Appendix C

Biological Survey Report

Final Biological Survey Report
San Luis Transmission Project

Western Area Power Administration, Sierra Nevada Region
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Folsom, CA 95630

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Appendix A Description of the Proposed Project and Alternatives
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1. Introduction

Western proposes to construct, own, operate, and maintain about 95 miles (153 kilometers) of new transmission lines through Alameda, San Joaquin, Stanislaus, and Merced Counties along the foothills of the Diablo Range in the western San Joaquin Valley. Western also would upgrade or expand its existing substations, make the necessary arrangements to upgrade or expand existing Pacific Gas and Electric (PG&E) substations, or construct new substations to accommodate the interconnections of these new transmission lines. Collectively, these proposed activities are referred to as the San Luis Transmission Project (project). The project location is shown in Figure 1.

A brief overview of the project is provided below; the full project description is provided in Appendix A. Project elements include:

- **A 500-kV transmission line:** a single-circuit 500-kV transmission line, about 65 miles (105 kilometers) long, terminating at the existing, expanded, or new substations in the Tracy and Los Banos areas.
- **230-kV transmission lines:** a single-circuit 230-kV transmission line, about 3 miles (4.8 kilometers) long, connecting the San Luis Substation and the existing Los Banos Substation or new Los Banos West Substation and a single-circuit 230-kV transmission line, about 20 miles (32 kilometers) long, connecting the San Luis and Dos Amigos Substations.
- **A 70-kV transmission line:** a single-circuit 70-kV transmission line, about 7 miles (11 kilometers) long, connecting the San Luis and O'Neill Substations.

Much of the project would be located adjacent to existing high-voltage transmission-line rights of way along the foothills west of Interstate 5 (I-5).

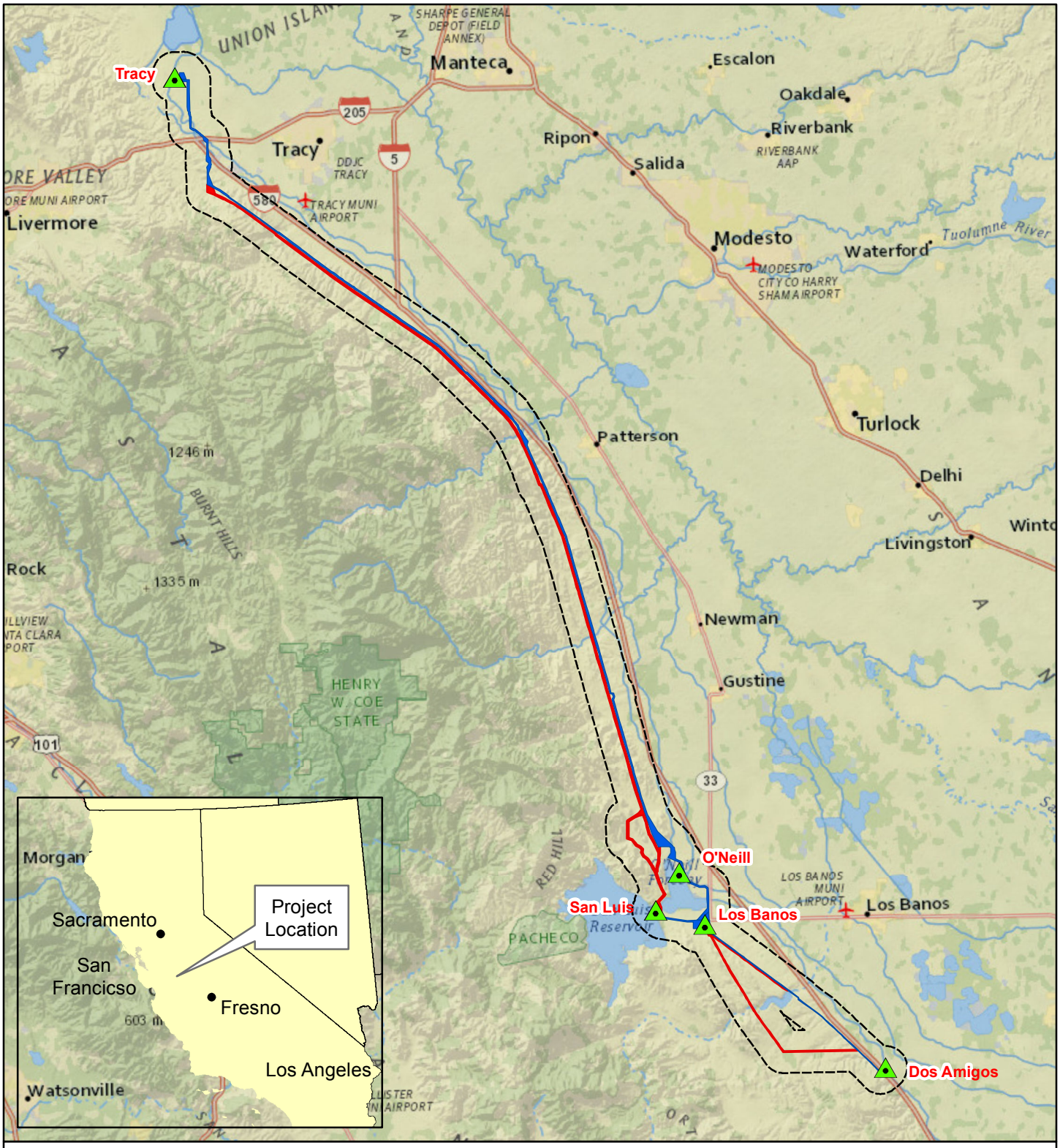
Western proposes to construct two new 500-kV substations: Tracy East Substation and Los Banos West Substation. The Tracy East Substation would be adjacent to and east of the existing Tracy Substation with a footprint of up to 50 acres (20 hectares). The Los Banos West Substation would be adjacent to and west of the existing Los Banos Substation with a footprint of up to 50 acres (20 hectares). The existing Tracy, Los Banos, San Luis, and/or Dos Amigos substations may be expanded to add new or modify existing 230-kV or 500-kV terminal bays. Western would also construct a 230/70-kV transformer bank and associated facilities at the San Luis Substation.

The project would also include ancillary facilities, such as communication facilities, improvements to existing access roads, new permanent access roads, and temporary access roads to facilitate construction. Western would acquire the necessary easements and fee land for the project.

Once constructed, operating and maintaining the line to ensure its safe and reliable functioning would include periodic aerial, ground, and climbing inspections of towers; maintaining vegetation around towers; maintaining access roads; and maintaining associated structures, hardware, and equipment. Operation and maintenance (O&M) activities are described in detail in Exhibit 1 of Appendix A.

In addition to the proposed corridor, a total of six corridor alternatives have been developed for the project (refer to Appendix A for details and locations of corridors). They were developed based on whether or not the alternatives (1) meet most of the project objectives/purpose and need; (2) are considered feasible; and (3) avoid or substantially lessen potential significant effects of the project. Figure 2 illustrates the location of the following six corridor alternatives:

- Patterson Pass Road Alternative
- Butts Road Alternative
- West of Cemetery Alternative
- Los Banos to Dos Amigos 230-kV Alternative
- Billy Wright Road 230-kV Alternative
- West of O'Neill Forebay Alternative



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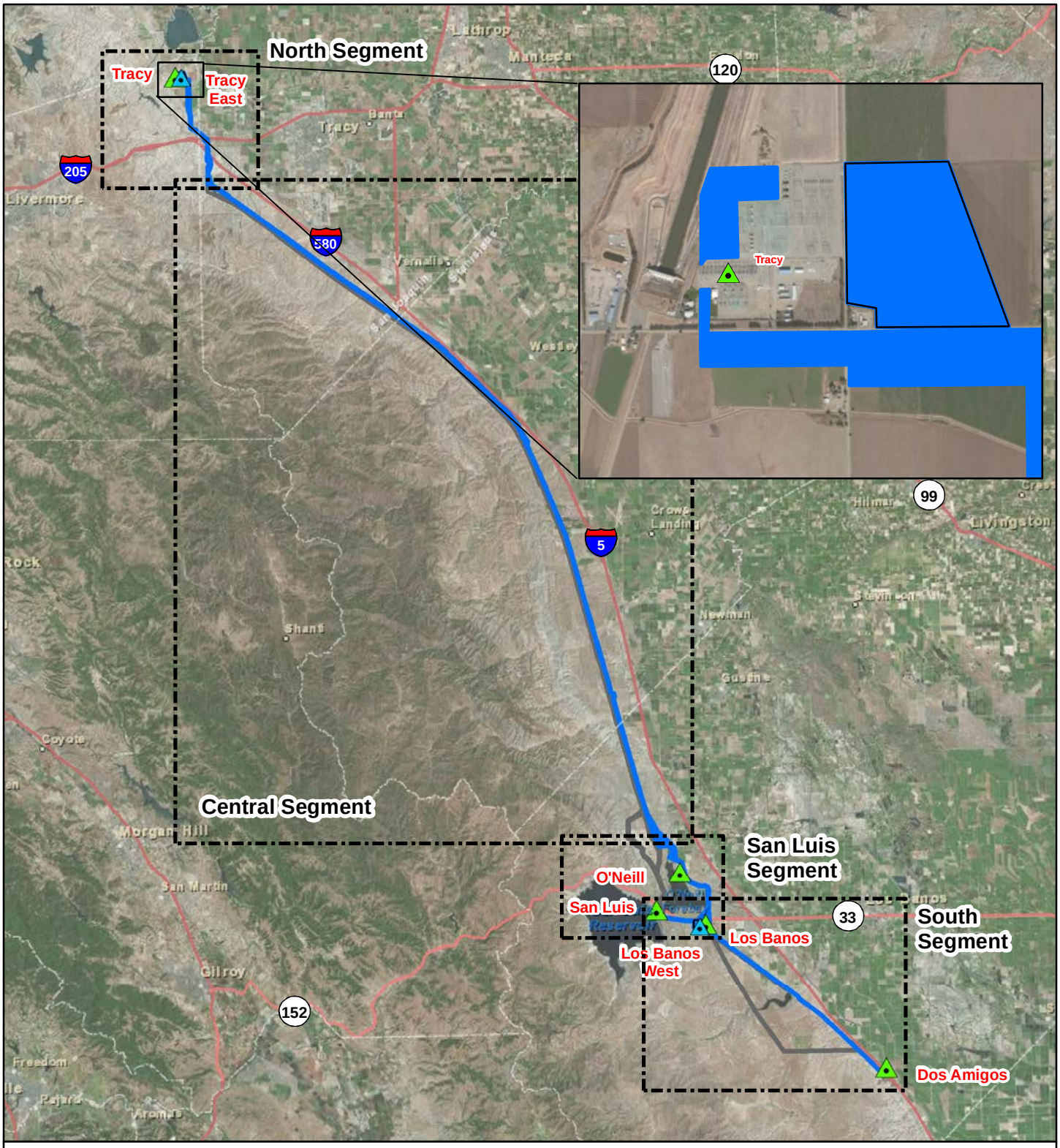
- Substation
- Proposed Project Corridor
- Corridor Alternatives
- 1.25-mile buffer around Project Area

0 5 10 Miles

Figure 1.

Project Location



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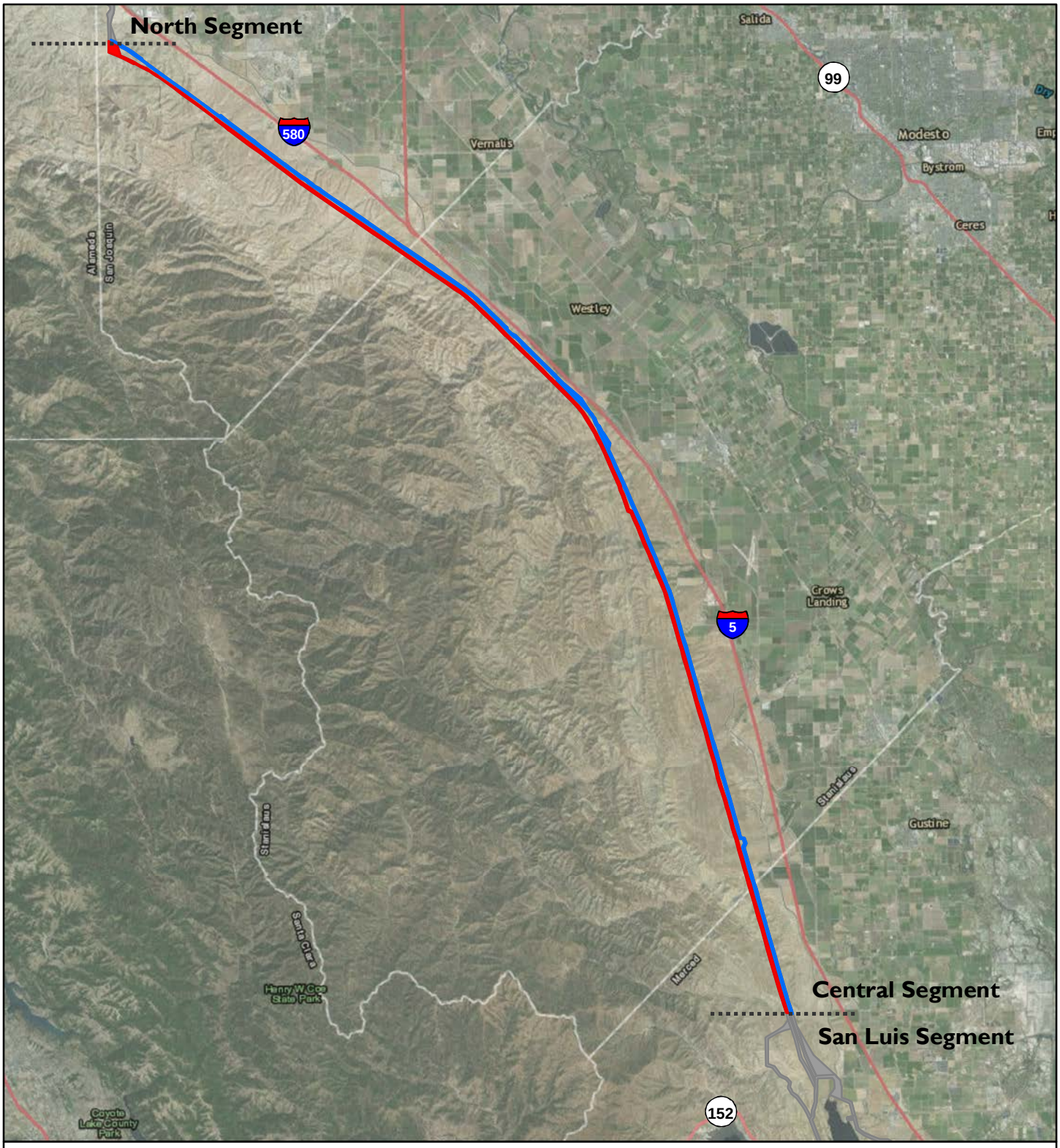
- Proposed New Substations
- Existing Substations
- Tracy East Substation Area*
- Proposed Project Corridor
- Corridor Alternatives

* Proposed new Tracy East Substation would occupy up to 50 acres within this area

0 5 10 Miles

Figure 2a.

Project Segments



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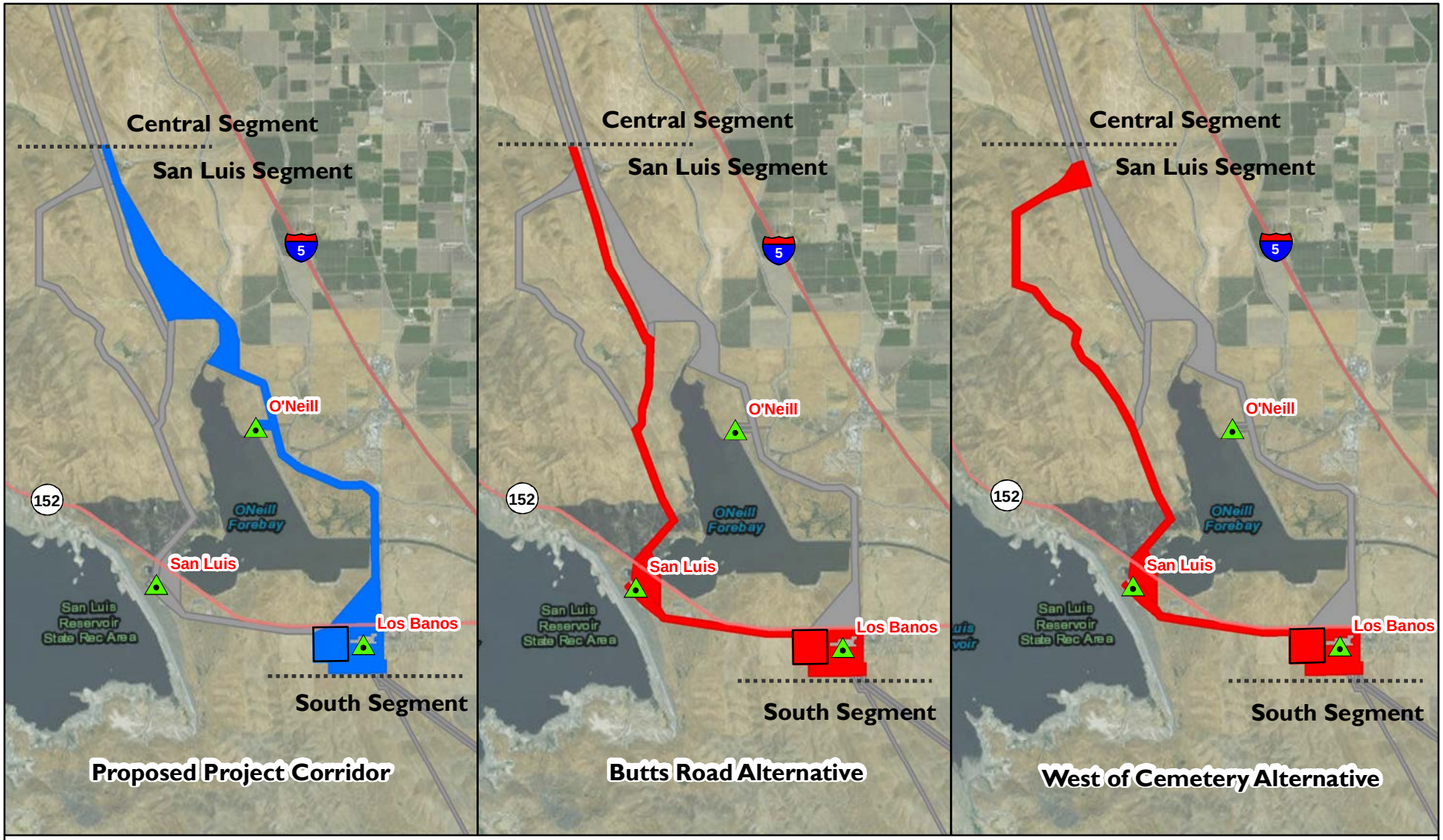
Patterson Pass Road Alternative
Proposed Project
Other Corridors

0 3 6 Miles

Figure 2b.

Corridor Alternatives
Central Segment



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Source: WAPA SNR, Aspen EG, ESRI

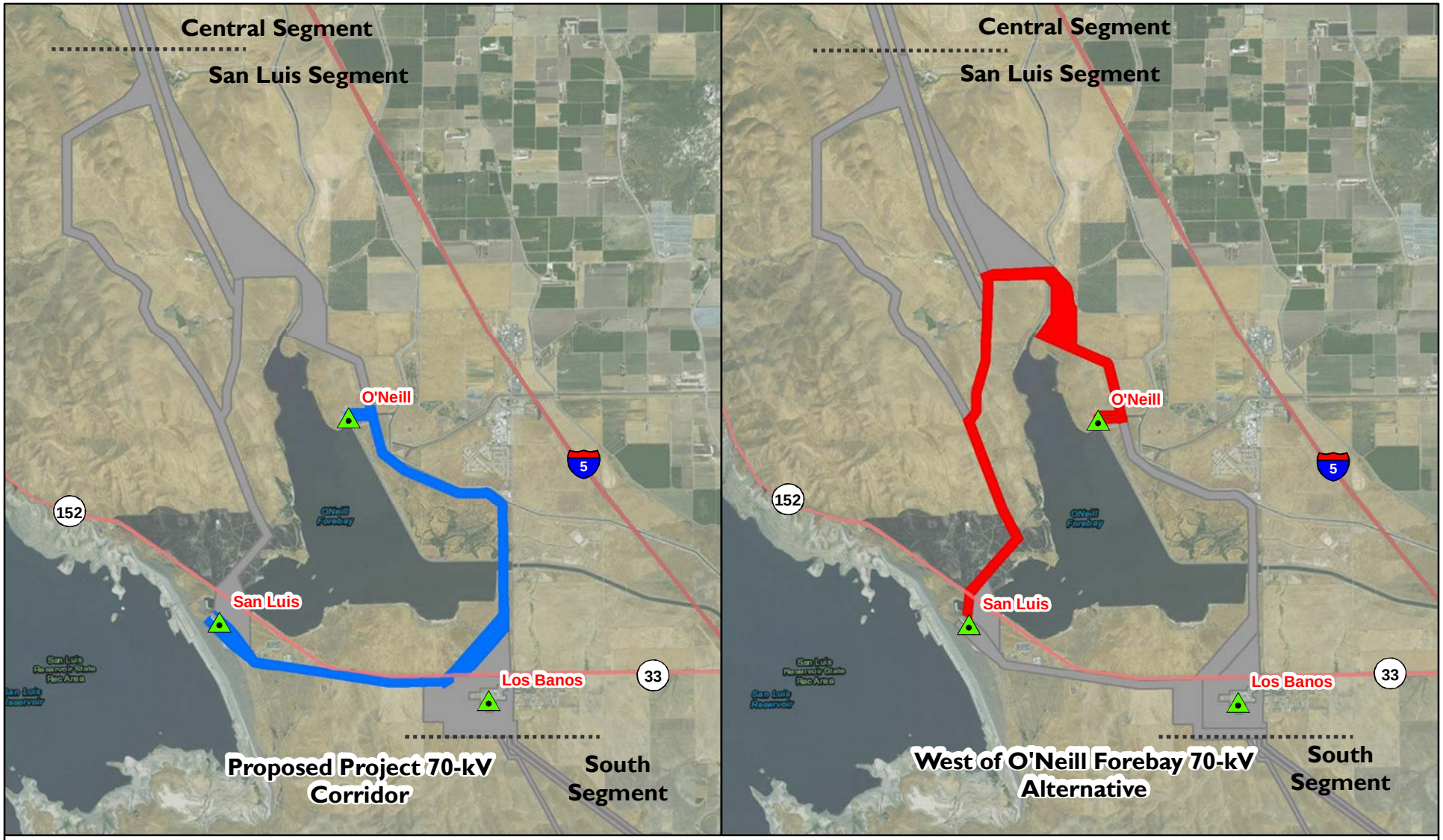
- Existing Substations
- Los Banos West Substation Area*
- Corridor Alternative
- Proposed Project
- Other Corridors

* Proposed new Los Banos West Substation would occupy up to 50 acres within this area

0 1 2 Miles

Figure 2c.

Corridor Alternatives
San Luis Segment



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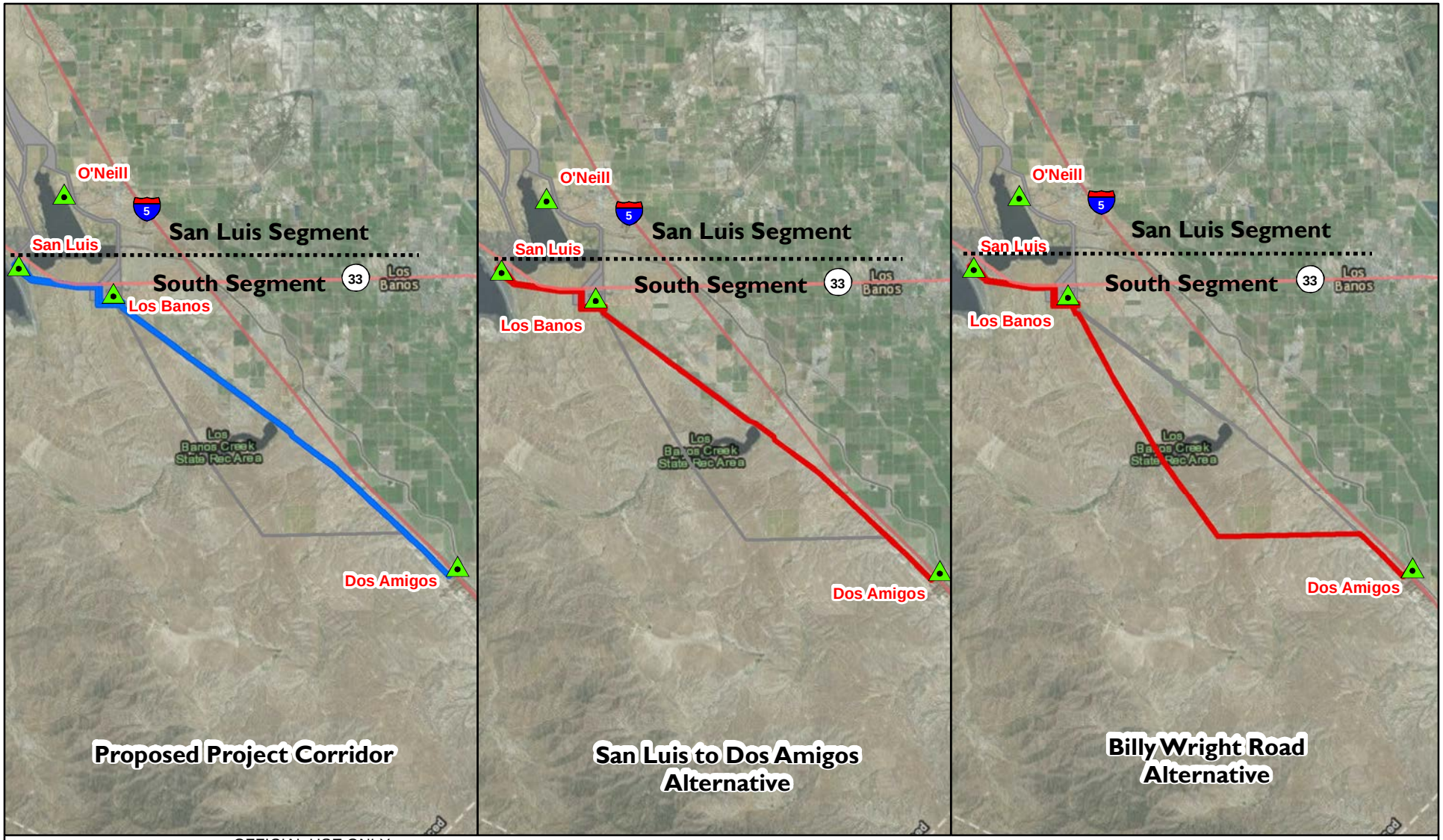
Source: WAPA SNR, Aspen EG, ESRI

Existing Substations
Corridor Alternative
Proposed Project
Other Corridors

0 1 2 Miles

Figure 2d.

70-kV Corridor Alternatives
San Luis Segment



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Source: WAPA SNR, Aspen EG, ESRI

- Existing Substations
- Proposed Project
- Corridor Alternative
- Other Corridors

0 2.5 5 Miles

Figure 2e.

Corridor Alternatives South Segment

2. Study Methods

2.1 Regulatory Requirements

2.1.1 Federal Endangered Species Act

The federal Endangered Species Act (FESA) protects plants and wildlife that are listed as endangered or threatened by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries). Section 9 of FESA prohibits the "take" of endangered wildlife, which is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (50 CFR 17.3). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging-up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 USC 1538). Under Section 7 of FESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed species (including plants) or its critical habitat. Through consultation and preparation of a biological opinion, the USFWS may issue an incidental take statement allowing take of the species that is incidental to another authorized activity, provided the action will not jeopardize the continued existence of the species. Section 10 of FESA provides for issuance of incidental take permits to private parties provided a habitat conservation plan is developed.

2.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), originally passed in 1918, implements the commitment of the U.S. to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. The original treaty prompting the passage of the MBTA was the Convention for the Protection of Migratory Birds signed in 1916 by the U.S. and Great Britain on behalf of Canada for the protection "of the many species of birds that traverse certain parts of the U.S. and Canada in their annual migration." The primary motivation for negotiation of the 1916 treaty and the passage of the MBTA was to stop the "indiscriminate slaughter" of migratory birds by market hunters and others. The MBTA was subsequently amended as the U.S. signed similar treaties with Mexico (1936, amended 1972 and 1999), Japan (1972), and Russia (1976). The Canadian treaty was amended in December 1995 to allow traditional subsistence hunting of migratory birds. Under the MBTA it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg or any such bird, unless authorized under a permit issued by the Secretary of the Interior. Some regulatory exceptions apply. Take is defined in regulations as: "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." The MBTA protects more than 1,000 bird species, more than 800 of which occur in the U.S.; however, not all birds in the U.S. are protected by the MBTA.

2.1.3 Federal Clean Water Act

The purpose of the federal Clean Water Act (CWA) is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Section 404 of the CWA prohibits the discharge of dredged or fill material into "waters of the United States" without a permit from the U.S. Army Corps of Engineers (USACE). Waters of the U.S. may include rivers, streams, estuaries, territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do

support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3 7b). The U.S. Environmental Protection Agency (USEPA) also has authority over wetlands and may override a USACE permit. Substantial impacts to wetlands may require an individual permit. Projects that only minimally affect wetlands may meet the conditions of one of the existing nationwide permits. A water-quality certification or waiver pursuant to section 401 of the CWA is required for section 404 permit actions; in California this certification or waiver is issued by one of nine Regional Water Quality Control Boards (RWQCB).

2.1.4 Federal Noxious Weed Act of 1974

- Defines a noxious weed as any living stage of a plant that can directly or indirectly injure crops, other useful plants, livestock, poultry, or other interests of agriculture including irrigation, navigation, the fish and wildlife resources of the U.S., or public health;
- Regulates the sale, purchase, and transportation of noxious weeds into or through the U.S.;
- Regulates the inspection and quarantine of areas suspected of infestation and provides for the disposal or destruction of infested products, articles, means of conveyance, or noxious weeds;
- Provides for fines of up to $5,000 and/or imprisonment up to one year for violation of the regulation; and
- Requires Federal agencies to work with state and local agencies to develop and implement noxious weed management programs on Federal lands.

Other Applicable Federal Regulations, Guidance, and Executive Orders

EO 13112, Invasive Species. This EO requires Federal agencies to: "prevent the introduction of invasive species"; "detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner"; "monitor invasive species populations accurately and reliably, provide for restoration of native species and habitat conditions in ecosystems that have been invaded"; "conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species"; and "promote public education on invasive species and the means to address them."

National Aquatic Invasive Species Act of 1996. This Act prescribes actions to combat invasive aquatic species.

Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990. This Act establishes a program to prevent the introduction of, and to control the spread of, introduced aquatic nuisance species.

2.1.5 California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of the federal ESA, but unlike its federal counterpart, CESA also applies take prohibitions to species proposed for listing, called "candidates" by the state. Section 2080 prohibits the take, possession, purchase, sale, import or export of endangered, threatened, or candidate species unless otherwise authorized by permit or in the regulations. Take is defined in section 86 as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful actions. State lead agencies are required to consult with the California Department of Fish and Wildlife (CDFW) to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

2.1.6 California Fully Protected Species

California first began to designate species as "fully protected" prior to the creation of CESA and FESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, amphibian, reptile, bird, and mammal species. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. The regulations that implement the statute for fully protected species (Fish and Game Code[1] sections 3511, 4700, 5050, and 5515) provide that fully protected species may not be taken or possessed at any time. Further, the CDFW prohibits any state agency from issuing incidental take permits for fully protected species, except for necessary scientific research.

2.1.7 Native Plant Protection Act

The state Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code sections 1900-1913) was created with the intent to "preserve, protect and enhance rare and endangered plants in this state." The NPPA is administered by the CDFW. The Fish and Game Commission has the authority to designate native plants as "endangered" or "rare" and to protect endangered and rare plants from take. The California Endangered Species Act of 1984 (Fish and Game Code sections 2050-2116) provided further protection for rare and endangered plant species, but the NPPA remains part of Fish and Game Code.

2.1.8 California Streambed Alteration Notification/Agreement

Section 1602 of California Fish and Game Code requires that a streambed alteration application be submitted to the CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions and, if necessary, submits to the applicant a proposal for measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the Department and the applicant is the streambed alteration agreement. Often, projects that require a streambed alteration agreement also require a permit from the USACE under section 404 of the Clean Water Act. In these instances, the conditions of the section 404 permit and the streambed alteration agreement may overlap.

2.1.9 California Laws and Codes Governing Noxious Weeds

The following is a digest of the most important laws affecting noxious weeds in California. For the most part, they are derived from the laws for pests in general. The laws are found in the California Food and Agriculture Code. This information is available from the California Department of Food and Agriculture (CDFA) website in the section entitled "Encycloweedia" at: http://www.cdfa.ca.gov/plant/ipc/encycloweedia/winfo_weedlaws.htm.

California Code of Regulations – State Regulations

Food and Agriculture (Title 3)
Plant Industry (Division 4)
Entomology and Plant Quarantine (Chapter 3)
Insect Pest Control (Subchapter 5)

[1] Though on January 1, 2013, the California Department of Fish and Game changed its name to California Department of Fish and Wildlife, its regulations are still called Fish and Game Code.

