4.4 BIOLOGICAL RESOURCES

This Section describes the existing biological resources and evaluates potential effects on these resources that may result from Project implementation. This evaluation includes a review of special-status species; wildlife habitats; vegetation communities; and waters of the U.S., including wetlands. The results of this evaluation are based on a combination of field surveys, literature searches, and database queries. For the purposes of this Draft EIR, the "Project study area" includes the proposed pipeline alignment and a 500-foot buffer on either side of the proposed alignment, while the "Project site" is defined as the area that may be disturbed during construction, operation, and maintenance of the project. The Project site includes the six permanent aboveground facilities, staging areas, and the 100-foot-wide construction right-of-way, which would consist of the 50-foot-wide temporary and 50-foot-wide permanent easements along the length of the project (with the exception of the Powerline Road DFM, which would have a 25-foot temporary and a 35-foot-wide permanent easement).

A number of technical studies prepared for the Project were reviewed and their results incorporated into this document. These studies include the following:

- PG&E Line 406 Wetland Delineation Report (CH2MHill 2008) (Appendix E-1);
- Draft Delineation of Waters of the United States, PG&E Line 407 Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007a) (Appendix E-1);
- Addendum to the Delineation of Waters of the United States, PG&E Line 407 Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2008a) (Appendix E-1);
- Revised Delineation of Waters of the U.S. Maps for PG&E Line 407 Natural Gas Transmission Pipeline Project (Gallaway Consulting Inc. 2008b);
- Rare Plant Survey, PG&E Line 406 Project in Yolo County, California (CH2MHILL 2007) (Appendix E-2);
- Special-status and Listed Plant Report, PG&E Line 407 East Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007b) (Appendix E-3);
- PG&E Line 407 East Additional Rare Plant Survey (Gallaway Consulting, Inc. 2007c) (Appendix E-4);

- Special-status and Listed Plant Report, PG&E Line 407 West Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007d) (Appendix E-5);
- Special-status Amphibian and Reptile Species Habitat Assessment for the PG&E Natural Gas Transmission Line 406/407 Project (PG&E 2006) (Appendix E-6);
- Special-status Avian and Mammalian Species Habitat Assessment for the Pacific Gas and Electric Company Natural Gas Transmission Line 406/407 Project (PG&E 2007) (Appendix E-7);
- Fish Habitat Assessment for the Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project (TRC 2007) (Appendix E-8);
- Dry-Season Sampling for Federally Listed Large Branchiopods at the PG&E Line 407 East Project (Helm Biological Consulting 2007) (Appendix E-9);
- Wet-Season Branchiopod Sampling, PG&E Line 407 East Project (Gallaway Consulting, Inc. 2007e) (Appendix E-10);
- Valley Elderberry Longhorn Beetle Survey, PG&E Line 407 West Natural Gas Transmission Pipeline (Gallaway Consulting, Inc. 2007f) (Appendix E-11); and
- Biological Assessment for the Pacific Gas and Electric Company Line 406 and Line 407 Pipeline Project (TRC 2008) (Appendix E-12).

4.4.1 Environmental Setting

The Project study area is located in the southern Sacramento Valley, extending east from the western edge of the Valley to the City of Roseville, and traversing portions of Yolo, Sutter, Sacramento, and Placer counties. Elevation within the Project study area ranges from approximately 50 to 125 feet above mean sea level (msl). The climate within the Project study area is characterized as Mediterranean with hot, dry summers and cool, wet winters. Average annual temperatures range from July highs of 97.8 degrees Fahrenheit (°F) to January lows of 37.6 °F. Average annual precipitation is 19.35 inches; precipitation occurs as rain primarily between the months of October to April (Western Regional Climate Center [WRCC] 2008).

The Project study area is largely rural. Agricultural land uses; including dryland grain crops, deciduous orchards, irrigated row crops, and associated irrigation canals and drainage channels are dominant in the area. The Project begins in the

west at the eastern base of the Capay Hills, just north of the unincorporated community of Capay in western Yolo County. The Project extends east across the Sacramento Valley floor traversing miles of agricultural fields. The Project crosses several small tributaries to Cache Creek, most of which have been channelized and are now used to deliver irrigation water; some of these tributaries support emergent vegetation and/or narrow strips of riparian vegetation.

Just east of Interstate (I) 505, the Project enters the western edge of the Dunnigan Hills. Topography of this area is gently to steeply rolling. Vegetation historically was perennial grassland; however, this area now supports California annual grassland, which is characterized by a diverse mix of non-native annuals and native herbaceous annual and perennial plant species. Land uses in the Dunnigan Hills include grazing and dryland grain crops.

From the Dunnigan Hills, the Project continues east along the Valley floor through several miles of agricultural fields and deciduous orchard. The Project then crosses Knights Landing Ridge Cut, which supports a thin strip of riparian vegetation and dense fresh emergent wetland, and enters the Yolo Bypass near the northwest corner of Yolo County. Land within the Yolo Bypass is cultivated extensively for rice. However, in the fall, winter, and spring, particularly in heavy rainfall years, these lands are used as wintering grounds for migratory waterfowl and shore birds.

After crossing Tule Canal, the Project exits the Yolo Bypass, turns north to County Road (CR) 16/Riego Road and continues east for a short distance before crossing the Sacramento River and entering Sutter County just south of Riego Road. At this location, the Sacramento River supports a thin band of riparian vegetation that is dominated by valley oak (*Quercus lobata*) and thick stands of blue elderberry shrubs (*Sambucus mexicana*).

The Project continues east along Riego Road past cultivated rice fields before crossing Steelhead Creek. From here east, the Project crosses scattered areas of vernal pool, vernal swale, fresh water emergent wetland, and seasonal wetland. The Project terminates at the southwestern edge of the City of Roseville at the intersection of Fiddyment Road and Baseline Road.

Vegetation Communities and Wildlife Habitats

Table 4.4-1 illustrates the total acreage of vegetation communities in the Project study area and within the Project site. The descriptions of each vegetation community that follow the table are based on the classification system used in the

Guide to Wildlife Habitats (Mayer and Laudenslayer 1988). By using this classification system, it is possible to predict the wildlife species likely to occur within the Project study area using the California Wildlife Habitat Relationship System (CWHR). CWHR is based upon the Guide to Wildlife Habitats; it is a predictive model that lists species likely to occur in a given location under certain habitat conditions.

Table 4.4-1: Vegetation Communities within the PG&E Line 406/407 Natural Gas Pipeline Project Study Area and Project Site

Vegetation Community	Acreage Within Project Study Area	Acreage Within Project Site			
		Temporary Easement	Permanent Easement	Above-ground Facilities	Project Site Total
Annual Grassland / Ruderal	1256.8	64.50	68.47	1.19	134.16
Riparian Woodland	26.1	0.03	1.01	0	1.04
Valley Oak Woodland	13.3	0.13	0.46	0	0.59
Orchard	234.2	11.00	11.75	0	22.75
Irrigated Row and Field Crops	2329.5	122.77	115.73	0.36	238.86
Rice	681.5	28.73	25.93	0.62	55.28
Developed / Disturbed	569.2	14.74	103.31	0.01	118.05
Fresh Emergent Wetland	3.80	0	0.01	0	0.01
Pond	1.59	0	0	0	0
Riparian Wetland	15.39	0.04	0.75	0	0.79
Seasonal Swale	4.20	0.25	0.46	0	0.71
Seasonal Wetland	24.47	2.79	3.73	0	6.52
Vernal Pool	6.70	0	0.01	0	0.01
Vernal Swale	1.41	0	0.01	0	0.01
Willow Riparian	1.90	0.02	0.02	0	0.04
Water	63.58	1.35	4.29	0	5.64
Total	**5233.54**	**246.35**	**259.11**	**2.18**	**505.46**

Source: Galloway Consulting Inc. 2008; CH2MHill 2008.

Annual Grassland / Ruderal

Annual grasslands in the Project study area support a diversity of annual grasses and herbaceous annual and perennial forbs; perennial grasses may also still be present in this habitat. Annual grass species commonly occurring in this habitat

include wild oat (*Avena barbata, A. fatua*), rip-gut brome (*Bromus diandrus*), soft chess (*B. hordeaceous*), red brome (*B. madritensis*), Italian ryegrass (*Lolium multiflorum*), barley (*Hordeum* sp.), rabbitfoot grass (*Polypogon monspeliensis*), and hedgehog dogtail (*Cynosurus echinatus*). Some perennial grass species, such as purple needlegrass (*Nasella pulchra*) and California melic (*Melica californica*) may also occur in patches.

Although typically dominated by non-native annual grasses, annual grasslands include reservoirs for populations of native annual and perennial herbaceous plant species. These may include brodiaea (*Brodiaea* sp.), blue-dicks (*Dichelostemma capitatum*), gumplant (*Grindelia camporum*), red-maids (*Calandrinia ciliata*), cryptantha (*Cryptantha* sp.), miniature lupine (*Lupinus bicolor*), fiddleneck (*Amsinckia* sp.), bitter-cress (*Cardamine oligosperma*), whisker brush (*Linanthus ciliatus*), goldfields (*Lasthenia* sp.), valley tassels (*Castilleja attenuata*), Chinese houses (*Collinsia heterophylla*), and clarkia (*Clarkia purpurea*), among others.

Annual grasslands provide pollen and nectar sources crucial to California's native bees and other pollinators. They also provide important habitat for a variety of wildlife species. Raptors, including red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk, white-tailed kite (*Elanus leucurus*), barn owl (*Tyto alba*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), and others, commonly use open grassland areas for foraging, while species such as western meadowlark (*Sturnella neglecta*) and burrowing owl (*Athene cunicularia*), use open grassland areas for nesting. Mammals common to grassland include coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), black-tailed jackrabbit (*Lepus californicus*), and California meadow vole (*Microtus californicus*).

The 1,257 acres of annual grassland/ruderal habitat in the Project study area, occurs throughout the Dunnigan Hills in the west, and in the east from Riego Road to the eastern terminus of the Project. Approximately 134.2 acres would be disturbed under the proposed Project; of these, 1.2 acres would be permanently removed due to construction of aboveground facilities.

Riparian Woodland

Riparian woodland habitats occur in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography (Mayer and Laudenslayer 1988); therefore, trees and shrubs tolerant of seasonal flooding and high

groundwater conditions typically dominate these areas. Common overstory associates include valley oak, Oregon ash (*Fraxinus latifolia*), Fremont cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), and box elder (*Acer negundo*). Common understory associates include California wild rose (*Rosa californica*), elderberry, California wild grape (*Vitis californica*), Himalayan blackberry (*Rubus discolor*), arroyo willow (*S*alix *lasiolepis*), coyotebrush (*Baccharis pilularis*), buttonbrush (*Cephalanthus occidentalis*), and pipevine (*Aristolochia californica*), among others.

More than 225 species of birds, mammals, reptiles, and amphibians depend on California's riparian habitats (Riparian Habitat Joint Venture 2004). Riparian areas are considered the most critical habitat for conservation of Neotropical migrants and resident birds in the West. They provide important breeding and over-wintering grounds, migration stopover areas, and corridors for dispersal (Riparian Habitat Joint Venture 2004). Bird species identified as having specific conservation concerns that depend upon this habitat include Swainson's hawk, western yellow-billed cuckoo (*Coccyzus americanus occidentalus*), willow flycatcher (*Empidonax trailii*), bank swallow (*Riparia riparia*), tree swallow (*Tachycineta bicolor*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), and yellow-breasted chat (*Icteria virens*), among others (Riparian Joint Habitat Venture 2004).

Amphibians and reptiles likely to occur in this habitat include western fence lizard (*Sceloporus occidentalis*), Pacific tree frog (*Hyla regilla*), valley garter snake (*Thamnophis sirtalis fitchi*), and Gilbert's skink (*Eumeces gilberti*). Mammals that are typically found within riparian woodland habitat may include broad-footed mole (*Scapanus latimanus*), striped skunk (*Mephitis mephitis*), gray fox (*Urocyon cinereoargenteus*), pallid bat (*Antrozous pallidus*), and western red bat (*Lasiurus blossevillii*). Riparian corridors also provide important foraging habitat for a number of bat species.

Within the Project study area, the 26.1 acres of riparian woodland habitat is restricted primarily to the Sacramento River, Yolo Bypass, Knights Landing Ridge Cut, and larger irrigation channels. Of these, 1.04 acres would be disturbed under the proposed Project.

Valley Oak Woodland

Valley oak woodlands are best developed on deep, well-drained alluvial soils that usually occur in valley bottoms. In the Central Valley, valley oak woodlands often

occur adjacent to annual grasslands or form borders along agricultural lands. In the foothills surrounding the valley, valley oak woodland intergrade with blue oak woodland or blue oak-foothill pine habitat; near stream courses it typically intergrades with valley foothill riparian habitat (Mayer and Laudenslayer 1988).

Valley oak woodland canopy is dominated almost exclusively by valley oak. Co-occurring tree species include sycamore (*Platanus racemosa*), black walnut (*Juglans nigra*), interior live oak (*Quercus wislizenii*), boxelder (*Acer negundo*), and blue oak (*Quercus douglasii*). This habitat often supports a well-developed shrub understory.

Oak woodlands, including valley oak woodlands, are known to support an especially diverse community of bird species, including acorn woodpecker (*Melanerpes formicivorus*), blue-gray gnatcatcher (*Polioptila caerulea*), oak titmouse (*Baeolophus inornatus*), western bluebird (*Sialia mexicana*), California quail (*Callipepla california*), rufous-sided towhee (*Pipilo erthrophthalmus*), red-shouldered hawk (*B. lineatus*), wild turkey (*Meleagris gallopavo*), Lewis's woodpecker (*Melanerpes lewisii*), Nuttall's woodpecker (*Picoides nuttallii*), white-breasted nuthatch (*Sitta carolinensis*), California thrasher (*Toxostoma redivivum*), western screech owl (*Megascops kennicottii*), and California towhee (*P. crissalis*). Mammal species common in valley oak woodlands includes gray fox, mule deer (*Odocoileus hemionus*), dusky-footed woodrat (*Neotoma fuscipes*), gray squirrel (*Sciurus griseus*), western red bat, and hoary bat (*Lasiurus cinereus*).

The 13.3 acres of valley oak woodland within the Project study area is restricted to the Sacramento River, Tule Canal, and other larger irrigation canals. Of these, 0.59 acre would be disturbed under the proposed Project.

Orchard

Orchards in California are typically habitats dominated by a single tree species. Depending on the tree type and pruning methods, they are usually low, bushy trees with an open understory to facilitate harvest. Orchards include trees, such as, almonds (*Prunus* sp.), apples (*Pyrus malus*), apricots (*Prunus armeniaca*), cherries (*Prunus avium*), figs (*Ficus* sp.), nectarines (*Prunus persica*), peaches (*Prunus* sp.), pears (*Pyrus communis*), pecans (*Carya* sp.), pistachios (*Pistacia vera*), plums (*Prunus* sp.), pomegranates (*Punica granatum*), and walnuts (*Juglans* sp.) (Mayer and Laudenslayer 1988).

Because they lack both structural and plant species diversity, these habitats generally support common wildlife species, including northern flicker (*Colaptes*

auratus), scrub jay (*Aphelocoma californica*), America crow (*Corvus brachyrhynchos*), plain titmouse (*Parus inornatus*), Brewer's blackbird (*Euphagus cyanocephalus*), house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), cedar waxwing (*Bombycilla cedrodorum*), yellow-rumped warbler (*Dendroica coronata*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), and mule deer.

There are 234.2 acres of orchards, including almond and walnut, scattered throughout the Project study area (with the exception of the Dunnigan Hills). Of these, 22.75 acres would be disturbed under the proposed Project.

Irrigated Row and Field Crops

Row crops are located on flat to gently rolling terrain. In California, irrigated row and field crops include asparagus (*Asparagus officinalis*), broccoli (*Brassica* sp.), carrots (*Daucus carota*), cauliflower (*Brassica* sp.), melons (*Cucamis* sp.), onions (*Allium* sp.), peppers (*Capsicum annum*) tomatoes (*Lycopersicon esculentum*), strawberries (*Frageria* sp.), and potatoes (*Solanum* sp.), among others. Most irrigated crops are annuals, which are planted in spring and harvested in summer or fall; sometimes they are planted in rotation with other irrigated crops or with dryland grain crops. This vegetation community also includes dryland grain crops such as barley, rye, oats, and wheat. These crops are annual and are often rotated with irrigated crops. They are typically planted in the fall and harvested in the spring (Mayer and Laudenslayer 1988).

Row and field crops are established on the state's most fertile soils, which historically supported an abundance of wildlife unequalled in other sites. Croplands have greatly reduced wildlife habitat richness and diversity in these areas of California. Many species of rodents and birds have adapted to croplands and are controlled by fencing, trapping, and poisoning to prevent excessive crop losses (Mayer and Laudenslayer 1988). Although raptors, including Swainson's hawk, forage in these areas, in general they do not provide significant habitat value. Additional information regarding species such as Swainson's hawk is provided in Table 4.4-3, below.

Approximately 2,329.5 acres of irrigated row and field crops occur throughout the Project study area; tomato appears to be the dominant row crop. Because crops are rotated, the diversity of these crops is likely greater than that observed during a single field visit. Approximately 238.9 acres of irrigated row and field crops would be

disturbed under the proposed Project; of these, 0.4 acre would be permanently removed due to construction of aboveground facilities.

Rice

Rice and wild rice (*Zizania aquatica*) are flood-irrigated crops that are seed producing annual grasses. Commercial rice generally is only a couple of feet tall, whereas commercially grown wild rice may be 6 feet tall or taller. Rice is usually grown in leveed fields that are flooded during most of the growing period; soils are allowed to dry to allow for crop maturation and to facilitate harvesting. Rice is planted in spring and harvested in fall. It usually produces 100 percent canopy closure as it matures (Mayer and Laudenslayer 1988).

Since the historic loss of wetlands throughout the Central Valley, California rice fields have been a source of food and habitat for a large number of waterfowl species. An average of 350 pounds per acre (lbs/acre) of unharvested rice grain coupled with 250 lbs/acre of small invertebrates, tubers, edible shoots, and seeds provide a food value nearly equivalent to that produced by natural wetlands. Thus waterfowl have become highly dependent on rice fields (and other grain fields) for food (Hill 1999).

In the Project study area, the 681.5 acres of federally-jurisdictional rice fields occur between Powerline Road and Natomas Road and along the DFM. Approximately 55.28 acres of rice would be disturbed under the proposed Project; of these, 0.6 acre would be permanently removed due to construction of aboveground facilities.

Developed / Disturbed

Disturbed / developed areas are habitats that have been altered significantly. They include urban development, rural residences, paved surfaces, roads (including dirt roads), and landscaped areas associated with these developments. Paved and unpaved roads and rural residences are scattered throughout the length of the project. There are typically a variety of horticultural plant species associated with these areas. Common trees include sweet gum (*Liquidambar styraciflua*), Chinese pistache (*Pistacia chinensis*), white mulberry (*Morus alba*), European hackberry (Celtis australis), Chinese flame tree (*Koelreuteria bipinnata*), and crape myrtle (*Lagerstroemia hybrid*), among others. A wide range of shrubs (e.g., rose, hydrangea) and herbaceous plants (e.g., iris, begonia, dahlia) are typical.

A number of wildlife species have adapted to developed landscapes and are common to urban and backyard suburban environments. They include raccoon, eastern fox squirrel (*Sciurus niger*), American crow, house finch, dark-eyed junco (*Junco hyemalis*), mourning dove, northern mockingbird, white-crowned sparrow (*Zonotrichia leucophrys*), and European starlings (*Sturnus vulgaris*) among others.

Approximately 569.2 acres of disturbed / developed areas occur throughout the Project study area. Approximately 118.05 acres would be disturbed under the proposed Project; of these, approximately 0.1 acre would be permanently removed due to placement of aboveground facilities.

Fresh Emergent Wetland

Fresh emergent wetland habitats are most common on level to gently rolling topography; however, they occur on virtually all exposures and slopes provided a basin or depression is saturated or at least periodically flooded. Fresh emergent wetland vegetation zones characteristically occur as a series of concentric rings that follow basin contours and reflect the relative depth and duration of flooding. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed (Mayer and Laudenslayer 1988).

Emergent vegetation consists of rooted plants that have parts extending above the water surface for at least part of the year, and are intolerant of complete inundation over prolonged periods. Water depths vary but rarely exceed 2 meters (6.6 feet) for long periods. Ponding is a condition in which free water covers the soil surface (e.g., in a closed depression) and is removed only by percolation, evaporation, or transpiration.

Fresh emergent wetland is characterized by erect, rooted herbaceous hydrophytes. These species include tule (*Scirpus* sp.), cattail (*Typha* sp.), rushes (*Juncus* sp.), sedges (*Carex* sp.), water plantain (*Alisma plantago-aquatica*), and arrowhead (*Sagittaria* sp.).

Fresh emergent wetlands support a number of small to medium wildlife species and provide food, cover, and water for over 160 species of bird. Species commonly encountered include red-winged blackbird (*Agelaius phoeniceus*), marsh wren (*Cistothorus palustris*), garter snake (*Thamnophis sirtalis*), northern harrier (*Circus cyaneus*), Pacific chorus frog (*Pseudacris regilla*), raccoon, and tree swallow (*Tachycineta bicolor*).

There are several fresh emergent wetlands scattered throughout the Project study area. The largest of these is associated with Curry Creek near the intersection of Baseline Road and Watt Avenue in Placer County (Appendix E-1; Exhibits 42, 46, 52, and 53). Approximately 3.8 acres of fresh emergent wetland occur throughout the Project study area; of these, 0.01 acre would be disturbed under the proposed Project. These features are considered federally jurisdictional under section 404 of the Clean Water Act.

Pond

Ponds are natural or created features that hold water year-round. They are deep enough to maintain open water free of emergent vegetation. There is often associated fresh emergent wetland in shallower areas, near the pond edges.

Because ponds provide open water habitat and associated emergent habitat, they are utilized in some way by nearly all local wildlife for water, food, shelter, or breeding. In addition to those found in fresh emergent wetlands, species may include mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), American coot (*Fulica americana*), western pond turtle (*Emmys marmorata*), California red-legged frog (*Rana draytonii*), double-crested cormorant (*Phalacrocorax auritus*), and a diverse invertebrate community that provides a food base for many of these species.

There are five ponds totaling 1.59 acres in the Project study area. One non-federally-jurisdictional pond is located near Line 406, and four ponds, which are considered federally jurisdictional features, occur along the Line 407 corridor (see Appendix E-1, Exhibits 46 and 47). None of these ponds would be disturbed under the proposed Project.

Riparian Wetland

Riparian habitats occur in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography; therefore, trees and shrubs tolerant of seasonal flooding and high groundwater conditions typically dominate these areas. Riparian wetlands generally are found at the interface between riverine habitat and riparian woodland habitat. Species that utilize these habitats are the same as those associated with riparian woodlands.

There are two federally jurisdictional riparian wetland types within the Project study area: riparian habitat (15.4 acres) and willow riparian habitat (1.9 acres). (Appendix E-1, Exhibits 24 and 25). Approximately 0.79 acres of riparian wetland and 0.04 acre of willow riparian would be disturbed under the proposed Project.

Seasonal Wetlands and Swales

Seasonal wetlands and swales are defined by the positive indication of three wetland parameters: hydrophytic vegetation, hydric soils, and hydrology (e.g., ponding). These features allow water to pond long enough to support hydrophytic vegetation and hydric soils. Seasonal wetlands tend to lack standing water during the late summer months, or during prolonged dry periods. They support hydrophytic species, such as spikerush (*Eleocharis*) that require longer and typically deeper inundation periods than those of vernal species. These features show positive indicators for hydric soils including mottling, an organic stratum, concretions, and oxidized root channels. Seasonal wetlands may be fed or connected by low drainage pathways called “swales.”

Because of their ephemeral nature, seasonal wetlands and swales generally do not support a unique suite of wildlife. However, seasonal wetlands do provide habitat for invertebrate communities whose diversity varies with size of the wetland and duration of ponding, among other factors.

Approximately 24.47 acres of federally jurisdictional seasonal wetlands and 4.20 acres of federally jurisdictional seasonal swales occur within the Project study area, primarily in the eastern portion (see Appendix E-1, Exhibits 39 through 55). Of these, approximately 6.52 acres of seasonal wetland and 0.71 acre of seasonal swale would be disturbed under the proposed Project.

Vernal Pools and Vernal Swales

In addition to supporting positive indicators for hydrophytic vegetation, hydric soil, and wetland hydrology, vernal pools exhibit unique characteristics. Vernal pools form where there is a soil layer below or at the surface that is impermeable or nearly impermeable. Precipitation and surface runoff become trapped or “perched” above this layer. Hardpans are formed by leaching, re-deposition, and cementing of silica materials from high in the soil horizon to a lower (“B”) horizon. In addition, vernal pools typically occur in landscapes that, at a broad scale, are shallowly sloping or nearly level, but on a finer scale may be quite bumpy or uneven.

Since appropriate combinations of climate, soil, and topography often occur over continuous areas rather than in isolated spots, vernal pools in the Central Valley tend to occur in clusters called "complexes." Within these complexes, pools may be fed or connected by swales. Swales are often themselves seasonal wetlands that remain inundated with water for much of the wet season, but not long enough to support strong vernal pool characteristics. Vernal pools may remain inundated until spring or early summer, and gradually dry down during the spring, often forming a unique "bathtub ring" of flowers from endemic vernal pool plants blooming successively at the pool margins.

Vernal pools are distinguished from other types of seasonal wetlands by a unique suite of plant species. In addition, there are a number of invertebrate species that are closely associated, and in some cases endemic, to vernal pool habitats, many of which are federally listed species. They include vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpool shrimp (*Lepidurus packardi*), and midvalley fairy shrimp (*Branchinecta mesovallensis*). Other closely associated species include Pacific chorus frog, western spadefoot (*Spea hammondii*), and California tiger salamander (*Ambystoma californiense*).

There are 6.7 acres of federally jurisdictional vernal pool and 1.41 acres of federally jurisdictional vernal swale habitat within the Project study area. Vernal pools and vernal swales occur primarily in the eastern portion of the Project study area (Appendix E-1, Exhibits 39 through 55). Up to 0.01 acre of vernal pool would be disturbed under the proposed Project.

Water

Water habitats include those aquatic habitats not discussed above. Within the Project study area, these include riverine, irrigation ditches and canals, ephemeral drainages, and roadside ditches. There are a total of 63.58 acres of water features in the Project study area; of these, approximately 5.64 acres would be disturbed under the proposed project. The federal jurisdictional status of each of these types of water features is discussed in the following Section, entitled Waters of the U.S., Including Wetlands.

Riverine habitats include rivers and streams. The temperature of riverine habitat is not constant; in general, small, shallow streams tend to follow, but lag behind air temperatures, warming and cooling with the seasons. Rivers and streams with large areas exposed to direct sunlight are warmer than those shaded by trees, shrubs and

high, steep banks (Mayer and Laudenslayer 1988). Variation in velocity, temperature and other abiotic factors generally determines the biotic diversity of riverine habitat. Species that depend upon these habitats include river otter (*Lutra canadensis*), various waterfowl, and fish species such as chinook salmon (*Oncorynchus tshawytscha*), and steelhead (*Oncorynchus mykiss*).

