

Appendix D

Biological Assessment Report

**Biological Assessment
Three Rivers Acquisition Co., LLC
Bouldin – Tyler Pipeline Project
San Joaquin and Sacramento Counties, California**

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Acronyms and Abbreviations

CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
GGS	Giant Garter Snake
RAB Consulting Three Rivers	Robert A. Booher Consulting Three Rivers Acquisition Co., LLC
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

INTRODUCTION

Three Rivers Acquisition Co., LLC (Three Rivers) proposes to install a welded steel 4.5-inch natural gas pipeline from an existing natural gas well site (the Summit Exploration (California), LLC “DW” 8-1 [DW 8-1]) located on the south side of State Highway 12 on Bouldin Island and an existing natural gas production facility (the Towne Exploration Company Tyler Island Farms 5-2 Well Site) located north of the Mokelumne River on Tyler Island. The proposed natural gas pipeline would be approximately 5,737 feet, or 1.09 miles, in length. The proposed pipeline route is located within unincorporated areas of San Joaquin and Sacramento Counties, California.

Three Rivers retained the services of Robert A. Booher Consulting (RAB Consulting) to conduct a biological survey and assessment of the Project site and areas immediately adjacent to the Project site. The biological resources assessment was performed to identify special-status plant and wildlife species and habitats that could potentially be impacted during implementation of the Project.

The biological survey and assessment of the Project and surrounding area was conducted on August 23, 2010 and March 6, 2012, to identify special-status plant and wildlife species that could potentially be impacted during implementation of the Project. This report presents the results of the biological survey and assessment, and presents recommended measures that would mitigate potential environmental impacts should the Project be implemented. The location of the Project is identified on Figures 1, 2, and 3. Photographs of the Project area are attached as Appendix A. A list of special-status plant and wildlife species potentially occurring in the Project area is attached as Table 1. Finally, plant and wildlife species observed during surveys is attached as Table 2.

PROJECT SETTING

The Project is situated within unincorporated areas of Sacramento and San Joaquin Counties, California. The Project is located in sections 7 and 8 (Township 03 North, Range 04 East) of the Bouldin Island USGS 7.5-minute quad, and sections 5 and 6 (Township 03 North, Range 04 East) of the Isleton USGS 7.5-minute quad, Mount Diablo Base and Meridian.

Existing land uses within and adjacent to the Project include the growing of agricultural crops (corn – *Zea Mays* L.), recreational (fishing and boating), and natural gas exploration and production activities. The Project occurs within both upland areas and agricultural wetlands, as well as under the Mokelumne River and agricultural drainage ditches. Wetlands were observed along the edges of the Mokelumne River and within agricultural drainage ditches under which the pipeline will be installed via horizontal directional drilling (HDD), and within the Mokelumne River and agricultural drainage ditches within the Project buffer area.

The area surrounding the Project consists of privately and publically owned lands. The City of Isleton is located approximately 2.53 miles northwest of the Project, while the

City of Rio Vista is located approximately 6.31 miles west of the Project. The proposed pipeline alignment crosses under the Mokelumne River.

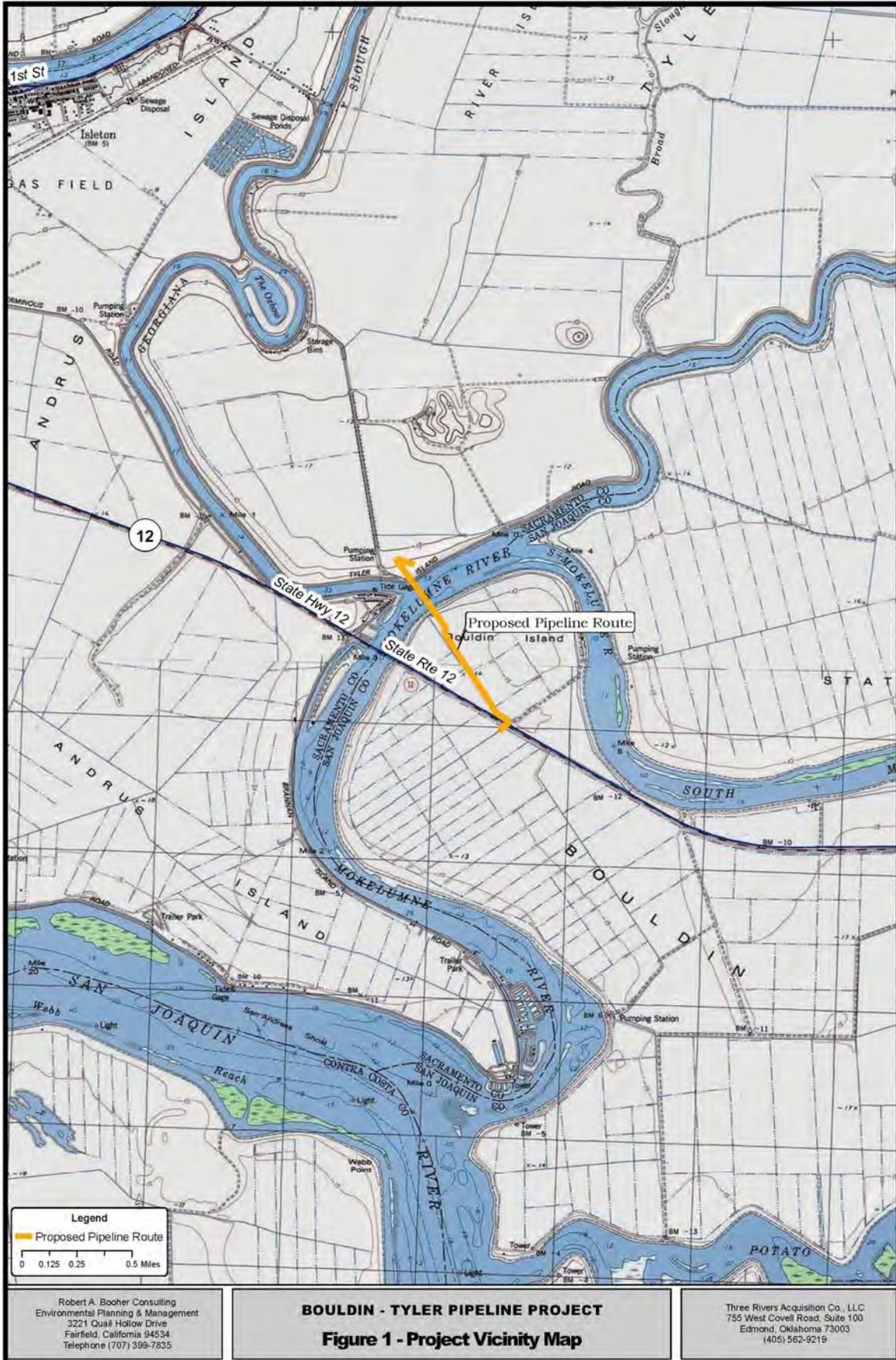
PROJECT DESCRIPTION

Three Rivers proposes to install a welded steel 4.5-inch natural gas pipeline from an existing natural gas well site (the “DW” 8-1) located on the south side of State Highway 12 on Bouldin Island and an existing natural gas production facility (the Towne Exploration Company Tyler Island Farms 5-2 Well Site) located north of the Mokelumne River on Tyler Island. The proposed natural gas pipeline would be approximately 5,737 feet, or 1.09 miles, in length. The proposed pipeline route is depicted on Figures 1 and 2.

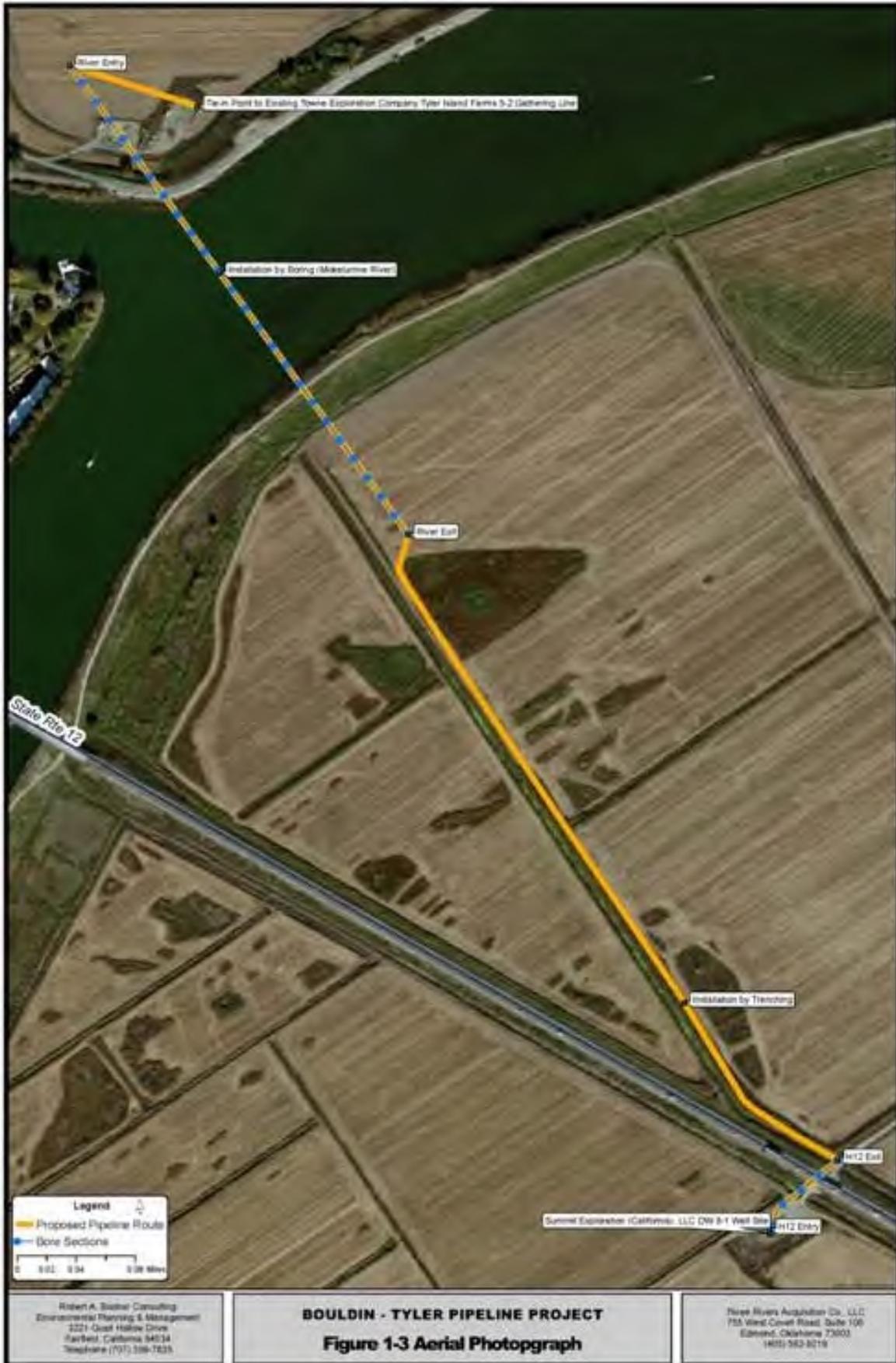
The Project includes installation of a valve station on the south side of the Mokelumne River and installation of the pipeline under State Highway 12 and the Mokelumne River. HDD would be utilized to install the pipeline under State Highway 12 and the Mokelumne River. The HDD entry for State Highway 12 (H12 Entry) will be at the existing natural gas well site located south of State Highway 12 and the HDD exit (H12 Exit) would be located on the north side of State Highway 12 immediately west of an existing gravel access road. The length of the State Highway 12 HDD will be approximately 400 feet. The HDD exit point (River Exit) for the Mokelumne River would be located near the valve station on the south side of the Mokelumne River and the entry point (River Entry) would be located on the north side of the Mokelumne River in an agricultural field north of the existing natural gas production facility (the Towne Exploration Company Tyler Island Farms 5-2 Well Site) on Tyler Island. The length of the Mokelumne River HDD will be 2,092 feet. The River Entry would be located at least 380 feet north of the levee of the Mokelumne River. The River Exit would be located at least 400 feet south from the levee of the Mokelumne River. HDD entry and exit sites within agricultural fields would be located within an approximately 100-foot by 100-foot area for each site. Shallow containment pits, approximately 18 to 24 inches in depth and covering an area of 10-foot by 10-foot area, would be located within these areas. Soil removed during excavation would be stockpiled around the perimeter of the pits. The surface disturbance for entry and exit sites would be approximately 20,000 square feet (0.5 acres).

