

Table 2: Potential Water Sources

Water Source	Location	Line Segment
Natural waterway	Knights Landing Ridge Cut	407 West
Natural waterway	Yolo Bypass	407 West
Natural waterway	Yolo Bypass	407 West
Natural waterway	Sacramento River	407 West
Fire hydrant	Near intersection of Fiddymment and Baseline roads	407 East
Irrigation canal	Northeast corner of West Elverta and Powerline roads	407 East
Irrigation canal	Northeast corner of West Elverta and Powerline roads	Powerline Road Distribution Feeder main
Irrigation canal	Near tie-in of Line 400/401 and Line 406; runs perpendicular to right-of-way	Line 406

OPERATIONS AND MAINTENANCE

Routine maintenance along the majority of the pipeline will consist of quarterly to annual patrolling (e.g., foot or aerial patrol), cathodic protection, and surveys. PG&E will maintain a 50-foot-wide permanent easement along the length of the project, with the exception of the Powerline Road DFM, which will have a 35-foot-wide permanent easement. Vegetation maintenance will be performed as needed to maintain a 30-foot-wide corridor centered on the pipe that is free of deep-rooted plants. Because the majority of the route is grassland and row crops or rice fields, very few areas are expected to require vegetation maintenance by PG&E.

3. DESCRIPTION OF ACTION AREA

The project action area includes the ROW and the full extent of additional space that may be directly or indirectly affected by project construction. This includes a 100-foot ROW consisting of 50 feet of temporary construction workspace and 50 feet of permanent easement for the 30-inch segments of pipeline, and a 60-foot ROW consisting of 25 feet of temporary construction workspace and 35 feet of permanent easement for the 10-inch segment of pipeline, in addition to all extra workspace areas necessary for laydown of materials, maneuvering of construction vehicles, and access to and from the ROW. The action area also includes areas outside of the ROW that support special-status species that could potentially be affected by project construction activities if significant amounts of contaminants, sedimentation, noise, or air pollution are carried beyond the ROW. These areas include nesting trees within 0.25 mile (1320 ft.) of the ROW, vernal pools within 250 ft. of the ROW, GGS upland habitat within 250 ft. of the ROW, and water up to 1000 ft. downstream of the project ROW that has the potential to support special-

status fish, critical habitat, or EFH for chinook salmon. It is not anticipated that direct or indirect effects resulting from project construction or operation will extend beyond this action area.

To delineate the project action area, local topography, hydrology, special-status species populations, and potential project effects were considered. The topography of the project area is relatively flat with the exception of the Dunnigan Hills, which have rolling hills. Water features in the project area that extend the action area beyond the ROW include the Sacramento River, the Yolo Bypass and Tule Canal, Knights Landing Ridge Cut, Goodnow Slough, Hungry Hollow Canal, Steelhead Creek, Curry Creek, a large matrix of irrigation canals in the Line 407 East and Line 407 West project segments, seasonal wetland features in the Dunnigan Hills, and vernal pools and swales in the Line 407 East project segment.

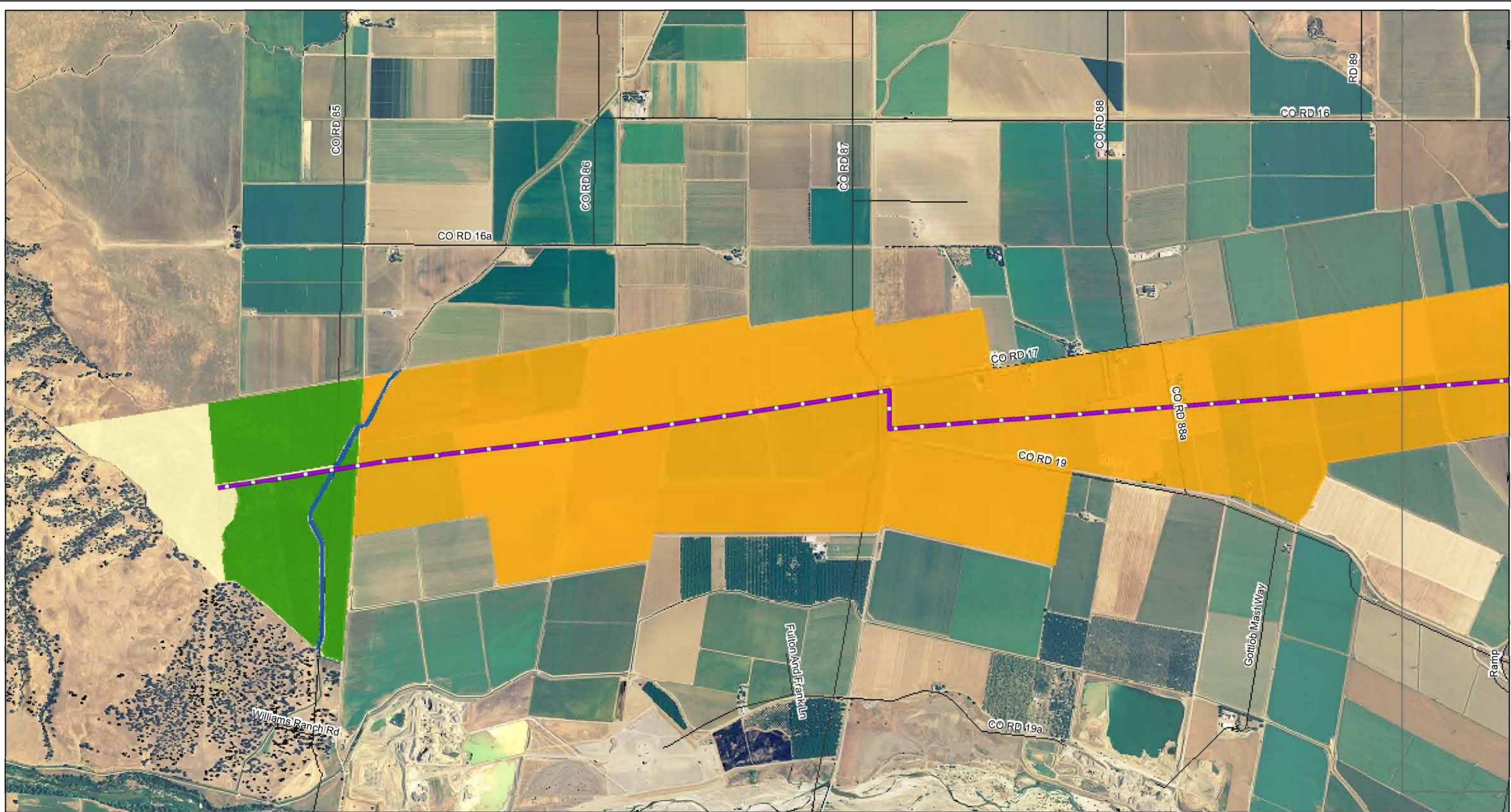
VEGETATION COMMUNITIES AND HABITAT TYPES

Plant communities and habitat types were mapped within a 1,000-foot study area centered on the proposed alignment of the pipeline. This study area was intended to cover all ROW adjustments, extra workspaces, and minor alignment modifications. Preconstruction surveys may be required to identify the location of special-status species habitat outside of the 1,000-foot study area but within the action area (e.g., nesting trees with active nests). Figures 2A-2G show the habitat characterization of the study area. The habitat types that were identified in the study area are described in detail below, based on Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California* (1986) and the California Department of Fish and Game's *California Wildlife Habitat Relationship System* (2006b).

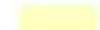
Agricultural Lands

Agricultural production in the project area includes orchards, row crops, and rice fields. Orchards can be found in the western portion of the Line 406 segment west of I-505, and in the Line 407 West segment west of the Sacramento River. Row crops exist predominantly in the Line 406 and Line 407 West segments, though small plots of row crops can also be found in the Line 407 East segment. Rice fields exist in the Line 407 West and Line 407 East/ Powerline Road DFM segments within the Natomas Basin between the Sacramento River and Steelhead Creek.

Agricultural fields provide habitat for a number of special-status species that have become accustomed to the consistent disturbance associated with farming. Swainson's hawk and other raptor species utilize agricultural fields for foraging and may nest in adjacent trees where prey is abundant. There are numerous CNDDDB records for Swainson's hawk within 0.25 mile of the Line 406 and Line 407 project alignment. Mountain plovers (*Charadrius montanus*) often utilize freshly plowed fields for foraging, and northern harriers have been observed foraging over agricultural fields in the project area. Other resident and migratory avian species also forage and nest in or adjacent to agricultural areas. Canals associated with agriculture and other aquatic habitat such as that found in rice provide foraging, breeding, cover, and basking habitat for the GGS.