Rodent and Weed Control and Seed Inspection (Chapter 5)
Weed Free Areas and Weed Eradication Areas (Chapter 6)
Alligatorweed (Article 5)
Hydrilla (Article 7)
Noxious Weed Species (Subchapter 6)
Pesticides and Pest Control (Division 6)

California Law – State Laws

California Food and Agricultural Code
Exotic Species Introductions (Division 1, Part 1, Chapter 3, Section 403)
Plant Quarantine and Pest Control

Other Legal Resources

Bills

AB 984 Tamarisk plant control September 29, 2006

California Invasive Plant Council (Cal-IPC)

AB 2631 proposes creation of a California Invasive Species Council, June 2004

California Department of Food and Agriculture

California Weed Laws
Plant Health and Pest Prevention Services – Regulations
Pest Exclusion Branch

Legislative Counsel of California

National Plant Board

State Plant Quarantine Summaries

University of California-Davis, Information Center for the Environment

CALWEED Database, California Noxious Weed Control Projects Inventory

Environmental Law Institute

Status and Trends in State Invasive Species Policy: 2002-2009 (May 2010).

2.2 Biological Studies

Studies conducted to evaluate the potential for project effects to sensitive habitats and special-status plants and animals are briefly described below.

- A California Natural Diversity Database (CNDDB–CDFW, 2015a) records search was conducted to identify sensitive habitats and special-status plants and animals that are known to occur within a nine-quadrangle[2] area of all quads associated with the project (43 quads were included). A list of quads for which records were searched and a summary table of all species and habitats found are provided in Appendix B.
- A list of federally protected plants and animals was generated for each quad on which the project lies, including Clifton Court Forebay, Midway, Tracy, Lone Tree Creek, Solyo, Westley, Patterson, Orestimba Peak, Newman, Howard Ranch, San Luis Dam, Volta, Los Banos Valley, Ortigalita Peak NW, and Charleston School.

[2] U.S. Geological Survey 7.5-minute quadrangle, or "quad," as shown on topographic maps produced by the USGS.

- A list of special-status plants was generated from the California Native Plant Society (CNPS) on-line electronic inventory of rare and endangered plants of California, 8th edition (CNPS, 2014) for each quad on which the project lies.
- Google Earth aerial imagery of the project area and its surroundings was reviewed extensively for both accessible and inaccessible portions of the project area.
- eBird.org, an online, real-time database of bird sightings launched in 2002 by the Cornell Laboratory of Ornithology and National Audubon, was reviewed for occurrence records of special-status birds.
- Habitat-level reconnaissance field surveys were conducted as described below.
- The following documents related to local conservation easements or conservation plans were reviewed.
  - Preserve Management Plan for the Tracy 580 Business Park Preserve (SJCOG, 2011).
  - Programmatic Biological Opinion for the East Alameda County Conservation Strategy (USACE File Number 2011-00230S) (USFWS, 2012c).
  - San Joaquin County Multi-species Habitat Conservation and Open Space Plan (SJCOG, 2000).
- Species experts were consulted and an extensive literature review on regionally occurring special-status species was conducted.
- Scoping letters were reviewed, including species lists provided within them.

Comprehensive lists of regionally occurring sensitive habitats and special-status plants and animals were compiled from the sources described above and are presented in section 3 below.

Habitat-level reconnaissance surveys were conducted to assess the potential for or actual presence of sensitive habitats and special-status plants and animals in the proposed project and alternative corridors. All habitat types were mapped according to the list of preliminary vegetation types of California, as first described in the *Preliminary Description of the Terrestrial Natural Communities of California, Nongame Heritage Program*, produced by CDFW (Holland, 1986). A list of habitat codes and their definitions are provided in Appendix C. For special-status plants, habitat suitability was based on a review of the general and micro-habitat preferences contained in the CNDDB, the CNPS Online Inventory of Rare and Endangered Plants (8th Edition–CNPS, 2014), and The Jepson Manual (Baldwin et al., 2012). Protocol surveys were not conducted for any plant or animal, and wetlands were not delineated. Rainfall in winter and spring 2013–2014 and 2014–2015 was significantly below normal but rainfall late in the season (March and April) of 2014 provided enough moisture for the majority of plants to flower. The April 2014 survey was well timed for identification of plant species; however, by May vegetation was dry and the likelihood of detection of special-status plants was reduced. The Billy Wright Road alternative corridor was very dry during the March 2015 survey, but most plants were still identifiable.

Pursuant to right-of-entry considerations on the largely private land-holdings crossed by the SLTP, proposed and alternative corridors were walked, driven and spot-checked, or assessed visually from public access points. Habitat types were characterized on detailed field maps where possible. Right-of-entry was not granted for all parcels and for areas where no public access was available for visual assessment, desktop review with Google Earth aerial imagery was used to map habitats.

During field surveys, all plants observed were recorded. Wildlife and their sign (dens, scats, nests, carcasses, skulls, prey remains) were also recorded when detected by either sight or song. A list of plants and wildlife seen during spring 2014 and spring 2015 reconnaissance surveys is provided in Appendix D.

Habitat maps and wildlife and rare-plant observations are presented as Figure 3; however, because Figure 3 comprises 54 maps, it is provided as a separate attachment.

2.3 Personnel and Survey Dates

Reconnaissance surveys were conducted by botany/wetland experts Jane Valerius and Zoya Akulova-Barlow, and by wildlife biologists Lawrence Hunt, PhD, and Anne Wallace. Two teams, each with one wildlife biologist and one botanist/wetland ecologist, conducted surveys. Surveys in 2014 were divided into two phases based primarily on right of entry. Phase I surveys were conducted April 9–15 and April 28–29, 2014, on those parcels for which right of entry had been granted by early April. Phase I surveys were completed by all four biologists. Phase II surveys were conducted May 16–20, 2014, by Zoya Akulova-Barlow and Anne Wallace and included those parcels for which additional right of entry had been granted, as well as areas where alternative corridors had been added or expanded. Reconnaissance surveys were conducted on March 27–29, 2015, for the Billy Wright Road alternative; these surveys were conducted by Lawrence Hunt and Zoya Akulova-Barlow.

2.4 Agency Coordination and Professional Contacts

On February 10, 2014, a draft memorandum (memo) was submitted to the USFWS outlining Western's proposed approach to surveys and permitting for biological resources protected under FESA. An initial consultation meeting was held on February 13, 2014, to discuss the memo. Follow-up questions were presented to USFWS biologists by email or telephone, and a final memo was submitted in mid-March 2014.

On February 28, 2014, a draft memo was submitted to CDFW outlining Western's proposed approach to surveys and permitting for biological resources protected under CESA.

On June 10, 2014, Brian L Cypher, PhD, Associate Director and Research Ecologist, California State University–Stanislaus, Endangered Species Recovery Program, was contacted by telephone for information on the potential presence of giant kangaroo rat (*Dipodomys ingens*) in the project area. He provided feedback and recommended contacting Dr. Tim Bean at Humboldt State and Mike Westphal with the Bureau of Land Management (BLM).

On June 10, 2014, Tim Bean, PhD, Assistant Professor, Department of Wildlife, Humboldt State University, was contacted by telephone (and, later, email) for information on the potential presence of giant kangaroo rat in the project area. He provided feedback and guidance on assessing presence using satellite imagery and sent a copy of a paper awaiting publication.

On June 10 and 30, 2014, Mike Westphal, BLM Wildlife Biologist, was contacted by telephone (voicemail) and email for his expertise on giant kangaroo rat. On June 30 in a telephone conversation, he provided his assessment of the potential for giant kangaroo rat occurrence in the southern part of the project area.

On June 10, 2014, Jeff Alvarez, MS, Herpetologist, The Wildlife Project, was contacted by email for his expertise on Alameda whipsnake; he responded on June 11. He was contacted by email again on June 23, 2014, with a question on California red-legged frog.

On February 4, 2015, a second consultation meeting was held with USFWS outlining results of 2014 reconnaissance surveys and plans for 2015 surveys.

On February 24, 2015, a second consultation meeting was held with CDFW outlining results of 2014 reconnaissance surveys and plans for 2015 surveys, and soliciting direction on our approach for avoiding impacts to the blunt-nosed leopard lizard.

On March 25, 2015, a third consultation meeting was held with CDFW to further discuss our approach for avoiding impacts to the blunt-nosed leopard lizard.

2.5 Limitations that May Influence Results

Pursuant to right-of-entry considerations on the largely private land-holdings crossed by the project, portions of the project area were not visited and most of the unvisited areas were not visible from public access points. Protocol surveys were not conducted for any species. Wetlands were not delineated and rare-plant surveys were not conducted, although rare plants were noted where detected during spring 2014 and spring 2015 surveys.

3. Description of Affected Environment

For this report, the project area is defined as the area encompassed by the proposed and alternative corridors between Tracy Substation on the north and Dos Amigos Substation on the south. Reference is at times made to resources found outside the project area; they may be within 1 mile of the project area or within the nine-quad search area[1] around a given location.

3.1 Existing Physical and Biological Conditions

3.1.1 Physical Conditions

The project area is located in western San Joaquin Valley along the foothills of the Diablo Range. In general, the area encompasses primarily open space characterized by terrain of varying steepness and sparse vegetation. West of the project area terrain becomes increasingly steep and east of the project area lies flat agriculture lands. The project area roughly parallels I-5, the Delta-Mendota Canal, and the California Aqueduct. Climate in the region is temperate, with mild winters and hot, dry summers.

The project area traverses portions of Alameda, San Joaquin, Stanislaus, and Merced Counties. From the north, the project area begins about 5 miles (8 km) northwest of the city of Tracy at the Tracy Substation. From here it extends south through agricultural lands and scattered development for about 6 miles (10 km) before turning southeast paralleling I-5 for about 50 miles (80 km) through private lands that are largely rural and undeveloped.

The project area skirts O'Neill Forebay on either the east or west side. This portion of the project area is primarily open space designated for recreational use and wildlife conservation. Several areas of residential and commercial development and scattered agriculture lands lie to the east of the project area near the Forebay. South of O'Neill Forebay, the project area continues through rural and undeveloped private lands with scattered development and agriculture lands along the eastern edge of the corridor, before crossing over I-5 and terminating at the Dos Amigos Substation.

Appendix E provides representative photos of the project area.

3.1.2 Biological Conditions

The sections below present the plant communities found in the project area and the general wildlife that are expected to use them. Appendix D presents a list of all plant species seen and a list of all wildlife species seen, heard, or otherwise detected during spring 2014 and spring 2015 reconnaissance surveys. Plant community designations are based on the vegetation codes used in Western's O&M GIS Database, (refer to Appendix C for a list of codes and definitions).

3.1.2.1 Plant Communities

Riparian Great Valley Forest (Rgf). The riparian great valley forest mapping unit (Rgf) corresponds to the great valley cottonwood riparian forest type as described by Holland (1986). The great valley cottonwood riparian forest is also a special-status vegetation community type with an S2.1 ranking

[1] As mentioned in section 2, the term *nine-quad search area* refers to a CNDDB search of all quads surrounding the quads on which the project lies. Because of the size of the project, the CNDDB search was, in fact, a search of 43 quads, and the term *nine-quad search* refers to an area within an equivalent distance of any location in the project area.

(defined in Table 1 below). This vegetation type is a dense, broad-leafed, winter-deciduous riparian forest dominated by cottonwood (*Populus fremontii*) and willow (*Salix* spp.), and occurs on fine-grained alluvial soils near perennial or nearly perennial streams that provide subsurface irrigation even when the channel is dry (Holland, 1986). Within the project area this vegetation community type occurs along major drainages, including Corral Hollow, Lone Tree, and Salado creeks.

The Rgf mapping unit was used to map another special-status community type, sycamore alluvial woodland, which is found along Orestimba creek. Sycamores (*Platanus racemosa*) are dominant and the trees are mostly well-spaced. Understory vegetation includes mule fat (*Baccharis salicifolia*), willows, California sagebrush (*Artemisia californica*), and non-native grasses such as hare barley (*Hordeum murinum* ssp. *leporinum*).

Riparian Great Valley Scrub (Rgs). The riparian great valley scrub mapping unit (Rgs) corresponds to the great valley willow scrub type as described by Holland (1986). This vegetation type is a shrubland type dominated by shrubby willows such as arroyo willow (*Salix lasiolepis*) and narrow-leaved willow (*Salix exigua*), and supports few if any cottonwood trees. The great valley willow scrub type was mapped along several unnamed intermittent drainages and also in isolated patches along Mountain House Creek and was also observed outside of the project area adjacent to Del Puerto Creek. Other species associated with this type include shrub understory species such as mulefat, Himalayan blackberry (*Rubus armeniacus*), and herbaceous species such as rabbit's-foot grass (*Polypogon monspeliensis*), nut sedge (*Cyperus eragrostis*), rushes (*Juncus* spp.), sedges (*Carex* spp.), curly dock (*Rumex crispus*), and brass buttons (*Cotula coronopifolia*).

Elderberry, Isolated (Ebis). One area with elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs was mapped along Salado Creek. The elderberries occurred within the larger great valley cottonwood riparian forest along the creek banks. This is not a separate vegetation community type since it is essentially a part of the riparian tree community. However, since elderberries can support the federally listed valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), these shrubs are discussed further in the wildlife section.

Grassland, Non-native Annual (Gnn). The non-native grassland mapping unit (Gnn) corresponds to the non-native grassland type as described by Holland (1986). This is the most common and widespread vegetation community in the project area. Plant species associated with this type are wild oats (*Avena barbata, A. fatua*), soft brome (*Bromus hordaeceus*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), weedy brome (*Bromus caroli-henrici*), hare barley, Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), ryegrass (*Festuca perennis*), rattail fescue (*Festuca myuros*), and Harding grass (*Phalaris aquatica*). One very invasive grass species, medusa-head (*Elymus caput-medusae*), was also observed in several areas within the project area. Non-native forbs species in this type include filarees (*Erodium* spp.), charlock mustard (*Sinapis arvensis),* shortpod mustard (*Hirschfeldia incana*), milk thistle (*Silybum marianum*), wild radish (*Raphanus sativus*), white horse-nettle (*Solanum elaeagnifolium*), hairy vetch (*Vicia villosa*), tocalote (*Centaurea melitensis*), Russian thistle (*Salsola tragus*), common groundsel (*Senecio vulgaris*), and London rocket (*Sisymbrium irio*). Native forbs also occur among non-native forbs and include fiddleneck (*Amsinckia menziesii*), blow wives (*Achyrachaena mollis*), tall stephanomeria (*Stephanomeria virgata*), Ithuriel's spear (*Triteleia laxa*), red maids (*Calandrinia ciliata*), purple owl's clover (*Castilleja exserta*), small-headed matchweed (*Gutierrezia microcephala*), California poppy (*Eschscholzia californica*), vinegar weed (*Trichostema lanceolatum*), and sacred datura (*Datura wrightii*). Many of the non-native grassland areas were grazed and some had been disked.

Grassland, Native Perennial (Gnp). The native perennial grassland mapping unit (Gnp) includes two special-status native grassland types: valley needlegrass grassland and valley wildrye grassland. Valley

needlegrass grassland is characterized by the presence of at least 5 percent absolute cover or 10 percent relative cover of purple needle grass (*Nasella pulchra*) (Sawyer et al., 2009). Valley needlegrass grassland is a special-status vegetation type with an S3.1 ranking. Other grasses associated with this type include non-native species such as red brome, wild oats, and hare barley. Native and non-native forbs also occur in this type.

Valley wildrye grassland is characterized by the presence of 50 percent or greater relative cover by creeping wildrye (*Elymus triticoides*) (Sawyer et al., 2009). Valley wildrye grassland is a special-status vegetation type with an S2.1 ranking. This type typically occurs along creeks and drainages and can also be a seasonal wetland type since creeping wildrye is a facultative wetland plant. However, the soils and hydrology of the site would also have to meet the wetland criteria for this type to also qualify as a seasonal wetland type. Other plants associated with this type include non-native grasses and forbs as described in the non-native grassland type. Within the project area *Elymus triticoides* was noted during surveys as occurring within an area mapped as seasonal wetland (Wse) along the south bank of Corral Hollow Creek within the Patterson Pass Road A alternative corridor.

One grassland area that is not a special-status type was dominated by plants associated with alkaline soils. Plant species associated with this type include inland saltgrass *(Distichlis spicata*) as the dominant species along with alkali heath (*Frankenia salina*) and big saltbush (*Atriplex lentiformis*). The significance of this area is that some of the special-status plants that could occur within the project area are associated with alkaline soils.

Wildflower Fields (Wldf). Several areas were mapped as wildflower fields (Holland, 1986) because they were different enough from the grassland types to be called out as a separate vegetation type. This type differs from the grassland types in that herbaceous forb species are dominant, rather than grasses, and in most areas the vegetation is relatively sparse with bare ground comprising up to 50 percent of the overall ground cover. As described by Holland (1986), wildflower field is an herb-dominated type noted for conspicuous annual wildflower displays and the plant species' dominance varies from site to site and year to year. They typically occur on droughty sites low in nutrients and are associated with grasslands or oak woodlands.

The first wildflower field type was dominated by foothill plantain (*Plantago erecta*). Non-native grasses have only 5 to10 percent of absolute cover in this type and can include wild oats and red brome. Soils are typically rocky, or often friable, sometimes with gypsum crystals. The vegetation is short, less than 1 foot (0.3 meters) tall. Co-dominant non-native and native forb species include red stemmed filaree (*Erodium cicutarium*), charlock mustard, sticky tarweed (*Holocarpha virgata*), Douglas' microseris (*Microseris douglasii* ssp. *douglasii*), common peppergrass (*Lepidium nitidum*), dwarf peppergrass (*Lepidium latipes*), and q-tips (*Micropus californicus*). This wildflower field vegetation type is habitat for three special-status species: round-leaved filaree (*California macrophylla*—CRPR[2] Rank 1B.1), hogwallow starfish (*Hesperevax caulescens*—CRPR Rank 4.2), and small-flowered morning-glory (*Convolvulus simulans*—CRPR Rank 4.2). These three species occupy the same habitat type within the project area and often are found growing together in the same area. Note that CRPR ranks are defined in Table 1 below.

The second kind of wildflower field had Fitch's spikeweed (*Centromadia fitchii*) as the dominant herb and a third kind of wildflower field had an herbaceous species of buckwheat (*Eriogonum* sp.) dominant and was located on a rocky slope comprising volcanic soils. The spikeweed and buckwheat are not special-status plants. Other plant species noted in these areas include oats, red brome, red stem filaree, and sticky tarweed.

[2] CRPR = California rare plant rank

Coyote Brush Scrub (Cbsc). Coyote brush scrub occurs in several locations within the project area. Coyote brush (*Baccharis pilularis*) was either sparse or dense but is the dominant and defining species. A few mesquites (*Prosopis glandulosa* var. *torreyana*) and big saltbush (*Atriplex lentiformis*) grow together with coyote brush. Other species occurring in this vegetation type are ripgut brome, gum plant (*Grindelia* sp.), perennial pepperweed (*Lepidium latifolium*), fiddleneck, small melilot (*Melilotus indicus*), winecup clarkia (*Clarkia purpurea* ssp. *quadrivulnera*), seaside heliotrope (*Heliotropium curassavicum*), horehound (*Marrubium vulgare*), and field bindweed (*Convolvulus arvensis*).

Agricultural Fields (Agor, Agps, Aggr, Agvn). This mapping unit includes areas planted in orchards (Agor), irrigated pastures (Agps), grain fields planted with hay or alfalfa (Aggr), and vineyards (Agvn). Most of the agricultural areas occur in the northern portion of the project area. Many were also irrigated and the irrigation ditches and canals were mapped separately (see below). A variety of fruits and nuts are grown in the San Joaquin Valley and include cherries, apricots, nectarines, peaches, plums, pluots, winegrapes, walnuts, almonds, and pistachios, although not all of these occur within the project area or within 1 mile. If identifiable at the time of the survey the type of crop was noted. If not identifiable, it was just designated as Aggr or Agor.

Other (Oth). A few areas that did not fall into any of the other vegetation types were noted. These include eucalyptus (*Eucalyptus* sp.) groves and areas that were noted as planted trees, such as planted pines (*Pinus* spp.), oaks (*Quercus* spp.), and eucalyptus. One area was a site that was probably associated with mitigation because, although the plant species were native, they were obviously planted and not in a natural setting. At Corral Hollow Creek the other (Oth) habitat type was applied to small areas of native California sagebrush (*Artemisia californica*) where this native habitat type occurs within and adjacent to the cottonwood riparian forest community. Another area mapped as other (Oth) was a debris pile consisting of old branches and pieces of wood. This was noted in the event that it might be considered habitat for sensitive wildlife species.

Barren (Bar). Barren habitat occurs scattered throughout the project area and generally consists of roads, road shoulders, dirt parking lots, and areas that were predominantly rock, gravel, bare soils, or sand. Sometimes bare areas were created as a result of grazing. Most surface substrates in this unit included asphalt, gravel, and dirt. Vegetation is typically absent, although sparse cover (1 to 5 percent cover) of ruderal species such as English plantain (*Plantago lanceolata*), filarees, prickly lettuce (*Lactuca serriola*), oats, soft brome and ryegrass may be present. Some native plants may also occur such as sticky tarweed, gum plant, and foothill plantain.

Commercial (Com). Areas mapped as commercial included buildings and paved parking lots or other developed areas. This type is devoid of vegetation unless landscaped, ornamental plants were planted associated with the development.

3.1.2.2 Wetlands and Waters of the U.S. and State

Waters, River (Warv). Rivers or creeks that were perennial or intermittent and were greater than 20 feet (6 meters [m]) wide were mapped as rivers (Warv). Within the project area the following drainages were mapped as rivers: Mountain House Creek, Patterson Run, Corral Hollow Creek, Lone Tree Creek, Hospital Creek, Del Puerto Creek, Salado Creek, Crow Creek, Orestimba Creek, Garzas Creek, Romero Creek, San Luis Creek, Los Banos Creek, and Ortigalita Creek. Ortigalita Creek crosses the two San Luis to Dos Amigos alternative corridors, and appears to be approximately 150 feet (46 meters) wide with possible seasonal wetland vegetation. This evaluation is based on a desktop review as this area was not accessible at the time of the surveys.

Corral Hollow Creek, Mountain House Creek, Del Puerto Creek, Lone Tree Creek, and Salado Creek had some water within the channel at the time of surveys. These creeks also supported freshwater marsh communities within the channel and a cottonwood-willow riparian tree and shrub community along the banks to top of bank. Elderberry shrubs were observed along Salado Creek and are further described in the wildlife section. These creek drainages, except for Salado Creek, also had populations of perennial pepperweed or white top (*Lepdium latifolium*), an invasive noxious weed species growing in and along the creek channel.

Hospital Creek, Garzas Creek, Romero Creek, and Crow Creek are wide, braided creek channels and were dry at the time of the surveys. Hospital and Garzas creeks range from approximately 200 to 400 feet (61 to 122 meters) in width, whereas Romero Creek ranges from 20 to 50 feet (6 to 15 meters) in width and Crow Creek ranges from 30 to 40 feet (9 to 12 meters) in width. These creeks also lacked any wetland or riparian vegetation. Vegetation associated with these channels was primarily upland plants. The invasive plant perennial pepperweed was present at Romero Creek.

Orestimba Creek was dry at the time of the survey but this creek supports a sycamore alluvial valley woodland riparian community, which is a special-status vegetation community type. Sycamore (*Platanus racemosa*) provides an open to moderately closed canopy. Mulefat was a common component of the tree understory.

Los Banos Creek within the project area has been channelized as it drains out of Los Banos Reservoir. At this location Los Banos Creek was observed as having some limited emergent vegetation and algae in the water.

All of the areas mapped as Warv qualify as waters of the U.S. and state and would come under the jurisdiction of the USACE, RWQCB, and CDFW.

Waters, Intermittent Creek (Waci) and Ephemeral Creek (Wace). Areas mapped as intermittent creek (Waci) or ephemeral creek (Wace) occur as natural drainages less than 20 feet (6 meters) wide and typically much less. Intermittent drainages range between 5 to 15 feet (1.5 to 4.6 meters) wide and generally lack any wetland vegetation. Ephemeral drainages are more incised, shallow to deep drainages that typically range from 1 to 5 feet (0.3 to 1.5 meters) wide, and can either have non-wetland vegetation or lack any vegetation. Dominant species that occur in these drainage types are oats, filarees (*Erodium cicutarium*, *E. moschatum*), bromes (*Bromus hordaceus*, *B. diandrus*), hare barley, Mediterranean barley, ryegrass, and a variety of non-native weedy species such as shortpond mustard, yellow star thistle (*Centaurea solstitialis*), and curly dock. Native species noted in these areas include Baltic rush, California poppy, and vinegar weed.

Most of the named, blue-line drainages that did not qualify as riverine habitat were mapped as intermittent creek (Waci). Named intermittent drainages within the project area include Martin Creek, Arkansas Creek, Mustang Creek, Ingram Creek, Salt Creek, Ortigalita Creek, and Little Salado Creek. Salt Creek in the project corridor was observed to have many species associated with alkaline soils. Species noted in this area included iodine bush (*Allenrolfea occidentalis*), alkali heath, ball saltbush (*Atriplex fruticulosa*), and alkali pepperweed (*Lepidium dictyotum*).

The intermittent creeks and drainages within the project area and within 1 mile of the project area are subject to federal and state regulation. Some of the ephemeral drainages may not be jurisdictional under the USACE but would be considered by the state agencies as waters of the state and subject to regulation by the RWQCB and possibly by CDFW.

Aqueducts and Irrigation Ditches and Canals (Waot, Waic, Wadr, Wot). The project area crosses the Delta-Mendota Canal and the California Aqueduct (Waot) near the intersection of I-205 and I-580, and crosses the Aqueduct again below the O'Neill Forebay. These canals are man-made, concrete-lined channels and although water levels may fluctuate seasonally, the channels are never dry. These aqueducts do not support riparian tree and shrub cover or emergent wetland vegetation. They are strictly open-water channels. The proposed and alternative corridors also cross several irrigation ditches and canals that are used to irrigate hay and alfalfa fields. These are either vegetated or unvegetated and some are concrete lined while others are constructed earthen channels.

The Delta-Mendota Canal was constructed as part of the Central Valley Project and its purpose is to supply water to the San Luis Reservoir for storage, and to replace water in the San Joaquin River that is diverted into the Madera Canal and Friant-Kern Canal at Friant Dam. The canal begins at the C. W. "Bill" Jones Pumping Plant (formerly the Tracy Pumping Plant), which raises water 197 feet (60 meters) from the Sacramento–San Joaquin Delta. The canal runs south along the western edge of the San Joaquin Valley parallel to the California Aqueduct for most of its route, but diverges to the east after passing the Dos Amigos Substation. Water is pumped from the canal into the O'Neill Forebay by the O'Neill Pumping Plant and then into San Luis Reservoir by the William R. Gianelli Pumping-Generating Plant. The Delta-Mendota Canal is operated by the U.S. Bureau of Reclamation and the San Luis Delta Mendota Water Authority. The canal passes through parts of Alameda, San Joaquin, Stanislaus, Merced, and Fresno Counties.

The Governor Edmund G. Brown California Aqueduct is a system of canals, tunnels, and pipelines that conveys water collected from the Sierra Nevada and Central Valley of northern and central California to southern California. The aqueduct begins at the San Joaquin–Sacramento River Delta at the Banks Pumping Plant, which pumps from the Clifton Court Forebay. Water is pumped to the Bethany Reservoir and from there the aqueduct flows by gravity to the O'Neill Forebay at the San Luis Reservoir. From O'Neill Forebay, it flows to the Dos Amigos Pumping Plant and south. The California Department of Water Resources (DWR) operates and maintains the California Aqueduct.

The waters of the Delta-Mendota and California Aqueducts are not jurisdictional since they were constructed in uplands and are not natural drainages.

The irrigation ditches and canals within the project area are located mostly in the Tracy area in the northern portion of the project area. Ditches mapped as drainages (Wadr) were earth-lined channels and often had wetland vegetation growing within the channel. These ditches tend to be narrow and shallow, whereas areas mapped as irrigation canal (Waic) were wider and deeper. Some of the irrigation canals were concrete lined and some were earth lined, and some had wetland vegetation growing in the channel although they tend to be unvegetated. It appears that vegetation is periodically removed as part of the maintenance of the irrigation ditches and canals to accommodate water volume and flow.

Areas that did not fit into one of the other categories were mapped as "waters, other" (Wot). This category includes drainages that were not associated with an irrigation system for agriculture and did not appear to be a part of a natural drainage system and did not support any wetland vegetation.

The irrigation ditches and canals, although man-made and constructed primarily in uplands, could be considered jurisdictional by the USACE if they support wetland vegetation and if they connect hydrologically to a natural creek or navigable waters. The RWQCB could exert jurisdiction over irrigation ditches and canals as waters of the state. However, CDFW would not exert jurisdiction as they are not natural channels.

Lakes (Walk), Ponds (Wapd), and Impoundments (Waim). Areas mapped as lakes (Walk) were large and greater than 6 feet (1.8 meters) in depth. Areas mapped as ponds (Wapd) were small and less than 6 feet (1.8 meters) deep. Ponds that were created as a result of impounding water within a drainage, such as stock ponds and man-made ponding features, were mapped as impoundments (Waim). Three areas were mapped as lakes and all are located in the southern portion of the project area. They include O'Neill Forebay, Los Banos Reservoir, and San Luis Reservoir.

Areas mapped as ponds, including stock ponds and man-made ponds, are small ponded areas less than 6 feet (1.8 meters) deep. Many of these ponds have some emergent wetland vegetation around the pond edge. However, the ponds tend to be unvegetated in the center either because the duration of ponding or water depth preclude vegetation establishment, or because ponds are increasingly trampled by livestock as they dry.

Areas mapped as Walk, Wapd and Waim likely qualify as waters of the U.S. and state and would come under the jurisdiction of the USACE, RWQCB, and CDFW. Ponds that are not associated with a natural drainage, and are therefore not hydrologically connected to a waters of the U.S., may not have any federal jurisdiction as defined by the USACE.

Freshwater Marsh (Wfm). The freshwater marsh (Wfm) mapping unit corresponds with the coastal and valley freshwater marsh as defined by Holland (1986). The coastal and valley freshwater marsh is a special-status vegetation type with an S2.1 ranking. Within the project area this type is dominated primarily by cattails (*Typha* spp.) and may include rushes, sedges and bulrush (*Schoenopletcus* spp.). The freshwater marsh type occurs as a fringe of permanently flooded emergent marsh at and below the ordinary high water of Corral Hollow, Mountain House, Lone Pine, and Salado creeks and flooded portions of roadside ditches and in some of the irrigation ditches. There are also some isolated freshwater marsh areas that may be remnant portions of drainages that have been filled. Portions of this habitat may be seasonally or infrequently exposed during low water or in drought years.

Freshwater marsh is a wetland type and all wetlands are subject to federal and state regulation. If they are hydrologically isolated then there is no federal jurisdiction since the USACE can only take jurisdiction when there is a connection to a waters of the U.S. However, the state RWQCB does not have the same restriction and can exert jurisdiction over isolated wetlands under the state Porter-Cologne Act.

Vernal Pools (Wvp) and Swales (Wsw). Areas mapped as vernal pools and swales are seasonal wetlands that occur as depressions within grassland habitat. An area was mapped as a vernal pool or swale if it also had a restrictive layer such as a hard pan or clay pan in the lower soil profile that creates water ponding for a sufficient length of time to support wetland vegetation and supported plant species typically associated with vernal pools. Areas mapped as vernal pools within the project area also qualify as Northern claypan vernal pool, which is a special-status vegetation type with an S1.1 ranking. Plants associated with this type include Fremont's goldfield (*Lasthenia fremontii*) or coyote thistle (*Eryngium* sp.) as a dominant species. Associated plants include woolly marbles (*Psilocarpus tenellus*), popcornflower (*Plagiobothrys stipitatus*), pale sack clover (*Trifolium depauperatum* var. *amplectens*), ryegrass, sand pygmyweed (*Crassula connata*), and daggerleaf cottonrose (*Logfia gallica*).

Vernal pools are a wetland type and all wetlands are subject to federal and state regulation. If they are hydrologically isolated then there is no federal jurisdiction since the USACE can only take jurisdiction when there is a connection to a waters of the U.S. However, the state RWQCB does not have the same restriction and can exert jurisdiction over isolated wetlands under the state Porter-Cologne Act.

Seasonal Wetlands (Wse). Areas mapped as seasonal wetlands (Wse), but not as vernal pools, occur as shallow to deep depressions, in ditches or intermittent drainages, or above man-made levees, and can

include wetland adjacent to ponds. Some seasonal wetlands were mapped along and within the major creek drainages such as at Patterson Run, Corral Hollow Creek, and Del Puerto Creek. Plants associated with this vegetation type include rushes, curly dock, rabbit's foot grass, swamp monkeyflower (*Mimulus guttatus*), bird's-foot trefoil (*Lotus corniculatus*), lambsquarters (*Chenopodium album*), cheeseweed (*Malva parviflora*), and perennial pepperweed. Areas mapped as Wse do not support vernal pool plant species and do not have a restrictive soil layer such as a clay pan or hard pan.

All wetlands are subject to federal and state regulation. If they are hydrologically isolated then there is no federal jurisdiction since the USACE can only take jurisdiction when there is a connection to a waters of the U.S. However, the state RWQCB does not have the same restriction and can exert jurisdiction over isolated wetlands under the state Porter-Cologne Act.

3.1.2.3 Invasive Species

Noxious weeds include species designated as federal noxious weeds by the U.S. Department of Agriculture, species listed by the California Department of Food and Agriculture, and other exotic pest plants designated by the California Invasive Plant Council. Roads, highways, railways, utility corridors, and related construction projects are some of the principal dispersal pathways for noxious weeds. The introduction and spread of pest plants adversely affect natural plant communities by displacing native plant species that provide shelter and forage for wildlife species.

A number of invasive species were observed within the various habitats. The main noxious weeds noted include giant reed (*Arundo donax*), perennial pepperweed, Italian thistle (*Carduus pycnocephalus*), winged thistle (*Carduus tenuiflorus*), tocalote, yellow star thistle, bull thistle (*Cirsium vulgare*), stinkwort (*Dittrichia graveolens*), and milk thistle. One very invasive grass species, medusa-head grass, was also observed in some of the non-native grassland areas. There were numerous other non-native, invasive species but they are less noxious and invasive than the species listed above based on the California Invasive Plant Council (Cal-IPC) ranking and listing system.