The section of pipeline approximately 2,723 feet between the H12Exit and the River Exit would be installed using trenching. The section of pipeline approximately 522 feet between the River Entry and the proposed sales point (an existing natural gas production facility [the Towne Exploration Company Tyler Island Farms 5-2 Well Site]) would be installed using trenching.

All construction activities would take place within private agricultural lands outside of the Mokelumne River, its levees, and agricultural drainage ditches. The Project would take place completely within active agricultural fields and within private dirt roadways. A corridor approximately 15 feet wide would be utilized for conducting construction activities outside of the proposed HDD. The total trenching







surface disturbance would be approximately 3,245 linear feet long and two (2) feet wide (approximately 6,490 square feet or 0.15 acres).

Construction is scheduled to take place during the spring of 2013, and is expected to be complete within six (6) weeks (1.5 months). Including mobilization and demobilization of equipment and personnel, and site restoration, Project activities would require a total of two (2) months.

METHODS

A literature review and reconnaissance-level field surveys were conducted to identify special-status plant and wildlife species, and sensitive habitats that could be present within the proposed pipeline alignment, existing access roads, and areas immediately adjacent to these areas. The following sections describe the survey methods used, and the literature and databases reviewed.

Literature Review

Biologists independently reviewed databases and reports that address biological resources within the Project and surrounding area, including the *California Natural Diversity Database* (CNDDDB) (CDFG 2012), the California Native Plant Society's (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2012), and the United States Fish and Wildlife Service (USFWS) online electronic database of endangered species (USFWS 2012). Relevant technical information from these databases are incorporated and referenced as appropriate.

Reconnaissance Survey

Biologists conducted reconnaissance-level biological surveys of the Project, existing access roads, and buffer areas on August 23, 2010 and March 6, 2012. Habitat types encountered during the surveys were characterized primarily by dominant and subdominant plant species. Wildlife use of these areas was described based on known and anticipated occurrences. Most species were recorded as present if they were observed, if species' vocalizations were heard, or if diagnostic field signs were found (i.e., scat, tracks, pellets). Some species known to occur in the region or for which suitable habitat is present onsite were recorded as "expected, but not observed." Plant taxonomy is based on the *Jepson Manual* (Hickman 1996), and wildlife taxonomy on Laudenslayer et al. (1991). Surveys were conducted within the proposed pipeline alignment, existing access roads, as well as a buffer area approximately 250 feet wide around these areas.

Special-status wildlife species (presented in Table 2), in particular, were surveyed for to determine the presence or absence of such species or their habitat. If a special-status wildlife species or populations were observed, digital photographs were taken, the individuals or populations were noted on a USGS 7.5-minute quad map, and the number of individuals present were estimated and recorded. If a special-status species or population were identified, a CNDDDB field survey form would be completed. In the case of the

Project, biological surveys failed to document the presence of any special-status wildlife species or populations, and the preparation of the above-mentioned documentation was not required.

Surveys were conducted to identify the following:

1. Suitability of habitat(s) to support sensitive wildlife species;
2. Presence of wildlife species and their habitats;
3. Potential of the site to contain vernal pools, natural wetlands, inland blowout lakes/ponds;
4. Potential of the site to support sensitive small mammal species;
5. Potential of the site to support sensitive avian species (e.g., waterfowl, etc.);
6. Potential of the site(s) to support special status plant species;
7. Habitat condition, quality and vegetation associations; and
8. On-site, adjacent and surrounding land uses.

Special-status Plant Survey

Special-status plant surveys were conducted on August 23, 2010 and March 6, 2012, to coincide with the flowering period of sensitive plant species potentially occurring within the Project area. A review of the various special-status species databases and literature indicated that 10 special-status plant species had potential to occur in the Project and buffer area (see Table 2). Botanical surveys conducted during 2010 were conducted within the blooming period of 9 of the 10 special-status plant species expected to potentially occur within these areas (surveys were not conducted during the blooming period of eel-grass pondweed – *Potamogeton zosteriformis*). Botanical surveys conducted during 2012 were conducted within the blooming period of 1 of the 10 special-status plant species expected to potentially occur within these areas (eel-grass pondweed). Surveys were floristic in nature (where possible), and were conducted in accordance with California Department of Fish and Wildlife's (CDFW) *Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (2000). If a special-status plant species or population was observed, digital photographs were taken, the population was noted on a USGS 7.5-minute quad map, and an estimate of the number of individuals present, their phenology, and the associated vegetation were recorded. For each special-status plant species or population identified, a CNDDDB field survey form was completed.

Rare plant surveys were performed using demographic survey techniques derived from the CNPS rare plant monitoring guidelines (CNPS 2001). These guidelines include conducting floristically based surveys, identifying to species level all plants encountered, or identifying to the level necessary to detect rare plants if present.

During field surveys, meandering transects were walked throughout the Project, proposed and existing access roads, and buffer areas to ensure that all habitats present were surveyed. All plant species observed were identified to the level necessary to ensure that any special-status species present would be detected. Scientific and common nomenclature followed *The Jepson Manual* (Hickman 1996).

RESULTS AND FINDINGS

A general discussion of biological resources is provided below and includes a discussion of the vegetation communities and wildlife habitats known to occur within the Project, existing access roads, and buffer areas, and special-status plants and wildlife that could potentially occur in these areas.

Habitats and Vegetation Communities

Vegetative communities identified within the Project and buffer area included ruderal/disturbed, agricultural field/agricultural wetland, and freshwater emergent wetland. Vegetative community designations are based on *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988).

Vegetation communities and wildlife detected or commonly occurring within these habitats are discussed below. The value of the Project, proposed and existing access roads, buffer areas, and associated habitats to wildlife is also provided below. A list of plant and wildlife species observed during biological surveys is included as Table 1.

Ruderal/Disturbed

The ruderal/disturbed vegetative community was observed within and immediately adjacent to the existing Delta Wetland 8-1 well site, on the banks of the levees on the north and south sides of the Mokelumne River, within portions of the pipeline alignment that will be installed by trenching between the Mokelumne River and the existing natural gas production facility (the Towne Exploration Company Tyler Island Farms 5-2 Well Site) tie-in point, and within and adjacent to existing access roads that would be used during Project implementation. Common vegetative species found in this community were composed of weedy non-native and weedy native species. Common species identified during the field visit included: wild oat (*Avena fatua*), black mustard (*Brassica nigra*), ripgut (*Bromus rigidus* Roth.), soft cheat grass (*Bromus hordeaceus*), soft chess (*Bromus mollis*), soft cheat grass (*Bromus secalinus* L.), yellow-star thistle (*Centaurea solstitialis*), hedge bindweed (*Calystegia sepium*), field bindweed (*Convolvulus arvensis*), redstem filaree (*Erodium cicutarium*), California poppy (*Eschscholzia californica*), fennel (*Foeniculum vulgare*), California mustard (*Guillenia lasiophylla*), cow parsnip (*Heracleum lanatum*), foxtail barley (*Hordeum leporinum*), prickly lettuce (*Lactuca serriola* L.), common mallow (*Malva neglecta* Wallr.), cheeseweed (*Malva parviflora*), bur clover (*Medicago polymorpha*), bristly ox-tongue (*Picris echioides*), wild radish (*Rhaphanus sativus*), spiny sowthistle (*Sonchus asper*), perennial sowthistle (*Sonchus arvensis* L.), and annual sowthistle (*Sonchus oleraceus*).

Although often comprised of non-native plant species, ruderal habitats, particularly at edges of natural communities, can provide foraging habitat for many species of birds and mammals. These habitats can be occupied by California ground squirrels and other rodents, and can potentially support special-status wildlife species, including burrowing

Table 1.
Plant and Animal Species Observed During Biological Surveys

Common Name	Scientific Name	Family
Animals		
Mallard	<i>Anas platyrhynchos</i>	Anatidae
Great blue heron	<i>Ardea herodias</i>	Ardeidae
Cattle egret	<i>Bubulcus ibis</i>	Ardeidae
Turkey vulture	<i>Cathartes aura</i>	Cathartidae
American crow	<i>Corvus brachyrhynchos</i>	Corvidae
Common raven	<i>Corvus corax</i>	Corvidae
Northern alligator lizard	<i>Elgaria coerulea</i>	Anguillidae
Black-tailed jackrabbit	<i>Lepus californicus</i>	Leporidae
House sparrow	<i>Passer domesticus</i>	Passeridae
Ring-necked pheasant	<i>Phasianus colchicus</i>	Phasianidae
Raccoon	<i>Procyon lotor</i>	Procyonidae
Western fence lizard	<i>Sceloporus occidentalis</i>	Phrynosomatidae
California ground squirrel	<i>Spermophilus beecheyi</i>	Sciuridae
Mourning dove	<i>Zenaida macroura</i>	Columbidae
Plants		
Water plantain	<i>Alisma plantago-aquatica</i>	Alismataceae
Common fiddleneck	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	Boraginaceae
Wild oat	<i>Avena fatua</i>	Poaceae
Black mustard	<i>Brassica nigra</i>	Brassicaceae
Ripgut	<i>Bromus rigidus</i> Roth.	Poaceae
Soft cheat grass	<i>Bromus hordeaceus</i>	Poaceae
Soft chess	<i>Bromus mollis</i>	Poaceae
Soft cheat grass	<i>Bromus secalinus</i> L.	Poaceae
Yellow-star thistle	<i>Centaurea solstitialis</i>	Asteraceae
Hedge bindweed	<i>Calystegia sepium</i>	Convolvulaceae
Poison hemlock	<i>Conium maculatum</i>	Apiaceae
Field bindweed	<i>Convolvulus arvensis</i>	Convolvulaceae
Umbrella sedge	<i>Cyperus eragrostis</i>	Cyperaceae
Common willow herb	<i>Epilobium ciliatum</i> ssp. <i>ciliatum</i>	Onagraceae
Redstem filaree	<i>Erodium cicutarium</i>	Geraniaceae
California poppy	<i>Eschscholzia californica</i>	Papaveraceae
Fennel	<i>Foeniculum vulgare</i>	Asteraceae
California mustard	<i>Guillenia lasiophylla</i>	Brassicaceae
Cow parsnip	<i>Heracleum lanatum</i>	Apiaceae
Foxtail barley	<i>Hordeum leporinum</i>	Poaceae
Mediterranean barley	<i>Hordeum marinum</i>	Poaceae
Baltic rush	<i>Juncus balticus</i>	Juncaceae
Common rush	<i>Juncus effusus</i>	Juncaceae
Prickly lettuce	<i>Lactuca serriola</i> L.	Asteraceae
Perennial rye grass	<i>Lolium perenne</i>	Poaceae
Common mallow	<i>Malva neglecta</i> Wallr.	Malvaceae
Cheeseweed	<i>Malva parviflora</i>	Malvaceae
Bur clover	<i>Medicago polymorpha</i>	Fabaceae
Phragmites	<i>Phragmites australis</i>	Poaceae
Bristly ox-tongue	<i>Picris echioides</i>	Asteraceae
Rabbitsfoot grass	<i>Polypogon monspeliensis</i> (L.) Desf.	Poaceae
Wild radish	<i>Rhaphanus sativus</i>	Brassicaceae
California blackberry	<i>Rubus ursinus</i>	Rosaceae
Curly dock	<i>Rumex crispus</i> L.	Polygonaceae
Willow	<i>Salix</i> spp.	Saliaceae
Common tule	<i>Scirpus acutus</i>	Cyperaceae
California bulrush	<i>Scirpus californicus</i>	Cyperaceae
Bulrush	<i>Scirpus microcarpus</i>	Cyperaceae
Spiny sowthistle	<i>Sonchus asper</i>	Asteraceae
Perennial sowthistle	<i>Sonchus arvensis</i> L.	Asteraceae
Annual sowthistle	<i>Sonchus oleraceus</i>	Asteraceae
Narrow-leaved cattail	<i>Typha angustifolia</i>	Typhaceae
Broad-leaved cattail	<i>Typha latifolia</i>	Typhaceae
Field corn	<i>Zea mays</i>	Poaceae