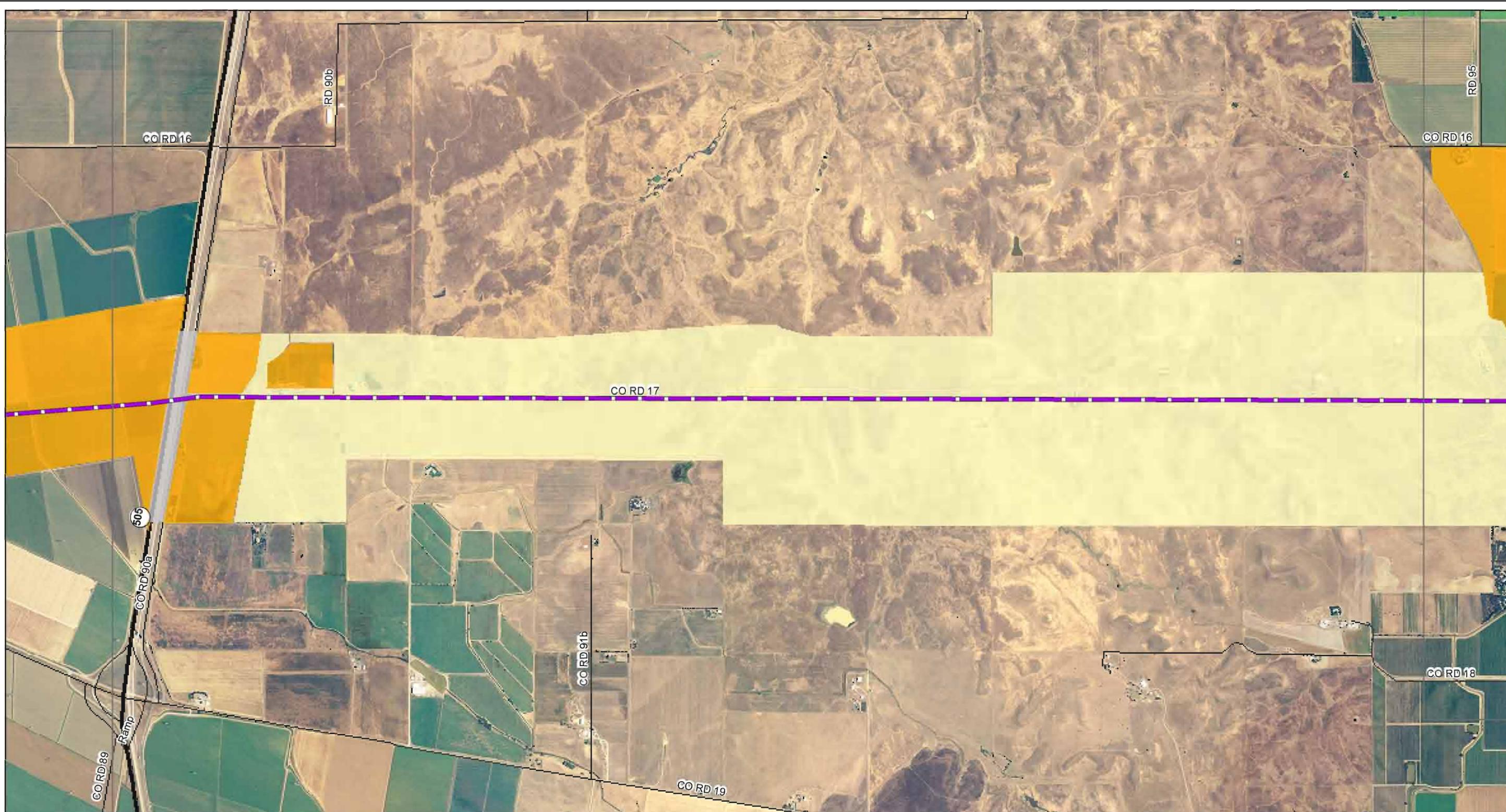


**Line 406 and Line 407
Pipeline Project
Figure 2A
Habitat Map**

- | | | |
|---|---|---|
|  Proposed Pipeline |  Developed |  Riparian Woodland |
|  Row Crops |  Wetland |  Oak Woodland |
|  Annual Grassland |  Orchard | |
|  Riverine |  Rice | |

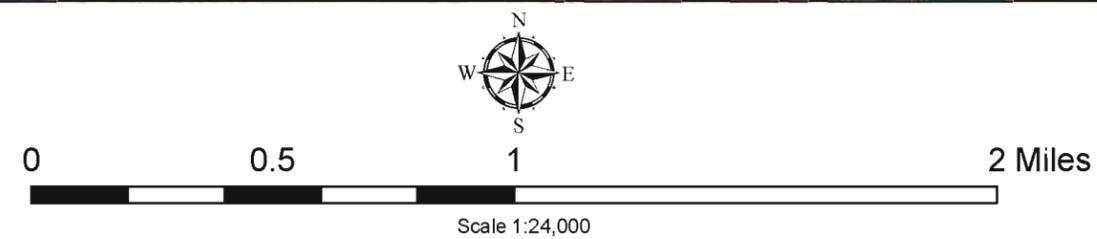


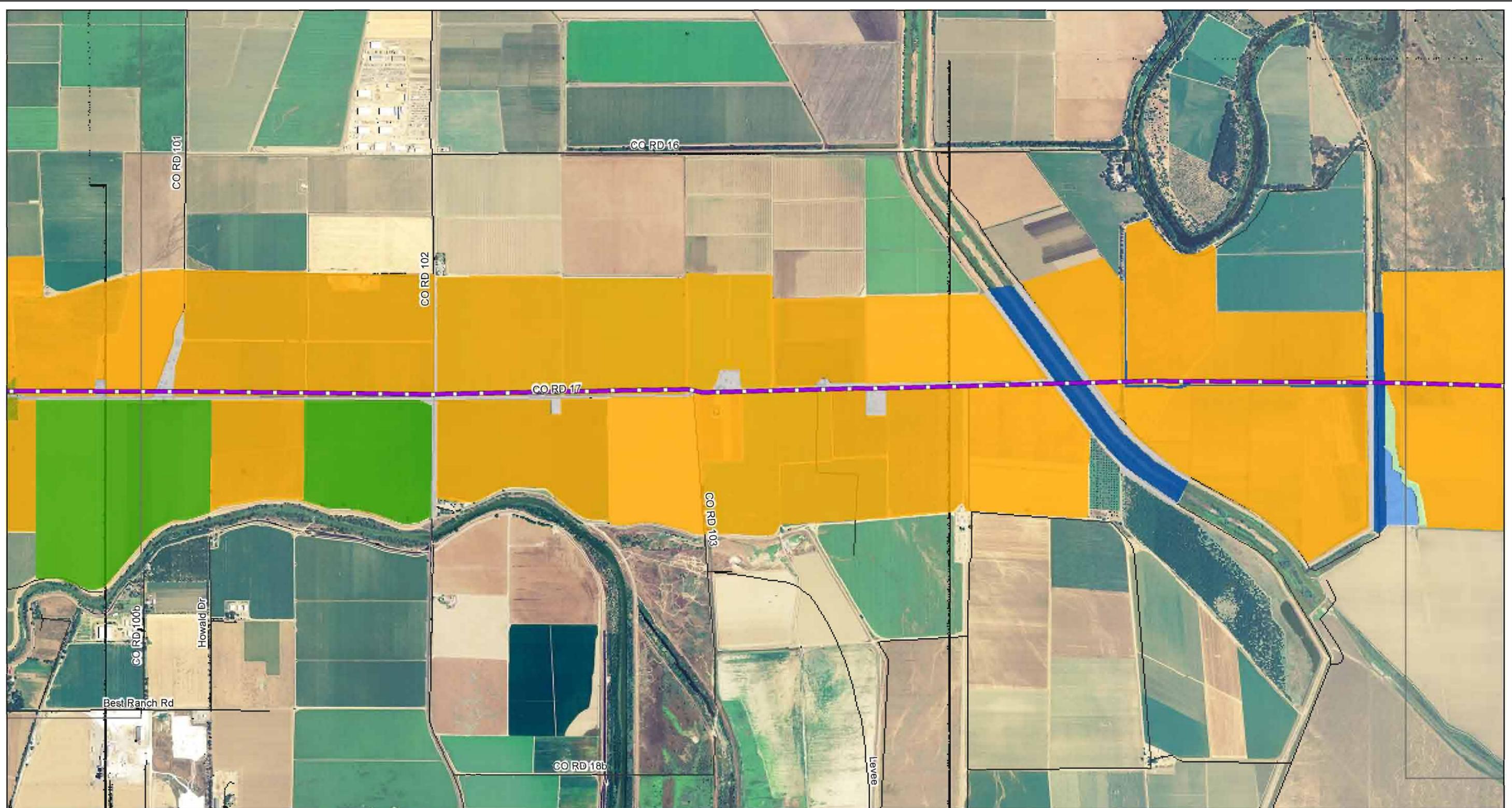
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**Line 406 and Line 407
Pipeline Project
Figure 2B
Habitat Map**

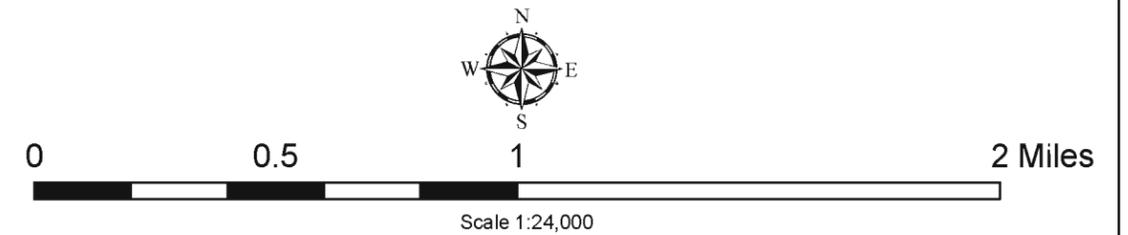
- | | | |
|-------------------|-----------|-------------------|
| Proposed Pipeline | Developed | Riparian Woodland |
| Row Crops | Wetland | Oak Woodland |
| Annual Grassland | Orchard | |
| Riverine | Rice | |