Giant reed and perennial pepperweed are associated with wetland areas, and perennial pepperweed was observed in many locations throughout the project area. Locations of notable stands were primarily associated with creeks. Perennial pepperweed was observed at Corral Hollow, Mountain House, Del Puerto, and Lone Tree Creeks, and in many other locations. Giant reed was observed only at Corral Hollow Creek.

3.1.2.4 General Wildlife Resources

From a general wildlife perspective, habitats in the project area can be combined into a few distinct categories. Grassland/brush habitats comprise native and non-native grassland, wildflower fields, coyote brush scrub, and most "other" types. These habitats also include ephemeral and intermittent creeks; while these habitat types may convey water during rainy periods and may be jurisdictional, they support only upland vegetation. The other distinct categories are riparian and wetland habitats, open-water habitats (such as lakes, rivers, impoundments, and irrigation canals), and agricultural areas.

Wildlife commonly associated with grassland/brush habitats include western fence lizard (*Sceloporis occidentalis*), northern Pacific rattlesnake (*Crotalus oreganus oreganus*), gopher snake (*Pituophis catenifer*), California toad (*Anaxyrus boreas halophilus*), California horned lark (*Eremophila alpestris actia*), western meadowlark (*Sturnella neglecta*), common raven (*Corvus corax*), Say's phoebe (*Sayornis saya*), western kingbird (*Tyrannus verticalis*), black-tailed hare (*Lepus californicus*), striped skunk (*Mephitis mephitis*), non-native red fox (*Vulpes vulpes*), and coyote (*Canis latrans*).

Riparian habitats in the project area comprise a few narrow stands of riparian forest, including a stand of sycamore alluvial woodland in Orestimba Creek, and riparian scrub; these generally support ash-throated flycatcher (*Myiarchus cinerascens*), American kestrel (*Falco sparverius*), black phoebe (*Sayornis nigricans*), great horned owl (*Bubo virginianus*), Bullock's oriole (*Icterus bullockii*), brown-headed cowbird (*Molothrus ater*), and house finch (*Carpodacus mexicanus*). Wetlands are made up primarily of freshwater marsh, seasonal wetland, and vernal pool, although the character of these types is very different, and during spring 2014 surveys, the vernal pools and seasonal wetlands were all dry. Freshwater marsh supports Sierran treefrog (*Pseudacris sierra*), marsh wren (*Cistothorus palustris*), great blue heron (*Ardea herodias*), Virginia rail (*Rallus limicola*), and red-winged blackbird (*Agelaius phoeniceus*), and where it is associated with open water, mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), and common muskrat (*Ondatra zibethicus*).

Open-water habitats include lake, river, impoundment, pond, irrigation canal, and aqueduct, although most of the rivers in spring of 2014 were dry, and most are probably intermittent even in the wettest years. Lake habitats were found at O'Neill Forebay and Los Banos Reservoir. Wildlife using these features include fishes such as bluegill (*Lepomis macrochirus*), common carp (*Cyprinus carpio*), largemouth bass (*Micropteris salmoides*), and white crappie (*Pomoxis annularis*), and birds such as American wigeon (*Anas americana*), bufflehead (*Bucephala albeola*), Canada goose (*Anser canadensis*), and mallard. Rivers that contained drying pockets of standing water were Corral Hollow Creek, Salado Creek, and Del Puerto Creek. These supported larvae of California toad, American bullfrog (*Lithobates catesbeiana*) adults and larvae, and western pond turtle (*Emys marmorata*).

Irrigation canals were seen to support American bullfrog. The Delta-Mendota Canal and California Aqueduct were often used by mallard, coot, and double-crested cormorant (*Phalacrocorax auritus*), and bridges over these canals supported nesting cliff swallows (*Petrochelidon pyrrhonota*) and, in one case, nesting rock pigeons (*Columba livia*). Banks of these large canals often support higher densities of small mammals than surrounding habitats (USFWS, 2010c).

Agricultural areas include grain fields, pasture, orchard, and vineyard, and these habitats were found to be supporting red-winged blackbird, Brewer's blackbird (*Euphagus cyanocephalus*), western meadowlark, and foraging barn swallow (*Hirundo rustica*), and would also be good foraging habitat for raccoon (*Procyon lotor*) and striped skunk. While agricultural areas may be used for foraging or even nesting by some wildlife species, and rice fields have become essential habitats for giant garter snake, they are primarily not equivalent to the native or naturalized uplands that provide the functions and values required by upland special-status species.

There were no Holland (1986) woodland habitat types in the project area with the exception of an "other" type, a eucalyptus grove containing scattered ornamental pines (*Pinus* spp.), found in two locations. This type was observed to support Eurasian collared dove (*Streptopelia decaocto*), great horned owl, Say's phoebe, American kestrel, house finch, mourning dove (*Zenaida macroura*), and others. One small grove was supporting at least 10 species of nesting birds during spring 2014 surveys.

3.1.2.5 Migration Corridors

Wildlife movement includes migration (usually one direction per season), inter-population movement (long-term genetic exchange), and small travel pathways (daily movement corridors within an animal's territory). While small travel pathways usually facilitate movement for daily home range activities such as foraging or escape from predators, they also provide connection between outlying populations and the main corridor, permitting an increase in gene flow between populations (Zuidema et al., 1997).

Linkages between habitat types can extend for miles between primary habitat areas and occur on a large scale throughout California. They facilitate movement between populations located in discrete areas and those located within larger areas. Even where patches of pristine habitat are fragmented, such as occurs with coastal scrub and many other California habitats, movement between wildlife populations is facilitated through habitat linkages, such as migration corridors and movement corridors (Zuidema et al., 1997).

CDFW (CDFW, 2014b) commented during scoping that the area north of San Luis Reservoir to south of Los Banos Reservoir (in the San Luis and South segments on Figure 2a) is a critical migration corridor for San Joaquin kit fox for continued existence and genetic diversity of the northern kit fox population. The Santa Nella area east of O'Neill Forebay and west of I-5 is identified as a critical migratory "pinch-point." The creation of San Luis Reservoir and O'Neill Forebay resulted in a substantial barrier to north–south movement, exacerbated by busy highways (state routes 152 and 33, and I-5) and urban development. Other species in the region, such as tule elk (*Cervus canadensis nannodes*), are also impeded by these existing features. However, because impacts to habitat from the project are primarily short-term and create no barriers to movement, the project would not contribute substantially to regional cumulative impacts resulting from interference with wildlife movement. The project's contribution to cumulative wildlife movement impacts will not be considerable under CEQA.

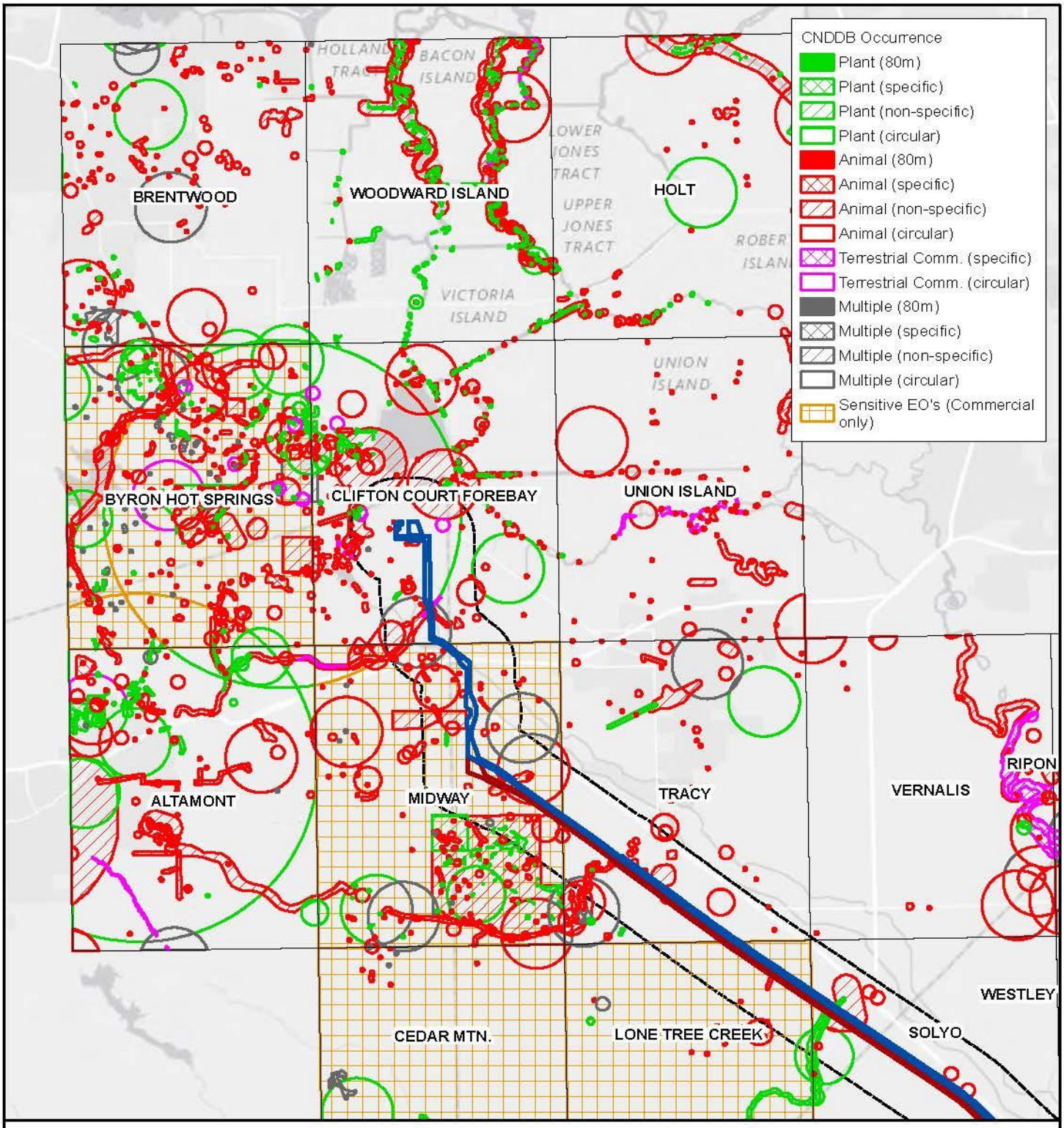
3.2 Regional Species and Habitats of Concern

In this report, special-status species and sensitive habitats are those plants, animals, and vegetation communities found on the CNDDB, CRPR, and USFWS species lists, or otherwise known to occur in the region, for which general geographic range and habitat overlaps with the project area and that are: (1) listed, proposed for listing, or candidates for listing as threatened or endangered under federal or state endangered species acts, (2) California species of special concern, (3) California fully protected species, (4) found on California Rare Plant Rank (CRPR)[3] lists 1B.1, 1B.2, and 2, and/or (5) have a state rank of S1, S2, or S3. Species and habitats that do not fall into at least one of these classifications are not discussed further with the following exception: two CRPR Rank 4 plants were identified during surveys and are discussed below.

Figure 4 provides a general overview of CNDDB records within the nine-quad search area for all project quads (see Appendix B for additional detail).

Figure 5 shows areas of critical habitat for federally listed species relative to project corridors.

[3] Formerly known as California Native Plant Society (CNPS) Lists; additional detail on rank definitions provided in Table 1 below.



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Source: WAPA SNR, Aspen EG, ESRI, CDFW

Proposed Project Corridor

Corridor Alternatives

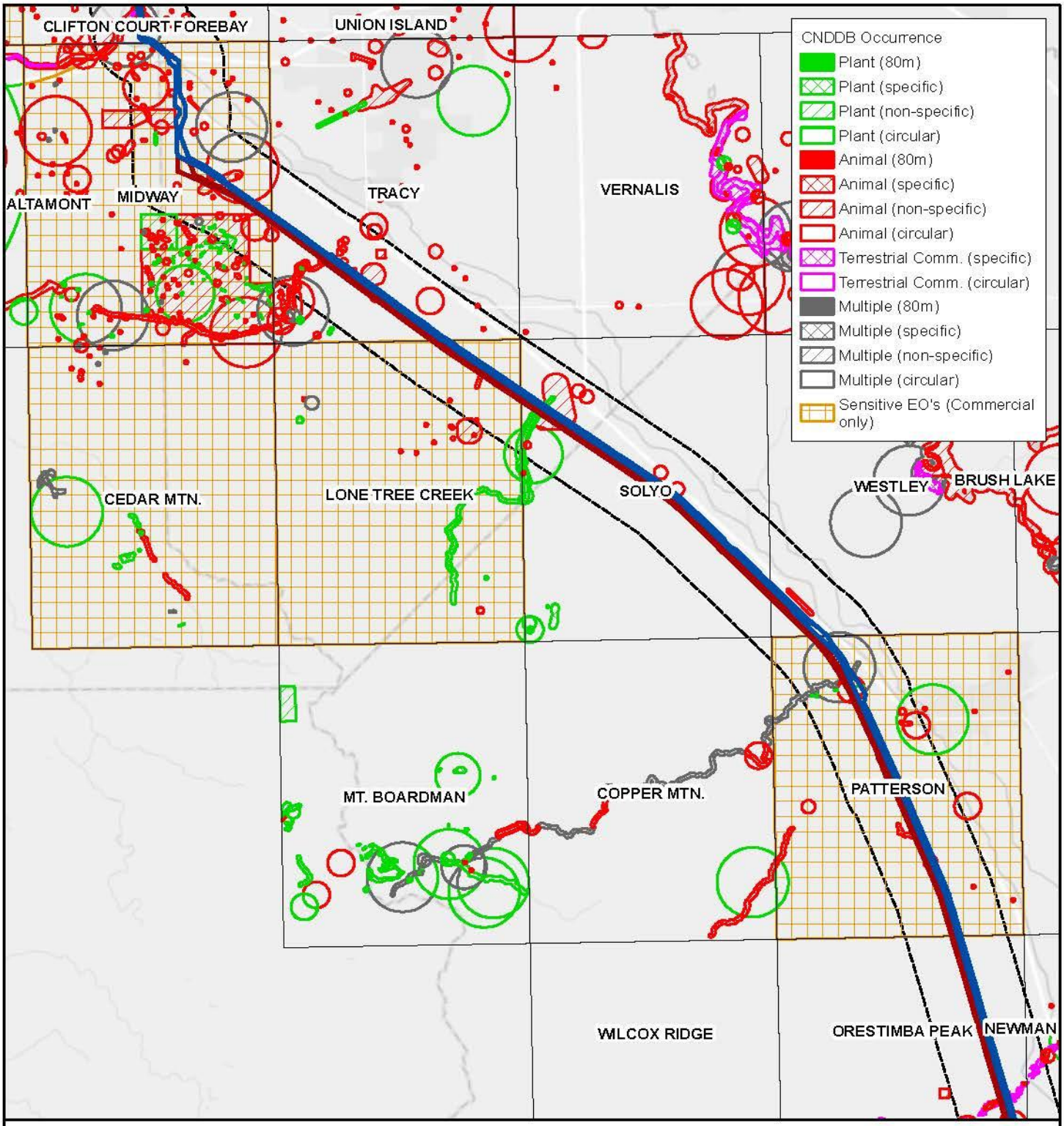
1.25-mile buffer around Project Area

USGS 7.5' Quadrangle

0 2 4 Miles

Figure 4a.

CNDDB Occurrences



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Source: WAPA SNR, Aspen EG, ESRI, CDFW

Proposed Project Corridor

Corridor Alternatives

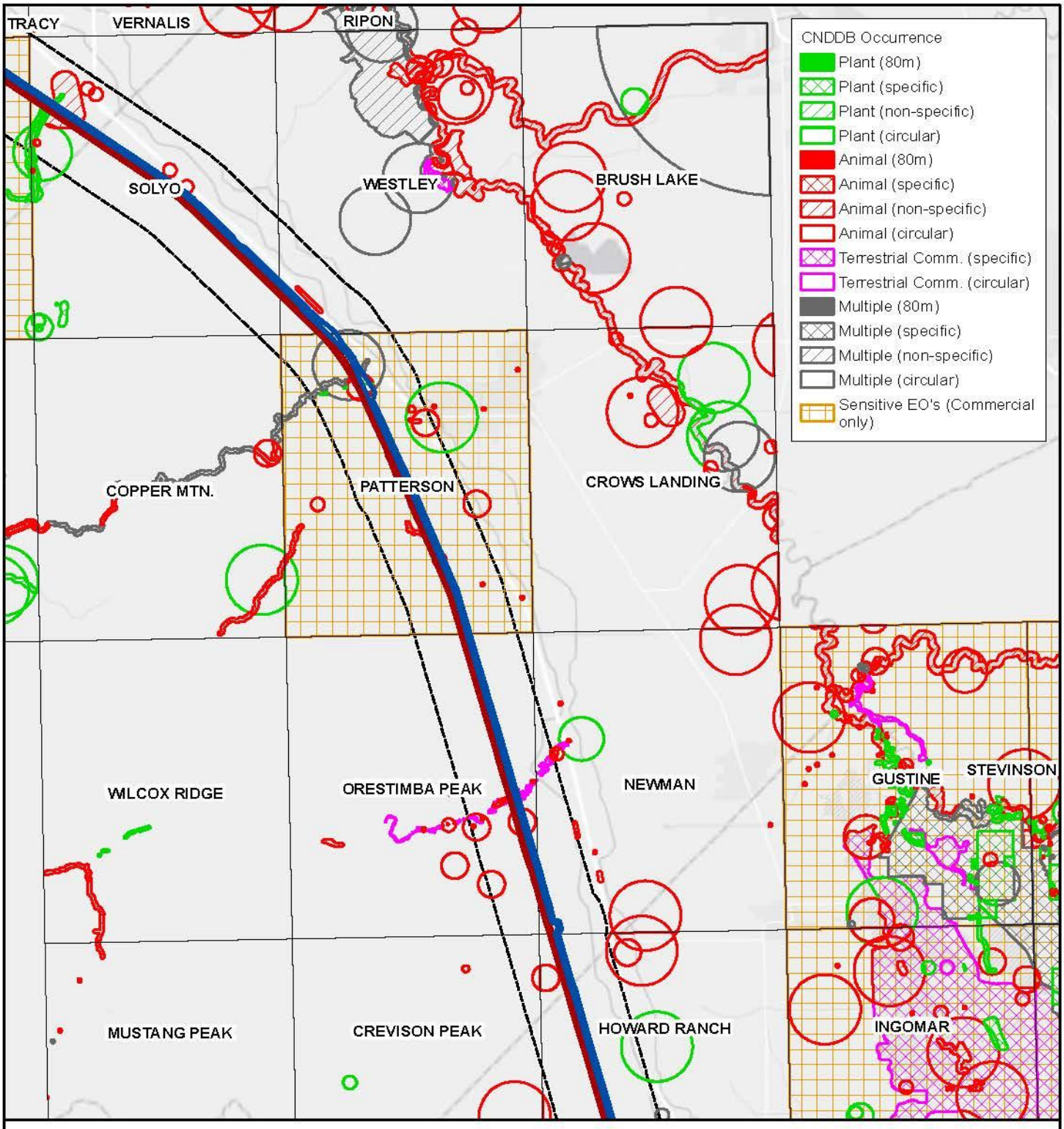
1.25-mile buffer around Project Area

USGS 7.5' Quadrangle

0 2 4 Miles

Figure 4b.

CNDDB Occurrences



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Source: WAPA SNR, Aspen EG, ESRI, CDFW

Proposed Project Corridor

Corridor Alternatives

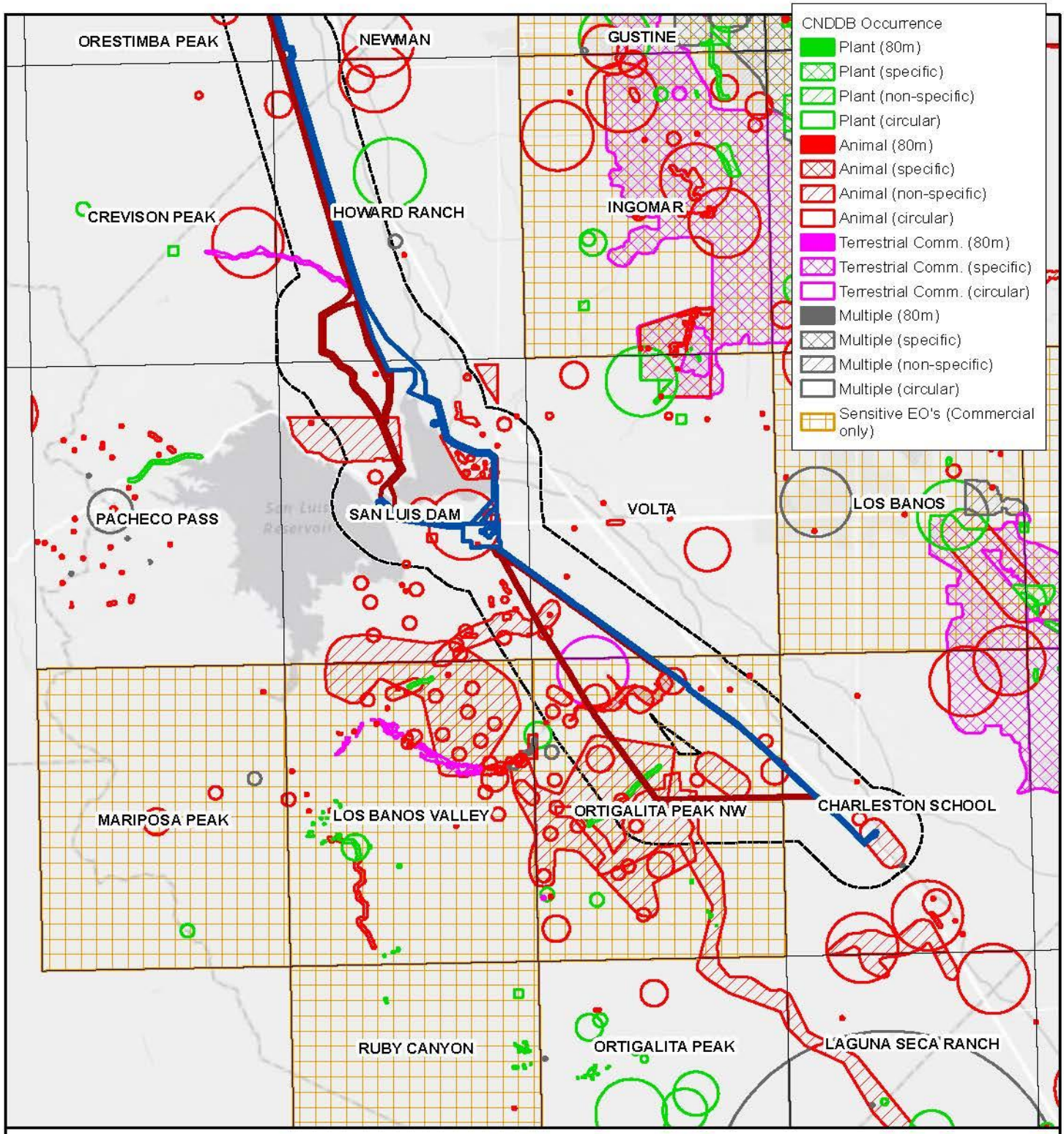
1.25-mile buffer around Project Area

USGS 7.5' Quadrangle

0 2 4 Miles

Figure 4c.

CNDDB Occurrences



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Source: WAPA SNR, Aspen EG, ESRI, CDFW

Proposed Project Corridor

Corridor Alternatives

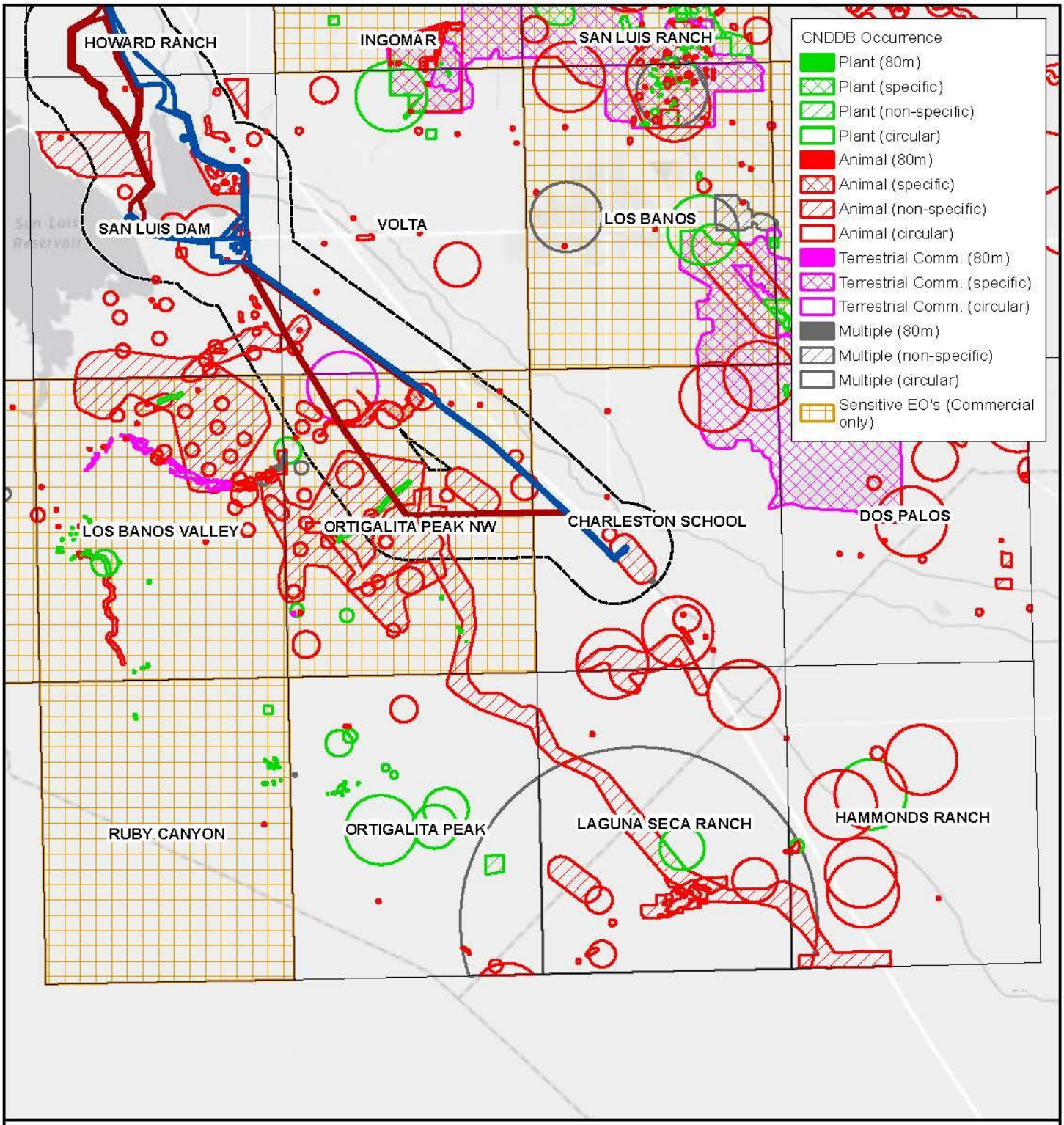
1.25-mile buffer around Project Area

USGS 7.5' Quadrangle

0 2 4 Miles

Figure 4d.

CNDDB Occurrences



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Name/Org: SNR Date: 4/15/2015

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Source: WAPA SNR, Aspen EG, ESRI, CDFW

Proposed Project Corridor

Corridor Alternatives

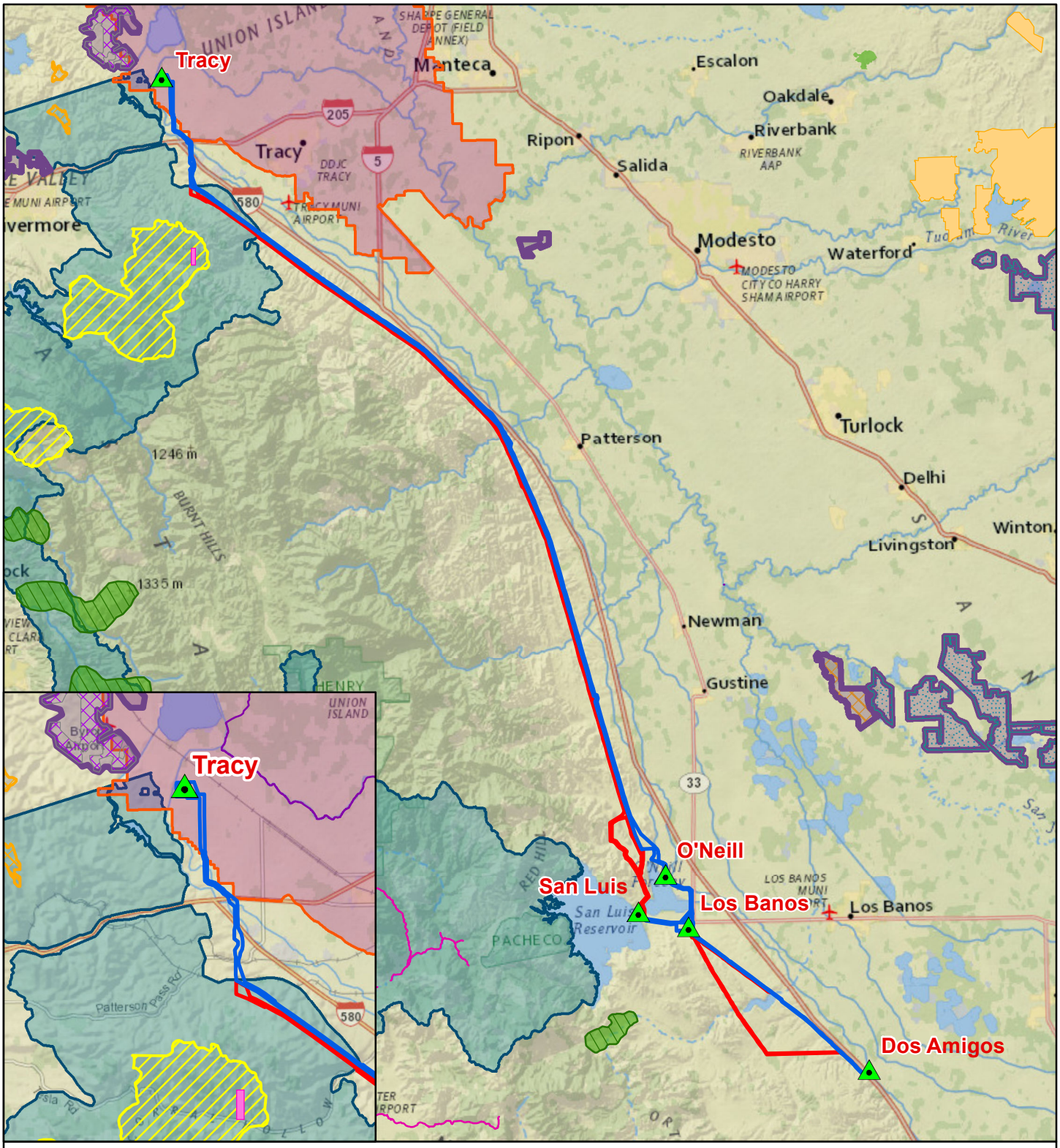
1.25-mile buffer around Project Area

USGS 7.5' Quadrangle

0 2 4 Miles

Figure 4e.

CNDDB Occurrences



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Name/Org: SNR Date: 4/8/2015

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Source: WAPA SNR, Aspen EG, ESRI, USFWS

Figure 5.

Critical Habitat

3.2.1 Special-status Plants and Habitats of Concern

Table 1 below presents 38 special-status plants and 11 special-status or sensitive vegetation communities that were reviewed for potential to occur within the project areabased on a search of the CNDDB, CRPR, and USFWS databases for the quadrangles within and surrounding the project area. Of the 38 species reviewed, eight were considered to not have the potential to occur based on lack of habitat; of the 11 vegetation communities reviewed, five were considered to not be present.

Table 1. Special-status Plant Species and Critical Habitat[1] that Occur or May Occur in the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Federal[2]/State[3]/ CRPR[4]	Habitat Type/General Geographic Range	Likelihood of Occurrence (No, Low, Moderate, High)/ Rationale[5]
Amsinckia grandiflora Large flowered fiddleneck	FE/SE/1B	Cismontane woodland and valley and foothill grassland. Blooms April to May. Elevation: 275–550m. Known from Alameda, Contra Costa, and San Joaquin Counties.	Low. Potential grassland habitat in project area. Known from fewer than 5 natural occurrences.
Astragalus tener var. *tener* Alkali milk-vetch	—/—/1B	Playas, valley and foothill grassland (alkaline clay), vernal pools in alkaline areas. Blooms March to June. Elevation: 1–60m. Known from Alameda, Contra Costa, San Joaquin, and other counties.	Moderate. Potential grassland and vernal pool habitat in project area. Recorded occurrences near Byron/ Livermore and Clifton Court Forebay.
Atriplex cordulata var. *cordulata* Heartscale	—/—/1B	Chenopod scrub, meadows and seeps, valley and foothill grasslands (sandy) in saline or alkaline areas. Blooms April to October. Elevation: 0–560m. Known from Alameda, Contra Costa, San Joaquin, and other counties.	Moderate. Potential grassland habitat in project area. Recorded occurrences from Clifton Court Forebay.
Atriplex joaquiniana San Joaquin spearscale	—/—/1B	Chenopod scrub, meadows and seeps, valley and foothill grasslands. Blooms April to October. Elevation: 1–835m. Known from Alameda, Contra Costa, San Joaquin, and other counties.	Moderate. Potential grassland habitat in project area. Recorded occurrences from Byron, Bryon Hot Springs, Mtn House Rd, and Clifton Court Forebay.
Blepharizonia plumosa Big tarplant	—/—/1B	Valley and foothill grassland, usually on clay soils. Blooms July to October. Elevation: 30–505m. Known from Alameda, Contra Costa, and San Joaquin, Solano and Stanislaus Counties	High. Potential grassland habitat in project area. Recorded occurrences from Tracy, Tesla, Corral Hollow, and many other locations near project area.
California macrophylla Round-leaved filaree	—/—/1B	Cismontane woodland, valley and foothill grassland on clay soils. Blooms March to May. Elevation: 15–1200m. Known from many counties including Alameda, Contra Costa, Fresno, Merced, and San Joaquin.	Observed. Habitat in project area. This species was observed within the project area along with *Convolvulus simulans* and *Hesperevax caulescens.*
Caulanthus lemmonii Lemmon's jewelflower	—/—/1B	Pinyon and juniper woodland, valley and foothill grassland. Blooms March to May. Elevation: 80–1220m. Known from Alameda, Fresno, Merced, San Joaquin, and other counties.	High. Potential grassland habitat in project area. Recorded occurrences from between Tesla and Corral Hollow, Corral Hollow and Los Banos.