owls (*Athene cunicularia*) nest sites and San Joaquin kit fox (*Vulpes macrotis mutica*) dens.

Agricultural Field/Agricultural Wetland

Large portions of the proposed pipeline alignment that will be installed via trenching methods were vegetated with the agricultural field/agricultural wetland community during our biological surveys. Agricultural fields/agricultural wetlands were either plowed or planted to field corn at the time of our biological surveys. Agricultural fields/agricultural wetlands were also observed covering large portions of the Project buffer area during biological surveys, and were either plowed or planted to field corn at the time of our biological surveys.

Common species identified during the biological surveys consisted of field corn or limited ruderal/disturbed vegetation as described above in the *Ruderal/Disturbed* vegetative community.

The general Project area once supported a wide variety of wetlands and wetland vegetation prior to the construction of levees to control the flow of water and to drain area wetlands. Agricultural lands in the Project are currently plowed on a regular basis and planted to corn and other agricultural crops. No wetland vegetation is now present within these areas.

Freshwater Emergent Wetland

The freshwater emergent wetland vegetative community was observed within agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the pipeline alignment on Bouldin Island. This vegetative community was also observed within similar habitats found within the Project buffer area. Standing water was observed in this vegetative community at the time of our surveys. No freshwater emergent wetland habitat was observed within areas proposed for ground-disturbing activities during Project implementation. Freshwater emergent wetlands are typically characterized by erect, rooted herbaceous hydrophytes. Dominant vegetation generally consists of perennial monocots up to 6.6 feet tall. All emergent wetlands are flooded frequently, enough so that the roots of the vegetation prosper in an anaerobic environment. The acreage of fresh emergent wetlands in California has decreased dramatically since the turn of the century due to drainage and conversion to other uses, primarily agriculture.

Vegetative species observed during field surveys included water plantain (*Alisma plantago-aquatica*), poison hemlock (*Conium maculatum*), umbrella sedge (*Cyperus eragrostis*), common willow herb (*Epilobium ciliatum* ssp. *ciliatum*), Mediterranean barley (*Hordeum marinum*), Baltic rush (*Juncus balticus*), common rush (*Juncus effuses*), Perennial rye grass (*Lolium perenne*), phragmites (*Phragmites australis*), rabbitsfoot grass (*Polypogon monspeliensis* [L.] Desf.), California blackberry (*Rubus ursinus*), curly dock (*Rumex crispus* L.), willow (*Salix spp.*), common tule (*Scirpus acutus*), California

bulrush (*Scirpus californicus*), bulrush (*Scirpus microcarpus*), narrow-leaved cattail (*Typha angustifolia*), and broad-leaved cattail (*Typha latifolia*).

Fresh emergent wetlands are among the most productive wildlife habitats in California. They provide food, cover, and water for more than 160 species of birds and numerous mammals, reptiles, and amphibians. Many species rely on fresh emergent wetlands for their entire life cycle. Wildlife species observed in this community during biological surveys included mallard (*Anas platyrhynchos*), great blue heron (*Ardea herodias*), cattle egret (*Bubulcus ibis*), and mourning dove (*Zenaida macroura*).

Special-status Biological Resources

The following is a discussion of the plant and wildlife species that have been afforded special recognition by federal, state, or local resource agencies and organizations. This discussion focuses on and summarizes species known or expected to occur within the Project study area. Legal protection is afforded to species listed as “threatened” or “endangered” under the federal and state Endangered Species Acts or “protected” under the CDFW Code. The CDFW designates species as “California Species of Special Concern,” because of declining population levels, limited ranges, and/or continuing threats that have made these species vulnerable to extinction. Sources used to determine the status of biological resources are as follows:

- Plants – CNDDDB (CDFG 2012), USFWS (USFWS 2012), and CNPS (2012)
- Wildlife – CNDDDB (CDFG 2012), USFWS (USFWS 2012), and Mayer and Laudenslayer (1988)
- Habitats – CNDDDB (CDFG 2012) and Sawyer and Keeler-Wolf (1995)

Through an electronic search of the CNDDDB and a literature review, 11 special-status plant species and 23 special-status animal species were identified as potentially occurring within the general Project area. Of these special-status species, 10 plant and 12 animal species were identified as potentially occurring within the Project and buffer area. Table 2 provides a complete list of the species identified by regulatory agencies as potentially occurring within the Project and buffer area. Figure 4 illustrates the location of documented special-status plant and animal occurrences within the vicinity of the Project. Special-status plant and wildlife species, identified through the literature review and by regulatory agencies, which occur outside of the elevational or geographic range of the Project and buffer area, or for which no appropriate habitat is present within these areas, are not discussed further in this document. The following discussion focuses only on special-status species that could potentially occur within the area surveyed.

Special-status Plant Species

Special-status plant surveys were conducted on August 23, 2010 and March 6, 2012, to coincide with the flowering period of sensitive plant species potentially occurring within the Project and buffer area. A review of the various special-status species

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
<i>Birds</i>					
Burrowing owl	<i>Athene cunicularia</i>	-	CSC	Open grasslands, prairies, farmlands, and deserts.	Potentially present. Potential foraging habitat for this species observed throughout the Project and buffer area during biological surveys. No potential burrows that could be used by this species for nesting purposes were observed during biological surveys. However, California ground squirrels and their burrows were observed during the biological surveys. This species has the potential to utilize these burrows should they become established in the Project or buffer area prior to Project implementation. No individual owls observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
Swainson's hawk	<i>Buteo swainsoni</i>	-	CT	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and ranch and agricultural lands. Requires adjacent suitable foraging areas such as grasslands or alfalfa/grain fields supporting rodent populations.	Potentially present. Potential foraging habitat for this species observed throughout the Project and buffer area during biological surveys. Trees that could be utilized from nesting occur approximately 480 feet to the west of the proposed pipeline alignment. No individual Swainson's hawks or potential nesting sites were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
White-tailed kite	<i>Elanus leucurus</i>	-	Special Animal	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Found in open grasslands, meadows, or marshes foraging close to isolated, dense-topped trees for nesting and perching.	Potentially present. Potential foraging and nesting habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River bore crossing, and within wetlands adjacent to portions of the northwest side of the pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individuals of this species were observed during surveys, nor were any potential nesting sites identified. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
California black rail	<i>Laterallus jamaicensis coturniculus</i>	-	CT	Mainly inhabits salt-marshes bordering larger bays. Occurs in tidal salt marsh heavily grown to pickleweed. Also found in freshwater and brackish marshes. Needs dense vegetation for nesting habitat.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
California clapper rail	<i>Rallus longirostris obsoletus</i>	FE	CE	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, Feeds away from cover on invertebrates from mud-bottomed sloughs.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Mammals					
Western red bat	<i>Lasiurus blossevillii</i>	-	CSC	Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging. Roosts primarily in trees, 2 to 40 feet	Potentially present. Potential foraging habitat for this species was observed throughout the Project and buffer area during biological surveys. No roosting

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
				above the ground surface.	habitat (trees) appropriate for use by this species was observed during biological surveys. No individual western red bats were observed during surveys, nor are any sightings documented in the Project area (CDFG 2012) (see Figure 4).
Riparian brush rabbit	<i>Sylvilagus bachmani riparius</i>	FE	CE	Inhabit dense, brushy areas of Valley riparian forests, marked by extensive thickets of wild rose (<i>Rosa</i> spp.), blackberries (<i>Rubus</i> spp.), and willows (<i>Salix</i> spp.). Thriving mats of low-growing vines and shrubs serve as ideal living sites where they build tunnels under and through the vegetation.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found near agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individuals of this species were observed during surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE	CT	Annual grasslands or grassy open stages with scattered shrubby vegetation. Require loose textured sandy soils for burrowing and suitable prey base.	Potentially present. Potential habitat for this species occurs within both the Project and buffer area. No individual San Joaquin kit foxes or sign of their presence (tracks, scats, prey remains, potential or occupied burrows, etc.) were observed during surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
<i>Invertebrates</i>					

Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Sacramento anthicid beetle	<i>Anthicus scaramento</i>	-	-	Restricted to sand dune areas. Inhabit sand slipfaces among bamboo and willow and willow but may not depend on presence of these plant species.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE	-	Endemic to grasslands. Found in large, turbid pools. Inhabit astatic pools located in swales formed by old braided alluvium filled by winter and spring rains.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Longhorn fairy shrimp	<i>Branchinecta longiantenna</i>	FE	-	Vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	-	Endemic to the grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains in astatic rain-filled pools. Inhabit small clear-water sandstone-depression pools and grassed swales, earth slumps, or basalt-flow depression pools.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	-	Occurs only in the Central Valley of California, in association with blue elderberry (<i>Sambucus mexicana</i>). Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for stressed elderberry shrubs.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Delta green ground beetle	<i>Elaphrus viridis</i>	FT	-	Restricted to the grassland margins of vernal pools, primarily between Jepson Prairie and Travis AFB.	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	-	Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Pools commonly found in grass bottomed swales of unplowed grasslands. Some pools are	No potential. Unlikely to occur due to lack of potential habitat within the Project, existing access roadways, or buffer areas.