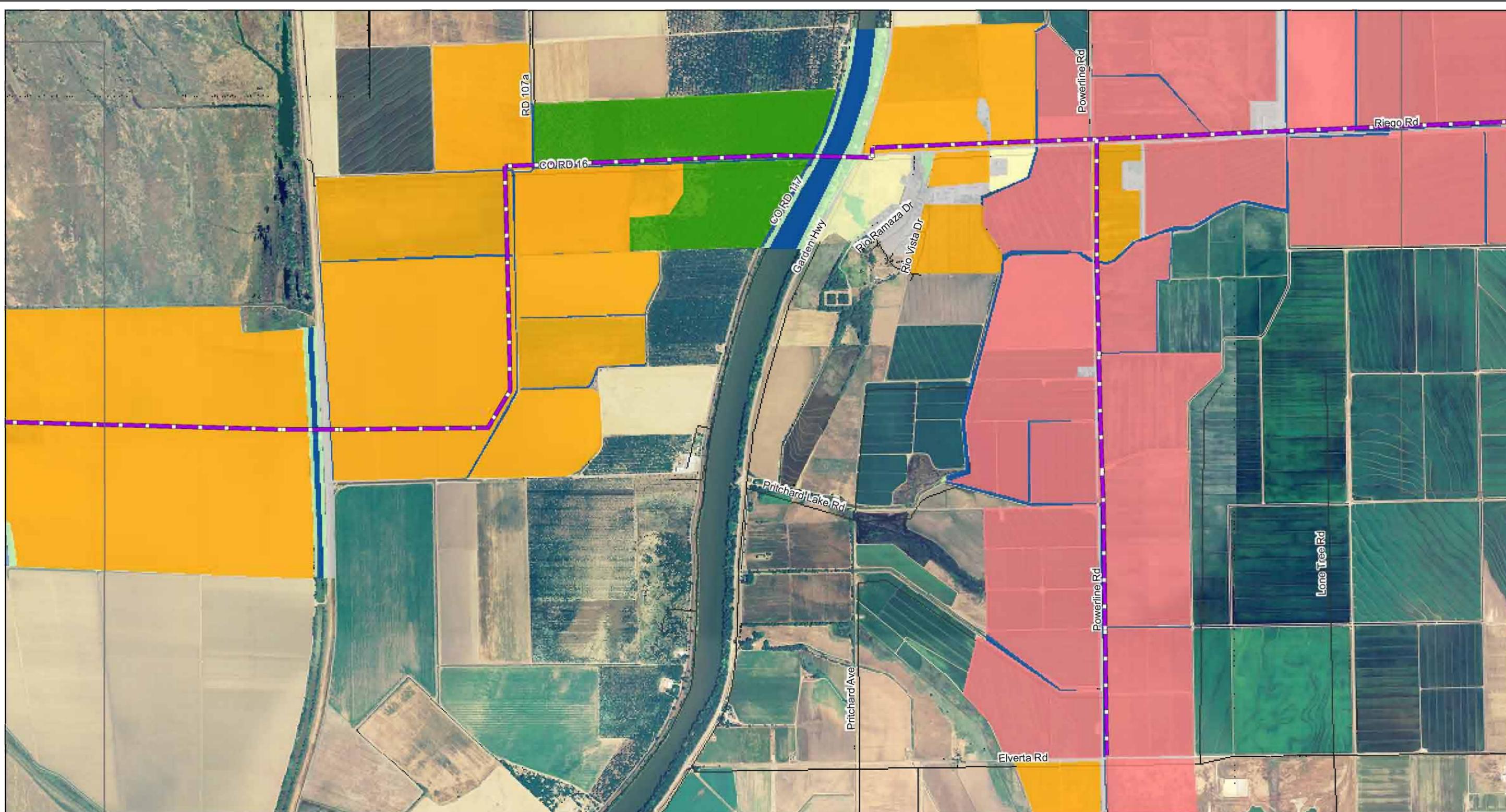




**Line 406 and Line 407
Pipeline Project
Figure 2D
Habitat Map**

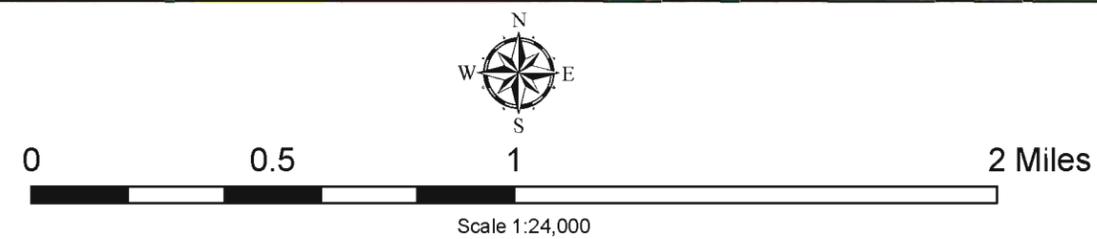
- | | | |
|-------------------|-----------|-------------------|
| Proposed Pipeline | Developed | Riparian Woodland |
| Row Crops | Wetland | Oak Woodland |
| Annual Grassland | Orchard | |
| Riverine | Rice | |

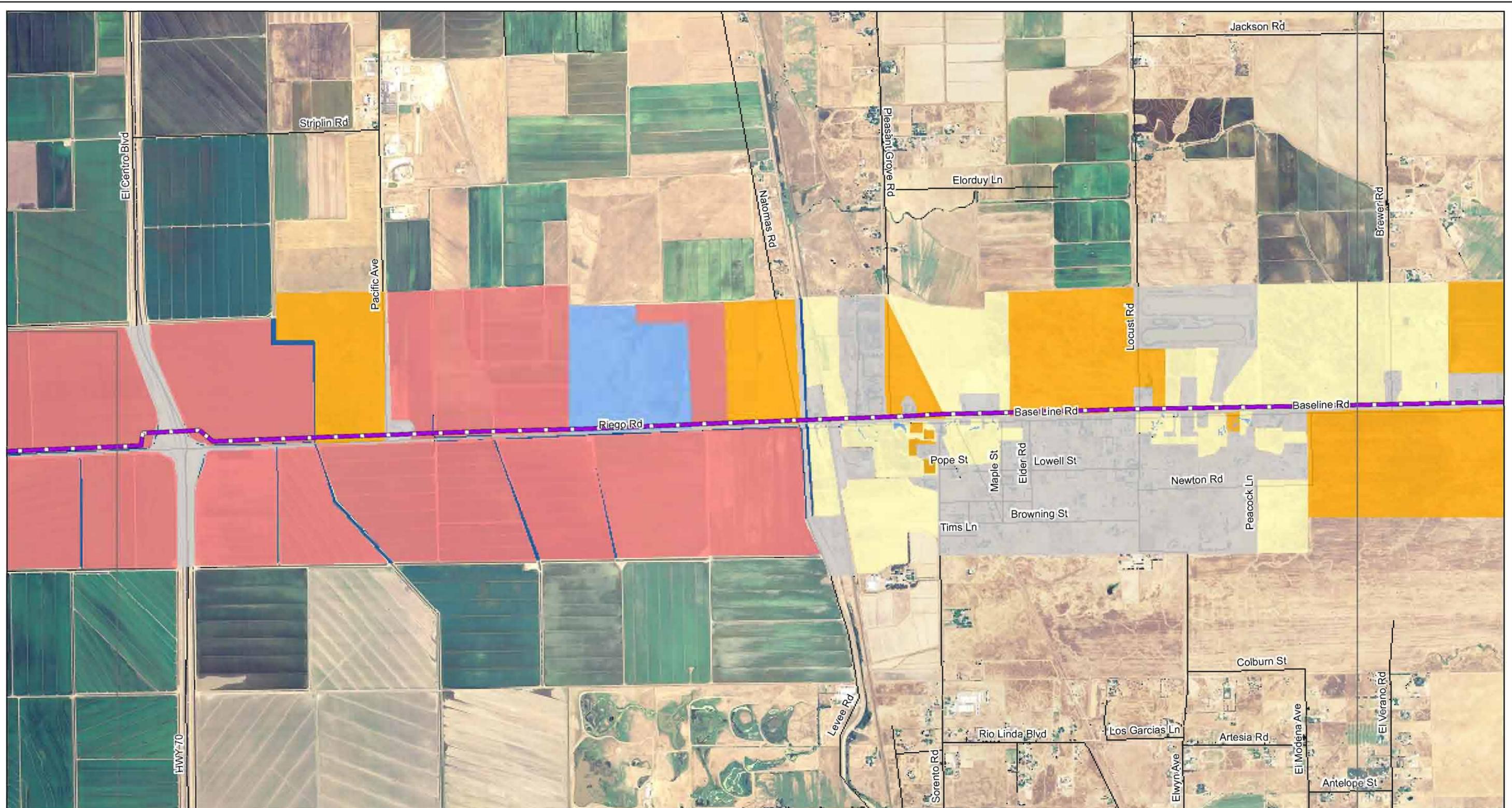




**Line 406 and Line 407
Pipeline Project
Figure 2E
Habitat Map**

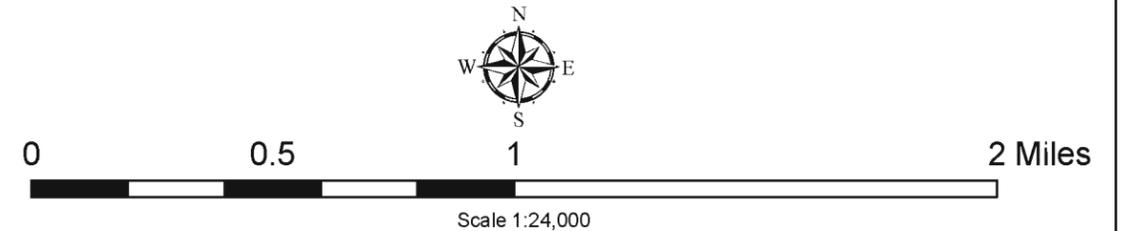
- | | | |
|-------------------|-----------|-------------------|
| Proposed Pipeline | Developed | Riparian Woodland |
| Row Crops | Wetland | Oak Woodland |
| Annual Grassland | Orchard | |
| Riverine | Rice | |