Within the Project study area, riverine habitat is restricted to the Sacramento River, Curry Creek, Knights Landing Ridge Cut, Cache Creek, Tule Canal, and Steelhead Creek. The largest of these features is the Sacramento River, which cuts through the western portion of the Project study area flowing north to south towards the San Francisco Bay. The Sacramento River encompasses approximately 12.29 acres (all of which is federally jurisdictional) of the Project study area, 0.58 acre of which would be disturbed under the proposed Project (Appendix E-1, Exhibit 24).

Irrigation canals transfer and deliver water to and from farmers for irrigating their agricultural fields. Due to the constant presence of water in some of the irrigation canals, hydrophytic vegetation has begun to grow in the canals, forming fresh water emergent wetlands and riparian habitats. These canals are under the management of the farmers and the local water district, however, and are subject to occasional maintenance and clearing of the vegetation to prevent the choking-up of the canals. Within the Project study area, there are approximately 42.86 acres of federally jurisdictional canal and 0.27 acre of non-federally-jurisdictional canal. Up to 1.55 acres of jurisdictional canal would be disturbed under the proposed Project.

Ephemeral and roadside drainages are unvegetated drainages that are seasonal in nature. These features carry stormwater flows during the rainy season and are dry during the remainder of the year. Ephemeral drainages are characterized by the presence of a well-defined channel that may show some scour. During storm events, adjacent vegetation may be flattened by high flows, and sediments and other debris may be deposited outside of the channel. Within the Project study area, there are approximately 2.4 acres of federally jurisdictional ephemeral drainages and 2.68 acre of non-federally-jurisdictional ephemeral and roadside drainages. Up to 0.04 acre of jurisdictional ephemeral drainage would be disturbed under the proposed Project.

Waters of the U.S., Including Wetlands

Jurisdictional delineations of waters of the U.S., including wetlands, were conducted throughout the Project study area on July 21, 24 through 28, August 10 and 25,

2006, April 4 and 5, 2007; on May 3, 8, and 14, June 21, and July 31, 2007; and on January 30-31, March 3, April 17, and May 5, 2008 (Gallaway Consulting 2007a, 2008a, 2008b), and on March 25 and 28, 2008 (CH2MHill 2008). A series of maps showing the locations of all delineation features is provided in Appendix E-1. The total acreage of federally-jurisdictional wetlands and other waters of the U.S. within the Project study area and within the area that would be subject to disturbance (Project site) is summarized below in Table 4.4-2. Definitions and brief descriptions of the "other waters of the U.S." terminology follows this table. Descriptions of jurisdictional wetland features were included above, under vegetation communities.

Table 4.4-2: Federally Jurisdictional Waters of the U.S., Including Wetlands, Within the PG&E Line 406/407 Natural Gas Pipeline Project Study Area and Project Site

Federally Jurisdictional Features				
Designation	Acres Within Project Study Area	Acres Within the Project Site		
		Temporary Easement	Permanent Easement	Total
Other Waters of the US				
Pond	0.11	0.00	0.00	0.00
Non-Relatively Permanent Water	2.4	0.01	0.03	0.04
Relatively Permanent Water	42.86	0.32	1.23	1.55
Traditionally Navigable Water	12.29	0.00	0.58	0.58
Total	**57.65**	**0.33**	**1.84**	**2.17**
Wetlands				
Fresh Emergent Wetland	3.80	0.00	0.10	0.10
Riparian Wetland	15.392	0.04	0.75	0.79
Seasonal Swale	4.20	0.25	0.46	0.71
Seasonal Wetland	24.47	2.79	3.73	6.52
Vernal Pool	6.70	0.00	0.10	0.10
Vernal Swale	1.41	0.00	0.01	0.01
Willow Riparian	1.90	0.02	0.02	0.04
Rice	681.45	28.73	26.55	55.28

Federally Jurisdictional Features				
Designation	Acres Within Project Study Area	Acres Within the Project Site		
		Temporary Easement	Permanent Easement	Total
Total	**739.32**	**31.83**	**31.72**	**63.55**
Total All Features	**796.97**	**28.73**	**26.55**	**65.95**
Source: Galloway Consulting Inc. 2007, 2008; CH2MHill 2008.				

Other Waters of the U.S.

Other Waters of the U.S. are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features that exhibit an ordinary high-water mark but lack positive indicators for one or more of the three wetland parameters (i.e., hydrophytic vegetation, hydric soil, and wetland hydrology) (33 CFR 328.4). The above definition was applied while delineating all Other Waters of the U.S. Drainages exhibit an ordinary high water mark and contained bed, bank, and/or scour morphology.

Pond

While ponds are not typically considered jurisdictional features, hydrological connectivity is apparent for four ponds in the Project study area (0.11 acres). Pond 1 is located within a jurisdictional seasonal swale feature and Pond 2 is directly connected to a jurisdictional Relative Permanent Water (RPW). The connectivity is not apparent from review of aerial photos for the other two pond features; however, during the site visit, USACE project manager, Erin Hess, stated that these two ponds should be identified as jurisdictional features. Pond 3 is part of a series of ponds that overflows into a remnant portion of a historic drainage located in an adjacent agricultural field. This series of ponds may be connected to jurisdictional features within or outside of the assessment area through roadside ditches or via subsurface flow. Pond 4 is a single pond located near a residence and may be connected to jurisdictional features within or outside of the assessment area through roadside ditches or via subsurface flow (Appendix E-1).

Non-Relatively Permanent Waters

A water body is “non-relatively permanent” if it does not hold flows for at least three months out of the year. Non-relatively permanent waters (NRPW) within the Project

study area include ephemeral drainages and smaller irrigation ditches that do not hold water for more than 3 months out of the year. There are a total of 2.40 acres of NRPWs scattered throughout the length of the Project study area, predominantly traversing annual grassland/ruderal habitat (Appendix E-1).

Relatively Permanent Waters

A water body is "relatively permanent" if its flow is year round or its flow is continuous at least "seasonally," (e.g., typically 3 months). Wetlands adjacent to a "relatively permanent" tributary are also jurisdictional if those wetlands directly abut such a tributary. Relatively permanent waters (RPW) within the Project study area include Tule Canal, Knights Landing Ridge Cut, the main tributary to Knights Landing Ridge Cut, Natomas East Main Drainage Canal, Curry Creek, and a few of the larger irrigation canals which hold water for more than 3 months out of the year. These irrigation canals transfer and deliver water to and from farmers for irrigating their agricultural fields.

The Knights Landing Ridge Cut flows into Tule Canal, which in turn flows directly into the Sacramento River. The other larger unnamed irrigation canals along the western portion of the Project flow directly into Tule Canal, Knights Landing Ridge Cut, or the Sacramento River. In the eastern portion of the Project, the Natomas East Main Drainage Canal flows directly into the American River further south of the survey area and Curry Creek flows into the Natomas East Main Drainage Canal north of the survey area. The other larger unnamed irrigation canals in the eastern portion of the Project flow either into the East Drainage Canal or West Drainage Canal; these two canals merge further south of the Project area to form the Natomas East Main Drainage Canal, which then flows directly into the Sacramento River.

Due to the constant presence of water in some of the irrigation canals, hydrophytic vegetation has begun to grow in the canals, forming fresh water emergent wetlands and riparian habitats. These canals are under the management of the farmers and the local water district, however, and are subject to occasional maintenance and clearing of the vegetation to prevent the choking-up of the canals.

There are a total of 42.86 acres of RPWs scattered along the length of the Project study area that traverse annual grassland/ruderal, irrigated row and field crop, riparian woodland, rice, orchard, and developed/disturbed areas (Appendix E-1).

Traditionally Navigable Waters

Traditionally Navigable Waters (TNWs) includes all of the "navigable water of the United States," defined in 33 Code of Federal Regulations (CFR) section 329, and by numerous decisions of the Federal courts, plus all other waters that are navigable-in-fact. As defined in 33 CFR section 329, "Navigable waters of the United States are those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. A determination of navigability, once made, applies laterally over the entire surface of the water body, and is not extinguished by later actions or events which impede or destroy navigable capacity." The one traditional navigable water (TNW) found within the Project study area is the Sacramento River. It cuts through the western portion of the Project study area flowing north to south towards the San Francisco Bay. The Sacramento River encompasses approximately 12.29 acres of the Project study area and traverses riparian woodland habitat (Appendix E-1, Exhibit 24).

Other Sensitive Resources

The Project study area contains a large number of native and horticultural trees. Many of these trees, because of their size, are suitable for nesting use by raptor species, including Swainson's hawk. Other wildlife that rely on trees include other nesting birds (migratory songbirds) and roosting bat species. In the Central Valley, nest trees are a limiting resources and their loss is considered significant.

Recent aerial photography (NAIP 2005) was reviewed to estimate the total number of potential nesting trees within the Project site (100-foot right-of-way) as well as within 250 feet of the Project site. Approximately 206 trees occur within the Project site and would be disturbed due to construction of the proposed Project. An additional 1,967 trees occur within 250 feet of the Project site.

In addition to their potential habitat value, native oak trees receive further protection under state and county tree protection ordinances, which generally recognize the value of oak trees to both the natural and human environments. Oaks bring with them a host of species that rely on acorns as a food source particularly during winter months.

Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized in some fashion by Federal, State, or other agencies as deserving special consideration. Some of these species receive specific legal protection pursuant to Federal or State endangered species legislation. Others lack such legal protection, but have been characterized as "sensitive" because of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special-status species" in this EIR, following a convention that has developed in practice but has no official sanction. The various categories encompassed by the term, and the legal status of each, are discussed later in this section under Section 4.4.2, Regulatory Setting.

For the purposes of this EIR, special-status species are those species:

- Listed as threatened or endangered under the Federal Endangered Species Act (ESA) and those species formally proposed or candidates for listing;
- Listed as threatened or endangered under California ESA (CESA) or candidates for listing;
- Designated as endangered or rare pursuant to California Fish and Game Code (section 1901);
- Designated as fully protected pursuant to California Fish and Game Code (sections 3511, 4700, and 5050);
- Designated as a species of special concern by California Department of Fish and Game (CDFG); and
- Plants listed as rare under the California Native Plant Protection Act or considered by the California Native Plant Society (CNPS) as List 1A, 1B, or 2 species.

Methodology

This evaluation of biological resources includes a review and inventory of potentially occurring special-status species (including those officially designated as

"endangered" or "threatened"), wildlife habitats, vegetation communities, and jurisdictional waters of the U.S. The setting descriptions provided in this section are based upon a combination of field reconnaissance, literature reviews, and database queries. The reference data reviewed for this report include the following:

- Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California, 7.5-minute topographic quadrangles (U.S. Department of the Interior, Geological Survey);
- CDFG California Wildlife Habitat Relationship System (CWHR) (CDFG 2005);
- California Natural Diversity Database (CNDDB), Rarefind computer program for the following 7.5-minute quadrangles: Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California (CDFG 2008);
- Inventory of Rare and Endangered Plants for the following 7.5-minute quadrangles: Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California (CNPS 2004);
- Special Animals List (California Department of Fish and Game, 2008a);
- Endangered and Threatened Animals List (California Department of Fish and Game 2008b)
- Special Plants List (CDFG 2008c); and
- List of Federal Endangered and Threatened Species that May Be Affected by Projects in the Esparto, Madison, Woodland, Knights Landing, Verona, Grays Bend, Taylor Monument, Rio Linda, Citrus Heights, Pleasant Grove, and Roseville, California 7.5-minute quadrangles (U. S. Fish and Wildlife Service [USFWS] 2008).

Special-Status Plant Species

The 26 special-status plant species reviewed for this document are listed in a table provided in Appendix E-13. This list was compiled based upon query results from CNDDB and the CNPS on-line inventory, as well as a list obtained from the U.S.

Fish and Wildlife Service (USFWS). CNDDB-recorded occurrences of special-status plant species within 5 miles of the Project site are shown in Figure 4.4-1.

Several regionally-occurring species were determined not to have potential to occur within the Project site either because the distribution of the species does not extend into the Project study area, or because the habitat and/or microsite conditions (e.g., serpentine soils, mesic sites) required by the species are not present.

Surveys for the special-status plant species having potential to occur within the Project study area were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. One special-status plant species, dwarf downingia (*Downingia pusilla*), was identified within the Project study area during protocol-level surveys (Gallaway Consulting 2007b). Five occurrences of dwarf downingia totaling approximately 1,541 individuals were mapped along Riego Road in the eastern portion of the Project study area (Appendix E-3, Figure 3). A detailed description of this species' life history and ecology is provided below.

Dwarf Downingia

Dwarf downingia (*Downingia pusilla)*, a strict endemic of the vernal pool hydrologic regime, is an annual member of the bellflower family (*Campanulaceae*). Mature plants can be erect and less than 1.2 inches in height at maturity; or longer, branched stems (up to 6 inches) may sprawl horizontally forming relatively dense colonies, or mix with the other sprawling vernal pool species. (Dittes and Guardino Consulting 2005).

Dwarf downingia is a self-fertilizing species; natural dispersal of seeds likely occurs via flowing water, transport on feet and feathers of waterfowl, and in mud on hooves and legs of livestock. Occurrences are associated mainly with northern claypan vernal pools in central Sacramento County, with northern hardpan vernal pools in the foothills of the Sierra Nevada, and with vernal pools of the interior valleys of the Coast Range in Napa and Sonoma counties. Throughout this area, the species occurs on a variety of landforms and soil associations (Dittes and Guardino Consulting 2005).

Dwarf downingia is a strict endemic of the vernal pool hydrologic cycle, and occupies more commonly occurring, smaller and/or shallower vernal pools with more "flashy" hydrology. Plant species that commonly co-occur with dwarf downingia include Fremont's goldfields (*Lasthenia fremontii*), smooth goldfields (*L. glaberrima*), dwarf

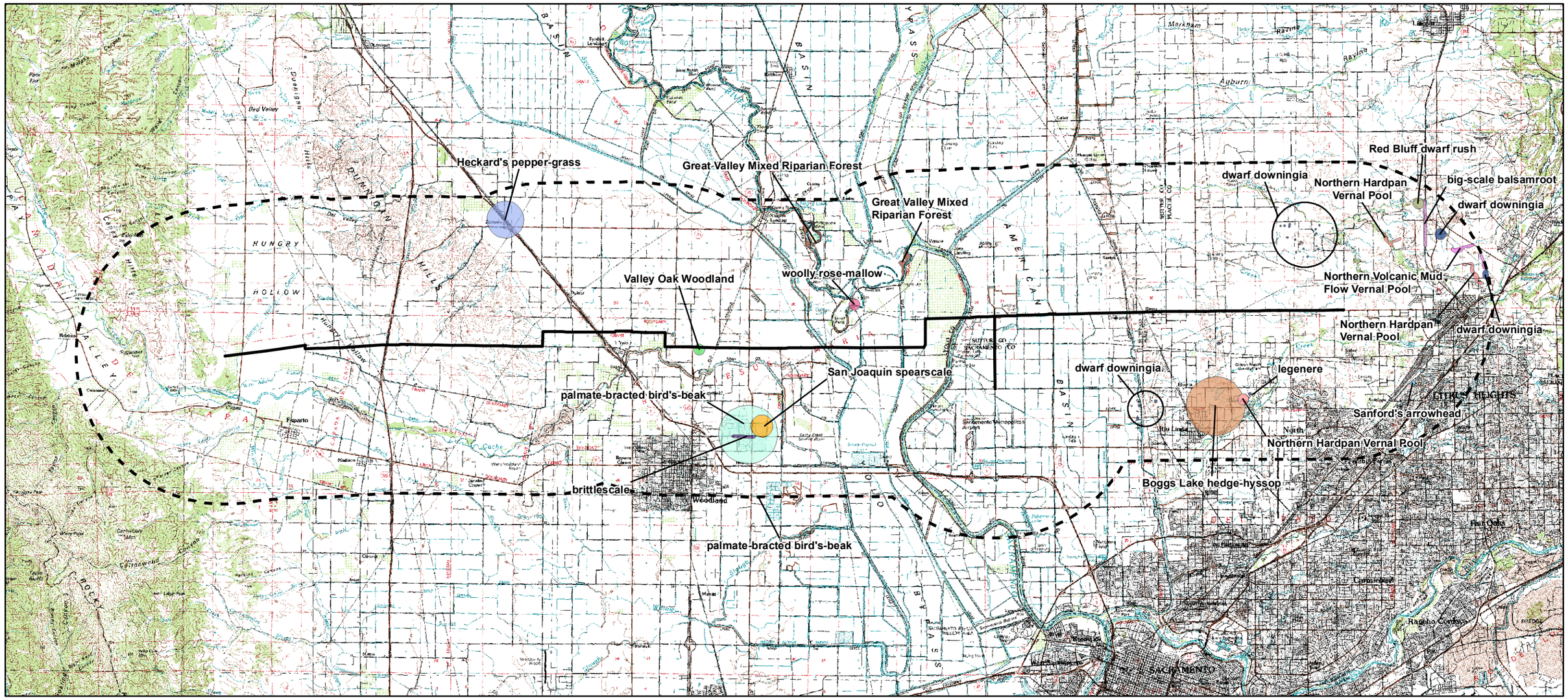
wooly marbles (*Psilocarphus brevissimus*), annual hairgrass (*Deschampsia danthonoides*), popcorn flower (*Plagiobothrys* sp.), double-horned downingia (*Downingia bicornuta*), American pillwort (*Pilularia americana*), quillwort (*Isoetes howellii*), and coyote thistle (*Eryngium* sp.), among others (Dittes and Guardino Consulting 2005).

Potential direct threats to dwarf downingia include: loss of vernal pool habitat to agricultural or urban/industrial land-use conversions; construction and maintenance of firebreaks, roads, and utility corridors; inappropriate livestock grazing regimes; grassland fires; recreational vehicles; equestrian and pedestrian traffic, and refuse dumping. Potential indirect threats to dwarf downingia include: hydrological alteration of sub-watersheds by surrounding developments and land uses; shifts in competitive interactions; windblown refuse accumulation; point and non-point source water pollution; air pollution, and global climate change (Dittes and Guardino Consulting 2005).

Special-Status Wildlife Species

The special-status wildlife species reviewed for this document are listed in a table provided in Appendix E-13. This list was compiled based on the USFWS list and query results from CNDDB and CWHR. The CWHR is a predictive model that lists species likely to occur in a given location under certain habitat conditions. It also predicts the suitability of those conditions for reproduction, cover, and feeding for each modeled species. Information fed into the model for this Project includes location (Yolo, Sacramento, Sutter, and Placer counties) and habitat type (irrigated row crop, annual grassland, etc.). The CWHR does not include any information on plants, fish, invertebrates, or rare natural communities. Several regionally-occurring species were determined not to have potential to occur within the Project area, either because the distribution of the species does not extend into the Project vicinity, or because the habitat or habitat elements (e.g., caves, tall snags) required by the species are not present.

Based upon results of the species review, there are 29 special-status wildlife species with potential to occur within the Project. Descriptions of these species are provided in Table 4.4-3. Recorded occurrences of special-status wildlife species within 5 miles of the Project site are shown in Figure 4.4-2.



Source: California Dept. of Fish and Game CNDDB Data May 2008, CaSIL USGS 100k Scale DRGs, MBA GIS 2008.

Legend

- Proposed Pipeline
- 5-Mile Buffer

Common Name (***Scientific Name***)

- Boggs Lake hedge-hyssop (*Gratiola heterosepala*)
- Heckard's pepper-grass (*Lepidium latipes var. heckardii*)
- Red Bluff dwarf rush (*Juncus leiospermus var. leiospermus*)
- San Joaquin spearscale (*Atriplex joaquiniana*)
- Sanford's arrowhead (*Sagittaria sanfordii*)
- big-scale balsamroot (*Balsamorhiza macrolepis var. macrolepis*)
- brittlescale (*Atriplex depressa*)
- dwarf downingia (*Downingia pusilla*)
- legenere (*Legenere limosa*)
- palmate-bracted bird's-beak (*Cordylanthus palmatus*)
- woolly rose-mallow (*Hibiscus lasiocarpus*)
- Great Valley Mixed Riparian Forest
- Northern Hardpan Vernal Pool
- Northern Volcanic Mud Flow Vernal Pool
- Valley Oak Woodland

NORTH

0 2.5 5 10 Miles

Michael Brandman Associates

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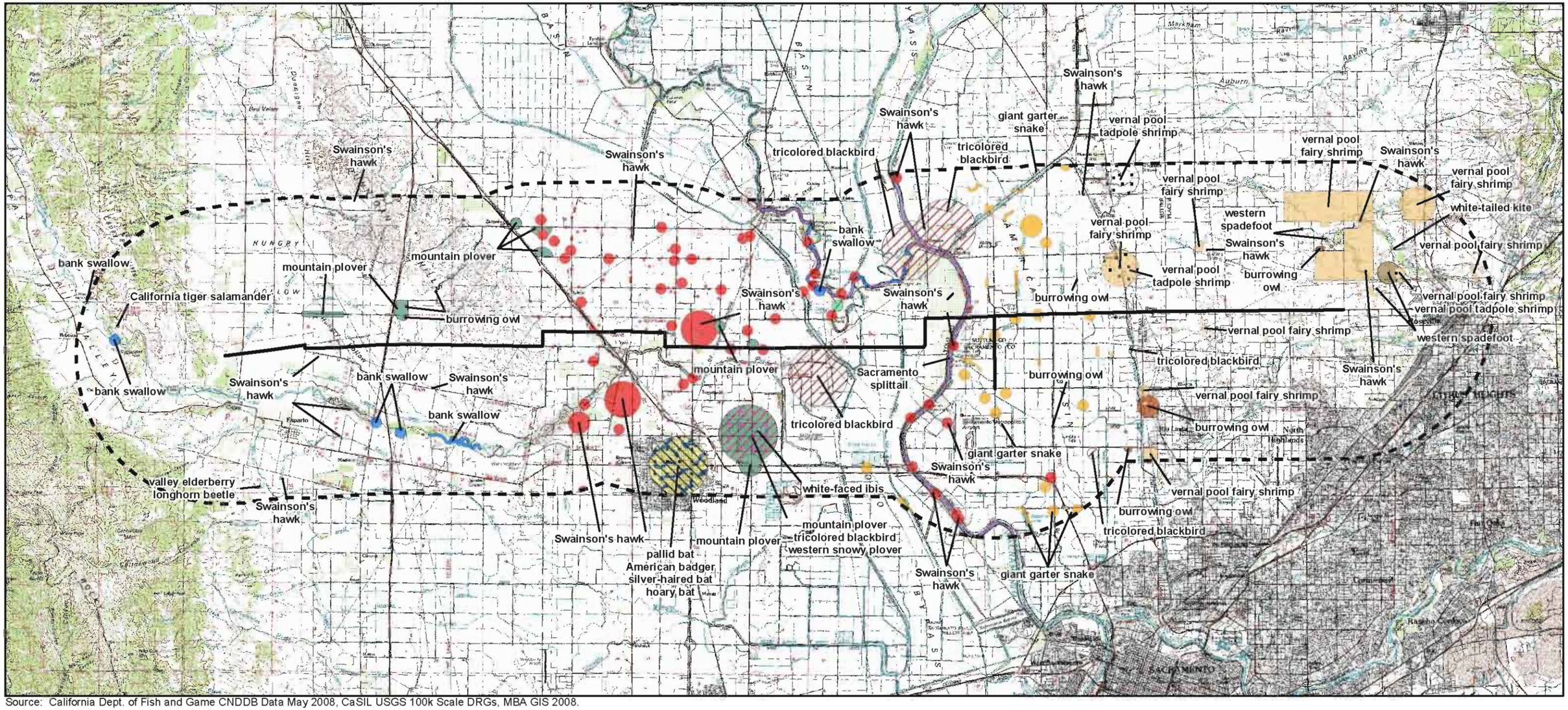
Figure 4.4-1
CNDDB-Recorded Occurrences of Sensitive Habitats and Special-Status Plant Species within Five Miles of the Project Site



Source: California Dept. of Fish and Game CNDDB Data May 2008, CaSIL USGS 100k Scale DRGs, MBA GIS 2008.