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
				mud-bottomed and highly turbid.	
<i>Amphibians and Reptiles</i>					
California tiger salamander	<i>Ambystoma californiense</i>	FT	CSC	Primarily inhabit non-native grassland providing underground refuges, especially ground squirrel burrows and vernal pools or other seasonal water sources for breeding.	No potential. Unlikely to occur due to lack of potential habitat within the Project and buffer area.
Western pond turtle	<i>Emys marmorata</i>	-	CSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Require basking sites and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	Potentially present. Potential habitat for this species occurs within agricultural drainage ditches crossing the proposed pipeline alignment and the Mokelumne River HDD crossing. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual western pond turtles were observed during surveys. This species has not been documented within the Project area by the CNDDB (CDFG 2012) (see Figure 4).
Giant garter snake	<i>Thamnophis gigas</i>	FT	CT	Prefers fresh water marsh and low gradient streams. Has adapted to drainage ditches and irrigation canals.	Potentially present. Potential habitat for this species occurs within agricultural drainage ditches crossing the proposed pipeline alignment and the Mokelumne River HDD crossing. Potential habitat was also observed within similar habitats found within the Project buffer area. Potential nesting and aestivation burrows were observed along the banks of the drainage ditches and the Mokelumne River within the Project and buffer area during biological surveys. Upland habitat adjacent to this

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
					aquatic habitat consisted of agricultural fields that are low in quality as use for aestivation habitat. No individual giant garter snakes were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
California red-legged frog	<i>Rana aurora draytonii</i>	FT	CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to aestivation habitat, consisting of small mammal burrows and moist leaf litter.	No potential. Unlikely to occur due to lack of potential habitat within the Project and buffer area.
Fish					
Green sturgeon	<i>Acipenser medirostris</i>	-	FT	Generally found in marine waters from the Bering Sea to Ensenada, Mexico. However, spawning populations have been found only in medium sized rivers from the Sacramento-San Joaquin system north to the Bering Sea. Adult green sturgeon enter the estuary and move up the Sacramento River in early spring. Anecdotal evidence suggests that spawning may also occur in the Feather River but has not yet been documented there. Spawning occurs in the Sacramento River between March and June. Spawning occurs in deep, fast water. Most young green sturgeon migrate from river to ocean when they are one to four years old.	Potentially present. Potential habitat for this species occurs within the Mokelumne River under the which the proposed pipeline will be installed via horizontal directional drilling methods. No individuals of this species were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4). However, this species is likely present within the Project area during portions of the year.

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Delta smelt	<i>Hypomesus transpacificus</i>	FT	CT	Delta smelt are found only from the Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, Solano and Yolo counties. Shortly before spawning, adults migrate upstream from the brackish-water habitat associated with the mixing zone and disperse widely into river channels and tidally-influenced backwater sloughs. They spawn in shallow, fresh or slightly brackish water upstream of the mixing zone. Most spawning happens in tidally-influenced backwater sloughs and channel edgewaters. Although spawning has not been observed in the wild, the eggs are thought to attach to substrates such as cattails, tules, tree roots and submerged branches.	Potentially present. Potential habitat for this species occurs within the Mokelumne River under the which the proposed pipeline will be installed via horizontal directional drilling methods. No individuals of this species were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4). However, this species is likely present within the Project area during portions of the year.
Central Valley steelhead	<i>Oncorhynchus mykiss</i>	FT	-	After maturing for 1 to 3 years in the ocean, adult steelhead typically begin their spawning migration into the Sacramento and San Joaquin Delta System in fall and winter. Adult steelhead enter the mainstream Sacramento River in July, peak in abundance in the fall, and continue migrating through February and March. Juvenile steelhead will remain in fresh water and continue to rear for 1 to 3 years before migrating to the ocean in November through May to mature. Smolt typically migrate to the ocean during march through June.	Potentially present. Potential habitat for this species occurs within the Mokelumne River under the which the proposed pipeline will be installed via horizontal directional drilling methods. No individuals of this species were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4). However, this species is likely present within the Project area during portions of the year.

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
Chinook salmon (Sacramento River Winter-Run, Central Valley Spring-Run, Central Valley Fall- and Late Fall-Run)	<i>Oncorhynchus tshawytscha</i>	FE / FT / FC	CE/CT/-	Adult winter-run Chinook salmon leave the ocean and migrate through the Sacramento-San Joaquin River Delta into the Sacramento River from November through July. Juvenile winter-run Chinook salmon rear and emigrate in the lower Sacramento River from October through March. Adult spring-run Chinook salmon enter the Sacramento and San Joaquin River main streams in February through July. Spring-run Chinook salmon appear to emigrate at 3 different life stages: as fry, fingerlings, or yearlings. Fry may occur between December and January, fingerlings occur from February through May, and yearling spring-run Chinook salmon emigrate from October through February. Central Valley fall run Chinook salmon occupy the major Central Valley river systems. After 2 to 4 years of maturation in the ocean, adult fall-run Chinook salmon return to their natal freshwater streams to spawn. Adult fall-run Chinook salmon enter the Sacramento River system from July through December and spawn from October through December. Juvenile fall-run and late fall-run Chinook salmon may rear from January to June.	Potentially present. Potential habitat for this species occurs within the Mokelumne River under the which the proposed pipeline will be installed via horizontal directional drilling methods. No individuals of this species were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4). However, this species is likely present within the Project area during portions of the year.
Sacramento splittail	<i>Pogonichthys macrolepidotus</i>	-	CSC	Endemic to the lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, associated marshes, slow moving river sections, and dead end	Potentially present. Potential habitat for this species occurs within the Mokelumne River under the which the proposed pipeline will be installed via horizontal

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
				sloughs. Require flooded vegetation for spawning and foraging for young.	directional drilling methods. No individuals of this species were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4). However, this species is likely present within the Project area during portions of the year.
Plants					
Bristly sedge	<i>Carex comosa</i>	-	List 2	Marshes, swamps, lake margins, and wet places. Elevational range: -5 to 1,005 meters. Blooming period: May through September.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
Delta tule pea	<i>Lathyrus jepsonii</i> <i>var. jepsonii</i>	-	List 1B	Freshwater and brackish marshes. Typically on marsh and slough edges, along with <i>Typha</i> , <i>Aster lentus</i> , <i>Rosa calif.</i> , <i>Juncus spp.</i> , <i>Scirpus</i> , etc. Elevational range: 0 to 4 meters. Blooming period: May through September.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
					proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has been documented approximately 0.4 miles southwest of the proposed pipeline alignment by the CNDDDB (CDFG 2012) (see Figure 4).
Mason's lilaepsis	<i>Lilaeopsis masonii</i>	-	Rare, List 1B	Freshwater and brackish marshes, riparian scrub. Elevational Range: 0 to 10 meters. Blooming period: April through November.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
Delta mudwort	<i>Limosella subulata</i>	-	List 2	Freshwater and brackish marshes, riparian scrub. Typically on mud banks of the delta. Often with <i>Lilaeopsis masonii</i> . Elevational range: 0 to 3 meters. Blooming period: May through August.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
					proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has not been documented within the Project area by the CNDDB (CDFG 2012) (see Figure 4).
Eel-grass pondweed	<i>Potamogeton zosteriformis</i>	-	List 2	Marshes, swamps, ponds, lakes, and streams. Elevational range: 0 to 1,860 meters. Blooming period: March through May.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has not been documented within the Project area by the CNDDB (CDFG 2012) (see Figure 4).
Sanford's arrowhead	<i>Sagittaria sanfordii</i>	-	List 1B	Marshes and swamps in standing or slow-moving fresh water. Elevational range: 0 to 610 meters. Blooming period: May through October.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
					Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has not been documented within the Project area by the CNDDB (CDFG 2012) (see Figure 4).
Marsh skullcap	<i>Scutellaria galericulata</i>	-	List 2	Marshes, swamps, wet places, lower montane coniferous forest, meadows, and seeps. Elevational range: 0 to 2,100 meters. Blooming period: June through September.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has not been documented within the Project area by the CNDDB (CDFG 2012) (see Figure 4).
Side-flowering skullcap	<i>Scutellaria lateriflora</i>	-	List 2	Wet Meadows, seeps, marshes, and swamps. Elevational range: -3 to 500 meters. Blooming period: July through September.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed

**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
					within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has been documented as occurring throughout the Project area by the CNDDDB (CDFG 2012) (see Figure 4).
Suisun marsh aster	<i>Symphyotrichum lentum</i>	-	List 1B	Marshes and swamps (brackish and freshwater). Most often along sloughs with <i>phragmites</i> , <i>typha</i> , <i>scirpus</i> , blackberry, etc. Elevational range: 0 to 3 meters. Blooming period: May to November.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has been documented immediately northeast of the proposed pipeline alignment by the CNDDDB (CDFG 2012) (see Figure 4).
Woolly rose-mallow	<i>Hibiscus lasiocarpus var. occidentalis</i>	-	List 2	Freshwater marshes and swamps. Moist, freshwater soaked river banks and low peat islands in sloughs. Elevational range: 0 to 150 meters. Blooming period: June through September.	Potentially present. Potential habitat for this species occurs within freshwater emergent wetland habitat found in agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the proposed pipeline alignment on Bouldin Island. Potential habitat was also observed

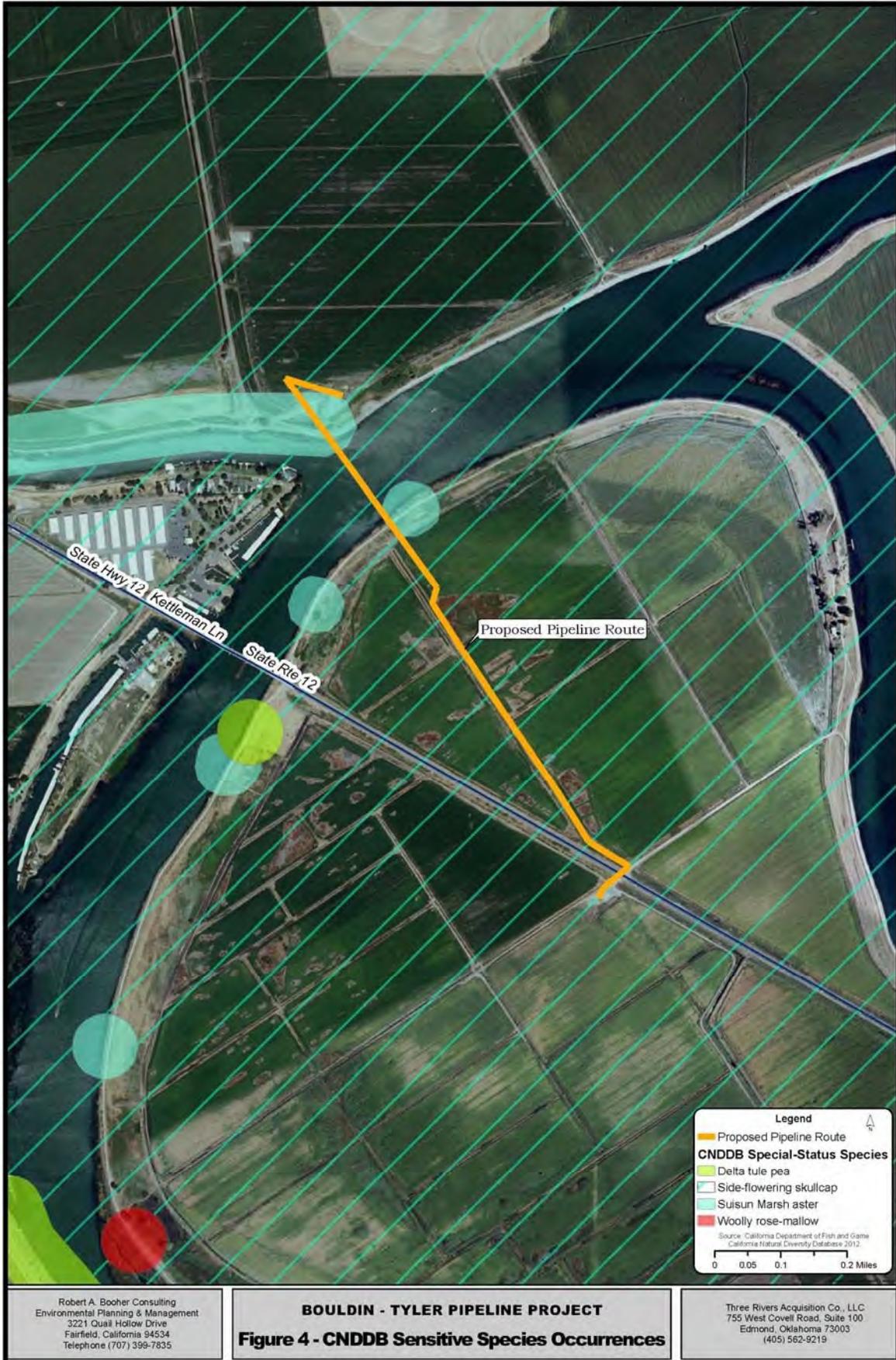
**Table 2.
Special-Status Wildlife Species Recorded or Potentially Occurring within the Project Area.**

