasses and native forbs are dependent, again giving non-native annual species a competitive advantage (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Grassland occurs extensively throughout the Los Vaqueros Watershed and along the Transfer-Bethany Pipeline. Grassland also occurs along the segment of the Transfer-LV Pipeline outside of the Los Vaqueros Watershed and along the western extent of the Delta-Transfer Pipeline. These grasslands occur on gently rolling hills, valley bottoms, and next to numerous ephemeral and intermittent drainages and channels. Annual grassland in the project area are dominated by nonnative Mediterranean annual grasses such as wild oats (*Avena fatua*), slender oats (*Avena barbata*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), barley (*Hordeum* spp.), Italian ryegrass (*Lolium multiflorum*), rattail fescue (*Vulpia myuros*), and dogtail grass (*Cynosurus echinatus*).

Native perennial bunch grasses including purple needlegrass (*Nassella pulchra*), blue wildrye (*Elymus glaucus*), and Idaho fescue (*Festuca idahoensis*) occur sporadically throughout the annual grasslands. Native and non-native forbs commonly found in these grasslands include vetch (*Vicia* spp.), burclover (*Medicago polymorpha*), Spanish clover (*Lotus purshianus*), clovers (*Trifolium* spp.), lupines (*Lupinus* spp.), field hedge parsley (*Torilis arvensis*), pitgland tarweed (*Holocarpha virgata*), yarrow (*Achillea millefolium*), filaree (*Erodium* spp.), white brodiaea (*Triteleia hyacinthina*), and mariposa lily (*Calochortu venustus*). Scattered blue oaks (*Quercus douglasii*), live oaks (*Q. agrifolia*, *Q. wislizeni*), and valley oaks occur sporadically throughout this habitat type, particularly along drainages, in the lowlands, and along grassland-woodland ecotones.

Perennial bunchgrass stands generally occur on protected north-facing slopes and are dominated by purple needlegrass. Mixed stands of perennial grassland also include blue wildrye, nodding needlegrass (*Nassella cernua*), California melic (*Melica californica*), pine bluegrass (*Poa secunda* ssp. *secunda*), and Idaho fescue. Within these stands, native bunchgrasses comprise 25 to 50 percent of the total plant cover. Such stands are scattered across the landscape in the Los Vaqueros Watershed.

Alkali grassland occurs in the northern and eastern regions of the Los Vaqueros Watershed and in limited portion of the Transfer-LV and Transfer-Bethany pipelines. This habitat type is characterized by low-growing halophytic species including saltgrass, low barley (*Hordeum*

depressum), little alkali grass (*Puccinellia simplex*), sickle grass (*Parapholis incurva*), and thin tail (*Hordeum brachyantherum*), in addition to halophytic forbs such as goldfields, saltbush/spearscale, popcorn flower, alkali mallow (*Malvella leprosa*), and alkali heath. Alkali scalds, barren areas with salt-encrusted soil surfaces, are prevalent throughout the alkali grassland.

Upland Scrub (Common Manzanita Series, California Sagebrush Series and Chamise Series)

Description

Upland scrub habitat includes habitat areas dominated by shrubs characteristic of coastal scrub, chaparral, and saltbush scrub communities. Dominant species in chaparral include scrub oak (*Quercus berberidifolia*), chaparral oak (*Q. durata*), and several species of ceanothus and manzanita. Commonly associated shrubs include chamise (*Adenostoma fasciculatum*), mountain mahogany (*Cercocarpus montanus*), toyon (*Heteromeles arbutifolia*), yerba-santa (*Eriodictyon californicum*), California buckeye (*Aesculus californica*), poison oak (*Toxicodendron diversilobum*), buckthorn (*Rhamnus cathartica*), and chaparral-pea (*Pickeringia montana*) (Mayer and Laudenslayer, 1988).

Historical and Current Distribution

Upland scrub communities occur on steep, dry slopes and require periodic fire to regenerate. As development encroached upon these habitats, fire suppression was necessary. Increased urbanization and development next to and within this habitat type have resulted in fragmentation and degradation of existing stands. Without recurrent fire, scrub communities can degenerate and become less biologically active (USFWS, 2002a).

Mixed chaparral generally occurs below 5,000 feet on mountain ranges throughout California, with the exception of desert regions. Elevation ranges vary significantly with climate, aspect, and substrate. Mixed chaparral occurs throughout the Coast Ranges. Coastal scrub occurs intermittently along a narrow strip throughout the length of California, within about 20 miles of the ocean. Elevation ranges from 0 to about 3,000 feet above mean sea level (Mayer and Laudenslayer, 1988).

Relationship to Project Area

Upland scrub habitat includes areas dominated by shrubs characteristic of chaparral and coastal scrub communities. East- and north-facing steep, rocky slopes and ridge tops in the western portion of the Los Vaqueros Watershed are characterized by chaparral and, to a lesser degree, coastal scrub. Chaparral is dominated by evergreen shrubs, generally with little or no herbaceous ground cover or overstory trees. Chamise is usually the dominant or co-dominant species throughout chaparral, although in some areas it is replaced by other species. Gaps in the dense shrub community support grassland species, both from the annual grassland series and the purple needlegrass series. Coastal scrub occurs on arid south-facing slopes in the Los Vaqueros Watershed. This community is typically composed of California sagebrush (*Artemisia californica*) and chamise as co-dominants, with lesser amounts of black sage (*Salvia mellifera*),

poison-oak, bush monkey flower (*Mimulus aurantiacus*), and California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*). Canopy openings support annual grassland species. Upland scrub habitat is limited to the upper Kellogg Creek watershed, west of the dam.

Valley/Foothill Woodland and Forest (Blue Oak Series, Mixed Oak Series, Interior Live Oak Series, Coast Live Oak Series and California Bay Series)

Description

Valley/foothill woodland and forest habitat includes non-riparian forest, woodland, and savanna of valleys and foothills. These vegetation communities are commonly dominated by valley oak, blue oak, interior live oak (*Quercus wislizeni*), coast live oak, and foothill pine (*Pinus sabiniana*).

Historical and Current Distribution

Blue Oak woodlands occur along the western foothills of the Sierra Nevada-Cascade Ranges, the Tehachapi Mountains, and in the eastern foothills of the Coast Range, forming a nearly continuous ring around the Central Valley. The habitat is discontinuous in the valleys and on lower slopes of the interior and western foothills of the Coast Range from Mendocino County to Ventura County. It is generally found at elevations from 500 to 2,000 feet at the northern end of its range and on the western slopes of the Sierra Nevada, from 250 to 3,000 feet in the central Coast Range, and from 550 to 4,500 feet in the Transverse and Peninsular Ranges (Mayer and Laudenslayer, 1988).

Coast live oak habitat occurs in the foothills and valleys of coastal regions of the northern and southern Coast Range, and the Transverse and Peninsular Range of southern California. They primarily are found at elevations ranging from sea level to about 5,000 feet in the interior regions (Mayer and Laudenslayer, 1988). Interior live oak occurs on slopes and in valleys, on raised stream benches, and terraces where soils are shallow and moderately to excessively drained. They typically occur at elevations ranging from 500 to 4,500 in the Transverse Ranges, South Coast Ranges, Sierra Nevada, Cascade Range, and north to the Klamath and North Coast ranges (Sawyer and Keeler-Wolf, 1995). Mixed oak stands occur in valleys on gentle to steep slopes underlain by moderately deep soils. They typically occur at elevations ranging from 250 to 2,000 feet in the Sierra Nevada Range, Cascade Range, and north to the Klamath and North Coast ranges (Sawyer and Keeler-Wolf, 1995). Relic stands of valley oak woodland occur in the Central Valley from Redding south into the Sierra Nevada foothills, in the Tehachapi Mountains, and in valleys of the Coast Range from Lake County to western Los Angeles County. Generally, this vegetation occurs below 2,000 feet (Mayer and Laudenslayer, 1988).

Relationship to Project Area

The steeper hillsides and canyons throughout the western and northern portions of the Los Vaqueros Watershed support valley/foothill woodland and forest, including stands dominated by blue oak, valley oak, coast live oak, and interior live oak, as well as some stands with no single dominant oak species. Oak woodland occurs as a mosaic of the oak species mentioned

above, with blue oak as the most widespread. Blue oak woodlands are the most common woodland community in the Los Vaqueros Watershed. They occur primarily on south-, west-, and east-facing slopes. The understory is fairly open and is dominated by annual grassland species such as bromes, wild oat, and clover. Small ephemeral channels flow through many blue oak woodlands, but these channels typically do not support wetland or riparian vegetation.

Coast live oak woodlands are limited to the westernmost part of the Los Vaqueros Watershed, where precipitation is higher and temperatures are cooler. These scattered woodlands are dominated by coast live oak and interior live oak with occasional occurrences of blue oak and foothill pine on drier sites. Interior live oak woodlands tend to occur in similar topographic, climatic, and edaphic (*i.e.*, related to soil) settings as the coast live oak woodlands. These woodlands are dominated by open to dense stands of interior live oak, with coast live oak, blue oak and foothill pine frequent subdominants. Mixed oak woodlands are not dominated by any single oak species but consist of a mix of blue oak, coast live oak, and interior live oak, as well as foothill pine. These woodlands are typically less open than the blue oak series, sometimes forming a nearly closed canopy. The terrain in these areas is steep and undulating to gently rolling, and in some areas is rocky. Valley oak woodland occurs as both upland woodland and riparian woodland. In upland settings, valley oak woodland occurs as oak savannah with an expansive grassland understory.

Upland Cropland (Cropland)

Description

Upland cropland habitat includes agricultural lands farmed for grain field, truck, and other crops for profit that are not seasonally flooded. Common agricultural crops in the Central Valley include wheat, corn, beans, safflower, alfalfa, cotton, tomatoes, commercial grasses, orchard fruits and nuts, and grapes. Wildlife species supported by this habitat type vary according to season, crop type, and cover. Common species occurring in cropland include small mammals such as voles and mice, and birds such as doves, pheasants, cranes, and blackbirds. Croplands are important foraging habitat for numerous raptors including the red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and white-tailed kite (*Elanus leucurus*).

Historical and Current Distribution

Agriculture has converted natural habitats throughout California, but particularly in areas that once supported fertile wetlands and riparian forests. More than one-fourth of California is now used for agriculture, including 5 million acres of federal grazing land. About half of this is used as pasture and rangeland, about 40 percent is cropland, and the rest is divided between woodland and other land. On average, agriculture accounts for about 43 percent of the total annual ground- and surface water used in California, of which the majority is supplied by surface water. Agricultural land uses and crop types are often dictated by soil type, topography, and water availability. The more intensively managed agricultural areas are primarily in valley floors on flat or slightly rolling terrain (CALFED Bay-Delta Program, 2000b).

As many natural habitats used by wildlife species have been converted or lost in California, an increasing number of wildlife have adapted to artificial wetland and upland habitats resulting from particular agricultural practices. Many species have now become adapted to and dependant on these agricultural areas to sustain their populations (CALFED Bay-Delta Program, 2000b).

Relationship to Project Area

Upland cropland habitat includes farmed land along the Delta-Transfer Pipeline and in the vicinity of the Old River Intake and Pump Station. Crops along these corridors include tomatoes, alfalfa, corn, and hay, and orchards of English walnut and persimmon. When observed in the spring of 2007, many of the fields were plowed and lying fallow.

Special-Status Species in the Project Area

The following comprehensive list of special-status plant and wildlife species in the regional project area was compiled based on records from the California Department of Fish and Game Natural Diversity Database (CNDDB), ongoing consultation with CDFG, USFWS, and resource experts, reviews of California Native Plant Society (CNPS) literature and the CNPS electronic database, scoping letters, biological literature of the region, and focused and reconnaissance-level field surveys.

This comprehensive regional species list of special-status plant and wildlife species includes 54 special-status plants and 38 special-status wildlife species with potential to occur in the regional project vicinity. Each species' habitat requirements were compared to available habitats in the study area for each project component, for which a summarized analysis is provided in **Table D-1**. Based on this review of habitat requirements and database records, 7 special-status plant species and 36 special-status wildlife species have a moderate to high potential to occur or are known to occur within the study area that could be affected by the project. This refined list of special-status plants and wildlife species that could be affected by the project, and methods used to prepare the narrowed species list are provided in Section 4.6 and **Table 4.6-4**. Select species are described following Table D-1.

Invertebrates

Federal or State Threatened and Endangered Species

Longhorn fairy shrimp (*Branchinecta longiantenna*)

Description

Longhorn fairy shrimp are among the rarest of California's vernal pool crustaceans. These small, aquatic crustaceans feed on algae, bacteria, protozoa, rotifers, and bits of detritus (USFWS, 2003). Males can be easily identified by their extremely long second antennae; however, females are difficult to distinguish from alkali fairy shrimp (*B. mackini*). Longhorn fairy shrimp require a minimum of 23 days to reach sexual maturity, with an average maturity period of 43 days (USFWS, 2005c).

**TABLE D-1
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT**

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
INVERTEBRATES					
Federal or State Threatened and Endangered Species					
<i>Branchinecta longiantenna</i> Longhorn fairy shrimp	FE/--/--m ¹	Rock outcrop pools or other areas capable of ponding water seasonally	Absent. No longhorn fairy shrimp habitat or local occurrences occur within 500 feet of project facilities; This species would not be affected by project activities	Year-round (eggs in dry season, adult shrimp in winter)	NSW (Rock outcrop pools)
<i>Branchinecta lynchi</i> Vernal pool fairy shrimp	FT/--/--/m	Vernal pools or other areas capable of ponding water seasonally	Present. Occupied and potential habitat identified in the Transfer-Bethany Pipeline alignment; possibly in a single pool on the Delta-Transfer Pipeline (ESA, 2008a). In-watershed occurrences are outside the project area.	Year-round (eggs in dry season, adult shrimp in winter)	NSW
<i>Desmocerus californicus dimorphus</i> Valley elderberry longhorn beetle	FT/--/--/R	Riparian habitat, levee and riprap lined stream banks containing its host plant, elderberry shrubs (<i>Sambucus</i> spp.)	Present (in-watershed). Elderberry shrubs in the Los Vaqueros Watershed show larval exit holes. Elderberry shrubs are not otherwise present in the project area.	Year round, nesting March-June	VFR, Gr, US, VFW, UC
Federal or State Species of Special Concern					
<i>Branchinecta mesovallensis</i> Midvalley fairy shrimp	--/--/--/m	Vernal pools or other areas capable of ponding water seasonally	Low. Low likelihood of occurrence in created pools on the Transfer-Bethany Pipeline.	Year-round (eggs in dry season, adult shrimp in winter)	NSW
<i>Hygrotus curvipes</i> Curved-foot hygrotus diving beetle	FSC/--/--/--	Drainages, seeps, and wet areas; standing water in ponds or ephemeral pools	Present. Present in stock ponds and drainages in the Los Vaqueros Watershed and likely in intermittent drainages and swales on pipeline routes.	Spring months	NSW
<i>Linderiella occidentalis</i> California linderiella	FSC/--/--/--	Vernal pools or other areas capable of ponding water seasonally	Low. Habitat is present on the Delta-Transfer Pipeline and Transfer-Bethany Pipeline. In-Watershed occurrences are outside the project area	Year-round (eggs in dry season, adult shrimp in winter)	NSW
<i>Lytta molesta</i> Molestan blister beetle	FSC/--/--/--	Anthophora bee nests may serve as hosts for the molestan blister beetle	Unknown. Habitat may be present in the Los Vaqueros Watershed, Transfer-LV Pipeline and Transfer-Bethany Pipeline		Gr

¹ Status codes are defined at the end of the table.

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
AMPHIBIANS					
Federal or State Threatened and Endangered Species					
<i>Ambystoma californiense</i> California tiger salamander	FT/CSC/--/m	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools	Present. Four breeding sites in the Los Vaqueros Watershed study area; uplands throughout the Los Vaqueros Watershed provide aestivation habitat; upland habitat present on the Delta-Transfer Pipeline, Transfer-LV Pipeline, and Transfer-Bethany Pipeline.	Winter rains and March-April	NFE, NSW, VFR, Gr, VFW
<i>Rana draytonii</i> California red-legged frog	FT/CSC/--/m	Breed in stock ponds, pools, and slow-moving streams	Present. Eleven breeding sites in the Los Vaqueros Watershed study area, with more potential breeding habitat. Frogs may be encountered in upland habitat on the Delta-Transfer Pipeline, Transfer-LV Pipeline, and Transfer-Bethany Pipeline.	Year-round	NFE, VFR, Gr, VFW
REPTILES					
Federal or State Threatened and Endangered Species					
<i>Masticophis lateralis euryxanthus</i> Alameda whipsnake (=Alameda striped racer)	FT/ST/--/m	Coastal ranges, in chaparral and riparian habitat and adjacent grasslands.	Present. Occupied scrub habitat present in the Los Vaqueros Watershed study area. Snakes are expected to use grasslands, woodlands, and other nonscrub habitat in the Watershed.	March-November	VFR, Gr, US, VFW
Federal or State Species of Special Concern					
<i>Actinemys marmorata</i> Western pond turtle	--/CSC/--/m	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands	Present. Present in stock ponds and drainages in the Los Vaqueros Watershed and likely in intermittent drainages and swales on pipeline routes.	Year-round	La, NFE, VFR, Gr, US, VFW
<i>Masticophis flagellum ruddocki</i> San Joaquin whipsnake (=coachwhip)	--/CSC/--/m	Open grassland, pasture, and alkali scrub	Present. Presumed present in grasslands in the Los Vaqueros Watershed, on pipeline routes, and at the Expanded Transfer Facility.	March-October	Gr, US, VFW
<i>Phrynosoma coronatum</i> Coast horned lizard	--/CSC/--/--	Valley woodland, coniferous forest, riparian, and grassland habitats; most commonly in sandy washes with scattered shrubs	High. Suitable habitat may be present on the Transfer-Bethany Pipeline, south of Armstrong Road, and parts of the Power Option 2 Western powerline alignment.	Year-round	VFR, US, VFW

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
BIRDS					
Federal or State Threatened and Endangered Species					
Buteo swainsoni <i>Swainson's hawk</i>	--/ST/--	Nests in large trees, often near water, open grasslands, or agricultural lands	Moderate. Historic nesting site noted at one location, 300 feet from the Delta-Transfer Pipeline; low likelihood of nesting on other pipeline alignments or in the watershed	March-July	VFR, Gr, UC
<i>Haliaeetus leucocephalus</i> Bald eagle	BEPA-FD/SE- CFP/--/m	Winter foraging at lakes and along major rivers	Low (nesting). The Los Vaqueros Watershed supports wintering and foraging habitat, but no active nesting	Year-round	La, NFE, VFR, VFW
Federal or State Species of Special Concern					
<i>Accipiter cooperi</i> Cooper's hawk	--/CSC/--/m	Nests in dense oak and riparian woodland	High. Expected to nest in wooded portions of the Los Vaqueros Watershed and on the Transfer-LV Pipeline and Transfer-Bethany Pipeline.	Year-round	VFR, VFW
<i>Accipiter striatus</i> Sharp-shinned hawk	--/CSC/--/--	Nests in dense stands of conifers and riparian habitats	High. Expected to nest in wooded portions of the Los Vaqueros Watershed and on the Transfer-LV Pipeline and Transfer-Bethany Pipeline.	Year-round	VFR, VFW
<i>Agelaius tricolor</i> Tricolored blackbird	--/CSC/--/m	Nests in freshwater marshes with dense stands of cattails or bulrushes, occasionally in willows, thistles, mustard, blackberry brambles, and dense shrubs and grains	Moderate. Nesting sites available at disjunctive locations in the Los Vaqueros Watershed and on pipeline routes.	Year-round; spring (nesting)	NFE, VFR, Gr, UC
<i>Aquila chrysaetos</i> Golden eagle	BEPA/CSC- CFP/--/m	Nests in canyons and large trees in open habitats	Present. Six nesting occurrences reported from the Los Vaqueros Watershed; one in the study area. Potential to occur on Transfer-LV Pipeline	Year-round	Gr, US, VFW
<i>Athene cunicularia hypugea</i> Western burrowing owl	--/CSC/--/m	Nests and forages in low-growing grasslands with burrowing mammals	High. Nesting habitat present in grasslands in the Los Vaqueros Watershed, on the fringes of agricultural lands and in grasslands on the Delta-Transfer Pipeline, Transfer-LV Pipeline, Transfer-Bethany Pipeline, and at the Expanded Transfer Facility.	Year-round	Gr, UC
<i>Asio flammeus</i> Short-eared owl	--/CSC/--/--	Inhabits open fields, meadows, and marshes	High. Nesting habitat present in grasslands in the Los Vaqueros Watershed and on the Delta-Transfer Pipeline, Transfer-LV Pipeline, and Transfer-Bethany Pipeline.	Year-round	Gr, UC

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
BIRDS (cont.)					
Federal or State Species of Special Concern (cont.)					
<i>Circus cyaneus</i> Northern harrier	--/CSC/--/m	Ground nester found in grasslands and in adjacent wetlands or upland/wetland areas	Moderate. Though nests have not been identified, low likelihood of nesting near marshland habitat in the Los Vaqueros Watershed; may nest in open grasslands on pipeline routes and at Expanded Transfer Facility.	Year-round	NFE, NSW, Gr, UC
<i>Elanus leucurus</i> White-tailed (=black shouldered) kite	--/CFP/--/m	Nests in shrubs and trees next to grasslands, forages over grasslands and agricultural lands	High. Nesting habitat available in Los Vaqueros Watershed. May nest in the few wooded areas in and near the Delta-Transfer Pipeline, Transfer-LV Pipeline, and Transfer-Bethany Pipeline.	Year-round	VFR, Gr, UC
<i>Eremophila alpestris actica</i> California horned lark	--/CSC/--/--	Nests and forages in short-grass prairie, mountain meadow, coastal plain, fallow fields, and alkali flats	High. May nest in short annual grasslands in the Los Vaqueros Watershed and on all pipeline segments.	Year-round	Gr, UC
<i>Falco mexicanus</i> Prairie falcon	--/CSC/--/--	Inhabits hills, canyons, and mountainous areas with grasslands; nests of cliffs or abandoned raptor nests	Low. Nesting not expected in study area	March-August	Gr, US
<i>Lanius ludovicianus</i> Loggerhead shrike	--/CSC/--/--	Scrub, open woodlands, and grasslands	Moderate. May nest in brush and scrub in the Los Vaqueros Watershed and on all pipeline segments.	Year-round	VFR, Gr, US, VFW
<i>Pandion haliaetus</i> Osprey	--/CSC/--/--	Large bodies of water that produce fish and are surrounded by forested habitats	High. Nesting may occur in Los Vaqueros Watershed. Less likely elsewhere in project area.	Year-round	VFR, Gr, UC
MAMMALS					
Federal or State Threatened and Endangered Species					
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	FE/ST/--/m	Annual grasslands or grassy open areas with shrubs, loose-textured soils for burrows and prey base	Presumed present. High-quality habitat is present in the Los Vaqueros Watershed and portions of each pipeline alignment; Low to moderate quality habitat is present at the Delta intake facilities and Expanded Transfer Facility.	Year-round	Gr, US, VFW

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
MAMMALS (Cont.)					
Federal or State Species of Special Concern					
<i>Antrozous pallidus</i> Pallid Bat	--/CSC/--/--	Roosts in buildings, caves, or cracks in rocks	Low. Habitat may be available in large trees in the Los Vaqueros Watershed study area, but large rock crevices are generally lacking.	February-August	La, VFR, Gr, US, VFW
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	--/CSC/--/--	Oak and coniferous woodland and arid grasslands. Roosts in caves, buildings, etc.	Low. Habitat may be available in large trees in the Los Vaqueros Watershed study area, but large rock crevices are generally lacking.	April-October	La, VFR, Gr, US, VFW
<i>Eumops perotis californicus</i> Greater western mastiff-bat	FSC/CSC/--/--	Breeds in rugged, rocky canyons and forages in a variety of habitats	Low. Habitat may be available in large trees in the Los Vaqueros Watershed study area, but large rock crevices are generally lacking.	February-August	La, VFR, Gr, US, VFW
<i>Myotis ciliolabrum</i> Small-footed myotis bat	FSC/--/--/--	Forages over grasslands and roosts in caves and rock crevices	Low. Habitat may be available in large trees in the Los Vaqueros Watershed study area, but large rock crevices are generally lacking.	February-August	La, VFR, Gr, US, VFW
<i>Myotis evotis</i> Long-eared myotis bat	FSC/--/--/--	Inhabits woodlands and forests up to an about 8,200-foot elevation; generally not in Central Valley	Low. Habitat may be available in large trees and rocks in the Los Vaqueros Watershed study area, but large rock crevices are generally lacking.	February-August	La, VFR, Gr, US, VFW
<i>Myotis thysanodes</i> Fringed myotis bat	FSC/--/--/--	Inhabits a variety of habitats including pinyon-juniper woodland, valley-foothill hardwood, hardwood-conifer forests, and desert scrub; generally not in Central Valley	Low. Rock crevice habitat is generally lacking in the Los Vaqueros Watershed study area.	February-August	La, VFR, Gr, US, VFW
<i>Myotis volans</i> Long-legged myotis bat	FSC/--/--/--	Inhabits forests and woodland habitats, primarily oak and juniper woodlands	Low. Habitat may be available in large trees in the Los Vaqueros Watershed study area, but large rock crevices are generally lacking.	February-August	La, VFR, Gr, US, VFW
<i>Myotis yumanensis</i> Yuma myotis bat	FSC/CSC/--/--	Open forests and woodlands below 8,000-foot elevation in close association with water bodies	Low. Rock crevice habitat is generally lacking in the Los Vaqueros Watershed study area.	February-August	La, VFR, Gr, US, VFW
<i>Perognathus inornatus inornatus</i> San Joaquin pocket mouse	--/CSC/--/--	Annual grasslands, saltbush scrub, and oak savannah habitats; usually found in areas with friable soils	Moderate. Alkali scrub habitat on the Western alignment and grasslands with friable soils on the Transfer-Bethany Pipeline and at the Western substation site provide the best available habitat. Non-native annual grasslands throughout the project area provide potential, though lesser quality habitat.	Year-round	Gr