Table 1. Special-status Plant Species and Critical Habitat[1] that Occur or May Occur in the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Federal[2]/State[3]/ CRPR[4]	Habitat Type/General Geographic Range	Likelihood of Occurrence (No, Low, Moderate, High)/ Rationale[5]
Chamaesyce hooveri Hoover's spurge	FT//1B	Vernal pools on volcanic mudflow or clay substrate. Blooms July to October. Elevation 25–250m. Known from Butte, Colusa, Glenn, Merced, Stanislaus, Tehama and Tulare Counties.	Low. Potential vernal pool habitat in project area on clay substrate but no volcanic mudflow vernal pools observed. There are no records for this species within the 9-quadrangle search for the project.
Clarkia rostrata Beaked clarkia	—/—/1B	Cismontane woodland, valley and foothill grassland on north-facing slopes, sometimes on sandstone. Blooms April to May. Elevation 60–500m. Known from Merced, Mariposa, Stanislaus, and Tuolumne Counties.	Low. Potential grassland habitat in project area. There are no records for this species within the 9-quadrangle search for the project.
Convolvulus simulans Small-flowered morning-glory	—/—/4	Chaparral (openings), coastal scrub, valley and foothill grassland on clay soils or serpentinite seeps. Blooms March to July. Elevation: 30–700m. Known from Contra Costa, San Joaquin, Stanislaus, and other counties.	Observed. Grassland habitat in project area. This species was found along with *California macrophylla* within the project area.
Delphinium californicum ssp. *interius* Hospital Canyon larkspur	—/—/1B	Chaparral, cismontane woodland (mesic), coastal scrub in wet boggy meadows, openings in chaparral and in canyons. Blooms April to June. Elevation: 195–1095m. Known from Alameda, Contra Costa, San Joaquin and other counties.	No. No potential habitat in project area. CNDDB record from a 1938 collection.
Delphinium recurvatum Recurved larkspur	—/—/1B	Chenopod scrub, cismontane woodland, valley and foothill grassland in alkaline soils. Blooms March to June. Elevation: 3–790m. Known from Alameda, Contra Costa, Fresno, Merced, San Joaquin and other counties.	Moderate. Potential grassland habitat in project area but limited to areas with alkaline soils. Multiple recorded occurrences in the region.
Eryngium racemosum Delta button-celery	—/SE/1B	Riparian scrub in vernally mesic clay depressions. Blooms June to October. Elevation: 3–30m. Known from Contra Costa, Merced, San Joaquin and other counties.	Moderate. Potential riparian habitat in project area. Recorded occurrence from near Grayson, 2 miles east of Westley.
Eryngium spinosepalum Spiny-sepaled button celery	—/—/1B	Valley and foothill grassland, vernal pools. Blooms April to May. Elevation: 80–255m. Known from Contra Costa, Merced and other counties.	Moderate. Potential grassland and vernal pool habitat in project area. Recorded occurrence from Byron Airport.
Eschscholzia rhombipetala Diamond-petaled California poppy	—/—/1B	Valley and foothill grassland on alkaline and clay soils. Blooms March to April. Elevation: 0–975m. Known from Alameda, Contra Costa, Colusa, San Joaquin, San Luis Obispo and Stanislaus Counties.	High. Potential grassland habitat in project area but limited to alkaline and clay soils. Recorded occurrences from Corral Hollow near Castle Rock, Lawrence Livermore National Laboratory and hills south of Byron.
Hesperevax caulescens Hogwallow starfish	—/—/4	Valley and foothill grassland in mesic sites and on clay soils, shallow vernal pools. Blooms March to June. Elevation: 0–505m. Known from Alameda, Contra Costa, San Joaquin, Fresno, Merced and other counties.	Observed. Grassland habitat in project area. This species was observed within the project area in same areas as *California macrophylla*.

Table 1. Special-status Plant Species and Critical Habitat[1] that Occur or May Occur in the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Federal[2]/State[3]/ CRPR[4]	Habitat Type/General Geographic Range	Likelihood of Occurrence (No, Low, Moderate, High)/ Rationale[5]
Hibiscus lasiocarpos var. occidentalis Woolly rose mallow	—/—/1B	Freshwater marshes and swamps, often in riprap on sides of levees. Blooms June to September. Elevation: 0–120m. Known from Contra Costa, San Joaquin and other counties.	Low. Limited potential habitat in project area. Recorded occurrences from Clifton Court Forebay.
Lasthenia conjugens Contra Costa goldfields	FE/—/1B	Cismontane woodland, alkaline playas, valley and foothill grassland, vernal pools in mesic sites. Microhabitat is vernal pools, swales and low depressions in open grassy areas. Blooms March to June. Elevation: 0–470m. Known from Alameda, Contra Costa, Mendocino, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Solano and Sonoma Counties.	Low. Potential grassland and marginal vernal pool habitat in project area and limited areas with alkaline soils. No recorded occurrences in CNDDB quad search.
Layia munzii Munz's tidy-tips	—/—/1B	Chenopod scrub, valley and foothill grassland on hillsides in white-grey alkaline soils. Blooms March to April. Elevation 150–700m. Known from Fresno, Kern, San Benito, and San Luis Obispo Counties.	Low. Limited potential habitat in project area based on microhabitat of white-grey alkaline soils.
Lepidium jaredii ssp. *album* Panoche pepper-grass	—/—/1B	Valley and foothill grassland on white or grey clay lenses on steep slopes, incidental in alluvial fans and washes, prefers clay and gypsum soils. Blooms February to June. Elevation 185–275m. Known from Fresno, San Benito and San Luis Obispo Counties.	Low. Limited potential habitat in project area based on microhabitat preference.
Leptosyne hamiltonii Mt. Hamilton coreopsis	—/—/1B	Cismontane woodland in rocky areas. Blooms March to May. Elevation: 550–1300m. Known from Alameda and other counties.	No. No habitat in project area. Known from Mt. Hamilton Range.
Lilaeopsis masonii Mason's lilaeopsis	—/SR/1B	Brackish or freshwater marshes and swamps, riparian scrub. Blooms April to November. Elevation: 0–10m. Known from Alameda, Contra Costa, San Joaquin and other counties.	Low. Typical habitat lacking in project area. Recorded occurrences from Clifton Court Forebay and other areas.
Limosella australis Delta mudwort	—/—/2B	Freshwater or brackish marshes and swamps, riparian scrub usually on mud banks. Blooms May to August. Elevation: 0–3m. Known from Contra Costa, San Joaquin and other counties.	Low. Limited habitat in project area. Known from Victoria Canal.
Madia radiata Showy golden madia	—/—/1B	Cismontane woodland, valley and foothill grassland mostly on adobe clay in grassland or around shrubs. Blooms March to May. Elevation: 25–1215m. Known from Contra Costa, Fresno, Kings, Kern, Monterey, San Joaquin and other counties.	Moderate. Potential grassland habitat in project area but limited to adobe clay soils. Recorded occurrences from lower Hospital Canyon, mouth of Big Panoche Canyon, Corral Hollow and Tumey Hills.
Malacothamnus hallii Hall's bush-mallow	—/—/1B	Chaparral, coastal scrub. Blooms May to October. Elevation: 10–760m. Known from Contra Costa, Merced, Stanislaus, and other counties.	No. No habitat in project area.

Table 1. Special-status Plant Species and Critical Habitat[1] that Occur or May Occur in the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Federal[2]/State[3]/ CRPR[4]	Habitat Type/General Geographic Range	Likelihood of Occurrence (No, Low, Moderate, High)/ Rationale[5]
Monardella leucocephala Merced monardella	—/—/1A	Valley and foothill grassland; requires moist subalkaline sands associated with low elevation grassland. Blooms May to August. Elevation 35–100m.	No. This species is presumed extinct. The mircohabitat requirements for this species area lacking in project area. No recorded occurrences in CNDDB search.
Navarretia nigelliformis ssp. *radians* Shining navarretia	—/—/1B	Cismontane woodland, valley and foothill grassland, vernal pools, sometimes clay. Blooms April to July. Elevation: 76–1000m. Known from Alameda, Contra Costa, San Joaquin and other counties.	Moderate. Potential grassland and vernal pool habitat in project area. Known occurrence from Billie Wright Rd NE of Los Banos Valley.
Navarretia myersii ssp. *myersii* Pincushion navarretia	—/—/1B	Vernal pools, often acidic. Blooms April to May. Elevation 20–330m. Known from Amador, Calaveras, Merced, Placer, and Sacramento Counties.	Low. Vernal pool habitat in project area but not acidic soils. No records in CNDDB search.
Phacelia ciliata var. *opaca* Merced phacelia	—/—/3	Valley and foothill grassland on adobe or clay soils of valley floors, open hills or alkaline flats. Blooms February to May. Elevation: 60–100m. Known from Merced County.	Very low. Limited potential grassland habitat in project area. No known occurrences within CNDDB search area.
Phacelia phacelioides Mt. Diablo phacelia	—/—/1B	Chaparral, cismontane woodland, on rock outcrops and talus slopes, sometimes on serpentinite. Blooms April to May. Elevation: 500–1370m. Known from Contra Costa, Stanislaus and other counties.	No. No habitat in project area.
Pseudobahia bahiifolia Hartweg's golden sunburst	FE/SE/1B	Cismontane woodland, valley and foothill grassland on acidic clay soils. Blooms March to April. Elevation 15–150m. Known from Fresno, Madera, Merced, Stanislaus, Tuolumne and Yuba Counties.	Low. No acidic clay soils in project area. No recorded occurrences in CNDDB search area.
Sidalcea keckii Keck's checkerbloom	FE/—/1B	Cismontane woodland, valley and foothill grassland — occurs on grassy slopes in blue oak woodland. Blooms April to June. Elevation: 75–650m. Known from Fresno and Merced Counties.	No. No blue oak woodland in project area. No recorded occurrences in CNDDB search area.
Senecio aphanactis Chaparral ragwort	—/—/2B	Chaparral, cismontane woodland, coastal scrub, sometimes in alkaline soils. Blooms January to April. Elevation: 15–800m. Known from Alameda, Contra Costa, Fresno, Merced and other counties.	No. No habitat in project area.
Strepthanthus insignis ssp. *lyonii* Arburua Ranch jewel-flower	—/—/1B	Coastal scrub, sometimes serpentinite. Blooms March to May. Elevation: 230–855m. Known from Merced County.	No. No habitat in project area.
Symphyotrichum lentum Suisun Marsh aster	—/—/1B	Brackish and freshwater marshes and swamps. Blooms May to November. Elevation: 0–3m. Known from Contra Costa, San Joaquin and other counties.	Low. Limited habitat in project area. No known occurrences within 1 mile of project area.

Table 1. Special-status Plant Species and Critical Habitat[1] that Occur or May Occur in the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Federal[2]/State[3]/ CRPR[4]	Habitat Type/General Geographic Range	Likelihood of Occurrence (No, Low, Moderate, High)/ Rationale[5]
Trichocoronis wrightii var. *wrightii* Wright's trichocoronis	—/—/2B	Meadows and seeps, marshes and swamps, riparian forest, vernal pools. Microhabitat is mud flats of vernal lakes, drying river beds, alkali meadows. Blooms May to September. Elevation: 5–435m. Known from Merced County and presumed extirpated from San Joaquin County.	Low. Microhabitat not present or very limited in project area.
Tropidocarpum capparideum Caper-fruited tropidocarpum	—/—/1B	Valley and foothill grassland, alkaline hills on alkaline clay soils. Blooms March to April. Elevation: 1–455m. Known from Alameda, Contra Costa, Fresno, San Joaquin and other counties.	Moderate. Potential grassland habitat in project area but limited to alkaline clay soils. Recorded occurrences from Mountain House, Byron, Livermore and Tracy.
Tuctoria greenei Green's tuctoria	FE/SR/1B	Vernal pools. Blooms May to September. Elevation 30–1070m. Known from Merced County. Presumed extirpated from Fresno, Madera, San Joaquin and Stanislaus Counties.	Very Low. Limited potential vernal pool habitat in project area but no known occurrences within CNDDB search area.
SPECIAL-STATUS / SENSITIVE VEGETATION COMMUNITIES			
Alkali Meadow	S2.1	Dense to fairly open growth of perennial grasses and sedges, usually low growing but occasionally with tufts up to 1 m high growing and flowering from late spring to early fall. Occurs on fine-textured more or less permanently moist alkaline soils. Characteristic species include *Allenrolfea occidentalis, Anemopsis californica, Carex spp., Distichlis spicata, Juncus* ssp., *Sporobolus airoides,* etc. (Holland, 1986).	No. No areas mapped in project area.
Alkali Seep	S2.1	Low growing perennial herbs, usually forming a relatively complete cover, growing through the year in areas with mild winters. Characteristic species include *Distichlis spicata, Nitrophila occidentalis, Potomogeton latifolius, p. pectinatus, Ruppia maritima, Zannichellia palustris, Najas marina* (Holland, 1986).	No. No habitat in project area.
Cismontane Alkali Marsh	S1.1	Dominated by perennial, emergent herbaceous monocots up to 2 m tall with most growth and flowering in the summer. More alkaline than Coastal Brackish Marsh. Characteristic species include *Anemopsis californica, Distichlis spicata*, *Carex spp., Elymus triticoides, Frankenia grandifolia, Juncus spp. Pluchea purpurascens, Salicornia virginica, Typha* spp. (Holland, 1986).	No. No habitat in project area.
Coastal and Valley Freshwater Marsh	S2.1	Dominated by perennial, emergent monocots to 4–5m tall, often forming completely closed canopies. *Schoenoplectus* spp. and *Typha* spp. Dominate. Occurs in sites that lack significant current and that are permanently flooded by freshwater (Holland, 1986).	Observed. Freshwater marsh areas mapped in project area.

Table 1. Special-status Plant Species and Critical Habitat[1] that Occur or May Occur in the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Federal[2]/State[3]/ CRPR[4]	Habitat Type/General Geographic Range	Likelihood of Occurrence (No, Low, Moderate, High)/ Rationale[5]
Great Valley Cottonwood Riparian Forest	S2.1	A dense, broad-leafed, winter deciduous riparian forest dominated by *Populus fremontii* and *Salix gooddingii*. Occurs in fine-grained alluvial soils near perennial or nearly perennial streams that provide subsurface irrigation even if the channel is dry (Holland, 1986).	Observed. Habitat present and mapped in project area. One recorded CNDDB occurrence from Quinto Creek north of San Luis Reservoir.
Great Valley Valley Oak Riparian Forest	S1.1	A medium to tall broad-leafed winter deciduous, closed-canopy riparian forest dominated by *Quercus lobata*. Understory species include *Fraxinus latifolia, Juglans hindsii* and *Platanus racemosa.* Restricted to the highest parts of floodplains, most distant from or higher above active river channels (Holland, 1986).	No. No habitat in project area.
Northern Claypan Vernal Pool	S1.1	Depressions in grassland with vernal pool plants such as *Eryngium* spp., *Plagiobothrys* spp., *Lasthenia* spp., *Psilocarphus* spp., etc. Often more or less saline (Holland, 1986).	Observed. Vernal pool habitat mapped in project area.
Sycamore Alluvial Woodland	S1.1	Open to moderately closed, winter deciduous broad-leafed riparian woodland overwhelmingly dominated by well-spaced *Platanus racemosa. Aesculus californica* and *Sambucus mexicana* are widely spaced in the subcanopy. Understory is usually non-native grasses or *Baccharis viminea*. Occurs in braded, depositional channels of intermittent streams, usually with cobbly or bouldery substrate (Holland, 1986).	Observed. Sycamore Alluvial woodland habitat mapped in project area at Orestimba Creek. CNDDB occurrence from Los Banos Creek west of Los Banos Reservoir; Orestimba Creek NW of Newman.
Valley Needlegrass Grassland	S3.1	Grassland dominated by perennial, tussock-forming *Nasella pulchra*. Native and introduced annuals occur between the perennials, often exceeding the bunchgrasses in cover. Usually on fine-textured (often clay) soils, moist or even waterlogged during winter, but very dry during summer (Holland, 1986).	Observed. Habitat present in project area in limited sites within non-native grassland areas.
Valley Sink Scrub	S1.1	Low, open to dense succulent shrublands dominated by alkali-tolerant chenopods, especially *Allenrolfea occidentalis* or several *Sueada* species (Holland, 1986).	No. No habitat in project area.
Valley Wildrye Grassland	S2.1	A dense sod prairie dominated by *Elymus triticoides* with greater than 50percent cover. Occurs in moist sites at low elevations, often adjacent to stands of riparian forest or freshwater marsh. Soils are frequently subalkaline and/or seasonally overflowed (Holland, 1986).	Observed. Habitat present in project area in limited areas. One occurrence noted at Corral Hollow Creek.

1 - Critical habitat only reported if within 1 mile of APE.
2 - Federal listing
FE = federally endangered
FT = federally threatened
3 - State listing–status codes
SE = state endangered
ST = state threatened
SR = state rare

1A = CRPR Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere.
1B = CRPR Rank 1B: Plants that are rare, threatened or endangered in California and elsewhere.
2B = CRPR Rank 2B: Plants that are rare, threatened or endangered in California but more common elsewhere.
3 = CRPR Rank 3: Plants about which more information is needed – a review list.
4 = CRPR Rank 4 Plants with a limited distribution – a watch list.
Threat rank of 0.1 (e.g., 1B.1) indicates a plant seriously endangered in California (high degree/immediacy of threat), 0.2 indicates a plant fairly endangered in California (moderate degree/immediacy of threat), 0.3 indicates a plant not very endangered in California (low degree/immediacy of threats or no current threats known). All CRPR 1A and some CRPR 3 plants lacking threat information receive no threat-rank extension

4 - Vegetation communities with an S1 to S3 code are considered to be rare and threatened throughout their range (Sawyer et al., 2009). S1 vegetation communities have fewer than 6 viable occurrences statewide and/or up to 518 hectares. S2 vegetation communities have 6 to 20 viable occurrences statewide and/or more than 518–2,590 hectares. S3 vegetation communities have 21–100 viable occurrences statewide and/or more than 2,590–12,950 hectares. Those with an additional threat rank of 0.1 are considered to be very threatened.

5 - Likelihood of occurrence: no, low, moderate, and high accounts for habitat presence and quality and geographic range

3.2.2 Special-status Wildlife and Fishes

Table 2 presents the special-status wildlife and fish species for which project-related impacts were considered. A total of 47 species of invertebrate, fish, reptile, amphibian, bird, and mammal, plus migratory birds, are considered in this document. Of these, six will not be discussed further because they are not expected to occur in the project area: green sturgeon, Central Valley spring-run chinook, Sacramento River winter-run chinook, Fresno kangaroo rat, riparian brush rabbit, and riparian woodrat.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status		Habitat Type and General California Range	Potential to Occur in Project Area[4]
	Fed[2]	State[3]		
INVERTEBRATES				
Conservancy fairy shrimp *Branchinecta conservatio*	FE	*	Inhabits relatively large, turbid cool-water vernal pools in the Central Valley. Occurs primarily in six disjunct populations in Tehama, Butte, Solano, Glenn, Merced, and northern Ventura Counties.	Yes. Not known to occur and suitable habitat not known to be present, but cannot be ruled out.
Longhorn fairy shrimp *Branchinecta longiantenna*	FE	*	Found in clear to highly turbid clay or grass-bottomed vernal pools, pools in swales, clear pools in sandstone depressions, and roadside ditches. Known occurrences highly disjunct: 8–10 locations in Merced, Contra Costa, Alameda, and San Luis Obispo Counties, including Altamont Pass and other locations near the project.	Yes. Potentially occurs in vernal and other seasonal pools and swales within project area.
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT	*	Dependent on elderberry shrubs, which are generally found along waterways and in floodplains.	Yes. Potentially occurs in elderberries found along Salado Creek; elderberries may occur in other locations not yet surveyed.
Vernal pool fairy shrimp *Branchinecta lynchi*	FT	*	Found in pools ranging from small, clear sandstone rock pools to large, turbid, alkaline grassland valley-floor pools. Disjunct populations found in the Central Valley from Shasta Co to Tulare Co, and in the coast ranges from northern Solano Co to Ventura Co.	Yes. Potentially occurs in vernal and other temporary pools within project area.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Fed[2]	 State[3]	Habitat Type and General California Range	Potential to Occur in Project Area[4]
Vernal pool tadpole shrimp *Lepidurus packardi*	FE	*	Inhabits vernal pools and swales ranging from clear to highly turbid and from small to large. Inhabits sites in the Central Valley from Shasta Co to northern Tulare Co and in the central coast range from Solano Co to Alameda Co.	Yes. Potentially occurs in vernal pools within project area.
FISHES				
Green sturgeon *Acipenser medirostris*	FT	SSC	Found in fresh and saltwater habitats, including deep pools in large, turbulent, freshwater rivers. Spawns in deep, fast water. Occurs in Sacramento River and tributaries, the Delta, and San Francisco, Suisun, and San Pablo bays. The project does not overlap with critical habitat.	No. Project is not near suitable or occupied aquatic habitat. Species will not be discussed further in this document.
Delta smelt and critical habitat *Hypomesus transpacificus*	FT	SE	Found in the Sacramento–San Joaquin Delta in brackish waters, also in Sacramento and San Joaquin rivers. Spawns in shallow waters. Critical habitat overlaps with the northernmost ~3 miles of the project area.	No. While critical habitat overlaps with a small portion of the northern project area, the project is not near or continuous with suitable or occupied aquatic habitat.
Chinook—Central Valley spring-run ESU *Onchorhynchus tshawytscha*	FT	ST	This ESU migrates through estuaries and spawns in spring in cold, clean, fast-flowing rivers with gravel bottoms. Occurs in Sacramento River and its tributaries.	No. Project area does not overlap with the range of this ESU. Species will not be discussed further in this document.
Chinook—Sacramento River winter-run ESU *Onchorhynchus tshawytscha*	FE	SE	This ESU migrates through estuaries and spawns in winter in cold, clean, fast-flowing rivers with gravel bottoms. Occurs in Sacramento River and its tributaries.	No. Project area does not overlap with the range of this ESU. Species will not be discussed further in this document.
Steelhead—Central Valley DPS and critical habitat *Oncorhynchus mykiss*	FT	*	Anadromous form of rainbow trout found in Sacramento and San Joaquin rivers and their tributaries. Spawns in shallow, swift riffles with small gravel and cobble. The western boundary of this DPS encompasses most of the project area.	Yes. Project area falls within boundaries of this DPS and steelhead are often rescued from fish facilities south of Clifton Court Forebay near the north end of project; however, the nearest occurrence outside of fish facilities is 5 mi east in the San Joaquin River. No creeks known to support this species occur in or near the project area.
REPTILES				
Alameda whipsnake and critical habitat *Masticophis lateralis euryxanthus*	FT	ST	Found in chaparral, valley-foothill riparian, and valley-foothill woodlands on south-facing slopes and ravines where shrubs form a mosaic with trees, grasslands, and rocky outcrops; may also use adjacent grasslands. Current range (2011): throughout Contra Costa County, most of Alameda County, and small portions of northern Santa Clara and western San Joaquin Counties.	Yes. Occurrence records from Corral Hollow area; however, suitable mosaic habitats and riparian are extremely limited within and near project area.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Fed[2]	 State[3]	Habitat Type and General California Range	Potential to Occur in Project Area[4]
Blunt-nosed leopard lizard *Gambelia sila*	FE	SE, CFP	Occurs in semiarid grasslands, alkali flats, and washes; prefers flat areas with open space; avoids dense vegetation. Current range extends from northwestern Santa Barbara County and western Kern County north to central Merced County; in the project area, the northern limit corresponds roughly with Santa Nella.	Yes. Occurrence records in vicinity of Los Banos Substation (Hwy 152) and south. Areas of high-quality habitat within project area.
California legless lizard *Anniella pulchra (sensu stricto)5*	*	SSC	Found in sandy and loamy sand soils in saltbush scrub, chaparral, and woodland habitats on valley floor and adjacent inner coast range foothills. Range extends discontinuously throughout project area, depending on soil type and vegetation.	Yes. Locality records are scattered throughout project area.
Coast horned lizard *Phrynosoma blainvillii*	*	SSC	Most common in lowlands along sandy washes with scattered low bushes, open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant ant and insect prey. Coast ranges from Contra Costa Co south to Baja, including Sierra foothills; absent from Central Valley floor.	Yes. Occurrence records in project area and potential in sandy washes associated with creeks and drainages.
Giant garter snake *Thamnophis gigas*	FT	ST	Found in sloughs, canals, and other small waterways with prey base of small fish and amphibians on the floor of the Central Valley. Requires grassy banks and emergent vegetation for basking, and areas of high ground protected from flooding during winter. Range extends from Chico in Butte Co south to Mendota Wildlife Area in Fresno Co. Known from Los Banos Creek.	Yes. Not known from closer than ~6 miles to project area but known to occur in Los Banos Creek.
Pacific pond turtle *Emys marmorata*	*	SSC	Permanent or nearly permanent lakes, ponds, marshes, rivers, streams, & irrigation ditches with aquatic veg. Needs basking sites such as partially submerged logs, vegetation mats, or open mud banks. Nests in suitable uplands, such as sandy banks or grassy, open fields on unshaded, south-facing slopes with less than 25% slope.	Observed. Occurrence records at several locations within 1 mile. Observed in Del Puerto Creek in 2014 and Los Banos Res in 2015. Likely to occur in suitable habitats in or near project.
San Joaquin whipsnake *Masticophis flagellum ruddocki*	*	SSC	Occurs in open, dry vegetative associations with little or no tree cover. Found in the coast ranges and southern San Joaquin Valley from Contra Costa south to San Luis Obispo and Kern Counties.	Yes. Occurrence records within 1 mile and suitable habitat available through much of project area.
			AMPHIBIANS	
California red-legged frog and critical habitat *Rana draytonii*	FT	SSC	Found in ponds, streams, and wetlands. Highly aquatic and prefers permanent, quiet pools and streams with dense vegetation. May travel in a direct route between habitats regardless of cover. Occurs in coast ranges from southern Monterey Co south to Baja.	Yes. A number of occurrence records within 1 mile from Corral Hollow north, and from Los Banos Creek. Project overlaps with critical habitat for about 5 miles (Figure 5).

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Fed[2]	 State[3]	Habitat Type and General California Range	Potential to Occur in Project Area[4]
California tiger salamander—central California DPS *Ambystoma californiense*	FT	ST, SSC	Annual grasslands and grassy understory of valley-foothill hardwood habitats in central and northern CA. Needs vernal pools or other aquatic habitats for breeding near uplands with underground burrows. Range from eastern foothills of Sierra west to outer coast range, from Sonoma and Yolo Counties south to Santa Barbara Co.	Yes. Occurrence records in northern project area and potential where there are creeks, stock ponds, and vernal or other temporary pools adjacent to suitable uplands.
Foothill yellow-legged frog *Rana boylii*	*	SSC	Found in partly shaded streams and riffles with a rocky substrate. Basks on large rocks. Coast ranges from Oregon border south to Transverse Mountains of Los Angeles Co, as well as Sierra and Cascades foothills.	Yes. Older occurrence records from Corral Hollow and Los Banos creeks. Low potential in all drainages in project area.
Western spadefoot *Spea hammondii*	*	SSC	Primarily found in grasslands but will occasionally use valley-foothill hardwood woodlands. Breeds in temporary rain pools without bullfrogs, fish, or crayfish; uses uplands when not breeding. Ranges throughout Central Valley and surrounding foothills from Redding south to southern California.	Yes. Occurrence records from Salado Creek; potential in Del Puerto Creek, other creeks, and vernal and other temporary pools in project area.
BIRDS				
Bald eagle *Haliaeetus leucocephalus* (nesting and wintering)	*	SE, CFP	Nests on cliffs or in large trees in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers where it feeds on fish and waterfowl. In winter, also takes hares and other mammals. Resident in suitable nesting areas; winters through much of the rest of the state.	Yes. Would not nest in project area and no CNDDB records but a number of winter and spring eBird reports from San Luis Reservoir and O'Neill Forebay.
Burrowing owl *Athene cunicularia* (burrow and wintering sites)	*	SSC	Grasslands, deserts, and along roads, canals, and edges of agricultural areas; rarely in vicinity of shrubs and trees; dens in underground burrows typically created by other animals, but also in culverts and debris piles. Found primarily in the Central Valley and other open, flat areas of the state; absent from steep terrain, foothill habitats, and higher elevations.	Observed. Occurrence records and reports in or near project north of Corral Hollow Creek, an old occurrence record near Del Puerto Creek, and recent occurrence records south of O'Neill Forebay. Observed in 2014 north of Patterson Pass Rd (Fig 3). Potential in other areas but likely absent in deeply incised foothills between Corral Hollow and Highway 152.
California condor *Gymnogyps californianus*	FE	SE, CFP	Permanent resident of semi-arid mountain ranges surrounding the southern Central Valley. Nests in caves, crevices, behind rock slabs, or on large ledges on high cliffs; roosts on cliffs and in large trees and snags. Forages over large areas of open rangeland; obligate carrion eater.	Yes. Nearest eBird record 20 mi W of Los Banos Res, nearest CNDDB record 35 miles southwest of Dos Amigos Substation, potential nesting habitat near project area between Patterson Pass Road and Corral Hollow. Not expected to nest there in near future but could expand into that area.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Fed[2]	 State[3]	Habitat Type and General California Range	Potential to Occur in Project Area[4]
Golden eagle *Aquila chrysaetos* (nesting and wintering)	*	CFP	Rolling foothill or coast-range terrain where open grassland turns to scattered oaks, sycamores, or large digger pines. Nests primarily in cliffs and large trees, but also transmission towers and nest platforms in open areas. Resident through much of the state, winter-only in Central Valley.	Observed. Occurrence records and other reports as well as spring 2014 and 2015 observations in several locations; potential foraging through much of project area; potential nesting on existing towers and elsewhere.
Least Bell's vireo *Vireo bellii pusillus* (nesting)	FE	SE	Found in lowland riparian with willows and dense understory. Nests in a variety of plants that provide concealment with dense foliage. Current range primarily southern CA but species is expanding back into historic range, which included Central Valley north to Red Bluff. 2005-07 nest records at San Joaquin River NWR, Stanislaus Co, ~6 mi east of project area, but no recent nesting there.	Yes. Potential to occur in any of the dense riparian habitats within the project area. Historic records (1928-32) in Corral Hollow and Del Puerto creeks.
Loggerhead shrike *Lanius ludovicianus* (nesting)	*	SSC	Prefers open, thinly wooded land or scrub savanna with clearings, including meadows, pastures, old orchards. Nests in dense shrubs or small trees with thick foliage, sometimes isolated trees. Found in suitable habitats throughout the state; absent from Sierra and Cascades and primarily forested areas.	Observed. No occurrence records within 1 mile but many reports from specific locations such as Corral Hollow, Del Puerto Canyon, O'Neill Forebay, and from Patterson Pass Road north to Clifton Court Forebay. Observed in project area and likely to nest where trees and shrubs are found.
Long-eared owl *Asio* otus (nesting)	*	SSC	Scarce over most of its range. Nests in conifer, oak, riparian, pinyon-juniper, and desert woodlands that are either open or are adjacent to grasslands, meadows, or shrublands. Prefers dense cover. Not known to nest in the project area.	Yes. Could nest around O'Neil Forebay and Salado Creek; potential also in sycamore alluvial woodland at Orestimba Creek.
Modesto song sparrow *Melospiza melodia heermanni* *(nesting)*	*	SSC	Nests in low, dense vegetation in riparian areas and freshwater marshes. Modesto population occurs east of Suisun Marsh, north to Butte and Glenn Counties, south of the greater Bay Area down to northwest Baja.	Yes. Could nest in dense riparian and freshwater marshes within project area.
Mountain plover *Charadrius montanus* (wintering)	*[6]	SSC	Winter resident on plowed fields, open grasslands with short vegetation, and open sagebrush areas in Central Valley, generally below 1000 feet and rarely near water. Avoids high, dense cover. Found in Central Valley from Sutter/Yuba co south, foothill valleys west of San Joaquin Valley, and Imperial Valley.	Yes. No known occurrences or other reports within several miles, and most observations are from lower elevations than the project, but there is some potential on grazed grasslands and other open areas with minimal vegetative cover.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Fed[2]	 State[3]	Habitat Type and General California Range	Potential to Occur in Project Area[4]
Northern harrier *Circus cyaneus* (nesting)	*	SSC	Nests in a variety of open habitats, especially meadows, grasslands, and open rangelands in dense grasses and shrubs. Resident through much of the Central Valley and Bay Area as well as other parts of the state; may winter where it is not resident.	Observed. Occurrence records around O'Neill Forebay and observed in spring 2014 near there. Suitably dense nesting habitat is limited; nesting potential highest around San Luis Res/O'Neill Forebay.
Short-eared owl *Asio flammeus* (nesting)	*	SSC	Requires open country with a high density of rodent prey, and herbaceous cover at least 12–15 inches tall. Rare in the project area.	Yes. Could nest in dense grasslands, open fields, and freshwater marshes, especially around Mountain House Creek and O'Neill Forebay.
Swainson's hawk *Buteo swainsoni* (nesting)	*	ST	Nests in riparian areas and isolated tree stands in open desert, grassland, and cropland. Forages in grasslands, pastures, and suitable grain or alfalfa fields. Primarily a summer resident of the Central Valley and northeastern California; small year-round population in the Delta.	Observed. Recent nest records from Orestimba Creek and observed there in 2014; recent nest records near O'Neill Forebay and observed there in 2014. Other 2014 observations near project area and nesting potential throughout.
Tricolored blackbird *Agelaius tricolor* (nesting colony)	*	SE	Nests in large colonies near open water in cattail, bulrush, willow, blackberry, wild rose, nettle, and thistle, with open foraging habitat nearby. Endemic and highly colonial. Most numerous in Central Valley. In December 2014, species was emergency-listed as endangered for an initial term of 6 months (expires ~June 29, 2015). CDFW determined in March 2015 that a listing action may be warranted. No further information available as of date of this report.	Observed. Recent occurrence records east of O'Neill Forebay, within proposed corridor south of Gonzaga Rd, and around the western edge of San Luis Res; slightly older occurrence records farther north. Suitable nesting habitat in a few locations and males heard singing (nesting not detected) at Mountain House Creek. This report assumes species will remain listed as endangered.
White-tailed kite *Elanus leucurus* (nesting)	*	CFP	Low rolling foothills/valley margins with scattered oaks; open grasslands, meadows, or marshes near isolated dense-topped trees for nesting and perching. Found throughout coastal and interior California; absent from higher elevations and heavily wooded areas.	Yes. Likelihood low. One 1993 occurrence near Tracy Substation; few other reports in or near project area.
Yellow-headed blackbird *Xanthocephalus xanthocephalus* (nesting)	*	SSC	Nests in freshwater marshes near open water. Found in Central Valley, northeastern and eastern California, and patchily distributed in southern California. Scarce breeder in Central Valley.	Yes. CNDDB records in nine-quad area are from 1919; no other reports in vicinity. Low potential to occur in freshwater marshes around O'Neill Forebay.
Migratory birds	MBTA	Cal FGC	Nesting migratory birds and their eggs and nests (including but not limited to the special-status birds named above) are protected by state and federal statutes.	Observed. Nests of a few species of migratory birds were found in 2014 and others are likely.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status		Habitat Type and General California Range	Potential to Occur in Project Area[4]
	Fed[2]	State[3]		
MAMMALS				
American badger *Taxidea taxus*	*	SSC	Most abundant in drier, open stages of most habitats; uses underground dens. Resident in suitable habitat throughout the state.	Yes. Presumed present and CNDDB records throughout project area.
Fresno kangaroo rat *Dipodomys nitratoides exilis*	FE	SE	Occurs in alkali sink and open grassland habitats on the floor of the San Joaquin Valley. Not known to occur west of I-5.	No. Range of this species does not overlap with project area. Will not be discussed further in this document.
Giant kangaroo rat *Dipodomys ingens*	FE	SE	Inhabits grassland and shrub communities on flat to gently sloping (10–22%) terrain. Historic range included Merced Co; current range includes Fresno and San Benito Counties. Not currently known to occur in Merced Co.	Yes. Unlikely but cannot be ruled out.
Pallid bat *Antrozous pallidus*	*	SSC	Roosts in rocky outcrops, cliffs, caves, mines, trees (including orchards), bridges, barns, porches, bat boxes, occupied and vacant buildings, and even on or near the ground. Forages over open grasslands, oak savanna grasslands, open pine forests, talus slopes, gravel roads, orchards, and vineyards. Range includes all of California.	Yes. No occurrence records or other reports but potential roosting habitat occurs in rocky areas, orchards, and riparian or other trees in isolated locations through project area.
Riparian brush rabbit *Sylvilagus bachmani riparius*	FE	SE	Typically inhabits dense thickets of wild rose, blackberry, coyote bush, and wild grape. Rarely ventures far from dense cover. Very restricted distribution; known only from in and around Caswell Memorial State Park in San Joaquin Co and introduced to San Joaquin River NWR in Stanislaus Co.	No. Range does not overlap with project area and suitable habitat not present. Will not be discussed further in this document.
Riparian (=San Joaquin) woodrat *Neotoma fuscipes riparia*	FE	SSC	Found in riparian areas supporting trees and brush. Nests in trees, snags, or logs, talus, or lodges in downed woody material. Known only from a single population on San Joaquin River in Caswell Memorial State Park.	No. Range does not overlap with project area and suitable habitat not present. Will not be discussed further in this document.
San Joaquin kit fox *Vulpes macrotis mutica*	FE	ST	Dens and forages in grassland, shrubland, alkali meadow, playa, valley oak savanna, and agricultural edges with loose soils. Endemic to Central Valley; current range is San Joaquin Valley and surrounding foothills from southern Kern Co north to Contra Costa, Alameda, and San Joaquin Counties.	Yes. Occurrence records and other reports of presence, including discovery of a carcass in project area during spring 2014. Presumed present but rare throughout project area.
Short-nosed kangaroo rat *Dipodomys nitratoides* brevinasus	*	SSC	Occupy grasslands with scattered shrubs and desert-shrub associations on friable soils on flats and gently rolling terrain; generally more numerous in lighter, friable soils. Not known to occur in the project area; general range and habitat overlap with giant kangaroo rat.	Yes. Unlikely but potential in grasslands south of O'Neill Forebay.