Common Name	Scientific Name	Federal Status	State Status	Habitat/Observances	Potential to Occur on Project Site
					within similar habitats found within the Project buffer area. No individual plants were observed during surveys. This species has been documented approximately 0.9 miles southwest of the proposed pipeline alignment by the CNDDDB (CDFG 2012) (see Figure 4).
Northern California black walnut	<i>Juglans hindsii</i>	-	List 1B	Riparian forest and woodland. Found in deep alluvial soils associated with a creek or stream. Elevational range: 0 to 395 meters. Blooming period: April through May.	No potential. This species was not identified within the Project or buffer area during biological surveys.
<i>Sensitive Habitats</i>					
Coastal and valley freshwater marsh (present)					
Great Valley valley oak riparian forest (not present)					

LEGEND

- | | | |
|---------|--------------|--|
| FEDERAL | FE | Federally listed as Endangered |
| | FT | Federally listed as Threatened |
| | FC | Federal Candidate Species (former Category 1 candidates) |
| STATE | CE | State listed as Endangered |
| | CT | State listed as Threatened |
| | CR | State designated as Rare |
| | CSC | California Department of Fish and Wildlife designated "Species of Special Concern" |
| CNPS | CNPS List 1b | Plants that are rare, threatened, or endangered in California and elsewhere |
| | CNPS List 2 | Plants that are rare, threatened, or endangered in California, but are more common elsewhere |
| | CNPS List 3 | Plants about which we need more information – a review list |
| | CNPS List 4 | Plants of limited distribution – a watch list |

Sources: CDFG 2012, CNPS 2012, and USFWS 2012





databases and literature indicated that 10 special-status plant species had potential to occur in the Project and buffer area (see Table 2). Botanical surveys conducted during 2010 were conducted within the blooming period of 9 of the 10 special-status plant species expected to potentially occur within these areas (surveys were not conducted during the blooming period of eel-grass pondweed). Botanical surveys conducted during 2012 were conducted within the blooming period of 1 of the 10 special-status plant species expected to potentially occur within these areas (eel-grass pondweed).

Surveys for special-status plant species were conducted within the Project and a buffer area approximately 250 feet wide around the Project. The freshwater emergent wetland vegetative community was surveyed in particular because it was the only vegetative community in the Project and buffer area that provided potential habitat for special-status plant species. No special-status plant species were identified during the course of the botanical surveys, and no occurrences of these special-status plant species have been documented in the Project by the CNDDDB. However, Delta tule pea, side-flowered skullcap, Suisun Marsh aster, and woolly rose-mallow, all special-status plant species, have been documented in the Project area previously by the CNDDDB (CDFG 2012) (see Figure 4). No ground-disturbing activities are proposed within freshwater emergent wetland habitat during Project implementation, and no impacts to this vegetative community is expected. As all the special-status plant species potentially occurring in the Project area only occur within freshwater emergent wetland habitat, and because no impacts to this vegetative community will occur during the Project, no impacts to special-status plant species are expected to occur during Project implementation, and no further plant surveys or other mitigation measures are necessary to protect these plant species.

Special-status Wildlife Species and Sensitive Habitats

A total of 12 wildlife species, including three (3) birds, three (3) mammals, two (2) reptiles, and four (4) fish species were identified during the literature search as potentially occurring within the Project and buffer area. A discussion of these species and their potential to occur within the survey area are included below.

Western Burrowing Owl

Potential foraging and nesting habitat for the western burrowing owl (*Athene cunicularia hypugea*) was observed throughout the Project and buffer area during biological surveys. No western burrowing owls, signs of their activity (i.e., pellets, whitewash, feathers, etc.), or active burrow/nest sites were observed within the Project or buffer area during surveys. California ground squirrels and their burrows were observed within the Project and buffer area during surveys. These burrows provide potential nesting habitat for burrowing owls should they become established within the Project or buffer area. At the time of our surveys, these burrows were in use by California ground squirrels. California ground squirrels are highly aggressive, and their presence likely precludes the use of their burrows by burrowing owls. Burrowing owls have not been documented in the Project area previously by the CNDDDB (CDFG 2012) (see Figure 4).

Swainson's Hawk

Potential foraging habitat for the Swainson's hawk (*Buteo swainsoni*) was observed throughout the Project and buffer area during biological surveys. Potential nesting habitat for this species was observed in a grove of eucalyptus trees approximately 480 feet west of the northern section of the proposed pipeline alignment during biological surveys. However, no Swainson's hawks or their nesting sites (active or inactive) were observed during biological surveys. Swainson's hawks have not been documented in the Project area previously by the CNDDDB (CDFG 2012) (see Figure 4).

White-Tailed Kite

Potential foraging habitat [i.e., rolling foothills and valley margins with marshlands] for the white-tailed kite was identified within the Project and buffer area during biological surveys. This species has the potential to forage intermittently within wetlands and adjacent upland areas in the Project and buffer area. Potential nesting habitat for this species was observed within scattered willow trees found within the freshwater emergent wetland vegetative community (Mokelumne River and agricultural drainage ditches). No individual white-tailed kites were observed during the field survey, nor were any nest sites (active or inactive) observed. This species has not been documented in the Project area previously by the CNDDDB (CDFG 2012) (see Figure 4).

Other Raptor Species

Potential nesting habitat for other raptor species was not identified in the Project or buffer area during biological surveys. Raptors may forage intermittently within any of the vegetative communities observed in the Project or buffer area. No individual raptors were observed during field surveys, nor were raptor nesting sites (active or inactive) observed.

Migratory Avian Species

Potential foraging and nesting habitat for migratory avian species was identified within both the Project and buffer area during biological surveys. Individual migratory bird species were observed during field surveys, including turkey vultures, American crows, common ravens, and mourning doves. No migratory avian species nests (active or inactive) were observed during surveys.

Western Red Bat

Potential foraging habitat for the western red bat (*Lasirurs blossevillii*) was observed within both the Project and buffer area during biological surveys. Pallid bats may forage intermittently within all the vegetative communities observed in the Project and buffer area. However, no roosting or maternity habitat or sites were observed during biological surveys. No western red bats were observed during biological surveys, and this species has not been documented in the Project area by the CNDDDB (CDFG 2012) (see Figure 4).

Riparian Brush Rabbit

Potential foraging and nesting habitat for the riparian brush rabbit (*Sylvilagus bachmani riparius*) was observed within the freshwater emergent wetland vegetative community during biological surveys. No individual riparian brush rabbits were observed during biological surveys, nor has this species been documented in the Project area by the CNDDDB (CDFG 2012) (see Figure 4).

San Joaquin Kit Fox

Potential foraging habitat for the San Joaquin kit fox (*Vulpes macrotis mutica*) was observed throughout the Project and buffer area during biological surveys. No potential or known dens of an appropriate size for use by the San Joaquin kit fox were observed in the Project or buffer area during biological surveys. RAB Consulting visited the Project on two (2) separate occasions during 2010 and 2012, and observed no “signs” (tracks, scats, active digging, etc.) of this species. This species has not been documented in the Project area previously by the CNDDDB (CDFG 2012) (see Figure 4).

Special-Status Fish Species

Potential habitat for green sturgeon (*Acipenser medirostris*), delta smelt (*Hypomesus transpacificus*), central valley steelhead (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*), and Sacramento splittail (*Pogonichthys macrolepidotus*) was observed within the Mokelumne River under the which the proposed pipeline will be installed via horizontal directional drilling methods. No individuals of these species were observed during biological surveys. These species have not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 3.3.4.1-1). However, these fish species have been recorded in the greater San Francisco Bay and Delta, and are likely present within the Mokelumne River during portions of the year.

Western Pond Turtle

Potential breeding and foraging habitat [i.e., emergent marsh with permanent water and aquatic vegetation] for the northwestern pond turtle (*Emys marmorata*) was observed within agricultural drainage ditches crossing the proposed pipeline alignment and the Mokelumne River bore crossing. Potential habitat was also observed within similar habitats found within the Project buffer area. Appropriate upland nesting habitat (non-native annual grassland) was not observed within the Project and buffer area during biological surveys. This species could potentially nest in the ruderal/disturbed vegetative community adjacent to aquatic habitat found in the Project and buffer area. However, this upland nesting habitat is lower in quality. No individual western pond turtles were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 3.3.4.1-1).

Giant Garter Snake

Giant garter snake (GGS) (*Thamnophis gigas*) typically inhabit sloughs, marshes, and drainage canals characterized by slow flowing or standing water, permanent summer water, mud bottoms, earthen banks, and an abundance of preferred forage species. The GGS is highly aquatic, but avoids areas of dense riparian overstory, preferring stands of emergent aquatic vegetation, such as bulrushes and cattails, and herbaceous terrestrial cover composed of annual and perennial grasses, blackberry, and mustard. This vegetation, along with burrows, undercut banks, and large rocks, provide escape cover. In addition, areas devoid of overstory shading are required for basking areas for thermoregulation. GGS rely on canals and ditches as movement corridors. These corridors are vital to giant garter snake dispersal and, most importantly, for continuing genetic exchange between subpopulations. Un-vegetated canals may be used as disposal corridors, but they typically do not remain in exposed canals due to increased vulnerability to predators. Essential habitat components of the giant garter snake consist of the following:

- Adequate water during the snake's active period (early spring through mid-fall) to provide a prey base and cover;
- Emergent, herbaceous wetland vegetation, such as cattail and bulrushes, for escape cover and foraging habitat; and
- Upland habitat for basking, cover, and retreat sites, and refuge from floodwaters.