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
MAMMALS (Cont.)					
Federal or State Species of Special Concern (cont.)					
<i>Taxidea taxus</i> American badger	--/CSC/--/--	Dry, open grasslands	Present. High-quality habitat is present in the Los Vaqueros Watershed and portions of each pipeline alignment; low to moderate quality habitat is present at the Delta intake facilities and Expanded Transfer Facility.	Year-round	Gr
PLANTS					
Federal or State Threatened and Endangered Species					
<i>Lasthenia conjugens</i> <i>Contra Costa goldfields</i>	FE/--/1B/m	Vernal pools and seasonal wetlands in grassland and woodland	Absent based on focused botanical survey findings.	March-June	NSW
<i>Cordylanthus palmatus</i> Palmate-bracted bird's beak	FE/SE/1B/m	Chenopod scrub; valley and foothill grassland, in alkaline soils.	Absent. Not identified during focused botanical surveys.	May-October	US, Gr
<i>Eryngium racemosum</i> Delta button-celery	--/SE/1B/r	Riparian scrub, in vernal mesic clay depressions	Absent. Not identified during focused botanical surveys.	June-September	VFR
<i>Trifolium amoenum</i> <i>Showy Indian clover</i>	FE/--/1B/m	Annual grasslands, disturbed sites and coastal bluffs	Absent based on focused botanical survey findings.	April-June	Gr
Federal or State Species of Special Concern					
<i>Amsinckia lunaris</i> Bent-flowered fiddleneck	--/--/1B/--	Coastal bluff scrub, cismontane woodland and valley and foothill grassland	Absent. Not identified during focused botanical surveys.	March-June	Gr, US, VFW
<i>Anomobryum julaceum</i> Slender silver-moss	--/--/2/--	Broad-leaved upland forest; lower montane coniferous forest; North coast coniferous forest/damp rock and soil on outcrops, usually on roadcuts	Absent. Not identified during focused botanical surveys.	n/a	VFW
<i>Arctostaphylos auriculata</i> Mt. Diablo manzanita	--/--/1B/m	Chaparral/sandstone; cismontane woodlands	Absent. Not identified during focused botanical surveys.	January-March	US
<i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i> Contra Costa manzanita	--/--/1B/m	Chaparral, rocky soil	Absent. Not identified during focused botanical surveys.	January-March; uncommonly in April	US
<i>Astragalus tener</i> var. <i>tener</i> Alkali milk-vetch	--/--/1B/r	In poor draining low ground of alkali playa, grasslands and vernal pools; usually in dry adobe soil	Absent based on focused botanical survey findings.	March-June	NSW, Gr

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
PLANTS (cont.)					
Federal or State Species of Special Concern (cont.)					
<i>Atriplex cordulata</i> Heartscale	--/--/1B/--	Chenopod scrub and sandy, alkaline grasslands	Low potential at a few distinct sites on the Transfer-Bethany Pipeline alignment; final survey delayed by site access.	April-October	NSW, Gr
<i>Atriplex depressa</i> Brittlescale	--/--/1B/m	Alkaline or clay grasslands, chenopod scrub, and playas; occasionally in riparian areas, marshes, or vernal pools	Present in Los Vaqueros Watershed. Moderate potential at a few distinct sites on the Transfer-Bethany Pipeline alignment; final survey delayed by site access.	May-October	NSW, Gr
<i>Atriplex joaquiniana</i> <i>San Joaquin spearscale</i>	--/--/1B/m	Alkaline seasonal wetlands and sinks in grasslands, chenopod scrub, and alkali meadows	Present outside staging area in the watershed, on portions of the Transfer-Bethany Pipeline alignment, Power Option 1 (i.e., new substation siting zone); and spanned by powerlines under Power Option 2.	April-October	NSW, Gr
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> Big-scale balsamroot	--/--/1B/--	Chaparral; cismontane woodlands; valley and foothill grasslands, sometimes in serpentine soils	Absent. Not identified during focused botanical surveys.	March-June	Gr, US, VFW
<i>Blepharizonia plumosa</i> Big tarplant	--/--/1B/m	In annual grasslands of dry hills and plains; soils are clay to clay-loam; often found in burned areas and usually on slopes	Absent. Not identified during focused botanical surveys.	July-October	Gr
<i>Calochortus pulchellus</i> Mt. Diablo fairy lantern	--/--/1B/m	Wooded or brushy hillsides, tends toward northern exposure	Low. Not present in study area	April-June	VFR, Gr, US, VFW
<i>Campanula exigua</i> Chaparral harebell	--/--/1B/--	Chaparral; usually rocky or serpentine soils	Absent. Not identified during focused botanical surveys.	May-June	US
<i>Carex vulpinoidea</i> Fox sedge	--/--/2/--	Freshwater marshes and swamps; riparian woodlands	Absent. Not identified during focused botanical surveys.	May-June	TFE, NFE
<i>Caulanthus coulteri</i> var. <i>lemmonii</i> Lemmon's jewelflower	--/--/1B/--	Pinon and juniper woodland; valley and foothill grassland	Absent. Not identified during focused botanical surveys.	March-May	Gr
<i>Centromadia parryi</i> ssp. <i>Congdonii</i> Congdon's tarplant	--/--/1B/m	Alkaline soils in grasslands	Absent. Not identified during focused botanical surveys.	June-November	Gr

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
PLANTS (cont.)					
Federal or State Species of Special Concern (cont.)					
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i> Hispid bird's-beak	--/1B/m	Seasonal wetlands in alkali sinks with valley sink scrub, alkali meadows, and alkali marsh communities	Absent. Not identified during focused botanical surveys.	June-September	NSW, Gr
<i>Cordylanthus nidularius</i> Mt. Diablo bird's beak	--/CR/1B/m	Chaparral; serpentine soil	Absent. Not identified during focused botanical surveys.	July-August	US
<i>Cryptantha hooveri</i> Hoover's cryptantha	--/1A/--	Inland dunes; valley and foothill grassland, in sandy soils	Absent. Not identified during focused botanical surveys.	April-May	Gr
<i>Deinandra bacigalupii</i> Livermore tarplant	--/1B/--	Sandy alkaline soils, alkaline swales and drainages and associated grasslands	Absent. Not identified during focused botanical surveys.	June-October	NSW
<i>Delphinium californicum</i> ssp. <i>interius</i> Hospital Canyon larkspur	--/1B/m	Chaparral; cismontane woodland	Absent. Not identified during focused botanical surveys.	April-June	US, VFW
<i>Delphinium recurvatum</i> Recurved larkspur	--/1B/m	On alkaline soils mostly in saltbush scrub and chenopod scrub but also grasslands and woodland.	Absent. Not identified during focused botanical surveys.	March-May	NSW, Gr, VFW
<i>Dirca occidentalis</i> Western leatherwood	--/1B/--	Broadleaved upland forest; closed-cone coniferous forest; chaparral; cismontane woodland; North Coast coniferous forest; riparian forest; riparian woodland; mesic soils	Absent. Not identified during focused botanical surveys.	January-March; uncommonly in April	US, VFR, VFW
<i>Eriastrum brandegeeeae</i> Brandegee's eriastrum	--/1B/m	Chaparral; cismontane woodland; volcanic or sandy soil	Absent. Not identified during focused botanical surveys.	April-August	US, VFW
<i>Eriogonum truncatum</i> Mt. Diablo buckwheat	--/1B/--	Chaparral; coastal scrub; valley and foothill grassland in sandy soil	Absent. Not identified during focused botanical surveys.	April-September; uncommonly November-December	Gr, US
<i>Erodium macrophyllum</i> Round-leaved filaree	--/2/--	Cismontane woodland; valley and foothill grassland in clay soil	Absent. Not identified during focused botanical surveys.	March-May	Gr, VFW
<i>Eschscholzia rhombipetala</i> Diamond-petaled California poppy	--/1B/m	On grassland slopes and flats; substrate clay and alkaline	Absent. Not identified during focused botanical surveys.	March-April	Gr

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
PLANTS (cont.)					
Federal or State Species of Special Concern (cont.)					
<i>Fritillaria agrestis</i> Stinkbells	--/--/4/--	Chaparral; cismontane woodland; pinyon and juniper woodland; valley and foothill grassland, in clay and sometimes serpentine soil	Absent. Not identified during focused botanical surveys.	March-June	Gr, US, VFW
<i>Fritillaria liliacea</i> Fragrant fritillary	--/--/1B/--	Cismontane woodland; coastal prairie; coastal scrub; valley and foothill grassland often in serpentine soil	Absent. Not identified during focused botanical surveys.	February-April	Gr, US, VFW
<i>Helianthella castanea</i> Diablo helianthella (=rock-rose)	--/--/1B/m	Forest, woodland, chaparral, coastal scrub, riparian woodland, and grassland; usually in chaparral/oak woodland ecotone	Present in Los Vaqueros Watershed, though absent from project study area	April-June	Gr, US, VFW
<i>Hesperolinon breweri</i> Brewer's dwarf-flax (=western flax)	--/--/1B/m	Transition between annual grassland and mixed chaparral; also near woodlands	Present. Portions of one population occur in the Los Vaqueros Watershed study area; absent from other project facilities.	May-July	Gr, US, VFW
<i>Hesperolinon serpentinum</i> Napa western flax	--/--/1B/--	Chaparral, in serpentine soil	Absent. Not identified during focused botanical surveys.	May-July	US
<i>Hibiscus lasiocarpus</i> Rose-mallow	--/--/2/m	Tidally influenced coastal and freshwater marsh	Present (New Intake). A population occurs at the site for the New Delta Intake and Pump Station	June-September	NFE
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tule pea	--/--/1B/r	Freshwater and brackish marshes and swamps	Absent. Not identified during focused botanical surveys.	May-July; uncommonly in September	NFE, TWE
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	--/SR/1B	Tidally influenced coastal and freshwater marsh	Present (off site). Near Delta intake facilities, 5,000 feet north and 1,200 feet south of Expanded Old River Intake and Pump Station, greater than 700 feet from the New Delta Intake and Pump Station site	April-November	TFE
<i>Limosella subulata</i> Delta mudwort	--/--/2/--	Mud flats and bank in tidal marshlands	Absent. Not identified during focused botanical surveys.	May-August	TFE
<i>Madia radiata</i> Showy (=golden) madia	--/--/1B/m	Valley and foothill grasslands, cismontane woodlands, and chenopod scrub	Absent. Not identified during focused botanical surveys.	March-May	Gr, VFW

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

Common Name Scientific Name	Listing Status USFWS/CDFG/ CNPS/CALFED	General Habitat	Potential for Species Occurrence in the Project Area	Period of Identification or Blooming Period	NCCP Habitat Associations
PLANTS (cont.)					
Federal or State Species of Special Concern (cont.)					
<i>Malacothamnus halii</i> Hall's bush mallow	--/1B/m	Chaparral and coastal scrub	Absent. Not identified during focused botanical surveys.	May-September; uncommonly in October	US
<i>Myosurus minimus</i> ssp. <i>apus</i> Little mouse-tail	--/3/--	Valley and foothill grasslands; vernal pools in alkaline soil	Absent. Not identified during focused botanical surveys.	March-June	NSW
<i>Phacelia phacelioides</i> Mt. Diablo phacelia	--/1B/m	Chaparral; cismontane woodland in rocky soil	Absent. Not identified during focused botanical surveys.	April-May	US, VFW
<i>Plagiobothrys glaber</i> Hairless popcorn flower	--/1A/--	Alkaline meadows and seeps; coastal salt marshes and swamps	Absent. Not identified during focused botanical surveys.	March-May	SE, NSW
<i>Sanicula saxatilis</i> Rock sanicle	--/SR/1B/--	Broadleaved upland forest; chaparral; valley and foothill grassland in rocky soil	Absent. Not identified during focused botanical surveys.	April-May	US, VFW
<i>Scutellaria galericulata</i> Marsh skullcap	--/2/m	Streambanks and meadows, seeps, marshes, and swamps	Absent. Not identified during focused botanical surveys.	June-September	NFE, NSW
<i>Senecio aphanactis</i> Rayless ragwort	--/2/--	Chaparral; cismontane woodland; coastal scrub sometimes in alkaline soil	Absent. Not identified during focused botanical surveys.	January-April	US, VFW
<i>Streptanthus albidus</i> ssp. <i>peramoenus</i> Most beautiful jewel-flower	--/1B/--	Chaparral; cismontane woodland; valley and foothill grassland in serpentine soil	Absent. Not identified during focused botanical surveys.	April-September; uncommonly in March and October	Gr, US, VFW
<i>Streptanthus hispidus</i> Mt. Diablo/Contra Costa jewel-flower	--/1B/--	Chaparral; valley and foothill grassland in rocky soil	Absent. Not identified during focused botanical surveys.	March-June	Gr, US
<i>Trifolium depauperatum</i> var. <i>hydrophilum</i> Saline clover	--/1B/--	Marshes and swamps; valley and foothill grassland in mesic and alkaline soil; vernal pools	Absent. Not identified during focused botanical surveys.	April-June	NFE, NSW, Gr
<i>Tropidocarpum capparideum</i> Caper-fruited tropidocarpum	--/1B/--	Grasslands in alkaline hills	Absent. Not identified during focused botanical surveys.	March-April	Gr
<i>Viburnum ellipticum</i> Oval-leaved viburnum	--/2/--	Chaparral; cismontane woodland; lower montane coniferous forest	Absent. Not identified during focused botanical surveys.	May-June	US, VFW

TABLE D-1 (Continued)
SPECIAL-STATUS SPECIES KNOWN FROM THE REGIONAL PROJECT VICINITY AND ANALYZED FOR THE PROJECT

STATUS CODES:

Federal (U.S. Fish and Wildlife Service):

BEPA = Bald Eagle Protection Act
 FE = Listed as Endangered by the Federal Government
 FT = Listed as Threatened by the Federal Government
 FPE = Proposed for Listing as Endangered
 FPT = Proposed for Listing as Threatened
 FSC = Former Federal Species of Special Concern (list is no longer maintained)
 FD = Federal Delisted Species
 FC = Candidate for Federal listing

State (California Department of Fish and Game):

SE = Listed as Endangered by the State of California
 ST = Listed as Threatened by the State of California
 SR = Identified as Rare by the State of California (plants only)
 CSC = California species of special concern
 CFP = California fully protected species

California Native Plant Society : List 1A = Plants believed extinct; List 1B= Plants rare, threatened, or endangered in California and elsewhere; List 2= Plants rare, threatened, or endangered in California but more common elsewhere; List 3=Plants about which more information is needed; List 4 = Plants of limited distribution

SOURCES: CNPS, 2007; CDFG, 2008; USFWS, 2007; ESA, 2008a ; ESA, 2008b

CALFED: (CALFED Bay-Delta Program Multi-Species Conservation Strategy [MSCS] Species Goals)

R = Recovery. Recover species' populations within the MSCS focus area to levels that ensure the species' long term survival in nature.
 r = Contribute to recovery. Implement some of the actions deemed necessary to recover species' populations within the MSCS focus area.
 m = Maintain. Ensure that any adverse effects on the species that could be associated with implementation of CALFED actions will be fully offset through implementation of actions beneficial to the species.

Natural Community Conservation Plan Habitat Type

Gr = Grassland
 La = Lacustrine
 NFE = Nontidal Freshwater Emergent
 NSW = Natural Seasonal Wetland
 SE = Saline Emergent
 TFE = Tidal Freshwater Emergent
 UC = Upland Cropland
 US = Upland Scrub
 VFR = Valley/Foothill Riparian
 VFW = Valley/Foothill Woodland Forest

Habitat

Although only known within a few locations, longhorn fairy shrimp are found in a variety of vernal pool habitats, ranging from small, clear, sandstone outcrop pools to large, turbid, alkaline, grassland pools. Longhorn fairy shrimp have been found at elevations ranging from 75 feet to 2,887 feet. They occur in the same vernal pool complexes as other listed vernal pool species, but only rarely co-occur with other fairy shrimp (USFWS, 2005c).

Distribution

General. It is likely that longhorn fairy shrimp were historically more widespread in the regions where they are currently known, and in adjacent areas such as the San Joaquin and Southern Sierra Foothill vernal pool regions. The known extant populations are few. These populations are in pools within a matrix of alkali sink and alkali scrub communities at Soda Lake and at Carrizo Plain National Monument; a series of sandstone outcrop pools in Contra Costa and Alameda Counties; alkaline grassland pools at Kesterson National Wildlife Refuge; and a roadside ditch 2 miles north of Los Banos (USFWS, 2005c).

Regional. Eleven longhorn fairy shrimp occurrences are reported by the CNDDDB: one in Contra Costa County, one in Alameda County, three from Merced County, and six in San Luis Obispo County (CDFG, 2008). Two records of longhorn fairy shrimp from the region are included in the ECCC HCP/NCCP: Souza Ranch and Vasco Caves Regional Preserve. The first description of this species was from specimens collected at Souza Ranch. Both of these locations are shallow sandstone-rock-outcrop vernal pools within non-native grasslands (ECCCHPA, 2006). Contra Costa County has not been thoroughly surveyed for this species and the ECCC HCP/NCCP (2006) hypothesizes that additional populations may be present in natural and artificial habitats in the County. Critical habitat has been designated for longhorn fairy shrimp at the Vasco Caves Regional Preserve, south of the Los Vaqueros Watershed.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities. Suitable habitat for the longhorn fairy shrimp occurs in the Los Vaqueros Watershed, though not in the project area, with occurrences known from the Vasco Caves area, about 1.25 miles east of the inundation boundary (Figure 4.6-14). The other possibly extirpated occurrence is at Souza Ranch, about 2 miles south-southwest of the dam. Designated critical habitat is present at Unit 1A, about 0.75 mile east of the inundation boundary at Vasco Caves and Unit 1B, about 2.5 miles from the inundation boundary.

Delta Intake and Pump Station. No longhorn fairy shrimp populations or potential habitat occurs near the Delta Intake Facilities (CDFG, 2008). The closest critical habitat unit to the Old River Intake and Pump Station is Unit 1A, about 8 miles southwest of the Old River Intake and Pump Station. Suitable habitat is not present at this location.

Delta-Transfer Pipeline. Suitable habitat does not occur in the study area. The nearest described population occurs about 4.5 miles south of the pipeline.

Transfer-LV Pipeline. Suitable habitat for longhorn fairy shrimp does not occur in or near the study area for the project component. The nearest population occurs about 2.3 miles south of the Transfer-LV Pipeline.

Transfer-Bethany Pipeline. An extant longhorn fairy shrimp population occurs roughly 5 miles from the Expanded Transfer Facility, (CDFG, 2008). A February 2008 field reconnaissance identified 16 vernal pools within and next to the proposed alignment along Armstrong Road (ESA, 2008a). It is estimated that at least four created pools west of Armstrong Road would be directly affected by the Transfer-Bethany Pipeline. However, longhorn fairy shrimp have not been documented from this location, are locally known only from rock outcrop pools (not claypan vernal pools), and are therefore unlikely to be affected by project activities in the study area.

Expanded Transfer Facility. Suitable habitat does not occur in the study area. The nearest described population occurs about 4.5 miles south of the Transfer Facility.

Power Supply Infrastructure. No longhorn fairy shrimp populations or potential habitat were identified in or near the proposed facilities (CDFG, 2008).

Vernal pool fairy shrimp (*Branchinecta lynchi*)

Description

Vernal pool fairy shrimp are small, aquatic crustaceans. They feed on algae, bacteria, protozoa, rotifers, and bits of detritus (USFWS, 2005a). One important adaptation vernal pool fairy shrimp have acquired is the ability for their cysts to remain dormant in the soil when vernal pool habitats are dry. When temperature conditions are appropriate, after a brief period of rainfall, vernal pool fairy shrimp can reach sexual maturity in as little as 18 days and can complete their life cycle in 9 weeks. In larger pools, vernal pool fairy shrimp have been observed to have multiple hatching events in the same season (USFWS, 2005c).

Habitat

Vernal pool fairy shrimp are found in a variety of vernal pool habitats, ranging from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, it tends to occur in smaller pools. Most commonly they occur in pools in grass- or mud-bottomed swales, or basalt flow depression pools in unplowed grasslands (USFWS, 2005a). Vernal pool fairy shrimp have been collected with other vernal pool crustaceans, but only rarely. In pools where they did co-occur, the pools were large and long-lived, with the vernal pool fairy shrimp less abundant than the other vernal pool crustaceans found. It is thought that vernal pool fairy shrimp may be competitively excluded from these pools by other fairy shrimp, or tadpole shrimp, which are known to consume vernal pool fairy shrimp (USFWS, 2005c).

Distribution

General. This species is known to occupy a wide range of vernal pool types and its historic distribution likely coincided with the historic distribution of Central Valley, southern California, and southern Oregon vernal pools. In California, current known populations extend from Shasta

County through most of the Central Valley into Tulare County. They range in coastal valleys from northern Solano County to the Carrizo Plain in San Luis Obispo County. A few additional isolated populations exist in southern California, including in Los Angeles, Santa Barbara, and Ventura Counties. Although vernal pool fairy shrimp are distributed more widely than other listed vernal pool species, they are generally uncommon throughout their range and are rarely abundant where they are found (USFWS, 2005c). As of 2007, there were 400 vernal pool fairy shrimp occurrences reported by the CNDDDB (CDFG, 2008).

Regional. Of the 400 reported vernal pool fairy shrimp locations reported by the CNDDDB, 14 are from Alameda and Contra Costa Counties (CDFG, 2008). The ECCC HCP/NCCP notes six records for vernal pool fairy shrimp within the ECCC inventory area. Contra Costa County has not been thoroughly surveyed for this species and the ECCC HCP/NCCP (2006) hypothesizes that vernal pool fairy shrimp may be found elsewhere in the area where habitat is appropriate. Critical habitat for vernal pool fairy shrimp occurs within the region.

In-Watershed Facilities. Vernal pool fairy shrimp are known to occur within the regional vicinity, with eight CNDDDB records occurring within 10 miles. One occurrence is known within the Los Vaqueros Watershed (CDFG, 2008). Before Los Vaqueros Reservoir was built, Jones and Stokes (1990) found vernal pool fairy shrimp in a rock outcrop vernal pool roughly 0.20 mile east and upslope from the inundation boundary (ESA, 2004) (Figure 4.6-14). Habitat for vernal pool fairy shrimp at the Vasco Caves vernal pool complex is 0.90 mile east of the inundation boundary (Figure 4.6-14). No other known vernal pool fairy shrimp populations or potential habitat are documented in the local reservoir vicinity or the vicinity of the Los Vaqueros Watershed and Recreational Facilities.

Delta Intake and Pump Station. An extant vernal pool fairy shrimp population occurs about 2.1 miles northwest of the Old River Intake and Pump Station. The study area does not provide suitable habitat for vernal pool fairy shrimp.

Delta-Transfer Pipeline. The nearest vernal pool fairy shrimp occurrence is about 1 mile north of the pipeline. Another occurrence is reported about 2.5 miles to the south in vernal pool fairy shrimp Potential habitat is present in an alkali scrub swale/ditch that occurs along the alignment. This area will be evaluated for vernal pool fairy shrimp during winter 2007 surveys.

Transfer-LV Pipeline. Much of this pipeline is within the Los Vaqueros Watershed. Habitat for vernal pool fairy shrimp at the Vasco Caves vernal pool complex is 2 miles from the pipeline. Another occurrence is about 1.8 miles to the north of the pipeline. The nearest critical habitat for vernal pool fairy shrimp are Unit 19B (USFWS, 2006a) 1.8 miles to the east of the pipeline, and Unit 19A, 2 miles north of the pipeline. This pipeline segment does not contain suitable habitat for this species.

Transfer-Bethany Pipeline. An extant population occurs in the local vicinity of the Byron Airport within vernal pool fairy shrimp critical habitat unit 19B (CDFG, 2008; USFWS, 2006a). The Transfer-Bethany Pipeline alignment traverses a roughly 4-mile portion of the unit. A May 21-22, 2007 field reconnaissance verified that potential habitat occurs within 16 pools within the

Transfer-Bethany Pipeline alignment, of which four are known or suspected to support vernal pool fairy shrimp (ESA, 2008a). These features would be directly affected by the proposed Transfer-Bethany Pipeline.

Expanded Transfer Facility. The nearest vernal pool fairy shrimp occurrence to the Expanded Transfer Facility is 2 miles to the northeast. The nearest critical habitat unit for vernal pool fairy shrimp is Unit 19A (USFWS, 2006a), 3 miles to the northeast of the Expanded Transfer Facility. Habitat for this species does not occur at the Expanded Transfer Facility.

Power Supply Infrastructure. During biological surveys in spring 2008, high-quality vernal pool habitat was noted in multiple pools in the Western alignment, just north of the Bureau of Reclamation's Skinner Delta Fish Protective Facility. This area would be spanned under Power Option 2 (with no activities in this area under Power Option 1). Habitat is absent from the new Western substation siting zone associated with Power Option 1 and the PG&E facilities associated with Power Option 2.

Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)

Description

Valley elderberry longhorn beetles are unique insects that spend most of their lives within the stems of elderberry (*Sambucus* spp.) shrubs. Females lay their eggs within the bark, where larvae hatch and bore into the stems. Larvae remain within the stems for 1 to 2 years. In March, when the elderberries begin to flower, they pupate and emerge as adults. Mating usually occurs in June. Often, the only indicators of their presence are the distinctive small oval openings that are left after larvae pupate and emerge (UC Berkeley, 2005; USFWS, 2005a).

Habitat

Valley elderberry longhorn beetles use elderberry shrubs with a stem diameter of at least 1 inch (at ground level) as a host plant (USFWS, 2005a). In the Central Valley, elderberry shrubs are fairly common in riparian forests and adjacent uplands (UC Berkeley, 2005). Elderberry shrubs are typically found growing in association with other riparian species, but they also occur as isolated shrubs in upland areas. All elderberry shrubs within the Los Vaqueros Watershed with stem diameters of at least 1 inch represent potential habitat for valley elderberry longhorn beetles.