Legend

- Proposed Pipeline
- 5-Mile Buffer

Common Name	(*Scientific Name*)
American badger	(*Taxidea taxus*)
California tiger salamander	(*Ambystoma californiense*)
Sacramento splittail	(*Pogonichthys macrolepidotus*)
Swainson's hawk	(*Buteo swainsoni*)
bank swallow	(*Riparia riparia*)
burrowing owl	(*Athene cunicularia*)
giant garter snake	(*Thamnophis gigas*)
hoary bat	(*Lasiurus cinereus*)
mountain plover	(*Charadrius montanus*)
pallid bat	(*Antrozous pallidus*)
silver-haired bat	(*Lasionycteris noctivagans*)
tricolored blackbird	(*Agelaius tricolor*)
valley elderberry longhorn beetle	(*Desmocerus californicus dimorphus*)
vernal pool fairy shrimp	(*Branchinecta lynchi*)
vernal pool tadpole shrimp	(*Lepidurus packardi*)
western snowy plover	(*Charadrius alexandrinus nivosus*)
western spadefoot	(*Spea hammondii*)
white-faced ibis	(*Plegadis chihi*)
white-tailed kite	(*Elanus leucurus*)

NORTH

0 2.5 5 10 Miles

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Figure 4.4-2
CNDDB-Recorded Occurrences of Special-Status Wildlife Species within Five Miles of the Project Site

1 **Table 4.4-3: Special-Status Wildlife Species Assessment Table**

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Invertebrates			
Branchinecta conservatio Conservancy fairy shrimp	FT/—	Conservancy fairy shrimp occur primarily in vernal pools, seasonal wetlands that fill with water during fall and winter rains and dry up in spring and summer. Typically, the majority of pools in any vernal pool complex are not inhabited by the species at any one time. Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary.	**Moderate.** Dry- and wet-season protocol surveys were conducted for the proposed Project on November 5, 6, and 18, 2006 by Helm Biological Consulting (2007), and between December 21, 2006 and May 18, 2007 by Gallaway Consulting, Inc. (2007b), to determine the presence or absence of sensitive vernal pool branchiopods, including the conservation fairy shrimp. Cysts belonging to the genus *Branchinecta* were found during dry season surveys; however, due to the similarities in cyst morphology between multiple species belonging to the genus Branchinecta, the presence or absence of this species (*Branchinecta conservatio)* could not be concluded based on the dry season survey alone. Wet season surveys were conducted to substantiate the findings of the dry season survey and complete USFWS protocol survey requirements. This species was not found during any of the wet season surveys and is presumed to be absent from the project site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Branchinecta lynchi Vernal pool fairy shrimp	FT/—	Vernal pool fairy shrimp occur primarily in vernal pools, seasonal wetlands that fill with water during fall and winter rains and dry up in spring and summer. Typically, the majority of pools in any vernal pool complex are not inhabited by the species at any one time.	**Moderate.** Dry- and wet-season protocol surveys were conducted for the proposed Project on November 5, 6, and 18, 2006 by Helm Biological Consulting (2007), and between December 21, 2006 and May 18, 2007 by Gallaway Consulting, Inc (2007b), to determine the presence or absence of sensitive vernal pool branchiopods, including the vernal pool fairy shrimp. Similar to the conservancy fairy shrimp, the presence of this

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary.	species (*Branchinecta lynchi*) could not be concluded based on the dry season survey alone. Wet season surveys were conducted to substantiate the findings of the dry season survey and complete USFWS protocol survey requirements. This species was not found during any of the wet season surveys and is presumed to be absent from the project site. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT/—	Associated with elderberry trees (*Sambucus* spp.) in California's Central Valley during its entire life cycle. The adults eat the elderberry foliage until about June when they mate. Upon hatching the larvae then begin to tunnel into the tree where they will spend 1-2 years eating the interior wood, which is their sole food source.	**High.** Twenty-three elderberry shrubs are located within 100 feet of the Project site. Valley elderberry longhorn beetle surveys were conducted for the proposed Project on May 8 and 14, 2007 by Gallaway Consulting, Inc (2007a). Although surveys were conducted during the adult emergence season (March through June), no individual beetles were observed. However, a total of 10 valley elderberry longhorn beetle emergence holes were observed on several of the elderberry bushes that occur within 100 feet of the proposed alignment for Line 407. Based on these results, this species is presumed present. There is a CNDDB-recorded occurrence of this species approximately 1 mile north of the Project (CNDDB 2008).
Amphibian and Reptiles			
Actinemys marmorata Western pond turtle	—/CSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. May move overland up to 325 feet for egg laying.	**Moderate.** The larger canals, sloughs, and creeks throughout the project area provide suitable habitat for the species. Upland areas surrounding these waterways potentially provide suitable nesting habitat. Habitat assessment surveys for the western pond turtle and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006 (PG&E 2006). Although not

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
			detected during surveys, this species has a moderate potential to occur along the canals, sloughs, and creeks throughout the Project site and therefore assumed to be present. There are no CNDDB-recorded occurrences of this species within 5 miles south of the Project site (CNDDB 2008).
Ambystoma californiense California tiger salamander	FE/SSC	From low elevations of the Coast Ranges from Sonoma County to Santa Barbara County and in the Central Valley from Colusa County to Tulare County. Breeds in ephemeral pools and permanent waterbodies within grassland and oak woodland habitats where small mammal burrows occur. Small mammal burrows and upland habitats adjacent to aquatic breeding habitats are frequently used as aestivation sites during the non-breeding season.	**High.** Habitat assessment surveys for the California tiger salamander and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006. Although not observed or otherwise detected during the surveys, this species was determined to have a high potential to use the ephemeral pools and waterways, and adjacent upland habitats that occur along the proposed alignment as breeding and dispersal habitat (PG&E 2006); and therefore is assumed present. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Spea hammondii Western spadefoot toad	—/SSC	Inhabits lowlands in open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, chaparral, sandy washes, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Breeds in temporary pools and quiet streams.	**High.** Habitat assessment surveys for the western spadefoot toad and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006 (PG&E 2006). Although not detected during surveys, this species was determined to have a moderate to high potential to occur along the vernal pool and seasonal wetland habitat within the Line 407 East segment of the Project site; and therefore is assumed to be present.

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Thamnophis gigas Giant garter snake	FT/CT	Marshes, sloughs, irrigation channels, and occasionally in slow-moving streams. Requires emergent vegetation for cover.	**High.** The Project contains suitable foraging, breeding, and refugia habitat for this species. Habitat assessment surveys for the giant garter snake and other reptile and amphibian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006 (PG&E 2006). Although this species was not detected during habitat assessment surveys, it was determined to have a high potential to occur based on the presence of suitable foraging, breeding, and refugia habitat (PG&E 2006). Furthermore, this species has been previously observed and recorded in 42 separate instances in the lowland areas in the proposed alignment for Line 407 East and West (CNDDB 2008) and therefore is assumed to be present. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Birds			
Agelaius tricolor Tricolored blackbird	—/SSC	Largely endemic to California, most numerous in the Central Valley and nearby vicinity. Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	**Moderate.** Freshwater marsh habitats and scattered brushy thickets provide marginal nesting habitat. the vegetation, open grassland, and agricultural habitats provide suitable foraging habitat. Habitat assessment surveys for the tricolored blackbird and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, and December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to nest and/or forage within the freshwater marsh and riparian type habitats that occur along the proposed alignment (PG&E 2007) and is therefore assumed to be present. There are several CNDDB-recorded occurrences of his species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Aquila chrysaetos Golden eagle	—/SSC, CFP	Breeds on cliffs or in large trees or electrical towers, forages in open habitats.	**High.** The species was observed during surveys in the Dunnigan Hills. Habitat assessment surveys for the golden eagle and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was detected during surveys and was determined to have a high potential to forage within the rolling grassland habitat along the Line 406 East segment (PG&E 2007). This species was also determined to have a potential to nest within the isolated trees and tree groves that occur on and in the immediate vicinity of the proposed alignment (PG&E 2007). There are up to 1,967 suitable nesting trees within 250 feet of the proposed Project, 206 of which occur within the Project site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Asio flammeus Short-eared owl	—/SSC	Forages in open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, and saline and fresh emergent wetlands. Nests on dry ground in a depression concealed in vegetation and lined with grasses, forbs, sticks, and feathers, and occasionally in burrows.	**Moderate.** Grasslands in the L406 (Dunnigan Hills) and Line 407 East areas and open agricultural areas within all three segments provide suitable nesting and foraging habitat. Habitat assessment surveys for the short-eared owl and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, suitable nesting and foraging habitat was confirmed throughout the open grasslands and agricultural areas along the proposed alignment (PG&E 2007) and is therefore assumed to be present. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Athene cunicularia Western burrowing owl	—/SSC	Open, dry annual or perennial grasslands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals.	**High.** Habitat assessment surveys for burrowing owl and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed during surveys and has a high potential to forage and nest throughout the open grasslands and agricultural areas within the Line 406 and Line 407 West segments. The species is not expected to occur within the Line 407 East segment (PG&E 2007). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Branta canadensis leucopareia Aleutian Canada goose	—/SSC	Nests on the Aleutian islands in Alaska and migrates south to the Sacramento and San Joaquin Valleys in winter. Populations are recovering from historically low numbers attributed to the introduction of the Arctic fox to their island breeding grounds. Uses agricultural areas, grasslands, and wetlands. Primarily observed on private ranches near the Stanislaus and San Joaquin rivers.	**Moderate.** Habitat assessment surveys for the Aleutian Canada goose and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to winter within the grassland habitat and agricultural land that occurs throughout the proposed alignment (PG&E 2007) and is therefore assumed to be present. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Buteo regalis Ferruginous hawk	—/SSC	Habitats include agricultural flatlands, open prairies, deserts, and semi-arid grasslands featuring scattered trees, rocky mounds or outcrops. May roost or nest on utility structures, trees, shrubs, cliffs, or ground outcroppings. May roost communally and forage in groups on the ground during winter migration. Forages in grasslands and occasionally in other open habitats during migration and winter.	**High.** Habitat assessment surveys for the ferruginous hawk and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not detected during habitat assessment surveys, suitable wintering and foraging habitat was determined to exist within the open grassland and agriculture areas that occur along the proposed alignment for the Line 406 and Line 407 West segments. This species is not expected to occur within the Line 407 East segment based on the lack of an adequate prey base. Suitable breeding and foraging habitat also occurs within the riparian and oak woodland habitats. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Buteo swainsoni Swainson's hawk	—/CT	Nests in open areas with stands of few, dense-topped trees in juniper-sage flats, riparian areas, and oak savannas. Forages in open grasslands, grain, and alfalfa fields (supporting rodent populations) adjacent to nesting opportunities.	**High.** Suitable nesting and foraging habitat is present throughout the scattered trees, open grasslands, and agricultural areas of the Project site. Habitat assessment surveys for the Swainson's hawk and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed on numerous occasions during surveys and suitable nesting and foraging habitat was confirmed throughout the scattered trees, open grasslands, and agricultural areas along the proposed alignment (PG&E 2007). There are up to 1,967 suitable nesting trees within 250 feet of the proposed Project, 206 of which occur within the Project site. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Charadrius montanus Mountain plover	—/SSC	Winter resident. Found on short grasslands and plowed fields of the Central and Imperial valleys, in foothill valleys west of San Joaquin Valley, and in plowed fields of Los Angeles and western San Bernardino counties. Uses open grasslands, plowed fields with little vegetation, and open sagebrush areas.	**High.** Habitat assessment surveys for mountain plover and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was identified foraging in the vicinity of the Line 406 segment during surveys, and was determined to have a moderate potential to winter within the grasslands and agricultural fields that occur along the proposed alignment. There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Circus cyaneus Northern harrier	—/SSC	Winter resident throughout most of the state; year-round in the Central Valley and Coast Range. Forages in marshes, grasslands, and ruderal habitats; nests in extensive marshes and wet fields or grasslands.	**High.** Habitat assessment surveys for the northern harrier and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was detected during surveys, and was determined to have a high potential to nest and/or forage within the open grassland and agricultural habitats throughout the proposed alignment (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Coccyzus americanus occidentalis Western yellow-billed cuckoo	—/CE	Nests in riparian forests along broad, lower floodplains of larger river systems. Requires broad, well-developed, low-elevation riparian woodlands of primarily mature cottonwoods and willows. Extirpated from a large portion of the historical range in California with current breeding populations restricted to four major areas (the Sacramento Valley,	**Moderate.** Habitat assessment surveys for the western yellow-billed cuckoo and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to nest and/or forage within the mature riparian habitat that occurs along the proposed alignment for Line 407 West (PG&E 2007) and is therefore assumed present. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		Kern River, Lower Colorado River and the Prado Basin).	
Elanus leucurus White-tailed kite	—/SSC, CFP	Nests or roosts in dense, broad-leafed deciduous trees. Forages in herbaceous lowlands with variable tree growth and dense populations of voles.	**High.** Habitat assessment surveys for the white-tailed kite and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed during surveys and suitable nesting and foraging habitat was confirmed throughout the scattered trees, open grasslands, and agricultural areas along the proposed alignment (PG&E 2007). Some of the 1,967 potential nesting trees within 250 feet of the proposed Project, 206 of which occur within the Project site, may be suitable for this species. There are several CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Grus canadensis tabida Greater sandhill crane	—/CT, CFP	Breeds in wetlands and forages in meadows, irrigated pastures, fields, and marshes. Roost together at night in shallow water and commonly feed on grains, seeds, aquatic invertebrates, insects, small reptiles, amphibians, and rodents. Historically wintered on California's Central Valley wetlands. Currently winters in lowland areas of Sacramento, San Joaquin, and Imperial Valleys.	**Moderate.** Habitat assessment surveys for the greater sandhill crane and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to winter within the open grassland and agricultural habitat that occurs throughout the proposed alignment (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
Haliaeetus leucocephalus Bald eagle	—/CE, CFP	Year-round at ocean shorelines, lake margins, and river courses. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine.	**Moderate.** No breeding habitat occurs within the Project site. Habitat assessment surveys for bald eagle and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was not detected during habitat assessment surveys and no breeding habitat was determined to exist on or in the vicinity of the Project site. However, this species was determined to have a moderate potential to migrate and potentially forage through the general Project area (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Lanius ludovicianus Loggerhead shrike	—/SSC	Found in a variety of habitats with open areas, available perches, and dense shrubs for nesting.	**Moderate.** Habitat assessment surveys for the loggerhead shrike and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was not detected during surveys, however suitable foraging and nesting habitat was determined to exist within the Project site. Therefore, this species was determined to have a moderate potential to nest and forage within the Project site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Numenius americanus Long-billed curlew	—/SSC	Breeds in upland shortgrass prairies and wet meadows in northeastern California; coastal estuaries, open grasslands, and croplands are used in winter	**Moderate.** Habitat assessment surveys for the long-billed curlew and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to winter within the open grassland and agricultural habitat that occurs throughout the proposed alignment (PG&E

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
			2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Plegadis chihi White-faced ibis	—/SSC	Feeds in emergent wetlands (often freshwater), wet meadows, flooded pastures or croplands. Nest sites are located in dense emergent wetlands. Usually forms small nesting colonies. Recently documented population recovery (>6,000) within the Kern NWR (San Joaquin Valley) after marsh restoration efforts. Ranges across southwestern North America.	**High.** Habitat assessment surveys for the white-faced ibis and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was observed along the Line 407 East segment during surveys, and was determined to have a high potential to nest and/or forage within the wetland habitat, grasslands, and agricultural fields that occur throughout the proposed alignment (PG&E 2007). Nesting habitat in the area is marginal due to narrow and sparse nature of emergent wetland vegetation; breeding is not likely to occur. There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Progne subis Purple martin	—/SSC	Nests in open and semi-open areas, including savannas, cultivated lands, fields, parks, pastures. Found near lakes, marshes, towns and suburbs. Utilizes natural cavities in trees and cliff niches. Additionally will nest in artificial housing, structures, or landscape features. Often forms colonies.	**Moderate.** Habitat assessment surveys for the purple martin and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not observed during surveys, it was determined to have a moderate potential to nest and/or forage within the scattered isolated trees, small tree groves, and anthropogenic structures that occur along the proposed alignment (PG&E 2007). There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Riparia riparia Bank swallow	—/CT	In summer, restricted to riparian, lacustrine, and coastal areas with vertical banks, bluffs, and cliffs with fine-textured or sandy soils, into which	**Moderate.** Habitat assessment surveys for the bank swallow and other avian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). Although this species was not

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		it digs nesting holes. In migration, flocks with other swallows over many open habitats.	observed during surveys, suitable nesting and foraging habitat was confirmed throughout the vertical or near vertical canals and stream banks along the proposed alignment (PG&E 2007). There are several CNDDB records of the species in the project area (records are along the large river systems in the region). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Mammals			
Antrozous pallidus Pallid bat	—/SSC	Broadly distributed in California from sea level to over 6,000 feet. Roosts in caves, buildings, rock crevices, and tree hollows. Overwinters in summer habitats at lower elevations.	**Moderate.** Habitat assessment surveys for the pallid bat and other mammalian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). This species was not observed during surveys; however, it was determined to have a moderate potential to roost and forage throughout the anthropogenic structures, riparian areas, and scattered trees and groves within the proposed alignment (PG&E 2007). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Lasiurus blossvillii Western red bat	—/SSC	Solitary, foliage-roosting bat. Day roosts in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. Closely associated with riparian habitats; cottonwood stands are considered preferred roost sites. Migrate south in the winter, and return north for breeding. Forage through a wide range of habitat types, feeding on	**Moderate.** Suitable roosting and foraging habitat occurs within the project site. This species is known to occur along the Sacramento River. Suitable roost sites and foraging habitat occurs within the scattered trees, woodland and forest habitats, and riparian and aquatic habitats that occur throughout the proposed alignment. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

Scientific Name Common name	Listing Status USFWS/ CDFG	General Habitat Description	Potential for Impacts
		moths, beetles, bees, wasps, flies, cicadas, treehoppers, and other sucking insects.	
Lasionycteris noctivagans Silver-haired bat	—/SSC	Occur throughout North America scarce through much of its range, and never very abundant. Migratory, moving north through Arizona and New Mexico in the spring. Will use buildings when migrating in prairie states.	**Moderate.** Suitable roost sites and foraging habitat occurs within the scattered trees, woodland and forest habitats, and riparian and aquatic habitats that occur throughout the proposed alignment. This species has a moderate potential to occur based on the presence of suitable habitat and proximity of the Project site to known occurrences. There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).
Taxidea taxus American badger	—/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**High.** Habitat assessment surveys for the American badger and other mammalian species were conducted by PG&E biologists on June 12 and 13, November 30, December 5 and 7, 2006; and on June 29, 2007 (PG&E 2007). A dead badger was observed on I-505 within the vicinity of the project site during surveys. This species was determined to have a moderate potential to occur within the proposed alignment for Line 406 West near the Dunnigan Hills (PG&E 2007). There are CNDDB-recorded occurrences of this species within 5 miles of the Project site (CNDDB 2008).

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Fisheries

The special-status fish species reviewed for this document are listed in Table 4.4-4. This list was compiled based upon query results from the CNDDB, as well as species lists obtained from the USFWS and the National Marine Fisheries Service (NOAA Fisheries Service, or NMFS), as provided in the fish habitat assessment effort for the proposed Project. CNDDB-recorded occurrences of special-status fish species within 5 miles of the Project site are shown in Figure 4.4-2.

Regionally-occurring species were determined not to have potential to occur within the Project site either because the distribution of the species does not extend into the Project study area, or because the important habitat elements required by the species are not present.

Reconnaissance-level surveys were conducted as part of a fish habitat assessment for the proposed Project by TRC Companies, Inc on July 20, 2006 and June 21, 2007 (Appendix E-7). The surveys targeted portions of the proposed alignment and vicinity that have the potential to support special-status fish species known to the region and their habitat. Specific conditions that were considered during the fish habitat assessment included important habitat suitability elements such as seasonal flow and water quality characteristics, riparian cover, substrate composition, and accessibility of the waterway, including the presence of any in-stream structures that may create barriers to fish passage.

Seven special-status fish species were determined likely to occur within the Project site within all or portions of the year: green sturgeon (*Acipenser medirostris*), river lamprey (*Lampetra ayresii*), Central Valley steelhead (*Oncorhynchus mykiss*), Central Valley fall- and late-fall-run chinook (*Oncorhynchus tsawytscha*), Central Valley spring-run chinook (*Oncorhynchus tsawytscha*), Sacramento River winter-run chinook (*Oncorhynchus tsawytscha*), and Sacramento splittail (*Pogonichthys macrolepidotus*).

1 **Table 4.4-4 Special-Status Fish Species Assessment Table**

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
Fish			
Acipenser medirostris Green sturgeon	FT/SSC	Anadromous species; large portions of life history are spent in the ocean. Migrations by adults into freshwater occur between late February and late July, with a spawning period generally ranging from March to July. Spawning takes place in deep, fast-moving water with temperatures between 46.5 and 57 degrees Fahrenheit (deg. F). Preferred spawning substrate is likely large cobble, but can range from clean sand to bedrock. Juveniles typically migrate out to sea before the end of their second year, primarily during summer and fall.	**High.** This species has the potential to occur within the Sacramento River between February and July. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Lampetra ayresii River lamprey	—/SSC	Lampreys are anadromous, entering the ocean in late spring and spending three to four months in saltwater before migrating back to freshwater in autumn. Spawning takes place between February and May in tributary streams to select	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass during wet months.

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
		larger rivers (Sacramento/San Joaquin). Presumably, adults need clean, gravelly riffles in permanent streams for spawning. Ammocoetes require sandy, silty backwaters or stream edges in which to bury themselves, where water quality is continuously high and temperatures do not exceed 77 deg. F.	
Oncorhynchus mykiss Central Valley steelhead	FT/—	Steelhead trout in the Central Valley enter freshwater from the ocean when winter rains provide large amounts of cold water for migration and spawning. They typically spawn in clean gravel within tributaries to mainstem rivers and return to the ocean after spawning, if possible. For one to two years after hatching, juveniles are found in cool, clear, fast-moving permanent streams and rivers where there is ample riparian cover or undercut banks, and where invertebrate life is abundant.	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. Critical habitat for the Central Valley steelhead has been designated in the Sacramento River, Yolo Bypass, and in Steelhead Creek approximately 6 miles south of the project crossing site. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
Onchorhynchus tshawytscha Central Valley spring-run chinook	FT/CT	Spring-run chinook salmon enter the Sacramento River as immature fish in spring and early summer and migrate into headwaters where they hold in pools until they spawn. Juveniles emerge from early November through the following April, and typically rear in freshwater for 3 to 15 months. Juveniles emigrate from the tributaries to estuarine waters and the ocean between mid November and June. Some fish remain in the stream until the following October and emigrate as yearlings, usually with the onset of storms starting in October through the following March. Optimal temperatures for growth and survival of chinook range between 41 and 66 deg. F. At approximately 71 to 73 deg. F, major mortality is experienced in wild populations.	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. Critical habitat has been designated in the Sacramento River and in the Yolo Bypass. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).
Oncorhynchus tshawytscha Central Valley fall- and late-fall-run chinook	—/SSC	Fall-run chinook migration into freshwater occurs in late summer and early fall. Valley reaches of rivers are often too warm to support salmon in summer. Spawning	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
		typically occurs on gravel bars within a few days or weeks of entering freshwater. Adults die after spawning. Late-fall-run chinook typically enter the river as four- to five-year-old fish beginning in October, and hold in freshwater for one to three months before spawning. Adapted for spawning in reaches of mainstem rivers, such as the upper Sacramento, which remain cold and deep enough in summer months for rearing of juveniles. Juveniles typically migrate to the ocean after 7 to 13 months in freshwater.	
Onchorhynchus tshawytscha Central Valley winter-run chinook	FE/CE	Winter-run chinook typically migrate upstream as immature fish during winter and spring, then spawn several months later in summer. Most winter-run chinook return to freshwater as three-year-olds, and spawn in clear, cool water released from Shasta Reservoir. Juveniles remain in fresh water for 5 to 10 months, followed by an intermediate time in estuarine waters before entering the ocean. Optimal	**High.** Potential to occur within the Sacramento River year-round and potentially the Yolo Bypass and Steelhead Creek during wet months. Critical habitat for winter-run chinook has been designated in the Sacramento River from Kenswick Dam to the San Francisco Bay. There are no CNDDB-recorded occurrences of this species within 5 miles of the Project (CNDDB 2008).

Scientific Name Common name	Listing Status NMFS-USFWS/ CDFG	General Habitat Description	Potential for Impacts
		temperatures for growth and survival of chinook range between 41 and 66 deg. F.	
Pogonichthys macrolepidotus Sacramento splittail	—/SSC	Sacramento splittail are primarily freshwater fish but can tolerate low salinities. They are commonly found in temperatures ranges from 41 to 75 deg. F, but can tolerate temperatures up to 91.5 deg. F for short periods. Adults move upstream during the winter and spring to forage and spawn. Spawning occurs between late February and early July in areas of flooded vegetation (Yolo and Sutter bypasses, low-lying parts of delta islands, and river mouths), though it is most frequent in March and April. Most splittail larvae remain near the spawning sites for 10 to 14 days before moving into offshore habitats.	**High.** Potential to occur within the Sacramento River in the winter and spring, and potentially within the Yolo Bypass during wet months. There are CNDDB-recorded occurrences of this species within the Project site in the Sacramento River (CNDDB 2008).

Invasive Plant Species

California's long history of settlement from oversea countries resulted in the introduction of many non-native plant species. Most non-native plants that were introduced early in California's history first established at coastal sites near ports and around missions and other settlements (Bossard et al 2000). These introduced species spread rapidly throughout the state with the movement of goods and people, but also greatly though movement of grazing livestock. A 1998 estimate puts the number of non-native plant species within the state at 1,045 (Bossard 35 al 2000).

There are many non-native species that occur throughout the Sacramento Valley that are represented in the project study area. They include the common non-native plant species such as filaree (*Erodium*), brome grasses (*Bromus*), oat grasses (*Avena*), mustards (*Brassica*, *Raphanus*, etc.), and clovers (*Trifolium*, *Medicago*, *Melilotus*, etc.) among others. However, there are also several non-native plant species present within the study area that are considered noxious weeds, which have potential to result in significant changes to the plant communities in which they occur. Noxious plant species that occur regionally in upland habitats include Chinese tallow (*Sapium sebifera*), tree-of-heaven (*Ailanthus altissimum*), yellow star-thistle (*Centaurea solstitialis*), medusa-head grass (*Taeniatherum caput-medusae*), fennel (*Foeniculum vulgare*), and barbed goatgrass (*Aegilops triuncialis*). With the exception of Chinese tallow and barbed goatgrass, all of these species have been reported in technical reports as occurring within the project study area. There are also several noxious plant species that occur regionally in wetland habitats. They include giant reed (*Arundo donax*), red sesbania (*Sesbania punicea*), Spanish broom (*Spartium junceum*), Pampas grass (*Cortaderia seloana*), manna grass (*Glyceria declinata*), and floating primrose-willow (*Ludwigia peploides*). Of these, only giant reed and floating primrose-willow were observed within the study area. Noxious weeds are spread by mechanical equipment, and the resulting disturbance often facilitates successful establishment of these species into new areas.

4.4.2 Regulatory Setting

Federal

Special-Status Species

Federal Endangered Species Act (ESA)

The USFWS (and NMFS for anadromous fish species) administers the Federal ESA, which provides a process for listing species as either threatened or endangered, and

methods of protecting them. The ESA defines as "endangered" any plant or animal species that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is a species that is likely to become endangered in the near future. A "proposed" species is one that has been officially proposed by USFWS for addition to the Federal threatened and endangered species list.

Section 9 of the ESA prohibits "take" of threatened or endangered species. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The presence of any federally threatened or endangered species that are in a Project area generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. Under the regulations of the ESA, the USFWS may authorize "take" when it is incidental to, but not the purpose of, an otherwise lawful act.

The Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess or attempt to do the same to any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the United States, Great Britain, Mexico, Japan, and the countries of the former Soviet Union.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). In addition, the law requires fishery management councils to include descriptions of EFH and potential threats to EFH in all Federal fishery management plans. The Pacific Fishery Management Council amended the Pacific Coast Salmon Plan in 2000 to include descriptions of EFH for different salmonid species. EFH for chinook salmon was defined for freshwater, estuarine, and marine waters.

Freshwater EFH for chinook salmon consists of five major components, including spawning and incubation, juvenile rearing, juvenile migration corridors, and adult migration corridors and adult holding habitat. Important features of essential habitat for spawning, rearing, and migration include substrate composition, water quality, water quantity, depth and velocity, channel gradient and stability, food, cover and habitat complexity, space, access and passage, and floodplain and habitat connectivity.

Chinook salmon EFH includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California. Salmon EFH excludes areas upstream of longstanding naturally impassible barriers (i.e., natural waterfalls in existence for several hundred years), but includes aquatic areas above all artificial barriers except specifically cited impassible dams.

Pacific Coast Salmon Plan

The Pacific Coast Salmon Plan guides management of commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California. This fishery management plan covers the coastwide aggregate of natural and hatchery salmon species that is contacted by salmon fisheries in the exclusive economic zone (EEZ) off the coasts of Washington, Oregon, and California. In addition, the plan contains requirements and recommendations with regard to EFH for the managed stocks.

The EFH includes marine areas within the EEZ, as well as estuarine and freshwater habitat within the internal waters of Washington, Oregon, California, and Idaho.

While all species of salmon fall under the jurisdiction of this plan, it currently only contains fishery management objectives for chinook, Coho, pink (odd-numbered years only), and any salmon species listed under the Federal ESA that is measurably impacted by Pacific Fishery Management Council fisheries.