GGS have the potential to occur within agricultural drainage ditches crossing the proposed pipeline alignment and the Mokelumne River HDD crossing. Potential habitat was also observed within similar habitats found within the Project buffer area. Potential nesting and aestivation burrows were observed along the banks of the drainage ditches and the Mokelumne River within the Project and buffer area during biological surveys. Upland habitat adjacent to this aquatic habitat consisted of agricultural fields that are low in quality as use for aestivation habitat. No individual giant garter snakes were observed during biological surveys. This species has not been documented within the Project area by the CNDDDB (CDFG 2012) (see Figure 3.3.4.1-1).

Sensitive Habitats

Freshwater emergent wetland is considered a sensitive habitat type by a number of regulatory agencies. The freshwater emergent wetland vegetative community was observed within agricultural drainage ditches crossing the proposed pipeline alignment, along the edges of the Mokelumne River HDD crossing, and within wetlands adjacent to portions of the northwest side of the pipeline alignment on Bouldin Island. This vegetative community was also observed within similar habitats found within the Project buffer area. No freshwater emergent wetland habitat is located in areas proposed for ground disturbance during Project implementation, and as such, no impacts to this habitat type is expected.

ANALYSIS OF POTENTIAL IMPACTS

Impacts to Common Wildlife Species and Habitats from Project Implementation

Direct mortality or injury to common wildlife species, plant populations, and common wildlife habitats could occur as a result of implementation of the Project. Project construction has the potential to impact small vertebrate species, and increased human activity and vehicle traffic in the vicinity may disturb wildlife species. Those species observed within the Project and buffer area have likely acclimated to on-going activities (i.e., vehicle traffic along access roads and intensive agricultural activities).

Species most likely to be affected by habitat disturbance are relatively sedentary such as plants, small mammals, and reptiles. Other more mobile wildlife species, such as most birds and larger mammals, can avoid Project-related activities by moving to other areas temporarily.

A short-term increase in vehicle traffic is anticipated during the construction of the pipeline. This will result in a short-term increase in associated noise, which may cause temporary disturbance to local wildlife. Species intolerant of human activities may use the Project and buffer area significantly less when humans are regularly present in the area. More tolerant species may adapt to and even take advantage of close human contact. Increased vehicular traffic can cause direct mortality to species or impede daily activities or dispersal.

However, because common wildlife species and habitats found in the Project and buffer area are locally and regionally common, potential impacts to these resources are considered less than significant. Therefore, no avoidance or minimization measures are proposed at this time.

Impacts to Nesting Special-Status Avian Species from Project Implementation

Implementation of the Project could potentially result in significant impacts on nesting special-status avian species by causing abandonment of nests and the destruction of active nest sites. Western burrowing owls, Swainson's hawk, white-tailed kite, and migratory bird species (protected by the Federal Migratory Bird Treaty Act and other state and federal protection acts) have the potential to nest within the vegetative communities observed within the Project and buffer area. Swainson's hawks, white-tailed kites, and migratory bird species would not be impacted by direct disturbance of nesting sites. Instead, they would be indirectly impacted by the visual presence of humans and construction equipment, and noise and vibration related to Project construction activities. Burrowing owls have the potential to nest in agricultural lands found within the Project where ground disturbance activities would occur. Burrowing owl nest sites could be directly impacted by ground disturbance activities, or indirectly impacted by the noise and vibration created by construction activities, and the visual presence of humans and construction equipment in the Project alignment and access roadways. It should be noted that no evidence of these species, nor active/inactive nest sites of these species were observed during biological surveys. However, these species have the potential to become established in the Project site and buffer area prior to Project implementation.

Impacts to nesting special-status avian species would be considered a potentially significant effect. Minimization and avoidance measures to protect special-status avian species from potential impacts are described further in the *Recommended Minimization and Avoidance Measures* section.

Impacts to Special-Status Mammal Species from Project Implementation

Riparian Brush Rabbit

Implementation of the Project could result in impacts to potential foraging and nesting habitat of the riparian brush rabbit. However, as stated previously, no evidence of the presence of this species was observed during biological surveys, and this species is presumed to be absent from areas proposed for ground-disturbance as these areas are located within active agricultural lands. However, the potential exists that this species may become present in the Project area prior to Project implementation. Portions of the proposed pipeline would be installed in close proximity to existing agricultural drainage ditches with freshwater emergent wetland that could provide potential habitat for this species. If this species were to be present during Project implementation and enter areas of the Project site where installation activities are taking place, the potential exists that individuals of this species could be injured or killed by construction activities.

Impacts to riparian brush rabbit would be considered a potentially significant effect. Minimization and avoidance measures to protect riparian brush rabbit from potential impacts are described further in the *Recommended Minimization and Avoidance Measures* section.

San Joaquin Kit Fox

No evidence of San Joaquin kit fox, or any potential/known burrows were observed within areas proposed for ground disturbance (i.e., the Project) or buffer areas during biological surveys. RAB Consulting observed no “signs” (tracks, scats, active digging, etc.) of this species during biological surveys of the Project and buffer area. San Joaquin kit fox could become established in the Project or buffer area at any time prior to Project implementation. This species could also dig out existing California ground squirrel burrows found within the Project and buffer zone for use as nesting and pupping dens.

Implementation of the Project could potentially result in significant impacts on individual San Joaquin kit foxes if they take up residence in the Project or buffer area prior to Project implementation. Impacts to this species would likely occur through one of the following ways:

- Through crushing or injury of individual San Joaquin kit foxes if they are present within Project disturbance areas during Project implementation. This could result in direct mortality to live individuals or small populations of this species.

- Through the destruction of burrows if they are excavated by San Joaquin kit foxes within disturbance areas prior to Project implementation. As stated previously, no potential or known dens were identified within disturbance areas.
- Through visual, noise, and vibration impacts. If San Joaquin kit foxes become established in burrows adjacent to or within proposed disturbance areas, the presence of construction personnel, and the noise and vibration caused by construction activities could lead to the abandonment of actively used burrows/dens. However, as discussed previously, potential burrows were not identified during biological surveys of the Project site or buffer area, and no “signs” (tracks, scats, active digging, etc.) of this species were documented. Project activities could cause the abandonment of occupied burrows if they become established prior to Project implementation.

Potential impacts to San Joaquin kit foxes and their potential burrows/dens would be considered a potentially significant impact. Minimization and avoidance measures to protect this species from potential impacts are described further in the ***Recommended Minimization and Avoidance Measures*** section.

Impacts to Special-Status Reptile Species from Project Implementation

Giant Garter Snake

Implementation of the Project could potentially result in significant impacts to GGS. Direct injury or mortality of individual GGS could result if GGS are present in work areas during Project implementation. GGS have the potential to be present within the Project in areas where pipeline installation activities will occur within 200 feet of their aquatic habitat. Individual GGS could be crushed by construction equipment and during pipeline installation activities should they be present in work areas.

Potential impacts to GGS would be considered a potentially significant impact. Minimization and avoidance measures to protect this species from potential impacts are described further in the ***Recommended Minimization and Avoidance Measures*** section.

Western Pond Turtle

Implementation of the Project could potentially result in significant impacts to western pond turtles during Project implementation. Direct injury or mortality of individual turtles could result if they are present in work areas during Project implementation. Impacts to individual western pond turtles would be considered a significant impact. Minimization and avoidance measures to protect western pond turtles from potential impacts are described further in the ***Recommended Minimization and Avoidance Measures*** section.

Impacts to Special-Status Fish Species from Project Implementation

Installation of the proposed pipeline under the Mokelumne River would be achieved using horizontal directional drilling techniques. The pipeline would be placed at a depth under the bed of the Mokelumne River that would highly reduce the likelihood of release of drilling fluids into this water feature. Placement of the pipeline in this manner under the Mokelumne River would avoid direct disturbance of the bed and bank of this water feature, and would avoid impacts to special-status fish species due to direct construction related disturbance. However, the remote chance does exist that a “frac-out” even could occur and a release of drilling materials could occur within the Mokelumne River or in adjacent areas that could eventually end up in this River. The release of drilling fluids into the habitat of special-status fish species could result in the injuring or mortality of special-status fish species should they come into contact with these materials.

Impacts to special-status fish species would be considered a potentially significant effect. Minimization and avoidance measures to protect special-status fish species from potential impacts are described further in the ***Recommended Minimization and Avoidance Measures*** section.

Impacts to Agricultural Wetlands from Project Implementation

Installation of the proposed pipeline within agricultural wetlands (agricultural fields) will be achieved through trenching. The trench will be excavated to provide a minimum cover of five (5) feet under farm fields and the trench will be approximately two (2) feet wide. The depth of the trench could be greater if special conditions are encountered. If segregation of topsoil is required, the trencher or backhoe will make a first pass in the trench-line to remove approximately 10 to 18 inches of topsoil. Topsoil will be placed alongside the trench opposite the side designated for trench spoils. Once the topsoil has been excavated, a trencher or backhoe will make a second pass along the trench-line to remove the subsoil and complete the trench excavation. The pipe would then be placed in the trench, and soils would be placed back in the trench in the same order in which it was removed, thus maintaining the original layers of the soil. The total trenching surface disturbance would be approximately 3,245 linear feet long and two (2) feet wide (approximately 6,490 square feet or 0.15 acres).

Impacts to agricultural wetlands would be considered temporary in nature. The USACE and RWQCB consider impacts to be temporary as long as impacted areas are restored within the same season. If agricultural wetland soils are restored in the same season, no compensatory wetland mitigation is required by these agencies to offset impacts. Therefore, impacts to agricultural wetlands would be considered a less than significant impact, and no impact minimization measures are required.

RECOMMENDED MINIMIZATION AND AVOIDANCE MEASURES

No sensitive animal or plant species were observed during the biological survey and assessment. However, RAB Consulting recommends the implementation of the following minimization and

avoidance measures for the protection of these resources during Project implementation in the remote case that a sensitive resource may be encountered:

1. A worker environmental awareness training should be conducted prior to Project initiation for construction personnel, and should consist of a brief presentation in which persons knowledgeable in local sensitive habitats and wildlife, and regulatory protection should discuss environmental concerns. All personnel working on the Project shall be educated on the sensitivity of adjacent habitats and species.
2. A pre-construction biological species clearance survey should be conducted no less than 14 days or more than 30 days prior to the beginning of construction activities to ensure that none of the special-status animal or plant species identified in Table 2 of the document is present.
3. In order to avoid or reduce potential impacts to nesting special-status avian species, Three Rivers will conduct pre-construction nesting surveys for special-status avian species within the Project and buffer area during the appropriate survey periods for each species. Surveys will follow CDFW and USFWS approved protocols where applicable. Where active special-status bird nest sites are identified or suspected to occur during pre-construction surveys, a qualified biologist will establish the following buffer zones around nest sites, and no disturbance activities will occur within these buffer zones until young birds have fledged. Nesting buffer zones shall be marked with stakes, and signs shall be placed on the stakes indicating that no construction activities are to be conducted in the buffer areas until the areas are cleared by a qualified biologist:

Swainson's Hawk

Swainson's hawk typically nests and rears young from March through August. In order to avoid and minimize impacts on nesting Swainson's hawks, a 1,320-foot buffer will be established around active nesting sites. No Project related activities will be allowed to occur within this zone. A biological monitor will monitor the nest site on a regular schedule to ensure no impacts are occurring to nesting Swainson's hawks. Monitoring protocol shall be determined in consultation with CDFW. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

White-Tailed Kite

White-tailed kites typically nest and rear young from January through October. In order to avoid and minimize impacts on white-tailed kites, a 250-foot buffer will be established around active nests. No Project related activities will be allowed to occur within this buffer until young have fledged or the species are no longer attempting to nest. The buffer area can be removed prior to October if a qualified biologist determines that all juveniles have fledged from occupied nests.