Table 2. Special-Status Wildlife Species and Critical Habitat[1] that Occur or May Occur in or Near the San Luis Transmission Project Biological Study Area

Scientific Name Common Name	Listing Status Fed[2]	 State[3]	Habitat Type and General California Range	Potential to Occur in Project Area[4]
Townsend's big-eared bat *Corynorhinus townsendii*	*	Cand	Found in a variety of habitats. Roosts in caves, mines, tunnels, and buildings, preferring sites with caves and cavernous features; also roosts in old-growth sycamore. Most common in mesic areas. Found in suitable habitats throughout California.	Yes. A 1991 CNDDB record of several males just south of Corral Hollow Road ~3 miles west of project area. No known maternity or hibernating habitat within or near project area. Roosting unlikely, but potential for foraging individuals.
Western mastiff bat *Eumops perotis*	*	SSC	Roosts primarily in cliffs high above the ground; may also use crevices in buildings, bridges, or boulders. Most common in broad, open areas in habitats from deserts to woodlands to alpine meadows. Range principally desert southwest regions, but extends through coast ranges to SF Bay and elsewhere in California to the Oregon border.	Yes. No occurrence records and suitable cliff habitat for roosting is limited but is found in two discrete areas described in text.
Western red bat *Lasiurus blossevillii*	*	SSC	Roosts primarily in foliage of mature trees, especially willows, cottonwoods, sycamores, and walnuts, in edge habitats adjacent to streams, open fields, orchards, and sometimes urban areas. Females riparian-dependent. Prefers edges or habitat mosaics with trees for roosting and open areas for foraging. Found throughout California from Sierra/Cascade foothills west to the coast; absent from northern California.	Yes. No occurrence records and no reports of breeding or wintering within project area. Potential habitat in mature riparian throughout project area.

1 - Critical habitat only included if it overlaps with the project.
2 - Federal listing
FE = federally endangered
FT = federally threatened
MBTA = Migratory Bird Treaty Act
* = no federal status
3 - State listing–status codes
SE = state endangered
ST = state threatened
SSC = California species of special concern
CFP = California fully protected. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.
Cand = candidate for listing as threatened or endangered under the California Endangered Species Act
Cal FGC = species protected by California Fish and Game Code
* = no state status
4 - Not all parts of proposed and alternative corridors were seen, so potential for occurrence is liberal.
5 - Recent genetic work suggests that the former single species, *Anniella pulchra,* is composed of multiple species-level taxa (Papenfuss and Parham, 2013). Likely form that occurs in project area is *A. pulchra*, but geographical limits of proposed species are unknown at this time.
6 - Mountain plover was formerly proposed for listing as threatened under the federal ESA but the proposed rule was withdrawn in May 2011.

4. Findings and Recommendations

This section describes the sensitive habitat types mapped for the BSA and provides recommendations to either avoid impacts to these habitats and species or provides measures to minimize impacts to these areas. When avoidance is not feasible compensation measures are also provided.

For all areas described under wetlands and waters of the U.S. and state, the following regulatory guidance applies: USACE takes jurisdiction over the ordinary high water mark of creeks and drainages including adjacent wetlands, while RWQCB and CDFW take jurisdiction over the bed and bank including any adjacent or associated riparian and wetland vegetation. All areas mapped as wetlands or waters are subject to regulation by these agencies.

Table 3 below provides a list of EPMs that will be implemented during project construction, operation, and maintenance; they are part of the project description (Appendix A).

Table 3. SLTP Environmental Protection Measures Related to Biological and Water/Wetland Resources*

Resource	EPM
Biological Resources	All Western and contract crews will complete biological awareness training to ensure they are familiar with project sensitive biological resources and the associated EPMs and mitigation measures. All supervisors and field personnel will have on file a signed agreement that they have completed the training, and understood and agreed to the terms. EPMs and applicable mitigation measures will be written into the contract for construction and O&M work, and contractors will be held responsible for compliance.
Biological Resources	Vehicle traffic will be restricted to designated access routes and the immediate vicinity of construction and O&M sites. Vehicle speeds will not exceed 15 mph on nonpublic access and maintenance roads and 10 mph on unimproved access routes. Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas, to the maximum extent feasible.
Biological Resources	No pets or firearms will be permitted at project sites.
Biological Resources	At the end of each work day, construction and O&M workers will leave work areas and adjacent habitats to minimize disturbance to actively foraging animals, and remove food-related trash from the work site in closed containers for disposal. Workers will not deliberately or inadvertently feed wildlife.
Biological Resources	Nighttime construction and O&M activities will be minimized to emergency situations. If nighttime construction and O&M work is required, lights will be directed to the minimum area needed to illuminate project work areas. If nighttime work is required, a speed limit of 10 mph will be enforced on all nonpublic access roads.
Biological Resources	Mortalities or injuries to any wildlife that occur as a result of project- or maintenance-related actions will be reported immediately to the Western Natural Resources Department or other designated point of contact, who will instruct construction and O&M personnel on the appropriate action, and who will contact the appropriate agency if the species is listed. The phone number for the Western Natural Resources Department or designated point of contact will be provided to maintenance supervisors and to the appropriate agencies.
Biological Resources	Caves, mine tunnels, and rock outcrops will never be entered, climbed upon, or otherwise disturbed.
Biological Resources	If a pesticide label stipulates a buffer zone width for protection of natural resources that differs from that specified in a project mitigation measure or EPM, the buffer zone width that offers the greatest protection will be applied.
Biological Resources	At completion of work and at the request of the land owner/manager, all work areas except access roads will be scarified or left in a condition that will facilitate natural or appropriate vegetation, provide for proper drainage, and prevent erosion.

Table 3. SLTP Environmental Protection Measures Related to Biological and Water/Wetland Resources*

Resource	EPM
Biological Resources	Prior to any application of herbicide, Western will query the California Department of Pesticide Regulation PRESCRIBE database, entering location information by county, township, range, and section, entering both the commercial name and the formulation of the desired pesticide, and will follow all use limitations provided to ensure compliance with applicable pesticide standards. This database is currently located at http://www.cdpr.ca.gov/docs/endspec/prescint.htm. The measures generated by the PRESCRIBE database will supersede those in the project EPMs where they are different.
Biological Resources	Seed mixtures applied for erosion control and restoration will be certified as free of noxious weed seed, and will be composed of native species or sterile nonnative species.
Biological Resources	Equipment will be washed prior to entering sensitive areas within the project area to control noxious weeds. The rinse water will be disposed of through the sanitary sewage system or other appropriate disposal method that minimizes the spread of noxious weeds.
Biological Resources	Measures described in the Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee 2006 or more current version) and Reducing Avian Collisions with Power Lines: The State of the Art in 2012 (Avian Power Line Interaction Committee 2012 or more current version) will be implemented during O&M activities to minimize bird mortality and injury. At such time when Western finalizes an Avian Protection Plan, Western will adhere to the guidance in that document.
Biological Resources	Construction and O&M excavations greater than 3 feet deep will be fenced, covered, or filled at the end of each working day, or have escape ramps provided to prevent the entrapment of wildlife. Trenches and holes will be inspected for entrapped wildlife before being filled. Any entrapped animals will be allowed to escape voluntarily before construction and O&M activities resume, or they may be removed by qualified personnel, with an appropriate handling permit if necessary.
Biological Resources	A hazardous-spill plan will be developed prior to construction and will remain in effect for all O&M activities. The plan will describe what actions will be taken in the event of a spill of toxic or hazardous materials. The plan will incorporate preventive measures to be implemented for vehicle and equipment staging, cleaning, maintenance, and refueling, and for containment management and storage of hazardous materials, including fuel. In the event of a contaminant spill, work at the site will immediately cease until the contractor has contained and mitigated the spill. The contractor will immediately prevent further contamination, notify appropriate authorities, notify Western's regional environmental manager, and will mitigate damage as appropriate. Adequate spill containment materials, such as oil diaper mats and hydrocarbon cleanup kits, will be available on site at all times, as will containers for storage, transportation, and disposal of contaminated absorbent materials.
Geology, Soils, and Mineral Resources	Erosion control measures will be implemented to prevent loss of soil. Construction will be in conformance with Western's Integrated Vegetation Management Environmental Guidance Manual.
Land Use	On completion of the work, all work areas except permanent access roads will be returned to pre-construction conditions unless otherwise specified by the land owner/manager.
Land Use	Construction and operations will be conducted in a manner that prevents unnecessary destruction, scarring, or defacing of the natural surroundings and to preserve the natural landscape to the extent practicable.
Land Use	No permanent discoloring agents will be applied to rocks or vegetation to indicate limits of survey.
Noise	All vehicles and equipment will be equipped with required exhaust noise abatement suppression devices.
Water Resources, Wetlands	Runoff from the construction and O&M sites will be controlled and meet RWQCB stormwater requirements and the conditions of a construction stormwater discharge permit. A stormwater pollution prevention plan will be prepared and implemented.
Water Resources and Floodplains	All contaminated discharge water created by construction and O&M activities (e.g., concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) will be contained and disposed of in accordance with applicable Federal, State, and local regulations.

Table 3. SLTP Environmental Protection Measures Related to Biological and Water/Wetland Resources*

Resource	EPM
Water Resources and Floodplains	All fill or rip-rap placed within a stream or river channel will be limited to the minimum area required for access or protection of existing Western facilities.
Water Resources and Floodplains	All equipment will be stored, fueled, and maintained in vehicle staging areas 300 feet or the maximum distance possible from any aquatic habitat (vernal pool, vernal pool grassland, seasonal wetland, seep, spring, pond, lake, river, stream, or marsh) and no closer than 200 feet unless a bermed (no ground disturbance) and lined refueling area is constructed and hazardous-material absorbent pads are available in the event of a spill. Vehicles and construction equipment will be inspected daily for fluid leaks before leaving staging areas during construction and O&M activities. Fluid leaks will be repaired before equipment is moved from staging areas.
Water Resources and Floodplains	All instream work, such as culvert replacement or installation, bank recontouring, or placement of bank protection below the high-water line, will be conducted during no-flow or low-flow conditions and in a manner to avoid impacts to water flow, and will be restricted to the minimum area necessary for completion of the work.
Water Resources and Floodplains	All equipment used below the ordinary high-water mark will be free of exterior contamination.
Water Resources and Floodplains	Excavated material or other construction materials will not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.
Water Resources and Floodplains	Non-biodegradable debris will be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris will be left in place or disposed of.
Water Resources and Floodplains	All soil excavated for structure foundations will be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excess soil will be removed from the site and disposed of appropriately. Areas around structure footings will be reseeded with native plants.
Water Resources and Floodplains	Wherever possible, new structures and access roads will be sited out of floodplains. Bridges will be used at new stream crossings wherever possible. If avoidance is not possible, Western will consult with U.S. Army Corps of Engineers (USACE) and obtain permits as required.
Water Resources and Floodplains	If wet areas cannot be avoided, Western will use wide-track or balloon tire vehicles and equipment and/or timber mats.
Water Resources and Floodplains	Construction vehicle movement outside of the ROW will be restricted (to the greatest extent possible) to approved access or public roads.
Water Resources and Floodplains	Where feasible, all construction activities will be rerouted around wet areas while ensuring that the route does not cross sensitive resource areas.

*The full list of EPMs is presented in the expanded project description presented in Appendix A; the list above includes only those measures related to biological and water/floodplain resources.

4.1 Wetlands and Waters of the U.S. and State

Rivers or drainages that were perennial or intermittent and were greater than 20 feet (6 meters) wide were mapped as rivers (Warv). The following is a list of the named and major creeks and drainages within the project area that were mapped as rivers:

- Mountain House Creek, located on Figure 3, map 3, is over 200 feet (61 meters) wide within the project area and supports riparian and freshwater marsh wetland vegetation.
- Patterson Run, located on Figure 3, map 4, is a dry, wide braided channel over 200 feet (61 meters) wide with some seasonal wetland plants but mostly dry.
- Corral Hollow Creek, located on Figure 3, map 8 ranges from 50 to 60 feet (15 to 18 meters) wide and supports riparian and freshwater marsh and seasonal wetland vegetation.

- Lone Tree Creek, located on Figure 3, map 11, ranges from 100 to greater than 200 feet (30 to greater than 61 meters) wide and is dry, braided channel with no wetland vegetation.
- Hospital Creek, located on Figure 3, map 12, is up to 500 feet (152 meters) wide and is a dry, braided channel with no wetland vegetation.
- Del Puerto Creek, located on Figure 3, map 19, ranges from 100 to 150 feet (30 to 45 meters) wide and supports freshwater marsh vegetation within the creek banks.
- Salado Creek, located on Figure 3, map 23, ranges from 100 to 200 feet 30 to 60 meters) wide and supports riparian, freshwater marsh, and seasonal wetland vegetation.
- Crow Creek, located on Figure 3, map 25, ranges from 30 to 40 feet (9 to 12 meters) wide and is a dry channel with upland, non-native grassland species.
- Orestimba Creek, located on Figure 3, map 27, ranges from 200 to 400 feet (61 to 122 meters) wide and is a dry, braided channel. Sycamore alluvial woodland riparian, a special-status vegetation type, occurs on the upper banks of this creek.
- Garzas Creek, located on Figure 3, map 30, ranges from 200 to 400 feet (61 to 122 meters) wide and is a dry channel with a dry, rocky, and sandy creek bottom. Vegetation associated with this creek includes shrub species such as mulefat, California sagebrush, and mesquite along with a variety of native and non-native herbaceous forb species.
- Romero Creek, located on Figure 3, map 35, ranges from 20 to 50 feet wide (6 to 15 meters) and is dry with no wetland vegetation.
- Los Banos Creek, located on Figure 3, map 48, is about 30 feet (9 meters) wide and within the proposed corridor. At this location Los Banos Creek is channelized and flows into Los Banos Reservoir. Los Banos Creek within the alternative corridor (Figure 3, map 45) is a natural, wide, dry channel up to 200 feet (61 meters) wide with riparian vegetation.
- Salt Creek, located on Figure 3, map 50, was mapped as a river in the San Luis to Dos Amigos corridor. At this location, Salt Creek is a dry creek channel approximately 200 feet (61 meters) wide. In the proposed corridor, Salt Creek narrows to less than 20 feet (6 meters) wide (Figure 3, map 49) and was mapped as an intermittent creek (Waci).
- Ortigalita Creek, located on Figure 3, map 51, crosses the San Luis to Dos Amigos alternative corridor, and appears to be approximately 150 feet (46 meters) wide with possible seasonal wetland vegetation. This evaluation is based on a desktop review as this area was not accessible at the time of the surveys. In the proposed corridor, Ortigalita Creek (Figure 3, map 52) is an intermittent to ephemeral drainage and ends inside the corridor near a junk yard.

Areas mapped as intermittent (Waci) or ephemeral (Wace) occur as natural drainages less than 20 feet (6 meters) wide. Named intermittent drainages within the project area include Martin Creek, Arkansas Creek, Mustang Creek, Ingram Creek, Salt Creek, and Ortigalita Creek. Little Salado Creek on Figure 3, map 23 has been filled or no longer occurs as drainage within the proposed and alternate routes. It is unknown whether the creek is still present outside of the project area.

Area mapped as lacustrine include lakes (Walk), ponds (Wapd) and impoundments, such as stock ponds (Waim). Two areas were mapped as lakes: the O'Neill Forebay; and the San Luis Reservoir.

Areas mapped as vernal pools and seasonal wetlands are both seasonal wetlands types. The vernal pool areas qualify as northern claypan vernal pool, which is a special-status vegetation community type with a S1.1 ranking.

Areas mapped as freshwater marsh (Wfm) qualify as coastal and valley freshwater marsh, which is a special-status vegetation community type with a S2.1 ranking.

4.1.1 Project Effects

Implementation of the EPMs will provide general protection for wetlands and waters of the U.S. and state, as well as for water quality. However, EPMs do not provide detailed guidelines for avoiding impacts to specific types of aquatic resources and would not achieve full protection of resources. Wetlands and water of the U.S. and state could be adversely affected by the project.

4.1.2 Avoidance and Minimization Measures

The following measures will avoid and minimize impacts to wetlands and waters of the U.S. and state.

BIO-1 During construction and O&M activities in the vicinity of vernal pools, vernal pool grasslands, and seasonal wetlands, Western will implement the following measures.

During O&M Category A activities (see Appendix A):

- Vehicle access will be permitted only on well-established roads unless soils are dry. Soils will be considered sufficiently dry for vehicle access when they resist compaction, and after annual plants have set seed (generally June 1 to September 30, or as determined by qualified personnel based on personal observation of the soils). For patrolling the ROW off of established roads in a pickup truck, or for inspecting hardware on structures with a bucket truck, vernal pools, vernal pool grasslands, and seasonal wetlands will be avoided by 50 feet (15 meters) during the wet season (generally October 1 to May 31). No avoidance will be necessary if soils are completely dry.

During construction and O&M Category B and C activities (Appendix A) in the vicinity of vernal pools, vernal pool grasslands, and seasonal wetlands:

- Vehicle access will be permitted only on well-established roads unless soils are dry. Soils will be considered sufficiently dry for vehicle access when they resist compaction, and after annual plants have set seed (generally June 1 to September 30, or as determined by an agency-approved biologist based on personal observation of the soils). If vegetation management activities were proposed within 250 feet ((76 meters) of a vernal pool, vernal pool grassland, or seasonal wetland, an agency-approved biologist will be present at all times to ensure the protection of the work-area limits below OR qualified personnel will clearly fence the limits of the work area, according to limits presented in the following, prior to the maintenance activity. (The herbicide restriction measures generated by the PRESCRIBE database supersede those below where they are different.)
  - Mixing or application of pesticides, herbicides, or other potentially toxic chemicals will be prohibited.
  - Herbicide application to target vegetation with hand-held applicator (cut-stump treatment) will be prohibited within 25 feet (7.6 meters) in the wet season (generally October 1 to May 31) and allowed up to the edge of the pool or seasonal wetland in the dry season (generally June 1 to September 30).
  - Herbicide application with power sprayers for spot treatment and selective elimination of target species will be prohibited within 100 feet (30.5 meters) in any season.

- Broadcast herbicide application by vehicle with boom for treating large or dense areas of the ROW will be prohibited within 150 feet (45.7 meters) in any season.
- Manual clearing of vegetation (chainsaw, axe, clippers) will be allowed up to the edge of the pool or seasonal wetland in the wet season (generally October 1 to May 31); a buffer will not be necessary in the dry season (generally June 1 to September 30).
- Mechanical clearing of vegetation (heavy-duty mowers, crawler tractors, or chippers) will be prohibited within 100 feet (30.5 meters) in the wet season (generally October 1 to May 31); a buffer will not necessary in the dry season (generally June 1 to September 30).

- For ground-disturbing activities, a 50-foot (15-meter) wet season or 25-foot (7.6-meter) dry season buffer zone from the edge of the vernal pool or wetland will be maintained and the vernal pool or wetland will be protected from siltation and contaminant runoff by use of erosion control. Erosion-control materials will be of a tightly woven natural fiber netting or similar material that will not entrap reptiles and amphibians (e.g., coconut coir matting). No monofilament plastics will be used for erosion control near vernal pools and seasonal wetlands. Erosion-control measures will be placed between the outer edge of the buffer and the activity area. All fiber rolls and hay bales used for erosion control will be certified as free of noxious weed seed. If work must occur within the buffer, the disturbance will not alter the hydrologic integrity of the wetland.
- For activities such as installation or repair of underground components (water, power, communication, or ground electrical line) or soil borings, a 250-foot (76-meter) buffer zone will be maintained. A smaller buffer could be approved after a site assessment by an agency-approved biologist, but must include silt fencing or other sediment control, to be established no less than 50 feet (15 meters) from the wetland boundary. If work must occur within the buffer, the disturbance will not alter the hydrologic integrity of the wetland.

BIO-2 During construction and O&M activities in the vicinity of seeps, springs, ponds, lakes, rivers, streams, and marshes, and their associated habitats, Western will implement the following measures.

During O&M Category A activities (see Appendix A):

- The following activities will be prohibited at all times within 100 feet (30.5 meters) of a seep, spring, pond, lake, river, stream, or marsh, and their associated habitats:
  - vehicle access, except on existing access and maintenance roads
  - dumping, stockpiling, or burying of any material
  - mixing of pesticides, herbicides, or other potentially toxic chemicals
  - open petroleum products

During construction and O&M Category B and C activities (see Appendix A):

- The following activities will be prohibited at all times within 100 feet (30.5 meters) of a seep, spring, pond, lake, river, stream, or marsh, and their associated habitats:
  - vehicle access, except on existing access and maintenance roads
  - dumping, stockpiling, or burying of any material, except as required for specific O&M activities such as rip-rap
  - mixing of pesticides, herbicides, or other potentially toxic chemicals
  - open petroleum products

- For vegetation management or maintenance within 100 feet (30.5 meters) of any seep, spring, pond, lake, river, stream, or marsh, or any of their associated habitats, the following work-area limits will be provided (the herbicide restriction measures generated by the PRESCRIBE database supersede those below where they are different):
  - Only manual clearing of vegetation will be permitted
  - Foliar application of herbicides will be prohibited. Only cut-stump treatments of target vegetation will be allowed using herbicide approved for aquatic use by the EPA and in coordination with the appropriate land manager.
- For ground-disturbing activities, a 100-foot (30.5-meter) buffer zone will be maintained from the edge of the seep, spring, pond, lake, river, stream, marsh, or their associated habitats for protection from siltation and runoff of contaminants by use of erosion-control measures. Erosion-control materials will be of a tightly woven natural fiber netting or similar material that will not entrap reptiles and amphibians (e.g., coconut coir matting). No monofilament plastics will be used for erosion control near seeps, springs, ponds, lakes, rivers, streams, or marshes. Erosion-control measures will be placed between the outer edge of the buffer and the activity area. All fiber rolls and hay bales used for erosion control will be certified as free of noxious weed seed. If work must occur within the buffer, the disturbance will not alter the hydrologic integrity of the wetland.
- Western will obtain applicable section 404 discharge and 401 water-quality permits prior to any maintenance activities that must take place within jurisdictional wetlands or other waters of the U.S. These will be coordinated with USACE and RWQCB as needed.
- Dewatering work for maintenance operations adjacent to or encroaching on seeps, springs, ponds, lakes, rivers, streams, or marshes will be conducted to prevent muddy water and eroded materials from entering the water or marsh.
- All stream crossings will be constructed such that they reduce the potential for stream flows to result in increased scour, washout, or disruption of water flow. Wherever possible, stream crossings will be located in stream segments without riparian vegetation, and structure footings will be installed outside of stream banks. Should Western need to modify existing access roads or install new access roads, they will be built at right angles to streams and washes to the extent practicable. Trees providing shade to water bodies will be trimmed only to the extent necessary and will not be removed unless they presented a specific safety concern.
- Trees that must be removed will be felled to avoid damaging riparian habitat. They will be felled out of and away from the stream maintenance zone and riparian habitat, including springs, seeps, bogs, and any other wet or saturated areas. Trees will not be felled into streams in a way that will obstruct or impair the flow of water, unless instructed otherwise. Tree removal that could cause streambank erosion or result in increased water temperatures will not be conducted in and around streams. Tree removal in riparian or wetland areas will be done only by manual methods.

4.1.3 Compensatory Mitigation

If avoidance cannot be achieved as described in BIO-1 and BIO-2, and in coordination with resource agencies it is determined that hydrological integrity would be compromised, compensatory mitigation for wetlands and open-water habitat may be required to comply with the CWA no-net-loss of wetlands policy.

BIO-3 Compensation for loss of wetlands and waters will depend on habitat value and integrity, and may take the form of creation, restoration, enhancement, or preservation. Federal and state agencies have a no-net-loss of wetlands policy, which requires that any permanent loss of wetlands be mitigated. Mitigation can be accomplished through purchase of credits in an approved wetland mitigation bank or contribution of in-lieu fees to a conservation bank or other conservation organization that will create the wetlands as mitigation/ compensation for impacts from the project. If these options are not available then mitigation will be accomplished by the creation of new wetlands on site or in an appropriate off-site location. All newly created wetlands must be monitored and maintained for a minimum of 5 years. Annual reporting to the USACE and RWQCB are required as part of monitoring. As part of the permit process, a wetland mitigation and monitoring plan must be prepared in compliance with USACE and RWQCB guidelines.

4.1.4 Cumulative Effects

Future agricultural and urban development projects may result in impacts to wetlands and waters that could contribute to cumulative impacts to these habitats. Impacts could be in the form of degradation of water quality and loss of wetland habitat. The creation of new wetlands to compensate for the loss of impacted wetlands may result in the loss of grassland habitat as this type would likely be used to create new wetlands for mitigation.

4.2 Special-status Vegetation Communities

Table 1 above presents the special-status plants and vegetation communities that occur or may occur within the project area and within 1 mile (1.6 kilometer) of the project area. Each special-status vegetation type that occurs within the project area is discussed in more detail below. Please refer to the table for the listing status and scientific name of each species and vegetation type.

4.2.1 Coastal and Valley Freshwater Marsh

Coastal and valley freshwater marsh habitat typically occurs in quiet sites that lack significant current and are permanently flooded by freshwater (Holland, 1986). This habitat type is characterized by the dominance of perennial, emergent plant species that can grow to from 12 to 15 feet (4 to 5 meters) tall, often forming completely closed canopies with cattail and bulrush dominating. This type occurs within the project area at Corral Hollow and Mountain House creeks and some of the unnamed intermittent creeks. It also occurs in areas that are not within a river or intermittent creek drainage but that receive sufficient ponded water to support emergent plants.

This habitat type has a state ranking of S2.1, is also a wetland type, and is regulated by federal and state agencies.

4.2.2 Great Valley Cottonwood Riparian Forest

Great Valley cottonwood riparian forest occurs as a dense, broadleafed, winter deciduous riparian forest dominated by Fremont cottonwood (*Populus fremontii*) and willows (*Salix* spp.). It typically occurs in fine-grained alluvial soils near perennial or nearly perennial streams that provide subsurface irrigation even when the channel is dry (Holland, 1986). Within the project area this type was mapped at Corral Hollow, Mountain House, and Salado creeks.

This habitat type has a state ranking of S2.1 and also falls under the permitting jurisdiction of the RWQCB and CDFW when it occurs as part of a stream or creek.

4.2.3 Northern Claypan Vernal Pool

Northern claypan vernal pools occur as depressions in grassland with vernal pool plants such as *Eryngium* spp., Plagiobothrys spp., *Lasthenia* spp., *Psilocarphus* spp., and others, and are often more or less saline (Holland, 1986). This habitat type occurs in multiple locations within the project area.

This habitat type has a state ranking of S1.1, is also a wetland type, and is regulated by federal and state agencies.

4.2.4 Sycamore Alluvial Woodland

Sycamore alluvial woodland occurs as an open to moderately closed, winter deciduous broadleafed riparian woodland overwhelmingly dominated by well-spaced sycamores trees. Buckeye and elderberry are often widely spaced and mixed in with the sycamore trees. The herbaceous understory is usually non-native grasses or mulefat. This habitat type typically occurs in braded, depositional channels of intermittent streams, usually with a cobble or boulder substrate (Holland, 1986).

This habitat type was observed to occur at Orestimba Creek. It has a state ranking of S1.1, is also a riparian tree community type, and is regulated by the RWQCB and CDFW.

4.2.5 Valley Needlegrass Grassland

Valley needlegrass grassland is characterized as being dominated by perennial, tussock-forming purple needlegrass that has at least 5 percent absolute cover or 10 percent relative cover within the grassland stand. Native and introduced annuals occur between the perennials, often exceeding the bunchgrasses in cover. This vegetation type usually occurs on fine-textured (often clay) soils, moist or even waterlogged during winter, but very dry during summer (Holland, 1986). This type has a state ranking of S3.1 and is regulated by CDFW. This vegetation type was mapped at a few locations within the project area.

4.2.6 Valley Wildrye Grassland

Valley wildrye grassland is characterized as having 50 percent or greater relative cover by creeping wildrye. This grassland type occurs in moist sites at low elevations, often adjacent to stands of riparian forest or freshwater marsh. Soils are frequently subalkaline and/or seasonally overflowed (Holland, 1986). This type was observed along the south bank of Corral Hollow Creek within the alternative project corridor within an area designated as seasonal wetland (Wse). It also occurs at the O'Neill Forebay in the West of Cemetery and West of O'Neill Forebay alternative corridors. This type has a state ranking of S2.1 and is regulated by CDFW.

4.2.7 Project Effects

Implementation of the EPMs will provide general protection for sensitive resources within the project area. However, EPMs do not provide detailed guidelines for avoiding impacts to special-status vegetation communities and would not achieve full protection of resources. Special-status vegetation communities could be adversely affected by project activities.

4.2.8 Avoidance and Minimization Measures

Implementation of Mitigation Measures BIO-1 and BIO-3 in Section 4.1.2 above will also avoid and minimize impacts to wetland and riparian habitats. In addition, Western will implement the measures below to ensure protection of and to reduce impacts to special-status vegetation communities and plants.