Distribution

General. Historically, valley elderberry longhorn beetles ranged throughout the Central Valley. Currently, they are locally common in scattered populations from Redding to Bakersfield where historical riparian forests still exist (USFWS, 2005a). The *USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle* considers the range of the valley elderberry longhorn beetle to include habitat up to 3,000 feet in elevation at the eastern boundary, and habitat within watersheds that drain into the Central Valley at the western range boundary (USFWS, 1999a). The CNDDDB notes a total of 194 occurrences of the valley elderberry longhorn beetle scattered throughout the Central Valley.

Regional. The eastern portions of Contra Costa County and Alameda County are included within the range of the valley elderberry longhorn beetle; this includes the project area (USFWS, 1999a). No Valley elderberry longhorn beetle occurrences are reported in Contra Costa or Alameda Counties (CDFG, 2008). The nearest occurrences are in San Joaquin County, where 16 occurrences are reported (CDFG, 2008). Critical habitat for valley elderberry longhorn beetle is designated along the American River in Sacramento County, more than 40 miles from the project area (USFWS, 2002b).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

In the Los Vaqueros Watershed, beetle exit holes were noted in elderberry shrubs in several drainages within the proposed inundation area. An inventory of the Watershed found 85 elderberry shrubs in 2005 (ESA, 2005). The 275 TAF inundation zone supports 45 elderberry shrubs with 249 stems measuring more than 1 inch in diameter (ESA, 2005). Of these, six shrubs exhibited beetle exit holes. An additional two elderberry shrubs (with 24 stems greater than 1 inch in diameter) occur within 100 feet of the inundation zone (ESA, 2005), with no beetle activity. The Inlet/Outlet Zone study area supports 10 elderberry shrubs with 53 stems more than 1 inch in diameter (ESA, 2005).

Delta Intake and Pump Station. The nearest CNDDDB occurrence of valley elderberry longhorn beetle is about 9 miles east of the Delta Intake Facilities. The next nearest CNDDDB occurrences are over 20 miles away (CDFG, 2008). The nearest known elderberry shrub within the Los Vaqueros Watershed is about 7 miles west of the Delta Intake Facilities. The habitat in the vicinity of the study area is well-developed for agricultural use and generally lacks riparian vegetation, especially shrubs and trees. Elderberry shrubs, and hence, the valley elderberry longhorn beetle, do not occur within this study area.

Delta-Transfer Pipeline. Elderberry shrubs were not found in this alignment during a May, 2007 reconnaissance survey of this study area, thus, the valley elderberry longhorn beetle does not occur in the study area.

Transfer-LV Pipeline. A survey for elderberry shrubs was conducted within at least 500 feet of the portion of the pipeline alignment that is within the Los Vaqueros Watershed boundary (ESA, 2007). Several elderberry shrubs are known to occur in the Inlet-Outlet Pipelines construction area within the Los Vaqueros Watershed; the nearest occurrence is within 100 feet of the alignment. Because appropriate habitat is present, valley elderberry longhorn beetles may be present in the project area.

Transfer-Bethany Pipeline. The alignment does not support elderberry shrubs.

Expanded Transfer Facility. No elderberry shrubs occur at the Expanded Transfer Facility.

Power Supply Infrastructure. Elderberry shrubs do not occur near the facilities proposed for Power Options 1 and 2.

Federal or State Species of Special Concern

Midvalley fairy shrimp (*Branchinecta mesovallensis*)

Description

Midvalley fairy shrimp are small, aquatic crustaceans that feed on phytoplankton, detrital bacterial colonies, rotifers, protozoa, and small larvae (USFWS, 2005a). Their life-cycle is especially suited for the short and unpredictable conditions of vernal pool habitats, they have been observed to reach maturity in as few as 8 days, and they reproduce as quickly as 16 days after hatching. Multiple hatching events are possible during a single rainy season (USFWS, 2005a; USFWS, 2005c).

Habitat

Midvalley fairy shrimp have been found in small, shallow, short-lived vernal pools, vernal swales, and artificial ephemeral wetland habitats. They prefer shallow cool pools with low to moderate dissolved salts. Midvalley fairy shrimp have only been collected with one other fairy shrimp, vernal pool fairy shrimp; possibly because it occupies short-lived pools that are not inundated long enough to support other fairy shrimp species (USFWS, 2005a; USFWS, 2005c).

Distribution

General. Midvalley fairy shrimp are known to occur in Sacramento, Solano, Yolo, Contra Costa, San Joaquin, Madera, Merced, and Fresno Counties. Due to their resemblance to the conservancy fairy shrimp (*Branchinecta conservatio*) and their relatively recent formal description, it has been suggested that the range and distribution of the midvalley fairy shrimp is larger than the distribution of the known occurrences. This is because much of the vernal pool habitat in this region has been converted to agricultural uses, and to the fact that they can occur in swales and short-lived pools which often are not detected in dry years (USFWS, 2005a). Species occurrences are mostly concentrated in the Central Valley between Yolo and Merced Counties (CDFG, 2008).

Regional. Of 65 reported occurrences, three are from Contra Costa County, eight from Solano County, and eight from San Joaquin County. No occurrences are recorded from Alameda County (CDFG, 2008). The three records for midvalley fairy shrimp are in the regional vicinity of the project. The ECCC HCP/NCP (2006) hypothesizes that midvalley fairy shrimp could occur throughout the inventory area in appropriate habitats but because of their brief life cycle they could be overlooked during aquatic surveys.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The three records for midvalley fairy shrimp are about 5.5 miles to the northeast, 5.5 miles to the east, and 3.8 miles to the east of the inundation boundary (CDFG, 2008). No other midvalley fairy shrimp populations are known in the vicinity of the reservoir. This species has not been described in rock outcrop pools, which provide the only available potential habitat in the Los Vaqueros Watershed. Based on known range and available habitat, this species is likely absent from the Los Vaqueros Watershed.

Delta Intake and Pump Station. The nearest extant midvalley fairy shrimp populations occur about 4 to 5 miles from the Delta Intake Facilities. The lack of suitable habitat indicates that this species is absent from the study area.

Delta-Transfer Pipeline. The nearest midvalley fairy shrimp occurrence is about 1 mile north of the alignment. Another occurrence is about 2.5 miles to the south (USFWS, 2006a). This species is absent from the study area based on the lack of suitable habitat.

Transfer-LV Pipeline. Much of this pipeline is within the Los Vaqueros Watershed, which is unlikely to support midvalley fairy shrimp. The nearest midvalley fairy shrimp occurrence to this pipeline is about 2.3 miles to the northeast. This species is absent from the study area based on the lack of suitable habitat.

Transfer-Bethany Pipeline. Midvalley fairy shrimp have not been documented in or near the Transfer-Bethany study area or from the vernal pool complex at the Byron Airport. A May 21-22, 2007 field reconnaissance verified that potential habitat occurs within 16 pools within the Transfer-Bethany Pipeline alignment (ESA, 2008a). These features would be directly affected by the proposed Transfer-Bethany Pipeline.

Though potentially suitable habitat is present, the likelihood of encountering midvalley fairy shrimp in the study area is considered low based on the described range of this species and reconnaissance-level fairy shrimp survey findings (ESA, 2008a).

Expanded Transfer Facility. The nearest midvalley fairy shrimp occurrence to the Expanded Transfer Facility is 2 miles to the northeast. Suitable habitat does not occur in the study area.

Power Supply Infrastructure. Habitat for this species does not occur in the study areas for the Power Options 1 and 2.

Curved-foot hygrotus diving beetle (*Hygrotus curvipes*)

Description

Very little information is available on the life history of the curved-foot hygrotus diving beetle. This beetle belongs to the Dytiscidae family with identifying characteristics including a distinctive elongated-oval shape, 1.2 to 40 mm long, and hind legs fringed for swimming. Hygrotus beetles are predatory diving beetles both in their adult and larval stages that feed on small aquatic invertebrates (Borror and White, 1970).

Habitat

Curved-foot hygrotus diving beetles are aquatic insects and have been found in stock ponds, irrigation channels, roadside drainages, slow moving creeks, ponds, and alkali pools.

Distribution

General. This is an aquatic insect known to occur in Alameda and Contra Costa counties.

Regional. CDFG (2008) documents 21 extant occurrences in Contra Costa and Alameda Counties. This aquatic insect occurs in several wetland sites and stock ponds within the Los Vaqueros Watershed, favoring alkaline vernal pools and drying portions of slow-moving creeks (Hafernik, 1988). In a 1988 survey, individuals were found in stock ponds throughout the Los Vaqueros Watershed, though not in flowing portions of creeks (Hafernik, 1988).

California linderiella (*Linderiella occidentalis*)

Description

California linderiella are a small (about 0.4 inch long) fairy shrimp crustacean in the Linderiellidae family. They have delicate elongate bodies, large stalked compound eyes, no carapaces, and eleven pairs of swimming legs. Average time to maturity is about 45 days with adults collected from late December to early May.

Habitat

California linderiella tend to live in large, fairly clear vernal pools and lakes. However, they can survive in clear to turbid water with pH from 6.1 to 8.5, and they have been found in very small pools. They are tolerant of water temperatures from 41° to 85° F, making them the most heat tolerant fairy shrimp in California (USFWS, 2007).

Distribution

The California linderiella is the most common fairy shrimp in the Central Valley. It has been documented on most land forms, geologic formations and soil types supporting vernal pools in California, at altitudes as high as 3,800 feet above sea level. Their range extends from Shasta County south to Fresno County and across the valley to the Coast and Transverse Ranges from Willits in Mendocino County south to near Sulfur Mountain in Ventura County (USFWS, 2007).

There is a low likelihood that this species may be present in a single pool on the Delta-Transfer Pipeline and up to 16 pools on the Transfer-Bethany Pipeline (as identified for vernal pool fairy shrimp). In-Watershed occurrences are outside the project area.

Molestan blister beetle (*Lytta molesta*)

Description

Molestan blister beetle is in the Meloidae family. Blister beetles are soft-bodied beetles with elongate, slender abdomens and broad heads. Molestan blister beetles can be found on the flowers and foliage of various plants. Adults are plant eaters while the larvae are parasitic and eat grasshopper or bee eggs (Borror and White, 1970).

Habitat

Blister beetles are found on flowering plants and plant foliage. There is some evidence that Molestan blister beetles are associated with vernal pool vegetation.

Distribution

Molestan blister beetles are found in the central valley of California from Contra Costa to Kern and Tulare Counties. The presence of this species in the project area is unknown.

CDFG (2008) documents 2 extant occurrences in Contra Costa County and none from Alameda County. Both local collections are historic (1945 and ca. 1960) from near the City of Brentwood. Little is known of this species' distribution in the regional area. The project would not affect either of the two locally described populations.

Amphibians

Federal or State Threatened and Endangered Species

California tiger salamander (*Ambystoma californiense*)

Description

California tiger salamanders are amphibians that spend much of their life cycle in underground refuges. Eggs and larvae require aquatic habitats that persist for at least 10 weeks. During their larval stage, they feed on algae and small invertebrates, incorporating larger items, including tadpoles of other amphibians, as they grow. Adults consume earthworms, snails, insects, fish, and small mammals, but rarely feed during the non-breeding season (Zeiner et al., 1988-1990; USFWS, 2005a).

Habitat

California tiger salamanders occur in annual grasslands and in the grassy understory of valley-foothill hardwood habitats in central and northern California. They require underground refuges (usually ground squirrel or other small mammal burrows and occasionally human-made refugia), where they spend the majority of their annual cycle. During the fall and winter, California tiger salamanders migrate from their refugia to breeding sites. Adults are known to travel distances greater than 1 kilometer (0.62 mile) from breeding ponds and have been documented at distances of 2 kilometers (1.2 miles) or more (Orloff, 2007). After breeding, eggs are laid in seasonal and perennial water sources such as vernal pools, streams, and stockpools. Common breeding sites include stockpools and vernal pools, while streams are rarely used (Stebbins, 2003; Zeiner et al., 1998-1990).

Distribution

General. California tiger salamanders occur in suitable habitat across central and northern California. Currently, they range from Kings and Tulare Counties north to Butte County in the Central Valley, and from Santa Barbara County north to Sonoma County along the coast (Zeiner et al., 1988-1990). It is estimated that they have disappeared from nearly 55 percent of their historic range (Stebbins, 2003).

Regional. California tiger salamanders are known from foothill grasslands of the Mt. Diablo Range and within the Los Vaqueros Watershed. More than 267 California tiger salamander occurrences are reported from Alameda, Contra Costa, and San Joaquin Counties (CDFG, 2008). Within Contra Costa County, many of these records are from the vicinity of the Los Vaqueros Watershed,

south of the Cities of Clayton and Brentwood, between Discovery Bay and San Ramon, and Alamo; the rest are from the grasslands of the Diablo Ridge north of the Los Vaqueros Watershed (CDFG, 2008). Exhaustive surveys for California tiger salamanders have not been conducted in eastern Contra Costa County and its current distribution in this area is still being studied. However, two-thirds of the ECCC HCP/NCCP inventory area is considered potential habitat for California tiger salamanders; this area is mostly in the hilly portions of the western side of the inventory area (ECCCHPA, 2006).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Surveys have detected tiger salamander larvae in ponds and creeks throughout the Los Vaqueros Watershed (Jones & Stokes, 1990) (see **Figures 4.6-7 and 4.6-8** and **Table 4.6-10**). Potential upland habitat for California tiger salamander includes grasslands and woodland habitats found throughout the Watershed. These grasslands and woodland areas provide sheltering and dispersal areas.

Delta Intake and Pump Station. There is no California tiger salamander habitat near the Delta Intake Facilities. The occurrence is a 2000 sighting 3.4 miles west of the study area (CDFG, 2008). No tiger salamander occurrences are reported east of the Byron Highway. In the vicinity of the Delta Intake Facilities, there are no suitable breeding ponds or upland habitat that would support this species.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline traverses cultivated and agricultural lands and ruderal areas that do not provide aquatic breeding habitat for California tiger salamander; however, at least four agricultural impoundments within 1 mile of the study area. Of these, three impoundments occur in close proximity to the Expanded Transfer Facility (the closest of these are 0.15 mile north and south of the alignment, just east of the Expanded Transfer Facility); another is in a walnut orchard 0.75 mile east of the Expanded Transfer Facility, and a channelized portion of Kellogg Creek managed by the Byron Bethany Irrigation District parallels the alignment within 100 feet for 2.4 miles. The portion of Kellogg Creek that parallels the Delta-Transfer Pipeline alignment is managed as an irrigation canal and can be characterized as a fast-flowing, maintained channel with no backwater areas or off-channel breeding habitat.

Transfer-LV Pipeline. CDFG (2008) documents a robust California tiger salamander population along the southernmost 4-mile portion of the Transfer-LV Pipeline that parallels Walnut Boulevard and terminates at the Reservoir. This species may occur in moderate to high densities in the study area. The 0.4-mile pipeline segment that runs from Walnut Boulevard to the Expanded Transfer Facility (at the east end of the Transfer-LV Pipeline) also provides suitable upland conditions for California tiger salamander. Thus, this species may be expected in all upland portions of the alignment at any time of the year. Breeding habitat is present in slow-moving portions of Kellogg Creek upstream from Walnut Boulevard, but is not generally present at the two stream crossing locations. Aside from Kellogg Creek, potential breeding habitat in the study area is present in at least five created mitigation ponds below the dam. Potential breeding habitat occurs in at least two and possibly more stock ponds within 0.25 mile of the alignment.

Transfer-Bethany Pipeline. Five California tiger salamander populations are noted within 0.25 mile of the Transfer-Bethany Pipeline (CDFG, 2008), and three additional breeding sites were identified during biological surveys in spring 2008 (B. Pittman, pers. obs.). One known breeding site and four potential breeding sites near Armstrong Road are within the immediate project area. In winter 2008, California tiger salamander larvae were also collected from a roadside ditch on the northern portion of Armstrong Road, but this feature dried before larvae could metamorphose (ESA, 2008a). Most of the Transfer-Bethany Pipeline alignment traverses grasslands that may support this species in some capacity (e.g., aestivation, foraging, or migration). Known and potential California tiger salamander breeding sites are present within 0.5 mile of the alignment along Vasco Road, Armstrong Road, and areas further south (CDFG, 2008).

Expanded Transfer Facility. CDFG (2008) reports that the California tiger salamander distribution in the local area includes the Camino Diablo road corridor and Kellogg Creek downstream to Camino Diablo, 0.25 mile southwest of the Expanded Transfer Facility. Additionally, potential breeding habitat is present in seasonal pools 0.15 mile north and west of the study area. This species would be presumed present at low to moderate densities in undisturbed annual grasslands habitat at the Expanded Transfer Facility. Breeding habitat is absent at this location.

Power Supply Infrastructure. California tiger salamander habitat is not present at the Western substation facilities under Power Option 1 or Western powerline alignments under Power Options 1 and 2. Upland aestivation habitat is present at the PG&E substation site under Power Option 2.

California red-legged frog (*Rana draytonii*)

Description

California red-legged frogs are largely aquatic frogs found at ponds and slow-moving streams with permanent or semipermanent water. This species opportunistically migrates into upland habitats, due to normal dispersal behavior. This species may aestivate in upland environments when aquatic sites are unavailable or environmental conditions are inhospitable. If water is unavailable, they shelter from dehydration in a variety of refuges, including boulders, downed wood, moist leaf litter, and small mammal burrows.

California red-legged frogs generally lay their eggs on emergent vegetation in standing or slow-moving water, but they are known to use unvegetated pools (USFWS 2005d). After hatching, the herbivorous larvae take 11 to 20 weeks to mature, depending on water temperatures. Adults will consume essentially any invertebrate or vertebrate prey they can capture (Jennings and Hayes, 1994; USFWS, 2005a; Zeiner et al., 1988-1990).

Habitat

Habitat for this species consists of slow moving streams and ponds, often with dense shrubby or emergent vegetation such as cattails. Adjacent uplands may be used for foraging, aestivation, and dispersal. California red-legged frogs are known to make straight-line dispersal movements when conditions allow, rather than following drainages. Little is specifically known, however, about how California red-legged frogs use upland habitats (Jennings and Hayes, 1994; USFWS, 2005a).

Distribution

General. Historically, the California red-legged frog occurred along the coast from the vicinity of Point Reyes National Seashore, Marin County, and inland from Redding, Shasta County southward to northwestern Baja California, Mexico (Jennings and Hayes, 1994). Currently, this species occurs in isolated areas of the Sierra Nevada, northern Coast Ranges, and northern Transverse ranges. It was believed to be extirpated from the southern Transverse and Peninsular ranges until recently when two populations were discovered. It is still locally common in the San Francisco Bay area and along the central coast (USFWS, 2004).

Regional. The majority of known California red-legged frog occurrences in the San Francisco Bay Area occur within Contra Costa and Alameda counties. However, this species is in danger of extirpation from the western lowland portions of these counties, particularly near urbanized areas (USFWS, 2002c). Two-thirds of the ECCC HCP/NCCP inventory area is considered potential habitat for California red-legged frogs; this area is mostly in the hilly portions of the western side of the inventory area (ECCCHPA, 2006).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

California red-legged frogs have been documented in suitable locations throughout the Los Vaqueros Watershed. The CNDDDB records a total of 96 occurrences of California red-legged frogs within the vicinity of the Watershed. Additionally, up to five of the wetlands and six of the stockponds that were created or enhanced for the original Los Vaqueros project are within the inundation zone (Figure 4.6-13A). Stockponds in the Watershed support some of the highest known densities of California red-legged frog in the region (ECCCHPA, 2006). Adult, sub-adult, and juvenile frogs are expected to migrate intermittently through annual grasslands and other upland habitats. Therefore, frogs are expected to intermittently migrate in low numbers across Walnut Blvd., and they may temporarily reside within the Stockpile Area. The CCWD actively manages habitat for this species within the Watershed, including non-native predator (American bullfrog, *Lithobates catesbeianus*) exclusion and control.

Delta Intake and Pump Station. No California red-legged frog occurrences are recorded in the vicinity of the Delta Intake Facilities. The nearest CNDDDB occurrence of California red-legged frog is a 2003 sighting 4 miles southwest of the Delta Intake Facilities (CDFG, 2008). The study area provides no suitable breeding habitat or upland habitat that would support California red-legged frogs.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline alignment traverses cultivated and agricultural lands and ruderal areas that do not provide aquatic breeding habitat for California red-legged frog; however, at least four agricultural impoundments within 1 mile of the alignment, and Kellogg Creek provide potentially suitable breeding habitat. Of these, three impoundments occur in close proximity to the Expanded Transfer Facility at the western end of the pipeline alignment (the closest of these are 0.15 mile north and south of the alignment, just east of the Expanded Transfer Facility); another is in a walnut orchard 0.75 mile east of the Expanded Transfer Facility, and a

channelized portion of Kellogg Creek managed by the Byron Bethany Irrigation District parallels the alignment within 100 feet for a linear distance of 2.4 miles.

The portion of Kellogg Creek that parallels the Delta-Transfer Pipeline is managed as an irrigation canal and can be characterized as a fast-flowing, maintained channel with no backwater areas or off-channel amphibian refugia. Kellogg Creek in this area is not expected to support breeding California red-legged frogs. East of the Expanded Transfer Facility, for a distance of 1.2 miles, the pipeline alignment crosses designated critical habitat for California red-legged frog. The critical habitat boundary is generally defined by the interface between grazed annual grasslands in the hills to the west and agricultural lands to the east. This species could be encountered in the 1.2-mile stretch that traverses annual grasslands during normal animal movements, but frogs are not expected to inhabit the barren upland portions of the alignment on a sustained basis.

Transfer-LV Pipeline. California red-legged frogs are expected to occur year-round in any aquatic or semi-aquatic environments in or near this pipeline alignment. This would include the entirety of Kellogg Creek from near the Expanded Transfer Facility to the Dam, natural and artificial ponds (including the two settling ponds near and to the west of the Expanded Transfer Facility) and alkali meadows, seeps, or drainages in the local area. Red-legged frogs would generally use ephemeral drainages on a seasonal basis. Additionally, adult, sub-adult, and juvenile frogs are expected to migrate intermittently through annual grasslands and other upland habitats. Breeding habitat is present in slow-moving portions of Kellogg Creek upstream from Walnut Blvd, but is not generally present at the two crossing locations. Potential red-legged frog breeding habitat in the study area is present in at least five created mitigation ponds directly below the dam. Potential breeding habitat occurs in at least two and possibly more stock ponds within 0.25 mile of the alignment.

Transfer-Bethany Pipeline. At least ten California red-legged frog breeding sites were identified within 0.5 mile of the Transfer-Bethany Pipeline. Occupied sites are documented from both instream impoundments and stock ponds along the alignment. This species generally requires long periods of standing water and is not expected to breed in many of the ephemeral pools along Armstrong Road (but may be otherwise present at these sites). One known breeding site and potential breeding habitat in Brushy Creek could be directly affected by this project component. The entire alignment traverses upland habitat that could support this species. Known and potential California red-legged frog breeding sites are present at regular intervals along Vasco Road, Armstrong Road, and areas further south (CDFG, 2008).

Expanded Transfer Facility. The Expanded Transfer Facility study area is within annual grassland communities that lack aquatic habitat. CDFG (2008) reports an extant population of California red-legged frogs in Kellogg Creek, for which the nearest ponded areas that provide suitable breeding habitat are 0.34 mile west of the Expanded Transfer Facility. Potential breeding habitat may be present in seasonal pools 0.15 mile north and west of the Expanded Transfer Facility. This species could be encountered during transient migrations through the Expanded Transfer Facility, but is not expected to inhabit the site on a continual basis.

Power Supply Infrastructure. Based on their known range and available habitat, California red-legged frogs are not expected to appear in the Western study area.

The PG&E substation site supports upland habitat and California red-legged frogs are not expected at this site.

Reptiles

Federal or State Threatened and Endangered Species

Alameda whipsnake (*Masticophis lateralis euryxanthus*)

Description

Alameda whipsnake is one of two subspecies of the California whipsnake (*Masticophis lateralis*). Alameda whipsnakes are slender, diurnal snakes that are quick and active predators, especially on western fence lizards (*Sceloporus occidentalis*), although they will take other small vertebrates. They hunt by holding their head high off the ground, looking over grass and rocks for potential prey (USFWS, 1997a). Alameda whipsnakes are most active during the breeding season and in late fall; retreating to hibernacula during most of the winter. Courtship and mating occurs from late-March to mid-June, at this time males move throughout their home ranges and females remain at their hibernacula where mating occurs (CDFG, 2005; Jones & Stokes, 1990; USFWS, 2005a).

Habitat

Alameda whipsnakes are known to associate closely with open chaparral, sage scrub, and coastal scrub. Recent telemetry data indicate that although home ranges are centered on shrub communities, they venture up to 4 miles into adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland (Swaim, pers. comm.). These data also indicate that Alameda whipsnakes use grassland habitats for periods of up to several weeks; with males using grassland habitats more frequently in the mating season and females using grassland habitats after mating occurs. Rock outcrops are an important feature of Alameda whipsnake habitat because they provide retreat opportunities and promote prey populations (CDFG, 2005; USFWS, 2002a).

Distribution

General. Historically, Alameda whipsnakes were probably found in coastal scrub, and nearby annual grasslands and oak woodland communities of the East Bay in Contra Costa, Alameda, western San Joaquin, and northern Santa Clara Counties (USFWS, 2002a). Currently, they are only found in the inner Coast Range in western and central Contra Costa and Alameda counties (USFWS, 2000a). Five isolated populations of Alameda whipsnake are now recognized within its historical range: Tilden–Briones, Oakland–Las Trampas, Hayward–Pleasanton Ridge, Sunol–Cedar Mountain, and Mt. Diablo–Black Hills (USFWS, 1997a).