Waters of the U.S., Including Wetlands

Clean Water Act

Section 404 of the Federal Clean Water Act, which is administered by U.S. Army Corps of Engineers (USACE), regulates the discharge of dredge and fill material into waters of the United States (U.S.). The USACE has established a series of nationwide permits that authorize certain activities in waters of the U.S., if a proposed activity can demonstrate compliance with standard conditions. Normally, the USACE requires an individual permit for an activity that would affect an area equal to or in excess of 0.5 acre of waters of the U.S. Projects that result in impacts to less than 0.5 acre can normally be conducted pursuant to one of the nationwide permits, if consistent with the standard permit conditions. The USACE also has discretionary authority to require an Environmental Impact Statement for Projects that result in impacts to an area between 0.1 and 0.5 acre. Use of any nationwide permit is contingent on the activities having no impacts to endangered species.

Section 401 of the Clean Water Act requires that "any applicant for a federal permit for activities that involve a discharge to waters of the State shall provide the federal permitting agency with a certification from the State, in which the discharge is proposed, that states the discharge will comply with the applicable provisions under the federal Clean Water Act." Therefore, before the USACE will issue a Section 404 Permit, applicants must apply for and receive a Section 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB).

State

Special-Status Species

California Endangered Species Act (CESA)

The CDFG administers the CESA. The State of California considers an endangered species as one whose prospects of survival and reproduction are in immediate jeopardy. A threatened species is considered as one present in such small numbers

throughout its range that it is likely to become an endangered species in the near future in the absence of special protection or management. A rare species is one that is considered present in such small numbers throughout its range that it may become endangered if its present environment worsens. Section 2080 of the Fish and Game Code prohibits "take" of any species that the commission determines to be an endangered species or a threatened species. Take is defined in section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California Endangered Species Act (CESA) allows for take incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species populations and their essential habitats. Sections 2081(b) and (c) of the CESA allow the Department to issue an incidental take permit for a State listed threatened and endangered species only if specific criteria are met.

CEQA Guidelines Section 15380

Threatened and endangered species are protected by specific Federal and State statutes. In addition, the CEQA Guidelines section 15380 provides that a species not listed on the Federal or State lists of threatened or endangered species may be considered rare or endangered under CEQA review if the species can be shown to meet certain specified criteria.

Sensitive plant species are afforded protection under CEQA through the CNPS inventory of rare, threatened, and endangered plants of California. CNPS is a California resource conservation organization that has developed an inventory of California's sensitive plant species. This inventory summarizes information on the distribution, rarity, and endangerment of California's vascular plants. The inventory is divided into four lists based on the rarity of the species. In addition, the CNPS provides an inventory of plant communities that are considered sensitive by the State and Federal resource agencies, academic institutions, and various conservation groups. Determination of the level of sensitivity is based on the number and size of remaining occurrences as well as recognized threats.

California Fish and Game Code, Sections 3503, and 3511, 4700 ,5050, and 5515

The CDFG administers the California Fish and Game Code. There are particular sections of the Code that are applicable to natural resource management. For example, section 3503 of the Code states it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3511 of the Code lists fully

protected bird species, where the CDFG is unable to authorize the issuance of permits or licenses to take these species. Under section 4700, fully protected mammals or parts thereof may not be taken or possessed at any time. Species included in sections 5050 (reptiles and amphibians) and 5515 (fish) do not occur in the Project study area.

Native Plant Protection Act

The Native Plant Protection Act (California Fish and Game Code sections 1900-1913) prohibits taking, possessing, or selling within the state any rare, threatened, or endangered plants as defined by the CDFG. Where state-listed plants are present on private property, the CDFG must be notified 10 days prior to destruction to allow for salvage of individuals and/or populations.

Recovery Plan for the Sacramento/San Joaquin River Delta Native Fishes

The Recovery Plan for the Sacramento/San Joaquin River Delta Native Fishes (Native Fishes Recovery Plan) by NMFS includes recovery and restoration objectives for eight species of fish that utilize the Sacramento/San Joaquin Delta for a significant segment of their life history, including Central Valley spring-run chinook salmon, Central Valley fall- and late-fall-run chinook salmon, winter-run chinook salmon, Sacramento splittail, Delta smelt, and green sturgeon (USFWS 1996).

The Native Fishes Recovery Plan delineated actions believed to be necessary for the restoration and recovery of the eight species. Recovery and restoration criteria were designed to monitor the effectiveness of the recovery actions, to determine when a species has stabilized to a secure level, and to determine when a species qualifies for delisting.

Though the Native Fishes Recovery Plan was designed to monitor and restore the eight species, many of them have had further declines in numbers and have been elevated in listing status since the plan was published.

Steelhead Restoration and Management Plan for California

The purpose of the Steelhead Restoration and Management Plan for California (Steelhead Management Plan) by CDFG (CDFG 1996) is to assure the maintenance, restoration, and enhancement of California's steelhead stocks. The Steelhead Management Plan provides guidelines for steelhead restoration and management to be integrated into current and future planning processes for specific

river and stream systems. It also identifies those needs specific to steelhead and is intended to augment current anadromous fish restoration plans.

The Steelhead Management Plan focuses on restoration of native and wild stocks of steelhead, as these stocks have the greatest value for the species as a whole in terms of maintaining genetic and biological diversity.

The Steelhead Management Plan focuses on the following five strategies to restore native stocks of steelhead:

- Restore degraded habitat;
- Restore access to historic habitat that is presently blocked;
- Review angling regulations to ensure that steelhead adults and juveniles are not over-harvested;
- Maintain and improve hatchery runs, where appropriate; and
- Develop and facilitate research to address deficiencies in information on freshwater and ocean life history, behavior, habitat requirements, and other aspects of steelhead biology.

The Steelhead Management Plan includes recommendations for the management of American River stocks of steelhead, including Steelhead Creek and Dry Creek.

Waters and Wetlands

Clean Water Act - Section 401

Per section 401 of the Clean Water Act (CWA), "any applicant for a Federal permit for activities that involve a discharge to waters of the State, shall provide the Federal permitting agency a certification from the State in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act." Therefore, before the USACE will issue a Section 404 Permit, applicants must apply for and receive a Section 401 Water Quality Certification from the RWQCB.

California Wetlands Conservation Policy

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.

- Reduce procedural complexity in the administration of State and federal wetlands conservation programs.

- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

Porter-Cologne Water Quality Act

The RWQCB regulates actions that would involve "discharging waste, or proposing to discharge waste, within any region that could affect the water of the state" (California Water Code section 13260(a)), pursuant to provisions of the Porter-Cologne Water Quality Act. "Waters of the State" are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code 13050 (e)).

California Fish and Game Code, Sections 1600 through 1603

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to sections 1600 through 1603 of the Fish and Game Code, requiring preparation of a Streambed Alteration Agreement. Under this Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. Additionally, the CDFG has jurisdiction over altered or artificial waterways as well as dry washes that carry water ephemerally during storm events based on the biological value of these drainages to fish and wildlife. Of the non-federally jurisdictional water features in the Project study area, approximately 3.2 acres have been identified as potentially CDFG jurisdictional

features: Hungry Hollow Canal, Acacia Canal, five unnamed irrigation canals, three agricultural drainage ditches, and one roadside drainage.

Oak Woodlands

In September 2004, the State of California approved Senate Bill No. 1334 (Kuehl), The Oak Woodlands Conservation Act. This act requires that a county, in determining whether CEQA requires an environmental impact report, negative declaration, or mitigated negative declaration; also determine whether a project in its jurisdiction may result in a conversion of oak woodlands that would have a significant effect on the environment. If the county determines that there may be a significant effect to oak woodlands, the county shall require one or more mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. These include conserving oak woodlands through conservation easements, or contributing funds into the Oak Woodlands Conservation Fund, as established under subdivision (a) of section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements. A portion of mitigation (no more than one-half) may also include planting an appropriate number of trees, including maintaining plantings for 7 years and replacing any dead or diseased trees. Other mitigation measures developed by the county may also be required.

Swainson's Hawk

The Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California (Swainson's Hawk Staff Report) was prepared in 1994 (CDFG 1994) for use in project review under CEQA. Mitigation measures contained in the Swainson's Hawk Staff Report are intended to reduce a project's impact to Swainson's hawk to less than significant levels. No intensive new disturbances or other project-related activities that may cause nest abandonment or forced fledging should be initiated within a 0.25-mile buffer of an active nest between March 1 and September 15. The buffer zone should be increased to 0.5 mile in nesting areas away from urban development. Nest trees should not be removed unless there is no feasible way of avoiding them.

To mitigate for the loss of foraging habitat, CDFG mitigation guidelines stipulate that projects within 1 mile of an active nest tree shall provide 1 acre of habitat management land for each acre of development authorized where 10 percent of the land is active managed for habitat; or 0.5 acre of habitat management land for each acre of development authorized where 100 percent of the land is actively managed for habitat. Projects located between 1 and 5 miles of an active nest tree shall

provide 0.75 acre of habitat management land for each acre of development authorized; projects located between 5 and 10 miles of an active nest tree shall provide 0.5 acre of habitat management land for each acre of development authorized.

Local

Local conservation plans and policies are included below. County General Plan goals, policies, and objectives were also evaluated in preparation of this DEIR; however, due to their length they are appended to this DEIR (see Appendix E-14).

Natomas Basin Habitat Conservation Plan

The Natomas Basin Habitat Conservation Plan (NBHCP) applies to the 53,341-acre interior of the Natomas Basin, located in the northern portion of Sacramento County and the southern portion of Sutter County (City of Sacramento et al. 2003). The Natomas Basin contains incorporated and unincorporated areas within the jurisdiction of the City of Sacramento, Sacramento County, and Sutter County. The purpose of the NBHCP is to promote biological conservation along with economic development and the continuation of agriculture within the Natomas Basin. The NBHCP establishes a multi-species conservation program to mitigate the expected loss of habitat values and incidental take of protected species that would result from urban development, operation of irrigation and drainage systems, and rice farming. The goal of the NBHCP is to preserve, restore, and enhance habitat values found in the Natomas Basin while allowing urban development to proceed according to local land use plans.

The primary biological goal of the NBHCP is to create a system of reserves, with both wetland and upland components, that would support viable populations of the giant garter snake, Swainson's hawk and other covered species. The NBHCP primarily focuses preservation efforts on the giant garter snake and Swainson's hawk. The habitat needs of the other covered species overlap significantly with the giant garter snake and the Swainson's hawk such that specific habitat requirements of the other covered species can be incorporated and met within the upland and wetland components of the reserves focused on providing Swainson's hawk and giant garter snake habitats. Specific consideration of the needs of the other covered species are incorporated into the restoration, enhancement, and management plans as they are developed for each reserve site according to criteria outlined in the NBHCP.

Sacramento County Code Relating to the Swainson's Hawk Impact Mitigation Program

In April 2006, the Sacramento County Board of Supervisors passed Sacramento County Code 1328, the intent of which is to prevent the unchecked loss of foraging habitat for Swainson's hawk resulting from urban growth. County Code 1328 applies to any requests (1) for a change in land use designation from Agricultural Designation AR-1, AR-2, or AR-5 to an Urban Designation; (2) to rezone agriculturally designated lands to an agricultural designation that permits smaller minimum parcel sizes; (3) for a land use entitlement for a non-agricultural use of land zoned with an Agricultural Designation; (4) for a land use entitlement for a non-agricultural use of land or public project located within the boundaries of the Elverta Specific Plan or Rancho Murieta's Urban Services Boundary; or (5) to any public improvement project proposed by any department or agency of Sacramento County on land with an Agricultural Designation; and (6) to subdivide five acres or more of contiguous land zoned as an Urban Designation to less than five acres.

For projects impacting 40 acres of habitat or more, preservation of one acre through conservation easement or fee title is required for each acre impacted. For projects determined to impact less than 40 acres, impacts may be mitigated through preservation of one acre for each acre impacted, or by payment of a Swainson's hawk impact mitigation fee per acre of calculated habitat impact to the County in the amount set for in Chapter 16.130.050 of the Sacramento County Code.

Yolo County Oak Woodland Conservation and Enhancement Plan

The Yolo County Oak Woodland Conservation and Enhancement Plan promotes voluntary efforts to conserve and enhance the County's existing oak woodlands. This plan applies to existing and former oak woodlands that cover 1 acre or more. Under the Plan, Yolo County would focus on supporting the existing efforts of willing landowners, non-profit organizations, and government agencies to enhance and conserve oak woodlands. In addition, Yolo County would assist these individuals and organizations in accessing funds for voluntary oak woodlands conservation and enhancement activities.

Agreement Regarding Mitigation for Impacts to Swainson's Hawk

Yolo County has entered into an agreement with the CDFG and the Yolo County HCP/Natural Community Conservation Plan (NCCP) Joint Powers Agency regarding Mitigation for Impacts to Swainson's Hawk Foraging Habitat in Yolo County. The

intent of the agreement is to continue to provide for mitigation of impacts to Swainson's hawk consistent with CEQA through acquisition and protection of Swainson's hawk foraging habitat. The Agreement is an interim measure to protect habitat while work continues on a County-wide NCCP. The Agreement requires urban development permittees to pay an acreage-based mitigation fee in an amount sufficient to fund the acquisition, enhancement, and long-term management of Swainson's hawk foraging habitat at the ratio of 1 acre acquired for each acre lost. In addition, consultation with the CDFG is required for projects that will be located within 0.5 mile of a Swainson's hawk nest tree, the purpose of which is to determine whether the project may result in incidental take of Swainson's hawk.

Placer County Tree Preservation Ordinance

The Placer County Tree Preservation Ordinance requires a permit, except for exempted circumstances, for activities impacting any native California tree with a single main stem or trunk at least 6 inches in diameter at breast height (dbh), or with a multiple trunk having an aggregate of at least 10 inches dbh. Permitted activities include activities conducted within the protected zone of any protected tree, or any activities that would harm, destroy, kill, or remove any protected tree. The permit application requires, in part, a site plan map, an arborist report, and a justification statement. Mitigation measures are required for trees designated to be saved that are located within 50 feet of any development activity. Permit approval may require replacement of trees removed, implementation of a revegetation plan, or payment into a tree preservation fund.

Sutter County

Conservation Banks and Regional Habitat Conservation Plans

River Ranch Conservation Bank

The River Ranch Conservation Bank, managed by Wildlands, Inc. (Wildlands), is a 76-acre mitigation bank west of the Sacramento River and on both sides of CR-16 in Yolo County. It provides permanent habitat for the threatened valley elderberry longhorn beetle (VELB). The bank is within a 3,682-acre property owned by the Sacramento River Ranch, LLC. The bank sells conservation credits for the loss of VELB and Swainson's hawk habitat within the primary service area, which includes all of Sutter, most of Sacramento, and smaller portions of Yolo and Placer counties. Wildlands has plans to open two additional portions of the River Ranch VELB Conservation Bank, encompassing an additional 95 acres.

Natomas Basin Habitat Conservation Plan

The Natomas Basin Habitat Conservation Plan (NBHCP) covers approximately 53,537 acres of land in northern Sacramento County and southern Sutter County that has historically been utilized for agriculture. The Natomas Basin is bound by Cross Canal on the northwest corner, the Sacramento River on the west, the American River on the south, and the Natomas East Main Drainage Canal (Steelhead Creek) on the east.

The purpose of the NBHCP is to promote biological conservation in conjunction with economic and urban development in the permit areas. The NBHCP establishes a multi-species conservation program to minimize and mitigate expected take of covered species that could result from development, including giant garter snake and Swainson's hawk. The NBHCP requires mitigation for designated types of development within the NBHCP area boundaries, including public and private utilities. Compliance includes the requirements for land and/or fee dedication, as well as the application of measures to avoid, minimize, and mitigate the take of species covered by the NBHCP.

Placer County Conservation Plan

In 2000, the Board of Supervisors directed staff to initiate the implementation of the Placer Legacy Program. As part of that direction, staff initiated the preparation of a Natural Community Conservation Plan (NCCP) and HCP to comply with the CESA, the Federal ESA, and the Federal CWA related to wetlands. That effort, now referred to as the proposed Placer County Conservation Plan, is intended to address the impacts associated primarily with unincorporated growth in western Placer County and growth associated with the build out of the City of Lincoln's updated general plan. Development will require the preservation of approximately 54,300 acres of land between now and 2050, and implementation and land protection measures will be managed in perpetuity.

Conservation planning within Placer County is taking place in phases. The first phase is the development of a plan for the western portion of the county. The draft plan (February 2005) specifies techniques for minimizing impacts to wetlands and aquatic ecosystems when constructing utility lines.

4.4.3 Significance Criteria

An adverse impact on biological resources is considered significant and would require mitigation as specified below.

Federally Jurisdictional Wetlands and Other Waters of the United States / Waters of the State

An adverse impact on federal or State jurisdictional wetlands and other waters of the U.S. is considered significant and would require mitigation if Project construction or operation activities would:

1. Fill or alter a jurisdictional wetland, water, or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community;

2. Cause short- or long-term violations of Federal or State water quality standards for streams that lead to wetlands, measured as in-stream elevated turbidity readings or decreased dissolved oxygen (DO) levels.

Vegetation

An adverse impact on vegetation is considered significant and would require mitigation if Project construction or operation activities would:

3. Result in the long-term (more than 5 years) reduction or alteration of unique, rare, or special concern vegetation types, riparian vegetation, or natural communities;

4. Introduce new, or lead to the expanded range of existing, invasive noxious weed species or soil pests, so that they interfere with crop production or successful revegetation of natural communities; or

5. Result in a spill or leak that would contaminate the soil to the extent of eradicating the existing vegetation, inhibiting revegetation, or migrating to other areas and affecting soil and water ecology via erosion and sedimentation.

Wildlife and Aquatic Resources

An adverse impact on wildlife and aquatic resources is considered significant and would require additional mitigation if Project construction or operation would:

6. Substantially interfere with the movement or range of migratory birds and other wildlife, or the movement, range, or spawning of any resident or anadromous fish;

7. Cause substantial deterioration of existing fish habitat for listed species;

8. Introduce new, invasive wildlife or aquatic species to an area; or

9. Create a potential health hazard or involve the use, production, or disposal of materials in a manner that would be expected to pose a hazard to wildlife or fish populations in the Project area.

Threatened, Endangered, and Special-Status Species

An adverse impact on federally or State-listed species or species proposed for listing is considered significant and would require mitigation if Project construction or operation activities would:

10. Reduce the abundance of sensitive species, including species under the protection of the Migratory Bird Treaty Act, that occur within the Project area;

11. Result in the loss or alteration of existing or proposed critical habitat for one or more listed species;

12. Cause a temporary loss or alteration of habitat important for one or more listed species that could result in avoidance by a listed species, or that could cause increased mortality or lowered reproductive success of the species;

13. Result in direct or indirect impacts on candidate or sensitive species populations, or their habitat, that would contribute to or result in the Federal or State listing of the species (e.g., substantially reducing species numbers or resulting in the permanent loss of habitat essential for the continued existence of a species); or

14. Create a potential health hazard or involve the use, production, or disposal of materials that pose a hazard to a special-status species population in the Project area.

4.4.4 Applicant Proposed Measures

Applicant Proposed Measures (APMs) were identified by PG&E in its Environmental Analysis prepared for the CSLC. APMs that are relevant to this Section are presented below. This impact analysis assumes that all APMs would be implemented as defined below. Additional mitigation measures are recommended in

the following impact analysis when it is determined that APMs do not fully mitigate the impacts for which they are presented.

General Preconstruction

APM BIO-1. Worker Training: PG&E will retain a qualified biologist(s) to conduct environmental compliance training, including an endangered species/sensitive habitat education program for construction crews prior to the commencement of the Project and during construction activities. Additional "tailgate" training will be conducted for new construction personnel as needed during construction. Sessions will include discussions of regulatory requirements, including the CWA, FESA, CESA, CDFG's Fish and Game Code, permit requirements, and consequences of noncompliance with these acts and requirements. Training will also include identification of special-status species that are likely to occur in the Project area, and discussion of the values of sensitive habitats.

APM BIO-2. Educational Brochure: As part of construction training, PG&E will produce an educational brochure for crews working on the Project. Color photos of threatened and endangered species, including vernal pool invertebrates, giant garter snake (GGS), California tiger salamander (CTS), burrowing owl, Swainson's hawk, and others known or likely to occur in the area will be included, as well as a discussion of protective measures agreed to by PG&E and the resource agencies.

APM BIO-3. Exclusion Zone Fencing: PG&E will mark the boundaries of environmentally sensitive exclusion zones and sensitive habitat features that are to be avoided (wetlands, vernal pools, etc.) before and during construction with highly visible flagging or fencing to prevent impacts from vehicles. All construction personnel will be required to conduct work activities within the defined area only.

APM BIO-4. Vegetation Removal: PG&E will only remove vegetation within the approved work area. Overhanging trees may be trimmed as necessary per accepted arborist practices to safely construct the Project.

General Construction

APM BIO-5. Work Area: PG&E will confine all heavy equipment, vehicles, and construction work to approved roads and work areas. Stream channel work areas will be limited to what is absolutely necessary for construction; where possible, construction vehicles will be kept out of watercourses with the potential to support special-status species. Where these avoidance measures are not feasible, PG&E will apply for and obtain the appropriate permits prior to construction from the USACE, USFWS, CDFG, and Central Valley Regional Water Quality Control Board (CVRWQCB), and will implement any additional avoidance or mitigation measures that are agreed upon during the permitting process.

APM BIO-6. Construction Monitoring: PG&E will retain a qualified biologist(s) to be on-site during construction activities to perform pre-activity surveys just prior to construction in order to clear the work area of any special-status species, and to monitor compliance with mitigation measures. This includes monitoring in giant garter snake and vernal pool habitat areas, and in wetland and riparian habitats, as described in greater detail below.

APM BIO-7. Erosion and Dust Control: PG&E will implement erosion, sediment, material stockpile, and dust control BMPs on-site to minimize the potential for fill or runoff to enter wetlands or waterways. A biological monitor will be retained as necessary to monitor and inspect the installation and removal of erosion/sediment control devices if applicable.

APM BIO-8. Workday Schedule: To the extent possible, PG&E will conduct all construction activity during daylight hours only, with the exception of HDD, which will continue 24 hours per day, 7 days per week to minimize the potential for frac-out, and hydrostatic testing which may require holding test pressure in the pipelines past sundown. Where it is deemed necessary and feasible, night lighting and monitors will be used for work that occurs after sundown.

APM BIO-9. Vehicle Inspection: PG&E will ensure that all construction personnel are instructed to visually check for wildlife beneath vehicles and equipment before moving or operating them.

APM BIO-10. Speed Limit: PG&E will enforce a speed limit of 20 miles per hour on private roads and the posted speed limit on public roads for vehicles in sensitive habitat.

APM BIO-11. Trench Ramping: At the conclusion of each day's trenching or excavating activities, the end of the trench or bore pit will be ramped at an approximate 2 to 1 slope to allow any wildlife that falls into the trench to escape. A biological monitor may approve the use of boards placed at an approximate 2 to 1 slope for site-specific, pre-approved locations where earthen escape ramps are not feasible.

APM BIO-12. Sensitive Habitat Monitoring and Procedures if Listed Species are Found: In accordance with the FESA and CESA, PG&E will retain a USFWS-approved biological monitor to inspect any construction activity in habitat that is to be avoided or preserved to ensure that no unauthorized or unnecessary take of listed species or destruction of their habitat occurs. The biologist will have the authority to stop all activities that may result in such take or destruction until appropriate corrective measures have been completed. The biologist also will be required to report immediately any unauthorized impacts to the USFWS and the CDFG.

APM BIO-13. Spill Prevention/Containment and Refueling Precautions: PG&E will maintain all construction equipment to prevent leaks of fuels, lubricants, or other fluids into waterways. Appropriate materials will be on-site to prevent and manage spills. PG&E will take appropriate precaution when handling and/or storing chemicals (e.g., fuel and hydraulic fluid) near waterways and wetlands, and any and all applicable laws and regulations will be followed. Service and refueling procedures will take place at least 100 feet from waterways or in an upland area at least 100 feet from wetland boundaries to prevent spills from entering waterways or wetlands. These activities may be performed closer than 100 feet if a qualified biologist finds in advance that no reasonable alternative exists, and

that PG&E and its contractors have taken the appropriate steps (including secondary containment) to prevent spills and provide prompt cleanup in the event of a spill. These measures will be outlined in a Hazardous Substance Control and Emergency Response Plan to be prepared by PG&E (See APM HAZ-2 in Section 4.7, Hazards and Hazardous Materials for a description of the Plan).

APM BIO-14. Trash Cleanup: PG&E will properly contain and remove all trash and waste items generated by construction or crew activities.

APM BIO-15. Prohibitions for Pets, Fire, Firearms: PG&E will prohibit pets, campfires, and firearms from the Project site.

General Post-Construction

APM BIO-16. ROW Restoration: PG&E will restore work areas to pre-existing contours and conditions upon completion of work. Restoration, including revegetation and soil stabilization, will be performed as outlined in the Restoration and Monitoring Plan described below.

APM BIO-17. ROW Restoration Plan: PG&E will prepare a Restoration and Monitoring Plan to address post-construction revegetation, success criteria, and monitoring periods in natural areas. The intent of this plan will be to ensure that impacts are minimized and adequately mitigated to the satisfaction of the permitting agencies, property owners, and/or habitat managers. Restoration in agricultural fields and landscaped areas will be negotiated with the landowners and will result in restoration of temporarily disturbed areas to conditions similar to preconstruction conditions. The Restoration and Monitoring Plan to be developed by PG&E for review with resource agencies will include, at a minimum, the following measures:

- At the completion of construction activities, the ROW will be graded to restore flow lines and natural topography.
- Ripping or disking will be performed to relieve compaction at identified locations, if needed.

- Stockpiled topsoil will be re-spread, providing organic matter and a seedbank for restoration.

- At the completion of soil work, all areas disturbed by construction activities will be subject to implementation of permanent erosion control measures.

- Permanent erosion control measures could include spreading a combination of native grass and forb seed, fertilizer, compost, and mulch for soil protection.

- Two seed mixes will be identified, one for upland areas and one for drainages and wetland areas (vernal pools and vernal swales will be seeded separately).

APM BIO-18. Seed Mix and Success Criteria: In sensitive communities such as wetlands or stream crossings, PG&E's Restoration and Monitoring Plan will include the use of native seed or plantings and will specify native species lists and propagule types, quantities of material, and appropriate success criteria and monitoring requirements to be determined in discussion with the appropriate resource agencies with responsibility for those areas, e.g., USACE, CDFG, and/or CVRWQCB).

APM BIO-19. Erosion Control: PG&E will install and maintain appropriate temporary erosion and sediment control measures until revegetation is successful as defined by the success criteria to be outlined in the Restoration and Monitoring Plan. Erosion and sediment control measures would include the following: silt fence, fiber rolls, gravel bag berm, sand bag barrier, storm drain inlet protection, tracking controls, stockpile management, etc., as applicable; installation of additional run-off/run-on control measures during construction, as needed; and temporary or permanent soil stabilization measures on all disturbed areas where work is delayed or completed.