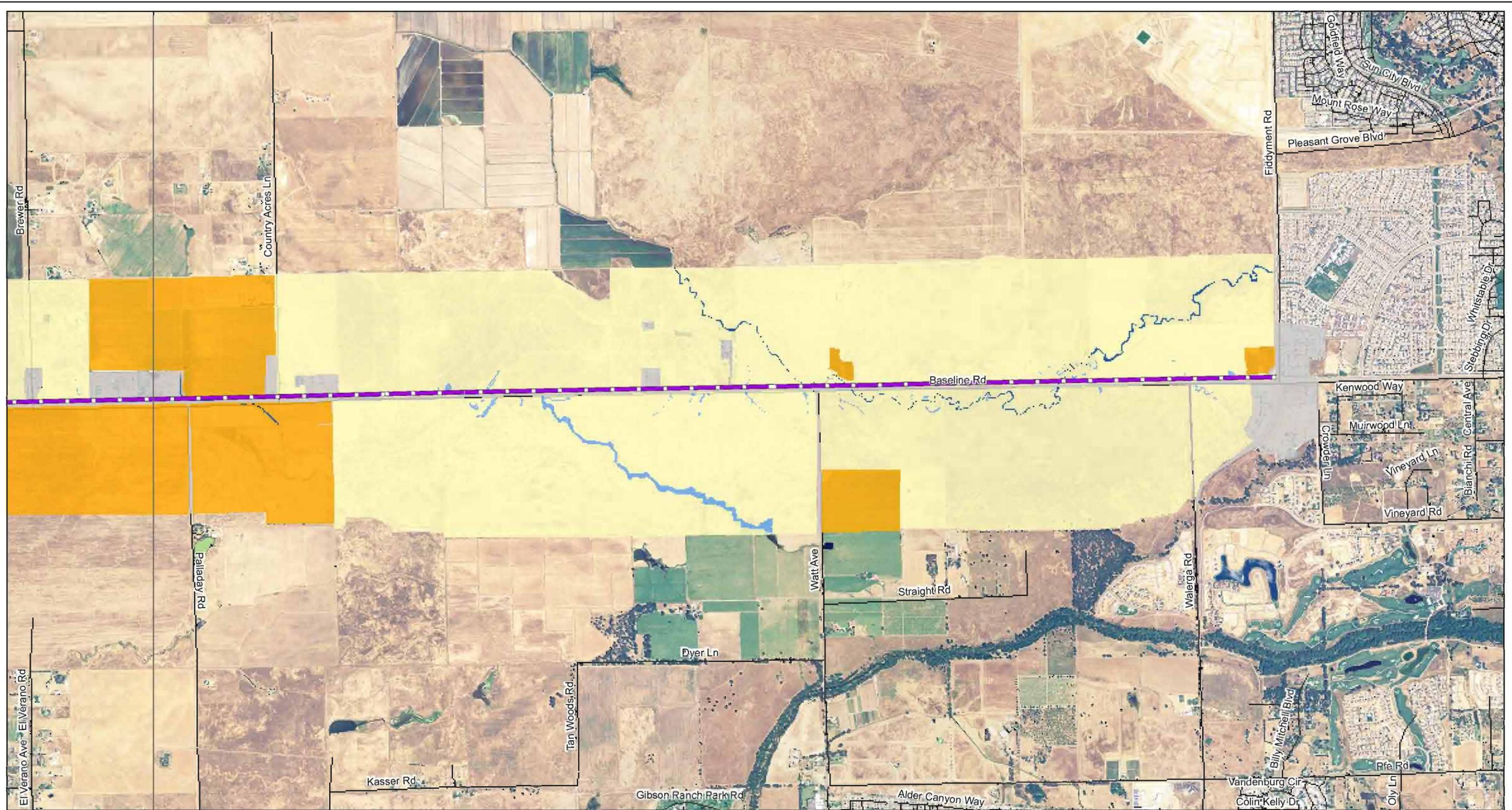




**Line 406 and Line 407
Pipeline Project
Figure 2F
Habitat Map**

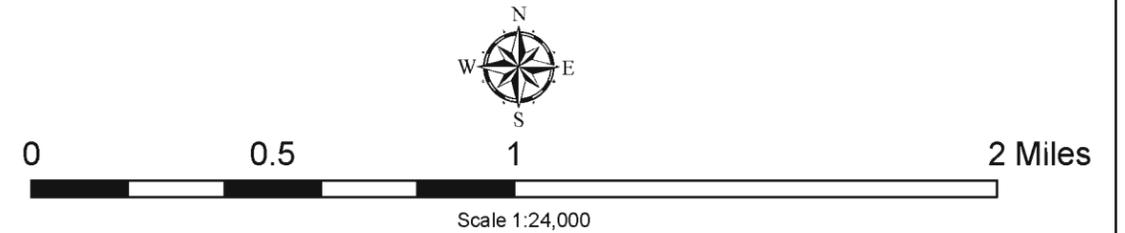
- | | | |
|-------------------|-----------|-------------------|
| Proposed Pipeline | Developed | Riparian Woodland |
| Row Crops | Wetland | Oak Woodland |
| Annual Grassland | Orchard | |
| Riverine | Rice | |





**Line 406 and Line 407
Pipeline Project
Figure 2G
Habitat Map**

- | | | |
|-------------------|-----------|-------------------|
| Proposed Pipeline | Developed | Riparian Woodland |
| Row Crops | Wetland | Oak Woodland |
| Annual Grassland | Orchard | |
| Riverine | Rice | |



Annual Grasslands

Grasslands in California are characterized by a diverse composition of native and introduced species of grasses, native wildflowers, and weedy annual forbs. In central California, grasslands occur on coastal terraces, valleys, and hillsides in areas where soil moisture is adequate in spring to support grasses and other shallow-rooted plants but generally becomes too dry in the summer to support woodlands. Characteristic species of annual grassland habitat include wild oat (*Avena* spp.), soft chess (*Bromus mollis*), wild rye (*Lolium perenne*), lupine (*Lupinus* spp.), owl's clover (*Orthocarpus densiflorus*), redstem filaree (*Erodium cicutarium*), and burclover (*Medicago hispida*).

Plant species inhabiting the annual grassland within the study area include silver European hairgrass (*Aira caryophyllea*), annual oatgrass, star-thistle (*Centaurea solstitialis*), bindweed (*Convolvulus arvensis*), nit grass (*Gastridium ventricosum*), gumplant (*Grindelia* spp.), Fitch's tarweed (*Hemizonia fitchii*), soft chess, Medusa-head grass (*Taeniatherum caput-medusae*), and vinegar weed (*Trichostema lanceolatum*). Much of the grassland has been disced, plowed, and/or graded for various agricultural uses, or has been disturbed as a consequence of urbanization.

Grasslands often 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 harriers, and others commonly use open grassland areas for foraging purposes, while species such as western meadowlark (*Sturnella neglecta*) and burrowing owl (*Athene cunicularia*) use open grassland areas for nesting. Reptiles that commonly breed within grassland habitat include western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), and western rattlesnake (*Crotalus viridis*). Mammals in grassland include the coyote (*Canis latrans*) and California ground squirrel (*Spermophilus beecheyi*).

Annual grasslands exist in the Dunnigan Hills area in the Line 406 project segment and in the Line 407 East project segment east of Steelhead Creek. Grasslands with ephemeral creeks in the Dunnigan Hills may provide habitat for the American badger (*Taxidea taxus*), California tiger salamander (*Ambystoma californiense*) (CTS), and western spadefoot toad, in addition to a number of sensitive raptor species that forage for lagomorphs and other small mammals in the area. Burrowing owls may utilize the extensive network of ground squirrel burrows in the Dunnigan Hills for nesting and rearing of young. Grasslands in the eastern portion of Line 407 East include numerous seasonal wetland features that may support listed vernal pool invertebrate species, but are not likely to support large numbers of burrowing mammals or the avian species that forage on them or utilize their burrows due to a hardpan soil layer that underlies the area and makes burrowing difficult.

Developed/Ornamental

Developed/ornamental habitat includes commercial and residential development and associated infrastructure, and is commonly landscaped with nonnative ornamental species. Though this habitat type does not typically host many native species, a number of wildlife species commonly utilize developed/ornamental habitat for foraging and roosting, and may even nest in ornamental

trees or under bridges and other urban structures. Species typically associated with the urban environment include scrub jay (*Aphelocoma californica*), raccoon (*Procyon lotor*), European starling (*Sturnus vulgaris*), mockingbird (*Mimus polyglottos*), house finch (*Carpodacus mexicanus*), striped skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), and rock dove (*Columba livia*). Other bird and bat species may also utilize developed/ornamental habitats for foraging, roosting, and/or nesting.

Developed/ornamental habitat exists throughout the project area, but is concentrated most heavily east of Steelhead Creek where houses and small businesses line Riego and Baseline roads. Developed/ornamental habitat in the rest of the project area is limited to scattered rural development and agricultural structures.

Oak Woodland

Oak woodlands can range from very open savanna-type woodlands to oak forests with nearly complete canopies. Denser stands typically grow in valley soils along natural drainages. Tree density decreases with the transition from lowlands to the less fertile soils of drier uplands. Forested oak woodlands usually have thick duff layers, and understory vegetation is often largely absent or typified by deciduous shrubs and herbaceous species.

This woodland type is dominated by a variety of trees, including valley oak (*Quercus lobata*), California sycamore (*Platanus racemosa*), Hinds black walnut (*Juglans hindsii*), boxelder (*Acer negundo*), and blue oak (*Quercus douglasii*). The understory is dominated by California rose (*Rosa californica*), poison oak (*Toxicodendron diversilobum*), everlasting (*Gnaphalium* spp.), snowberry (*Symphoricarpos* spp.), and toyon (*Heteromeles arbutifolia*). Various sorts of wild oats, brome (*Bromus* spp.), barley (*Hordeum vulgare*), ryegrass (*Lolium* spp.), and needlegrass (*Nassella* spp.) dominate the ground cover.

Oak woodlands in the Central Valley are often found below 2,000 feet adjacent to annual grasslands or agricultural lands. Oaks provide food, cover, and nesting habitat for many species of wildlife. Typical bird species that utilize oak woodlands include European starling, California quail (*Callipepla californica*), oak titmouse (*Baeolophus inornatus*), California towhee (*Pipilo crissalis*), scrub jay, acorn woodpecker (*Melanerpes formicivorus*), nuthatches (*Sitta* spp.), western bluebird (*Sialia mexicana*), red-shouldered hawk (*Buteo lineatus*), Swainson's hawk, and other raptors. Typical mammals found in oak woodlands include western gray squirrel (*Sciurus griseus*), bats, mule deer (*Odocoileus hemionus*), and California ground squirrel.