Regional. All 73 CNDDDB occurrences for the Alameda whipsnake occur within Contra Costa and Alameda Counties. The CNDDDB considers all of these occurrences extant (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The Los Vaqueros Watershed falls within the range of the Mt. Diablo-Black Hills population of

Alameda whipsnake. This species has been documented from and is presumed extant in the chaparral habitats of the southwestern portion of the Watershed, and adjoining non-scrub habitat. Alameda whipsnakes have been recorded in upland scrub habitat in the southwestern portion of the Watershed where the high quality scrub habitat is present (Jones and Stokes, 1990; CDFG, 2008). In 2003 and 2004, field surveys found Alameda whipsnakes in all age classes (adult, sub-adult, and young of the year) within the Watershed (D. McGriff, pers. com). Additional occurrences have been documented from at least three grassland areas that are not associated with chaparral habitat (ESA, 2004).

Delta Intake and Pump Station. The habitats within the Delta are mostly cropland, potential wetlands, grassland, and aquatic habitats that are not suitable habitat for Alameda whipsnake. Alameda whipsnake do not occur in this study area.

Delta-Transfer Pipeline. The habitats within the study area are mainly cropland, potential wetlands, grassland, and aquatic habitat. These habitats are not near scrub habitat and are not suitable for Alameda whipsnake. Alameda whipsnake do not occur in this study area.

Transfer-LV Pipeline. The habitats in the study area include cropland, potential wetlands, grassland, and aquatic habitats. These habitats are not near scrub habitat and are not suitable for Alameda whipsnake. Alameda whipsnake do not occur in this study area.

Transfer-Bethany Pipeline. The habitats in the study area include mainly wetlands, grasslands, and limited riparian. These habitats are not near scrub habitat and are not suitable for Alameda whipsnake. Alameda whipsnake do not occur in this study area.

Expanded Transfer Facility. The Expanded Transfer Facility is within grassland habitat that is not near scrub habitat and is not suitable for Alameda whipsnake. Alameda whipsnake do not occur in this study area.

Power Supply Infrastructure. The habitats in the study area are not near scrub habitat and are not suitable for Alameda whipsnake. Alameda whipsnake do not occur in this study area.

Federal or State Species of Special Concern

Western pond turtle (*Actinemys marmorata*)

Description

Western pond turtles are moderate-sized aquatic turtles that feed on plants, insects, worms, amphibians, crustaceans, and carrion. Mating usually occurs in late April or early May, but may occur year-round. Hatchling turtles are thought to emerge from the nest and move to aquatic sites in the spring (Jennings and Hayes, 1994; Stebbins, 2003; Zeiner et al., 1998-1990).

Habitat

Western pond turtles are commonly found in ponds, lakes, marshes, rivers, streams, and irrigation ditches with rocky or muddy substrates surrounded by aquatic vegetation. These watercourses usually

are within woodlands, grasslands, and open forests, between sea level and 6,000 feet in elevation. Turtles bask on logs or other objects when water temperatures are lower than air temperatures. Nests are at upland sites, often up to 0.25 mile from aquatic sites (Jennings and Hayes, 1994; Stebbins, 2003; Zeiner et al., 1988-1990).

Distribution

General. Western pond turtles are uncommon and discontinuously distributed throughout California west of the Cascade-Sierran crest with isolated populations in the Mojave River area and Andreas Canyon (Jennings and Hayes, 1994).

Regional. There are 83 western pond turtles occurrences noted for Alameda, Contra Costa, and San Joaquin Counties (CDFG, 2008). The western pond turtle is known throughout the inventory area for the East Contra Costa County HCP/NCCP. Turtle populations are noted throughout the Marsh Creek watershed and the Los Vaqueros Watershed (ECCCHPA, 2006).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

A variety of habitats such as creeks, ponds, and drainages, as well as semi-permanent marsh, alkali marsh, riparian woodland, and some grassland within the Los Vaqueros Watershed provide suitable habitat for western pond turtle. These correspond to lacustrine, nontidal freshwater permanent emergent, and valley/foothill riparian NCCP habitats within the Watershed. Western pond turtles are known throughout the Watershed. Data collected by Jones and Stokes Associates, Los Vaqueros Watershed biologists and CNDDDB data reveal western pond turtle populations in Adobe Creek (west arm of Kellogg Creek), along Upper and Lower Kellogg Creek, in several created wetlands and stockponds, and in drainages within the Los Vaqueros Watershed (Jones & Stokes, 1990; CDFG, 2008).

A total of six stockponds, five created wetlands, and several drainages are within the 275 TAF inundation zone. Of these, one stockpond, one created wetland, and two drainages are known to support western pond turtle. The stockpond is along Horseshoe Creek in a southeastern arm of the reservoir; the created wetland is along an unnamed drainage in an eastern arm of the reservoir; and the drainages are Upper and Lower Kellogg Creek.

Within the construction easement for the dam and associated Intake/Outlet pipelines five occurrences of western pond turtle within created wetlands are known, and there is suitable habitat throughout Lower Kellogg Creek. One stockpond along Adobe Creek is within the construction easement for the proposed Westside access road, and another occurrence is within the Stockpile study area. Pond turtles may be present in aquatic habitats and upland areas within roughly 0.25 to 0.5 mile of aquatic sites.

Delta Intake and Pump Station. No CNDDDB occurrences of western pond turtle are recorded within the study area of the Delta Intake Facilities; however, Old River and Middle River may provide suitable aquatic habitat, and adjacent levee banks may provide suitable basking and egg-laying habitat for this species. The occurrence nearest to the Old River Intake and Pump

Station is almost 2 miles south at Clifton Court Forebay (CDFG, 2008). Western pond turtle may sporadically occur in and near the study area.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline traverses mostly cropland, but several aquatic sites occur within the study area that may be used by western pond turtle. No CCWD or CNDDDB pond turtle occurrences are reported within the study area; the occurrence nearest to the study area is 1.5 miles south (CDFG, 2008). Western pond turtles can be expected to occur in association with Kellogg Creek and the numerous larger irrigation canals (e.g., the Byron-Bethany Canal) that occur in agricultural portions of the study area.

Transfer-LV Pipeline. Three CNDDDB-reported pond turtle occurrences are recorded within the study area (CDFG, 2008). These occurrences include areas along Lower Kellogg Creek where several stockponds and created wetlands support western pond turtle. All wetlands, including the Kellogg Creek and stockponds, and adjacent upland habitat are suitable habitat for western pond turtle. Western pond turtle are likely to occur in these habitats within the study area.

Transfer-Bethany Pipeline. No CNDDDB-reported pond turtle occurrences are recorded in the study area. The nearest occurrence is about 0.3 mile to the west, near the eastern boundary of the Los Vaqueros Watershed (CDFG, 2008). The Transfer-Bethany Pipeline crosses several small creeks, including Brushy Creek, that support wetlands and provide habitat for western pond turtle. This species is expected to occur in and near aquatic sites that provide suitable habitat.

Expanded Transfer Facility. The Expanded Transfer Facility is in a grassland community that does not provide suitable aquatic habitat for western pond turtle. No CNDDDB occurrences of western pond turtle are recorded within the study area. The occurrence nearest to the Expanded Transfer Facility is more than 1 mile south-southwest of the Expanded Transfer Facility (CDFG, 2008) and the closest potential habitat is over 900 feet away. Pond turtles are unlikely to occur in the study area.

Power Supply Infrastructure. Pond turtles may be present in irrigation and drainage features within the Western powerline alignment under Power Options 1 and 2, with breeding and movement in project area upland habitat potentially within the alignments and at the Western substation siting zone under Power Option 1. An occurrence is noted near Italian Slough, west of the Skinner Delta Fish Protective Facility (CDFG, 2008). Aquatic habitat does not occur at the Western substation site. Because pond turtles can persist with unpredictable water sources, they may be present in and near agricultural ditches that parallel and cross the alignment at various locations. Pond turtles may be present in upland habitat near the proposed PG&E substation under Power Option 2.

San Joaquin whipsnake (*Masticophis flagellum ruddocki*)

Description

San Joaquin whipsnakes are energetic diurnal foragers. They become active later in the spring than other snakes, and are mostly active during warm periods of the day. They forage primarily on lizards, bird eggs and young, and small mammals, occasionally foraging on carrion. Mating is

thought to occur in May, and oviposition in June or early July. Life history information on this subspecies is poorly known and much information has been taken from similar subspecies (Jennings and Hayes, 1994).

Habitat

San Joaquin whipsnakes use open, dry, areas with little or no tree cover. In the western San Joaquin Valley, they occur in valley grassland and saltbush scrub associations and are known to climb shrubs and bushes to view prey and potential predators. They use small mammal burrows for refuge and probably for oviposition sites as well (Jennings and Hayes, 1994).

Distribution

General. San Joaquin whipsnakes occur from the eastern edge of the San Joaquin Valley from Colusa County southward to the Kern County into the inner South Coast Ranges, with an isolated population in the Sutter Buttes; populations range in elevation from 65 to 2,955 feet (Jennings and Hayes, 1994). Most records in the CNDDDB are from San Benito County and western Merced County, with scattered records in other San Joaquin Valley counties (CDFG, 2008).

Regional. Of the 65 occurrences recorded in the CNDDDB, five are from Alameda, Contra Costa, and San Joaquin Counties (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

One sighting reported in the Los Vaqueros Watershed in 1980 was at the current location of the Los Vaqueros Reservoir dam (CDFG, 2008). The next closest CNDDDB records are about 11.5 miles south and southeast of the dam, in San Joaquin County (CDFG, 2008). The Watershed provides suitable open grassland habitat for San Joaquin whipsnake; therefore, San Joaquin whipsnake are expected in grasslands habitat throughout the study area where habitat conditions are suitable.

Delta Intake and Pump Station. The Delta region is largely developed for agriculture and does not provide suitable habitat for San Joaquin whipsnake. Therefore, San Joaquin whipsnake are not expected in this area.

Delta-Transfer Pipeline. The alignment traverses a limited amount of open grassland habitat suitable that could support San Joaquin whipsnake. The absence of standing cover in heavily grazed grasslands likely reduces habitat quality for San Joaquin whipsnake, resulting in a low likelihood of occurrence in the study area.

Transfer-LV Pipeline. The nearest CNDDDB occurrence to the Transfer-LV Pipeline is near the existing dam (CDFG, 2008). The alignment traverses open grassland habitat suitable for San Joaquin whipsnake. Therefore, San Joaquin whipsnake may occur in low densities within the study area where annual grassland habitat is available.

Transfer-Bethany Pipeline. The nearest reports of San Joaquin whipsnake to the Transfer-Bethany Pipeline are from the Los Vaqueros Dam and another site almost 5 miles southeast of the alignment (CDFG, 2008). The alignment traverses open grassland habitat that is suitable for San Joaquin whipsnake. San Joaquin whipsnake are expected to occur at low densities in annual grasslands habitat in the study area.

Expanded Transfer Facility. The nearest CNDDDB occurrence within the vicinity of this facility is about 3 miles to the southwest, near the existing dam (CDFG, 2008). The Expanded Transfer Facility is in open grassland habitat that is suitable for San Joaquin whipsnake. San Joaquin whipsnake may occur in low densities within the study area where habitat conditions are suitable.

Power Supply Infrastructure. Based on the availability of suitable habitat, this species may also occur in grasslands in the study areas for Power Option 2.

Near the PG&E substation, San Joaquin whipsnakes are known from similar habitat in the Los Vaqueros Watershed, and may be encountered in upland areas during construction.

Coast horned lizard (*Phrynosoma coronatum frontale*)

Description

The coast horned lizard is a large flattened lizard with five backward-pointing head spines, a large shelf above the eyes, and two parallel rows of pointed scales fringing each side of the body. The back color is highly variable, but typically gray, tan, reddish-brown, or whitish, and usually resembles the prevailing soil color. The belly is yellow to white with discrete, dark spots (Jennings and Hayes, 1994). Coast horned lizards primarily eat insects such as ants and beetles. Their population decline is mainly attributed to conversion of land for agricultural purposes. The human introduction of non-native Argentine ants (*Iridomyrmex humilis*), which are inedible to horned lizards and tend to displace the native carpenter ants (*Camponotus* spp.), is another attributed factor in their decline.

Habitat

The coast horned lizard seems to occur in several habitat types including areas with an exposed gravelly-sandy substrate containing scattered shrubs, clearings in riparian woodlands, dry uniform chamise chaparral, and annual grassland with scattered perennial seepweed (*Suaeda fruticosa*) or saltbush. Horned lizard reaches its maximum abundance in sandy loam areas and on alkali flats often dominated by iodine bush. Coast horned lizards use small mammal burrows or burrow into loose soils under surface objects during extended periods of inactivity or hibernation (Jennings and Hayes, 1994).

Distribution

This California endemic has a patchy distribution from below Lake Shasta in Shasta County southward along the edges of the Sacramento Valley into much of the South Coast Ranges, San Joaquin Valley, and Sierra Nevada foothills to northern Los Angeles, Santa Barbara, and Ventura counties. The known elevational range for this species extends from near sea level at Monterey,

Pacific Grove, and Seaside to 1,980 m at Breckenridge on Breckenridge Mountain (Jennings and Hayes, 1994).

Alkali areas with sandy loam soils and alkali flats have limited distribution in the project area. High-quality habitat is present in the Power Option 2 Western powerline alignment, just north of the Skinner Delta Fish Protective Facility and would be spanned by powerlines.

Birds

Federal or State Threatened and Endangered Species

Swainson's hawk (*Buteo swainsoni*)

Description

Swainson's hawks are medium-sized hawks that are opportunistic predators, feeding on rodents, rabbits, bats, large arthropods, amphibians, reptiles, birds, and, rarely, fish (Woodbridge, 1998; Zeiner et al., 1988-1990). In the Central Valley, the majority of their diet is composed of California voles (*Microtus californicus*) (CDFG, 2000). Swainson's hawks begin arriving in California in late February and depart for their wintering grounds in early September (Woodbridge, 1998). Swainson's hawks reside in the Central Valley from March through October, with eggs typically laid in April and early May (peaking in late April).

Habitat

Swainson's hawks reside in a wide variety of open habitats, from prairie and shrub-steppe to deserts and intensive agricultural matrices (Woodbridge, 1998). Nests are usually constructed in habitats with scattered trees or along riparian corridors that are next to agricultural fields or pastures (Woodbridge, 1998).

Distribution

General. Swainson's hawks were historically distributed throughout the lowlands of California, absent only from the Sierra Nevada, north Coast Ranges and Klamath Mountains, and portions of the southern California deserts. Currently, they are only found in portions of the Central Valley and Great Basin regions; where suitable habitat is still present (Shuford and Gardali, 2005). The highest density currently is in the Central Valley, between Sacramento and Modesto, and in the northern San Joaquin Valley (Woodbridge, 1988). There are 1,462 Swainson's hawk nesting occurrences recorded in the CNDDDB (CDFG, 2008).

Regional. The CNDDDB reports 280 nesting occurrences from Contra Costa and San Joaquin Counties. No occurrences are reported from Alameda County (CDFG, 2008). Swainson's hawks have been documented nesting within the ECCC HCP/NCCP inventory area, but they are not regular breeders. Most have been observed nesting in eucalyptus groves in the inventory area and the potential habitat model conducted for the HCP/NCCP identified areas within the northeast portion of the inventory area that were suitable for Swainson's hawk nesting (ECCCHPA, 2006).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Neither the CCWD nor CNDDDB report Swainson's hawk nesting in the Los Vaqueros Watershed. The nearest CNDDDB-reported nesting site is more than 5 miles from the dam and about 3 miles from the Stock Pile area (CDFG, 2008). However, the Contra Costa Breeding Bird Atlas (2005) notes breeding in the area northeast of the Los Vaqueros Watershed. CCWD staff have also observed non-breeding Swainson's hawks in the Watershed. Grassland and riparian communities in the Watershed may provide suitable foraging and breeding habitats for this species, but nesting is not anticipated in the Watershed.

Delta Intake and Pump Station. A few occurrences of nesting Swainson's hawk are recorded near the Delta Intake Facilities. The nearest CNDDDB report is about 2 to 3 miles from the Old River Intake and Pump Station (CDFG, 2008). Habitat in the vicinity of the study area is developed for agricultural uses and does not provide nesting opportunities for Swainson's hawk.

Delta-Transfer Pipeline. There is one recent Swainson's hawk nest reported near the Delta-Transfer Pipeline, from a large cottonwood tree on an active farm facility roughly 300 feet from the alignment (CDFG, 2008). The habitat in the vicinity of the study area is developed for agricultural use. Scattered clumps of trees along the alignment and in the Kellogg Creek corridor provide suitable breeding sites for Swainson's hawk. Swainson's hawks may breed in the study area where suitable nesting habitat is present.

Transfer-LV Pipeline. The nearest Swainson's hawk nest to the study area is about 3 miles east of the Transfer -LV Pipeline alignment (CDFG, 2008). The habitat in the vicinity of the study area is agricultural and grassland which provides potential foraging habitat. The patchy cottonwood riparian corridor of Kellogg Creek may provide suitable nesting habitat for Swainson's hawk, but nesting has not been documented from this area. There is a low likelihood that Swainson's hawks may breed in riparian portions of the study area.

Transfer-Bethany Pipeline. Swainson's hawk has not been documented near the Transfer-Bethany Pipeline. The nearest documented occurrence is about 3 miles east of the alignment (CDFG, 2008). The habitat in the study area is grassland and potential nesting sites are generally limited.

Expanded Transfer Facility. Swainson's hawk has not been documented near the Expanded Transfer Facility. The closest reported nest is about 3 miles east of the study area (CDFG, 2008). Nesting sites are not available near the Expanded Transfer Facility.

Power Supply Infrastructure. Nesting habitat is not present at the Delta Intake Facilities, Expanded Transfer Facility, or within the study areas for Power Options 1 and 2 and nesting is unlikely near other facilities.

Bald eagle (*Haliaeetus leucocephalus*)

Description

Bald eagles are large raptors and opportunistic foragers. They usually feed on fish or waterfowl, but also prey on other small animals and eat carrion. Bald eagles nest in large stick nests constructed in a variety of trees, with size and height appearing to be more important than species. In Arizona, bald eagles have been documented nesting on cliffs. A breeding pair may re-use a nest from the previous year, or construct new nests within their territory, often resulting in multiple nests per territory. In California, resident breeding pairs usually remain in the vicinity of their breeding territory during winter. Hundreds of migratory bald eagles winter in California, arriving each year from the north during the fall and early winter (CDFG, 2005; USFWS, 1999c; Zeiner et al., 1988-1990).

Habitat

Bald eagles occupy a wide range of habitats, including woodlands, forests, grasslands, and wetlands. They winter throughout California near lakes, reservoirs, rivers, and some rangelands and coastal wetlands. Breeding is usually restricted to mountainous habitats near reservoirs, lakes, and rivers. Bald eagles usually nest in large coniferous trees within 1 mile of permanent water. They forage on large water bodies or rivers with easily-approached snags and other perches (CDFG, 2005; Zeiner et al., 1988-1990).

Distribution

General. Bald eagles are distributed throughout North America. In California they occur over much of the state, except in desert areas. They breed in the northern half of the state, in the southern Sierra Nevada, the Central Coast Range, in inland southern California, and on Santa Catalina Island. Currently 231 records appear in the CNDDDB for bald eagle (CDFG, 2008).

Regional. There is one CNDDDB occurrence (1996) of nesting bald eagles in Alameda County, at Del Valle Reservoir, southeast of the City of Livermore. In 2006 a bald eagle pair nested at San Pablo Reservoir in Contra Costa County (CDFG, 2008). No nesting occurrences are recorded in San Joaquin or Solano Counties (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Bald eagles winter in small numbers near the Reservoir. Trees and snags within the Los Vaqueros Watershed provide suitable roosting and foraging habitat for bald eagles. Several observations are reported of bald eagles perched in trees and snags along the edge of the reservoir. Winter roosting sites within the Watershed have been observed generally in the valley/foothill woodland and forest habitats. Before the establishment of the existing reservoir, bald eagles were not documented as occurring in the Watershed, although there is anecdotal information that they at least occasionally used the Kirker Creek drainage in winter (D. Sterner, pers. com).

As of 2007, bald eagles were not breeding within the Los Vaqueros Watershed. Habitat suitability within the Watershed is limited by the relative lack of tall conifers available for nesting. The

Contra Costa Breeding Bird Atlas (2005) does not report bald eagles in the regional project vicinity. The closest known nesting bald eagles occur in Del Valle Regional Park in Alameda County, about 15 miles to the southeast of the inundation boundary. The pair near San Pablo Reservoir in Contra Costa County is about 25 miles west of the inundation boundary (CDFG, 2008).

Delta Intake and Pump Station. The nearest bald eagle nesting occurrence is about 20 miles south of the Delta Intake Facilities (CDFG, 2008). The habitat in the Delta Intake Facilities vicinity is well-developed for agricultural use and generally lacks appropriate bald eagle breeding habitat. Suitable nesting habitat is absent from the study area.

Delta-Transfer Pipeline. The nearest CNDDDB occurrence of bald eagle is about 20 miles south of the Delta-Transfer Pipeline (CDFG, 2008). The habitat in the vicinity of the Delta-Transfer Pipeline is well-developed for agricultural use and generally lacks appropriate bald eagle breeding habitat. Suitable nesting habitat is absent from the study area.

Transfer-LV Pipeline. The nearest CNDDDB occurrence of bald eagle is about 15 miles south of the Transfer-LV Pipeline (CDFG, 2008). The habitat in the vicinity of the Transfer-LV Pipeline is generally lacks appropriate bald eagle breeding habitat. Nesting habitat does not occur in the study area.

Transfer-Bethany Pipeline. The nearest CNDDDB occurrence of breeding bald eagles is about 15 miles south of the Transfer-Bethany Pipeline (CDFG, 2008). The habitat in the vicinity of the Transfer-Bethany Pipeline is annual grassland and generally lacks appropriate bald eagle breeding habitat. Bald eagle nesting sites are not present in the study area.

Expanded Transfer Facility. The nearest CNDDDB occurrence of bald eagle is about 20 miles south of the Expanded Transfer Facility (CDFG, 2008). The habitat in the vicinity of the Expanded Transfer Facility is grazed annual grassland and generally lacks appropriate bald eagle breeding habitat.

Power Supply Infrastructure. The study area is in agricultural use and lacks bald eagle breeding and foraging habitat. Suitable nesting habitat is absent from the study area.

This species is not expected to nest in or near the proposed PG&E facilities.

Federal or State Species of Special Concern

Cooper's hawk (Accipiter cooperii)

Description

Cooper's hawks nest in dense forested habitats near freshwater and forage mostly on small birds and mammals, although they will take reptiles and amphibians. Peak breeding season is May through July, although it can occur anywhere from March to August (Zeiner et al., 1988-1990).

Habitat

Cooper's hawks use dense wooded stands for breeding and patchy to open woodlands and habitat edges for foraging. They can often be found in live oak and riparian deciduous habitats. Other habitats used frequently include forested habitats near water (Zeiner et al., 1988-1990).

Distribution

General. A total of 92 occurrences of nesting Cooper's hawks, scattered throughout California, have been recorded in the CNDDDB (CDFG, 2008). Their elevational range is anywhere from sea level to 9,000 feet (Zeiner et al., 1988-1990).

Regional. Of these 92 occurrences, eight were recorded in Contra Costa and Alameda Counties. No occurrences of Cooper's hawk breeding are recorded in San Joaquin County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Woodland habitat in the Los Vaqueros Watershed is known to support Cooper's hawk. A nesting location is described in Brady and Associates (1996) within the Watershed and next to (but outside) the western administrative boundary (about 2.75 miles west from the existing dam). It is likely that Cooper's hawks also use wooded portions of the Watershed during the non-breeding season. The Contra Costa Breeding Bird Atlas (2005) indicates that Cooper's hawks are a possible breeder in the western portion of the Watershed; and confirms breeding farther to the west. The CNDDDB does not record any breeding occurrences near the Los Vaqueros Watershed, conveyance corridors, or the Delta or Los Vaqueros Watershed facilities (CDFG, 2008), but this species is typically underreported. The nearest recorded breeding occurrences in the CNDDDB are 16 to 18 miles away from the Los Vaqueros Watershed, in Alameda County (CDFG, 2008). Cooper's hawk are expected to breed in dense wooded habitat in the Los Vaqueros Watershed.

Delta Intake and Pump Station. The Delta region is characteristically open cropland habitat with few and sparse stands of trees. The study area provides no habitat for Cooper's hawk.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline traverses open cropland grassland. The nearest known occurrence of Cooper's hawk is about 5.5 miles to the southwest of the alignment (Brady and Associates, 1996). Cooper's hawk is not likely to breed in the study area.

Transfer-LV Pipeline. The Transfer-LV Pipeline alignment traverses open grassland, but also riparian habitat suitable for nesting or roosting Cooper's hawk. The nearest known occurrence of Cooper's hawk is about 3 miles east of the alignment (Brady and Associates, 1996). Cooper's hawk may breed in wooded portions of the study area in association with Kellogg Creek.

Transfer-Bethany Pipeline. The Transfer-Bethany Pipeline traverses open grassland, but also small groups of trees suitable for nesting or roosting Cooper's hawk. The nearest known occurrence of Cooper's hawk is about 5.5 miles east of the alignment (Brady and Associates, 1996). Cooper's hawk may breed in the study area where habitat conditions are appropriate.

Expanded Transfer Facility. The Expanded Transfer Facility is located in open grassland, which is not suitable for Cooper's hawk.

Power Supply Infrastructure. The Western alignment supports open cropland habitat with few and sparse stands of trees. The study area provides no habitat for Cooper's hawk.

Cooper's hawk are not expected near the PG&E substation due to the lack of trees, but may be encountered in wooded areas (i.e., near Kellogg Creek) that are identified on the Transfer-LV pipeline.

Sharp-shinned Hawk (*Accipiter striatus*)

Habitat

The sharp-shinned hawk occupies a wide variety of forests and woodland habitats, ranging from mixed deciduous forests, riparian woodlands, to oak woodlands, among others. Like the Cooper's hawk, this species forages in dense forested habitats near freshwater and forage mostly on small birds, though they will take small mammals, frogs, lizards, and insects.