BIO-4 Prior to construction, an agency-approved botanist will survey project areas during appropriate blooming periods for listed and special-status plant species and sensitive habitats. Special-status vegetation communities and species will be reported to the USFWS and/or CDFW.

BIO-5 For special-status vegetation communities and special-status plants the following measures will be implemented during construction and O&M activities.

- From March 1 to August 31, vehicle access will be permitted only on well-established roads until the site has been surveyed by an agency-approved botanist. Off-road travel will be avoided to the extent possible and off road travel outside of designated work areas will be prohibited.
- If vegetation management activities are proposed between March 1 and August 31, an agency-approved biologist will mark plant populations, including a 50-foot (15-meter) buffer zone, prior to construction and O&M activities. Within 100 feet (30.5 meters) of the marked area, the following work area limits will be provided: 1) only manual clearing of vegetation will be allowed within 50 feet of the edge of the flagged area, 2) mechanical treatment of all kinds (including mowers, tractors, chippers, dozers) will be prohibited, and (3) herbicide use will be prohibited at all times with the exception of direct application to target vegetation.
- Ground-disturbing activities proposed will require a bloom season survey by an agency-approved biologist to mark existing plant populations or clear the site. Ground disturbance will be prohibited within flagged boundaries. Flagging or other field markers such as temporary fence posts, or other markers that will last for the construction season, will be placed in the prohibited area to ensure that no disturbance occurs at that location. Locations of special-status plant communities will also be mapped and located in the field using a GPS so that they are clearly identified at all times of the year and construction workers can easily identify areas to be avoided. These areas will be avoided by workers doing construction activities at all times of the year. Areas that have been cleared will require no further field or map identification.
- Standard erosion- and sediment-control measures will be installed for all ground-disturbing activities to prevent impacts to special-status vegetation communities.

4.2.9 Compensatory Mitigation

If avoidance is not feasible, for special-status vegetation communities the following mitigation measures will be implemented:

BIO-6 Western will purchase credits in an appropriate mitigation bank or habitat conservation bank for the vegetation community to be impacted. If a mitigation bank is not available Western will contribute in-lieu fees to a mitigation bank or habitat conservation bank that

can provide appropriate mitigation for the vegetation type. Western will work with the appropriate resource agency (USFWS or CDFW) to ensure adequate compensation.

If no mitigation bank, conservation bank, or in-lieu-fee compensation is available then Western will prepare a mitigation monitoring and reporting plan that describes the compensatory mitigation measures that will be implemented for these vegetation communities. The mitigation plan will be submitted to the CDFW for approval.

4.2.10 Cumulative Effects

Future agricultural and urban development projects may result in reduced special-status plant communities and could contribute to cumulative impacts to these vegetation communities in the region.

4.3 Special-status Plants

Table 1 above presents the special-status plants and vegetation communities that occur or may occur within the project area and within 1 mile (1.6 kilometer) of the project area. Each species in Table 1 that has the potential to occur within the project area and within 1 mile (1.6 kilometer) of the project area or is a federal or state listed species is discussed in more detail below. Please refer to the table for the listing status and scientific name of each species and vegetation type. Eight plant species were considered to not occur in the project area due to lack of potential habitat such as chaparral, cismontane woodland, or coastal scrub or microhabitat requirements such as moist subalkaline sands, blue oak woodlands, or serpentine soils. These species are Hospital Canyon larkspur, Mt. Hamilton coreopsis, Hall's bush-mallow, Merced monardella, Mt. Diablo phacelia, Keck's checkerbloom, chaparral ragwort, and Arburua Ranch jewel-flower. Keck's checkerbloom is a federally listed species that occurs in grassy slopes in blue oak woodland and is known only from the Sierra Nevada foothills and is therefore considered to not have the potential to occur in the project area.

A detailed discussion of the following plants is provided below:

- five federally listed species—large-flowered fiddleneck, Contra Costa goldfields, Hoover's spurge, Hartweg's golden sunburst, and Greene's tuctoria—and two state-listed species—Delta button-celery and Mason's lilaeopsis—have the potential to occur based on the presence of potential habitat. Large-flowered fiddleneck, Hartweg's golden sunburst, and Greene's tuctoria are both federally and state-listed species.
- eighteen special-status plants with a CRPR Rank 1B are either recorded to occur within the project area or have the potential to occur based on the presence of potential habitat. These are alkali milk-vetch, heartscale, San Joaquin spearscale, big tarplant, beaked clarkia, round-leaved filaree, Lemmon's jewel-flower, recurved larkspur, spiny-sepaled button celery, diamond-petaled California poppy, wooly rose mallow, Munz's tidy-tips, Panoche pepper-grass, showy golden madia, shining navarretia, pincushion navarretia, Suisun marsh aster, and caper-fruited tropidocarpum
- two special-status plants with a CRPR Rank 2B—Delta mudwort and Wright's trichocoronis—have the potential to occur within the project area
- one CRPR Rank 3 species—Merced phacelia—has the potential to occur within the project area, and two CRPR Rank 4 species—hogwallow starfish and small-flowered morning glory—were observed within the project area.

4.3.1 Large-flowered Fiddleneck

Large-flowered fiddleneck is an annual herbaceous plant in the Borage family. This species flowers from April to May and occurs at elevations ranging from 902 to 1804 feet (275 to 550 meters) in woodland and valley and foothill grassland habitats. It has orange-red flowers that are larger than other species in this genus, thus the name large-flowered fiddleneck.

This species is has been documented from fewer than five natural occurrences and is known to occur at the north side of Corral Canyon at Lawrence Livermore National Laboratory and from two locations on the Connolly Ranch in San Joaquin County. These locations range 15 to 20 miles (24 to 32 kilometers) from the proposed transmission line corridor.

Suitable habitat for large-flowered fiddleneck is present in the project area and within 1 mile (1.6 kilometers) of the project area but was not found during the 2014 reconnaissance surveys. Even though potential habitat is present throughout the project area in the form of grassland habitat, this species appears to have limited distribution as it is known from only five occurrences and has not been found in the area in spite of surveys done for other projects in the same habitat and general location. Critical habitat for this species is mapped southwest of Tracy (Figure 5) and is within 5 miles (8 kilometers) of the proposed transmission line corridor. The common fiddleneck, *Amsinckia menziesii*, was observed in many areas within the grassland communities.

4.3.2 Contra Costa Goldfields

Contra Costa goldfields is an annual herbaceous plant in the Aster family or Asteraceae. This species flowers from March to June and occurs at elevations ranging from 0 to 1542 feet (0 to 470 meters) in oak woodland, alkaline playas, valley and foothill grassland, and vernal pools in moist sites. The microhabitat for this species is vernal pools, swales, and low depressions in open grassy areas.

There are no CNDDB recorded occurrences for this species within the project area and within 1 mile (1.6 kilometers) of the project area and for the USGS quads that intersect with the project area. However this species is known to occur in Alameda and Contra Costa Counties and shows up in the USFWS quad search for the project area and within 1 mile (1.6 kilometers) of the project area. Critical habitat for this species is mapped north of Tracy (Figure 5) and is within approximately 3 to 5 miles (5 to 8 kilometers) of the proposed transmission line corridor.

Suitable habitat is present in the project area in areas mapped as vernal pools. This species is considered to have a low potential to occur in the project area. Potential suitable habitat is present; however, there are no known recorded occurrences within the project area and within 1 mile (1.6 kilometers) of the project area and this species prefers alkaline soils, which are limited within the project area.

4.3.3 Hoover's Spurge

Hoover's spurge is an annual herbaceous plant in the spurge family. This species flowers from July to October and occurs at elevations ranging from 82 to 820 feet (25 to 250 meters) in vernal pools on volcanic mudflow or clay substrate. This is a low-growing plant with white flowers.

Within the project area this species is known from Merced and Stanislaus Counties. There are no recorded occurrences for this species within the nine-quad search for the project area. This species is considered to have a low potential to occur in the project area due to limited suitable habitat. Although vernal pools were observed in the project area, there are no volcanic mudflow vernal pools.

4.3.4 Hartweg's Golden Sunburst

Hartweg's golden sunburst is an annual herbaceous plant in the sunflower family. This species flowers from March to April and occurs at elevations ranging from 49 to 492 feet (15 to 150 meters) in oak woodland and valley and foothill grassland on clay soils which are often acidic. This is a small 2 to 8 inch (5 to 20 centimeter) tall plant with yellow flowers.

Within the project area this species is known from Merced and Stanislaus Counties. There are no recorded occurrences for this species within the CNDDB search for the project area and within 1 mile (1.6 kilometers) of the project area. This species is considered to have a low potential to occur in the project area due to limited suitable habitat. There is no oak woodland habitat; however, there is grassland habitat although acidic clay soils are either lacking or limited within the project area.

4.3.5 Greene's Tuctoria

Greene's tuctoria is an annual herbaceous plant in the grass family. This species flowers from May to September and occurs at elevations ranging from 98 to 3510 feet (30 to 1070 meters) in vernal pools. This grass has an erect stem that becomes decumbent and often has purplish nodes. The inflorescence or flowering portion of the grass is spike-like and is partly enclosed by an upper sheath that becomes exerted with age.

There are no recorded occurrences of this species within the nine-quad search of the project area but there are recorded occurrences in Merced County. It is considered to be extirpated from Fresno, San Joaquin, and Stanislaus Counties. Potential suitable habitat is present within the project area in areas mapped as vernal pools. This species has a very low potential to occur based on the lack of recorded occurrences and limited vernal pool habitat in the project area.

4.3.6 Delta button-celery

Delta button-celery is a biennial to perennial herbaceous plant in the Carrot family or Apiaceae. This species flowers from June to October and occurs at elevations ranging from 10 to 98 feet (3 to 30 meters) in riparian scrub in seasonally wet clay depressions. It has small greenish-white to faint-purple flowers.

This species is known from one recorded location near Grayson, about 2 miles (3 kilometers) east of Westley. This occurrence is outside of the project area.

Suitable habitat for Delta button-celery is present in the project area in areas mapped as great valley riparian scrub. This species has a moderate potential to occur in the project area based on presence of suitable habitat and one known CNDDB occurrence on the Westley USGS quad.

4.3.7 Mason's Lilaeopsis

Mason's lilaeopsis is a perennial rhizomatous herbaceous plant in the Carrot family or Apiaceae. This species flowers from April to November and occurs at elevations ranging from 0 to 33 feet (0 to 10 meters) in brackish or freshwater marshes and swamps and in riparian scrub. The microhabitat for this species is described as tidal zones in muddy or silty soil formed through river deposition or river bank erosion.

This species is not recorded to occur within the project area and within 1 mile (1.6 kilometers) of the project area but has multiple recorded occurrences on the Clifton Court Forebay USGS quad and is known from Clifton Court Forebay and other nearby areas.

Suitable habitat for this species is potentially present in areas mapped as freshwater marsh and riparian scrub. However, this species typically occurs in tidal zones, which are not present in the project area, it is considered to have a low potential to occur in the project area.

4.3.8 Alkali Milk-Vetch

Alkali milk-vetch is an annual herbaceous plant in the Pea or Legume family. This species flowers from March to June and occurs at elevations ranging from 3 to 197 feet (1 to 60 meters) in playas, valley and foothill grassland, and vernal pools in alkaline areas. It is a low growing plant with pink-purple flowers with stems from less than 1 inch to 5 inches (2 to 12 centimeters).

There is potential vernal pool and grassland habitat for this species within the project area. This species is known to occur in Alameda, San Joaquin, and other counties and there are CNDDB recorded occurrences from near Byron/Livermore and Clifton Court Forebay.

4.3.9 Heartscale

Heartscale is an annual herbaceous plant in the Chenopod family. This species flowers from April to October and occurs at elevations ranging from 0 to 1837 feet (0 to 560 meters) in chenopod scrub, meadows and seeps, valley and foothill grasslands (sandy) in saline or alkaline areas. It has greenish flowers and stems are one to many from the base with ascending to erect branches that are gray-scaly. It grows from 4 to 20 inches (1 to 5 decimeters).

There is potential grassland habitat for this species within the project area. This species is known to occur in Alameda, San Joaquin, and other counties and there are CNDDB recorded occurrences from Clifton Court Forebay.

4.3.10 San Joaquin Spearscale

San Joaquin spearscale is an annual herbaceous plant in the Chenopod family. This species flowers from April to October and occurs at elevations ranging from 3 to 2740 feet (1 to 835 meters) in chenopod scrub, meadows and seeps, playas, valley and foothill grasslands in alkaline areas. It is an erect plant that grows from 4 to 39 inches (1 to 10 decimeters). The stems are generally striate with ascending branches, sparsely scaly and glabrous in age. The flowers are greenish in color.

There is potential grassland habitat for this species within the project area. This species is known to occur in Alameda, San Joaquin, and other counties and there are CNDDB recorded occurrences from Byron, Byron Hot Springs, Mountain House Road, and Clifton Court Forebay.

4.3.11 Big Tarplant

Big tarplant is an annual herbaceous plant in the Aster family. This species flowers from July to October and occurs at elevations ranging from 98 to 1656 feet (30 to 505 meters) in valley and foothill grassland habitats, usually on clay soils. It has white ray flowers that are red-veined and the inflorescence is glandular and strongly scented.

This species is known from many occurrences within the project area and within 1 mile (1.6 kilometers) of the project area and has a high likelihood to occur within the project area based on a search of the CNDDB. The 2014 surveys were conducted outside of the flowering season for this species. However, potential habitat is present within the grassland areas located within the project area.

4.3.12 Beaked Clarkia

Beaked clarkia is an annual herbaceous plant in the evening primrose family. This species flowers from April to May and occurs at elevations ranging from 197 to 1640 feet (60 to 500 meters) in oak woodland and valley and foothill grassland habitats, on north-facing slopes, sometimes on sandstone. This is a small, delicate plant with pink flowers.

This species is known to occur in Merced, Mariposa, Stanislaus, and Tuolumne Counties. Although there is potential grassland habitat in the project area, this is considered to have a low potential to occur based on the lack of known occurrences within the nine-quad search for the project area.

4.3.13 Round-leaved Filaree

Round-leaved filaree is an annual herbaceous plant in the Geranium family. This species flowers from March to May and occurs at elevations ranging from 49 to 3936 feet (15 to 1200 meters) in oak woodland and valley and foothill grassland habitats on clay soils. It has white flowers that can be tinged red to purple. The stems are glandular-hairy and the leaves are round, which makes it different from other plants that are closely related to this species.

This species was found in several locations within the project area and was mapped. This species was commonly found in areas mapped as wildflower fields. It was not found in every area mapped as wildflower fields; however, these areas would be considered potential habitat for this species.

4.3.14 Lemmon's Jewelflower

Lemmon's jewelflower is an annual herbaceous plant in the Mustard family. This species flowers from March to May and occurs at elevations ranging from 262 to 4002 feet (80 to 1220 meters) in pinyon and juniper woodland and valley and foothill grassland habitats. It has white flowers that have dark purple veins.

This species is known from recorded CNDDB occurrences within the project area between Tesla and Corral Hollow, from Hospital Canyon, and from the Los Banos area. Suitable habitat for Lemmon's jewelflower is present in the project area in the form of grassland habitat. This species has a high potential to occur in the project area based on presence of suitable habitat and known occurrences within the project area.

4.3.15 Recurved Larkspur

Recurved larkspur is a perennial herbaceous plant in the Buttercup family. This species flowers from March to June and occurs at elevations ranging from 10 to 2,591 feet (3 to 790 meters) in chenopod scrub, oak woodland, and valley and foothill grassland habitats in alkaline soils. It has light blue flowers with the lower petals being white.

This species is known from recorded CNDDB occurrences within the project area from Salt Creek and from the Los Banos Reservoir area. Suitable habitat for recurved larkspur is present in the project area in the form of grassland habitat in alkaline soils. It was not found during the 2014 surveys. This species

has a moderate potential to occur in the project area based on presence of suitable habitat and known occurrences within the project area. However it prefers areas with alkaline soils, which are limited within the project area.

4.3.16 Spiny-Sepaled Button-Celery

Spiny-sepaled button-celery is an annual to perennial herbaceous plant in the Carrot family or Apiaceae. This species flowers from April to June and occurs at elevations ranging from 262 to 2034 feet (80 to 620 meters) in valley and foothill grasslands and vernal pools. It has ovoid to spheric flower heads with white petals.

This species is known to occur in Merced, Stanislaus, and other counties, and is known from one recorded location near Byron Airport within the project area. Suitable habitat for Delta button-celery is present in the project area in areas mapped as grassland and vernal pools. This species has a moderate potential to occur in the project area based on presence of suitable habitat and one known CNDDB occurrence.

4.3.17 Diamond-petaled California Poppy

Diamond-petaled California poppy is an annual herbaceous plant in the Poppy family. This species flowers from March to April and occurs at elevations ranging from 0 to 2972 feet (0 to 975 meters) in valley and foothill grassland habitats on alkaline and clay soils. It has yellow flowers and the leaf segments are obtuse.

This species is known from several recorded CNDDB occurrences within the project area and within 1 mile (1.6 kilometers) of the project area. The recorded occurrences are from Corral Hollow near Castle Rock, Lawrence Livermore National Laboratory, hills north of Del Puerto Canyon and the hills south of Byron. Although not found during the 2014 surveys, this species has a high potential to occur in the project area based on presence of suitable habitat and known occurrences within the project area and within 1 mile (1.6 kilometers) of the project area.

4.3.18 Woolly Rose Mallow

Woolly rose mallow is a perennial rhizomatous herbaceous plant in the Mallow family. This species flowers from June to September and occurs at elevations ranging from 0 to 394 feet (0 to 120 meters) in freshwater marshes or swamps, often in riprap on sides of levees. It has bell-shaped flowers and the petals are white with a rose-red center.

This species is from San Joaquin and other counties and there are recorded occurrences within the project area from Clifton Court Forebay. There is limited suitable habitat for this species within the project area and within 1 mile (1.6 kilometers) of the project area.

4.3.19 Munz's Tidy-tips

Munz's tidy-tips is an annual herbaceous plant in the Aster family. This species flowers from March to April and occurs at elevations ranging from 492 to 2296 feet (150 to 700 meters) in chenopod scrub and valley and foothill grassland habitats on hillsides in white-grey alkaline soils. This is a glandular sunflower-looking plant with yellow ray flowers with white tips.

Within the project area this species is known to occur in Fresno County. This species is considered to have a very low potential to occur in the project area based on microhabitat of white-grey alkaline soils, which are lacking in the project area.

4.3.20 Panoche Pepper-grass

Panoche pepper-grass is an annual herbaceous plant in the Legume family. This species flowers from February to June and occurs at elevations ranging from 607 to 902 feet (185 to 275 meters) in valley and foothill grassland on white or grey clay lenses on steep slopes. It can occur in alluvial fans and washes and prefers clay and gypsum soils.

This species is known to occur in Fresno County. This species is considered to have a very low potential to occur in the project area based on the microhabitat preference of white or grey clay lenses on steep slopes, which are lacking in the project area.

4.3.21 Showy Golden Madia

Showy golden madia is an annual herbaceous plant in the Aster family. This species flowers from March to May and occurs at elevations ranging from 82 to 3985 feet (25 to 1215 meters) in oak woodland and valley and foothill grassland habitats on adobe clay soils. It has yellow flowers with a yellow to orange center and glandular stems.

This species is known from recorded CNDDB occurrences at Corral Hollow near Castle Rock, Lawrence Livermore National Laboratory, and the hills south of Byron. Suitable habitat for showy golden madia is present in the project area in the form of grassland habitat but it was not found during the 2014 surveys. This species has a high potential to occur in the project area based on presence of suitable habitat and known occurrences within the project area and within 1 mile (1.6 kilometers) of the project area.

4.3.22 Shining Navarretia

Shining navarretia is an annual herbaceous plant in the phlox family. This species flowers from April to July and occurs at elevations ranging from 249 to 3280 feet (76 to 1000 meters) in oak woodlands, valley and foothill grasslands and vernal pools, sometimes in clay. It has yellow flowers and the inflorescence is densely white-hairy in the center.

This species is known to occur in Alameda, Contra Costa, San Joaquin, and other counties, and there is a recorded occurrence from Billie Wright Road northeast of Los Banos Valley.

4.3.23 Pincushion Navarretia

Pincushion navarretia is an annual herbaceous plant in the phlox family. This species flowers from April to May and occurs at elevations ranging from 66 to 1082 feet (20 to 330 meters) in vernal pools, often acidic. It has white flowers.

This species is known to occur in Merced and other counties. There are no recorded occurrences for this species in the project area and within 1 mile (1.6 kilometers) of the project area based on the CNDDB search. There is potential vernal pool habitat for this species within the project area although soils in the project area are not likely to be acidic.

4.3.23 Suisun Marsh Aster

Suisun marsh aster is a perennial rhizomatous herbaceous plant in the aster family. This species flowers from May to November and occurs at elevations ranging from 0 to 10 feet (0 to 3 meters) in brackish and freshwater marshes and swamps. It has violet colored flowers.

This species is known to occur in San Joaquin and other counties. There are no known recorded occurrences within the project area and within 1 mile (1.6 kilometers) of the project area based on the CNDDB search.

4.3.24 Caper-fruited Tropidocarpum

Caper-fruited tropidocarpum is an annual herbaceous plant in the mustard family. This species flowers from March to April and occurs at elevations ranging from 3 to 1387 feet (1 to 455 meters) in valley and foothill grassland habitats, on alkaline hills, and on alkaline clay soils. It has yellow flowers with erect stems with few branches.

This species is known from recorded CNDDB occurrences at Mountain House, Byron, Livermore, and Tracy. Suitable habitat for Caper-fruited tropidocarpum is present in the project area and within 1 mile (1.6 kilometers) of the project area in the form of grassland habitat but it was not found during the 2014 reconnaissance surveys. This species has a high potential to occur in the project area based on presence of suitable habitat and known occurrences within the project area and within 1 mile (1.6 kilometers) of the project area.

4.3.25 Delta Mudwort

Delta mudwort is a perennial stoloniferous herbaceous plant in the Figwort family. This species flowers from May to August and occurs at elevations ranging from 0 to 6 feet (0 to 3 meters) in fresh or brackish water marshes and swamps, riparian scrub, usually on mud banks. This is a small, low-growing plant with white flowers.

Within the project area and within 1 mile (1.6 kilometers) of the project area this species is known to occur in Contra Costa and San Joaquin Counties. This species is considered to have a low potential to occur in the project area because there is limited habitat, especially within the microhabitat of mud banks. There is a CNDDB occurrence from Victoria Canal recorded within the nine-quad search area, which is approximately 15 miles (24 kilometers) from the proposed corridor.

4.3.26 Wright's Trichocoronis

Wright's trichocoronis is an annual herbaceous plant in the Aster family. This species flowers from May to September and occurs at elevations ranging from 15 to 1305 feet (5 to 435 meters) in meadows and seeps, marshes and swamps, riparian forest, and vernal pool habitats. The microhabitat is mud flats of vernal lakes, drying river beds, alkali meadows.

Within the project area this species is known to occur in Merced County and presumed extirpated from San Joaquin County. This species is considered to have a very low potential to occur in the project area and within 1 mile (1.6 kilometers) of the project area because the microhabitat not present or is limited.

4.3.27 Other Special-status Plants

The three CRPR Rank 3 and Rank 4 species found or potentially occurring in the project area are described below.

Hogwallow Starfish. Hogwallow starfish is a low-growing annual herbaceous plant in the Aster family. This species flowers from March to June and occurs at elevations ranging from 0 to 1656 feet (0 to 505 meters) in valley and foothill grassland habitats in mesic sites and on clay soils and in shallow vernal pools. It has greenish flowers that occur in dense groups of 10 to 40 with 10 to 20 leaves beneath the flowers.

There were no recorded occurrences for this species in the area but this species was observed in grassland habitats within the project area. It occurs in the same areas and habitats as for round-leave filaree, a CRPR Rank 1B species.

Small-flowered Morning-glory. Small-flowered morning-glory is a low-growing annual herbaceous plant in the Morning Glory family. This species flowers from March to July and occurs at elevations ranging from 98 to 2296 feet (30 to 700 meters) in chaparral openings, coastal scrub, valley and foothill grassland habitats on clay soils or serpentine seeps. It has bell shaped pinkish or bluish flowers and the stems are diffusely branched.

There were no recorded occurrences for this species in the area but this species was observed in grassland habitats within the project area. It occurs in the same areas and habitats as round-leave filaree, a CRPR List 1B species.

Merced Phacelia. Merced phacelia is an annual herbaceous plant in the Borage family. This species flowers from February to May and occurs at elevations ranging from 197 to 328 feet (60 to 100 meters) in valley and foothill grassland on adobe or clay soils of valley floors, open hills or alkaline flats. It has bell shaped blue flowers with hairy to plus or minus glandular stems.

This species is known from Merced County but there are no known records for this species within the nine-quad search of the project area and within 1 mile (1.6 kilometer) of the project area. This species is considered to have a very low potential to occur based on limited clay or alkaline soils and the lack of any recorded occurrences within the project area or within 1 mile (1.6 kilometer) of the project area.

4.3.28 Project Effects

Implementation of the EPMs will provide general protection for sensitive resources within the project area. However, EPMs do not provide detailed guidelines for avoiding impacts to special-status plants and would not achieve full protection of resources. Special-status plants could be adversely affected by project activities.

4.3.29 Avoidance and Minimization Measures

In addition to Mitigation Measures BIO-1 through BIO-6 above, the following measures will be implemented to ensure protection of special-status plant species. Western will consult with USFWS and CDFW; any avoidance, minimization, and compensation measures developed through consultation will supersede those provided in this document.

BIO-7 For the federal and state listed plant species (large-flowered fiddleneck, Hoover's spurge, Delta button-celery, Contra Costa goldfields, Mason's lilaeopsis, Hartweg's golden sunburst, and Greene's tuctoria), and for all CRPR special-status plants the following measures will be implemented.

During construction activities:

- From March 1 to August 31, vehicle access will be permitted only on well-established roads until the site has been surveyed by an agency-approved biologist. Off-road travel will be avoided to the extent possible and off road travel outside of designated work areas will be prohibited. Ground-disturbing activities proposed between March 1 and August 31 will require a survey by an agency-approved biologist to flag any existing plant populations. Ground disturbance will be prohibited within the flagged boundary unless further consultation with USFWS or CDFW is completed. Flagging or other field markers such as temporary fence posts, or other markers that will last for the construction season, will be placed in the prohibited area to ensure that no disturbance occurs at that location. Populations of special-status plants will also be mapped and located in the field using a GPS so that they are clearly identified at all times of the year and construction workers can easily identify areas to be avoided. The area where special-status plants that are being preserved will be avoided by workers doing construction activities at all times of the year. After construction is completed the flagging and markers can be removed.
- During project construction, a biological monitor will be present when work occurs within 100 feet of a flagged listed plant population.
- Standard erosion- and sediment-control measures will be installed for all ground-disturbing activities to prevent impacts to special-status plants.

  Where impacts to special-status plants cannot be avoided, and mitigation cannot be achieved through the purchase of credits at a mitigation or conservation bank, the top 4 inches of topsoil will be removed and salvaged and applied to an appropriate on-site or off-site restoration area. When this topsoil is replaced, compaction will be minimized. Soil will not be stockpiled for more than one year to maintain seed viability.

During O&M activities:

- From March 1 to August 31, vehicle access will be permitted only on well-established roads until the site has been surveyed by an agency-approved biologist. All vehicles will have rubber tires. Off-road travel will be avoided to the extent possible.
- If vegetation management activities are proposed between March 1 and August 31, an agency-approved biologist will mark plant populations, including a 50-foot (15-meter) buffer zone, prior to construction or O&M activities. Within 100 feet (30.5 meters) of the flagged area, the following work-area limits will be provided: 1) only manual clearing of vegetation will be allowed within 50 feet of the edge of the flagged area, and 2) mechanical treatment of all kinds (including mowers, tractors, chippers, dozers) will be prohibited, and (3) herbicide use will be prohibited at all times with the exception of direct application to target vegetation.
- Workers will refer to maps that show the location of mapped populations of special-status plants so that these areas can be avoided.
- Standard erosion- and sediment-control measures will be installed for all ground-disturbing activities to prevent impacts to plants.
- Where impacts to special-status plants cannot be avoided, the top 4 inches of topsoil will be excavated and stockpiled in an appropriate location. When this topsoil is replaced compaction will be minimized. Topsoil will not be stockpiled for more than one year.

4.3.30 Compensatory Mitigation

If avoidance is not feasible, for special-status plants the following mitigation measures will be implemented:

BIO-8 Western will purchase credits in an appropriate mitigation bank or habitat conservation bank for the plants species to be impacted. If a mitigation bank is not available Western will contribute in-lieu fees to a mitigation bank or habitat conservation bank that can provide appropriate mitigation for the special-status plant species affected. Western will work with the appropriate resource agency (USFWS and/or CDFW) to ensure adequate compensation. Mitigation ratios will be sufficient to achieve performance criteria of no net loss of the affected plant species

If mitigation cannot be achieved by purchase of credits in a mitigation or conservation or by in-lieu fees, then Western will prepare a mitigation plan that describes the compensatory mitigation measures that will be implemented for special-status plants. The mitigation plan will be submitted to the USFWS for approval for federal listed plants and to CDFW for state-listed and CRPR plants. The mitigation plan will include the mitigation measures, which are adopted from the CNPS *Policy on Mitigation Guidelines Regarding Impacts to Rare, Threatened and Endangered Plants* (CNPS, 1998), or equally effective alternative measures.

4.3.31 Cumulative Effects

Future agricultural and urban development projects may result in reduced grassland habitat and could contribute to cumulative impacts to plant species in the region.

4.4 Special-status Wildlife and Fishes

Table 2 above presents all the special-status wildlife species that were considered potentially affected by the project. Note that six species presented in Table 2 have been eliminated from further consideration because the project area does not overlap with the geographic range of the species and/or does not provide suitable essential habitats. These include green sturgeon, Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon, Fresno kangaroo rat, riparian brush rabbit, and riparian woodrat. The remaining species are discussed in more detail below, as are migratory birds in general. Please refer to the table for the listing status and scientific name of each species.

- Conservancy fairy shrimp
- Longhorn fairy shrimp
- Valley elderberry longhorn beetle
- Vernal pool fairy shrimp
- Vernal pool tadpole shrimp
- Delta smelt
- Central Valley steelhead
- Alameda whipsnake
- Blunt-nosed leopard lizard
- California legless lizard
- Coast horned lizard
- Giant garter snake
- Pacific pond turtle
- San Joaquin whipsnake
- California red-legged frog
- California tiger salamander
- Foothill yellow-legged frog
- Western spadefoot
- Bald eagle
- Burrowing owl
- California condor
- Golden eagle
- Least Bell's vireo
- Loggerhead shrike
- Long-eared owl
- Modesto song sparrow
- Mountain plover
- Northern harrier
- Short-eared owl
- Swainson's hawk
- Tricolored blackbird
- White-tailed kite
- Yellow-headed blackbird
- American badger
- Giant kangaroo rat
- Pallid bat
- San Joaquin kit fox
- Short-nosed kangaroo rat
- Townsend's big-eared bat
- Western mastiff bat
- Western red bat

4.4.1 Conservancy Fairy Shrimp, Longhorn Fairy Shrimp, Vernal Pool Fairy Shrimp, and Vernal Pool Tadpole Shrimp

4.4.1.1 Conservancy Fairy Shrimp

The majority of sites inhabited by Conservancy fairy shrimp are large to very large, turbid, clay-bottomed vernal pools called playa pools (Eriksen and Belk, 1999; Helm and Vollmar, 2002). Playa pools typically remain inundated much longer than most vernal pools, often well into the summer, even though they often have maximum depths comparable to vernal pools (Vollmar, 2002: 35). Playa pools are much larger and more rare on the landscape than vernal pools. However, while typically found in larger pools, they have also been found in pools as small as 323 square feet (30 square meters–USFWS, 2005a). Ericksen and Belk (1999) report that Conservancy fairy shrimp are usually associated with cool-water pools that are low to moderate in dissolved solids. Conservancy fairy shrimp are believed to have historically occupied suitable vernal pools throughout a large portion of the Central Valley (USFWS, 2005a). This species is currently known from disjunct populations in Tehama, Glenn, Placer, Solano, Yolo, Stanislaus, and Merced Counties (USFWS, 2007). There is no critical habitat for this species near the project area.

There are no CNDDB records for Conservancy fairy shrimp within the BSA, and no critical habitat overlaps with the project (Figure 5). The nearest CNDDB record is for a location roughly 12 miles (19 kilometers) east of the project area. Five vernal pools or vernal pool areas were mapped within the project area. One, shown on Figure 3, map 24, Patterson Pass A alternative corridor, is in a sandstone formation; other vernal pools *not shown* occur a short distance to the east of this pool between the Patterson Pass A alternative corridor and the proposed corridor. Two more mapped vernal pools are shown on Figure 3, map 30, in the proposed corridor just north of Garzas Creek, the fourth mapped vernal pool occurs just east of San Luis Substation in all corridors, proposed and alternative, that run into and out of this substation to the east. It is shown on Figure 3, map 39. The fifth mapped vernal pool is a vernal pool grassland (an area with multiple pools) west of Los Banos Substation, shown on Figure 3, maps 40 and 41.

Playa pools and other very large, turbid pools are not present in the project area; however, a playa-sized pool occurs approximately 550 feet (168 meters) east of the proposed corridor and 0.9 miles (1.4 kilometers) southeast of the vernal pools shown on Figure 3, map 25. In addition to vernal pools found within proposed and alternate corridors, at least two vernal pools are known to occur within 200 feet (61 meters) outside of these corridors, and others could be present within and adjacent to the project area in areas not surveyed in 2014 and 2015. Unless protocol surveys in the year prior to construction or O&M indicate absence, Conservancy fairy shrimp will be assumed to be present in suitable habitat throughout the project area.