Migratory Song Birds

Nesting migratory song birds typically nest and rear young from March through August. In order to avoid and minimize impacts on nesting migratory song birds, a 250-foot buffer will be established around active nesting sites when Project activities will occur during their nesting period. No Project activities will be allowed to occur within this zone. The buffer area can be removed prior to August if a qualified biologist determines that all juveniles have fledged from occupied nests.

4. If active burrowing owl nest sites are observed within 500 feet of the Project area during the pre-construction biological survey (MM BIO-2), the biologist shall consult with CDFW and the following measures shall be implemented:
 - (a) On-site passive relocation of burrowing owls should be implemented if owls are using the burrows after August 31. The burrowing owl nesting season begins as early as February 1 and continues through August 31. Passive relocation is defined as encouraging owls (by installing one-way doors in burrow openings to evict burrowing owls and prevent burrow re-occupation) to move from occupied burrows to alternate natural or artificial burrows that are beyond 500 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 should only be implemented during the non-breeding season.
 - (b) Owls should be excluded from burrows in the immediate impact zone and within a 500 feet buffer zone by installing one-way doors in burrow entrances. Owl exclusion activities shall only be conducted during the non-breeding season (September 1 through January 31). One-way doors should be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow should be provided for each burrow that will be excavated in the Project impact zone. The Project area should be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone.
 - (c) Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags should be inserted into burrow tunnels to prevent tunnel collapse while soil is excavated around that portion of a tunnel.
5. If San Joaquin kit foxes are determined to be residing in the Project or within 200 feet of the Project during the pre-construction biological surveys, Three Rivers will implement the measures contained in the USFWS's "Standardized recommendations for protection of the San Joaquin kit fox prior to or during ground disturbance" (USFWS 2011):
 - If kit fox dens have become established within 200 feet of the construction area prior to Project implementation that may be indirectly impacted by construction activities exclusion zones shall be established prior to construction by a qualified biologist and

dens shall not be disturbed in any way. Exclusion zone fencing should include untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the USFWS and CDFW. Exclusion zones shall be roughly circular with a radius of the following distances measured outward from entrance; potential den 50 feet, and known den 100 feet. Fencing must contain openings for kit fox ingress/egress and keeps humans and equipment out. If a natal/pupping den is discovered within the Project or within 200 feet of the Project, the USFWS and CDFW shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction survey reveals an active natal pupping or new information, the Project applicant should contact the USFWS and CDFW immediately to obtain the necessary take authorization/permit. If the take authorization/permit has already been issued, then the biologist may proceed with den destruction within the Project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the Project footprint.

- San Joaquin Kit fox exclusion zone barriers shall be maintained until all construction and drilling activities have been completed, and then removed. If specified exclusion zones described above cannot be observed for any reason, USFWS and CDFW shall be contacted for guidance prior to ground disturbing activities on the den or within the exclusion zones described above. In the event that USFWS and CDFW concur that an occupied San Joaquin kit fox den would be unavoidably destroyed by a planned Project action, procedures detailed in the USFWS Standardized Recommendations for protection of the San Joaquin Kit Fox (USFWS 2011) shall be implemented. Den excavation shall be undertaken only by a qualified biologist pursuant to USFWS and CDFW authorization and direction for excavation of kit fox dens.
- In the event that a San Joaquin kit fox is injured or killed, the incident shall immediately be reported to the Project biologist. The Project biologist shall contact CDFW immediately in the case of a dead, injured or entrapped kit fox. The CDFW contact for immediate assistance is State Dispatch at (916)445-0045. The Project biologist will contact the local warden or Mr. Paul Hoffman, wildlife biologist, at (530)934-9309. The USFWS should be contacted at Endangered Species Division, (916) 414-6620 or (916) 414-6600. The USFWS and CDFW shall be notified in writing within three (3) working days of the accidental death or injury to a San Joaquin kit fox during Project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The USFWS contact is the Chief of the Division of Endangered Species, 2800 Cottage Way, Suite W2605, Sacramento, California 95825-1846. The CDFW contact is Mr. Paul Hoffman at 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670. New sightings of kit fox shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly

marked with the location of where the kit fox was observed should also be provided to the USFWS as well.

- Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe should not be moved until the USFWS and CDFW has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
- Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the USFWS and CDFW. Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped, without further disturbance, from the partially destroyed den. Natal or pupping dens which are occupied cannot be destroyed until the pups and adults have vacated and then only after consultation with the USFWS and CDFW. Known dens occurring within the footprint of the activity must be monitored for three (3) days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use. If kit fox activity is observed at the den during this period, the den should be monitored for at least five (5) consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five (5) or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities. The USFWS and CDFW encourage hand excavation, but realize that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised. For potential dens, if a take authorization/permit has been obtained, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then

potential dens should be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the USFWS and CDFW shall be notified immediately.

6. Three Rivers will implement the following measures to avoid impacts to northwestern pond turtle during Project implementation:
 - If northwestern pond turtles are not found within the Project disturbance zone during pre-construction surveys, Project activities may proceed without any further actions. If juvenile or adult turtles are found within Project work areas, the individual turtles shall be moved out of the Project disturbance zone by a qualified biologist.
 - If this species is observed within Project work areas at any time during construction activities, construction work shall cease within 150 feet of the area until the turtle(s) can be moved by a biological monitor to a safe location consistent with CDFW regulations.
 - As part of the worker environmental training awareness program, Project personnel shall be trained to identify this species, its natural history, its habitat, and protective measures.
7. In areas where Project activities are proposed adjacent to freshwater emergent wetland habitat (potential habitat for the riparian brush rabbit), wildlife proof barrier fencing shall be installed prior to conducting Project activities (i.e., clearing of the pipeline right-of-way, trenching activities, etc.) to prevent riparian brush rabbits from entering Project work areas. If at any time during Project implementation an individual riparian brush rabbit is discovered within the fenced Project, all activities in the area would cease, and a qualified biologist would temporarily open the protective fencing and herd the rabbit out of the work area. Fencing would be closed after the rabbit has left the Project.
8. To reduce or avoid impacts to special-status fish species and other aquatic wildlife species, Three Rivers will implement a *Frac-Out Contingency Plan* in the event a frac-out should occur in the Mokelumne River, in agricultural drainage ditches, or in adjacent upland areas, including areas immediately adjacent to areas with aquatic resources. This plan has been prepared, and a copy will be maintained at the Project for reference during all times. Appropriate clean up materials will be staged at each individual location of HDD so that equipment will be available at all times.
9. In accordance with *Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat* (USFWS 1997), the following mitigation measures shall be implemented during implementation of the Project to avoid impacts to GGS:

- 24 hours prior to construction activities, construction work areas within 200 feet of agricultural drainage ditches shall be surveyed for GGS by a qualified biologist. Survey of these areas shall be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during surveys, Three Rivers shall report the sighting(s) to the USFWS immediately by telephone at (916) 414-6600. Additionally, the Project biologist must submit all sightings to the CDFW CNDDDB using a California Native Species Field Survey Form and provide copies to CDFW and the USFWS.
- Construction activities within 200 feet of agricultural drainage ditches shall be conducted between May 1 and October 1. This is the active period for GGS and direct mortality is lessened considerably because snakes are expected to actively move and avoid danger.
- If any construction activities will take place between October 2 and April 30 within 200 feet of agricultural drainage ditches, the USFWS Sacramento Fish and Wildlife Office and CDFW will be consulted with to determine what additional measures are necessary to minimize and avoid take, and what permits would be required.
- Vegetative clearing will be confined to the minimal area necessary to facilitate construction of pipeline components. Potential GGS habitat adjacent to the proposed pipeline alignment shall be flagged and posted prior to ground-disturbing activities to avoid encroachment by construction personnel.
- All Movement of construction equipment and vehicles shall be confined to existing roadways and the proposed pipeline alignment.
- A qualified biologist shall be on-site during all construction and earthmoving activities that occur within 200 feet of potential GGS habitat. In the event GGS are observed near or in the construction area, the biologist will have the authority to stop construction until the snake has left the area. Physical removal of snakes from the Project area will only be conducted with agency authorization, and will be conducted by a biologist qualified and listed by USFWS to handle this species. The biologist will contact CDFW and USFWS if any GGS are encountered, or if any incidental take occurs. The biologist will record all relevant environmental, biological, and behavior data observed, and submit summary reports to CDFW and USFWS.
- All Project related traffic will observe a speed limit of 15 mph to ensure that any giant garter snakes crossing or basking on access roadways or the proposed pipeline alignment will have time to move out of the way of traffic.

10. Hazardous materials, fuels, lubricants, or solvents that are accidentally spilled during drilling activities should be cleaned up and disposed of immediately and according to applicable federal, state and local regulations.
11. The speed of Project-related vehicular traffic should be limited to 15 miles per hour once vehicles have left State or County roads and are traveling along unpaved dirt access roads to and from the Project.
12. All equipment storage during site development and operation should be confined to areas proposed for disturbance or to previously disturbed off site areas that are not habitat for sensitive species.
13. Sediment-control devices (e.g., weed-free straw wattles, silt fence, straw bales, etc.) should be installed around construction work zones to prevent runoff to adjacent sensitive wildlife habitats.
14. To prevent entrapment of wildlife species during the construction phase of the Project, all excavated, steep-walled holes and trenches in excess of 3 feet in depth should be provided with one or more escape ramps constructed of earthen fill or a wood/metal plank. If wildlife proof barricade fencing is available, it should also be utilized where appropriate. Escape ramps should be at less than a 45° angle. Trenches and pits should be inspected for entrapped wildlife each working day before construction activities resume. Before such pits and trenches are filled, they should 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.
15. All construction pipes, culverts, or similar structures that are stored at a construction site overnight should be thoroughly inspected for trapped animals before the pipe is buried, capped, or otherwise used or moved. Pipes laid in trenches overnight should be capped. If an animal is discovered inside a pipe, that section of pipe should not be capped or buried until the animal has escaped.
16. All trash items such as wrappers, cans, bottles, and food scraps generated both during construction and subsequent operation should be disposed of in closed containers only and regularly removed from the site. Food items may attract animals onto the Project, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife should be allowed.
17. To prevent harassment, mortality, or unauthorized “take” of sensitive species and/or their habitat by domestic dogs and cats, no pets should be permitted onsite.
18. Impacts associated with wild fires can be minimized by maintaining firefighting equipment on site during Project related activities. The use of shields, protective mats

or use of other fire preventive methods during grinding and welding activities will prevent or minimize the potential for fire. Personnel should be trained regarding fire hazard for wildlife and their habitats.

CONCLUSIONS

Special-status species and their habitat have been documented in the general vicinity of the Project. However, no special-status animal or plant species were observed during the biological survey and assessment of the Project and buffer area. It is highly unlikely that the Project will have impacts on listed or sensitive species or habitats.

The Project would temporarily disturb common wildlife species. However, this impact is considered less-than-significant because common wildlife species associated with the vegetative communities present within the Project and buffer area are locally and regionally common. With the implementation of the previously described best management guidelines during the construction phase of the Project, potential impacts to common and common wildlife species will be avoided.