Distribution

This species was not described in the Los Vaqueros Resource Management Plan (Brady and Associates, 1996), which characterized special status wildlife species known to occur in the Los Vaqueros Watershed. The *Contra Costa Breeding Bird Atlas* (2005) indicates that Cooper's hawks are a possible breeder west of the Los Vaqueros Watershed, but does not identify nest sites in the watershed. Similarly, the CNDDDB reports no nesting occurrences within 10 miles of the Los Vaqueros Watershed. However, suitable nesting and foraging habitat is present throughout woodlands in the Los Vaqueros Watershed and this species may be present.

Sharp-shinned hawks are expected to nest in the wooded portions of the Transfer-LV Pipeline and Transfer-Bethany Pipeline. Nesting habitat is not present at the Delta intake facilities, Expanded Transfer Facility, or within the power supply project areas, and nesting is unlikely near other facilities.

Tricolored blackbird (*nesting colony*) (*Agelaius tricolor*)

Description

Tricolored blackbirds are a colonial species that nest in dense vegetation in and around freshwater wetlands. They are opportunistic foragers, during the breeding season consuming mostly small animal material such as insects, while in the non-breeding season consuming seeds and cultivated grain (Hamilton, 2004; Zeiner et al., 1988-1990). Breeding season is usually mid-April to late-July, but breeding has been reported as late as November (Orians, 1960).

Habitat

During breeding, tricolored blackbirds require freshwater wetland areas large enough to support colonies of 50 pairs or more. They prefer freshwater emergent wetlands with tall, dense cattails or tules for breeding, but will also breed in thickets of willow, blackberry, wild rose, or tall herbs.

During the non-breeding season flocks are highly mobile and forage in grasslands, croplands, and wetlands (Zeiner et al., 1988-1990).

Distribution

General. Tricolored blackbirds are locally common throughout the Central Valley and coastal areas south of Sonoma County. Historically, they were restricted to California and northern Baja California, and generally found in the valleys and areas with agricultural production (Zeiner et al., 1988-1990). Recently, tricolored blackbirds have expanded their breeding ranges into Oregon, Washington, and British Columbia (Hamilton, 2004). It appears that the size of tricolored blackbird breeding colonies has decreased in recent years, however, the distribution in California has remained relatively stable (USFWS, 1999b). CNDDDB records a total of 421 nesting colonies (CDFG, 2008).

Regional. Of the 421 nesting colonies recorded by the CNDDDB, 36 are in Alameda, Contra Costa, and San Joaquin Counties (CDFG, 2008). The ECCC HCP/NCCP (2006) considered tricolored blackbirds a sporadic resident of their inventory area.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The CNDDDB notes four occurrences of tricolored blackbirds near the Los Vaqueros Watershed. Two of these are about 3 miles from the existing dam and the other two occurrences are about 3 and 5 miles, respectively, southeast of the Watershed. Grasslands and freshwater permanent wetlands in the Watershed provide suitable breeding habitat for tricolored blackbirds. Tricolored blackbirds are known to use the Los Vaqueros Watershed during the non-breeding season (Jones and Stokes, 1990). During surveys for the Los Vaqueros Reservoir Project, no nesting colonies were found in the Watershed (Jones and Stokes, 1989); however, the Contra Costa Breeding Bird Atlas (2005) documents breeding within the Watershed and confirmed breeding east and south of the Watershed. Therefore, tricolored blackbird may breed in the Los Vaqueros Watershed where suitable habitat is available.

Delta Intake and Pump Station. The nearest reported tricolored blackbird breeding site is about 5.4 miles west of the Delta Intake Facilities. The Delta is abundant with wetland, marsh, and cropland habitats that provide suitable breeding habitat for tricolored blackbird. Potentially suitable breeding habitat is present on the opposite side of Old River from the Delta Intake Facilities, but this species has not been observed nesting at this location.

Delta-Transfer Pipeline. The closest reported tricolored blackbird breeding site is about 0.5 mile west from the Expanded Transfer Facility (at the west end of the Delta-Transfer Pipeline) (CDFG, 2008). These wetland, marsh, and cropland habitats may occur within the study area and may provide suitable habitat for tricolored blackbird. Suitable breeding sites may occur on the fringes of agricultural areas and in unmaintained irrigation canals that occur throughout the study area.

Transfer-LV Pipeline. The nearest known occurrences of tricolored blackbird are less than 1 mile southeast and about 1 mile northwest from the Expanded Transfer Facility (at the east end of the Transfer-LV Pipeline). In addition to multiple nesting sites that are available in Kellogg Creek,

cropland habitats occur within the study area that may provide suitable nesting sites for tricolored blackbird. Tricolored blackbirds could potentially nest at numerous locations where suitable habitat is available.

Transfer-Bethany Pipeline. A tricolored blackbird breeding colony was documented about 800 feet west of the Transfer-Bethany Pipeline (CDFG, 2008). Two more occurrences are reported within 2.5 miles of the southern end of this alignment. In addition, numerous foraging tricolored blackbirds were observed at a large impoundment within the study area during reconnaissance surveys conducted by ESA in May, 2007. This alignment mostly traverses annual grassland communities; numerous stock ponds and creek drainages which may provide habitat for tricolored blackbird. Therefore, this species should be presumed present in the study area wherever suitable habitat is available.

Expanded Transfer Facility. The nearest known occurrences of tricolored blackbird are 0.5 mile to 2 miles from the Expanded Transfer Facility. The Expanded Transfer Facility is within annual grassland communities that may provide foraging habitat for tricolored blackbird; however, breeding habitat is not present at this location.

Power Supply Infrastructure. Tricolored blackbird nesting could occur in mustard fields and annual grassland communities on the Western powerline alignment under Power Options 1 and 2, or in association with agricultural drainages on these alignments. Breeding may occur locally to the Western substation siting zone under Power Option 1. This species is not expected at new PG&E facilities under Power Option 2.

Golden eagle (*Aquila chrysaetos*)

Description

Golden eagles are large raptors that have a varied diet of mostly terrestrial vertebrates such as rabbits and ground-squirrels. They frequently soar while hunting and occasionally hunt from perches. They nest in open areas on cliffs and in large trees, often constructing multiple nests in one breeding territory (Zeiner et al., 1988-1990).

Habitat

Golden eagles prefer open habitats such as rolling grasslands, deserts, savannahs, and early successional forest and shrub habitats, with cliffs or large trees for nesting and cover (Zeiner et al., 1988-1990).

Distribution

General. Golden eagles are a widespread resident and migrant species throughout much of North America. The only area of California where they do not occur is the center of the Central Valley (Zeiner et al., 1988-1990). The CNDDDB tracks both nesting and wintering locations of golden eagles, and has 112 total occurrences recorded (CDFG, 2008).

Regional. Of the 112 reported CNDDDB golden eagle nest sites, 15 are from Alameda and Contra Costa Counties. No occurrences are recorded in San Joaquin County (CDFG, 2008). The Altamont Pass region is known for its particularly high density of golden eagles. Golden eagle numbers in the Altamont area are unusually high relative to other areas in California; however, population modeling in the Altamont pass area suggests that the local golden eagle population may be declining (Hunt et al., 1998; NWCC, 2001).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Golden eagles are a resident breeder within the Los Vaqueros Watershed and the Watershed is also used by migrant eagles during the non-breeding season. Both the Contra Costa County Breeding Bird Atlas (2005) and CCWD staff report golden eagle nesting in the Watershed. The CNDDDB notes six breeding occurrences within the Watershed (CDFG, 2008). Golden eagle nesting success has been monitored regularly within the general vicinity of the Watershed (ECCCHPA, 2006).

Portions of seven breeding territories have been documented in the Los Vaqueros Watershed. Four of these territories were active in 2002; two failed and three young were fledged from the other two nests (CCWD, 2002). The Watershed breeding territories are likely an important component of the Altamont area breeding population. No golden eagle breeding sites occur within the inundation boundary, but one recently active nest is 16 feet from the edge of the westside access road. Several nest sites occur within 2 miles of the inundation boundary and other in- Watershed facilities (e.g., the Dam, Inlet/Outlet Pipeline Zone and Recreational Facilities).

Delta Intake and Pump Station. The habitat in the vicinity of the Delta Intake Facilities study area is developed or is used for agriculture and lacks appropriate golden eagle breeding habitat, such as tall trees on hillsides or cliff faces. Therefore, golden eagles are not likely to breed in the study area.

Delta-Transfer Pipeline. Habitat in the study area is well-developed for agricultural use and generally lacks appropriate golden eagle breeding habitat, such as tall trees on hillsides or cliff faces. The closest recorded occurrence is about 1.2 miles from the Delta-Transfer Pipeline (CDFG, 2008). Golden eagles are unlikely to breed in the study area.

Transfer-LV Pipeline. Several CNDDDB occurrences of golden eagle are recorded within the Los Vaqueros Watershed, and the Transfer-LV Pipeline is mostly contained within the Watershed boundary. The nearest recorded occurrence is about 0.2 mile from the study area (CDFG, 2008). The habitat in the vicinity of the study area is mostly grassland and oak savanna and may provide suitable breeding and foraging habitat for golden eagle. Therefore, both breeding and non-breeding golden eagles may occur in the study area.

Transfer-Bethany Pipeline. Several CNDDDB occurrences of golden eagle are recorded within the project region. The nearest recorded occurrence is about 1.7 miles from the Transfer-Bethany Pipeline (CDFG, 2008). The habitat in the vicinity of the study area is mostly grassland and breeding sites are generally absent.

Expanded Transfer Facility. Several CNDDDB occurrences of golden eagle are recorded within the project region. The nearest recorded occurrence is about 1.7 miles from the Expanded Transfer Facility (CDFG, 2008). The habitat in the vicinity of the study area is generally annual grassland and does not provide suitable nesting sites for golden eagle.

Power Supply Infrastructure. The Western alignment supports open cropland habitat with few and sparse stands of trees that would provide nesting sites. As such, the study area does not provide golden eagle nesting habitat.

Golden eagles are not expected to nest near the PG&E substation due to the lack of trees. There is a low likelihood that this species may be encountered in wooded areas (e.g., near Kellogg Creek) on the transmission line alignment.

Western burrowing owl (*Athene cunicularia*)

Description

Western burrowing owls are relatively small, semi-colonial owls, and are mostly residents of open dry grasslands and desert areas. As their name suggests, they occupy burrows for both breeding and roosting. They use burrows excavated by ground squirrels and other small mammals and will use man-made burrows and cavities. Burrowing owls hunt from perches and are opportunistic feeders. They will consume arthropods, small mammals (e.g., meadow voles), birds, amphibians, and reptiles. Insects (e.g., crickets) are often taken during the day, while small mammals are taken at night (Zeiner et al., 1988-1990).

Habitat

This species uses grasslands, vernal pool grasslands, fallow agricultural fields, and open oak woodlands for foraging and breeding. They use burrows excavated by mammals, including ground squirrels, badgers, and skunks. Where the number and availability of natural burrows is limited, owls will occupy man-made burrows such as drainage culverts, cavities under piles of rubble, discarded pipe, and other tunnel-like structures (Zeiner et al., 1988-1990).

Distribution

General. Western burrowing owls occur in the western half of North America, south of southern Canada. They occur throughout non-mountainous regions of California. Some populations (e.g., in coastal areas) are experiencing declines (DeSante and Ruhlen, 1995). A total of 857 wintering and burrow sites are recorded for burrowing owls in CNDDDB (CDFG, 2008).

Regional. Of the 857 wintering and burrow sites recorded for western burrowing owls, 160 of these occurrences are from Alameda, Contra Costa, and San Joaquin Counties (CDFG, 2008). Forty-two breeding occurrences are reported in Contra Costa County (CDFG, 2008), but comprehensive surveys have not been conducted recently in the County. The location database compiled for the ECCC HCP/NCCP (2006) includes 17 data records from 1989 to 2000. Of these, 13 are from the last 10 years, with accurate enough information to locate five of them within the inventory area.

Only one of these is within developed areas. The remaining locations are from nonnative annual grassland habitats, or next to roads or irrigation canals in agricultural fields.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The Los Vaqueros Watershed provides suitable open grassland habitat for burrowing owl. The Contra Costa Breeding Bird Atlas (2005) confirms owl breeding within and just to the east of the Watershed, but not near the Reservoir. Surveys conducted before the development of the Los Vaqueros Reservoir documented up to 10 pairs of owls within the Los Vaqueros Watershed (Jones & Stokes, 1989), mostly in the eastern portion of the Watershed. A few occurrences are reported in the south end of the Los Vaqueros Watershed, and several owls observed in the northern end of the Los Vaqueros Watershed (nesting status unknown). Burrowing owl has been seen but not mapped in other areas of the Watershed as well. These occurrences are all within 1 to 2 miles of the inundation zone. The nearest CNDDDB occurrence is about 1 mile east of the inundation zone.

Delta Intake and Pump Station. The Delta Intake Facilities are in developed or agricultural areas that lack suitable burrows or other nesting features. As such, this species is not expected at this location. The nearest occurrence is about 3.5 miles to the southwest of the Old River Intake.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline traverses agricultural and grassland areas that provide suitable burrowing owl nesting habitat. A May 2007 biological reconnaissance survey during the breeding season did not identify burrowing owls within short annual grasslands habitat. The nearest reported occurrence is about 2 miles south of the alignment. The Contra Costa Breeding Bird Survey (2003) indicates that burrowing owls breed in the general area between the Los Vaqueros Watershed and the Delta. The availability of suitable habitat and their local distribution indicates that burrowing owls could potentially be present on the fringe of agricultural lands and in annual grasslands in the study area.

Transfer-LV Pipeline. The Transfer-LV Pipeline traverses mostly grassland habitat that provides suitable burrowing owl nesting opportunities. The closest occurrence is 1 mile southeast of the pipeline alignment, within the Los Vaqueros Watershed. Burrowing owls should be presumed present on the fringes of agricultural lands and in annual grasslands in the study area.

Transfer-Bethany Pipeline. The Transfer-Bethany Pipeline traverses mostly grassland habitat. The CNDDDB notes numerous burrowing owl occurrences near the study area (CDFG, 2008). The CNDDDB documents eight occurrences of burrowing owl within 1.5 miles, east of the alignment.

Expanded Transfer Facility. The Expanded Transfer Facility is in grassland habitat that may support burrowing owls to a limited degree. Observed in May 2007, the ungrazed annual grasslands throughout much of this area were generally too tall to support owl breeding, but small pockets of shorter grass were available. The nearest CNDDDB occurrence is about 3.3 miles to the southeast of the Expanded Transfer Facility.

Power Supply Infrastructure. A CDFG-documented population was observed within the Western powerline alignment under Power Option 2 (CDFG, 2008). Though nesting habitat is unavailable over most of the study areas for Power Options 1 and 2, due to agricultural activities and pasture irrigation, burrowing owls are presumed present on the fringes of agricultural lands and in uncultivated annual grasslands in both alignments.

Short-eared owl (*Asio flammeus*)

Description

The short-eared owl is a bird of open country that is seen most often at dawn and dusk. Short-eared owls will usually nest on dry ground in a depression that is concealed by vegetation. Also, nesting within burrows has been observed. Breeding is from early March through July with a usual clutch size of five to seven eggs. This owl is a widespread winter migrant but breeding has severely declined over most of the range in recent decades because of destruction and fragmentation of grasslands and riparian habitats (CDFG, 1995). The short-eared owl is a California Species of Special Concern.

Habitat

The short-eared owl was formerly a resident throughout the state, excluding the higher mountains. They are usually found in open areas with few trees such as annual and perennial grasslands, prairies, meadows, dunes, irrigated lands, and saline and fresh emergent marshes. This owl requires dense vegetation for roosting and resting cover. This includes tall grasses, brush, ditches, and wetlands.

Distribution

The short-eared owl is one of the most widely distributed owls in the world. It is found across North America, South America, and Eurasia, and on many oceanic islands. Summer breeding occurs across Alaska and Canada, southward to northern California, Kansas, northern Ohio, and northern Maine, but breeding has declined in the United States. Winter range occurs from southern Canada to Mexico and the southern United States (Roberson, 2008). This species is expected to occur sporadically in annual grasslands and other suitable habitat throughout the project area.

Northern harrier (*Circus cyaneus*)

Description

Northern harriers forage primarily on voles and other small mammals, birds, frogs, small reptiles, crustaceans, insects, and, rarely, fish. They forage by making low flights above open ground, diving from flight or hover to capture prey. The northern harrier rarely captures prey from perches. Nests are built on the ground of sticks in wet areas and grasses in dry areas (Zeiner et al., 1988-1990).

Habitat

Northern harriers are found in a wide variety of habitats from annual grasslands up to lodgepole pines and alpine meadow habitats. Known to frequent meadows, grasslands, open rangelands, desert sinks, fresh and saltwater emergent wetlands; harriers are seldom found in wooded areas.

Nests are constructed amid shrubby vegetation, usually in emergent wetlands or near a river or lake may nest in grasslands, grain fields, or sagebrush flats several miles from water (Zeiner et al., 1988-1990).

Distribution

General. Northern harriers are permanent residents of the northeastern plateau, the Central Valley, low-elevations of the Sierra Nevada, and coastal areas. Northern harriers can be found throughout California in suitable habitat during the winter (Zeiner et al., 1988-1990). The CNDDDB records a total of 40 occurrences of nesting northern harriers, these occurrences are clustered in the greater San Francisco Bay area (CDFG, 2008).

Regional. Of the 40 occurrences of nesting northern harriers recorded in CNDDDB, eight are from Alameda and Contra Costa Counties (CDFG, 2008). Northern harriers are most commonly observed foraging over croplands, marshlands, or grasslands within the project region.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The Los Vaqueros Watershed provides suitable open grassland habitat for northern harrier. The nearest occurrences are 8 to 9 miles from the existing dam (CDFG, 2008). The Contra Costa Breeding Bird Atlas (2005) indicates that breeding is probable within the Watershed, confirmed east of the Watershed, and possible north of the Watershed. This species may nest near marshland habitats in the Los Vaqueros Watershed.

Delta Intake and Pump Station. The Delta region provides suitable open cropland habitat for foraging northern harriers. The nearest nesting occurrence to the Delta Intake Facilities is south of Clifton Court Forebay, about 5 miles south of the Delta Intake Facilities (CDFG, 2008). There is a low likelihood they may nest in tall grasslands in the study area.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline traverses open cropland and grassland habitat suitable for northern harrier nesting. The nearest nesting occurrence is south of Clifton Court Forebay, about 5 miles south of the Old River Intake and Pump Station (CDFG, 2008). This species may nest in alkali grasslands and tall fields in the study area.

Transfer-LV Pipeline. The Transfer-LV Pipeline traverses open grassland habitat suitable for foraging northern harriers. The nearest occurrences are 8 to 9 miles from the existing dam (CDFG, 2008). This species may nest in grasslands in the study area.

Transfer-Bethany Pipeline. The Transfer-Bethany Pipeline traverses open grassland habitat suitable for northern harrier nesting. The nearest occurrence is south of Clifton Court Forebay, and about 4 miles directly east of the study area (CDFG, 2008). This species may nest in alkali grasslands and tall grasslands in the study area.

Expanded Transfer Facility. The Expanded Transfer Facility is in open grassland habitat suitable for foraging, but the grasslands are generally too tall and weedy to support harrier nesting.

Power Supply Infrastructure. study areas for Western powerlines under Power Options 1 and 2 traverse open grassland habitat that is suitable for northern harrier foraging and nesting.

This species is not expected to nest in or near the proposed PG&E facilities.

White-tailed kite (*Nesting*) (*Elanus leucurus*)

Description

White-tailed kites are a unique species that hovers up to 100 feet above the ground in search of prey. Typical prey includes voles and other small mammals, but they will occasionally eat birds, insects, reptiles, and amphibians. Nesting begins as early as February when nests of loosely piled sticks and twigs lined with grass, straw, or roots are built. Nesting is usually complete by August (Zeiner et al., 1988-1990).

Habitat

White-tailed kites forage in open grasslands, meadows, farmlands, and emergent wetlands. They typically nest in oak woodlands or trees, especially along marsh or river margins, although they will use any suitable tree or shrub that is of moderate height. They are rarely found far from agricultural areas (Zeiner et al., 1988-1990).

Distribution

General. White tailed kites are year-round residents in coastal and valley lowlands, particularly in Central California (Zeiner et al., 1988-1990). They can be found in most lowlands of California west of the Sierra Nevada and southeast deserts. They are commonly found along the California coast and in the Central Valley (Moore, 2000). There are 108 occurrences of nesting white-tailed kites recorded by the CNDDDB, generally concentrated in the vicinity of San Francisco Bay (CDFG, 2008).

Regional. Of the 108 occurrences recorded in the CNDDDB, 11 were recorded within Contra Costa and Alameda Counties. There is one kite nesting occurrence reported in San Joaquin County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The Los Vaqueros Watershed provides suitable open foraging and nesting habitat for white-tailed kite. The Contra Costa County Breeding Bird Atlas (2005) reports kite breeding in the Watershed. The CNDDDB occurrence closest to the Watershed is about 7.5 miles southeast of the inundation boundary, in Contra Costa County (CDFG, 2008). This species may nest in oaks, cottonwoods, and other trees within the Los Vaqueros Watershed.

Delta Intake and Pump Station. The Delta Intake and Pump Station provides suitable foraging habitat for foraging white-tailed kite, but nesting sites are not present.

Delta-Transfer Pipeline. The Delta-Transfer Pipeline traverses open cropland and grassland habitat suitable for foraging, and wooded areas suitable for nesting or roosting white-tailed kites. This species may nest in the few wooded portions of the study area.

Transfer-LV Pipeline. The Transfer-LV Pipeline traverses open grassland habitat suitable for kite foraging, and riparian habitat suitable for nesting and roosting. The nearest CNDDDB occurrence within the vicinity of the study area is about 8 miles southeast of the alignment (CDFG, 2008). This species may nest in the few wooded portions of the study area.

Transfer-Bethany Pipeline. The Transfer-Bethany Pipeline traverses open grassland habitat suitable for foraging, and small groups of trees suitable for nesting or roosting white-tailed kites. The nearest CNDDDB occurrence to the study area is about 2 to 3 miles east of the alignment (CDFG, 2008). This species may nest in the few wooded portions of the study area.

Expanded Transfer Facility. The Expanded Transfer Facility is in open grassland habitat suitable for kite foraging, but nesting sites are not present.

Power Supply Infrastructure. The Western alignment provides suitable open cropland habitat for white-tailed kite foraging, but nesting trees are not available in the study area.

This species is not expected to nest in or near the proposed PG&E facilities.

California horned lark (*Eremophila alpestris*)

Description

California horned larks breed from March through July, with peak activity in May. After breeding they form large flocks for foraging and roosting. Horned larks build grass-lined nests directly on the ground, in dry, open habitats with sparse vegetation.

Habitat

Horned larks are common to abundant resident songbirds in a variety of open habitats. Range-wide, California horned larks breed in level or gently sloping shortgrass prairie, montane meadows, barren hills, opens coastal plains, fallow grain fields, row crops, and alkali flats.

Distribution

Horned larks range across North America from Alaska and the Canadian arctic southward to southern Mexico.

This species is persistently present in portions of the Altamont Hills in Alameda and Contra Costa counties where regular grazing helps to maintain annual grasses at a short height (B. Pittman, pers. obs.). This species is expected to breed and forage in short annual grasslands within the Los Vaqueros Watershed and at the following facilities: the westernmost 1.2 miles of the Delta-Transfer Pipeline; the entirety of the Transfer-Bethany Pipeline and Transfer-LV Pipeline alignments.

This species is expected to breed and forage in short annual grasslands within the Western powerline alignment under both Power Options and at proposed PG&E facilities under Power Option 2.

Prairie falcon (*Falco mexicanus*)

Description

A large falcon of the arid American west, the prairie falcon is pale brown, and exhibits a whitish chest with brown streaking and a dark mustache mark.

Habitat

Habitat use of the prairie falcon includes annual grasslands to alpine meadows, but they are also associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields, and desert scrub areas. Typically they are in dry environments of western North America, where cliffs or bluffs are available for nest sites.

Distribution

General. Prairie falcons range from southwestern Canada southward to northern Mexico, and eastward to Saskatchewan, Nebraska, and central Texas. In California it is a year-round resident in suitable habitat throughout most of the state. In the central valley prairie falcons have not been observed during the breeding season and only occur during the winter (CDFG, 1983).

Regional. Eastern Contra Costa and Alameda Counties are within the known year-round range of the prairie falcon. Breeding habitat, which includes cliffs and bluffs, is extremely limited near proposed project facilities.

Loggerhead shrike (*Lanius ludovicianus*)

Description

Loggerhead shrikes are medium-sized grey, white, and black songbirds with a prominent black eye mask. Shrikes are unique among songbirds in that their diet regularly includes vertebrate prey. Shrikes typically hunt from dead trees, tall shrubs, utility wires and fences. Shrikes generally build their nests in shrubs in fairly open areas.

Habitat

Loggerhead shrikes are common in low densities in a variety of habitats, including grasslands, woodlands, and scrub.

Distribution

General. This species ranges from central Canadian prairie provinces and the Canadian border southward to Florida and southern Mexico.

Regional. Loggerhead shrikes are common throughout California. Shrikes are common throughout California and are expected to occur in moderate to high densities throughout the project area where shrubby wooded habitat provides adequate cover and nesting sites.

Within the Los Vaqueros Watershed, loggerhead shrike may be encountered near wooded drainages or areas with moderate to dense shrub cover. Habitat in the watershed occurs sporadically in and adjacent to Kellogg Creek and tributary drainages. Due to the lack of perch sites and cover, this species is not expected to breed near the Delta intake facilities, but may be encountered sporadically on each of the pipeline alignments where shrubby vegetation is present.

This species may breed sporadically within the study areas for Power Option 1 and 2.

Osprey (*Pandion haliaetus*)

Description

Ospreys are a unique species that build stick platform nests on top of large dead-topped trees or snags. Nests are occasionally built on cliffs, human-made structures or on the ground. They generally catch fish from near the water's surface by diving from flight, from a hover, or a perch. They will also occasionally prey on mammals, birds, reptiles, amphibians, or invertebrates. Ospreys arrive in California beginning in March, with most departing for wintering grounds by October (Zeiner et al., 1988-1990).