Creek Crossings and Wetland Habitats

APM BIO-20. Water Crossings in Special-status Species Habitats: PG&E will schedule water-crossing construction in waterways with suitable

habitat for special-status aquatic species, including salmonids and other fish species, during dry months when the waterways have low or no flow in order to minimize potential impacts. This applies where traditional trenching methods will be used. Other waterways that have potential to support special-status fish species but that are likely to have flows during construction will be crossed using HDD methods.

APM BIO-21. Wetland and Waterway Avoidance During Final Design: PG&E will consider the locations of sensitive wetland habitats and waterways (including vernal pools) during final routing, and the pipeline will be routed to avoid these features wherever possible. Routing considerations will include trenchless construction technologies such as HDD, and narrowing of the ROW to the minimum needed for construction, where appropriate and feasible, to avoid impacts to sensitive wetland habitats and waterways.

APM BIO-22. Wetland Restoration and Monitoring Plan: Where wetland and/or vernal pool avoidance is not possible, PG&E will develop and implement a Wetland Restoration and Monitoring Plan that will describe construction restoration methods and compensatory mitigation. This plan will include discussion of a combination of on-site restoration and off-site compensation for any net permanent losses of vernal pools or wetlands based on mitigation ratios developed in coordination with the USACE and the USFWS. The plan will be submitted to the resource agencies, including the CDFG, USACE, CVRWQCB, and USFWS/NMFS as appropriate based on permitting requirements, for their review as part of the permitting processes for these areas. In addition to planting details such as the species to be planted and planting densities, the Wetland Restoration and Monitoring Plan will include information on performance criteria, monitoring, annual reporting, and remedial actions to be undertaken should monitoring determine that the success criteria have not been achieved.

APM BIO-23. HDD Fluid Release Contingency Plan: Prior to construction, PG&E will prepare an HDD Fluid Release Contingency Plan that will specify procedures to contain and clean up any drilling fluids

released into waterways or wetlands in the event of an inadvertent release of drilling fluids during HDD procedures.

Vernal Pool Crustacean Habitat

APM BIO-24. Vernal Pool Invertebrate Mitigation: Section 7 consultation is anticipated to be required for the Project's effects on listed vernal pool invertebrate species. PG&E will minimize effects to these species by the general mitigation measures described above. Additional compensation for unavoidable direct effects to vernal pool invertebrate habitat will be based on the guidelines outlined in the USFWS Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California (1996c), and will include:

- Preservation component. For every acre of habitat directly or indirectly affected, at least two vernal pool credits will be dedicated within a USFWS-approved ecosystem preservation bank, or, based on USFWS evaluation of site-specific conservation values, 3 acres of vernal pool habitat may be preserved on the Project site or on another non-bank site as approved by the USFWS.

- Creation component. For every acre of habitat directly affected, at least one vernal pool creation credit will be dedicated within a USFWS-approved habitat mitigation bank, or, based on USFWS evaluation of site-specific conservation values, 2 acres of vernal pool habitat will be created and monitored on the Project site or on another non-bank site as approved by the USFWS.

Giant Garter Snake

Because giant garter snake habitat is primarily aquatic, PG&E anticipates a Section 7 Consultation with the USFWS to take place as part of the USACE 404 permitting process. The following avoidance and mitigation measures are based on the Programmatic Biological Opinion for giant garter snake:

APM BIO-25. Giant Garter Snake Habitat Buffer: PG&E will avoid construction activities within 200 feet of the banks of suitable giant garter snake aquatic habitat where feasible.

APM BIO-26. Construction Window in Giant Garter Snake Habitat: With the exception of ROW isolation dike construction and irrigation flow culvert installation, PG&E will limit construction activity within giant garter snake habitat (predominantly in rice production areas of Line 407 East and Line 407 West Project segments within the Natomas Basins) to the period between May 1 and October 1. This is the active period for giant garter snake and direct mortality is lessened because snakes are expected to actively move and avoid danger. For work that occurs between October 2 and April 30, PG&E will contact the USFWS and CDFG to determine if additional measures are necessary to minimize and avoid take.

APM BIO-27. Giant Garter Snake Monitoring: PG&E will retain a qualified biologist to survey for giant garter snake immediately prior to construction activities that take place in or within 200 feet of giant garter snake habitat. Survey of the Project area will be repeated if a lapse in construction activity of two weeks or more has occurred. If a snake is encountered during construction, activities will cease until the snake leaves or is removed by a permitted biologist in accordance with the Biological Opinion to be issued by the USFWS for the Project.

APM BIO-28. Dewatering Giant Garter Snake Habitat: To protect giant garter snake, for any dewatering of potential giant garter snake habitat that occurs after April 15, PG&E will keep the dewatered habitat dry for at least 15 consecutive days prior to excavating or filling the dewatered habitat. This may be required at smaller canal crossings within the Line 407 East and Line 407 West area in rice production areas within the Natomas Basin. Where habitat cannot be dried, a biological monitor will survey the area for giant garter snake immediately prior to and during all construction activities until construction is complete in the area.

Special-Status and Nesting Birds

APM BIO-29. Bird Nest Surveys and Monitoring: Because construction will take place during the breeding and nesting season of avian species in the Project area (typically February 1 through August 31), PG&E will conduct nesting bird surveys prior to construction for avian species with potential to occur on-site, or where accessible, in areas adjacent to construction. Where nesting migratory birds are found in or near the Project area, these factors will be evaluated by a qualified biologist, and where nest disturbance may occur, the biologist will ensure adequate mitigation measures are implemented.

APM BIO-30. Nesting Birds: In accordance with the MBTA, if an active nest is observed in the Project area during construction, PG&E will stop work within the appropriate buffer for the species and contact the biological monitor immediately. Nest disturbance is dependant on a number of site-specific and activity-specific factors, including the sensitivity of the species, proximity to work activity, amount of noise or frequency of the work activity, and intervening topography, vegetation, structures, etc. Additional mitigation may be required to minimize disturbance of detected nesting activity, such as allowing nesting activity to conclude before continuing construction in an area, restricting certain types of construction practices/activities, creating screening devices to shield nest sites from construction activity, and establishing buffer areas around active nest sites. For inactive nests, measures could include removal and/or handling of nest materials, which will be conducted under the supervision of a qualified biologist.

Burrowing Owls

APM BIO-31. Burrowing Owl Surveys: PG&E will retain a qualified biologist to conduct burrowing owl surveys and to identify any occupied burrows in all Project sites and buffer zones with suitable habitat along the Line 406 and Line 407 West segments of the proposed Project. These surveys will be conducted not more than 30 days prior to initial ground-disturbing activities.

APM BIO-32. Burrow Avoidance: If occupied burrows are identified during surveys, PG&E will maintain a buffer of approximately 160 feet from occupied burrows during the nonbreeding season of September 1 through January 31, and approximately 250 feet during the breeding season of February 1 through August 31. Occupied burrows will not be disturbed within these buffers during the nesting season, from February 1 through August 31, unless a qualified biologist has verified that the birds have not begun egg-laying and incubation or that the juveniles from those burrows are foraging independently and capable of independent survival at an earlier date. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or a single unpaired resident bird; given the large amount of adjacent habitat in the Dunnigan Hills area, this measure is considered to be met throughout the Project area.

APM BIO-33. Burrow Relocation: If avoidance of occupied burrows is not possible during construction, PG&E will retain a qualified biologist to supervise and/or conduct passive relocation of burrows. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond approximately 160 feet from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Relocation of owls will only be implemented during the non-breeding season. If relocation is necessary, the biologist will conduct the following measures:

- Owls will be excluded from burrows in the immediate impact zone and within an approximately 160-foot buffer zone by installing one-way doors in burrow entrances.
- One-way doors will be left in place 48 hours to ensure owls have left the burrow before excavation.
- One alternate natural or artificial burrow will be provided for each burrow that will be excavated in the Project impact zone.

- The Project area will be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone.

- Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation; sections of flexible plastic pipe or burlap bags will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

APM BIO-34. Burrowing Owl Monitoring Plan: If relocation of burrows is required, PG&E will prepare a Burrowing Owl Monitoring Plan, which will include mitigation success criteria and a timeline for submittal of annual reports to the CDFG. Annual reports will describe the number and locations of relocations, relocation procedures used, and the degree of success.

Compensatory Mitigation

APM BIO-35. Species-specific and Habitat-specific Compensation: PG&E will provide compensatory mitigation for impacts to vernal pools, wetlands, giant garter snake, and other special-status species as agreed upon through consultation with the USFWS, USACE, and/or CDFG. Proposed measures and compensation ratios have been outlined in the above sections by species. Total acreages of impact to special-status species and sensitive habitats will be calculated upon determination of a final route by the CEQA Lead Agency (California State Lands Commission), and final compensatory mitigation ratios will be determined in consultation with the appropriate resource agencies during permitting of the Project. Compensatory mitigation will likely consist of a combination of restoration of habitat on-site, and creation and/or preservation of the appropriate habitat at a suitable location in the Project vicinity, or at a suitable agency-approved mitigation bank. Mitigation banks in the immediate project vicinity include the Natomas Basin Conservancy and the Sacramento River Ranch Conservation Bank. Other mitigation banks in the area include Laguna Terrace East, Bryte Ranch, and Clay Station. Both Wildlands and Westervelt

Ecological Services manage additional mitigation banks in the Project area.

4.4.5 Impact Analysis and Mitigation

Impact Discussion

Wetland Water Quality

Installation of the Project has the potential to impact the water quality in wetlands, as well as in streams that lead to wetlands, including the Sacramento River, Knights Landing Ridge Cut, Curry Creek, Steelhead Creek, Yolo Bypass, Tule Canal and Goodnow Slough; most which are adjacent to other sensitive wetland habitats. In APM HWQ-4, APM BIO-20, and APM BIO-21, the Project proposes that the crossing of major waterways and floodplain areas along the proposed alignment would be conducted using HDD methodologies. Entrance and exit locations would be set back from streams and channels. As proposed in APM HWQ-5, APM BIO-23, and MM HWQ-1, the Project would implement a HDD Fluid Release Contingency Plan that would require that any drilling fluids inadvertently released into waterways or wetlands during HDD procedures would be cleaned up.

Open-cut trenching is proposed during the dry months within small irrigation/drainage canals, seasonal wetlands, riparian wetlands, and other smaller wetland features. Restoration of disturbed wetland habitats is discussed below under Impact BIO-2. Regarding potential water quality impacts to these and adjacent wetland features, trenching activities would have the potential to impair water quality if the areas disturbed during construction are not re-contoured and restored before the wet season. Because open-cut trenching would be temporary and would be restricted to the summer dry months, no sedimentation or erosion into active waterways are anticipated. Open trenches would be backfilled, re-contoured, and compacted immediately following excavation and installation of pipeline sections. Restoration of affected areas would occur during the same dry season, thereby preventing the exposure of unsettled substrate to streamflow within the affected areas during the wet season (see Impact BIO-2).

Regardless, soil erosion directly into wetlands and other water features during trenching activities has the potential to decrease wetland water quality. As discussed in Section 4.8 under Impact HWQ-1, implementation of APM BIO-35 would ensure that PG&E acquires all necessary permits from the USACE, the CVRWQCB, and the CDFG for potential stream channel impacts. There may be

some additional avoidance or mitigation measures that are required by the CVRWQCB or the CDFG during the permitting process with regard to water quality criteria, standards, or objectives that would be implemented.

Implementation of APM HWQ-1, APM HWQ-2, and APM BIO-7 would ensure that the Project adheres to BMPs during the construction phase to avoid or minimize potential adverse impacts to water quality. Implementation of the PG&E Water Quality Construction Best Management Practices Manual and the Erosion Control and Sediment Transport Plan would ensure the avoidance or minimization of potential impacts to water quality from erosion and sedimentation. APM BIO-6 requires that a qualified biologist be on-site to monitor compliance with mitigation measures. APM BIO-21 states that PG&E will consider locations of sensitive wetland habitats and waterways during final routing such that additional wetland features may be avoided (rather than trenched through) during Project construction;

Therefore, the Project as designed would not result in short- or long-term violations of Federal or State water quality standards in streams. Potential impacts would be less than significant (Class III).

Spill or Leak / Health Hazard

The Project has the potential to result in a spill or leak of fuels, lubricants, or other fluids from use of vehicles and other equipment near or in a water feature; from leaking or other damage to containers used to store hazardous materials on site; or from inadvertent release of drilling fluids when HDD methods are deployed. The use of HDD methods to install pipeline beneath sensitive habitats and waterways, such as the Sacramento River, has the potential to release non-toxic substances that could adversely impact aquatic species. APM BIO-23 requires PG&E to prepare an HDD Fluid Release Contingency Plan, which is described in Section 2.0, Project Description, Contingency Planning.

To prevent equipment leakage into sensitive habitats, PG&E would implement APM BIO-5, which confines all heavy equipment, vehicles, and construction work to approved areas only and restricts equipment, where possible, from entering watercourses with the potential to support special-status species. Where avoidance of such watercourses is not possible, implementation of APM BIO-35 would ensure that PG&E acquires all necessary permits and adheres to mitigation measures required from the USACE, the CVRWQCB, and the. In addition, implementation of APM BIO-13 requires PG&E to prepare and implement a Hazardous Substance

Control and Emergency Response Plan (see APM HAZ-2 in Section 4.7, Hazards and Hazardous Materials, for a description of the plan). Measures outlined in this plan would include maintenance of construction equipment to prevent leaks of fuels, lubricants, or other fluids into waterways and other sensitive habitats and restriction of refueling activities to areas at least 100 feet from waterways or wetland boundaries, among others.

Similarly, due to implementation of the APMs discussed above, the Project would not create a potential health hazard or involve the use, production, or disposal of materials in a manner that would be expected to pose a hazard to wildlife or fish populations in the project area. Implementation of APM BIO-7 includes construction avoidance and minimization measures to ensure that erosion, sediment, and material stockpile BMPs are implemented to minimize the potential for fill and construction runoff into affected waterways and adjacent wetlands potentially supporting wildlife and fish populations. APM BIO-14 includes measures for trash cleanup to ensure that all trash and waste items generated by construction and crew activities are properly contained.

The Project, as planned, would not result in a spill or leak that would contaminate the soil to the extent of eradicating the existing vegetation or that would migrate to other areas. Potential impacts would be less than significant (Class III). The proposed Project also incorporates avoidance and minimization measures during the construction phase that would reduce potential impacts associated with potential health hazards or the use, production, or disposal of materials that could be hazardous to wildlife and fish populations to less than significant.

Deterioration of Existing Habitat for Special-status Fish Species

All waterways that support the required habitat elements for the movement, range, or spawning of special-status resident or anadromous fish would be crossed using HDD methodologies. For the proposed Project, such waterways consist of the Sacramento River, Steelhead Creek, Tule Canal, and the Yolo Bypass. HDD entrance and exit points would be set back from aquatic, riparian, and wetland habitat that could contribute to the movement, range, or spawning of any resident or anadromous fish. In the unlikely event of the release of drilling fluids during HDD procedures, the Project could result in potential impacts to the movement, range, or spawning of resident or anadromous relating to the temporary impairment of water quality and degradation of aquatic habitat. Potential impacts resulting from a frac-out during HDD procedures would be reduced to less than significant levels with the

implementation of a HDD Fluid Release Contingency Plan, as proposed in APM BIO-23.

The implementation of open-cut trenching methodologies would be limited to waterways that do not have the potential to support suitable spawning, rearing, or foraging habitat, or suitable water quantities and connectivity to support the movement, range, or spawning of any resident or anadromous fish. Any potential impacts resulting from open-cut trenching in the vicinity of waterways supporting special-status resident or anadromous fish would be avoided by implementation of APM BIO-20, which restricts construction activities to dry months when migratory, ranging, and spawning activities for resident or anadromous fish do not typically occur, or are unable to occur, due to limited or restricted access and unsuitable conditions. Therefore, no impacts to the movement, range, or spawning of any resident or anadromous fish are anticipated to result from the open-cut trenching of waterways.

Implementation of APM BIO-3, APM BIO-5, APM BIO-7, APM BIO-12, APM BIO-13, APM BIO-16, APM BIO-17, and APM BIO-22 would further reduce potential impacts to the movement, range, or spawning of any resident or anadromous fish. Potential impacts would be less than significant (Class III).

Critical Habitat

The Project would not result in the loss or alteration of existing or proposed critical habitat for one or more listed species. The Project site does not contain designated critical habitat for any listed plant or wildlife species.

Critical habitat for the Central Valley steelhead has been designated in the Sacramento River, Yolo Bypass, and within lower Steelhead Creek approximately 6 miles south of the section to be crossed by the proposed Project. Additionally, critical habitat for winter-run chinook salmon has been designated in the Sacramento River from the San Francisco Bay upstream to Keswick Dam near Redding, California. Primary constituent elements have been developed for salmonids (salmon and steelhead) that define the physical or biological features that are essential to one or more life stages of a species. Generally, these include freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas.

The primary constituent elements for salmonid habitat that are relevant to the proposed Project would include: spawning sites with adequate water quantity and

quality and suitable substrate; rearing sites with adequate water quantity and floodplain connectivity to support and maintain juvenile development, including natural cover (shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rock and boulders, or side channels); and undercut banks to support juvenile mobility and survival. Also required are freshwater migration corridors free of obstruction with adequate water quantity, quality conditions, and natural cover (NMFS 2005, NMFS 2008a, NMFS 2008b).

Although not designated as existing or proposed critical habitat, EFH for Central Valley fall- and late-fall-run chinook salmon, winter-run chinook salmon, and spring-run chinook salmon occurs within the Sacramento River, and within the Tule Canal and Yolo Bypass during the wet months when these areas support adequate water quantities and water quality. Chinook salmon EFH includes all those streams, lakes, ponds, wetlands, and other waterbodies currently or historically accessible to salmon. It also includes aquatic areas above all artificial barriers except specifically cited impassible dams. Excluded are areas upstream of longstanding naturally impassible barriers (i.e., natural waterfalls in existence for several hundred years). Freshwater EFH for chinook salmon consists of spawning and incubation habitat, juvenile rearing habitat, juvenile migration corridors, and adult migration corridors. Physical components of freshwater EFH include suitable substrate composition, water quality, water quantity, depth and velocity, channel gradient and stability, food, cover and habitat complexity, space, access and passage, and floodplain habitat connectivity (TRC 2007, NMFS 2008c).

As described above, the crossing of all features designated as critical habitat and/or supporting EFH would incorporate HDD procedures, per APM BIO-20. HDD procedures would include directional drilling beneath the Sacramento River, Steelhead Creek, and Tule Canal within the Yolo Bypass, thereby avoiding any direct impacts and disturbance to primary constituent elements of any special-status species' critical habitat within these features. HDD entrance and exit points would be setback within upland areas from all potential fish habitat associated with these waterways. APM BIO-21 ensures that adjacent wetland and riparian habitats will be avoided wherever possible during construction and, when disturbed, APM BIO-22 ensures that these areas will be restored to pre-construction conditions. As proposed in APM BIO-23, potential indirect impacts to critical habitat resulting from an unlikely frac-out during HDD procedures would be reduced to less than significant levels with the implementation of a HDD Fluid Release Contingency Plan.

Potential impacts to critical habitat for listed fish species would therefore be less than significant (Class III).

Interference with the Movement or Range of Wildlife Species

Wildlife habitat removal would result from construction and ongoing operation and maintenance activities, including: (1) ground surface blading, grading, and subsurface trenching, (2) tree or shrub removal and tree trimming/crushing, (3) storage of trench spoils, or (4) pipeline stringing and installation. Each of these activities could effectively remove existing habitat, thereby reducing its availability to local wildlife populations. In some areas, construction access would require construction of new roads or upgrading of existing roads. Grading previously undisturbed surfaces to access the ROW could remove rocks, shrubs and other objects from the soil surface, leaving a relatively clear pathway for construction vehicles.

Temporary loss of habitat within the ROW could affect some small mammal, reptile and/or amphibian species with very limited home ranges and mobility. For these species, the clearing for the pipeline right-of-way and access roads could represent a slight reduction in the carrying capacity of a portion of their home range until a productive vegetation cover is re-established. However, most of these species are common and widely distributed throughout the area and the loss of a few individuals as a result of habitat removal would have a negligible impact on overall populations of the species, either locally or throughout the region.

Temporary removal of wildlife habitat along the length of the pipeline right-of-way would result in loss of wildlife habitat, and is therefore considered a potentially significant impact. This temporarily affected habitat, however, will be restored to pre-existing conditions (pre-existing topography and vegetation community) immediately following construction (*MM BIO-1 and MM BIO-2*). Implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35 would reduce impacts to wildlife movement to less than significant. Potential impacts to special-status wildlife species are discussed below under Impact BIO-4.

Candidate or Sensitive Species Populations

The Project would not result in direct or indirect impacts on candidate or sensitive plant or fish species populations, or their habitat, that would contribute to or result in the Federal or State listing of the species (e.g., substantially reducing species

numbers or resulting in the permanent loss of habitat essential for the continued existence of a species).

Plant Species

Sensitive plant species would not be impacted by the Project. Protocol-level surveys identified populations of only one special-status plant species, dwarf downingia, within the Project study area. These populations are located outside of the Project site, south of Riego Road east of Pleasant Valley Road. At this location, installation of the Project would occur on the north side of Riego Road, thereby avoiding impacts to these populations. APM BIO-3 requires PG&E to mark the boundaries of sensitive habitat features that are to be avoided, and APM BIO-4 restricts vegetation removal only to the approved work area, Implementation of these measures would ensure that these populations are not directly impacted by workers or by equipment during construction.

Fish Species

The following candidate or sensitive fish species that are not listed as threatened or endangered have a potential to occur within the Sacramento River during all or portions of the year and within the Yolo Bypass (including the Tule Canal) and Steelhead Creek during wet months: Central Valley fall- and late-fall run chinook salmon, river lamprey, and Sacramento splittail. As discussed above, implementation of APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-23 would reduce impacts to sensitive fish species to less than significant (Class III).

Impact BIO-1: Wetlands

The Project would fill or alter a wetland or vernal pool, resulting in a long-term change in its hydrology or soils, or the composition of vegetation of a unique, rare, or special concern wetland community (Potentially Significant, Class II).

Table 4.4-2 contains a conservative estimate of the acreage of federally jurisdictional wetlands and other waters of the U.S. that occur within the Project site. The Project site was defined as the area that may be disturbed during construction, including a maximum 100-foot right-of-way, pipe storage yards, staging and laydown areas, and permanent aboveground facilities. Of the 796.97 acres of federally jurisdictional wetlands and other waters of the U.S. that occur within the Project study area, up to 65.95 acres (2.17 acres of other waters of the U.S., and 63.55 acres of wetlands) would potentially be disturbed due to construction of the proposed Project.

Specifically, up to 0.04 acre of NRPW, 1.55 acres of RPW, 0.58 acre of TNW (Sacramento River), 0.1 acre of fresh emergent wetland, 0.79 acre of riparian wetland, 0.71 acre of seasonal swale, 6.52 acres of seasonal wetland, 0.1 acre of vernal pool, 0.04 acre of willow riparian, and 55.28 acres of rice would be disturbed.

Of the non-federally jurisdictional water features in the Project study area, approximately 3.07 acres may be subject to CDFG jurisdiction. These features include five irrigation canals (Hungry Hollow Canal, Acacia Canal, and three unnamed irrigation canals), and one agricultural drainage ditch along Line 406. The proposed project has the potential to affect portions of these features.

Appendix E-1 contains the jurisdictional delineation reports prepared for the proposed Project. The majority of the jurisdictional wetlands and water features are located along Line 407. In addition, the easternmost portion of the Project crosses vernal pools that are within the Beale and Western Placer County core areas of the Southeastern Sacramento Valley vernal pool region, as identified in the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005). The Project has the potential to directly and indirectly affect these vernal pools, vernal swales, and vernal pool/vernal swale complexes through alteration of surface hydrology or subsurface hydrology through disruption of impermeable soil layers.

Of the locations proposed for constructing the six aboveground facilities, two (the Powerline Road Main Line Valve and the Powerline Road Pressure Regulating Station) contain wetlands or water features (see Table 4.4-1). Construction of these aboveground stations would result in the permanent conversion of 0.62 acre of jurisdictional rice field.

Table 2-5 in Section 2.0, Project Description, indicates that PG&E proposes to avoid several vernal pools and vernal pool complexes using HDD methodology; however, several vernal pools and swales and numerous seasonal wetlands, riparian wetlands, and other jurisdictional water features would be disturbed by trenching during project construction. The Project therefore has the potential to directly and indirectly impact vernal pools, vernal swales, and vernal pool/vernal swale complexes through alteration of surface hydrology, or subsurface hydrology through disruption of impermeable soil layers.

Vernal pools in this region are classified primarily as Northern Hardpan. Northern Hardpan vernal pools are formed on impermeable surfaces created by an accumulation of clay particles. Long-term hydrologic change to vernal pools and

other wetlands could result from trenching activities. Temporary impacts to adjacent wetlands and waters of the U.S. could be caused by the interception and detention of groundwater or surface water within excavated trenches, reducing the hydrologic input to adjacent wetlands. Backfill material and methods would affect wetland hydrology by altering surface and subsurface flow. For example, the pipeline backfill materials (such as gravel or coarse-textured non-native fill) could be more or less permeable than native materials. Surface alteration would impede or accelerate drainage. Compaction and settlement of backfill would create ditches along the pipeline. Excess backfill may restrict surface or groundwater connections to wetlands. Impacts to the hydrologic function of wetlands would be considered potentially significant (Class II).

Impacts to wetlands that are habitat for special-status plant species would cause an impact to the species occupying those habitats. Impacts to these special-status plant species and wetlands/riparian forests would be considered potentially significant. However, protocol-level surveys of the Project study area indicate that no special-status plant species occur within the Project site and, therefore, no impacts to special-status wetland-dependent plants are anticipated to occur under the proposed Project.

There are several APMs incorporated into the Project design that reduce potential direct impacts to federal and State jurisdictional wetlands and water, including APM BIO-1, APM BIO-2, APM BIO-3, APM BIO-5, APM BIO-7, APM BIO-12; APM BIO-13, APM BIO-14, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-19, APM BIO-20, APM BIO-21, APM BIO-22, APM BIO-23, APM BIO-24, and APM BIO-35, APM BIO-21 states that PG&E will consider the locations of sensitive wetland habitats and waterways during final routing and, where possible, the pipeline would be routed to avoid these features. APM BIO-22 stipulates that where wetland and/or vernal pool avoidance is not possible, PG&E will develop and implement a Wetland Restoration and Monitoring Plan that would describe restoration methods and compensatory mitigation. For vernal pool habitat suitable for special-status crustaceans, APM BIO-24 requires that direct, unavoidable impacts be mitigated through preservation and creation of additional habitat at an approved mitigation bank. While implementation of the APMs listed above is required to reduce impacts to wetlands and waters, additional mitigation is necessary to reduce impacts to less than significant.