Two small stands of oak woodland exist in the Line 407 West project segment west of Knights Landing Ridge Cut along CR 17.

Riparian Woodland

Riparian habitat supports a great diversity of natural communities that provide foraging and nesting opportunities for special-status species, and is often associated with areas that experience flooding from the adjacent waterways. Trees and shrubs in riparian communities are tolerant of these seasonal flooding and high groundwater conditions, and include valley oak and Fremont

cottonwood (*Populus fremontii*) within the project area. Understory conditions are highly variable, but can include annual grasses or emergent wetland vegetation. Understory shrubs may include assorted willow (*Salix* spp.), poison oak, California blackberry (*Rubus ursinus*), Himalayan blackberry (*Rubus discolor*), California rose, and elderberry shrubs, the host plant of the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB).

Riparian woodlands provide abundant food, cover, and breeding sites for wildlife in close proximity to water. These factors and the structural diversity of riparian woodland are largely responsible for the high productivity of this habitat. Bird species commonly found in this habitat include black phoebe (*Sayornis nigricans*), California quail, mourning dove (*Zenaida macroura*), western wood-pewee (*Contopus sordidulus*), California towhee, and song sparrow (*Melospiza melodia*). Riparian woodlands also provide important feeding, resting, and nesting habitat for neotropical migrant songbirds, such as grosbeak (*Pheucticus* spp.), vireo (*Vireo* spp.), warbler (*Phylloscopus* spp.), and flycatcher (*Empidonax* spp.).

Amphibians and reptiles likely to occur in this community include western fence lizard, Pacific tree frog (*Hyla regilla*), California king snake (*Lampropeltis getula californiae*), valley garter snake (*Thamnophis sirtalis fitchi*), and Gilbert's skink (*Eumeces gilberti*). Mammals that are typically found within riparian woodland habitat may include opossum, raccoon, deer mouse (*Peromyscus maniculatus*), broad-footed mole (*Scapanus latimanus*), striped skunk, and gray fox (*Urocyon cinereoargenteus*).

Riparian woodland is primarily found adjacent to the Sacramento River, Yolo Bypass, Knights Landing Ridge Cut, and other larger waterways in the project action area.

Riverine

The riverine classification includes rivers and canals where water flows continually, as well as intermittently flowing creeks and canals. Riverine habitats tend to occur with contiguous wetlands and upland habitats, and have the potential to support special-status aquatic species, including fish, amphibians, and reptiles. They also provide foraging habitat for a variety of waterfowl, and numerous other species rely on these areas for drinking water. Tricolored blackbird (*Agelaius tricolor*), bank swallow, and burrowing owl may nest along the banks of riverine habitats.

Riverine habitat exists in the Sacramento River, Tule Canal, Knights Landing Ridge Cut, Spangler Canal, Steelhead Creek, Curry Creek, and in several small, unnamed intermittent channels within the project area. Much of the riverine habitat in the project action area experiences seasonal flow, including Knights Landing Ridge Cut, Tule Canal (and Yolo Bypass), Steelhead Creek, and Curry Creek. Riverine habitat with limited seasonal flows is not likely to support special-status fish during the proposed construction periods for the project due to poor water quality and high temperatures, though special-status fish species may occur in these areas during wet months when flows allow the fish access to the project area and water quality is suitable to their survival.

Wetlands

Wetland habitat in the project area consists of freshwater emergent wetlands, seasonal wetlands and swales, and vernal pools and swales. These different wetland types are described below.

Freshwater Emergent Wetlands

Many of the irrigation and drainage canals in the project area support freshwater emergent wetlands along their edges, which include species such as cattail (*Typha* spp.), vervain (*Verbena* spp.), yellow nutsedge (*Cyperus esculentus*), tall cyperus (*Cyperus eragrostis*), and floating primrose willow (*Ludwigia peploides*). Steelhead and Curry creeks also support small, narrow bands of freshwater emergent wetland, which become especially apparent in the dry season when water flows subside and only ponded sections of water remain. Canals and freshwater emergent wetlands may support nesting and foraging activities of numerous special-status species, including the northwestern pond turtle, GGS, tricolored blackbird, greater sandhill crane, white-faced ibis, and bank swallow (*Riparia riparia*).

Seasonal Wetlands and Swales

Seasonal wetlands and swales are shallow depressions that include three defining characteristics: hydrophytic vegetation, hydric soils, and hydrology (i.e., ponding). These features allow water to pond for a long enough period of time to support hydrophytic vegetation and hydric soils, but do not typically pond water for prolonged periods of time due to permeable soils. Seasonal wetlands in the project area support a number of hydrophytic vegetative species, including iris-leaved rush (*Juncus xiphioides*), Italian ryegrass (*Lolium multiflorum*), yellow nutsedge, dove weed (*Eremocarpus setigerus*), and rabbit's-foot grass (*Polypogon monspeliensis*). These wetland features may provide important reproductive or aestivation habitat for the CTS and the western spadefoot toad, and were delineated in the Line 406 and Line 407 East project segments.

Vernal Pools and Swales

Vernal pools and swales are seasonal wetlands that convey and pond water during fall and winter rains, but that do not drain like other seasonal wetland features. They are typically associated with low topographic depressions and soils with an impermeable layer of clay and/or an iron-silica cemented hardpan. Winter rainfall does not penetrate the hardpan layer, causing a pool to form. Germination and growth of annual herbs and grasses begins with the onset of winter rains, and continues as pools fill with water. In the spring, water in the pools begins to evaporate, often leaving behind concentric rings of flowers that encircle the pool.

Vernal pools and swales were delineated within annual grasslands in the Line 407 East project segment, yet support a community distinct from the surrounding grassland community. They provide unique habitats for several endemic California plants and invertebrates, as well as amphibians. Plant species inhabiting vernal pools within the study area include annual hairgrass (*Deschampsia danthonioides*), dwarf downingia (*Downingia pusilla*), dove weed, coyote thistle (*Eryngium castrense*), bractless hedge hyssop (*Gratiola ebracteata*), toad rush (*Juncus bufonius*), tidy tips (*Layia* spp.), white-flowered navarretia (*Navarretia leucocephala*), American pillwort (*Pilularia americana*), stalked popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*), Sacramento Valley pogogyne (*Pogogyne zizyphoroides*), and common knotweed

(*Polygonum arenastrum*). Vernal pool invertebrates that may occur in the project area include the vernal pool fairy shrimp, Conservancy fairy shrimp, and vernal pool tadpole shrimp. Vernal pools and swales may also provide habitat for the western spadefoot toad.

4. STUDY METHODS AND SPECIES CONSIDERED

LITERATURE REVIEW

Special-status species lists from the USFWS (USFWS, 2007a and 2008a), National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS) (NMFS, 2007a), CNDDDB (CDFG, 2007), and any applicable habitat conservation plans including the Natomas Basin Habitat Conservation Plan (NBHCP) were referenced to compile a master list of special-status and sensitive species that could potentially occur in the project action area (see Attachment C for special-status species lists). Aerial photography and geographic information system (GIS) maps were then used to assess the potential for sensitive habitats in the project area. In order to encompass the full extent of the project action area, species lists were compiled for the following USGS 7.5-minute quadrangles (quads):

- Esparto
- Bird Valley
- Madison
- Zamora
- Woodland
- Eldorado Bend
- Grays Bend
- Knights Landing
- Taylor Monument
- Verona
- Rio Linda
- Pleasant Grove
- Citrus Heights
- Roseville

Special-status species that were considered include all federally listed threatened and endangered species, candidates for listing, species proposed for listing, species delisted within the last five years, species of concern (NMFS), and species covered by the NBHCP. A special-status species was considered a potential inhabitant of the project action area if its known geographical distribution encompassed any of the 14 quads and its general habitat requirements (e.g., roosting, nesting, or foraging habitat; specific soil type; permanent water source) were present. A list of special-status species with the potential to occur was compiled, and the habitat requirements of each species were considered during focused field surveys and habitat assessments. Figures 3A to 3C show the locations of CNDDDB records near the project action area. Table 3 lists the special-status species identified in the literature review, their listing status, habitat association, and potential to occur in the project action area.

A total of eight special-status plant species were found in record searches for the 14 quads that were reviewed and in the NBHCP. Of these, all eight species listed below were ruled out from potentially occurring in the project action area because the action area is out of the species' known range, suitable habitat is absent from the project area, and/or they were not found during focused rare plant surveys of the project area:

- Palmate-bracted bird's-beak (*Cordylanthus palmatus*), federally listed endangered
- Boggs Lake hedge-hyssop (*Gratiola heterosepala*), covered by NBHCP

- Delta tule pea (*Lathyrus jepsonii* spp. *jepsonii*), covered by NBHCP
- Legenere (*Legenere limosa*), covered by NBHCP
- Colusa grass (*Neostapfia colusana*), federally listed threatened, and covered by NBHCP
- Slender Orcutt grass (*Orcuttia tenuis*), federally listed threatened, and covered by NBHCP
- Sacramento Orcutt grass (*Orcuttia viscida*), federally listed endangered, and covered by NBHCP
- Sanford's arrowhead (*Sagittaria sandfordii*), covered by NBHCP

Twenty-six special-status wildlife species (or distinct populations of species) were found in record searches within the 14 quads (refer to Table 3). Of these, the following five species were ruled out from potentially occurring in the project action area because the action area is out of the species' known range, suitable habitat is absent from the project area, and/or they were not found during focused surveys of the project area:

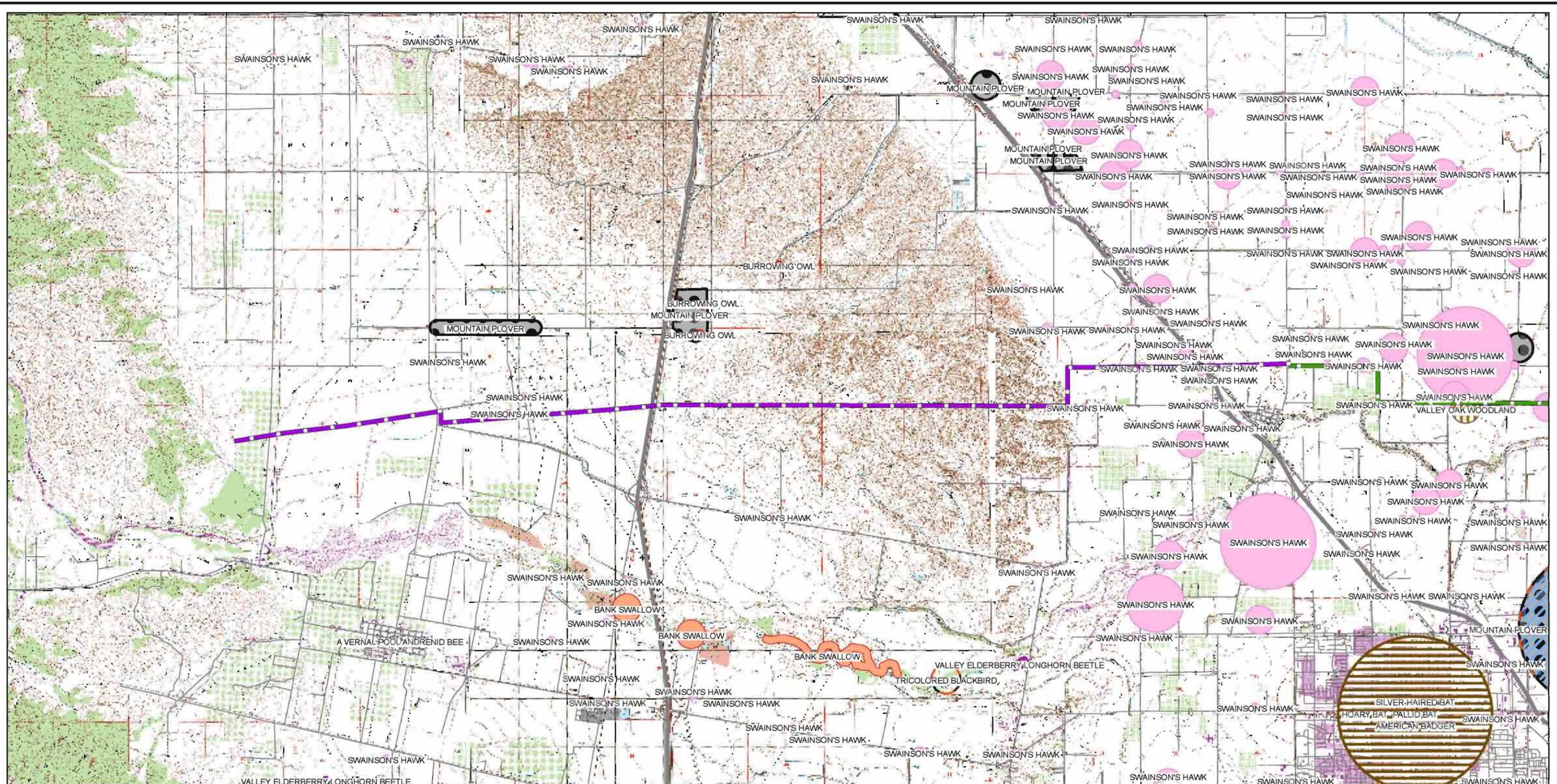
- Midvalley fairy shrimp (*Branchinecta mesovallensis*), covered by NBHCP
- Delta green ground beetle (*Elaphrus viridis*), federally listed threatened
- California freshwater shrimp (*Syncaris pacifica*), federally listed endangered
- Delta smelt (*Hypomesus transpacificus*), federally listed threatened
- California red-legged frog (*Rana aurora draynonii*), federally listed threatened

CONSULTATION TO DATE

John Baker of the NMFS Sacramento Area Office was contacted by Benjamin Hart of TRC on August 17 and 24, 2006 in regard to special-status fish species with the potential to exist in the project action area, critical habitat designations, and EFH. Jeff Stuart of the NMFS was contacted by Benjamin Hart of TRC on December 5 and 26, 2007 to verify that the species considered potential inhabitants of the project action area had not changed since the August 2006 discussions with Mr. Baker. Jana Milliken of the USFWS Sacramento Office was contacted by Benjamin Hart of TRC on October 24, 2007 to discuss the 2006 wet-season branchiopod survey completed by Gallaway and potential for listed vernal pool invertebrates to exist in the project area. A letter dated October 29, 2007 was received from the Sacramento Fish and Wildlife Office of the USFWS in response to the Notice of Preparation of a Draft Environmental Impact Report and Notice of Public Scoping Meeting for the Line 406 and Line 407 Project. The letter included a list of species of primary concern to the USFWS, and other projects in the area that may potentially affect species or habitat under their jurisdiction (see Attachment D for a copy of the letter). PG&E and its consultants met with Jana Milliken of the USFWS on January 14, 2008 to discuss the project and concerns of the USFWS in detail.

FIELD SURVEYS

Preliminary site visits to the project area were conducted to identify sensitive resources in proximity to the project and consisted primarily of driving all accessible roads adjacent to the project route. After initial site visits, biological surveys were conducted in the Line 406 and Line 407 segments within a 1,000-foot survey corridor (approximately 500 feet on either side of the proposed alignment) by PG&E, CH2M HILL, GANDA, TRC, Gallaway, and Helm Biological Consulting.



**Line 406 and Line 407
Pipeline Project
Figure 3A
CNDDDB Records**

Animals

- Great blue heron
- Black-crowned night heron
- Great egret
- Snowy egret
- White-tailed kite
- Swainson's hawk
- White-faced ibis
- California tiger salamander
- Burrowing owl
- American badger
- Bank swallow
- Purple martin
- Tricolored blackbird
- Giant garter snake
- Western snowy plover
- Mountain plover
- Western spadefoot

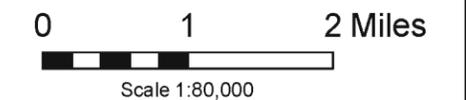
- western pond turtle
- Sacramento splittail
- California linderella
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Valley elderberry longhorn beetle
- Ricksecker's water scavenger beetle

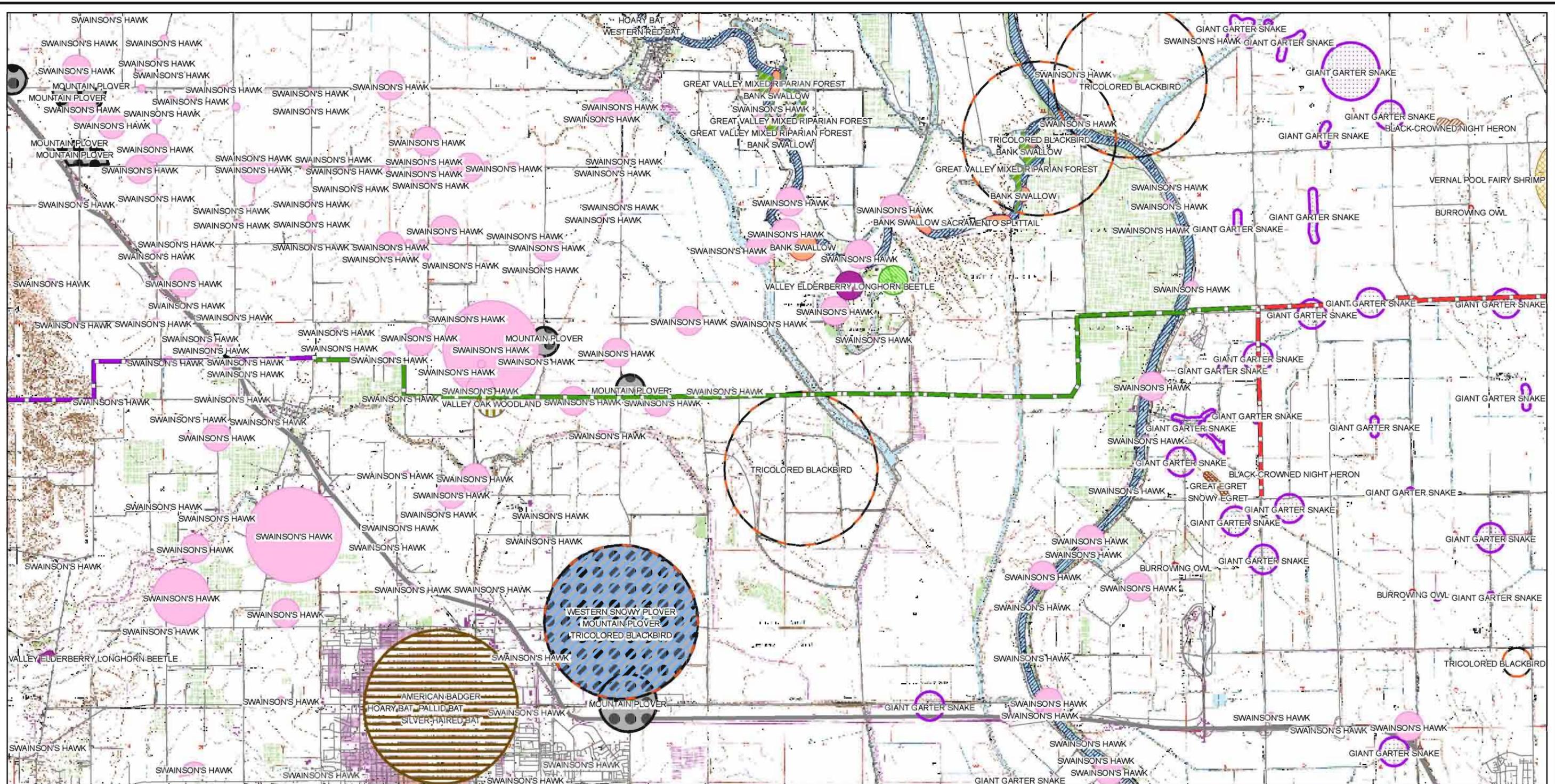
Plants

- Sanford's arrowhead
- Big-scale balsamroot
- Hispid bird's-beak
- Legenere
- Dwarf downingia
- Rose-mallow
- Red Bluff dwarf rush
- Boggs Lake hedge-hyssop