Habitat

Ospreys are closely associated with large bodies of clear water that produce fish and are surrounded by ponderosa pine or mixed conifer habitats. Tall trees and snags are required for breeding, foraging, and cover. Nests are usually built within 1,500 feet of fish-productive water, but may be built up to a mile from water (Zeiner et al., 1988-1990).

Distribution

General. During the breeding season ospreys can be found in northern California from the Cascade Ranges south to Lake Tahoe and along the coast south to Marin County. They are also uncommonly found breeding along the Colorado River (Zeiner et al., 1988-1990). Historically they bred throughout much of California (Remsen, 1978). There have been a total of 410 occurrences of osprey recorded in the CNDDDB. These occurrences are scattered throughout northern California, with concentrations in Humboldt and Lassen Counties (CDFG, 2008).

Regional. The CNDDDB reports one breeding occurrence from San Joaquin County, along the Mokelumne River. None are reported from Contra Costa or Alameda Counties (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Though not reported by the CNDDDB, the Contra Costa County Breeding Bird Atlas (2005) cites osprey breeding in the Los Vaqueros Watershed and areas east of the Watershed. No evidence of

nesting has been observed in the Watershed by CCWD staff. There is a potential that they may breed in oak woodlands or large snags (i.e. dead trees) in the Los Vaqueros Watershed.

Delta Intake and Pump Station. The nearest osprey breeding record is from San Joaquin County, greater than 30 miles northeast of the Delta Intake Facilities (CDFG, 2008). The study area generally lacks appropriate osprey breeding habitat.

Delta-Transfer Pipeline. The habitat in the vicinity of the study area is well-developed for agricultural use and lacks appropriate osprey breeding habitat. No CNDDDB occurrences are recorded within 30 miles (CDFG, 2008).

Transfer-LV Pipeline. The habitat in the vicinity of the study area lacks appropriate osprey breeding habitat. No known CNDDDB occurrences are recorded within 30 miles of the alignment (CDFG, 2008).

Transfer-Bethany Pipeline. The habitat in the vicinity of the study area is grazed annual grassland and lacks appropriate osprey breeding habitat. No known CNDDDB occurrences are recorded within 30 miles of the alignment (CDFG, 2008).

Expanded Transfer Facility. The habitat in the vicinity of the study area is grazed annual grassland and lacks appropriate osprey breeding habitat. Osprey are unlikely to breed in this study area due to lack of suitable nesting habitat such as large snags or cliffs.

Power Supply Infrastructure. The Western study area is in agricultural use and lacks nesting sites. Suitable nesting habitat is absent from the study area.

This species is not expected to nest in or near the proposed PG&E facilities.

Mammals

Federal or State Threatened and Endangered Species

San Joaquin kit fox (*Vulpes macrotis mutica*)

Description

San Joaquin kit foxes are one of two subspecies of the kit fox that still exist in California. They are a permanent resident of arid grasslands or open scrubland, where friable soils are present. Dens are usually dug, but San Joaquin kit foxes will use dens constructed by other animals or use human-made structures. Dens are required year-round for reproduction, shelter, temperature regulation, and protection from predators (USFWS, 1998; USFWS, 2005a).

Habitat

San Joaquin kit foxes require open grassland and savannah habitats for foraging and dispersal. Historically their habitat included native alkali marsh and saltbush scrub of the valley floor, but the availability of such habitats has diminished markedly due to agricultural conversion. Grasslands with friable soils are considered the principal habitat for denning, foraging, and dispersal, while

open oak woodlands provide lower quality foraging and dispersal habitat. Kit foxes will use habitats that have been extensively modified by humans, including grasslands and scrublands with active oil fields, wind turbines, and agricultural matrices (USFWS, 1998).

San Joaquin kit foxes are principally nocturnal predators that feed on small mammals such as black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*) and various mice. The kit fox diet may also include small birds, reptiles, insects, and vegetation (USFWS, 1998; USFWS, 2005a). In the northern portion of its range, California ground squirrels are a chief component of the kit fox diet (Hall, 1983).

Distribution

General. San Joaquin kit foxes occur only in and around the Central Valley, inhabiting open habitat in the San Joaquin Valley and surrounding foothills. In the northern portion of its range, the kit fox occurs primarily in foothill grasslands, since much of their former habitat on the valley floor has been eliminated. Historically, the San Joaquin kit fox ranged in the San Joaquin Valley from near Tracy, San Joaquin County on the west to La Grange, Stanislaus County on the east, and south to southern Kern County. Their current range includes the foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains, from Contra Costa County south to Kern County, and from Alameda and San Joaquin Counties east to Stanislaus County. Kit fox population densities are greatest in the southern portion of their range. Kit fox populations in the northern portion of their range are highly fragmented and sparsely distributed (Orloff, Hall, and Spiegel, 1986; USFWS, 2005a). The CNDDDB reports a total of 204 kit fox occurrences from 1972 to 2007 (CDFG, 2008).

Regional. The CNDDDB reports 21 kit fox occurrences from Contra Costa, San Joaquin, and Alameda Counties, and numerous others are reported from other sources. Since 1967, 53 San Joaquin kit fox sightings are documented from the northern range of this species from the Black Diamond Mines Regional Preserve and Lone Tree Valley to the north, to Round Valley, Los Vaqueros, Vasco Caves, and Brushy Creek (H.T. Harvey & Associates, 1997). North of Interstate 580, data show that most occurrences are concentrated along a movement corridor that follows foothill grasslands and undeveloped grasslands habitat to the east.

About two-thirds of the ECCC inventory area is considered suitable habitat for San Joaquin kit foxes, and while populations generally have sporadic distribution and cannot be accurately pinpointed, they are considered to present at low densities (ECCCHPA, 2006).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities. The Los Vaqueros Watershed is in the northwestern extent of the San Joaquin kit fox range. Nine occurrences of the San Joaquin kit fox have been recorded in the Watershed vicinity, the most recent from August 2008 (H.T. Harvey & Associates, 1997; Howard, 2008; CDFG, 2008). As a requirement of the 1993 Biological Opinion (BO) for the Los Vaqueros Project, CCWD has been undertaking a long-term mitigation monitoring program for San Joaquin kit fox in the Los Vaqueros Watershed area.

In the upper Kellogg Creek portion of the Los Vaqueros Watershed, two potential north-to-south kit fox movement corridors are generally recognized. Such migration corridors serve to maintain connectivity between blocks of annual grasslands habitat. Kit fox have not been documented to use these corridors, but as identified previously, detection can be difficult in areas with sparse populations.

The corridor to the west of the Reservoir is composed of annual grasslands, roughly 500 to 1,800 feet wide, on a moderate east-facing slope. The corridor is interrupted in two locations by oak woodlands that measure roughly 80 feet and 300 feet wide. Suitable topography generally consists of low to moderate hills with slopes of less than 40 degrees (Morrell 1972), though more recent attention has focused on kit fox use of slopes of between 0 to 15 degrees (Larsen, pers. comm.).

Annual grasslands east of the Reservoir provide a considerably wider potential migration pathway, though again, kit fox use has not been identified in this area. From the base of the Dam to the northeastern edge of the Los Vaqueros Watershed, the width of this corridor is about 2 miles.

Recent kit fox observations near the Los Vaqueros Watershed include a sighting at Brushy Peak in 2002 and Vasco Caves in 2001 and 2002 (CDFG, 2003).

Delta Intake and Pump Station. The Delta Intake Facilities and associated habitats do not provide suitable habitat for San Joaquin kit fox. The Old River embankments and access road are constructed from imported engineered fill. Though consisting of friable soils, both ongoing facility maintenance activities and the control of small mammals along the embankment reduces opportunities for kit fox denning and distribution. Impacts to kit fox are not anticipated as a result of the proposed expanded intake facilities.

Delta-Transfer Pipeline. Open grassland and agricultural lands south of State Route 4 along the Delta-Transfer Pipeline may provide San Joaquin kit fox habitat. This portion of the alignment, which runs from Route 4 to the Expanded Transfer Facility, provides varying degrees of habitat quality for kit foxes. The highest quality areas are annual grasslands within 1.2 miles of the Expanded Transfer Facility, followed by moderate quality areas further east that support walnut orchards and fallow agricultural fields. The lowest quality portion of this alignment for kit fox is a roughly 1-mile segment that traverses corn fields, though this area may provide moderate quality habitat during the non-growing season.

Transfer-LV Pipeline. The Transfer-LV Pipeline traverses annual grassland habitats that could support kit fox denning, foraging, or dispersal. The linear extent of potential San Joaquin kit fox habitat in this alignment is 4.4 miles.

Transfer-Bethany Pipeline. Nearly the entire Transfer-Bethany Pipeline traverses annual grassland or alkali meadow habitats that could be used for kit fox denning, foraging, or dispersal. This alignment traverses the eastern kit fox dispersal corridor where kit foxes have been sighted within the last 15 years (CDFG, 2008; USFWS file data). The linear extent of San Joaquin kit fox habitat in this alignment is 7.5 miles in Contra Costa County and 1.4 miles in Alameda County (tunnel portion of alignment).

Expanded Transfer Facility. The Expanded Transfer Facility provides low to moderate quality habitat for the San Joaquin kit fox.

Power Supply Infrastructure. The Western powerline alignments and substation under Power Options 1 and 2 are located in moderate to high-quality kit fox habitat and suitable habitat is similarly available at the proposed PG&E facilities under Power Option 2.

Federal or State Species of Special Concern

Pallid bat (*Antrozous pallidus*)

Description

Pallid bats are pale to light brown in color, with long prominent ears, a blunt snout, and pinkish-brown or gray wing and tail membranes, and, at about 24 grams, one of the state's largest bats. Pallid bats are known for their unique habit of feeding from the ground, but also glean prey off of surfaces. Its most common prey includes crickets, beetles, grasshoppers, and even scorpions (BCI, 2007). Mating occurs from October to February, birthing from late April to July, and weaning in August. Females have one to two pups per year. Maternity colonies disperse between August and October (WBWG, 2005).

Habitat

Pallid bat inhabits low elevation (< 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, and higher elevation coniferous forests (> 7,000 feet). It is most abundant in xeric (dry) ecosystems, including the Great Basin, Mojave, and Sonoran Deserts (WBWG, 2005). Pallid bats roost in rock crevices, unoccupied buildings, hollows in large trees, and under bridges.

Distribution

Pallid bat ranges throughout western North America, from British Columbia's southern interior, south to Queretaro and Jalisco, and east to Texas. This is the most widely described special status bat species in central California and in the project region, with the nearest occurrences located 6 miles north of the Los Vaqueros Watershed (CDFG, 2008). Though not verified within the Los Vaqueros Watershed, habitat for this species is available in large hollow trees, snags, or under loose bark in the watershed study area. Though rock outcrops are common along ridgelines, open rock crevices that could support bat roosts are uncommon in the 275-TAF zone and in project study areas.

Pallid bat habitat is considered limited in portions of the project area outside the watershed, thus, this species is only expected within the watershed.

Townsend's big-eared bat (*Corynorhinus townsendi*)

Description

Townsend's big-eared bats are agile fliers that travel long distances to forage. In winter, these bats hibernate in caves and abandoned mines. Summer maternity colonies range in size from a few

individuals to several hundred individuals. Maternity colonies form between March and June, with a single pup born between May and July. They are extremely sensitive to disturbance at their roosting sites and have suffered severe population declines throughout much of the U.S (BCI, 2007). This species has been listed as vulnerable to extinction (VU) by the World Conservation Union's 2004 IUCN Red List of threatened species and is a California Department of Fish and Game Species of Special Concern (WBWG, 2005).

Habitat

Townsend's big-eared bat has been reported in a wide variety of habitat types including coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat, ranging from sea level to 3,300 meters (WBWG, 2005). Their most typical habitat is arid western desert scrub and pine forest regions.

Distribution

Townsend's big-eared bats occur throughout the west with their distribution strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines. Habitat may be available in large trees in the watershed study area, but their more typical cave habitat is absent from this area. Cave habitat in eastern portion of the Los Vaqueros Watershed is not open to public access and is greater than 500 feet from the project study area.

Though not verified within the Los Vaqueros Watershed, habitat for this species is available in large hollow trees, snags, or under loose bark in the watershed study area. Though rock outcrops are common along ridgelines, open rock crevices that could support bat roosts are uncommon in the 275-TAF zone and in project study areas.

Habitat for this species does not occur in study areas located outside the watershed.

Greater western mastiff bat (*Eumops perotis californicus*)

Description

The greater western mastiff bat is the largest bat in the United States. Greater western mastiff bats do not hibernate, but will go into a daytime torpor during the winter, emerging at night to feed. They forage for insects between 100 and 2,000 feet above the ground, catching them in flight (Williams, 1986; Zeiner et al., 1988-1990).

Habitat

This species prefers open, semi-arid to arid habitats with low elevation and rugged, rocky areas that have suitable crevices for roosting. These crevices must open downward to allow bats to launch into flight and are usually found in granite or sandstone. They will roost in buildings and trees, provided they have adequate drops to allow them to take flight (Williams, 1986; Zeiner et al., 1988-1990).

Distribution

General. The greater western mastiff bat is the only subspecies of *Eumops perotis* to occur in North America. This species occurs from central California southward to central Mexico. They have been recorded from Butte County southward including lowland valleys of coastal southern California and western portions of the southern California deserts. Most have been recorded from low-lying areas, although they have been recorded in Yosemite Valley and the area near Hetch Hetchy Reservoir. Greater western mastiff bats are uncommon, widespread residents of the San Joaquin and Salinas Valleys and coastal lowlands south of San Francisco Bay (Williams, 1986; Zeiner et al., 1988-1990). A total of 185 occurrences of the greater western mastiff bat were recorded in the CNDDDB. These occurrences are scattered throughout central and southern California (CDFG, 2008).

Regional. No CNDDDB occurrences of greater western mastiff bat are recorded within Contra Costa County, but there is one in Alameda County and one in San Joaquin County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The nearest documented occurrences are an 1899 collection near Hayward and a 1957 observation from near Oakdale, both greater than 20 miles from the study area (CDFG, 2008). Open grassland, canyons, and woodland communities in the watershed provide habitat for greater western mastiff-bats; however, based on available species distribution data that identifies low densities in the project region, this species appears is considered unlikely in the project area. Habitat for this species does not occur in study areas located outside the watershed.

Delta Intake and Pump Station. The nearest CNDDDB occurrence is about 17.5 miles south of the Delta Intake Facilities (CDFG, 2008). Suitable roosting habitat is absent from the study area.

Delta-Transfer Pipeline. The nearest CNDDDB occurrence is about 18 miles south of the alignment (CDFG, 2008). The study area does not provide suitable roosting habitat for greater western mastiff bat.

Transfer-LV Pipeline. The nearest CNDDDB occurrence is about 18.5 miles southeast of the existing dam (CDFG, 2008). Suitable roosting habitat is absent from the study area.

Transfer-Bethany Pipeline. The nearest CNDDDB occurrence is about 12 miles southeast of the alignment (CDFG, 2008). The Transfer-Bethany Pipeline may traverse limited riparian and oak woodland communities but the habitat quality is not likely to support greater western mastiff bat. Therefore, greater western mastiff bats are considered unlikely within the study area.

Expanded Transfer Facility. The nearest CNDDDB occurrence is about 18 miles southeast of the Expanded Transfer Facility (CDFG, 2008). The study area is mostly annual grassland and does not support suitable roosting habitat. Therefore, greater western mastiff bat is unlikely within the study area.

Power Supply Infrastructure. The nearest CNDDDB occurrence is about 17.5 miles to the south of the Western study area (CDFG, 2008). Suitable roosting habitat is absent from the study area.

This species is not expected to roost in or near the proposed PG&E facilities due to the absence of suitable roost sites in the study area.

Small-footed myotis bat (*Myotis ciliolabrum*)

Description

Small-footed myotis is a small bat with a keeled calcar, small foot, black ears, and a black mask across the eyes and nose. Body color varies from brown to pale yellow. The western small-footed myotis rears its young in cliff-face crevices, erosion cavities, and beneath rocks on the ground. Some females care for their pups alone, while others form small groups. These bats can also be found hibernating in caves or mines, but little else is known about them; they are among America's least-studied animals (BCI, 2007). They forage early in the evening, feeding on various small insects. Copulation takes place in the fall, with sperm being stored in females until spring when ovulation occurs. Females produce one young per year in late spring or early summer.

Habitat

Small-footed myotis occurs in deserts, chaparral, riparian zones, and western coniferous forest; it is most common above pinon-juniper forest. Individuals are known to roost singly or in small groups in cliff and rock crevices, buildings, concrete overpasses, caves, and mines.

Distribution

The range of the small-footed myotis includes much of the State of California and the western half of North America (CDFG, 2005). Roost sites are not documented within 100 miles of the Los Vaqueros Watershed (CDFG, 2008). Based on the described distribution of roost sites and lack of cliffs and rock crevices in the Los Vaqueros Watershed study area, there is a low likelihood that this species would be encountered in the watershed.

Due to the lack of suitable structural habitat in study areas located outside the watershed, this species is not expected in these areas.

Long-eared myotis bat (*Myotis evotis*)

Description

The relatively long black ears of the long-eared myotis are dramatic in contrast with its paler body fur. Long-eared myotis capture prey in flight, but also glean stationary insects from foliage or the ground. Their main diet appears to consist of moths, and their relatively quiet echolocation calls are well suited for sneaking up on prey undetected as well as for maneuvering through cluttered habitats (BCI, 2007). Females give birth to one young per year in late spring to early summer. For the size this mammal has a long life with individuals having lived up to 22 years.

Habitat

Long-eared myotis are found predominantly in coniferous forests, typically only at higher elevations in southern areas (between 7,000 and 8,500 feet). Individuals roost under exfoliating tree bark, and in hollow trees, caves, mines, cliff crevices, sinkholes, and rocky outcrops on the ground. They

also sometimes roost in buildings and under bridges. Pregnant long-eared myotis often roost at ground level in rock crevices, fallen logs, and even in the crevices of sawed-off stumps, but they cannot rear young in such vulnerable locations.

Distribution

These bats are endemic to the west, ranging from southwestern Canada, south through California into Baja, eastward through northern Arizona and New Mexico, and north into the Dakotas (WBWG, 2005). The nearest described sightings are about 60 miles to the north in Chiles Valley (Napa County) and 95 miles to the east in Stanislaus National Forest (Tuolumne County) (CDFG, 2008). Based on this species' described range, which includes much of California, it cannot be ruled out from the project area. Thus, there is a low likelihood that it may roost in trees and rocky outcrops in the watershed.

Due to the lack of suitable structural habitat in study areas located outside the watershed, this species is not expected in these areas.

Fringed myotis bat (*Myotis thysanodes*)

Description

The fringed myotis got its name from the conspicuous fringe of hair along the posterior edge of its tail membrane. Fur color is variable (brown to reddish brown) and often noticeably lighter on belly. These bats are not caught commonly in great numbers, but may be widely dispersed. Nursery colonies of dozens to hundreds of individual bats have been encountered (BCI, 2007). Fringed myotis capture insects in flight using tail cupping as well as glean prey from plants and ground surfaces. Females produce one pup per year in late June. Fringed myotis is a Species of Special Concern in California.

Habitat

Distribution of fringed myotis is patchy and occurs from sea-level to 2850 m but is most common at middle elevations. It appears to be most common in drier woodlands (oak, pinyon-juniper, ponderosa pine) but is found in a wide variety of habitats including desert scrub, mesic coniferous forest, grassland, and sage-grass steppe. Night and day roosts include caves, mines, and buildings (typically abandoned). Hibernacula include caves and buildings, but not much is known about their wintering whereabouts (WBWG, 2005).

Distribution

Fringed myotis ranges through much of western North America from southern British Columbia, Canada south to Chiapas, Mexico, and from Santa Cruz Island in California east to the Black Hills of South Dakota.

The nearest described occurrence is a 2005 observation near Crystal Springs Reservoir (San Mateo County), about 40 miles west of the Los Vaqueros Watershed (CDFG, 2008). Based on this species' described range, which includes much of California, it cannot be ruled out in the project area. Thus, there is a low likelihood that it may roost in rocky outcrops in the watershed.

Due to the lack of suitable structural habitat in study areas located outside the watershed, this species is not expected in these areas.

Long-legged myotis bat (*Myotis volans*)

Description

Long-legged myotis is distinguished by its short rounded ears, small hind feet, long legs, distinctly keeled calcar, and long, dense fur on the underside of the wing membrane that extends from the body to a line joining the elbow and the knees. Although some variation in color exists, it is typically dark brown. Long-legged myotis forage over ponds, streams, water tanks, and in forest clearings, often on moths. Individuals copulate in autumn, with females storing the sperm overwinter, ovulating in the spring, and giving birth from May through August. Individuals have lived a minimum of 21 years (WBWG, 2005).

Habitat

Long-legged myotis are especially dependent on wooded habitats from pinon- juniper to coniferous forests, usually at elevations of 4,000 to 9,000 feet. This species uses abandoned buildings, cracks in the ground, cliff crevices, exfoliating tree bark, and hollows within snags as summer day roosts; caves and mine tunnels as hibernacula (WBWG, 2005). Radio-tracking studies have identified maternity roosts beneath bark and in other cavities. Most nursery colonies live in at least 100 year-old trees that provide crevices or exfoliating bark (BCI, 2007)

Distribution

The long-legged myotis is one of western America's most widely distributed bat species. Long-legged myotis ranges across western North America from southeastern Alaska, British Columbia and Alberta in Canada to Baja California and central Mexico. It occurs throughout the western United States from the Pacific coast to the Great Plains and central Texas.

The nearest described observation is a 1999 sighting from Don Pedro Reservoir (Tuolumne County), 75 miles east of the Los Vaqueros Watershed (CDFG, 2008). However, based on this species' geographic range, which is described as much of California, it cannot be ruled out from the project area. Thus, there is a low likelihood that it may roost in trees and rocky outcrops in the watershed.

Due to the lack of suitable structural habitat in study areas located outside the watershed, this species is not expected in these areas.

Yuma myotis bat (*Myotis yumanensis*)

Description

Yuma myotis is a small bat that is usually gray or brown to pale tan on the back and light on chest and belly; ears and membranes are frequently pale brown to gray. Although Yuma myotis feed predominantly over water, they eat a variety of insects that includes moths, froghoppers, leafhoppers, June beetles, ground beetles, midges, mosquitoes, muscid flies, caddisflies, and crane flies. Mating is

typically in the fall and females give birth to one young from mid-spring to mid-summer in maternity colonies that may range in size up to several thousand. Yuma myotis are threatened by loss of riparian habitats and the decline in permanent water sources in the southwest (BCI, 2007).

In general, the long term persistence of North American bat species is threatened by the loss of clean, open water; modification or destruction of roosting and foraging habitat; and, for hibernating species, disturbance or destruction of hibernacula. Chemicals in the environment that affect bats or their prey are also a threat. Because of low fecundity, high juvenile mortality, and long generational turnover, many bat populations may be vulnerable to human-induced pressures.

Habitat

Yuma bats are usually associated with permanent sources of water, but Yuma myotis also use tinajas in the arid West (WBWG, 2007). It occurs in a variety of habitats including riparian, arid scrublands, deserts, and forests. Occasionally roosting in mines or caves, these bats are most often found in buildings or bridges. Bachelors also sometimes roost in abandoned cliff swallow nests, but tree cavities were probably the original sites for most nursery roosts.

Distribution

The Yuma myotis is found throughout western North America, from British Columbia through Washington, Idaho, and western Montana, southern Wyoming, Colorado, New Mexico, West Texas and into Mexico (BCI, 2007).

The nearest described observation is a 2003 sighting in the City of Pleasanton (Alameda County), 12 miles southwest of the Los Vaqueros Watershed (CDFG, 2008). Based on this species' described range, which is described as much of California, it cannot be ruled out from the project area. Thus, there is a low likelihood that it may roost in trees and rocky outcrops in the watershed.

Due to the lack of suitable structural habitat in study areas located outside the watershed, this species is not expected in these areas.

American badger (*Taxidea taxus*)

Description

American badgers are rather large, robust, short-legged mammals with broad bodies. They have a short bushy tail, small eyes and ears, shaggy grayish fur, and distinct white and black markings on the face. Badger front feet are large, with claws 25 mm or more long used for digging. Badgers prey primarily on gophers, ground squirrels, marmots, and kangaroo rats, but will also eat a variety of other animals, including mice, woodrats, reptiles, birds and their eggs, bees and other insects, etc. Badgers were reduced in numbers over almost all of their range in California by 1937 (Williams, 1986). Deliberate killings and agricultural and urban developments have been the primary causes of decline and extirpation of populations of badgers in California.

Habitat

In California, Badgers occupy a diversity of habitats; grasslands, savannas, and mountain meadows near timberline are preferred, though they can be found in deserts as well. The principal requirements seem to be sufficient food, friable soils, and relatively open, uncultivated ground.

Distribution

American Badgers occur from northern Alberta southward to central Mexico. They range from the Pacific Coast eastward through Ohio. They are absent from the humid coastal forests and from other regions with dense forests. In California, Badgers ranged throughout the state except for the humid coastal forests of northwestern California in Del Norte Co. and the northwestern portion of Humboldt Co (Williams, 1986). This species is expected to occur in low densities throughout the project area.

San Joaquin pocket mouse (*Perognathus inornatus inornatus*)**Habitat**

The San Joaquin pocket mouse lives in dense annual grasslands, saltbush scrub, and oak savannah habitats, exploiting the topography of flat ground and low hills. It is usually found in areas with friable soils, constructing its small burrows in sandy soil near bases of bushes. Microhabitats include dense grass, dirt roadsides, and rock outcroppings.

Distribution

Sparse iodine bush scrub and short grasslands habitat in the Western alignment provide the best available habitat in the project area for this species, and provides the only described local occurrence of this species (CDFG, 2008).