Implementation of MM BIO-1a, MM BIO-1b, and MM BIO-1c is intended to reduce impacts to federally and State-jurisdictional wetlands and water features to less than significant.

Mitigation Measures for Impact BIO-1: Wetlands

MM BIO-1a. **Wetland Avoidance and Restoration.** PG&E shall avoid, minimize, and/or compensate for damage and/or loss of wetland vegetation types due to pipeline construction activities by completing the following:

- Maximum avoidance of jurisdictional wetlands by fencing wetlands and appropriate buffer zones.
- Restricted vegetation removal and topsoil storage and replacement.
- Consultation with the USACE and RWQCB for any unavoidable wetland impacts.
- Preparation and implementation of wetlands restoration for any unavoidable impacts to wetlands.
- Supervision and verification of the implementation of these measures by the Environmental Monitor (see APM BIO-6).

Avoidance will consist of fencing the wetlands within the ROW, including appropriate buffer zones, to minimize impacts to wetland vegetation types. If construction work areas and/or associated overland travel in wetlands is unavoidable, all equipment, vehicles and associated construction materials shall be placed on protective mats to avoid soil compaction, such that they do not make direct contact with the wetland. Vegetation clearing and/or installation of mats shall be conducted only from areas scheduled for immediate construction work (within 10 days) and only for the width needed for active construction activities. Mats shall be removed immediately following completion of activities within each active construction area. During pipeline construction, the 12 inches of topsoil shall be salvaged, stored in an upland location, and replaced wherever the pipeline is trenched in wetlands. Prior to permit issuance and final design, project construction plans shall depict appropriate measures for topsoil protection and storage that will allow survival of native seed within the topsoil. Topsoil shall be placed at the surface on top of fill material and not be used to backfill the trench,

and excavated trench spoils or excess fill shall be placed on top of the pipeline under topsoil and not dispersed onto the surface of the ROW. Implementation of these measures prior to and during construction will be supervised and verified by the Environmental Monitor (see APM BIO-6).

Unavoidable direct impacts to wetland vegetation types during construction and/or associated overland travel will require consultation with the appropriate jurisdiction (USACE, RWQCB, CDFG) and will likely require a permit. These impacts shall be mitigated by restoration of the affected area to pre-construction conditions in accordance with permits issued by the USACE, RWQCB, and CDFG. Consistent with requirements set forth in permits issued by the USACE, RWQCB, and CDFG for work in wetlands and waters, and with other plans developed for the pipeline construction project, including (but not limited to) the Restoration and Monitoring Plan (see APM BIO-17), the following procedures shall be implemented:

- A delineation of potentially affected wetlands for any areas not included in the jurisdictional delineation performed by CH2MHill (2008) and Galloway (2007a; 2008a; 2008b).

- A discussion demonstrating how maximum avoidance has been accomplished and why the wetlands proposed to be impacted cannot be avoided.

- Methods proposed for restoring the affected wetlands, including topsoil preservation (inclusive of restoration of an impermeable layer, i.e., hardpan, if approved) and backfilling, soil and grade preparation such that there is no change in pre-construction contours, regionally native seed and/or plant materials to be used and installation methods, and maintenance measures, including weed control.

- Minimum 1:1 replacement ratio (in-land, on-site) for area and function of temporarily damaged wetland areas.

- A minimum five-year monitoring program with detailed success criteria regarding species cover, species composition, species diversity, wetland area and depth as compared with pre-construction conditions documented prior to construction by a qualified biologist such that the function of the affected wetland and hydrology is fully restored, the methods and results of which shall be described in the Plan.

- Annual monitoring over a minimum five-year period to evaluate whether the pipeline installation is substantially altering surface or subsurface flow of water as determined through (1) topographic assessments of the pipeline sites and (2) assessments of vegetation and hydrology conditions within adjacent wetlands (as compared to pre-construction conditions).

- Methods for correcting observed alterations to surface or subsurface flows.

- Annual reporting requirements to responsible agencies.

- Detailed contingency measures in case of restoration failure, as determined by the responsible agencies following the five-year monitoring period, requiring additional off-site wetland creation at a minimum ratio of 2:1 for created wetland acreage.

MM BIO-1b. **Trench Backfill and Topographic Restoration.** The purpose of this measure is to prevent temporary and permanent hydrologic alteration to wetlands and associated sensitive vegetation from backfill activities associated with pipeline installation by requiring:

- Appropriately-timed work so that trenches are not excavated or backfilled during the wet season.

- Preparation and implementation of soil and grade restoration measures including backfill and compaction methods and an annual monitoring program.

- Supervision and verification of the implementation of these measures by the Environmental Monitor.

Prior to construction, responsible agencies (including the RWQCB, CDFG, USACE, and County agencies) shall evaluate soil and grade restoration measures to be implemented along the ROW. Restoration of wetlands directly impacted by pipeline construction is addressed in MM BIO-1a. To prevent hydrologic impacts to wetlands and associated vegetation resulting from pipeline backfill activities the following procedures shall, at a minimum, be addressed in accordance with any permit conditions issued by responsible agencies:

- Excavation, soil storage and backfill methods to ensure that topsoil returned to the surface and is not be used to backfill the trench, and subsoil is not be dispersed onto the surface.
- Requirements for the separation of topsoil and subsoil in upland storage locations.
- Methods to ensure native seed survival within stored topsoil.
- Circumstances requiring use of imported soils, proposed source of soil.
- Backfill compaction specifications to ensure that changes in infiltration and lateral flow do not substantially alter subsurface hydrology.
- Specifications for the restoration of pre-construction surface topography to ensure that mounds or berms, due to overfill, or trenches, due to soil settling, are not created that will substantially alter surface hydrology.

Implementation of these measures during and after construction shall be supervised by the Environmental Monitor.

MM BIO-1c. **Riparian Avoidance and Restoration.** PG&E shall avoid, minimize, and compensate for impacts to riparian habitat during construction due to trenching, open cut crossings of streams, and pit excavation for bore crossings of streams by:

- Identification and avoidance of riparian forest by boring under streams where feasible.
- Consultation with CDFG for any unavoidable impacts to riparian vegetation.
- Fencing riparian vegetation adjacent to work areas to prevent impacts.
- Preparation and implementation of riparian restoration, including replanting and monitoring elements.
- Supervision and verification of implementation of these measures by the Environmental Monitor.

Riparian habitat within the ROW shall be identified by a qualified ecologist, mapped on construction plans, and fenced prior to construction. These areas should be avoided to the maximum extent feasible. If riparian habitat cannot be avoided by boring under the stream, the following impact minimization measures, at a minimum, shall be implemented during construction in accordance with any permit conditions imposed by responsible agencies:

- The work area shall be limited to the minimum necessary and shall be fenced prior to construction.
- Vegetation within the work area shall be cleared in a manner that does not damage the root system of adjacent remaining vegetation.
- The upper 12 inches of topsoil shall be salvaged, stored at an upland location, and returned to the surface after trench backfilling is complete.
- Existing vegetation shall be cleared only from areas scheduled for immediate construction work (within 10 days).

The Environmental Monitor shall supervise compliance with these protective measures prior to and during construction activities.

Unavoidable direct impacts to riparian vegetation during construction will require consultation with the appropriate jurisdiction (CDFG) and will likely require a permit (portions of riparian habitat, specifically riparian wetland and willow riparian, are federally jurisdictional wetlands and impacts to these areas would need to be addressed in consultation with USACE). These impacts shall be mitigated by restoration of the affected area to pre-construction conditions in accordance with permits issued by CDFG. A qualified ecologist shall dictate the following procedures to ensure that they will be consistent with applicable local jurisdiction requirements, such as County Tree Ordinances, and with any additional permit conditions imposed by the local agency as well as CDFG and other agencies. If a tree within the riparian forest to be removed qualifies as a Protected Tree under the local jurisdiction, MM BIO-2a and 2b shall be applied and any mitigation standards shall default to the one requiring the higher standard. Riparian habitat removal shall not be permitted until the following procedures are documented:

- Identification of proposed riparian habitat removal (and subsequent restoration) locations from CH2MHill and Galloway Consulting, Inc. Jurisdictional Delineation Reports (see Appendix E-1).

- A discussion demonstrating how maximum avoidance has been accomplished and why the riparian habitat proposed for removal cannot be avoided.

- Methods to restore streambanks to pre-construction conditions.

- Discussion of appropriate replacement ratios (in accordance with issued permit conditions, or, at a minimum, a 1:1 replacement ratio of habitat acreage and at least 3:1 replacement ratio of the number of trees and shrubs present prior to construction).

- Proposed native tree and shrub species matching pre-construction conditions.

- Proposed understory native seed mix composition and application methods.
- Planting methodology, including spacing and proper timing of plant installation.
- Description of protective staking and caging measures for installed plants.
- Description of irrigation and plant maintenance regime.
- Description of five-year monitoring effort to measure replacement success.
- Success criteria (including survival rates and habitat function as compared to pre-construction conditions) and contingency measures for off-site habitat creation in case of mitigation failure.
- Submission of an annual monitoring report to responsible agencies evaluating mitigation success.

Successful implementation of the riparian restoration procedures shall be evaluated five years after all human support (e.g., replanting, fertilization, irrigation) has ceased. At that time, a report shall be submitted to the responsible agencies summarizing the results and a determination will be made by these agencies as to whether continued monitoring is required and/or whether implementation of contingency measures is required.

Rationale for Mitigation

Implementation of BIO-1a, BIO-1b, and BIO1-c would ensure that impacts to federally and State-jurisdictional wetlands and other waters of the U.S. are minimized to the greatest extent feasible and that following construction of the proposed Project, backfilling and restoration activities properly ensure that wetland functionality is restored to disturbed features.

Impact BIO-2: Reduce or Alter Vegetation

The Project would result in the long-term (more than 5 years) reduction or alteration of unique, rare, or special concern vegetation types, riparian vegetation, or natural communities (Potentially Significant, Class II).

Temporary impacts to upland vegetation communities such as annual grassland / ruderal (134.16 acres), riparian woodland (1.04 acres), valley oak woodland (0.59 acre), orchard (22.75 acres), irrigated row and field crops (238.86 acres), and developed/disturbed areas (118.05 acres) would occur due to vegetation removal within the 100-foot right-of-way during grading, trenching, pit excavation, and staging. This temporary impact to annual grasslands, irrigated row and field crops, and developed/disturbed areas would be considered less than significant based on the abundance of these vegetation communities in the Project study area. However, impacts to treed habitats such as riparian woodland, valley oak woodland, and orchard are potentially significant (Class II).

Based on conservative estimates made using recent aerial photography (NAIP 2005), approximately 206 trees occur within the Project site and would be removed to accommodate project construction within the temporary and permanent rights-of-way. An additional 1,967 trees occur within 250 feet of the Project site, some of which may require removal or pruning/trimming in order to construct the Project. None of these trees are designated as Heritage or Landmark trees (Sacramento County Code Chapter 19.12 (Kent Reeves, Principal Natural Resources Planner, personal communication; Breann Sober, Planner, personal communication). However, these trees would be directly and/or indirectly impacted by Project construction. Direct and indirect impacts to native oak trees within the Project site would conflict with both state and county protection ordinances. In addition, the Project passes through a small, mature valley oak woodland. This is a rare habitat type and is suitable for nesting by a variety of raptor species, including Swainson's hawk; direct and indirect impacts to this habitat type are considered potentially significant (Class II).

Construction of the six aboveground facilities would permanently convert 1.19 acres of annual grassland/ruderal, 0.36 acre of irrigated row and field crop, 0.62 acre of rice, and 0.01 acre of developed/disturbed area. Impacts to the 0.62 acre of rice field were addressed above under Impact BIO-1 and implementation of MM BIO-1a, MM BIO-1-b, and MM BIO-1c is required to reduce impacts to rice habitat to less than significant. Because the remaining area permanently impacted at the proposed

valve locations is small and occurs in predominantly developed or disturbed areas, these permanent impacts to annual grassland/ruderal, irrigated row and field crop, and developed/disturbed areas is considered less than significant.

APM BIO-4 limits the area within which vegetation can be removed during construction, and APM BIO-17 requires PG&E to prepare a Restoration and Monitoring Plan to address post-construction vegetation. While these APMs reduce impacts to treed habitats, additional mitigation measures are necessary to reduce impacts to less than significant. Implementation of MM BIO-1a, 1b, and 1c would assist in the protection and restoration of riparian treed habitats. However, implementation of MM BIO-2a and MM BIO-2b would be required to reduce impacts to these vegetation communities to less than significant.

Mitigation Measures for Impact BIO-2: Reduce or Alter Vegetation

MM BIO-2a. **Tree Avoidance and Replacement.** PG&E shall avoid, minimize, and compensate for impacts to trees, including those protected by local ordinances, by:

- Pre-construction identification, fencing and avoidance of trees to the maximum extent during construction.
- Consultation with local jurisdiction if unavoidable impacts to locally protected trees ("Protected Trees") are likely to occur.
- Development and implementation of a Tree Replacement Plan for loss and/or significant damage to trees.
- Supervision and verification of the implementation of these measures by the Environmental Monitor.

The initial step for this measure shall be to determine the size and location of all trees located within and adjacent to the project right-of-way, work areas, staging areas, and launcher/receiver stations. These trees will be then assessed by a qualified arborist to identify and map Protected Trees. If it is determined that the project will trim, remove, or damage the roots of Protected Trees, avoidance measures shall be taken. Avoidance will consist of installing protective fencing around the dripline of any Protected Tree. All construction activities, including excavation, grading, leveling, and

disposal or deposition of harmful materials will be prohibited inside the dripline fence. Attachment of wires, ropes, or signs to Protected Trees shall also be prohibited. The approved Environmental Monitor shall supervise compliance with these protective measures prior to and during construction activities.

If trimming, removal or root damage to a Protected Tree is unavoidable, the appropriate jurisdiction will be consulted. Further actions may require a permit that will include fees and/or replacement for affected trees. For example, Placer County's permit application requires, in part, a site plan map, an arborist report, and a justification statement. Mitigation measures are required for trees designated to be saved that are located within 50 feet of any development activity. Permit approval may require replacement of trees removed, implementation of a revegetation plan, or payment into a tree preservation fund.

Proposed trimming or other damage to Protected Trees along the proposed route shall be evaluated by a qualified arborist, who shall identify appropriate measures to minimize tree loss and shall supervise all associated activities in accordance with permit conditions issued by the responsible jurisdiction.

If the Proposed Project requires removal of trees (Protected Trees or others), a qualified forester, arborist, or restoration ecologist shall evaluate the tree replacement procedures to ensure that the replacement will be consistent with applicable local jurisdiction requirements, such as the Placer County Tree Ordinance, and with additional permit conditions imposed by the local agency (e.g., local oak tree protection requirements). Additional mitigation may be required by CDFG for impacts to riparian trees (refer to MM BIO-1c). Tree removal shall not be permitted until a qualified forester, arborist, or restoration ecologist has reviewed the following procedures (see also MM BIO-2b):

- Identification of proposed tree removal locations.

- A discussion demonstrating how maximum avoidance has been accomplished and why the trees proposed for removal cannot be avoided.
- Discussion of appropriate tree replacement ratios, as defined by the local jurisdiction, or, at a minimum, a 3:1 replacement to removed/impacted ratio for non-protected trees.
- Identification of suitable tree replacement locations within or immediately adjacent to the original tree impact area.
- Tree species and size specifications.
- Proposed understory native seed mix composition and application methods.
- Planting methodology, including spacing and proper timing of plant installation.
- Description of protective staking and caging measures.
- Description of irrigation and plant maintenance regime.
- Description of five-year monitoring effort to measure replacement success.
- Success criteria (including survival rates) and contingency measures in case of mitigation failure.
- Submission of an annual monitoring report to responsible agencies evaluating mitigation success.

Successful implementation of tree replacement shall be evaluated five years after all human support (e.g., replanting, fertilization, irrigation) has ceased. At that time, a report shall be submitted to the local jurisdiction, and CDFG, if requested, summarizing the results. A determination will be made by these agencies as to whether continued monitoring is required and/or whether contingency measures are required.

MM BIO-2b. **Avoidance of Valley Oak Woodland.** Direct and indirect impacts to the valley oak woodland located adjacent to State Route 113 would be minimized by employing trenchless excavation techniques through this area. Trenchless techniques shall be implemented west of the valley oak woodland at the point where the right-of-way (ROW) enters the dripline of the woodland. Trenchless techniques can be terminated only when the ROW exits the dripline of the woodland in the east. Either guided or unguided trenchless techniques can be employed.

Rationale for Mitigation

Implementation of the above mitigation measures ensures that no net loss of native trees would occur as a result of Project construction. Implementation of MM BIO-2a would ensure that all native trees within the Project site are identified and mapped; that avoided trees are identified and protected during Project construction; and that trees directly or indirectly impacted by Project construction are replaced. Implementation of MM BIO-2a reduces direct and indirect impacts to native trees to a less than significant level.

Implementation of MM BIO-2b ensures that existing mature valley oak woodland habitat is not disturbed by Project construction. Although valley oak woodland was once widespread throughout the Sacramento Valley, this habitat is now considered rare and sensitive.

Impact BIO-3: Invasive Species or Soil Pests

The Project would introduce new, or lead to the expanded range of existing, invasive noxious weed species or soil pests, so that they interfere with crop production or successful revegetation of natural communities (Potentially Significant, Class II).

Construction-related disturbance of habitats could allow invasion of weeds. Weeds are non-native opportunists that have developed reproductive features that give them a competitive advantage over many native plants. The introduction or expansion of exotic species is deleterious to native vegetation types. The introduction or expansion of exotic species may cause an impact to native species in the Project study area. Impacts to special-status plants, upland vegetation, and/or wetlands from weed invasion would be considered potentially significant (Class II). Implementation of MM BIO-3 would reduce this impact to less than significant. .

New, invasive aquatic species are not anticipated to be introduced to any wetlands or waterways as a result of Project construction. Due to the timing of construction during the dry months and limited staging requirements, invasive aquatic vegetation and animals would not be expected to be conveyed via construction vehicles or personnel working within wetlands and waterways. No construction vehicles or personnel would be working within any areas that contain invasive aquatic species that could potentially be introduced into the Project area from offsite sources.

The potential for an affected area to recruit new and invasive aquatic species during the post-construction phase could be increased as a result of construction disturbances. Implementation of APM BIO-5, APM BIO-16, APM BIO-17, APM BIO-18, APM BIO-22, and MM BIO-3 include measures that would ensure that direct and indirect impacts to aquatic habitat are avoided and minimized to the maximum extent feasible, and that all affected areas are adequately mitigated through the regulatory permitting process and the implementation of restoration and/or compensatory mitigation. Required long-term maintenance would ensure that invasive species remain absent from restored areas throughout the course of the effort.

Mitigation Measures for Impact BIO-3: Invasive Species or Soil Pests

MM BIO-3. **Prepare and Implement an Invasive Species Control Program.** Prior to Project initiation, all construction equipment shall be steam cleaned before the equipment crosses any county border to remove potential soil and/or water-borne contaminants. Equipment shall be made available for inspection by any State or county agricultural officials upon request. The California Department of Food and Agriculture, Control and Eradication Division shall be notified before equipment crosses into the state (if equipment for the Project is coming from outside of California) and county agricultural commissioners shall be notified before equipment enters their counties.

Plant materials and mud shall be cleaned from construction equipment regularly in a controlled area to avoid the spread of noxious weeds in sensitive areas (prime agricultural land, special native plant communities, and rare plant habitats).

Weed management procedures will be developed and implemented to monitor and control the spread of week populations along the pipeline.

The following measures shall be implemented to control the introduction of weed species within areas disturbed during pipeline construction; implementation of these measures during construction will be verified by the Environmental Monitor:

- Vehicles used in pipeline construction will be cleaned prior to operation off maintained roads.
- Fill material, soil amendments, gravel, etc. required for construction/restoration activities on land shall be obtained from a source that can certify the soil as being "weed free."
- Existing vegetation shall be cleared only from areas scheduled for immediate construction work (within 10 days) and only for the width needed for active construction activities.
- During pipeline construction, the upper 12 inches of topsoil (or less depending on existing depth of topsoil) shall be salvaged and replaced wherever the pipeline is trenched through open land (not including graded roads and road shoulders).
- Disturbed soils shall be revegetated with an appropriate seed mix that does not contain weeds (as defined below).

Rationale for Mitigation

There is the potential that equipment used in Project construction would be brought in from outside of the region. This equipment would have the potential to introduce new invasive weed species, soil pathogens, or aquatic invertebrates that currently do not occur within the State and/or region that could have significant ecosystem-level impacts. There is also the potential to spread weed populations during construction of the pipeline. Implementation of MM BIO-3 would reduce these impacts to a less than significant level.

Impact BIO-4: Habitat Removal or Loss of Special-Status Species

The Project would cause a temporary loss or alteration of habitat important for one or more listed species that could result in avoidance by a listed species, or that could cause increased mortality or lowered reproductive success of the species (Potentially Significant, Class II).

Twenty-nine special-status wildlife species were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3).

Construction of the Project has the potential to impact intact vernal pool, vernal swale, and vernal pool/vernal swale complex habitat suitable for several special-status species, including western spadefoot toad and listed vernal pool branchiopods. Much of this habitat is located within the Beale and Western Placer core areas of the Southeastern Sacramento Valley vernal pool region. It is anticipated that some of the habitat in core areas would be required for recovery of special-status species associated with vernal pool habitat (USFWS 2005). Implementation of MM BIO-1a would reduce impacts to this habitat and the wildlife species that inhabit it. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

The Project has the potential to impact the valley elderberry longhorn beetle. Although no individuals were observed during protocol-level surveys, 23 elderberry shrubs are located within 100 feet of the Project site and exit holes were identified in several shrubs located just west of the Sacramento River (Appendix E-11, Figure 2). Direct and indirect impacts to these shrubs have the potential to reduce the abundance of the valley elderberry longhorn beetle locally and/or regionally. The Project meets the criteria for inclusion under the Programmatic Formal Consultation Permitting Projects with Relatively Small Effects on the Valley Elderberry Longhorn Beetle within the Jurisdiction of the Sacramento Field Office, California (Sacramento Fish and Wildlife Office 1996a). Implementation of MM BIO-4a would reduce impacts to less than significant.

The larger canals, sloughs and creeks throughout the Project study area provide habitat for western pond turtle, and habitat for California tiger salamander is present in the ephemeral pools and waterways and adjacent upland habitats. Implementation of MM BIO-4a would reduce impacts to these species to less than significant.

The Project traverses areas designated as Mitigation Lands by the Natomas Basin Conservancy (Figure 4.4-3). These Mitigation Lands contain foraging habitat for Swainson's hawk that nest along the adjacent Sacramento River. They also contain a drainage canal that is considered a movement corridor for giant garter snake. Impacts to these Mitigation Lands would be considered significant. Implementation of APM BIO-25 through APM BIO-28 would reduce impacts to this species.

However, implementation of MM BIO-4b would be required to reduce impacts to less than significant.

Installation of the pipeline has the potential to significantly impact Swainson's hawk nesting habitat. There are several large, native trees within the Project site, many of which have recorded occurrences of nesting by Swainson's hawk. Implementation of MM BIO-2a and MM BIO-2b would reduce impacts to avoided native trees. APM BIO-29 and APM BIO-30 would also reduce impacts to nesting bird species.

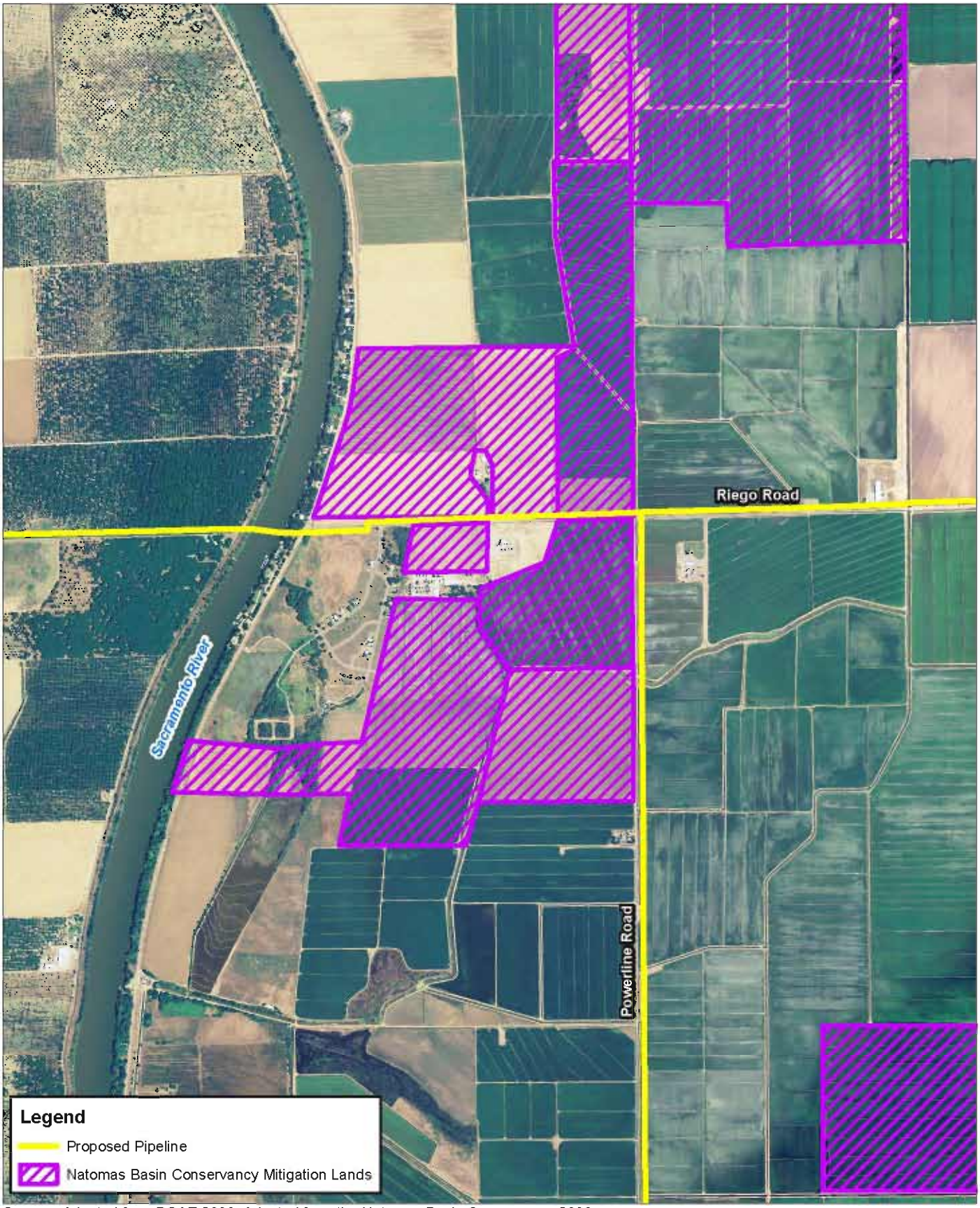
The Project also traverses the Sacramento River Ranch Conservation Bank, which is owned and operated by Wildlands, Inc (Figure 4.4-4). Areas of the Bank in the Project vicinity are croplands that provide foraging habitat for Swainson's hawk, and one parcel that is a wetlands mitigation area. Direct and/or indirect impacts to Swainson's hawk or wetlands habitat located within mitigation lands would be considered potentially significant. Implementation of MM BIO 4-a and 4-c would reduce impacts to less than significant.