4.4.1.2 Longhorn Fairy Shrimp

The longhorn fairy shrimp is not well understood. It is known from a few widely dispersed locations with very different microhabitat characteristics, including sandstone rock pools near Livermore (Contra Costa County), alkaline grassland pools within basin rim formations (Merced County), and alkali pools within alkali sink scrub habitat on the Carrizo Plain (San Luis Obispo County) (Vollmar et al., 2013). While it is currently known only from six disjunct populations in Tehama, Butte, Solano, Glenn, Merced, and northern San Luis Obispo Counties (CDFW, 2015a), it likely was once more widespread in the regions where it is currently known, including the San Joaquin Vernal Pool Region (USFWS, 2005a), which runs

roughly the length of the project area just to the east. One known location is a roadside ditch 2 miles (3.2 kilometers) north of Los Banos.

There are no CNDDB records for longhorn fairy shrimp within the BSA, and no critical habitat overlaps with the project (Figure 5). The nearest CNDDB record is for a location roughly 3 miles (4.8 kilometers) west of the project area. Locations of vernal pools are as described above in section 4.4.1.1. Because it is known from a number of widely spaced locations and from a variety of vernal pool types, some of which could or do occur in the project area (sandstone rock pools and alkaline grassland pools), presence of longhorn fairy shrimp is assumed in the few places where vernal pools occur throughout the project area, unless protocol surveys in the year prior to construction or O&M indicate absence.

4.4.1.3 Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp can occur in a range of pool sizes and depths, but typically occupies pools at least 4 inches (10 centimeters) in maximum potential ponding depth (Helm and Vollmar, 2002). It can tolerate a range of water-quality conditions though it seems to prefer pools with relatively clear water and a medium level of algal growth; it thrives under cold-water conditions, and it occurs in varied terrain, including basin rim, low terrace, and high terrace settings, and a range of soil types (Vollmar et al., 2013). It is the most widespread of the large California vernal pool branchiopods, occurring in scattered areas throughout much of the Central Valley, sporadically in the central and southern coast ranges and Los Angeles Basin, and up into southern Oregon.

Vernal pool fairy shrimp critical habitat Unit 19B lies approximately 2 miles (3.2 kilometers) northwest of the Tracy Substation, with other patches lying farther west and still others farther east of different parts of the project area. There are no CNDDB records for vernal pool fairy shrimp within the BSA, and no critical habitat overlaps with the project (Figure 5). The nearest CNDDB record is for a location roughly 15 miles (24 kilometers) east of the project area. Locations of vernal pools are as described above in section 4.4.1.1. Presence of vernal pool fairy shrimp in the project area is assumed unless protocol surveys in the year prior to construction or O&M indicate absence.

4.4.1.4 Vernal Pool Tadpole Shrimp

This species typically inhabits medium to large pools that are at least 6–7 inches (15–18 centimeters) in maximum potential ponding depth (Helm and Vollmar, 2002) and commonly occurs in areas with a medium to high density of large, hydrologically interconnected pools (Vollmar et al., 2013). It is found in many types of pools, from small to large, from clear to turbid (Vollmar et al., 2013). It can tolerate a range of water-quality conditions including high turbidity and is occasionally found in seasonal stock ponds. The vernal pool tadpole shrimp is nearly endemic to the Central Valley with the exception of a few occurrences documented in southwest Alameda County near the southern end of San Francisco Bay. Within the Central Valley, most occurrences are concentrated along the eastern side, though population centers extend into western Merced and Solano Counties; there are also some scattered occurrences along the west side of the Sacramento Valley.

There are no CNDDB records for vernal pool tadpole shrimp within1 mile (1.6 kilometers) of the project area, and no critical habitat overlaps with the project (Figure 5). The nearest CNDDB record is for a location roughly 10 miles east of the project area. Locations of vernal pools are as described in section 4.4.1.1 above. Presence of vernal pool tadpole shrimp is assumed in vernal pools and stock ponds within the project area, unless protocol surveys in the year prior to construction or O&M indicate absence.

4.4.1.5 Potential to Occur in Project Vicinity

In the absence of negative protocol surveys, all vernal pool branchiopods are assumed to be present in vernal pools and, for tadpole shrimp, in stock ponds within the project area.

4.4.1.6 Project Effects

Four species of vernal pool branchiopod could be affected by project activities. Direct effects could include physical damage to occupied or potential habitats, construction-related erosion or runoff into aquatic habitats, and loss of individuals during project construction. Indirect effects could include degradation or loss of occupied or potential habitats through erosion or runoff from construction areas and new roads, and from operations and maintenance such as long-term use of new or existing access roads, tower/line repairs, introduction of human trash, introduction or spread of non-native plants or predators, spread of disease, spill of hazardous materials, and increased susceptibility to wild fire.

Project effects to habitats for branchiopods cannot yet be quantified. Implementation of EPMs will ensure that direct effects from erosion or runoff and indirect effects associated with human trash and introduction of non-native plants will be minimized or avoided. In the absence of other avoidance and minimization measures, individuals and their habitats would still be vulnerable to direct and indirect physical damage during construction and O&M activities.

4.4.1.7 Avoidance and Minimization Measures

Western will consult with USFWS for federally listed branchiopods and with SJCOG for impacts to special-status species falling under the jurisdiction of the San Joaquin County Multi-species Conservation and Open Space Plan (SJCOG, 2000) where the project lies within San Joaquin County, as appropriate. Any avoidance, minimization, or compensation measures developed during consultation with these agencies will supersede those listed in this report. Implementation of BIO-1 and BIO-2 would also avoid and minimize impacts to vernal pool branchiopods.

4.4.1.8 Compensatory Mitigation

BIO-9 If effects to branchiopod habitats cannot be avoided, Western will compensate for effects through one of the following: (a) affected pools will be restored on site after construction is complete, (b) credits will be acquired from an agency-approved conservation bank, (c) funds will be deposited into an approved in-lieu fee program, or (d) a conservation easement will be purchased. Western will work with the USFWS to ensure adequate compensation.

For onsite creation or restoration, Western will develop and implement a mitigation monitoring and reporting plan with input from and approval by regulatory agencies that outlines performance standards and success criteria for ensuring long-term success of mitigation. If it is necessary for cysts to be salvaged to restore affected pools and with concurrence from the USFWS, an agency-approved biologist will salvage soils from local sites that are known to support vernal pool branchiopods at least 2 weeks before the onset of construction, or during the preceding dry season if pools are anticipated to hold water when construction begins. The salvaged soil samples will be stored and used to inoculate restored pools.

4.4.1.9 Cumulative Effects

The project would not contribute to cumulative effects to branchiopods with implementation of EPMs and avoidance, minimization, and compensation measures.

4.4.2 Valley Elderberry Longhorn Beetle

The valley elderberry longhorn beetle is endemic to the Central Valley and foothills of California, and is found only in association with its host plant, elderberry (*Sambucus* spp.), a common component of riparian forests and adjacent uplands (USFWS, 1999). Elderberry plants that support elderberry beetle populations are generally found along waterways and in floodplains and savannas that support remnant stands of riparian vegetation. The beetle inhabits plants of various sizes, ages, and growth forms. Larvae feed internally on the pith of the trunk and larger branches, while adults appear to feed externally only on foliage and flowers (USFWS, 2006). The life cycle takes one to two years to complete. From March through June, beetles mate and females lay eggs on living elderberry plants. The first instar larvae bore to the center of elderberry stems where they develop for one to two years (USFWS, 2006).

Use of elderberry plants by this beetle is rarely apparent. Frequently, the only exterior evidence of use is an exit hole created by the larvae just prior to the pupal stage. Field work indicates that larval galleries can be found in elderberry stems with no evidence of exit holes—the larvae either succumb prior to constructing an exit hole or are not far enough along in the developmental process to construct an exit hole (USFWS, 1997). Larvae appear to be distributed primarily in stems that are 1 inch (2.54 centimeters) or greater in diameter at ground level (USFWS, 1999). This beetle is found in the Central Valley and foothills from Shasta County to Kern County.

There are no CNDDB records for valley elderberry longhorn beetle within 1 mile (1.6 kilometers) of the project area, nor is there critical habitat within that distance. Of interest within the nine-quad search area: three breeding adults were found in 2002 in an elderberry stand in a small canyon on Lawrence-Livermore property about 1.5 miles (2.4 kilometers) southwest of the of the project area north of Corral Hollow. Another CNDDB record from 1987 along Los Banos Creek was later determined to be a different subspecies. All other CNDDB records are from well east of the project area.

A number of large, well-developed elderberry plants were found within the narrow riparian zone along Salado Creek during spring 2014 surveys. Approximately 12 large shrubs were visible within the proposed corridor and 12–13 large shrubs were visible within the alternative corridor. Additional shrubs may be found within the relatively dense riparian in both locations. Salado Creek is best shown on Figure 3, map 23. A formal survey for exit holes in these shrubs was not conducted, but easily accessible plants were examined superficially and exit holes were not seen. Adults were not seen. Elderberry plants were also found within the floodplain of Los Banos Creek in the Billy Wright Road alternative (Figure 3, map 47).

Elderberry plants were not detected at any other location but there is potential for their occurrence in parts of the project area not accessible during spring 2014 and 2015.

4.4.2.1 Potential to Occur in Project Vicinity

Valley elderberry longhorn beetle could be present in the elderberry shrubs found along Salado Creek and in areas not surveyed during spring 2014.

4.4.2.2 Project Effects

Direct effects to valley elderberry longhorn beetle could include physical damage to occupied or potential habitats and loss of individual beetles during project construction. Indirect effects could include degradation or loss of occupied or potential habitats through operation and maintenance such as long-term use of new or existing access roads, tower/line repairs, introduction of human trash, introduction or spread of non-native plants or predators, spread of disease, spill of hazardous materials, and increased susceptibility to wild fire. Project effects to elderberry plants cannot yet be quantified. Implementation of project EPMs would ensure protection of riparian areas in general, but individual elderberry beetles or elderberry plants would still be vulnerable to physical damage and local degradation within riparian zones, and project EPMs provide no protection of elderberry plants outside of a riparian zone. This invertebrate could be adversely affected by the project.

4.4.2.3 Avoidance and Minimization Measures

Pursuant to conservation guidelines provided in USFWS 1999 (or more current document), the measures below apply to construction and O&M activities. Western will consult with USFWS for impacts to valley elderberry longhorn beetle and with SJCOG for impacts falling under the jurisdiction of the San Joaquin County Multi-species Conservation and Open Space Plan (SJCOG, 2000) where the project lies within San Joaquin County, as appropriate.

BIO-10 During project construction, Western will protect valley elderberry longhorn beetle by implementing the following:

- If the project may affect valley elderberry longhorn beetle, take authorization/permits will be obtained from the USFWS. Upon completion of the authorization/permit process, Western will implement the terms and conditions of the authorizations for this beetle, which could include but may not be limited to the following.
- A 100-foot (30.5-meter) no-disturbance buffer fence will be installed and maintained around the perimeter of elderberry shrubs. No grading or any other ground-disturbing activities will be conducted within the fenced area without prior verification that the requirements of the USFWS have been satisfied including the issuance of any necessary permits or authorizations.
- Contractors will be briefed on the status of the beetle, the need to protect its elderberry host plant, the need to stay out of this 100-foot buffer, and the possible penalties for not complying with these requirements.
- Signs will be erected every 50 feet (15 meters) along the edge of avoidance areas with the following statements: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.” The signs will be clearly readable from a distance of 20 feet (6 meters), and will be maintained for the duration of construction.
- Biological monitoring will be provided by an agency-approved biologist during construction in all areas within 100 feet (30.5 meters) of elderberry plants.

BIO-11 During O&M activities, Western will implement the following measures.

- Prior to initiating vegetation clearance with elderberry plants present, qualified personnel will clearly flag or fence each elderberry plant with a stem measuring 1 inch (2.54

centimeters) or greater in diameter at ground level. If an elderberry plant meeting this criterion is present:

- A minimum buffer zone of 20 feet (6 meters) outside of the dripline of each elderberry plant will be provided during all routine O&M activities within which all O&M activities except manual clearing will be prohibited.
- No insecticides, herbicides, fertilizers, or other chemicals will be used within 100 feet (30.5 meters) of an elderberry plant, except direct application to target vegetation.
- Trimming, rather than removal of shrubs, will be used where feasible. Directional felling of trees and manual-cutting trees prior to removal will be used to minimize impacts to elderberries.
- Replacement of existing conductor or installation of additional lines will be performed by pulling the line from tower to tower without touching the vegetation in areas where elderberry plants were present.

4.4.2.4 Compensatory Mitigation

It is expected that complete avoidance of elderberry plants will be feasible. If avoidance is not feasible, compensatory mitigation will be required as follows:

BIO-12 If complete avoidance (100 feet) of elderberry plants is not feasible, a mitigation plan will be developed in accordance with the most current USFWS mitigation guidelines (currently USFWS, 1999) that will include provision for compensatory mitigation. The mitigation plan will include, but may not be limited to, relocating elderberry shrubs, planting elderberry shrubs, establishing success criteria, monitoring relocated and planted elderberry shrubs to ensure success, and an adaptive management plan in the event that mitigation is not successful.

4.4.2.5 Cumulative Effects

The project would not contribute to cumulative effects to valley elderberry longhorn beetle if elderberry plants are completely avoided, or if, in the event avoidance is not feasible, mitigation measures are implemented and successful in the long term. If either of these does not occur, the project would contribute to the cumulative loss of habitat for this invertebrate.

4.4.3 Fishes

4.4.3.1 Delta Smelt

The Delta smelt is tolerant of a wide range of salinities but spawns in fresh water. For a large part of its annual life cycle it is associated with the freshwater edge of the mixing zone, called the saltwater-freshwater interface (USFWS, 1994). Shortly before spawning, it disperses widely into upstream river channels and tidally influenced backwater sloughs (USFWS, 1994, Leidy, 2007). After several weeks of development, larvae migrate downstream until they reach nursery habitat in a low-salinity zone (USFWS, 2010). Juvenile smelt rear and grow in this zone, preferring relatively shallow, open water. Once adulthood is reached, Delta smelt begin a gradual migration back into freshwater areas to spawn (USFWS, 2010). Delta smelt is a true estuarine-dependent species and is therefore restricted to the tidal portions of the Delta, Suisun Bay, San Pablo Bay, and the lower Sacramento and San Joaquin rivers (Herbold et al., 1992, *in* Leidy, 2007).

Critical habitat for the Delta smelt includes all water and all submerged lands below ordinary high water within specific geographic boundaries (USFWS, 1994). These boundaries include uplands surrounding waterways, but uplands are not themselves critical habitat. Figure 5 shows overlap of the project with critical habitat. The northernmost 3 miles (4.8 kilometers) of the project lies within critical habitat for Delta smelt. This area includes Mountain House Creek and other canals and ditches that could potentially harbor this fish; however, there is no evidence that any waterway within the project area communicates directly or indirectly with waterways occupied by Delta smelt (F. Mizuno pers. comm.), and the likelihood of Delta smelt occurrence is considered extremely low. The nearest CNDDB records are for a slough north of Clifton Court Forebay that is 4 miles (6.4 kilometers) north of the project area. Delta smelt has been discussed in this document because of project overlap with critical habitat.

4.4.3.2 Central Valley Steelhead

Hatched in fresh water, the anadromous form of the rainbow trout, the steelhead, emigrates to the ocean where most of its growth occurs, and returns to fresh water to spawn (McEwan, 2001). Peak spawning occurs from December through April in small streams and tributaries with cool, well-oxygenated water. Spawning takes place in shallow swift riffles with small gravel and cobble as the primary substrate (McEwan, 2001). The Central Valley steelhead's typical habitats are freshwater rivers and streams that are tributaries to the Sacramento and San Joaquin River systems. In the San Joaquin Valley, these streams originate in the Sierra; existing data do not show spawning streams originating in the coast ranges (McEwan 2001, NOAA Fisheries, 2014).

The western boundary of the Central Valley distinct population segment (DPS) of the steelhead encompasses most of the project area (NOAA Fisheries, 2014); however, the streams tributary to the San Joaquin River within which steelhead are known or expected to spawn all originate east of the San Joaquin River in the Sierra Nevada. The boundaries of the DPS show no known or expected spawning in tributaries originating west of the San Joaquin River (NOAA Fisheries, 2014); a range map provided in McEwan 2001 limits the current range of the Central Valley steelhead to an area bounded on the west by the western edge of the San Joaquin River many miles from the project area. Central Valley steelhead are therefore not expected to occur in any of the streams found in the project area.

North of the Tracy Substation, however, two CNDDB records for Central Valley steelhead (CDFW, 2015a) identify two fish-salvage facilities, Tracy Fish Facility and Skinner Delta Fish Protective Facility, where steelhead are frequently rescued from entrainment during Central Valley Project and State Water Project pumping activities. These CNDDB records identify areas 1.4 and 1.9 miles (2.25 and 3.1 kilometers) northeast and northwest of project boundaries. All other CNDDB records are for the San Joaquin River, well east of the project, or other waterways, well north of the project.

4.4.3.3 Potential to Occur in Project Vicinity

Within the northernmost 3 miles (4.8 kilometers) of the project area, Mountain House Creek and other ditches and canals fall within Delta smelt critical habitat and could potentially, but are considered unlikely to, support this fish. With the exception of Central Valley steelhead found entrained at fish-salvage facilities north of Tracy Substation, there is no evidence that Central Valley steelhead occur anywhere within the project area.

4.4.3.4 Project Effects

Direct and indirect effects to Central Valley steelhead are not expected because this species is not expected to occur in the project area. Similarly, Delta smelt is not expected to occur in or near the

project area; however, given project overlap with critical habitat, project effects to Delta smelt have been considered. Direct effects to Delta smelt could include physical damage to potential habitats. Indirect effects could include degradation or loss of potential habitats through erosion or runoff from construction areas and new roads, and from project operations and maintenance such as long-term use of new or existing access roads, tower/line repairs, introduction of human trash, introduction or spread of non-native plants or predators, spread of disease, spill of hazardous materials, and increased susceptibility to wild fire, which could reduce shade and affect both water quality and water temperature. Project EPMs would sufficiently minimize the potential for direct and indirect effects to Delta smelt.

4.4.3.5 Avoidance and Minimization Measures

No specific avoidance and minimization measures are proposed for Delta smelt and Central Valley steelhead because project EPMs would adequately protect their habitats in the unlikely event of the occurrence of these species in the project area.

4.4.3.6 Cumulative Effects

In the absence of project effects, the project would not contribute to cumulative effects.

4.4.4 Reptiles

4.4.4.1 Alameda Whipsnake

Typical habitat for the Alameda whipsnake is chaparral/scrub plant communities and any of the naturally occurring plant communities found in association with this type, including grassland, oak savanna, oak-bay woodland, mixed evergreen forest, rock outcrop, and riparian zones (Swaim 1994, Alvarez et al., 2005). This snake is often found where grassland meets chaparral, and in riparian zones they prefer cobble creek beds for travel and foraging (K Swaim pers. comm.). Swaim 1994 reported that most telemetry locations of snakes occur within 170 feet (50 meters) of scrub habitats, with some as far as 500 feet (152 meters), but Alvarez et al. 2005 reported one snake found in annual grassland 4.5 miles from scrub. However, the type of vegetation may have less to do with preference by the whipsnake than the extent of the canopy, slope exposure, the availability of retreats such as rock outcrops and rodent burrows, and prey species composition and abundance (Swaim, 1994), and homogeneous grassland is of low suitability when not contiguous with a mosaic of riparian, rock outcrops, and/or scrub (J Alvarez pers. comm.).

The current range of the Alameda whipsnake includes mosaics of chaparral, coastal scrub, and adjacent habitat types throughout Contra Costa County, most of Alameda County, and small portions of northern Santa Clara and western San Joaquin Counties (USFWS, 2011a). This range has been subdivided into five populations that correspond to relatively contiguous mosaics of chaparral and coastal scrub, grassland, oak woodland/savanna, and riparian vegetation types; these five populations are otherwise fragmented by urban development, transportation corridors, and a lack of coastal scrub and chaparral vegetation (USFWS, 2011a). As described in the USFWS 5-year review (USFWS, 2011a), the draft recovery plan established five draft recovery units corresponding to each of these five populations; two additional draft recovery units were established to correspond to corridors that best provide habitat linkage between the five populations. Draft recovery unit 5 is the unit nearest the project area; it lies at closest roughly 3.25 miles (5.2 kilometers) west of the alternative corridor in western San Joaquin County.

There are a number of CNDDB records for Alameda whipsnake within 1 mile (1.6 kilometers) represented by two large polygons, one comprising the entire Midway quad and the other comprising the entire Lone Tree Creek quad (CDFW, 2015a), both of which overlap with parts of the project area from just north of I-205 south to roughly the level of Hospital Creek. Records are from 1937, and the 1970s, 1980s, and 1990s, including a record that describes habitat as grassland/coastal sage scrub. Most of the project area within these polygons was either walked or driven and spot-checked in spring 2014, and coastal scrub habitats were not found. Habitats in the proposed and alternative corridors within Alameda whipsnake range are almost entirely non-native annual grassland with an occasional rock outcrop and ephemeral drainage, but the mosaic of habitats preferred by Alameda whipsnake was not seen. While there are exceptions, most Alameda whipsnakes are found within 500–1000 feet (152–305 meters) of scrub habitats or some kind of suitable habitat mosaic (Swaim, 1994; Alvarez et al., 2005; Alvarez, pers. comm.). The best habitats within the project area occur within or adjacent to Corral Hollow, Lone Tree, and Hospital creeks where there is slightly more diversity of cover types. Grazed non-native grassland without a diversity of cover types is considered marginal. It should be noted that USFWS considers habitats within the species' range to be occupied.

Unit 5A is the critical habitat unit nearest the project area but it is roughly 2.25 miles (3.6 kilometers) west of the alternative corridor north of Corral Hollow (USFWS, 2011a). The project does not overlap with critical habitat for this species (Figure 5).

4.4.4.2 Blunt-nosed Leopard Lizard

Blunt-nosed leopard lizards inhabit flat to rolling slopes, alluvial fans, alkali flats, and washes vegetated with sparse shrubs and grasses with little or no understory. They generally avoid areas of dense vegetation, such as dense grasses, and long-term studies show that population densities decline after years of consecutive above-average rainfall (Germano et al., 2004; Germano et al., 2005; Germano and Williams, 2005). Radio-telemetry studies near the Elk Hills in Kern County have documented that blunt-nosed leopard lizards are generally restricted to more open habitats (e.g., washes, roads, grazed pastures) when grass cover is thick, but they may utilize grassland areas if the herbaceous cover is sparse (Warrick et al., 1998).

Leopard lizards use small mammal burrows created by California ground squirrels, pocket mice, kangaroo rats, and other rodents for permanent shelter and dormancy and into which they retreat to aestivate during the winter months. Surface activity occurs between May and September, but activity is highly regulated by air and soil temperatures. Optimal activity occurs when air temperatures are between 77F and 95F (25F and 35C) and ground temperatures are between 72F and 97F (22C and 36C). Leopard lizards are most likely to be observed in the morning and late afternoon during hotter days. Smaller lizards and young have a wider activity range than adults, both daily and seasonally. Sub-adult lizards emerge from hibernation earlier than adults and remain active later in the fall, so that by the end of June or July almost all sightings are of sub-adults and hatchlings. Juvenile lizards also are active earlier and later in the day than adults. Adults retreat to their burrows and enter a dormancy period beginning in August or September, but hatchlings are active on the surface until mid-October or November, depending on weather (www.esrp.csustan.edu).

Blunt-nosed leopard lizards inhabit interior coast range saltbush scrub (Holland, 1986, Sawyer et al., 2009), which in the project area ranges from Pacheco Pass southward. Much of this habitat has been converted to non-native annual grassland by intensive livestock grazing and fire. Other foothill communities that occur within the range of the blunt-nosed leopard lizard are Upper Sonoran subshrub scrub and serpentine bunchgrass (Holland, 1986). In general, leopard lizards are absent from steep slopes (>20-30 degrees), dense vegetation, or areas subject to seasonal flooding.

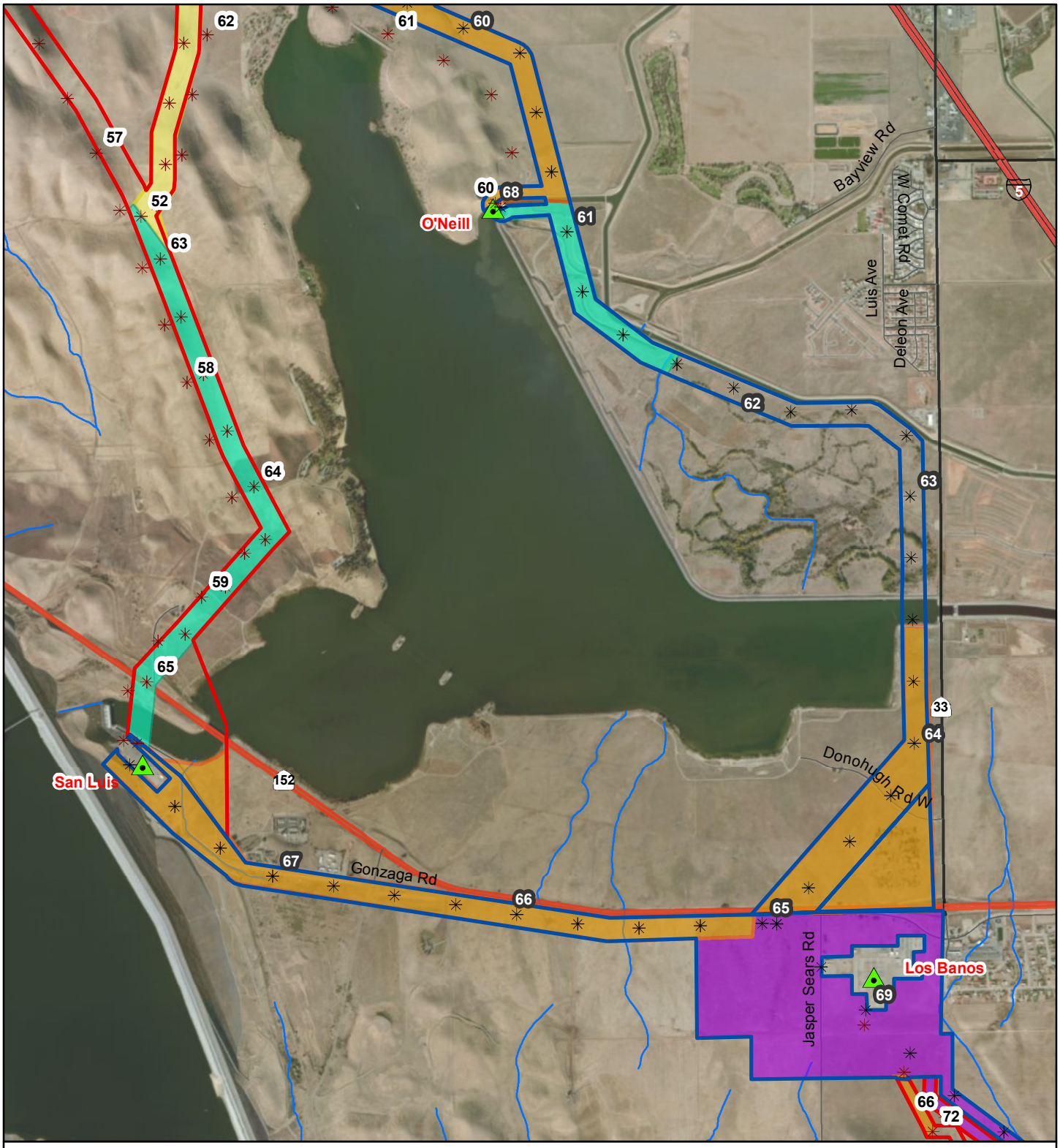
This relatively large, predatory lizard formerly ranged in arid habitats throughout the San Joaquin Valley and into the surrounding foothills and associated valleys from San Joaquin County southward through Kern County into northeastern Santa Barbara County and northwestern Ventura County. Conversion of saltbush scrub and valley grassland habitat to agricultural, oil, and urban expansion has eliminated this species from more than 90 percent of its historic range (Germano and Williams, 1992; USFWS, 2010b). Blunt-nosed leopard lizards now are restricted to highly fragmented patches of arid-land habitats on the floor of the San Joaquin Valley and surrounding foothills from about Merced County southward (USFWS, 2010b). More contiguous habitat occurs in the foothills that border the western edge of the Valley in this region, such as the Kettleman Hills, Temblor Range, Ciervo Hills, Panoche Hills, and Tumey Hills, as well as the isolated valleys between individual ranges, including the Kettleman Plain, Panoche Valley, Carrizo Plain, Elkhorn Plain, and upper Cuyama Valley of northeastern Santa Barbara and Ventura Counties (USFWS, 2010b). In the latter region, it hybridizes with the widespread species, *G. wislizenii* (Montanucci, 1970).

There are six blunt-nosed leopard lizard records in the CNDDB from the project region with observations made between 1931 and 1993. The records are clustered in foothill regions ranging 2–3 miles south and southwest of the southern end of the project area northward to the southern edge of San Luis Reservoir. The most recent USFWS five-year status review (USFWS, 2010b), and the Service's guidance for us during agency meetings for this project, places the northernmost range limit at Santa Nella, near the north end of San Luis Reservoir. Leopard lizards were not observed during spring 2014 reconnaissance surveys but suitable habitat was found discontinuously across the southern portion of the project area. Figure 6 below presents relative habitat suitability in proposed and alternative corridors; note that habitat suitability was assessed using aerial imagery where right of entry was not available. Appendix F presents the data behind Figure 6 in tabular form, as well as a memo prepared for agencies on habitat requirements of blunt-nosed leopard lizard.

4.4.4.3 California Legless Lizard

Despite a large geographic range that extends from San Francisco Bay southward into Baja California, Mexico, the local occurrence of the California legless lizard is determined by edaphic (soil), climatic, and vegetative conditions. It inhabits a variety of habitats, including coastal dunes, scrub, savanna, woodland, and forest habitats that share the common feature of growing on sand or sandy loam soils (Hunt, 2008). Surface activity is correlated with the rainy season when air and soil temperatures are seasonally low and soil moisture is elevated. Home ranges are very small (Kuhnz et al., 2005) and activity is focused around individual or clumps of shrubs and trees (Hunt, 1998). The species is also associated with streamside growths of sycamores, cottonwoods, and oaks with plenty of ground litter (Stebbins 2003; City of Oakley, 2005). A diurnal species, the California legless lizard forages in leaf litter under the overhang of trees and bushes and under rocks, logs, and old boards (Jennings and Hayes, 1994). Recent genetic work (Papenfuss and Parham, 2013) suggests that the taxon called *A. pulchra* contains at least five species-level taxa, although the geographical limits and contact zones of these taxa remain poorly known. The nominate form *pulchra* occurs in the project area.

There are no CNDDB records for legless lizards in the nine-quad search area, but they are known from sites surrounding the project area and are expected to occur in sandy scrub and woodland habitats and sandy washes such as Orestimba Creek, Quinto Creek, Garzas Creek, and similar creeks (Hunt pers. obs.).



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- Substation
- Proposed Corridor Alternative Quarter-mile Marker
- Proposed Project Corridor Survey Area
- Corridor Alternatives Survey Area
- 1-mile buffer around Project Area
- The Nature Conservancy Land

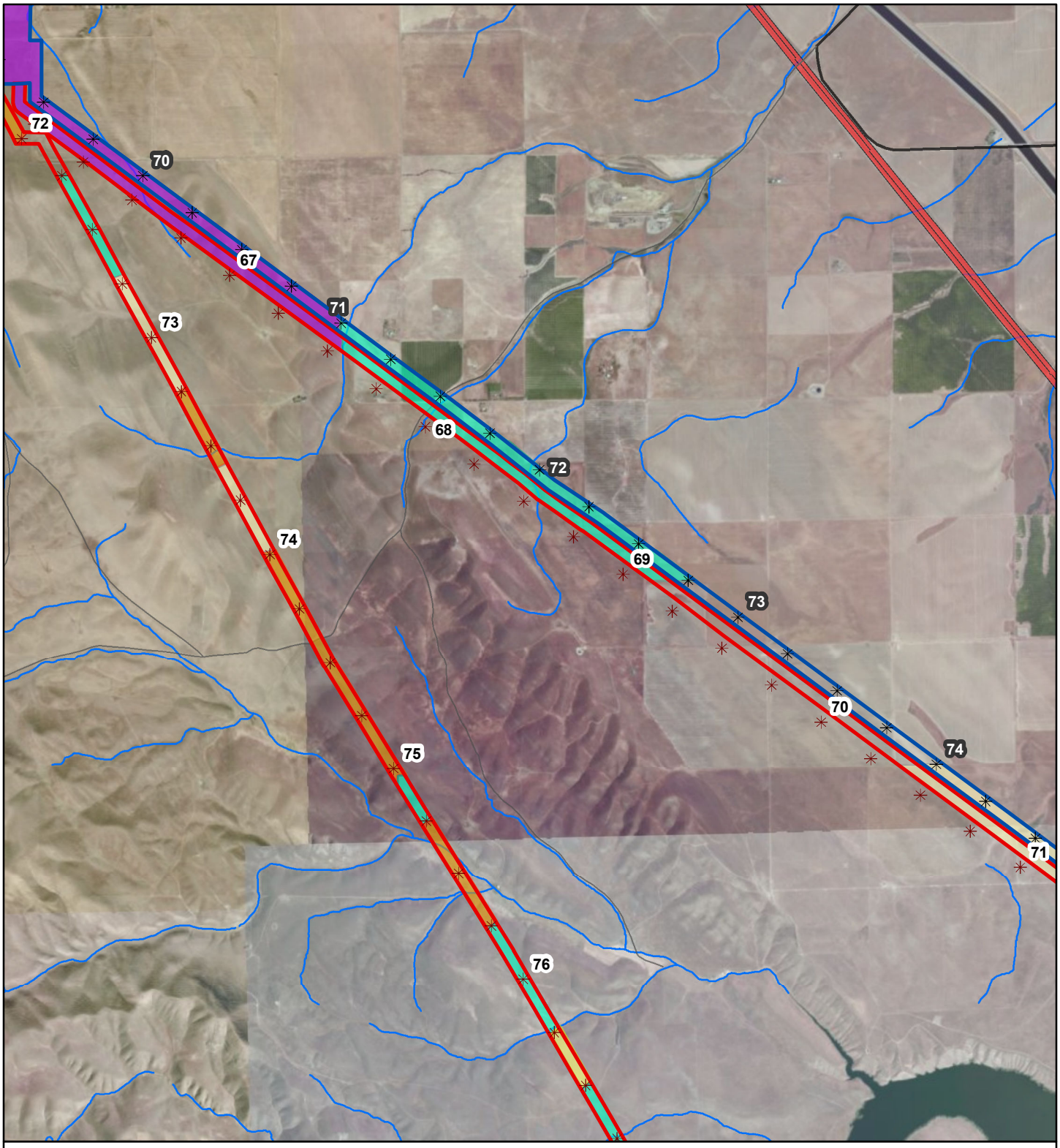
Habitat Suitability

- None (no fill)
- None to Low
- Low
- Low to Moderate
- Moderate
- Moderate to High
- High

0 0.25 0.5 Miles

Figure 6a.