Grasslands with friable soils on the Transfer-Bethany Pipeline and at the Western substation site provide high quality habitat where this species could occur. Non-native annual grasslands throughout the project area provide potential, though lesser quality habitat.

Plants***Federal or State Threatened and Endangered Species*****Contra Costa goldfields (*Lasthenia conjugens*)****Description**

Contra Costa goldfields is a small spring annual in the sunflower family (Asteraceae). The species typically ranges from 4 to 12 inches high, is somewhat fleshy, and has simple to freely branched stems. Its linear leaves are opposite and stem leaves are often one to two-lobed with thin fissures that extend greater than halfway toward the stem (USFWS, 2005c; Hickman, 1993). From March to June the species produces solitary golden-yellow flowers (CNPS, 2008). This species is distinguished from similar species *L. burkei* and *L. fremontii* by its flowers. Contra Costa goldfields has partially fused phyllaries (less than half their length) and its fruits lack a pappus.

The similar genus *Blennosperma* is differentiated by having alternate leaves, clustered flower heads, and paler yellow ligules (USFWS, 2005c).

Habitat

Habitat for this species occurs in vernal pools, swales and moist flats within alkaline playas, valley and foothill grasslands, and cismontane woodland below 1,500 feet in elevation (CNPS, 2008). The species is often found in association with other endemic vernal pool plants such as coyote thistle, smooth goldfields (*Lasthenia glaberrima*), flatface downingia (*Downingia pulchella*), and common mousetail (CDFG, 2008).

Distribution

General. Historically, Contra Costa goldfields were known within the north coast, the southern Sacramento Valley, the San Francisco Bay Area, and south coast. Currently, it is known to occur in Mendocino, Napa, Marin, Contra Costa, Alameda, Solano, Sonoma, and Monterey counties, and is believed to be extirpated from Santa Barbara and Santa Clara counties (CNPS, 2008).

Regional. CDFG (2008) reports four occurrences in Contra Costa County and four in Alameda County. One of the occurrences in Contra Costa County and three of the occurrences in Alameda County are presumed extant (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

No occurrences of Contra Costa goldfields are known within the Los Vaqueros Watershed. The nearest occurrence is about 11 miles north of the existing dam (CDFG, 2008). This occurrence is originally from a herbarium collection in 1884 in the vicinity of Byron Hot Springs, but surveys conducted in the Los Vaqueros Watershed in 1988 and 2005 did not find any plants (CDFG, 2008). The CNDDDB considers this recorded occurrence extirpated. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. Contra Costa goldfields is not known to occur in the vicinity of the Delta Intake Facilities. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. Contra Costa goldfields is not known to occur in the vicinity of the Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. The Transfer-LV Pipeline alignment is about 9.5 miles southeast of the nearest recorded Contra Costa goldfields population and critical habitat is within 2 miles east of the alignment (CDFG, 2008; USFWS, 2006a). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. Vernal pool wetlands along the Transfer-Bethany Pipeline provide suitable habitat for Contra Costa goldfields; the nearest occurrence is 9.5 miles northwest of the

alignment (CDFG, 2008). This alignment passes through critical habitat for Contra Costa goldfields; however, the goldfields population appears to have been extirpated prior to 1920 (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. The nearest known occurrence of Contra Costa goldfields to the Expanded Transfer Facility is about 9.5 miles northwest of the Transfer Facility (CDFG, 2008). within the study area is mainly disturbed annual grassland and lacks vernal pool wetlands that support this species; therefore, Contra Costa goldfields is not likely to occur in the study area.

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Federal or State Species of Special Concern

Large-flowered fiddleneck (*Amsinckia grandiflora*)

Description

Large-flowered fiddleneck is an herbaceous annual in the borage family (Boraginaceae) that ranges from 1 to 2 feet high. This species germinates in the fall or early winter after the onset of the rainy season and continues to develop throughout the winter until early spring (Carlsen et al., 1999). The typical blooming period for this species is April to May (CNPS, 2008). The plant dies after it sets seed in early summer (Carlsen et al., 1999).

Habitat

The species is restricted to steep slopes ranging from 900 to 1,800 feet in elevation in valley grasslands that are typically bordered by blue oak woodland and coastal sage scrub communities (CNPS, 2008; Carlsen et al., 1999). Historically, the species occurred in native perennial bunchgrass plant communities dominated by species such as purple needlegrass (USFWS, 1997b). Currently, the species is found growing in association with non-native annual grasses such as wild oats and ripgut brome, native lupines and fiddlenecks, and blue oak (CDFG, 2008).

Distribution

General. The species is known within the Altamont Hills in the northern Diablo Range and a portion of the inner south Coast Range.

Regional. The first reported occurrence of this species was in 1887 at a mining camp on the northeast slope of Mt. Diablo, but this population has since been extirpated (CDFG, 2008). Three natural occurrences have been reported within and next to Lawrence Livermore Laboratory Site 300, south of Tracy in San Joaquin County. Re-establishment at historic and other appropriate locations within the region is ongoing; however the majority of all reintroduced populations are declining and few to none of these individuals have been seen since the 1990's (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The nearest large-flowered fiddleneck populations that are presumed extant are near Lawrence Livermore Laboratory, which is also where the critical habitat is designated (CDFG, 2008; USFWS, 2006a). Two experimental re-introductions occurred in the Los Vaqueros Watershed, about 2 miles south of Round Valley; however, these reintroductions failed and no individuals have been seen since 1995 (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. A known population is present in the Western substation study area (Power Option 1), which is spanned by powerlines under Power Option 2.

Mt. Diablo manzanita (*Arctostaphylos auriculata*)

Description

Mt. Diablo manzanita is a tall (3 to 15 feet), evergreen shrub in the heath family (Ericaceae). The shrub has erect stems, densely white-tomentose twigs with long bristles, and oblong-ovate to round-ovate leaves. The blooming period for this species extends from January to March (CNPS, 2008).

Habitat

Mt. Diablo manzanita occurs on dry sandstone slopes primarily in chamise and manzanita chaparral plant communities at elevations ranging from 440 to 2130 feet (CNPS, 2008; ECCCHPA, 2006). The shrub also occurs as an understory component in coast live oak woodlands (ECCCHPA, 2006). It commonly grows in association with manzanita (*Arctostaphylos* spp.), chamise, chaparral pea, buckbrush (*Ceanothus cuneatus*), sticky monkeyflower, black sage, oak (*Quercus* spp.), and knobcone pine (*Pinus attenuata*).

Distribution

General. This species is endemic to Mt. Diablo and the surrounding hills. It is locally rare and plants are generally sparsely scattered or found in small clumps.

Regional. CDFG (2008) reports 18 extant populations within Contra Costa County and one possibly extirpated occurrence.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

There are three CNDDDB-reported occurrences of Mt. Diablo manzanita in the Los Vaqueros Watershed, totaling about 740 individual plants. These occurrences are all in the vicinity of Morgan Territory Regional Park and associated with the common manzanita plant series (CDFG, 2008). They are clustered into a relatively well-defined area 0.35 mile west of the 275 TAF reservoir expansion inundation zone.

The distribution of chaparral and manzanita plant series are well described within the 275 TAF inundation area and within the Los Vaqueros Watershed. Less 4.41 acres of chamise habitat would be inundated and an additional 0.86 acre (consisting of 0.75 acre of chamise, 0.07 acre of wedgeleaf ceanothus and 0.04 acre of common manzanita) (ESA, 2004) would be impacted. Based on botanical surveys (ESA, 2004), Mt. Diablo manzanita does not occur in the inundation or facilities construction area (ESA, 2007).

Delta Intake and Pump Station. This species does not occur in this study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species does not occur in this study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species does not occur in this study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species does not occur in this study area (ESA, 2007; 2008b).

Expanded Transfer Facility. This species does not occur in this study area (ESA, 2007; 2008b).

Power Supply Infrastructure. This species does not occur in this study area (ESA, 2007; 2008b).

Contra Costa manzanita (*Arctostaphylos manzanita* ssp. *laevigata*)

Description

Contra Costa manzanita is a bushy evergreen shrub in the heath family (Ericaceae). The plant is low with intricately branched smooth to finely tomentose twigs (USFWS, 2002a). Leaves are glossy and smooth and range from widely ovate to oblong-ovate with rounded to wedge-shaped bases (USFWS, 2002a; Hickman, 1993). Its drooping, branched inflorescences have small, white flowers that are urn-shaped (USFWS, 2002a). Its blooming period extends from January to February and fruits from July to August (CNPS, 2008; USFWS, 2002a). The bright red fruits resemble miniature apples. Unlike some in the genus, Contra Costa manzanita does not re-sprout after fires and is therefore an obligate seeder (USFWS, 2002a).

Habitat

Contra Costa manzanita occurs on rocky slopes within chemise, manzanita, and mixed chaparral plant communities at elevations ranging from 1,600 to 3,610 feet (CNPS, 2008; Hickman, 1993; CDFG, 2008). It is typically found on southern exposures from 500 to 2,600 feet in elevation (USFWS, 2002a). Common associates include manzanita, chamise, chaparral pea, buckbrush, sticky monkeyflower, toyon, linear-leaved goldenbush (*Ericameria linearifolia*), California sagebrush, Mt. Diablo helianthella (*Helianthella castanea*), coast live oak, and interior live oak (CDFG, 2008).

Distribution

General. The species is restricted to the Mt. Diablo Range in the San Francisco Bay region and the Vaca Mountains in the inner north Coast Ranges (Hickman, 1993).

Regional. Currently, eight occurrences of Contra Costa manzanita are reported, all within the vicinity of Mt. Diablo in Contra Costa County. Known occurrences are within Mt. Diablo State Park and on East Bay Regional Park District lands (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The CNDDDB reports one known occurrence, about 0.2 mile just west of and next to the Los Vaqueros Watershed boundary, in Morgan Territory Regional Park (CDFG, 2008). There is potential for this species to occur within chaparral communities in the Los Vaqueros Watershed, but based on botanical surveys (ESA, 2004), Contra Costa manzanita does not occur in the study area.

Delta Intake and Pump Station. This species does not occur in this study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species does not occur in this study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species does not occur in this study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species does not occur in this study area (ESA, 2007; 2008b).

Expanded Transfer Facility. This species does not occur in this study area (ESA, 2007; 2008b).

Power Supply Infrastructure. This species does not occur in this study area (ESA, 2007; 2008b).

Alkali milk-vetch (*Astragalus tener* var. *tener*)

Description

Alkali milk-vetch is an inconspicuous annual herb in the legume family (Fabaceae). Upright plants reach 12-inches high and are smooth to covered with stiff, straight hairs that hug the stem. Each pinnately compound leaf has seven to 12 separated, oval leaflets with notched tips. Flowers are pink to purple (sometimes fading to white) and occur in dense clusters of three to 12. Its typical blooming period occurs from March to June (CNPS, 2008).

Habitat

Alkali milk-vetch occurs on adobe clay playas, vernal flats, and moist grasslands with alkali or heavy clay soils in the Central Valley up to 200 feet in elevation (CNPS, 2008). Plant associates of this taxon are Italian ryegrass, woolly marbles (*Psilocarphus tenellus*), stalked popcornflower (*Plagiobothrys stipitatus* var. *micranthus*), and coyote thistle (*Eryngium aristulatum* var. *aristulatum*) (CDFG, 2008).

Distribution

General. Alkali milk-vetch was historically found in the southern Sacramento Valley, the northern San Joaquin Valley, and the eastern San Francisco Bay region (Hickman, 1993). Occurrences are recorded for thirteen counties in California; however it is now known only from Merced, Solano, and Yolo Counties (CDFG, 2008). Of the 67 recorded occurrences in the CNDDDB, 38 are presumed extant (CDFG, 2008).

Regional. Only one of the 13 known occurrences within the region is presumed extant, and this population is in Alameda County west of Fremont (CDFG, 2008).

Project Area Distribution**Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.**

Two known occurrences of alkali milk-vetch are in the vicinity of the Los Vaqueros Watershed, but no occurrences are recorded within the watershed. Both occurrences are within 2.5 miles of the Watershed, one to the east and one to the south. One of the occurrences was first reported in 1988 at the junction Byron Hot Springs Road and Armstrong Road northeast of Livermore. This site was surveyed in 2002 and the species was not observed. The other occurrence is a record from 1938 in the east end of Livermore Valley, but this area is mostly developed now. Both occurrences are possibly extirpated (CDFG, 2008). This species was not observed during focused surveys for rare plants conducted in the Los Vaqueros Watershed in 2005, 2007, and 2008 (ESA, 2007; 2008a).

Delta Intake and Pump Station. Alkali milk-vetch is not known to occur in the study area. The nearest recorded occurrence is about 3.8 miles southwest of the Delta Intake Facilities (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. Alkali milk-vetch is not known to occur in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. The Transfer-LV Pipeline is about 4 miles northwest of the nearest recorded alkali milk-vetch population (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. Vegetation within the study area is mainly disturbed annual grassland and lacks alkali wetland and alkali grassland to support this species.

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Heartscale (*Atriplex cordulata*)

Description

Heartscale is a low-growing annual herb in the goosefoot family (Chenopodiaceae). This monoecious species has few erect, rigid stems from the base that grow from 4 to 20 inches. The ascending-to-erect branches are gray-scaly with tips covered with densely interwoven, generally matted hairs (Hickman, 1993). Heartscale blooms from April to October, but the plant is most easily identified when in fruit (CNPS, 2008).

Habitat

Heartscale grows in sandy, saline or alkaline flats or scalds, in chenopod scrub, meadows, and valley and foothill grassland at elevations less than 1,230 feet (CNPS, 2008). It often grows in association with other atriplex, saltgrass, alkali heath, and common tarweed (*Hemizonia pungens*) (CDFG, 2008). *Atriplex* species are relatively tolerant of disturbance.

Distribution

General. Heartscale is known within the southern Sacramento Valley to the San Joaquin Valley. Its current distribution ranges from Glenn and Butte Counties in the north to Kern County in the south (CNPS, 2008). The CNDDDB has identified 58 occurrences of heartscale, of which 53 are presumed extant (CDFG, 2008).

Regional. Of the 53 extant CNDDDB occurrences, two are recorded in the vicinity of Livermore in Alameda County. No reported occurrences are recorded in Contra Costa or San Joaquin Counties (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

No occurrences of heartscale are recorded within the Los Vaqueros Watershed; however two occurrences are reported in the vicinity, south of the Watershed (CDFG, 2008). Alkali flats and alkali grasslands within the Watershed provide suitable habitat for this species. During a 2005 focused survey for these species, there was one location where potential individuals of this species were discovered; however, these plants had not yet fully formed their fruits and therefore were not definitively identified to species. Therefore, pending verification of these plants, heartscale may potentially occur within the study area.

Delta Intake and Pump Station. Heartscale is not known to occur in the vicinity of the Delta Intake Facilities and was not detected during focused surveys. This species is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. Heartscale is not known from the Delta-Transfer Pipeline alignment, and was not detected during focused surveys. This species is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. Heartscale is not known from the Transfer-LV Pipeline alignment, and was not detected during focused surveys. This species is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. Alkali wetlands and alkali grasslands in the vicinity of the Transfer-Bethany Pipeline provide suitable habitat for heartscale, although no occurrences have been recorded in the study area. The nearest occurrence is about 7 miles south of the existing dam (CDFG, 2008). Potential habitat is only available at a few distinct sites on the Transfer-Bethany Pipeline alignment, where final botanical surveys were delayed due to site access constraints. Based on the spring 2008 survey findings (ESA, 2008), which did not identify this species and the species' described distribution there is a low likelihood that this species may be encountered in this area.

Expanded Transfer Facility. The nearest known occurrences of heartscale to the Expanded Transfer Facility are south of the Los Vaqueros Watershed (CDFG, 2008). Vegetation within the study area is mainly disturbed annual grassland and lacks alkali wetland and alkali grassland to support this species. Therefore, heartscale is not likely to occur within the study area.

Power Supply Infrastructure. Heartscale is not known from the Power Facilities study areas, and was not detected during focused surveys. This species is considered absent from the study area (ESA, 2007; 2008b).

Brittlescale (*Atriplex depressa*)

Description

Brittlescale is a low-growing annual herb in the goosefoot family (Chenopodiaceae). This monoecious species has prostrate, scaly stems that are white and brittle and that grow to less than 8 inches (Hickman, 1993). The species blooms from May to October, but is best identified when in fruit (CNPS, 2008).

Habitat

Brittlescale is associated with alkaline or clay soils in chenopod scrub, playas, vernal pools, or seeps and in valley grassland at elevations less than 1,050 feet (CNPS, 2008). It is often associated with the alkali soils of the Pescadero and Solano series (ECCCHPA, 2006). Populations occur in semi-barren areas of saline and alkaline meadows with other atriplex, alkali heath, salt grass, alkali mallow, meadow barley (*Hordeum brachyantherum*), common tarweed, and bush seepweed. Brittlescale is sometimes associated with other rare plants such as palmate-bracted bird's-beak and San Joaquin saltbush (*Atriplex joaquiniana*) (CDFG, 2008).

Distribution

General. Brittlescale is known within the southern end of the Sacramento Valley through the San Joaquin Valley. It is currently known within Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Madera, Merced, Solano, Tulare, and Yolo Counties. There are 52 known occurrences in the CNDDDB and all are presumed extant (CDFG, 2008). However, it is believed that some of these occurrences may be misidentified lesser saltscale (*Atriplex miniscula*) (ECCCHPA, 2006).

Regional. There are 17 reported occurrences distributed throughout Alameda and Contra Costa Counties for this species (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Brittlescale has been recorded within the Watershed, within the Lower Kellogg Creek watershed (CDFG, 2008). Three populations were identified during surveys conducted in the Los Vaqueros Watershed in 1988. About 500 plants were found 0.8 mile south of Marsh Creek Road, another 500 were observed about 0.6 mile north of Vasco Road, and 150 plants were found on the west side of the reservoir spillway south of the dam (Jones and Stokes Associates, Inc., 1988).

Delta Intake and Pump Station. Agricultural lands within the study area does not provide habitat for this species. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. Agricultural lands within the study area does not provide habitat for this species. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. Alkali wetlands and alkali grasslands within the study area provide suitable habitat for brittlescale. Several known populations are recorded within the vicinity of the study area, and three populations occur within the study area. Alkali wetlands and alkali grasslands north and south of Vasco Road and along Armstrong Road provide suitable habitat for this species. These locations were verified during focused surveys (ESA, 2007; 2008b). Final botanical surveys of these areas were delayed in 2008 due to site access constraints, thus, there remains a moderate potential that several additional, small brittlescale populations occur in this area.

Expanded Transfer Facility. Vegetation within the study area is mainly disturbed annual grassland and lacks alkali wetland and alkali grassland which would support this species. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

San Joaquin sparscale (*Atriplex joaquiniana*)

Description

San Joaquin sparscale is an annual herb in the goosefoot family (Chenopodiaceae). This species ranges in height from 1 to 3 feet and has erect, striate stems. Leaf blades are ovate to triangular, finely gray-scaly or green above, and wavy-toothed. Upper stem leaves are abruptly reduced. Female inflorescence fruiting bracts are fused below the middle, round-deltate, and ribbed (Hickman, 1993). The species blooms from April through October (CNPS, 2008), but is best identified when in fruit.

Habitat

San Joaquin sparscale occurs in seasonal alkali wetlands or sink scrub within chenopod scrub, meadows, and grasslands. It is typically found at lower elevations, but is reported to grow up to 2,740 feet elevation (CNPS, 2008). The species is commonly found in association with other atriplex, saltgrass, alkali heath, Italian ryegrass, alkali mallow, and nitgrass (*Lepidium nitidum*) (CDFG, 2008). Members of the *Atriplex* genus are relatively tolerant of disturbance.

Distribution

General. San Joaquin saltbush is known within the east side of the southern inner Coast Ranges, the southern end of the Sacramento Valley, and San Joaquin Valley. Historically, the species' range extended from Glenn County in the north to Tulare County in the south, but it is currently assumed to be extirpated from Santa Clara, San Joaquin, and Tulare Counties (CNPS, 2008).

Regional. The CNDDDB reports 43 occurrences throughout the region, in Alameda, Contra Costa, and San Joaquin Counties. The majority of occurrences are within Contra Costa County. San Joaquin County has one occurrence; this record is from 1927 and the occurrence has not been seen since (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities

This species is known to occur within the Watershed, in alkali wetlands and along alkaline watercourses. The occurrences recorded from the Kellogg Creek watershed include the largest recorded populations for this species (Jones and Stokes Associates, Inc., 1988). Populations of San Joaquin sparscale were noted in this area during surveys conducted in 2005. The majority of occurrences is along the Lower Kellogg Creek watershed and is within 1 to 2.5 miles of the dam (CDFG, 2008). No occurrences are recorded within the inundation zone. The Stockpile Area is next to one population (CDFG, 2008).

Delta Intake and Pump Station. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. The Transfer-LV Pipeline generally follows Lower Kellogg Creek to the existing dam. Several populations of San Joaquin spearscale occur in alkali wetlands and alkali grasslands in this area, although San Joaquin spearscale populations do not occur within the study area (CDFG, 2008; ESA 2008b).

Transfer-Bethany Pipeline. For the Transfer-Bethany Pipeline, several San Joaquin spearscale populations were identified in alkali wetlands and alkali grasslands south of Armstrong Road, in alkali grasslands habitats that were outside the pipeline study area (CDFG, 2008; ESA 2008b).

Expanded Transfer Facility. Vegetation within the study area is mainly disturbed annual grassland and lacks alkali wetland and alkali grassland to support this species. Therefore, San Joaquin spearscale is not likely to occur within the study area.

Power Supply Infrastructure. Several populations were also identified in the Western alignment study area that can be avoided by project design (ESA, 2008b).

San Joaquin spearscale does not occur in the PG&E study area.

Big Tarplant (*Blepharizonia plumosa*)

Big tarplant is an annual herb in the sunflower family (Asteraceae) that is endemic to California. This species ranges from 1 to 4 feet high and it occurs in grasslands of eastern Contra Costa County. At least four occurrences, all considered extant, are documented near the north entrance to the Los Vaqueros Watershed. No occurrences are documented in the Los Vaqueros Watershed study area. Focused surveys failed to identify this species in out-of-watershed study areas.

Mt. Diablo fairy lantern (*Calochortus pulchellus*)

Description

Mt. Diablo fairy-lantern is a bulbiferous, perennial herb in the lily family (Liliaceae). This species ranges from about 4 to 12 inches high, has persistent basal leaves, and two to three cauline leaves. From April to June, plants produce one to many showy, light yellow nodding flowers with thick hairs on the petals. Plants become dormant in winter persisting only as bulbs below the soil surface.

Habitat

Mt. Diablo fairy-lantern occurs in chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland at elevations ranging from 650 to 2,600 feet (CNPS, 2008). It is typically found on wooded or brushy slopes in association with oaks, foothill pine, common manzanita, chamise, California buckeye, poison oak, California bay laurel (*Umbellularia californica*), Diablo helianthella, baby blue eyes (*Nemophilla heterophylla*), blue-eyed grass (*Sisyrinchium bellum*), shooting-stars (*Dodecatheon* spp.), California goldfields (*Lasthenia californica*), and Torrey melic (*Melica torreyana*) (CDFG, 2008; ECCHPA, 2006).

Distribution

General. The species was believed to be restricted to the Diablo Range (Hickman, 1993) in Contra Costa and Alameda counties, but one new occurrence was discovered in Solano County in 2004. This new occurrence significantly extends the species' range (CDFG, 2008).

Regional. Mt. Diablo fairy-lantern has a total of 31 occurrences in the region, with 30 in Contra Costa County and one in Alameda County.

Project Area Distribution**Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.**

Mt. Diablo fairy-lantern has two reported occurrences in the Los Vaqueros Watershed – about 0.6 and 1.8 miles from the inundation boundary (CDFG, 2008). Ten plants were found in 1991 in the southwest section of Round Valley, and the other occurrence was reported in 1935 about 10 miles north of Livermore on Morgan Territory Road and has not been surveyed for since. This species was observed in two distinct populations totaling about 105 individuals during special-status plant surveys conducted for this project (ESA, 2007). Both populations are west of and south of the reservoir, along oak woodland-chaparral ecotones. One of these populations is within 180 feet of the inundation boundary and 80 feet from the westside access road; another population is within 390 feet of the inundation boundary and a proposed picnic area, and within 350 feet of the westside access road. These populations would not be impacted by the project.

Delta Intake and Pump Station. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. No occurrences of Mt. Diablo fairy-lantern are known in the study area; the nearest occurrence is within the Los Vaqueros Watershed, over 5 miles southwest of the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. No occurrences of Mt. Diablo fairy-lantern are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. No occurrences of Mt. Diablo fairy-lantern are known in the study area; the nearest occurrence is within the Watershed, about 6 miles west of the alignment. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. No occurrences of Mt. Diablo fairy-lantern are known in the study area; the nearest occurrence is about 5.8 miles southwest of the existing Expanded Transfer Facility.

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)

Description

Congdon's tarplant is a summer annual in the sunflower family (Asteraceae). Plants grow prostrate to erect, range from 4 to 28 inches high, and lack hairs and glands. This much branched species have short, spine-tipped leaves that are entire to few toothed. Inflorescences are borne in leaf axils with yellow ray flowers and disk flowers with yellow anthers. Disk flower fruits have a pappus of three to five scales. The species closely resembles the more widespread common spikeweed (*Hemizonia pungens*), but common spikeweed lacks a pappus on disk fruits (Hickman, 1993). The species blooms from May through November (CNPS, 2008).

Habitat

Congdon's tarplant occurs in valley and foothill grasslands in alkali soils below elevations of 760 feet (CNPS, 2008). It is often found in ruderal grassland habitat in association with common knotweed (*Polygonum arenastrum*), annual bromes (*Bromus* spp.), horseweed (*Conyza bonariensis*), bristly ox-tongue (*Picris echioides*), annual beard grass (*Polypogon monspeliensis*), shortpod mustard (*Hirschfeldia incana*), Italian ryegrass, yellow star-thistle (*Centaurea solstitialis*), lamb's quarters (*Chenopodium album*), Russian thistle (*Salsola tragus*), fiddle dock (*Rumex pulcher*), and alkali mallow (CDFG, 2008).