Western burrowing owl was observed during surveys and has a high potential to forage and nest throughout the open grasslands and agricultural areas within the Line 406 and Line 407 West segments. Implementation of APM BIO-31 through 35 would reduce impacts to this species to less than significant.

Three bat species have potential to roost and forage in the Project site. Implementation of MM BIO-1c, MM BIO-2a, and MM-BIO-2b are expected to reduce impacts to less than significant.

American badger has the potential to occur within the proposed alignment for Line 406 West near the Dunnigan Hills. Implementation of MM BIO-4a would reduce impacts to less than significant.

Numerous bird species, including those protected under the Migratory Bird Treaty Act, have the potential to nest and forage in the Project study area. Temporary loss of foraging habitat is not considered a significant impact because implementation of MM BIO-1a, BIO-1b, BIO-1c, BIO-2a, and BIO-2b would ensure that disturbed habitats are returned to pre-construction conditions. However, impacts to nesting species would be potentially significant (Class II). Implementation of APM BIO-29 and BIO-30 would reduce impacts to nesting species. However, implementation of MM BIO-4d is required to reduce impacts to nesting bird species to less than significant.



Source: Adapted from PG&E 2008, Adapted from the Natomas Basin Conservancy 2009.

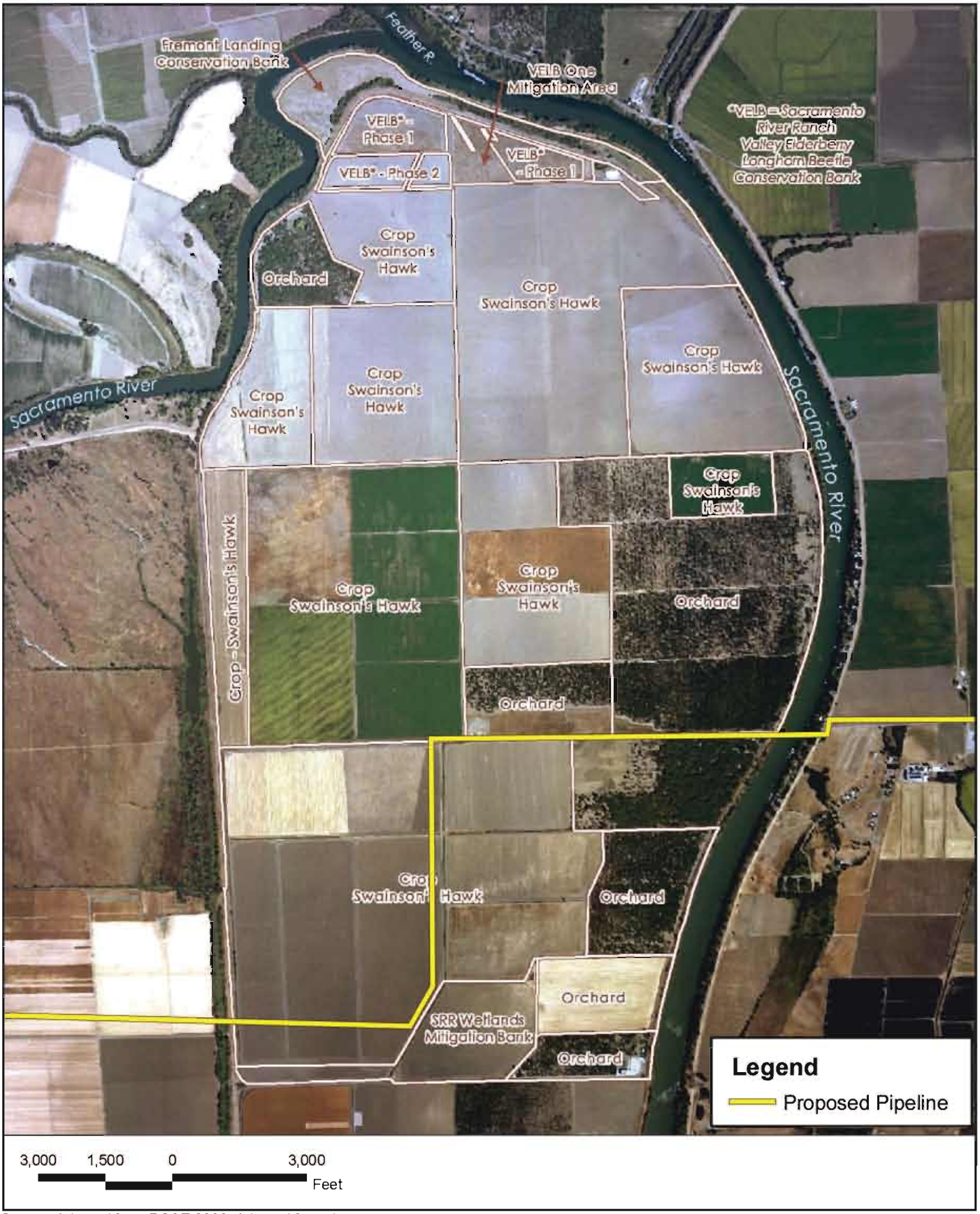
NORTH

2,000 1,000 0 2,000

Feet

Michael Brandman Associates

Figure 4.4-3
Project Location Relative to the Natomas Basin Conservancy



Source: Adapted from PG&E 2008, Adapted from the Sacramento River Ranch Conservation Bank 2008.

NORTH

Michael Brandman Associates

Figure 4.4-4
Project Location Relative to the Sacramento River Ranch Conservation Bank

Mitigation Measures for Impact BIO-4: Habitat Removal or Loss of Special-Status Species

MM BIO-4a. **Protect Special-status Wildlife.** Where construction will occur within or near known or potential special-status species habitat, as defined below, PG&E shall perform the actions defined in the following paragraphs.

General Wildlife Protection During Construction. PG&E shall provide all excavated, steep-walled holes and trenches in excess of three feet in depth with one or more escape ramps constructed of earthen fill or a wood/metal plant. If wildlife-proof barricade fencing is available, it will also be used where appropriate. Escape ramps shall be less than a 45 degree angle. Trenches and pits shall be inspected for entrapped wildlife each working day before construction activities resume. Before such pits and trenches are filled, they shall be thoroughly inspected for entrapped animals. If any wildlife species are discovered, they should be allowed to escape voluntarily, without harassment, before construction activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded. All construction pipes, culverts, or similar structures that are stored at a construction site overnight shall be thoroughly inspected for trapped animals before the pipe is buried, capped, or otherwise used or moved. Pipes laid in trenches overnight shall be capped. If an animal is discovered inside a pipe, that section of the pipe shall not be capped or buried until the animal has escaped. PG&E shall not use plastic mono-filament netting (erosion control matting) or similar material because amphibians and snakes may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

Valley Elderberry Longhorn Beetle. Prior to initiating construction, focused surveys for elderberry shrubs will be conducted within any areas not included in the Valley Elderberry Longhorn Beetle Survey performed by Galloway Consulting, Inc. (2007f) (Appendix E-11).

Elderberry shrubs shall be avoided to the greatest extent feasible. According to the Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999), complete avoidance is assumed when a 100-foot (or wider) buffer is established and maintained around elderberry shrubs. For all shrubs that would be avoided, the following measures are required:

1. Protective fencing shall be erected around each elderberry shrub that would be avoided. The fencing shall be located no greater than 100 feet from the greatest dripline of the shrub.

2. Contractors shall be briefed on the need to avoid damage to elderberry shrubs and the possible penalties for not complying with requirements. In addition, work crews shall be instructed on the status of the beetle and the need to protect its host plant.

3. Signs shall be erected every 50 feet along the edge of the avoidance areas with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be readable from a distance of 20 feet and must be maintained for the duration of construction.

For any activities that inadvertently impact avoided elderberry shrubs, the following measures are required:

1. Restore any damage done to the buffer area. Provide erosion control and revegetate with native plants.

2. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant shall be used in the buffer areas during either construction or maintenance activities.

3. Mowing to reduce fire hazard may occur from July through April. No mowing should occur within 5 feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants.

The USFWS must be contacted if encroachment within the 100-foot buffer is expected, and Section 7 Federal Endangered Species Act consultation is required if elderberry bushes will be disturbed as a result of project activities. Typically, the USFWS requires a minimum setback of at least 20 feet from the dripline of each elderberry plant. If complete avoidance of elderberry plants is not possible, transplantation may be necessary as prescribed by the Guidelines. However, at the discretion of the USFWS, a plant that would be extremely difficult to move because of access problems may be exempted from transplantation (USFWS 1999). Planting of additional seedlings or cuttings may be required under the mitigation guidelines, depending upon the absence or percentage of elderberry plants with emergence holes found in the project area. The Conservation Guidelines require that each elderberry stem measuring 1 inch or greater in diameter that is impacted must be replaced, and additional native species planted. Replacement ratios for replaced shrubs and planting of native species varies depend on the diameter of the stems impacted and whether or not they are located in a riparian area. Mitigation shall occur in accordance with the mitigation ratios outlined in the guidance, and shall be approved by USFWS prior to Project implementation.

Western Pond Turtle. Where construction is to occur near known or potential habitat for western pond turtle (i.e., pipeline water crossing and near ponds), pre-construction surveys shall be conducted to determine the presence or absence of this species. If pond turtles are observed, a determination shall be made in consultation with CDFG as to whether or not construction will adversely impact this species and what measures shall be implemented. Potential impacts to this species shall be minimized through implementation of the proposed water crossing techniques (HDD, bore) outlined in Table 2-5.

California Tiger Salamander. Where construction is to occur near known or potential habitat for California tiger salamander (i.e., ephemeral pools and waterways and adjacent upland habitats), pre-construction surveys shall be conducted to determine the presence or absence of this species. If California tiger

salamanders are observed, a determination shall be made in consultation with CDFG as to whether or not construction will adversely impact this species and what measures shall be implemented.

Swainson's Hawk. If project activities will occur during the breeding period (March 1 to September 15) qualified biologists shall conduct pre-construction surveys within a 0.5 mile radius of the project right-of-way, at least two weeks prior to construction. If nesting Swainson's hawks are found, project activities within 0.25 miles of the project will be delayed until the young have fledged. Swainson's hawk nest sites within 0.5 mile of active construction will be monitored by a qualified biologist to evaluate whether the construction activities are disturbing nesting hawks. If the nesting birds appear distressed, the monitor shall halt all construction activities within 0.5 mile of the nest site and CDFG will be contacted to identify appropriate contingency measures. If construction occurs between September 16 and February 28, no pre-construction surveys or other mitigation measures for Swainson's hawk will be necessary. PG&E will consult with the CDFG to determine if mitigation for the temporary loss of Swainson's hawk foraging habitat will be required. CDFG considers loss of foraging habitat within a 10-mile-radius of any active nest as an impact to this species.

American Badger. Pre-construction surveys for burrows suitable for American badger shall be conducted within suitable habitat along the proposed alignment for Line 406 West near the Dunnigan Hills no more than 30 days prior to initiation of ground disturbing activities. If no burrows are identified, no additional mitigation is required. If suitable burrows are identified, they shall be mapped and CDFG shall be consulted to determine the avoidance measures necessary to prevent direct impacts to this species.

MM BIO-4b. **Mitigation for Potential Impacts to Natomas Basin Conservancy Mitigation Lands.** Prior to Project construction, PG&E shall provide a detailed Project Description to the Natomas Basin Conservancy and shall discuss with the Conservancy the potential for impacts to Mitigation Lands. The following mitigation is required for project implementation:

1. Project construction within Mitigation Lands shall occur only during the months of November through February when Swainson's hawk is generally absent from the state;

2. Under APM BIO-16 and APM BIO-17, PG&E shall ensure that Mitigation Lands are restored to pre-construction conditions;

3. No tree located on Mitigation Lands or with canopy extending into Mitigation Lands and that is suitable for nesting by Swainson's hawk shall be directly or indirectly impacted by Project construction; and

4. If the above measures cannot be met, PG&E shall implement Alternative Option H, which avoids Natomas Basin Conservancy Mitigation Lands (Figure 3-2).

MM BIO-4c. Mitigation for Potential Impacts to Sacramento River Ranch Conservation Bank Mitigation Lands.

1. Project construction within the Conservation Bank shall occur only during the months of November through February when Swainson's hawk is generally absent from the state;

2. Under APM BIO-16 and APM BIO-17, PG&E shall ensure that Mitigation Lands are restored to pre-construction conditions;

3. No tree located on Mitigation Lands or with canopy extending into Mitigation Lands and that is suitable for nesting by Swainson's hawk shall be directly or indirectly impacted by Project construction;

4. Project construction shall not directly or indirectly impact wetlands located in the wetlands mitigation area; and

5. If the above measures cannot be met, PG&E shall implement Alternative Option H, in consultation with Sacramento River Ranch, which crosses only a very small corner of Sacramento River Ranch Conservation Bank (Figure 3-2).

MM BIO-4d. Protect Special-status Bird Species. Where construction is proposed to occur near riparian or wetland habitats (e.g., riparian

wetland, willow riparian) that support special-status bird species, as defined below, PG&E shall limit construction periods to outside the respective breeding season of the affected species.

- Tricolored Blackbird, western yellow-billed cuckoo, loggerhead shrike, bank swallow. No more than two weeks prior to construction between March 1 and August 31, for project activities within 250 feet of potential nesting habitat of the tricolored blackbird, western yellow-billed cuckoo, loggerhead shrike, and bank swallow, pre-construction surveys shall be conducted to determine the presence of nesting birds. If pre-nesting or nesting activity is identified, a determination shall be made in consultation with CDFG as to whether or not construction will adversely impact nesting birds. If it is determined that construction will impact nests or nesting behavior, construction within 250 feet of the nesting locations shall be delayed until juvenile birds have fledged. The 250-foot buffer is considered an initial guideline that may be modified at specific sites following consultation with CDFG.

Protect Raptor Nests. PG&E shall avoid disturbance to active raptor nests at all locations. Pre-construction surveys shall be performed in all areas to identify potential raptor nesting sites within or near the ROW.

No pre-construction surveys shall be required if construction activities are to occur only during the non-breeding season (September 1 through January 31). If, however, construction activities are scheduled to occur during the breeding season (February 1 through August 31), pre-construction surveys of all potentially active nest sites within 500 feet of the construction corridor shall be conducted in areas that may potentially have nesting raptors, including ground nesting raptor species such as northern harrier and short-eared owl. If surveys indicate that nests are inactive or potential habitat is unoccupied during the construction period, no further mitigation shall be required.

If active nests are found, a 500-foot, no-disturbance buffer shall be established around the active nest(s). The size of individual buffers

can be adjusted, following a site evaluation by a qualified raptor biologist, which shall depend upon the presence of topographical features that obstruct the line of site from the construction activities to the nest or observations of the nesting pair during construction based on the level of ongoing disturbance (e.g., farming activities or road traffic) and the observed sensitivity of the birds. Site evaluations and buffer adjustments shall be made in consultation with the local CDFG representative. The portion of the project that is within the designated buffer shall be identified in the field by staking and flagging.

Consultation to Minimize Impacts. If avoidance of sensitive wildlife species habitat is not feasible (e.g., by modifying the route or boring), PG&E shall develop appropriate mitigation in consultation with the resource agencies (CDFG and USFWS). No construction activity shall be permitted until the applicable resource agencies determine that the proposed mitigation (in the Biological Opinion) will result in less than significant impacts to the affected species.

Rationale for Mitigation

The purpose of Mitigation Measure MM BIO-4 is to define specific actions to reduce potential impacts to special-status wildlife species in the project vicinity. Effective application of this measure and all other proposed mitigation measures (BIO-1 through BIO-3) would reduce potential impacts to special-status wildlife species to less than significant levels.

Impacts and Alternatives

A No Project Alternative and twelve alternative options have been proposed for the alignment in order to minimize or eliminate environmental impacts of the proposed Project and to respond to comments from nearby landowners. Where possible, the twelve options, labeled A through L, have been analyzed in comparison to the portion of the proposed route that would be avoided by implementing the option. Descriptions of the options can be found in Section 3.0, Alternatives and Cumulative Projects, and the options are depicted in Figure 3-2A through Figure 3-2K.

In estimating the potential impacts associated with each of the twelve options, it was assumed that the potential impact corridor associated with each option included a

100-foot buffer on either side of the potential centerline (with the exception of Option L, which would simply extend the proposed Line 406-E HDD for approximately 1,000 feet to the east along Base Line Road along the existing alignment). Therefore, impact estimates for each Option assume that the entire 200-foot corridor would be potentially disturbed. This conservative estimate of impacts takes into account the potential for PG&E to place the permanent and temporary easements on either side of the proposed centerline for each Option.

APMs BIO-1 through BIO-35 would be implemented for all alternative options to avoid or minimize biological impacts. Additional mitigation measures necessary to reduce impacts to less than significant are identified under each Option, below.

Vegetation Communities and Wildlife Habitats

Potential impacts to vegetation communities and wildlife habitats for each Option and the applicable portion of the proposed Project are shown in Table 4.4-5.

No Project Alternative

The No Project Alternative would result in no impacts. Under the No Project Alternative, existing vegetation communities and wildlife habitats would remain unaltered.

Option A

Option A would result in greater potential impacts to annual grassland/ruderal and irrigated row and field crop, developed/disturbed areas, and water than the applicable portion of the proposed Project (Table 4.4-5). Option A would result in fewer potential impacts to native trees; there are 23 trees within 100 feet of Option A, and 143 trees near the equivalent portion of the proposed Project. Option A would increase the length of the pipeline by 2,200 feet, increasing the potential for the spread of invasive species or soil pests. Spill-related impacts to vegetation communities under Option A would be similar to those described for the proposed Project.

Table 4.4-5: Estimated Acreage of Vegetation Communities Subject to Potential Impacts under Alternative Options

Vegetation Community	Option A[1]	Option B[1]	Option C	Option D[1]	Option E[1]	Option F	Option G	Option H[1]	Option I	Option J	Option K	Option L
Annual Grassland/Ruderal	129.59	0.00	0.94	0.00	0.00	4.02	0.00	0.00	16.90	33.63	9.45	3.70
Developed/Disturbed	6.40	0.56	0.00	0.56	0.02	0.00	4.24	3.90	2.70	2.75	0.43	0.02
Irrigated Row and Field Crops	202.00	155.61	25.11	47.52	39.49	32.62	5.06	118.89	0.01	10.89	0.00	0.00
Orchard	0.00	0.00	2.36	0.30	17.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rice	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.22	18.50	0.95	0.00	0.00
Riparian Woodland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00
Valley Oak Woodland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fresh Emergent Wetland	0.06	0.00	0.00	0.00	0.00	0.00	0.00	2.36	0.00	0.00	0.00	0.00
Pond	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Riparian Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Seasonal Swale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.01	0.00
Seasonal Wetland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	3.35	0.45	0.81
Vernal Pool	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10	0.45	0.00
Vernal Swale	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.01	0.00
Willow Riparian	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water	2.67	3.38	2.65	3.62	3.81	0.21	0.00	18.80	0.90	3.61	0.00	0.00

[1] Only portions of Options A, B, D, E, and H were fully surveyed for vegetation communities and wetland resources. Therefore, acreages reported for these Options are only estimates. For areas not surveyed, the following data source was used: FRAP Mutli-source Land Cover Data, Version 2.2, 2009.
Source: Galloway Consulting Inc. 2008, CH2MHill 2008, TRC 2009, FRAP 2009.

Impacts to vegetation communities and wildlife habitats under Option A would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option B

Option B would result in fewer potential impacts to annual grassland/ruderal and orchard communities and greater potential impacts to developed/disturbed areas, water, and irrigated row and field crops. Option B would increase the length of the pipeline by 2,640 feet, increasing the potential for the spread of invasive species or soil pests. Option B would result in greater potential impacts to native trees; there are 11 trees within 100 feet of Option B, and six trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option B would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option C

Option C would result in greater potential impacts to annual grassland/ruderal, orchard, irrigated row and field crops, and water communities. Option C would result in greater potential impacts to native trees; there are 21 trees within 100 feet of Option C, and no trees near the equivalent portion of the proposed Project. Option C would increase the length of the pipeline by 1,150 feet, increasing the potential for the spread of invasive species or soil pests. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option C would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option D

Option D would result in greater potential impacts to orchard, irrigated row and field crops, developed/disturbed areas, and water than the applicable portion of the proposed Project. Option D would result in greater potential impacts to native trees; there are 53 trees within 100 feet of Option D, and two trees near the equivalent portion of the proposed Project. These include several large, valley oak trees located along CR-17. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option D would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option E

Option E would result in greater potential impacts to orchard, irrigated row and field crops, water, and developed/disturbed areas than the applicable portion of the proposed Project. Option E would result in greater potential impacts to native trees; there are 35 trees within 100 feet of Option E, and two trees near the equivalent portion of the proposed Project. These include several large, valley oak trees located along CR-17. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option E would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option F

Option F would result in slightly fewer potential impacts to annual grassland/ruderal and developed/disturbed areas and greater potential impacts to irrigated row and field crops and water than the applicable portion of the proposed Project. Option F would result in fewer potential impacts to native trees; there are 3 trees within 100 feet of Option F, and 9 trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described

for the proposed Project. Option F borders an ephemeral drainage with adjacent seasonal wetlands; the proposed Project avoids these features.

Impacts to vegetation communities and wildlife habitats under Option F would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option G

Option G would result in greater potential impacts to irrigated row and field crops and developed/disturbed areas than the applicable portion of the proposed Project. Option G would result in greater potential impacts to native trees; there are 48 trees within 100 feet of Option G, and 25 trees near the equivalent portion of the proposed Project. Several of these are large valley oak trees. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option G would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option H

Option H would result in fewer potential impacts to annual grassland/ruderal, developed/disturbed areas, and orchard vegetation communities. However, Option H would result in greater potential impacts to irrigated row and field crops, rice, water, and riparian woodland communities. Option H would result in greater potential impacts to native trees; there are 86 trees within 100 feet of Option H, and 59 trees near the equivalent portion of the proposed Project. Option H crosses a large seasonal wetland on West Elverta Road; the proposed Project avoids this feature. Option H also crosses Steelhead Creek and crosses more area in the Yolo Bypass. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option H would be similar to those described for the proposed project (Class II). In addition to

implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option I

Option I would result in greater potential impacts to annual grassland/ruderal areas, rice, and water, and fewer potential impacts to irrigated row and field crops and developed/disturbed areas. Option I crosses additional seasonal wetlands, seasonal swales, a vernal pool, and Steelhead Creek. Option I would result in fewer potential impacts to native trees; there are 42 trees within 100 feet of Option I, and 79 trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option I would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option J

Option J would result in greater potential impacts to annual grassland/ruderal areas, irrigated row and field crops, and rice, and fewer potential impacts to developed/disturbed areas and waters. Option J crosses additional seasonal wetlands, seasonal swales, and a vernal pool feature. Option J would result in slightly fewer potential impacts to native trees; there are 77 trees within 100 feet of Option J, and 79 trees near the equivalent portion of the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option J would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option K

Option K would result in greater potential impacts to annual grassland/ruderal and developed/disturbed areas. Option K crosses an additional vernal pool, vernal swale, seasonal swales, and seasonal wetlands. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project. There are no trees within 100 feet of Option K or the equivalent portion of the proposed Project.

Impacts to vegetation communities and wildlife habitats under Option K would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Option L

Under Option L, impacts to vegetation communities and wildlife habitats, including the potential for the spread of invasive species or soil pests, would be similar to the proposed Project. Spill-related impacts to vegetation communities would be similar to those described for the proposed Project. There are no trees within 100 feet of Option L or the equivalent portion of the proposed Project. There is a seasonal wetland within 100 feet of the pipeline alignment but outside of the Project site.

Impacts to vegetation communities and wildlife habitats under Option L would be similar to those described for the proposed project (Class II). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands), MM BIO-2 (trees), and MM BIO-3 (invasive species) would need to be implemented to reduce impacts to less than significant.

Table 4.4-6: Comparison of Alternatives for Vegetation Communities and Wildlife Habitats

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts

Alternative	Comparison with Proposed Project
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Waters of the U.S., Including Wetlands

No Project Alternative

The No Project Alternative would result no impacts compared to the proposed Project. Under the No Project Alternative, existing waters of the U.S., including wetlands, would remain unaltered.

Option A

Option A could result in additional impacts to waters of the U.S., including wetlands (Class II). Similar to the proposed Project, Option A would require the crossing of Hungry Hollow Canal, Smith Creek, and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point at Line 172A and Line 407. Similar to the proposed Project, these crossings would be conducted using open-cut trenching methodologies. From aerial photos, it appears that a portion of Option A that parallels CR-15B would cross several drainages and seasonal wetlands; vernal pools may be present as well (NAIP 2005). Option A has the potential to increase the level of impacts to waters of the state and waters of the U.S., including wetlands. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option B

Option B could result in additional impacts to waters of the U.S., including wetlands (Class II). Similar to the proposed Project, Option B requires the crossing of Hungry Hollow Canal and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point immediately east of I-505. From aerial photos, it appears that Option B would cross Goodnow Slough, Hungry Hollow, and several irrigation/drainage ditches. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option C

Option C would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option C along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Similar to the proposed Project, Option C requires the crossing of Hungry Hollow Canal at its departure point from the proposed Line 406. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option D

Option D would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). From aerial photos, it appears that Option D would cross two irrigation laterals. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option E

Option E would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). From aerial photos, it appears that Option E would cross two irrigation laterals. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option F

Option F would result in similar impacts to waters of the U.S., including wetlands, relative to the proposed Project (Class II). Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option F along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Similar to the proposed Project, Option F would include the crossing of an unnamed irrigation canal west of the intersection of CR-17 and CR-96. From aerial photos, it appears that Option F borders an ephemeral drainage (0.21 acre) with adjacent seasonal wetlands; the proposed Project avoids these features. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option G

Option G would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II). Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option G along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Option G does not traverse any additional waters or wetlands.