Habitats

- Valley Oak Woodland
- Alkali Meadow
- Alkali Seep
- Northern Claypan Vernal Pool
- Northern Volcanic Mud Flow Vernal Pool
- Northern Hardpan Vernal Pool
- Great Valley Mixed Riparian Forest





**Line 406 and Line 407
Pipeline Project
Figure 3B
CNDDDB Records**

Animals

- Great blue heron
- Black-crowned night heron
- Great egret
- Snowy egret
- White-tailed kite
- Swainson's hawk
- White-faced ibis
- California tiger salamander
- Burrowing owl
- American badger
- Bank swallow
- Purple martin
- Tricolored blackbird
- Giant garter snake
- Western snowy plover
- Mountain plover
- Western spadefoot

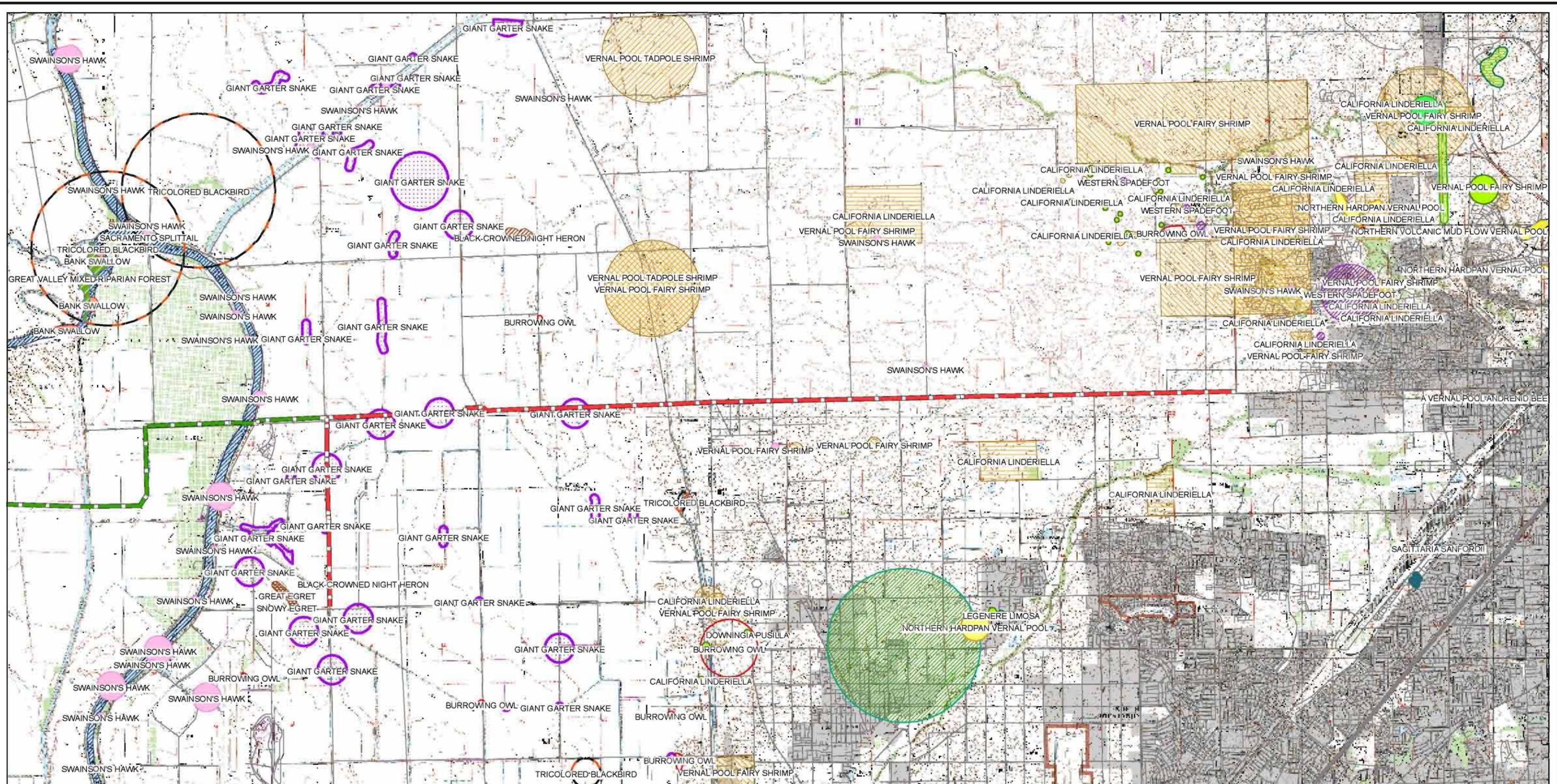
Plants

- Sanford's arrowhead
- Big-scale balsamroot
- Hispid bird's-beak
- Legenere
- Dwarf downingia
- Rose-mallow
- Red bluff dwarf rush
- Boggs Lake hedge-hyssop
- Western pond turtle
- Sacramento splittail
- California linderiella
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Valley elderberry longhorn beetle
- Ricksecker's water scavenger beetle

Habitats

- Valley Oak Woodland
- Alkali Meadow
- Alkali Seep
- Northern Claypan Vernal Pool
- Northern Volcanic Mud Flow Vernal Pool
- Northern Hardpan Vernal Pool
- Great Valley Mixed Riparian Forest





**Line 406 and Line 407
Pipeline Project
Figure 3C
CNDDDB Records**

Animals

- Great blue heron
- Black-crowned night heron
- Great egret
- Snowy egret
- White-tailed kite
- Swainson's hawk
- White-faced ibis
- California tiger salamander
- American badger
- Bank swallow
- Purple martin
- Tricolored blackbird
- Giant garter snake
- Western snowy plover
- Mountain plover
- Western spadefoot

- Burrowing owl
- Western pond turtle
- Sacramento splittail
- California linderiella
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Valley elderberry longhorn beetle
- Ricksecker's water scavenger beetle

Plants

- Sanford's arrowhead
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Table 3: Habitat Associations and Assessment Results for Special-Status Species in the Action Area

Species	Listing Status ¹	Habitat Association	Potential to Occur
<i>Plants</i>			
palmate-bracted bird's-beak (<i>Cordylanthus palmatus</i>)	FE	Chenopod scrub/valley and foothill grassland/alkaline soils	No potential to occur. Was not found during protocol-level surveys.
Boggs Lake hedge-hyssop (<i>Gratiola heterosepala</i>)	NBHCP	Marshes and swamps/vernal pools/clay	No potential to occur. Was not found during protocol-level surveys.
delta tule pea (<i>Lathyrus jepsonii</i> spp. <i>jepsonii</i>)	NBHCP	Freshwater and brackish marshes and swamps	No potential to occur. Was not found during protocol-level surveys.
legenere (<i>Legenere limosa</i>)	NBHCP	Vernal pools	No potential to occur. Was not found during protocol-level surveys.
Colusa grass (<i>Neostapfia colusana</i>)	FT NBHCP	Large adobe vernal pools	No potential to occur. Was not found during protocol-level surveys.
slender Orcutt grass (<i>Orcuttia tenuis</i>)	FT NBHCP	Vernal pools	No potential to occur. Was not found during protocol-level surveys.
Sacramento Orcutt grass (<i>Orcuttia viscida</i>)	FE NBHCP	Vernal pools	No potential to occur. Was not found during protocol-level surveys.
Sanford's arrowhead (<i>Sagittaria sandfordii</i>)	NBHCP	Marshes and swamps (assorted shallow freshwater)	No potential to occur. Was not found during protocol-level surveys.
<i>Invertebrates</i>			
conservancy fairy shrimp (<i>Branchinecta conservatio</i>)	FE	Conservancy fairy shrimp inhabit rather large, cool-water vernal pools with moderately turbid water (Eriksen and Belk, 1999) that generally last until June. Populations are known in only eight locations, none of which is in the project action area.	Suitable habitat may exist in eastern portion of Line 407 East. Not found in initial vernal pool invertebrate surveys of project area. ²
vernal pool fairy shrimp (<i>Branchinecta lynchi</i>)	FT NBHCP	Habitats vary from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Most often found in pools measuring less than 0.05 acre, in grass or mud bottomed swales, or basalt flow depression pools in unplowed grasslands.	Suitable habitat exists in eastern portion of Line 407 East. Not found in initial vernal pool invertebrate surveys of project area. ²

Species	Listing Status ¹	Habitat Association	Potential to Occur
midvalley fairy shrimp (<i>Branchinecta mesovallensis</i>)	NBHCP	Midvalley fairy shrimp have been found in shallow vernal pools, vernal swales, and various artificial ephemeral wetland habitats in the following California counties: Sacramento, Solano, Yolo, Contra Costa, San Joaquin, Madera, Merced, and Fresno.	Project action area is out of known range of the midvalley fairy shrimp. Not likely to occur.
valley elderberry longhorn beetle (<i>Desmocerus californicus dimorphus</i>)	FT NBHCP	Riparian forests and adjacent upland habitats of California's Central Valley where elderberry shrubs with a diameter of 1 inch at ground level are prevalent.	Elderberry shrubs with valley elderberry longhorn beetle exit holes were observed in the Line 407 West project area during focused surveys. Likely to occur.
delta green ground beetle (<i>Elaphrus viridis</i>)	FT	Preferred habitat is not well understood. Species may prefer more open habitats in the grassland-playa pool matrix where the beetle is found, such as edges of pools, trails, roads, and ditches. Adults may also occur in surrounding grasslands. Larvae may hide under dense vegetation or in cracks in the ground, making them hard to see. To date, the delta green ground beetle has only been found in the greater Jepson Prairie area in south-central Solano County, California.	Project action area is out of known range of the delta green ground beetle. Not likely to occur.
vernal pool tadpole shrimp (<i>Lepidurus packardii</i>)	FE NBHCP	Inhabits vernal pools containing clear to highly turbid water, ranging in size from 54 square feet in the former Mather Air Force Base area of Sacramento County to the 89-acre Olcott Lake at Jepson Prairie.	Suitable habitat exists in eastern portion of Line 407 East. Not found in initial vernal pool invertebrate surveys of project area. ²
California freshwater shrimp (<i>Syncaris pacifica</i>)	FE	Found only in low-elevation (less than 380 feet) and low-gradient (generally less than 1 percent) streams. Excellent habitat conditions include streams of 12 to 36 inches in depth with exposed live roots of trees such as alder and willow, undercut banks greater than 6 inches with overhanging woody debris or stream vegetation and vines such as stinging nettles, grasses, vine maple, and mint. Historically, the shrimp was probably common in low elevation, perennial freshwater streams in Marin, Sonoma, and Napa counties. Today, it is found in 16 stream segments within these counties.	Project action area is out of range of the species and suitable habitat conditions do not exist in the project action area. Not likely to occur.