Distribution

General. This species' range is described as the central and southern regions of Central Western California in Santa Clara, Contra Costa, and Alameda counties and from San Luis Obispo to Santa Cruz counties (Hickman, 1993; LSA Associates, 2004). Known occurrences in Santa Cruz and Solano counties are believed to be extirpated. Out of 76 known occurrences, 62 are presumed extant and the majority of these are distributed throughout Monterey, Contra Costa, and Alameda counties (CDFG, 2008).

Regional. Within the region, 15 presumed extant populations are recorded in Alameda County and 16 in Contra Costa County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

This species is not known to occur in the Los Vaqueros Watershed. The nearest occurrence is about 6 miles south of the existing dam (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. Congdon's tarplant is not known to occur within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. Congdon's tarplant is not known to occur within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. Congdon's tarplant is not known to occur within the study area. The nearest occurrence is about 6 miles south of the existing dam (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. Congdon's tarplant is not known to occur within the study area. The nearest occurrence is about 3 miles southwest of the terminus of the pipeline at the Bethany Reservoir (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. The nearest known occurrences of Congdon's tarplant to the study area are within the Los Vaqueros Watershed (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Hispid bird's-beak (*Cordylanthus mollis* spp. *hispidus*)

Description

Hispid bird's-beak is an annual herb in the figwort family (Scrophulariaceae). This highly-branched plant is gray-green with tinges of purple and covered in stiff, bristly hairs. It ranges from 4 to 16 inches high. Its small leaves are oblong and entire to seven lobed. Corollas are whitish, sparsely tomentose, and two-lipped with an upper lip that is shaped like a bird's beak and a lower lip that is inflated. Flowers are mostly hidden by green leaf-like outer bracts, and inner bracts are pinnately lobed three to seven times. This species is physically similar to soft bird's-beak (*C. mollis* ssp. *mollis*), but the later is distinguished by the presence of soft hairs, fewer stem branches, and a densely tomentose corolla pouch and tube (Hickman, 1993). Hispid bird's-beak blooms from June through September (CNPS, 2008).

Habitat

Hispid bird's-beak grows in damp saline or alkaline soils in meadows, sinks, playas, and grasslands at elevations below 510 feet (CNPS, 2008). It is often found in alkaline meadows and sinks in association with salt grass. Other halophytic plant associates include alkali heath, spearscale, and iodine bush, and it co-occurs with palmate-bracted birds-beak at one site (CDFG, 2008).

Distribution

General. Historically, the range for hispid bird's-beak was described as the central and southern regions of the Central Valley in Solano, Merced, and Kern counties (Hickman, 1993). Currently, there are 28 extant occurrences, the majority of which are in Merced County. One known occurrence has been documented in each of Alameda, Kern, Placer, Fresno, and Solano Counties (CDFG, 2008).

Regional. Within the region, one population occurs in the Springtown Alkali Sink Ecological Reserve, which is north of Livermore in Alameda County. In 1999, over 200 individuals were estimated at this location (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

This species is not known to occur in the Los Vaqueros Watershed. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. Hispid bird's-beak is not known to occur within the study area. The nearest occurrence is about 14 miles southwest of the dam (CDFG, 2008). Agricultural land and disturbed annual grassland within the facilities area do not provide habitat for this species. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. Hispid bird's-beak is not known to occur within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species is not known to occur within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. Vegetation within the study area is mainly disturbed annual grassland and lacks alkali wetland and alkali grassland to support this species. Based on focused survey findings, Hispid bird's-beak is not present in the study area.

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Recurved larkspur (*Delphinium recurvatum*)

Description

Recurved larkspur is a perennial herb in the buttercup family (Ranunculaceae). This medium-sized plant ranges from 7 to 33 inches high and has a smooth stem with a base that is narrower than the root. Leaves are palmately lobed (three to 11 lobes) and generally basal leaves are much larger than cauline leaves. From March to May, this species produces showy, light blue flowers that generally have reflexed sepals and white lower petals (Hickman, 1993; CNPS, 2008).

Habitat

Recurved larkspur occurs in chenopod scrub, cismontane woodland, and valley and foothill grasslands with poorly drained, alkaline soils between 100 to 2,500 feet elevation (CNPS, 2008; Hickman, 1993). The species occurs in association with salt grass, alkali barley, alkali heath, California goldfields, and common spikeweed (CDFG, 2005; Jones & Stokes, 1990).

Distribution

General. Recurved larkspur was historically distributed throughout the Central Valley, from Butte to Kern County (ECCCHPA, 2006). The majority of known occurrences are within Kern, San Luis Obispo, and Tulare counties, but extant populations are reported for Alameda, Contra Costa, Merced, Fresno, Kings, Solano, Kern, Monterey, San Joaquin, Colusa, and Madera counties (CDFG, 2008).

Regional. The CNDDDB reports six presumed extant occurrences in the region: four in Contra Costa County, one in Alameda County, and one in San Joaquin County (CDFG, 2008).

Project Area Distribution**Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.**

No occurrences of recurved larkspur are known within the Los Vaqueros Watershed. The nearest occurrences are 5.5 to 7 miles east of the Watershed (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. Vegetation within the study area is mostly disturbed and developed for agriculture, and is not likely to support this species. Recurved larkspur considered absent from the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. Four known occurrences of recurved larkspur are in the vicinity of the study area (CDFG, 2008); however, this species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. No known occurrences of recurved larkspur are reported from the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Diamond-petaled California poppy (*Eschscholzia rhombipetala*)

Description

The diamond-petaled California poppy is a small annual herb in the poppy family (Papaveraceae). This erect, hairless species grows from a taproot and ranges from 2 to 12 inches high. Its finely dissected linear leaves generally have obtuse segments and fleshy bases. Within the genus, the fleshy leaf bases are unique to diamond-petaled California poppy (Cypher, 2005). From March through April, the species produces small yellow flowers with four petals and barrel-shaped receptacles and buds are erect (Hickman, 1993; Cypher, 2005). Fruits are cylindrical and can be nearly equal in length to the entire plant and have tiny, rounded black seeds (Hickman, 1993). This small species is typically difficult to see at a distance and this may account for its infrequent observation (Clark, 2000).

Habitat

The species occurs in fallow fields and open spaces in valley and foothill grasslands and alkali scrub below 3,200 feet in elevation and typically on clay and alkaline soils. The species is known to occur in association with pine bluegrass, bromes, slender wild oats, wind poppy (*Stylomecon heterophylla*), Douglas microseris (*Microseris douglasii*), San Benito thornmint (*Acanthomintha obovata*), large-leaved filaree (*Erodium macrophyllum*), spinescale saltbush (*Atriplex spinifera*), common mousetail (*Myosurus minimus*), purple owl's clover (*Castilleja exserta*), and goldfields (CDFG, 2008). The plant is also known to occur in small vernal pools at Carrizo Plain in association with goldfields and phacelia (*Phacelia* spp.) (Clark, 2005).

Distribution

General. Historically, Diamond-petaled California poppy was known within seven sites in the northern inner Coast Range, the eastern San Francisco Bay Area, eastern portion of the outer southern Coast Range, and the inner southern Coast Range in Alameda, Colusa, Contra Costa, San Luis Obispo, and Stanislaus counties (Hickman, 1993; Cypher, 2005). This species was thought to be extinct until it was rediscovered at Carrizo Plain in 1992. Since then it was also found at Lawrence Livermore Laboratory Site 300 in 1997. An occurrence in San Luis Obispo County is thought to be a misidentified Lemmon's poppy (*E. lemmonii* ssp. *lemmonii*) and the occurrence at Carrizo Plain has not been seen since its discovery (CNPS, 2008).

Regional. Within the region, CDFG (2008) reports two occurrences each in Contra Costa and Alameda Counties and one occurrence in San Joaquin County that are all presumed extant. However, the three occurrences in Contra Costa and San Joaquin Counties are historical collections and have not been seen since. The two occurrences in Alameda County are at Lawrence Livermore Laboratory Site 300.

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

The one broad known occurrence in the region overlaps with the Los Vaqueros Watershed (CDFG, 2008). This is a historical occurrence dated from 1888, and the location was generally

reported as “near Byron” (CDFG, 2008). Potential exists for this species to occur throughout the Kellogg Creek watershed, but no populations were discovered during past and recent field surveys (Jones and Stokes Associates, Inc., 1988; ESA, 2007). Intensive long-term livestock grazing, fire suppression, and competition from non-native annual grasses are a few reasons that may be why the diamond-petaled California poppy has been absent from suitable habitat in the region (Jones and Stokes Associates, Inc., 1988). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Mt. Diablo helianthella (=rock-rose) (*Helianthella castanea*)

Description

Mt. Diablo helianthella is a perennial herb in the sunflower family (Asteraceae). This medium-sized plant ranges from 4 to 20 inches high and grows from a stout taproot and caudex. Leaves are mostly basal but stems have few leaves with long petioles and narrowly to widely elliptic blades. Yellow flowers are produced on long, stout stems from March through June (CNPS, 2008; Hickman, 1993). The outer phyllaries of the flower are generally enlarged, appear to be leaves, and are incurved and the involucre (group of phyllaries) is 1 to 1.5 inches wide. Its smooth fruits are thick and have 0 to two pappus awns (Hickman, 1993). Plants become dormant in winter, persisting only at or below the soil surface. The species is similar to California helianthella (*H. californica*), but is distinguished by wider leaves, more leafy-bracted phyllaries, and thick fruits (Hickman, 1993).

Habitat

Diablo helianthella occurs in grassy openings within valley and foothill grasslands, broadleaved upland forests, chaparral, cismontane woodland, coastal scrub, and riparian woodland from 190 to 4,200 feet in elevation (CNPS, 2008). It is found in association with annual grasses, mule-ears

(*Wyethia* spp.), purple needlegrass, yarrow, California sagebrush, sticky monkeyflower, chamise, coyotebrush (*Baccharis pilularis*), poison oak, and blue oak (CDFG, 2008; ECCCHPA, 2006).

Distribution

General. The species is endemic to the northern San Francisco Bay Area (Hickman, 1993). Currently, 81 occurrences of this species are known to be distributed throughout Alameda, Contra Costa, Marin, San Francisco, and San Mateo Counties. Many of these occurrences are on State Park and East Bay Regional Park District lands (CDFG, 2008).

Regional. The majority of these are in the Project Area region, with 68 occurrences recorded in Contra Costa County and ten in Alameda County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Four populations of Diablo helianthella have been identified in the Watershed (CDFG, 2008). None are within the inundation boundary. One location is 130 feet from inundation boundary, and within 90 feet of the westside access road. Another location is about 450 feet from the inundation boundary, and about 380 feet from the westside access road. These two locations are included within a CNDDDB occurrence that is generally about 1 to 4 miles south of Round Valley and consists of 32 colonies and greater than 2,296 individuals (CDFG, 2008). This occurrence was last surveyed in 1991. The other three CNDDDB occurrences are between 0.3 and 0.7 mile east of Morgan Territory Road and consist of five colonies with about 130 plants (CDFG, 2008).

In addition, during special-status plant surveys conducted in June, 2004, Diablo helianthella was observed in one distinct population totaling about 85 individuals. This population is southwest of the reservoir along an oak woodland-chaparral ecotone, about 400 feet outside the inundation boundary and about 360 feet from the westside access road. This population has not been documented in the CNDDDB. While occurrences are documented from the Los Vaqueros Watershed, this species is considered absent from the study area.

Delta Intake and Pump Station. No occurrences of Diablo helianthella are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. No occurrences of Diablo helianthella are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. No occurrences of Diablo helianthella are known in the study area. The nearest occurrence is within Round Valley Regional Park, about 1.3 miles northwest of the dam. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. No occurrences of *Diablo helianthella* are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. No occurrences of *Diablo helianthella* are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Brewer's dwarf-flax (=western flax) (*Hesperolinon breweri*)

Description

Brewer's dwarf-flax is a low-growing annual in the flax family (Linaceae). The species ranges from about 2 to 8 inches high and has alternately arranged linear leaves. Its short, dense inflorescences produce numerous small yellow flowers with gland-toothed sepals (Hickman, 1993). The species typically blooms from May through July (CNPS, 2008).

Habitat

Brewer's dwarf flax occurs on serpentine, sandstone, and volcanic soils in chaparral, woodlands, and valley foothill grasslands between 100 and 2,300 feet elevation (CNPS, 2008; ECCCHPA, 2006). The species is generally found on slopes in areas with low growing vegetation and in association with toyon, manzanita, chamise, foothill pine, buckbrush, scrub oak, sticky monkeyflower, yarrow, Mt. Diablo fairy lantern (*Calochortus pulchellus*), purple needlegrass, and slender wild oats (CDFG, 2008).

Distribution

General. The species range is described as the Vaca Mountains at the southern end of the inner North Coast Range in Napa and Solano counties and Contra Costa County (Hickman, 1993).

Regional. Twenty-two known occurrences are recorded in the CNDDDB in Contra Costa, Napa, and Solano Counties; and 16 occurrences are known in Contra Costa County, with one historic occurrence that is believed to have been extirpated (CDFG, 2008; ECCCHPA, 2006). About half of these occurrences are on State Park and Regional Park lands (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities. Multiple records for this species are documented in and near the Watershed. One occurrence was reported in the southern portion of Round Valley in 1987 with greater than 1,000 individuals. The other five occurrences were found during surveys of the Watershed conducted in 1988. One of these occurrences was found along Vasco Road (about 0.25 mile north of the reservoir) and had about 4,500 individuals. The other four were off of Morgan Territory Road at distances ranging

from 0.8 to 1.8 mile with a total of about 4,375 individuals (CDFG, 2008). This species was observed during special-status plant surveys conducted for this project in six distinct populations totaling about 1,850 individuals (ESA, 2004). Population sizes range from 100 to 500 plants. All populations are west or south of the reservoir within oak woodlands (five populations) or grasslands (one population) and on north- and northeast-facing slopes. Typical associates include blue oak, buckeye, yarrow, and along ecotones with open grasslands or dense chaparral within the oak woodlands (Jones and Stokes Associates, Inc., 1988). These populations are important as they are not growing on serpentinite substrate, which is typical of the species (CNPS, 2008).

One population identified by CDFG is within the inundation boundary and westside access road alignment, and two mapped populations are known to occur within 150 feet of the westside access road (CDFG, 2008). Another population observed during field surveys consists of about 200 plants that would be inundated by the project. A population of about 85 individuals observed during rare plant surveys lies 350 feet west of the proposed westside access road, near the southern tip of the reservoir (ESA, 2004). In total, the species has up to eight known occurrences in the vicinity of the Los Vaqueros Watershed (CDFG, 2008).

Delta Intake and Pump Station. No occurrences of Brewer's dwarf-flax are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. No occurrences of Brewer's dwarf-flax are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. No occurrences of Brewer's dwarf-flax are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. No occurrences of Brewer's dwarf-flax are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. No occurrences of Brewer's dwarf-flax are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Rose-mallow (*Hibiscus lasiocarpus*)

Rose-mallow is a perennial, rhizomatous herb in the mallow family (Malvaceae). This species ranges from 3 to 6 feet high. This species produces large, showy white flowers during the July to October blooming period.

Habitat for this species occurs in freshwater wetlands and freshwater marshes in California and elsewhere in North America. This species range includes the northern and central Sacramento Valley. It is currently known from San Joaquin, Solano, Contra Costa, Sacramento, Sutter, Colusa, Glenn and Butte Counties (CNPS, 2007).

Habitat for this species in the project area only occurs on the banks of Old River, near the Delta intake facilities. Two populations were identified locally to the Expanded Old River Intake and Pump Station, both outside the project study area. Two plants occur within a 1-square-meter area roughly 1,400 feet north of the Delta intake facilities, a colony with fewer than 15 plants occurs 1,100 feet south of the facilities, and a single plant occurs across Old River (CDFG, 2008). These populations are outside the Expanded Old River Intake and Pump Station project area. A colony consisting of fewer than 15 plants occurs at the site for the New Delta Intake and Pump Station. No other populations are known or were identified during focused botanical surveys in spring 2008 (ESA, 2008b).

Mason's lilaepsis (*Lilaeopsis masonii*)

Description

Mason's lilaepsis is a rhizomatous perennial herb in the carrot family (Apiaceae). This small plant generally grows prostrate and produces solitary to tufted leaves. Its cylindrical, thread-like leaves range from 0.6 to 3 inches long and are segmented. Flowering occurs from April to November and plants produce simple, open umbels with tiny white or maroon flowers (Hickman, 1993). Plants become dormant in winter persisting only as rhizomes below the soil surface. Many populations of this species are ephemeral, and they generally colonize newly deposited or exposed sediments (CNPS, 2008).

Habitat

Mason's lilaepsis occurs on tidally influenced mudflats and mud-banks of sloughs and rivers, freshwater and brackish marsh, and riparian scrub. The species typically grows in saturated clay substrates that are inundated by tidal action or waves on a regular basis. Common associates of this species include bulrush, bugleweed (*Lycopus* spp.), marsh pennywort (*Hydrocotyle* spp.), rushes, spikerush, loosestrife (*Lythrum* spp.), dock (*Rumex* spp.), coyote thistle, willow, cattail, and horsetail (*Equisetum* spp.) (CDFG, 2008). It is often found in association with other special-status plants including Delta mudwort, Delta tule pea, and Suisun Marsh aster (*Aster lentus*) (CDFG, 2005).

Distribution

General. Mason's lilaepsis occurs in the Sacramento-San Joaquin River Delta and sloughs, Suisun Marsh, and Lower Napa River.

Regional. Numerous occurrences are recorded in the region: 59 in Contra Costa County, 37 in San Joaquin County, and one in Alameda County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

Mason's lilaepsis is not known from the Los Vaqueros Watershed. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. Mason's lilaepsis has been documented in the vicinity of the Delta Intake Facilities site on the banks of Old River. Two small colonies were identified on the banks of Old River near the Delta Intake Facilities, 5,000 feet north and 1,200 feet south of Expanded Old River Intake and Pump Station. The south population is located about 700 feet north of the New Delta Intake and Pump Station site. This species was not detected during focused surveys and is considered absent from the project area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. No occurrences are known within this study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. No occurrences are known within this study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. The Expanded Transfer Facility study area is within annual grassland communities that do not support habitat for Mason's lilaepsis.

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Delta mudwort (*Limosella subulata*)

Description

Delta mudwort is a stoloniferous perennial herb in the figwort family (Scrophulariaceae). This tufted creeping plant has short cylindrical to awl-shaped leaves that resemble grass blades. Leaves are linear and range from 0.4 to 1.2 inches long. From May through August, plants produce solitary white to lavender-blue flowers with five rounded petal lobes (Hickman, 1993; LSA Associates, 2004). According to Jepson (1993), Delta mudwort is not native to California, but CNPS (2008) considers it native but in need of further study.

Habitat

Delta mudwort grows in muddy or sandy intertidal flats in freshwater and brackish marsh and riparian scrub communities below elevations of 10 feet (Hickman, 1993; CDFG, 2008). This species is tolerant of complete submergence under high tides. It is often associated with the special-status plant Mason's lilaepsis. Other common associates include water pygmy weed (*Crassula aquatica*), common reed, dallis grass (*Paspalum dilatatum*), broad-leaved cattail, rush, bulrush, willow, whorled marsh-pennywort (*Hydrocotyle verticillata*), and bugleweed (CDFG, 2008).

Distribution

General. Within California, Delta mudwort is restricted to the Delta region of the Central Valley in Contra Costa, Sacramento, San Joaquin, and Solano Counties. Outside of California, it is known to occur in Oregon, southern British Columbia, and along the East Coast (Hickman, 1993). There are 42 extant occurrences in the state and all reported within the last 25 years (CDFG, 2008). The Calflora database reports one sighting in Sierra County in a ditch along a roadway, which was reported to San Jose State Herbarium (Calflora, 2005). It is also reported to occur at Jepson Prairie Preserve (Jepson Prairie, 1998). No occurrences are recorded in Sierra County and at Jepson Prairie Preserve in the CNDDDB.

Regional. The majority of known occurrences are within the region. Contra Costa County has 16 occurrences and 14 are reported for San Joaquin County (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

No occurrences of Delta mudwort are known within the Los Vaqueros Watershed. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. This species is known to occur in the Delta, along Victoria Canal, just upstream from Clifton Court Forebay and about 2 to 2.5 miles southeast of the Delta Intake Facilities (CDFG, 2008). The Delta Intake Facilities are on Old River where no occurrences of Delta mudwort are known. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. No occurrences of Delta mudwort are known within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. No occurrences of Delta mudwort are known within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. No occurrences of Delta mudwort are known within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. No occurrences of Delta mudwort are known within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Showy (=Golden) madia (*Madia radiata*)

Description

Showy madia is an annual herb in the sunflower family (Asteraceae). The plant ranges from 4 to 35 inches high and is generally branched throughout. Yellow to brown colored glands cover stems and leaves. Leaves are 0.7 to 4 inches long, sometimes clasping the stem, entire or serrate, and often covered in short, bristly hairs. Flowers have glandular phyllaries, golden yellow ray flowers, and disk flowers with yellow to black anthers. Fruits lack a pappus and ray fruits are strongly curved, black, and beaked (Hickman, 1993). Showy madia blooms from March through May (CNPS, 2008).

Habitat

Showy madia occurs in valley and foothill grasslands, cismontane woodlands, and chenopod scrub from 80 to 4,000 feet in elevation. The species mostly grows in grasslands or among shrubs in adobe clay soils. Associated plant species include non-native annual grasses, Great Valley phacelia (*Phacelia ciliata*), cupped monolopia (*Monolopia major*), silvery lupine (*Lupinus argenteus* var. *argenteus*), yellow mustard (*Guillenia flavescens*), dwarf white milk-vetch (*Astragalus didymocarpus*), chia sage (*Salvia columbariae*), larkspur (*Delphinium* spp.), pine bluegrass, interior goldenbush (*Ericameria linearifolia*), allscale saltbush, common groundsel (*Senecio vulgaris*), red-stemmed filaree (*Erodium cicutarium*), California goldfields, and another special-status plant Kern mallow (*Eremalche parryi* ssp. *kernensis*) (CDFG, 2008).

Distribution

General. Showy madia is known within scattered occurrences in the western San Joaquin Valley, eastern San Francisco Bay Area, and inner South Coast Ranges from Contra Costa, Fresno, Kings, Kern, Monterey, Santa Barbara, San Benito, San Joaquin, and San Luis Obispo Counties (Hickman, 1993; CDFG, 2008). The CNDDDB reports 41 occurrences in the state, the majority of which are historical (CDFG, 2008).

Regional. Five historical occurrences in the region were all reported during or prior to 1941. Three occurrences in Contra Costa were reported from the vicinity of Antioch and Lone Tree Valley and two occurrences in San Joaquin County were reported from Lower Hospital Canyon and Corral Hollow (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

There are no records of this species in the vicinity of the Los Vaqueros Watershed (CDFG, 2008). The nearest occurrences in the region are the historical regional occurrences, about 7 to 12 miles northwest of the dam (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. The nearest known occurrences of showy madia are more than 10 miles northwest of the Delta Intake Facilities (CDFG, 2008). Habitat within the study area is

mostly disturbed and developed for agriculture, and is not suitable for this species. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta-Transfer Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

Marsh skullcap (*Scutellaria galericulata*)

Description

Marsh skullcap is a perennial herb in the mint family (Lamiaceae). Plants grow from slender rhizomes and its smooth to short-hairy stems are more or less descending and range from 8 to 32 inches long. Leaves are mostly along the stem with lanceolate to narrowly oblong-ovate blades, entire to crenate margins, truncate to lobed bases, and acute tips. The species typically flowers from June through September and produces tiny (0.06 to 0.08 inch), violet-blue to blue irregular flowers with white-mottled lower lips and inner surfaces with small protuberances (papillae) (Hickman, 1993; CNPS, 2008).

Habitat

Marsh skullcap occurs along streambanks and in lower montane coniferous forest, meadows, seeps, marshes, and swamps from near sea level up to 6,900 feet in elevation (CNPS, 2008). It occurs in association with common tule, water smartweed (*Polygonum* spp.), rushes, California loosestrife (*Lythrum californicum*), and umbrella sedge (*Cyperus eragrostis*) (CDFG, 2008).

Distribution

General. Marsh skullcap is found throughout North America. The species is relatively rare in California, which represents the southernmost distribution of the species. Marsh skullcaps are known to occur in Lake Tahoe Basin and Modoc Plateau in California (Hickman, 1993).

Regional. Three known occurrences are recorded in the south Delta in San Joaquin County. These occurrences represent a significant increase in the extent of this species' range (CDFG, 2008).

Project Area Distribution

Los Vaqueros Reservoir Expansion, In-Watershed Facilities, and Recreational Facilities.

No occurrences of marsh skullcap are known within the Los Vaqueros Watershed. The nearest occurrence is in the Delta, along Middle River, more than 12 miles east-northeast of the dam (CDFG, 2008). This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Delta Intake and Pump Station. One occurrence last seen in 1978 is reported from Middle River between Victoria Island and Upper Jones Tract and is in the vicinity of the Delta Intake Facilities, about 3.4 miles northeast (CDFG, 2008). The Old River Intake and Pump Station are on Old River, where an historic occurrence was recorded in 1949, nearly 10 miles upstream (CDFG, 2008). Tidal marsh along Old River provides suitable habitat for marsh skullcap. However, this species was not identified during focused botanical surveys in May 2007 and April 2008, and is considered absent from the study area.

Delta-Transfer Pipeline. No occurrences of marsh skullcap are known within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-LV Pipeline. No occurrences of marsh skullcap are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Transfer-Bethany Pipeline. No occurrences of marsh skullcap are known within the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Expanded Transfer Facility. No occurrences of marsh skullcap are known in the study area. This species was not detected during focused surveys and is considered absent from the study area (ESA, 2007; 2008b).

Power Supply Infrastructure. Focused protocol-level surveys failed to identify this species in the Western and PG&E study areas.

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