Western burrowing owls, Swainson's hawks, white-tailed kites, and migratory bird species have the potential to nest within the vegetative communities found in the Project or buffer area. In order to avoid or reduce potential impacts to these species, Three Rivers will conduct pre-construction surveys for these species. Three Rivers will also implement the avoidance and minimization measures described in the *Recommended Minimization and Avoidance Measures* section.

Implementation of the Project could potentially result in significant impacts to GGS and western pond turtles. Direct injury or mortality of these species could result if they are present in work areas during Project implementation. Three Rivers will implement the avoidance and minimization measures described in the *Recommended Minimization and Avoidance Measures* section to protect GGS from potential impacts.

Implementation of the Project could potentially result in significant impacts to special-status fish species, GGS, western pond turtles, and other aquatic wildlife species in the event a frac-out should occur within the Mokelumne River, agricultural drainage ditches, or in adjacent upland areas where HDD fluids could reach these aquatic resources. Direct injury or mortality of these species could result if they are present in the area of a frac-out. Three Rivers will implement the avoidance and minimization measures described in the *Recommended Minimization and Avoidance Measures* section to protect these resources from potential impacts.

Implementation of the Project could potentially result in significant impacts to special-status mammal species (riparian brush rabbit and San Joaquin kit fox) should they become established within the Project or buffer area prior to construction of the Project. It should be noted that neither of these species or signs of their presence were observed during biological surveys in the Project or buffer area. Direct or indirect impacts to these species would be

considered significant. Three Rivers will implement the avoidance and minimization measures described in the *Recommended Minimization and Avoidance Measures* section to protect these resources from potential impacts.

In order to protect common and sensitive wildlife resources, RAB Consulting recommends that Three Rivers implement the recommended best management measures and species-specific mitigation measures described in this report to ensure that no impacts to these resources occur.

REFERENCES CITED AND REVIEWED

- Brode, J. 1988. Natural history of the giant garter snake (*Thamnophis couchii gigas*). Pages 25-28, In Proceedings of the conference on California herpetology, H.F. DeListe, P.R. Brown, B. Kaufman, and B.M. McGurty (eds). Southwestern Herpetologists Society, Special Publication No. 4.
- Brode, J., and G. Hansen. 1992. Status and future management of the giant garter snake (*Thamnophis gigas*) within the southern American Basin, Sacramento and Sutter counties, California. California Department of Fish and Game, Inland Fisheries Division.
- Bushnel, R. G. 1978. Effect of noise on wildlife. Introduction. Pages 7-22. *In*: Fletcher, J. L. and R. G. Busnel (eds.). Effects of noise on wildlife. Academic Press, New York. 305 pp.
- CDFG (California Department of Fish and Game. 1986. Status of the giant garter snake *Thamnophis couchii gigas* (Fitch) in the Southern San Joaquin Valley during 1986. Final report for California Department of Fish and Game, Standard Agreement No. C1433. Unpublished. 31 pp.
- CDFG (California Department of Fish and Game. 1990. Guidelines for procedures and timing of activities related to the modification or relocation of giant garter snake habitat. California Department of Fish and Game Inland Fisheries Division, October 1990.
- CDFG (California Department of Fish and Game). 1995. Staff report on burrowing owl mitigation. September 25, 1995. 8 pages and an attachment.
- CDFG (California Department of Fish and Game. 1996. Status of the giant garter snake (*Thamnophis gigas*) in the San Joaquin Valley in 1995. Final report for California Department of Fish and Game, Standard Agreement No. FG4052IF. Unpublished 31 pp.
- CDFG (California Department of Fish and Game. 2000. Guidelines for assessing effects of proposed developments on rare and endangered plants and natural communities. May 8, 2000.
- CDFG (California Department of Fish and Game). 2009. Protocols for Surveying and evaluating impacts to special-status native plant populations and natural communities. California Department of Fish and Game, November 2009.
- CDFG (California Department of Fish and Game. 2012. California Natural Diversity Database. Rare Find 3, Version 3.0.5. Habitat Planning and Conservation Branch. Electronic Database.

- CNPS (California Native Plant Society). 2001. *Botanical Survey Guidelines of the California Native Plant Society*. Fremontia. Vol. 29: 3-4.
- CNPS (California Native Plant Society). 2012. Inventory of Rare and Endangered Vascular Plants of California, version 8. California Native Plant Society. Sacramento, CA. Accessed from <http://www.cnps.org/inventory>.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. Publication FWS/OBS-2279/31. U.S. Fish and Wildlife Service, Washington, D.C.
- Cypher, B.L., G.D. Warrick, M.R.M. Otten, T.P. O'Farrell, W.H. Berry, C.E. Harris, T.T. Kato, P.M. McCue, J.H. Scrivner and B.W. Zoellick. 2000. Population dynamics of San Joaquin kit foxes at the Naval Petroleum Reserves in California. Wildlife Society Monograph Number 145. 43 pp.
- Dragoo, J. W., J. R. Choate, T. L. Yates, and T. P. O'Farrell. 1990. Evolutionary and taxonomic relationships among North American arid-land foxes. *Journal of Mammalogy*. 71:318-332.
- Engles, E. 1994. Rice farming: best hope for the giant garter snake. Page 283 in C. G. Thelander and M. Crabtree (eds.), *Life on the edge: a guide to California's endangered natural resources, wildlife*. Santa Cruz, CA: Biosystems Books.
- Hansen G.E., and J.M. Brode. 1980. Status of the giant garter snake, *Thamnophis couchi gigas* (Fitch). California Department of Fish and Game. Inland Fisheries Endangered Species Program Special Publication Report No. 80-5. 14pp.
- Hansen, G.E. 1988. Review of the status of the giant garter snake (*Thamnophis couchi gigas*) and its supporting habitat during 1986-1987. Final report for California Department of Fish and Game, Contract C-2060. Unpublished.
- Hansen G.E., and J.M. Brode. 1993. Results of relocating canal habitat of the giant garter snake (*Thamnophis gigas*) during widening of State Route 99/70 in Sacramento and Sutter Counties, California. Final report for Caltrans Interagency Agreement 03E325 (FG7550) (FY 87/88-91-92). Unpublished. 36 pp.
- Hansen, R.W. and G.E. Hansen. 1990. *Thamnophis gigas*. Reproduction. *Herpetological Review* 21(4):93-94.
- Hickman, J. C. (ed.). 1996. *The Jepson manual: Higher Plants of California*. University of California Press. Berkeley, CA.

- Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Unpublished manuscript, California Department of Fish and Game, Nongame - Heritage Program, Sacramento. 156 pp.
- Kramer, Gary. 2003. Fresh Emergent Wetland. California Wildlife Habitat Relationship System Database Version 8.0.
- Laudenslayer, W.F., Jr., et al. 1991. A checklist of Amphibians, Reptiles, Birds, and Mammals of California. California Department of Fish and Game.
- Laughrin, L. 1970. San Joaquin kit fox, its distribution and abundance. Wildlife Management Branch Administrative Report Number 70-2. State of California Resources Agency, Department of Fish and Game. Sacramento, California. 19 pp.
- Lee, J. M. and D. B. Griffith. 1977. Transmission audible noise and wildlife. *In*: Proceedings Symposium Ninth International. Congress on Acoustics. July 4-9, 1977. Madrid, Spain.
- Mayer, K.E., and W.F. Laudenslayer. 1988. A guide to wildlife habitats of California. California Department of Fish and Game, Sacramento, California. 166 pages.
- O'Farrell, T. P. 1983. San Joaquin kit fox recovery plan. U. S. Fish and Wildlife Service, Sacramento, California. 84 pp.
- Orloff, S.G. 1992. Survey techniques for the San Joaquin kit fox (*Vulpes macrotis mutica*). pp 185-197. *In*: Williams, D.F., S. Byrne and T. A. Rado (eds.), Proceedings of a conference on endangered and sensitive species of the San Joaquin Valley, California, Bakersfield, California, December 10-11, 1987. California Energy Commission, Sacramento, California. 388 pp.
- Orloff, S. F. Hall, and L. Spiegel. 1986. Distribution and habitat requirements of the San Joaquin kit fox in the northern extreme of its range. California-Nevada Wildlife Society Proceedings.
- Rossman, D.A., N.B. Ford, and R.A. Seigel. 1996. The garter snakes: evolution and ecology. University of Oklahoma Press, Norman. 331 pp.
- Sawyer, J. and T. Keeler-Wolf. 1995. A manual of California Vegetation. California Native Plant Society. Sacramento, California.
- Stebbins, R. C. 1985. Western reptiles and amphibians. Houghton Mifflin Company, Boston. 336 pp.
- Thomsen, L. 1971. Behavior and ecology of burrowing owls on the Oakland municipal airport. *The Condor*. 73:177-192.

- USFWS (U.S. Fish and Wildlife Service). 1989. Standardized recommendations for the protection of the San Joaquin kit fox. April 1989.
- USFWS. 1995. Standardized recommendations for the protection of the San Joaquin kit fox, 1995.
- USFWS (United States Fish and Wildlife Service). 1997. Programmatic formal consultation for U.S. Army Corps of Engineers 404 permitted projects with relatively small effects on the giant garter snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California.
- USFWS (United States Fish and Wildlife Service). 1999a. Standardized recommendations for the protection of the San Joaquin kit fox prior to or during ground disturbance. Unpublished protocol prepared by USFWS, Sacramento, CA. 7 pp.
- USFWS (United States Fish and Wildlife Service). 1999b. Draft recovery plan for the Giant Garter Snake (*Thamnophis gigas*). Portland, OR.
- USFWS (U.S. Fish and Wildlife Service). 2011. Standardized recommendations for the protection of the San Joaquin kit fox.
- USFWS (United States Fish and Wildlife Service). 2012. Website Address: http://sacramento.fws.gov/es/spp_lists/QuickList.cfm.
- Weinstein, M. 1978. Impact of off-road vehicles on the avifauna of Afton Canyon, California. Report to Bureau of Land Management, California Desert Plan Program, Riverside California. Contract Number CA-0606-CT7-2734. 34 pp.
- Zarn, M. 1974. Habitat management for unique or endangered species. Burrowing owl, *Speotyto cunicularia hypugaea*, Report Number 11. Technical Note, U. S. Department of Interior, Bureau of Land Management. Denver, Colorado. 25 pp.
- Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White. 1990. California's wildlife, volumes 1, 2, and 3. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento, CA.

Appendices

Appendix A

Photographs



Photograph 1

View of existing Delta Wetlands 1-8 well site and location of H12 Entry site for the HDD under State Highway 12. View looking northeast from well site.



Photograph 2

View of proposed pipeline alignment on north side of State Highway 12. The pipeline will be installed in active agricultural fields by trenching methods.



Photograph 3

View of proposed pipeline alignment on north side of State Highway 12. The pipeline will be installed in active agricultural fields by trenching methods.



Photograph 4

View of Mokelumne River Exit site and proposed pipeline alignment on north side of State Highway 12. The pipeline will be installed in active agricultural fields by trenching methods.



Photograph 5

View to the South of the Proposed Pipeline Alignment from the North Side of the Mokelumne River.



Photograph 6

View of tie-in point to existing Towne Exploration Company Tyler Island Farms 5-2 Well Site at the northern terminus of the proposed pipeline. View looking southwest at existing production facility.