Species	Listing Status ¹	Habitat Association	Potential to Occur
<i>Fish</i>			
green sturgeon (southern Distinct Population Segment) <i>(Acipenser medirostris)</i>	FT	Inhabits marine waters for majority of life; spawning takes place in deep, fast-moving water with temperatures between 46 and 57 degrees Fahrenheit (deg. F). Juveniles typically migrate out to sea before the end of their second year, primarily during summer and fall.	Moderate potential to occur in project action area in the Sacramento River.
delta smelt <i>(Hypomesus transpacificus)</i>	FT	Estuarine waters with temperatures ranging from 43 to 82 deg. F, and salinities between 2 and 7 parts per thousand (ppt), but rarely above 18 ppt. Delta smelt spawn in fresh water at temperatures from about 45 to 59 deg. F between February and June. Spawning takes place in dead-end sloughs and shallow edge waters of channels in the western Delta.	While delta smelt are known to occur in the tidally influenced (brackish) lower portions of the Sacramento River and Yolo Bypass approximately 11 miles downstream of the project, suitable habitat conditions are not present in the action area and the action area is out of the species known range. Not likely to occur.
California Central Valley steelhead <i>(Oncorhynchus mykiss)</i>	FT CH	Spawning takes place in fresh water in clean gravel within tributaries to mainstem rivers with temperatures in the range of 59 to 64 deg. F, rarely below 34 or above 81 deg. F. Juvenile steelhead utilize cool, clear, fast-moving permanent streams and rivers where there is ample cover of riparian vegetation or undercut banks, and where invertebrate life is abundant. Juvenile steelhead spend between one and three years in fresh water before smolting and migrating to sea. Adults spend between one and four years at sea before returning to spawn. Critical habitat for steelhead has been designated in lower Steelhead Creek and Dry Creek.	Likely to occur in the project action area within the Sacramento River year-round, in the Yolo Bypass during wet months, and in Steelhead Creek downstream of the project action area (species could stray into project action area during wet months).
Central Valley fall- and late-fall-run chinook <i>(Oncorhynchus tshawytscha)</i>	FSC EFH	Cool, clear year-round flowing water with temperatures between 41 and 66 deg. F. At around 72 to 73.5 deg. F, major mortality is experienced in wild populations. Adults require clean gravel bars and cool, well-oxygenated fresh water for spawning. Juveniles require in-stream structures such as undercut banks, log structures, boulders, etc., for optimal rearing habitat in streams, and plentiful invertebrate life for feeding.	Likely to occur in the project action area within the Sacramento River year-round, in the Yolo Bypass during wet months, and in Steelhead Creek downstream of the project action area (species could stray into project action area during wet months).

Species	Listing Status ¹	Habitat Association	Potential to Occur
Central Valley spring-run chinook <i>(Oncorhynchus tshawytscha)</i>	FT CH EFH	Cool, clear year-round flowing water with temperatures between 41 and 66 deg. F. At around 72 to 73.5 deg. F, major mortality is experienced in wild populations. Adults require clean gravel bars and cool, well-oxygenated fresh water for spawning. Juveniles require in-stream structures such as undercut banks, log structures, and boulders for optimal rearing habitat in streams, and plentiful invertebrate life for feeding. Critical habitat for Central Valley spring-run chinook has been designated in the Sacramento River and Yolo Bypass.	Likely to occur in the project action area within the Sacramento River year-round, in the Yolo Bypass during wet months.
Sacramento River winter-run chinook <i>(Oncorhynchus tshawytscha)</i>	FE CH EFH	Cool, clear year-round flowing water with temperatures between 41 and 66 deg. F. At around 72 to 73.5 deg. F, major mortality is experienced in wild populations. Adults require clean gravel bars and cool, well-oxygenated water for spawning. Juveniles require in-stream structures such as undercut banks, log structures, and boulders for optimal rearing habitat in streams, and plentiful invertebrate life for feeding. Critical habitat for Sacramento River winter-run chinook has been designated in the Sacramento River.	Likely to occur in the project action area within the Sacramento River year-round, in the Yolo Bypass during wet months.
<i>Amphibians</i>			
California tiger salamander <i>(Ambystoma californiense)</i>	FT NBHCP	Inhabits lowlands and foothills. Breeds in long-lasting temporary pools as well as some permanent pools in grasslands and oak woodland habitats. Aestivates in small mammal burrows, particularly those of the California ground squirrel, as well as cracks and crevices in dry earth.	Likely to occur in project action area.
California red-legged frog <i>(Rana aurora draytonii)</i>	FT	Believed to either never have occurred or to have been extirpated from valley floor. Inhabits lowlands and foothills in or near permanent deep water with dense growth of emergent and woody riparian vegetation bordering permanent and semi-permanent ponds, ponded streams, marshes, and springs. Upland habitat surrounding breeding areas is important for shelter during dispersal and aestivation.	Project action area is out of species' known range. Not likely to occur.

Species	Listing Status ¹	Habitat Association	Potential to Occur
western spadefoot toad (<i>Spea hammondi</i>)	NBHCP	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.	Likely to occur in project action area.
Reptiles			
northwestern pond turtle (<i>Clemmys marmorata marmorata</i>)	NBHCP	Can be found throughout the state inhabiting woodland, grassland, and open forest habitats that contain ponds, permanent pools along intermittent drainages, lakes, marshes, rivers, streams, or irrigation ditches with rocky or muddy bottoms and emergent or aquatic vegetation.	Likely to occur in project action area.
giant garter snake (<i>Thamnophis gigas</i>)	FT NBHCP	Inhabits freshwater marshes, wetlands, slow-moving streams, drainage ditches, irrigation canals, and rice fields of the Central Valley. Requires emergent or riparian vegetation for cover and foraging and basking and upland habitat for retreat and hibernation activities.	Likely to occur in project action area
Birds			
tricolored blackbird (<i>Agelaius tricolor</i>)	NBHCP	Colonial nester that requires a protected nesting substrate of tall emergent or shrubby vegetation over or near open water. Foraging habitat includes annual grasslands, seasonal wetlands, agricultural fields, riparian areas, and cattle dairies.	Likely to occur in project action area.
burrowing owl (<i>Athene cucularia</i>)	NBHCP	Open, dry, low-growing vegetation, grasslands (annual or perennial), deserts, scrublands, agricultural, and rangelands. Suitable habitat may contain trees and shrubs if overall canopy closure is low (less than 30 percent). Subterranean nester associated with burrowing mammals, but may use manmade structures and debris piles.	Likely to occur in project action area.
Swainson's Hawk (<i>Buteo swainsoni</i>)	NBHCP	Nesting habitat consists of open areas with stands of few, dense-topped trees in juniper-sage flats, riparian areas, and oak savannas. Foraging habitat consists of open grasslands, grain, and alfalfa fields (supporting rodent populations) adjacent to nesting opportunities.	Likely to occur in the project action area.

Species	Listing Status ¹	Habitat Association	Potential to Occur
western yellow-billed cuckoo (<i>Coccyzus americanus occidentalis</i>)	FC	Nests in riparian forests along broad, lower floodplains of large river systems. Requires broad, well-developed, low-elevation riparian woodlands of primarily mature cottonwoods and willows.	Moderate potential to occur in riparian habitat along project action area waterways.
bald eagle (<i>Haliaeetus leucocephalus</i>)	FD	Nests in the upper canopy of towering mature trees with open branches or on cliffs near large rivers, lakes, bays, and coastlines. Migrants arrive late in fall and winter among dense conifer stands. Wintering areas include large rivers, lakes, reservoirs, and additional habitats along migration routes.	Moderate potential to occur in project action area as a migrant during winter.
loggerhead shrike (<i>Lanius ludovicianus</i>)	NBHCP	Grasslands interspersed with scattered trees and shrubs. Breeding territories may encompass cultivated cropland, transportation rights-of-way, and shelterbelts. Typically located in scrub deserts, shrub-steppe habitats, western oak savanna, and agricultural landscapes. Shrikes typically hunt from dead trees, tall shrubs, utility wires, and fence posts, and impale prey on sharp twigs, thorns, or barbed wire.	Moderate potential to occur in project action area.
white-faced ibis (<i>Plegadis chihi</i>)	NBHCP	Feeds in emergent wetlands (often fresh water), wet meadows, flooded pastures, or croplands. Nest sites are located in dense emergent wetlands. Nests are constructed as a deep cup of wetland plants slightly raised on a mound or platform within tall vegetation.	Likely to occur in project action area.
bank swallow (<i>Riparia riparia</i>)	NBHCP	Historically found along large, lowland rivers, and along the coast in southern California. Inhabits riparian lowlands and nests in colonies. Requires vertical cliffs or soft banks with fine-textured soils near streams, rivers, lakes, and oceans for nesting.	Likely to occur in project action area.

Sources: CNDDB, 2007; NBHCP, 2003; NMFS, 2007a; USFWS, 2007