Option H

Option H would result in additional impacts to waters of the U.S., including wetlands (Class II). Alternative H crosses a large seasonal wetland on West Elverta Road; the proposed Project avoids this feature. Option H would increase the distance of the crossing of the Yolo Bypass and would also cross the Tule Canal, Steelhead Creek, and the Sacramento River. Option H would increase the potential for impacts to sensitive wetland vegetation communities and habitats. In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option I

Option I was evaluated for wetland resources on January 20 and 21, 2008 (PG&E 2009; Appendix C-1). Option I would result in additional impacts to waters of the U.S., including wetlands (Class II). Option I crosses additional seasonal wetlands (0.48 acre), seasonal swales (0.46 acre), a vernal pool (0.04 acre), and Steelhead Creek (0.90 acre). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option J

Option J was evaluated for wetland resources on January 20 and 21, 2008 (PG&E 2009; Appendix C-1). Option J would result in additional impacts to waters of the U.S., including wetlands (Class II). Option J crosses additional seasonal wetlands (3.35 acres), vernal swales (0.45 acre), a vernal pool feature (0.10 acre), and waters including Steelhead Creek and several irrigation ditches (3.61 acres). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option K

Jurisdictional delineations of waters of the U.S., including wetlands, were conducted within Option K along with those covering the Project study area (Gallaway Consulting 2007a, 2008a, 2008b; CH2MHill 2008). Option K would result in additional impacts to waters of the U.S., including wetlands (Class II). Option K crosses an additional vernal pool (0.45 acre), vernal swale (0.01 acre), seasonal swale (0.01 acre), and seasonal wetlands (0.45 acre). In addition to implementing APM 1 through APM 35, MM BIO-1 (wetlands) would need to be implemented to reduce impacts to less than significant.

Option L

Option L would result in impacts to waters of the U.S., including wetlands, similar to those of the proposed Project (Class II) since Option L follows the proposed alignment. Option L does not traverse any additional waters and wetlands.

Table 4.4-7: Comparison of Alternatives for Waters of the U.S., Including Wetlands

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts

Option G	Similar Impacts
Option H	Greater Impacts
Option I	Greater Impacts
Option J	Greater Impacts
Option K	Greater Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Special-Status Plant Species

No Project Alternative

The No Project Alternative would result in no impacts compared to the proposed Project. Under the No Project Alternative, any existing special-status plant populations would remain unaltered.

Option A

Option A may result in additional impacts to special-status plant species (Class II). Option A would cross annual grassland/ruderal, developed/disturbed, irrigated row and field crops, and water communities. Similar to the proposed Project, Option A would require the crossing of Hungry Hollow Canal, Smith Creek, and various unnamed irrigation canals and seasonal wetlands; vernal pools and fresh emergent wetland may be present as well. Option A would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option A would be required.

Impact BIO-5: Construction Impacts on Special-status Plant Species

The Project would result in direct or indirect impact on special-status plant species that could reduce the abundance or substantially reduce the species numbers of special-status plant species (Potentially Significant, Class II).

There are 23 special-status plant species that have the potential to occur within the areas crossed by Option A. Construction and related activities causing direct impacts to special-status plant species or its habitat would be considered potentially significant (Class II). Implementation of MM BIO-5, requiring appropriately timed pre-construction surveys to map and flag locations supporting these species (if located) for avoidance during construction, would reduce this impact to less than

significant levels. The loss of individuals or known habitats of rare, threatened, or endangered plant species would be considered a significant impact. Construction activities resulting in the removal of a special-status plant species would be considered potentially significant (Class II).

Mitigation Measures for Impact BIO-5: Special-status Plant Species

MM BIO-5. **Rare Plant Avoidance.** PG&E shall avoid impacts to special-status plant species by:

- Having a qualified biologist conduct habitat classification surveys along unsurveyed portions of the alignment.
- Conducting pre-construction surveys during the appropriate flowering period for special-status plant species with potential to occur within un-surveyed locations of the proposed right-of-way.
- Flagging, mapping, and fencing to protect any special-status plant species within the 200-foot-wide study area during construction.
- Limiting all proposed roadway construction to the existing roadway surface(s) where adjacent special-status plant species occur.

Prior to construction, the location of special-status plant species will be determined through appropriately-timed surveys according to established botanical protocol (e.g., CNPS, CDFG). Determination of potential habitat for rare species, and surveys conducted for presence of rare plant species will be performed by a qualified botanist. These surveys will be appropriately timed to cover the blooming periods of the special-status plant species with the potential to occur in the area.

Any rare plant species within the study area (including the 100 foot-wide right-of-way and a 50 foot-wide buffer zone on each side of the right-of-way, work areas, staging areas, and/or launcher/receiver stations) will be flagged, accurately mapped on construction plans, and fenced to protect the area occupied by the species during construction, per APM BIO-3.

Compliance with these measures prior to and during construction will be supervised and verified by the Environmental Monitor per APM BIO-6.

Option B

Option B may result in additional impacts to special-status plant species (Class II). Option B would cross developed/disturbed, irrigated row and field crops, and water communities. Similar to the proposed Project, Option B requires the crossing of Hungry Hollow Canal and various unnamed irrigation canals Seasonal wetlands may be present as well. Option B would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option B would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option C

Under Option C, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option C does not contain any special-status plant species.

Option D

Option D may result in additional impacts to special-status plant species (Class II). Option D would cross orchard, irrigated row and field crops, developed/disturbed areas, and water. From aerial photos, it appears that Option D would cross two irrigation laterals. Wetland habitats may be present as well. Option D would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option D would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option E

Option E may result in additional impacts to special-status plant species (Class II). Option E would cross orchard, irrigated row and field crops, water, and developed/disturbed areas. From aerial photos, it appears that Option E would cross two irrigation laterals. Wetland habitats may be present as well. Option E

would increase the potential for impacts to special-status plant species. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option E would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option F

Under Option F, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option F does not contain any special-status plant species.

Option G

Under Option G, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option G does not contain any special-status plant species.

Option H

Option H may result in additional impacts to special-status plant species (Class II). Option H would cross annual grassland/ruderal, developed/disturbed areas, orchard vegetation communities, irrigated row and field crops, rice, water, and riparian woodland communities. Alternative H crosses a large seasonal wetland on West Elverta Road; the proposed Project avoids this feature. Option H would increase the distance of the crossing of the Yolo Bypass and would also cross the Tule Canal, Steelhead Creek, and the Sacramento River. Option H would increase the potential for impacts to special-status species, particularly hydrophytes. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option I

Option I may result in additional impacts to special-status plant species (Class II). Option I would cross annual grassland/ruderal areas, rice, water, irrigated row and field crops, and developed/disturbed areas. Option I crosses additional seasonal wetlands, seasonal swales, a vernal pool, and Steelhead Creek. Option I would

increase the potential for impacts to special-status species, particularly hydrophytes. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option I would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option J

Option J may result in additional impacts to special-status plant species (Class II). Option I would cross annual grassland/ruderal areas, irrigated row and field crops, rice, developed/disturbed areas, and waters. Option J crosses additional seasonal wetlands, seasonal swales, and a vernal pool feature. Option J would increase the potential for impacts to special-status species, particularly hydrophytes. Protocol-level surveys for plant species with potential to occur in habitat types crossed by Option J would be required. Implementation of MM BIO-5 would reduce this impact to less than significant.

Option K

Under Option K, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option K does not contain any special-status plant species.

Option L

Under Option L, impacts to special-status plant species would be similar to the proposed Project (Class III). Surveys for the special-status plant species having potential to occur within this Option were conducted within all suitable habitats on May 5 and 12, and July 21, 24, and 26, 2006; on May 3, 8, and 14, 2007; and on May 31 and June 1, 2007. The area traversed by Option L does not contain any special-status plant species.

Table 4.4-8: Comparison of Alternatives for Special-Status Plant Species

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Greater Impacts

Alternative	Comparison with Proposed Project
Option B	Greater Impacts
Option C	Similar Impacts
Option D	Greater Impacts
Option E	Greater Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Greater Impacts
Option I	Greater Impacts
Option J	Greater Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Special-Status Wildlife Species

No Project Alternative

The No Project Alternative would result in no impacts compared to the proposed Project. Under the No Project Alternative, special-status species and their habitats would not have the potential to be impacted by the Project.

Option A

Option A would result in similar impacts to special-status wildlife species relative to the proposed Project (Class II).

Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option A would result in fewer potential impacts to nesting birds; there are up to 23 potential nesting trees within 100 feet of Option A, and 143 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 53 potential nesting trees within 250 feet of Option A, and 288 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option B

Option B would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II).

Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option B would result in slightly greater potential impacts to nesting birds; there are up to 11 potential nesting trees within 100 feet of Option B, and 6 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 28 potential nesting trees within 250 feet of Option B, and 26 trees near the equivalent

portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option C

Option C would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option C would result in greater potential impacts to nesting birds; there are up to 21 potential nesting trees within 100 feet of Option C, and no potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 5 potential nesting trees within 250 feet of Option C, and 2 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option D

Option D would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option D would result in greater potential impacts to nesting birds; there are up to 53 potential nesting trees within 100 feet of Option D, and 2 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 65 potential nesting trees within 250 feet of Option D, and 10 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option E

Option E would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM

BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option E would result in greater potential impacts to nesting birds; there are up to 35 potential nesting trees within 100 feet of Option E, and 2 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 39 potential nesting trees within 250 feet of Option E, and 10 trees near the equivalent portion of the proposed Project. In addition to the APMs, implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option F

Option F would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option F would result in fewer potential impacts to nesting birds; there are up to 3 potential nesting trees within 100 feet of Option F, and 9 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 40 potential nesting trees within 250 feet of Option F, and 81 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option G

Option G would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option G would result in slightly greater potential impacts to nesting birds; there are up to 48 potential nesting trees within 100 feet of Option G, and 25 potential nesting trees near the equivalent portion of the proposed Project. However, there are 48 potential nesting trees within 250 feet of Option G, and 68 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as

having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option H

Option H would result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Option H would involve a greater amount of trenching through the Yolo Bypass, which has the potential to support special-status species. Option H avoids Natomas Basin Conservancy Mitigation Lands set aside for Swainson's hawk and giant garter snake. Option H also avoids Sacramento River Ranch Mitigation Bank lands set aside for Swainson's hawk and for wetlands. Option H also avoids 19 of the 23 elderberry shrubs that occur within 100 feet of the construction workspace.

Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option H would result in greater potential impacts to nesting birds; there are up to 86 potential nesting trees within 100 feet of Option H, and 59 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 163 potential nesting trees within 250 feet of Option H, and 127 trees near the equivalent portion of the proposed Project.

Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as

having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option I

Option I would have the potential to result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Several seasonal wetland features are located along Option I, and Option I is within 250 feet of a delineated vernal pool that may provide potential habitat for vernal pool invertebrates. Option I may result in direct impacts to vernal pools that are suitable habitat for special-status vernal pool branchiopods and plant species. However, it is anticipated that a majority of these features would be avoided as outlined in the APMs BIO-1 through BIO-35, provided above, and that only a very few may require mitigation. Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option I would result in fewer potential impacts to nesting birds; there are up to 42 potential nesting trees within 100 feet of Option I, and 79 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 55 potential nesting trees within 250 feet of Option I, and 109 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to

implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option J

Option J would have the potential to result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Several seasonal wetland features are located along Option J, and Option J is within 250 feet of a delineated vernal pool that may provide potential habitat for vernal pool invertebrates. Option J may result in direct impacts to vernal pools that are suitable habitat for special-status vernal pool branchiopods and plant species. However, it is anticipated that a majority of these features would be avoided as outlined in the APMs BIO-1 through BIO-35, provided above, and that only a very few may require mitigation. Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

Option J would result in slightly fewer potential impacts to nesting birds; there are up to 77 potential nesting trees within 100 feet of Option J, and 79 potential nesting trees near the equivalent portion of the proposed Project. Similarly, there are 58 potential nesting trees within 250 feet of Option J, and 109 trees near the equivalent portion of the proposed Project. Implementation of MM BIO-2a and 2b, and BIO-4a and 4d would reduce impacts to tree-dependent species to less than significant.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option K

Option K would have the potential to result in impacts to special-status wildlife species similar to those of the proposed Project (Class II). Potential impacts related to spills or leaks / health hazard impacts on special-status wildlife species would be less than significant with implementation of APM HAZ-2, APM BIO-5, APM BIO-7, APM BIO-13, APM BIO-14, APM BIO-23, and APM BIO-35

Interference with the movement or range of wildlife species would be a less than significant impact with implementation of APM BIO-1, APM BIO-2, APM BIO-4, APM BIO-5, APM BIO-6, APM BIO-15, APM BIO-16, APM BIO-17, APM BIO-20, APM BIO-21, APM BIO-22, and APM BIO-35.

Option K would cross a vernal pool and seasonal wetland features and potentially result in direct impacts to special-status vernal pool branchiopods and plant species. However, it is anticipated that a majority of these features would be avoided as outlined in the APMs BIO-1 through BIO-35, provided above, and that only a very few may require mitigation. Implementation of MM BIO-1a, 1b, and 1c would reduce impacts to wetland-dependent species to less than significant. Implementation of APM BIO-24 would also reduce impacts to vernal pool branchiopods to less than significant.

There are no potential nesting trees located within 250 feet of Option K or the equivalent portion of the proposed Project.

Impact BIO-4, Habitat Removal or Loss of Special-status Species, discusses potential impacts to the 29 special-status wildlife species that were identified as having a moderate or high likelihood of occurring within the Project study area and being impacted by Project construction (see Table 4.4-3). In addition to implementing APM 1 through APM 35, implementation of MM BIO-4a and 4d would reduce impacts to special-status wildlife species to less than significant.

Option L

Option L would result in impacts to special-status wildlife species similar to those of the proposed Project since Option L follows the proposed alignment (Class II). There are no potential nesting trees located within 250 feet of Option L or the equivalent portion of the proposed Project.

Table 4.4-9: Comparison of Alternatives for Special-Status Wildlife Species

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

Fisheries

No Project Alternative

The No Project Alternative would result in no impacts compared to the proposed Project. A No Project Alternative would eliminate any potential direct or indirect impacts to fish and their habitat that could result from the crossing of waterways and their adjacent wetlands for the installation of a natural gas pipeline.

Option A

Similar to the proposed Project, Option A would require the crossing of Hungry Hollow Canal, Smith Creek, and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point at Line 172A and Line 407. Similar to the proposed Project, these crossings would be conducted using open-cut trenching methodologies. Hungry Hollow Canal, Smith Creek, and the unnamed irrigation canals that would be open-cut trenched as a result of Option A do not support suitable habitat for any special-status fish species due to restricted access

and the absence of important habitat suitability elements including riparian cover, in-stream structures, suitable substrate, undercut banks, among other limiting factors.

Based on the similarities and extent of potential impacts, Option A would have no more or no less of an effect on fisheries resources than the proposed Project.

Option B

Similar to the proposed Project, Option B requires the crossing of Hungry Hollow Canal and various unnamed irrigation canals between its origin at Lines 400 and 401 and its terminus and tie-in point immediately east of I-505. Similar to the proposed Project, the crossings of Hungry Hollow Canal and the unnamed irrigation canals would be conducted using open-cut trenching methodologies. Hungry Hollow Canal and the unnamed irrigation canals that would be open-cut trenched as a result of Option B do not support suitable habitat for any special-status fish species due to restricted access and the absence of important habitat suitability elements.

Based on the similarities and extent of potential impacts, Option B would have no more or no less of an effect on fisheries resources than the proposed Project.

Option C

Similar to the proposed Project, Option C requires the crossing of Hungry Hollow Canal at its departure point from the proposed Line 406. Open-cut trenching would be employed for the crossing of this feature in both the proposed Project and Option C. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, Hungry Hollow Canal is not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option C would have no more or no less of an effect on fisheries resources than the proposed Project.

Option D

Similar to the proposed Project, Option D may include the crossing of a number of unnamed irrigation canals throughout its short reach. The crossings of irrigation canals would be conducted using open-cut trenching methodologies. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option D would have no more or no less of an effect on fisheries resources than the proposed Project.

Option E

Similar to the proposed Project, Option E may include the crossing of a number of unnamed irrigation canals throughout its short reach. The crossings of irrigation canals would be conducted using open-cut trenching methodologies. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option E would have no more or no less of an effect on fisheries resources than the proposed Project.

Option F

Similar to the proposed Project, Option F would include the crossing of an unnamed irrigation canal west of the intersection of CR-17 and CR-96. This crossing would be conducted using open-cut trenching. Due to restricted access and the absence of important habitat suitability elements for special-status fish species, the unnamed irrigation canal is not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option F would have no more or no less of an effect on fisheries resources than the proposed Project.

Option G

The alignment considered for Option G would not involve any crossing of waterways or resources that could support fish species or their habitat. Option G would provide an alternative route for a short reach of the alignment for the proposed Project that also does not involve any crossings of waterways or resources that could support fish species or their habitat.

Based on the determination that neither the proposed Project nor Option G would result in any impacts to fisheries resources, Option G would have no more or no less of an effect on fisheries resources than the proposed Project.

Option H

Option H would increase the distance of the crossing of the Yolo Bypass and would also cross the Tule Canal, Steelhead Creek, and the Sacramento River. The

crossing of the Yolo Bypass, the Tule Canal, and the Sacramento River would be conducted using HDD methodologies. The Yolo Bypass, including the Tule Canal, as well as the Sacramento River, were determined to provide suitable habitat for special-status fish species and have a potential to support special-status fish species during all or portions of the year.

Although Option H would also employ HDD methodologies, it would have a greater potential adverse affect on fisheries resources due to the increased distance of the crossing of the Yolo Bypass as compared to the proposed Project.

Option I

Similar to the proposed Project, Option I may include the crossing of a number of unnamed irrigation canals and would cross Steelhead Creek. During wet months, Steelhead Creek has the potential to support special-status fish species, but the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option I would have no more or no less of an effect on fisheries resources than the proposed Project.

Option J

Similar to the proposed Project, Option J may include the crossing of a number of unnamed irrigation canals and would cross Steelhead Creek. During wet months, Steelhead Creek has the potential to support special-status fish species, but the unnamed irrigation canals are not likely to support special-status fish species or their habitat.

Based on the similarities and extent of potential impacts, Option I would have no more or no less of an effect on fisheries resources than the proposed Project.

Option K

The alignment considered for Option K would not involve any crossing of waterways or resources that could support fish species or their habitat. Option K would provide an alternative route for a short reach of the alignment for the proposed Project that also does not involve any crossings of waterways or resources that could support fish species or their habitat.

Based on the determination that neither the proposed Project nor Option K would result in any impacts to fisheries resources, Option K would have no more or no less of an effect on fisheries resources than the proposed Project.

Option L

The alignment considered for Option L would not involve any crossing of waterways or resources that could support fish species or their habitat. Option L would provide an alternative route for a short reach of the alignment for the proposed Project that also does not involve any crossings of waterways or resources that could support fish species or their habitat.

Based on the determination that neither the proposed Project nor Option L would result in any impacts to fisheries resources, Option L would have no more or no less of an effect on fisheries resources than the proposed Project.

Table 4.4-10: Comparison of Alternatives for Special-Status Fish Species

Alternative	Comparison with Proposed Project
No Project	No Impacts
Option A	Similar Impacts
Option B	Similar Impacts
Option C	Similar Impacts
Option D	Similar Impacts
Option E	Similar Impacts
Option F	Similar Impacts
Option G	Similar Impacts
Option H	Similar Impacts
Option I	Similar Impacts
Option J	Similar Impacts
Option K	Similar Impacts
Option L	Similar Impacts
Source: Michael Brandman Associates 2009.	

4.4.6 Cumulative Projects Impact Analysis

Vegetation Communities and Wildlife Habitats

Construction of the proposed Project would not result in long-term impacts to vegetation communities and wildlife habitats. The temporary impact to annual grasslands, irrigated row and field crops, and developed/disturbed areas is considered less than significant based on the abundance of these vegetation communities in the Project vicinity. Construction of the aboveground facilities would permanently convert 1.19 acres of annual grassland/ruderal, 0.36 acre of irrigated row and field crop, 0.62 acre of rice, and 0.01 acre of developed/disturbed area. Impacts to rice fields, which are federally jurisdictional features, are discussed below. Given the scale of other projects in the Cumulative Projects Study Area, the proposed Project impacts to upland vegetation communities would be negligible. Therefore, the proposed Project would not contribute to a cumulatively significant impact when viewed in conjunction with other projects identified within the Cumulative Projects Study Area.

Waters of the U.S., Including Wetlands

Of the 796.97 acres of federally jurisdictional wetlands and other waters of the U.S. that occur within the Project study area, up to 65.95 acres (2.17 acres of other waters of the U.S., and 63.55 acres of wetlands) would potentially be disturbed due to construction of the proposed Project. Specifically, up to 0.04 acre of NRPW, 1.55 acres of RPW, 0.58 acre of TNW (Sacramento River), 0.1 acre of fresh emergent wetland, 0.79 acre of riparian wetland, 0.71 acre of seasonal swale, 6.52 acres of seasonal wetland, 0.1 acre of vernal pool, 0.04 acre of willow riparian, and 55.28 acres of rice would be disturbed.

The majority of the vernal pool features within the Project site would be avoided using HDD methodology (see Table 2-5) and as outlined in APMs BIO-1 through BIO-35 and MM BIO-1 (a, b, and c), provided above. There are several proposed Projects within the Cumulative Projects Study Area that would impact vernal pool habitats. The largest of these is the Placer Vineyards Specific Area Plan, which contains approximately 2,000 acres of vernal pool habitat. All other projects identified in Cumulative Projects Study Area also have the potential to impact seasonal wetlands and/or vernal pools. However, this Project's contribution is less than cumulatively considerable and, therefore, less than significant because the Project would impact very few vernal pools and the Project would implement its fair

share of mitigation measures designed to alleviate the cumulative impact (CEQA Guidelines section 15130(a)).

The proposed Project would result in permanent impacts to 0.62 acre of rice field and temporary impacts to fresh emergent wetlands, riparian wetlands, seasonal swales, seasonal wetlands, willow riparian, rice, and numerous other waters of the U.S. The Project would result in few long-term impacts to federally jurisdictional wetlands and other waters of the U.S. Implementation of APMs BIO-1 through APM BIO-35 and MM BIO-1 (a, b, and c) would minimize or compensate for impacts to these features and prevent temporary and permanent alteration or loss of habitat function. Given the scale of other projects in the Cumulative Projects Study Area, the proposed Project impacts to these habitats are considered less than cumulatively considerable and are not significant.

Special-Status Plant Species

Construction of the proposed Project would not result in any impacts to special-status plant species. Therefore, the proposed Project would not contribute to a cumulatively significant impact when viewed in conjunction with other projects identified within the Cumulative Projects Study Area.

Special-Status Wildlife Species

The proposed Project may result in direct impacts to vernal pools that are suitable habitat for special-status vernal pool branchiopods. The majority of the potential impacts to vernal pools would be temporary in nature due to the on-site restoration of the wetlands, and implementation of APM BIO-1 through APM BIO-35 and MM BIO-1 (a, b, and c), provided above, would reduce impacts to these species to less than significant. There are several proposed projects within the Cumulative Projects Study Area that would impact vernal pool habitats. The largest of these is the Placer Vineyards Specific Area Plan, which contains approximately 2,000 acres of vernal pool habitat. All other projects identified in the Cumulative Projects Study Area also have the potential to impact vernal pools. However, this Project's contribution is less than cumulatively considerable and, therefore, less than significant because the Project would impact very few vernal pools and the Project would implement its fair share of mitigation measures designed to alleviate the cumulative impact (CEQA Guidelines section 15130(a)).

The proposed Project may result in indirect impacts to elderberry shrubs that may support valley elderberry longhorn beetle. Although 23 elderberry shrubs are

located within 100 feet of the Project site, and multiple exit holes were observed on several of these shrubs, none of these shrubs are located within 20 feet of the Project site and none would require removal. Implementation of MM BIO-4 would reduce these impacts to a less-than-significant level. There are several other proposed projects within the Cumulative Projects Study Area that are likely to directly and indirectly impact valley elderberry longhorn beetle. Given the scale of the other projects in the Cumulative Projects Study Area, the potential for indirect impacts to elderberry shrubs that may support the valley elderberry longhorn beetle is cumulatively not significant.

The proposed Project may result in direct and indirect impacts to Swainson's hawk nesting habitat. Based on conservative estimates made using recent aerial photography (NAIP 2005), approximately 206 potentially suitable nesting trees would be removed during construction of the proposed Project, and an additional 1,967 potentially suitable nesting trees occur within 250 feet of the Project site, some of which may require removal or trimming/pruning in order to construct the project. Several of these trees have recorded occurrences of nesting by Swainson's hawk. Although mitigation measures prescribed under Impact BIO-4 would reduce these impacts to a less-than-significant level, there are several other proposed projects within the Cumulative Projects Study Area that likely would also impact foraging and nesting habitat of Swainson's hawk. These impacts are cumulatively considerable.

The Project would traverse areas designated as Mitigation Lands by the Natomas Basin Conservancy, and implementation of MM BIO-4b is required to reduce impacts to less than significant. The Natomas Levee Improvement Plan is also occurring within or adjacent to lands designated as Mitigation Lands. None of the other cumulative projects that occur within the Natomas Basin Habitat Conservation Plan Area would occur within the boundaries of the NBHCP.

The proposed Project has the potential to result in impacts to western burrowing owl and numerous other bird species, three bat species, and American badger. Implementation of APM BIO-1 through APM BIO-35, MM BIO-1 (a, b, and c), MM BIO-2 (a, b), and MM BIO-4 (a, b, c, d) would reduce impacts to less than significant. There are several other proposed projects within the Cumulative Projects Study Area that likely would also impact these special-status species. However, given the scale of other projects in the Cumulative Projects Study Area and the fact that the proposed Project would not result in long-term, permanent impacts to these species, impacts are considered less than cumulatively considerable and are not significant.

Fisheries

Construction of the proposed Project would not result in any impacts to fisheries. All waterways that support the required habitat elements for the movement, range, or spawning of special-status resident or anadromous fish would be crossed using HDD methodologies, and no impacts are anticipated to result from the open-cut trenching of waterways. Therefore, the proposed Project would not contribute to a cumulatively significant impact when viewed in conjunction with other projects identified within the Cumulative Projects Study Area.

4.4.7 Summary of Impacts and Mitigation Measures

Table 4.4-11: Summary of Biological Resources Impacts and Mitigation Measures

Impact	Mitigation Measure
BIO-1. Wetlands.	**BIO-1a.** Wetland Avoidance and Restoration. **BIO-1b.** Trench Backfill and Topographic Restoration. **BIO-1c.** Riparian Avoidance and Restoration.
BIO-2. Reduce or alter vegetation.	**BIO-2a.** Tree Avoidance and Replacement. **BIO-2b.** Avoidance of Valley Oak Woodland.
BIO-3. Invasive Species or Soil Pests.	**BIO-3a.** Prepare and Implement an Invasive Species Control Program.
BIO-4. Habitat Removal or Loss of Special-status Species.	**BIO-4a.** Protect Special-status Wildlife. **BIO-4b.** Mitigation for potential impacts to Natomas Basin Conservancy Mitigation Lands. **BIO-4c.** Mitigation for potential impacts to Sacramento River Ranch Conservation Bank mitigation lands. **BIO-4d.** Protect Special-status Bird Species.
BIO-5. Construction Impacts on Special-status Plant Species.	**BIO-5a.** Rare Plant Avoidance.
Source: Michael Brandman Associates 2009.	