Blunt-nosed Leopard Lizard Habitat Suitability



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- Substation
- Proposed Corridor Alternative Quarter-mile Marker
- Proposed Project Corridor Survey Area
- Corridor Alternatives Survey Area
- 1-mile buffer around Project Area
- The Nature Conservancy Land

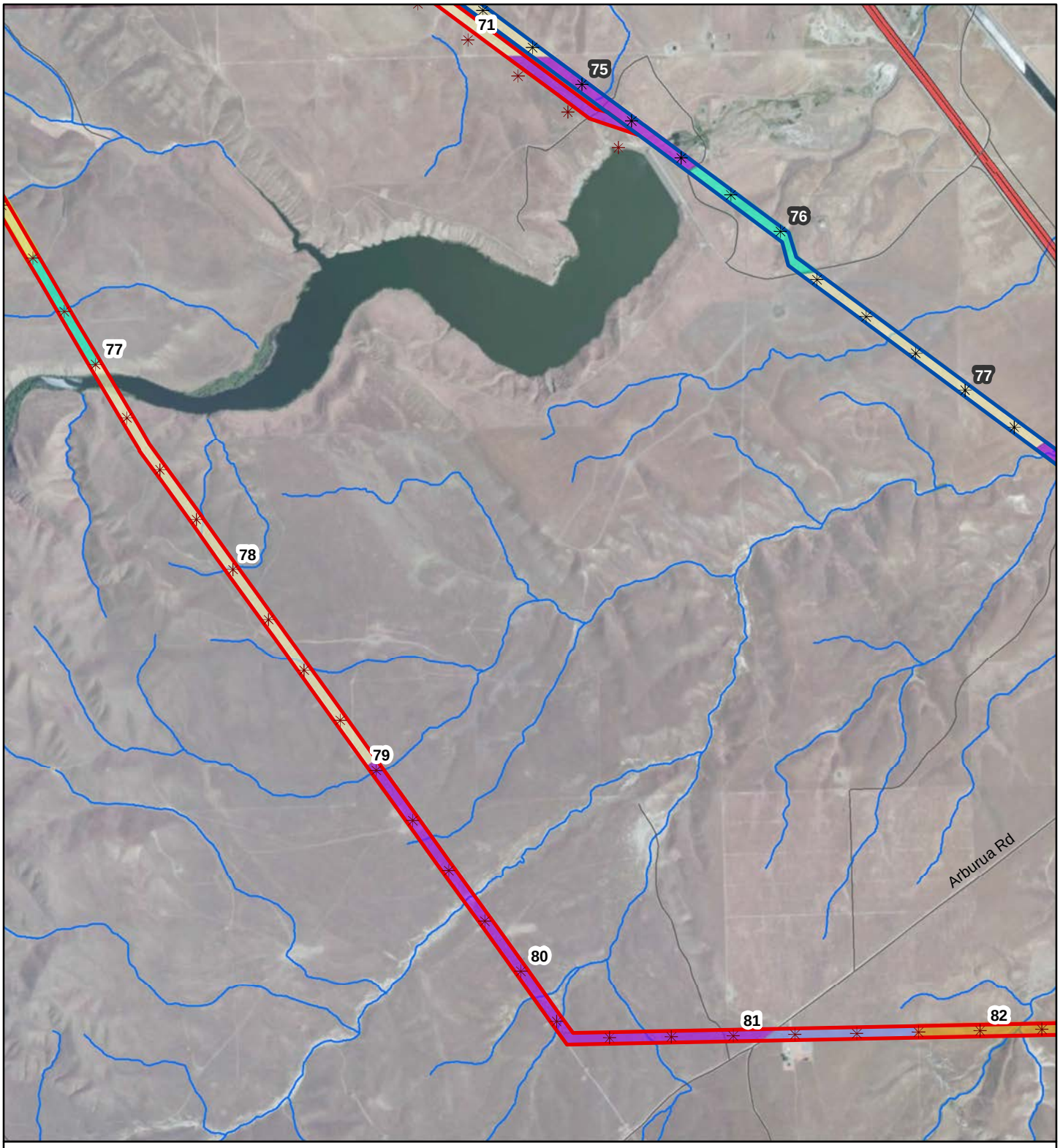
Habitat Suitability

- None (no fill)
- None to Low
- Low
- Low to Moderate
- Moderate
- Moderate to High
- High

0 0.25 0.5 Miles

Figure 6b.

Blunt-nosed Leopard Lizard Habitat Suitability



Western AREA POWER ADMINISTRATION

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Source: WAPA SNR, Aspen EG, ESRI, CPAD

Substation

Proposed Cor

Corridor Alternative Quarter-mile Marker

Proposed Project Corridor Survey Area

Corridor Alternatives Survey Area

1-mile buffer around Project Area

The Nature Conservancy Land

Habitat Suitability

None (no fill)

None to Low

Low

Low to Moderate

Moderate

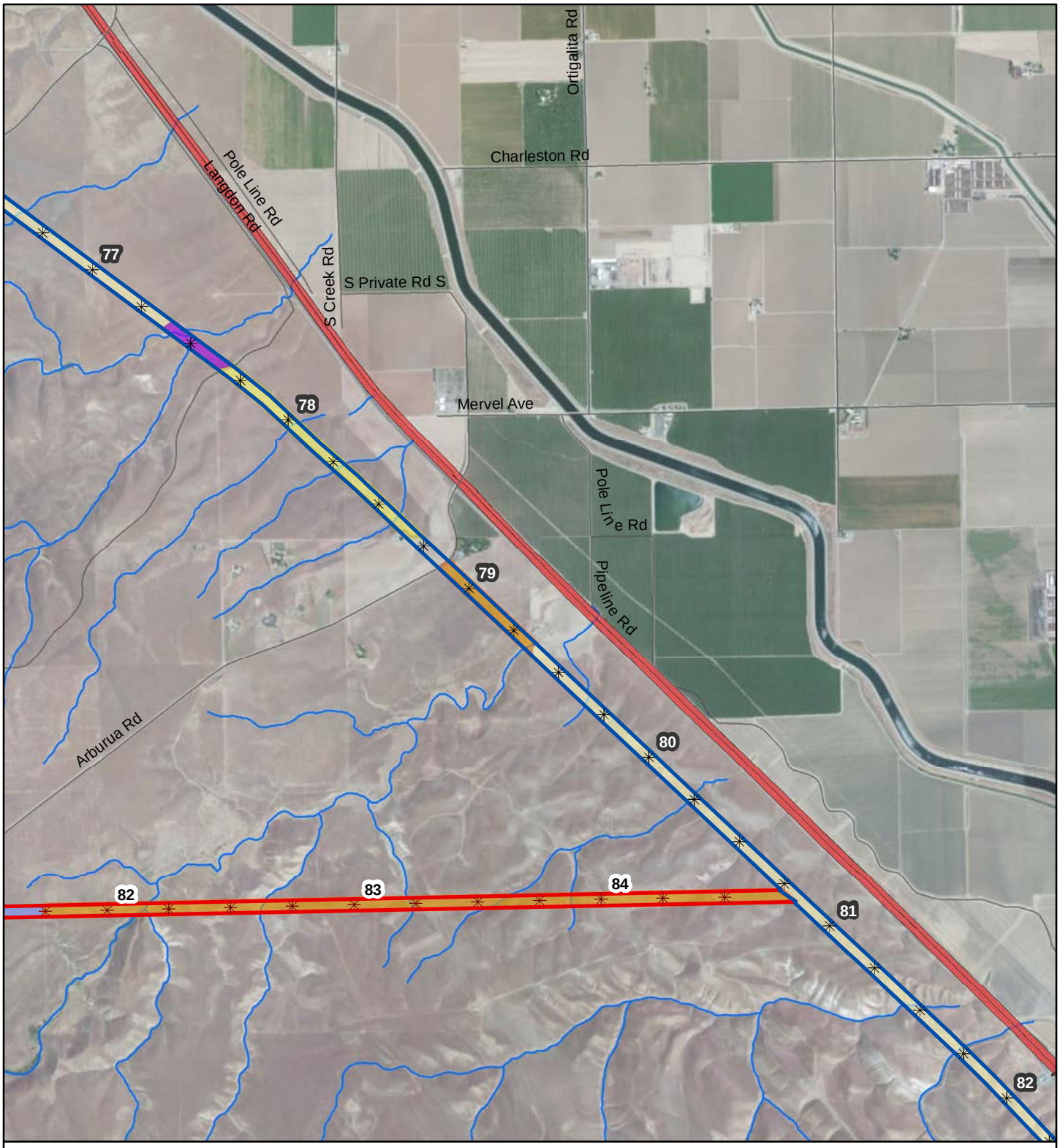
Moderate to High

High

0 0.25 0.5 Miles

Figure 6c.

Blunt-nosed Leopard Lizard Habitat Suitability



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Source: WAPA SNR, Aspen EG, ESRI, CPAD

- Substation
- Proposed Corridor Alternative Quarter-mile Marker
- Proposed Project Corridor Survey Area
- Corridor Alternatives Survey Area
- 1-mile buffer around Project Area
- The Nature Conservancy Land

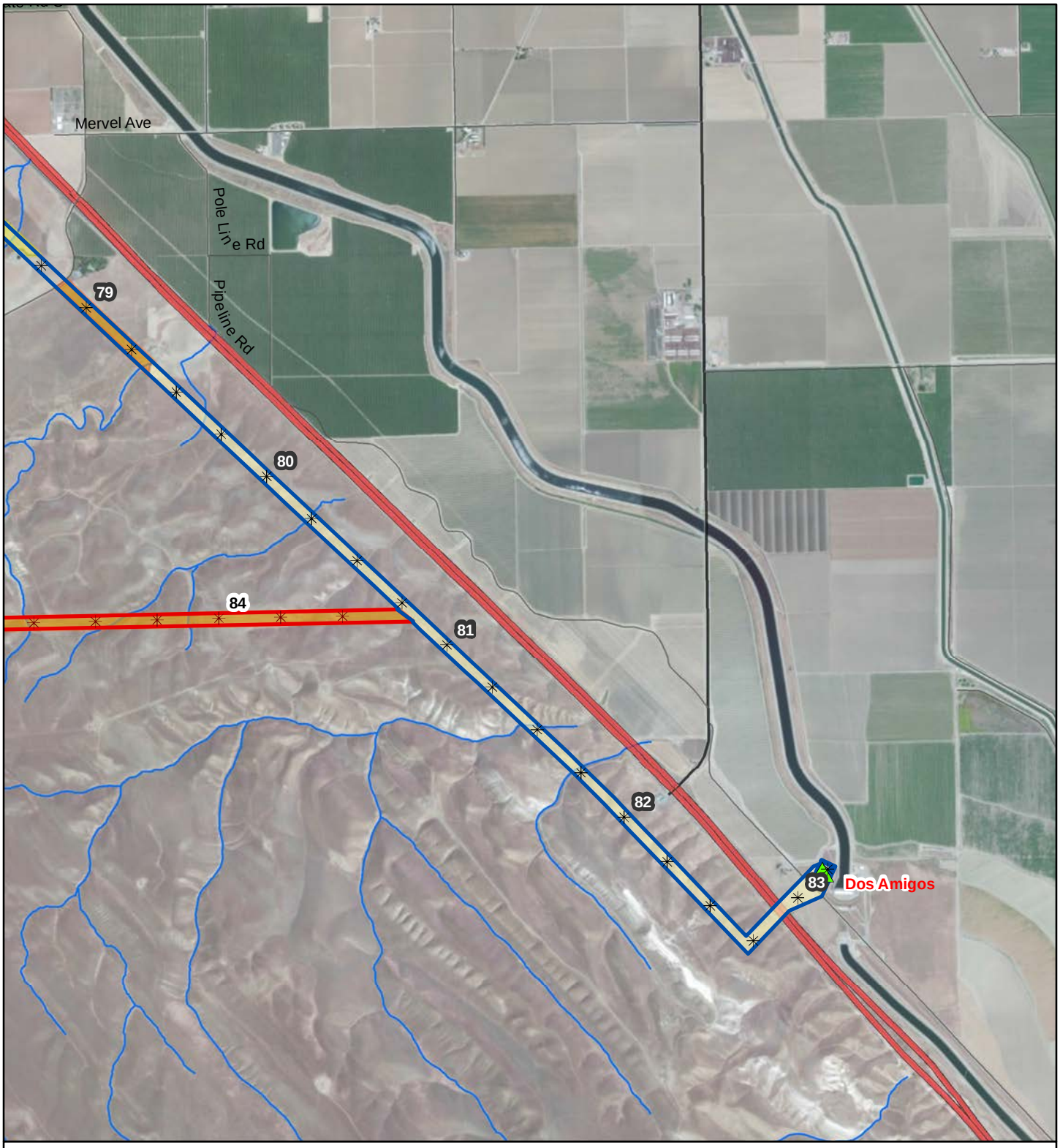
Habitat Suitability

- None (no fill)
- None to Low
- Low
- Low to Moderate
- Moderate
- Moderate to High
- High

0 0.25 0.5 Miles

Figure 6d.

Blunt-nosed Leopard Lizard Habitat Suitability



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Name/Org: SNR Date: 4/15/2015

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- Substation
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- Proposed Project Corridor Survey Area
- Corridor Alternatives Survey Area
- 1-mile buffer around Project Area
- The Nature Conservancy Land

Habitat Suitability

- None (no fill)
- None to Low
- Low
- Low to Moderate
- Moderate
- Moderate to High
- High

0 0.25 0.5 Miles

Figure 6e.

Blunt-nosed Leopard Lizard Habitat Suitability

4.4.4.4 Coast (Blainville's) Horned Lizard

The coast horned lizard inhabits open country, especially sandy areas, washes, floodplains, and wind-blown deposits in a variety of habitats (Morey, 2000), including annual and perennial grassland, oak woodland, chaparral, conifer, riparian, and juniper habitats. Important habitat features include loose, fine soils with high sand fraction, abundance of native ant species, open areas with limited overstory for basking, and areas with low, dense shrubs for refuge (YHJPA, 2013). Limiting habitat requirements are believed to include an exposed gravelly sandy substrate such as clearings in riparian woodlands or annual grassland with scattered perennial species (Jennings and Hayes, 1994). It is found in suitable habitats through the Central Valley and central and southern coast ranges and coastal areas. Four CNDDB records within 1 mile (1.6 kilometers) of the project area are dated 1990-1992 and are located between I-205 and just south of Corral Hollow Road. No coast horned lizards were detected during spring 2014 surveys; however, a number of the major and minor creeks, washes, and drainages, as well as adjacent grasslands, provide suitable habitat for this reptile.

With two exceptions, all CNDDB records are west of the project area and north of Corral Hollow in the preserve lands associated with the Highway 580 Business Park (SJCOG, 2011). The two exceptions are locations roughly 2 miles (3.2 kilometers) south of Corral Hollow, one of which overlaps with the project area. Suitable habitat is present throughout the project area.

4.4.4.5 Giant Garter Snake

Standard descriptions of giant garter snake habitat include marshes, ponds, sloughs, small lakes, low-gradient streams, and other waterways, as well as agricultural wetlands such as irrigation and drainage canals, rice fields, and their adjacent uplands (USFWS, 2006). A habitat suitability model described by the Butte County Association of Governments (BCAG, 2012) identifies the following land cover types below 200 feet mean sea level as giant garter snake habitat: rice, managed wetland, emergent wetland, willow scrub, irrigated cropland adjoining the above wetland types, and canals, sloughs, and permanent or intermittent low-gradient small streams that are within 8 km (5 mi) of the above wetland types. Further refinement is provided by Halstead et al. (2010), particularly for giant garter snake in the Sacramento Valley: giant garter snakes occur in areas with a dense network of canals, close to rice fields, with a low density of streams, close to open water and wetlands, and far from other agriculture, with a negative association with streams. On a microhabitat level, increased odds of use by giant garter snakes were associated with increased percent cover of emergent vegetation, terrestrial vegetation, litter (dead vegetation), and submerged vegetation (Halstead et al., 2011). Giant garter snakes usually occur within a few feet of water and are often found between the water level and the top of the bank (City of Sacramento, 2003). Giant garter snake expert Eric C Hansen (pers. comm.) describes giant garter snake habitat as flood basins with flood-bottom habitats with occupational covariates appearing to show that soils are important drivers, as are historical flood conditions. Giant garter snakes overwinter in burrows and crevices near foraging habitats; individuals have been seen using burrows as far as 164 feet (50 meters) from marsh edges during the active season, and retreating as far as 820 feet (250 meters) from wetland edges while overwintering, presumably to reach hibernacula above prevailing flood elevations (BCAG, 2012). Adequate burrows are typically located in sunny exposures (USFWS, 2006).

The current known distribution of giant garter snake is patchy, and extends from near Chico in Butte County, south to Mendota Wildlife Area in Fresno County (Hansen, 2008). Extant populations within the San Joaquin Valley, with one exception, originate south and west of the San Joaquin River where large wetland complexes remain (Hansen, 2008). Most of the CNDDB records are associated primarily with the Grasslands Ecological Area, the Mendota Wildlife Area, and the Los Banos Wildlife Area Complex

(Hansen, 2008). The USFWS 5-year review (USFWS, 2012a) identifies a similarly restricted range in the San Joaquin Valley; the currently occupied areas are all some distance from the project area. While known to occur in Los Banos Creek, which overlaps with the project area, there are no records of giant garter snake closer than 5 miles (8 kilometers) from the project area, and there are no records west of Interstate 5. This snake is not expected to occur upstream of Los Banos Reservoir where the Billy Wright Road alternative corridor crosses the creek, and the proposed corridor spans the concrete-lined spillway below the Los Banos Creek dam.

4.4.4.6 Pacific Pond Turtle

The Pacific pond turtle occurs in perennial waters such as lakes, ponds, rivers, streams, irrigation ditches, and sloughs with aquatic vegetation, deep or muddy water for cover, and sunny openings (Jennings and Hayes, 1994). Pond turtles need basking sites for thermoregulation such as logs, vegetation mats, open banks, or rock outcrops adjacent to deep water for escape. While adults are found in a variety of habitats, hatchlings and juveniles require specific habitats for survival: shallow water with relatively dense submergent or short emergent vegetation in which to forage and hide from predators (Jennings and Hayes 1994, Stebbins 2003, CDFW, 2014a).

Although primarily aquatic, pond turtles leave aquatic habitats in the fall to mate and some overwinter in uplands (Jennings and Hayes, 1994). They nest in grassy uplands from late April to early August. Suitable upland habitat for egg-laying includes unshaded sandy banks or grassy, open fields on unshaded, south-facing slopes with generally less than 25 percent slope. Eggs are deposited in excavated nests, typically within 650 feet (200 meters) from aquatic habitats, but nests may be as far as 1300 feet (400 meters) from aquatic habitats (Jennings and Hayes, 1994). This turtle occurs in suitable habitats throughout California from mountainous foothills on the east to the coast on the west (CDFW, 2014a).

CNDDB records for Pacific pond turtle within 1 mile (1.6 kilometers) of the project are for Delta-Mendota Canal, Mountain House Creek, Corral Hollow Creek, Orestimba Creek, and Los Banos Creek. Pacific pond turtles were also detected during spring 2014 field surveys in Del Puerto Creek. They are likely to occur in suitable habitats throughout the project area and are expected to nest in uplands around some or most of the occupied aquatic sites. Project corridors provide nesting habitat around aquatic sites that may be some distance away.

4.4.4.7 San Joaquin Whipsnake

Little is known about the natural history of the San Joaquin whipsnake. It occurs in open, dry, treeless areas, including grassland and saltbush scrub, where it takes refuge in rodent burrows, under shaded vegetation, among rocks or surface objects, or in the branches of a bush (Stebbins, 2003; California Herps, 2014). San Joaquin whipsnakes are extremely active snakes that generally do not emerge from burrow retreats until surface temperatures reach 28C or higher (Hammerson, 1989). Consequently, emergence from winter aestivation occurs in late spring and diurnal emergence occurs in late morning (Jennings and Hayes, 1994). This snake is active from late April through August. This subspecies is found in the inner south coast ranges and southern San Joaquin Valley from Contra Costa County south to San Luis Obispo and Kern Counties.

CNDDB records for San Joaquin whipsnake in the project area are centered around Corral Hollow in the north and Los Banos Creek in the south. While extensive patches of suitable habitat are found in both proposed and alternative corridors, open grassland/rangeland without rodent burrows (formerly disked land or disused dry-farmed land) is not likely to be occupied. Washes associated with Corral Hollow, Lone Tree, Hospital, Orestimba, Romero, Quinto, Garzas, Ortigalita, Los Banos, Salt Creek, and similar

creeks may also provide suitable habitat for this species. This species was not observed during spring 2014 surveys.

4.4.4.8 Potential to Occur in Project Vicinity

With the exception of the giant garter snake, all of the reptiles described above have the potential to occur in suitable habitats within the project area. Giant garter snake is known to occur in Los Banos Creek, but not known to occur west of Interstate-5. It is not expected to occur in the project area.

4.4.4.9 Project Effects

Seven reptile species could be affected by project activities: Alameda whipsnake, blunt-nosed leopard lizard, California legless lizard, coast horned lizard, giant garter snake, western pond turtle, and San Joaquin whipsnake. Direct effects to all include temporary or permanent loss of or physical damage to occupied and otherwise suitable upland and aquatic habitats, mortality during construction or through vehicle ingress/egress, disturbance through human presence and construction noise and vibration, and collapse of burrows. Indirect effects could include degradation or loss of habitat through project operations and maintenance such as long-term use of new or existing access roads, tower/line repairs, introduction of human trash, introduction or spread of non-native plants or predators, spread of disease, spill of hazardous materials, and increased susceptibility to wild fire. In the relative scarcity of suitable habitat for Alameda whipsnake within the project area, direct effects are unlikely but not impossible. Tower pads would be constructed primarily in grazed non-native grasslands, which in the project area do not contain the diversity or types of cover preferred by this snake. Alameda whipsnake is most likely to occur in Corral Hollow and other northern creeks where there are more shrubs and a diversity of cover types. While creeks are likely to be entirely spanned by the proposed transmission line, thereby minimizing impacts to creek habitats, improvements to existing access roads and construction of new access roads could adversely affect occupied and potential habitats. Project EPMs do not provide sufficient protection for this snake and it could be adversely affected.

Similarly, California legless lizard, coast horned lizard, and San Joaquin whipsnake prefer a diversity of cover types not found in most of the grazed non-native grasslands where tower pads would be placed; however, improvements to existing access roads and construction of new roads could adversely affect occupied and potential habitats. Areas with more shrub cover occur around O'Neill Forebay and San Luis Reservoirs (in roughly a 1-mile radius around each) and through many of the creek corridors in the project area. Project EPMs do not provide sufficient protection for these three species.

Giant garter snake is not expected to occur west of Interstate 5 or upstream of the Los Banos Reservoir, and the project would not directly affect Los Banos Creek or any other creek flowing into occupied habitat. While project effects will occur in uplands associated with Los Banos Creek, the creek below the dam is a concrete spillway and not suitable for this snake. Project EPMs sufficiently protect this snake in the unlikely event of its presence.

Western pond turtle could be affected by impacts to both aquatic and upland habitats. Project EPMs do not provide sufficient protection for this reptile.

The blunt-nosed leopard lizard is both state and federally endangered, but it is its status as a California fully protected species that entirely prohibits project-related take of this species; CDFW cannot authorize take (CDFW in litt., 2014b). Project EPMs do not provide sufficient protection for this lizard.

4.4.4.10 Avoidance and Minimization Measures

Measures to protect special-status reptiles are presented below. Western will consult with USFWS and CDFW. Western will consult with SJCOG for impacts to special-status species falling under the jurisdiction of the San Joaquin County Multi-species Conservation and Open Space Plan (SJCOG, 2000) where the project lies within San Joaquin County, as appropriate. Any avoidance, minimization, or compensation measures developed during consultation with these agencies will supersede those listed below.

BIO-13 Western will minimize or avoid effects to Alameda whipsnake and its habitats by implementing the following measures.

- If suitable Alameda whipsnake habitat will be impacted by the proposed project, Western will consult with the USFWS and CDFW. Take authorization/permits will be obtained from the USFWS and CDFW, as necessary. Upon completion of the authorization/permit process, Western will implement the terms and conditions of the authorizations, which could include but may not be limited to the following.
- If habitat for Alameda whipsnake will be impacted by project activities, Western will develop and implement a protection and monitoring plan for Alameda whipsnake that will be approved by USFWS and CDFW during formal consultation. Measures in this plan will include, but may not be limited to a procedure for conducting preconstruction surveys and/or trapping surveys before the onset of initial ground-disturbing activities in areas with high-quality habitat that cannot be avoided, surveying before construction and/or restoration begins each day that these activities will occur, and direct monitoring by an agency-approved biologist of the clearing of occupied or potentially occupied grassland/scrub/mosaic habitats in the project area that will be directly affected by project construction.

BIO-14 To protect blunt-nosed leopard lizard, Western will implement the following for both construction and O&M activities.

- An agency-approved (USFWS and CDFW) biologist will conduct blunt-nosed leopard lizard surveys for each ground disturbance site in blunt-nosed leopard lizard habitat per the *2004 Approved Survey Methodology for the Blunt-nosed Leopard Lizard* (CDFG, 2004) or currently approved methodology.
- If blunt-nosed leopard lizards are not detected during surveys, a flashing barrier or other short-term or longer-term fencing plan approved by CDFW will be installed when possible and necessary around the work area to prevent blunt-nosed leopard lizards from entering the work area. Fencing options may be shorter term (temporary for just a few hours) or longer term (days or weeks) and may include but would not be limited to a 36-inch (0.9-meter) tall barrier, buried 6 inches (15 centimeters) deep, and reinforced with rebar or T-posts, and may include escape ramps of silt-fencing material, wood, or soil to allow any undetected blunt-nosed leopard lizard to exit the site. Fencing plans and types may be altered based on length of time the fence is to remain in place, terrain, and project needs. Fencing will be removed upon project completion.

  If blunt-nosed leopard lizards are subsequently found within the fenced work area, a section of fence may be removed so that the lizard may leave the exclusion zone. The agency-approved biologist will monitor the location of the blunt-nosed leopard lizard to ensure that it has moved outside of the work area. The fencing will be immediately replaced to exclude the lizard from the construction area. When all observed blunt-nosed

leopard lizards have exited the site, additional surveys will be implemented during appropriate conditions for detection for at least five survey days before construction begins to ensure that no more blunt-nosed leopard lizards inhabit the work-area exclusion zone.

- If blunt-nosed leopard lizards are detected during surveys, any active burrow within a 200-foot radius of activity sites will be flagged and marked with a burrow number prior to construction or O&M activities. Flagged, 50-foot (15-meter) exclusion zones will be established around any potentially active burrow. Construction activities, with the exception of essential vehicle operation on existing roads and foot travel, will be prohibited within this exclusion zone. A flashing barrier or appropriate fencing approved by CDFW will be established between burrow(s) and work sites. The barrier or fencing will be established at least 180 degrees around the burrow site and will flare out at the ends to direct lizards away from the activity sites. The barrier or fencing will not enclose an active burrow site.
- An agency-approved biological monitor will monitor all vehicular traffic within 200 feet (61 meters) of potentially active burrows by escorting all vehicles through this zone on foot. The monitor will walk in front of the vehicle to ensure that no blunt-nosed leopard lizards are in the road or path of travel. All personnel vehicles or other vehicles not needed for construction activities will park at least 200 feet (61 meters) from the flagged burrow site and crews will walk into the work area.
- An agency-approved biological monitor will be on site for any activities within suitable blunt-nosed leopard lizard habitat. Prior to construction or O&M activities each day within suitable blunt-nosed leopard lizard habitat, the monitor will conduct a brief ground survey of the site during appropriate conditions for detection to verify that no blunt-nosed leopard lizards are visible within the site. The agency-approved biological monitor will have the authority to stop and/or redirect project activities in coordination with the project manager and Western's natural resources staff to ensure the protection of blunt-nosed leopard lizards. The agency-approved biological monitor will complete daily reports/logs summarizing activities and environmental compliance.
- Vehicle speed limit of 15 mph (24 kph) will be enforced during construction and O&M activities on all nonpublic project access roads within blunt-nosed leopard lizard habitat and outside of blunt-nosed leopard lizard flagged areas. Vehicle speeds within 200 feet (61 meters) of flagged blunt-nosed leopard lizard areas (known presence) will be contingent upon the walking speed of biological monitor.

BIO-15 To protect California legless lizard, coast horned lizard, and San Joaquin whipsnake, Western will implement the following measures.

- A pre-construction survey for California legless lizard, coast horned lizard, and San Joaquin whipsnake will be conducted by an agency-approved biologist in all suitable habitats where tower construction or new access roads will affect suitable sandy grassland, scrub, sycamore, or sandy wash habitats. The survey will be conducted within 14 to 30 days of the onset of construction. If individuals of these species are not found, no further action will be required.
- If California legless lizard, coast horned lizard, and/or San Joaquin whipsnake are found, occupied habitat as well as other suitable habitats will be avoided to the maximum extent

feasible. An agency-approved biologist will conduct daily surveys in suitable habitats during construction and O&M activities and will attempt to capture or otherwise move animals out of harm's way when necessary.

BIO-16 While considered a remote possibility, giant garter snake could occur in Los Banos Creek and adjacent uplands below the dam impounding Los Banos Creek Reservoir. Projection of giant garter snake will be partially accomplished through implementation of Mitigation Measures BIO-1 and BIO-2, which protect aquatic habitats. Western will implement the following additional measures:

During construction activities:

- A preactivity survey will be conducted no more than 24 hours before construction activities begin, and an agency-approved biologist will be on site during all activities in potential giant garter snake aquatic and upland habitats. Preactivity surveys will be repeated whenever a lapse in construction activity of two weeks or longer occurs. The biologist will have the authority to stop construction if a giant garter snake is encountered; construction may resume when the snake has been seen to leave the area on its own or the agency-approved biologist confirms the snake will not be harmed. Only personnel with a USFWS 10(a)(1)(A) recovery permit will have the authority to capture and/or relocate giant garter snakes encountered in project area. All sightings and incidental take will be reported to the Western Natural Resources Department, who will report to the USFWS.

During Category A O&M activities (Appendix A):

- Follow EPMs and Mitigation Measures BIO-1 and BIO-2.

During Category B O&M activities (Appendix A):

- Follow EPMs and Mitigation Measures BIO-1 and BIO-2.
- With the exception of direct application, use of herbicides within 200 feet (61 meters) of potential giant garter snake habitat will be prohibited at all times.
- Giant garter snake aquatic and upland habitats will be flagged as environmentally sensitive areas by an agency-approved biologist within or adjacent to the disturbance footprint. Only manual vegetation removal will be allowed within the flagged area.
- An agency-approved monitor will be present for O&M activities within the flagged area. Ground-disturbing activities will be avoided within 200 feet (61 meters) from the banks of giant garter snake aquatic habitat. If this were not feasible, O&M activities will be conducted between May 1 and September 30, the giant garter snake active period, and all potentially affected aquatic habitats will be dewatered prior to any ground disturbance. Dewatered areas will remain dry with no puddled water remaining for at least 15 consecutive days prior to excavation or filling of that habitat. If a site could not be completely dewatered, prey items will be netted or otherwise salvaged if present.
- If it is not feasible to conduct O&M activities between May 1 and September 30, the Sacramento Fish and Wildlife Office will be contacted, and the following actions will be performed:
  - A preactivity survey will be conducted no more than 24 hours before construction activities begin, and an agency-approved biologist will be on site during all activities in

potential giant garter snake aquatic and upland habitat. Preactivity surveys will be repeated whenever a lapse in construction activity of two weeks or longer occurs. The biologist will have the authority to stop construction if a giant garter snake is encountered; construction may resume when the snake has been seen to leave the area on its own or the agency-approved biologist confirms the snake will not be harmed. Only personnel with a USFWS 10(a)(1)(A) recovery permit will have the authority to capture and/or relocate giant garter snakes encountered in project area. All sightings and incidental take will be reported to the Western Natural Resources Department, who will report to the USFWS

- Any temporary fill and debris that might provide habitat for giant garter snakes will be immediately removed and disturbed areas will be restored to pre-project conditions after completion of O&M activities. Restoration work could include replanting species removed from banks or replanting emergent vegetation in the active channel. Filter fences and mesh will be of a material that will not entrap reptiles and amphibians. Erosion-control blankets will be used as a last resort because of their tendency to biodegrade slowly and trap reptiles and amphibians. No monofilament plastics will be used for erosion control near aquatic features.

During Category C O&M activities (Appendix A):

- Follow all measures listed for Category A and B activities above. Prior to site mobilization, Western will provide notification to appropriate agencies.

BIO-17 It is expected that aquatic sites that could support western pond turtle will be avoided, either because they occur in drainages that will be spanned or because of protection of buffer distances around aquatic sites for California red-legged frog and California tiger salamander. It is also likely that protection measures for these latter two species (outlined in section 4.4.5 below) will confer protection on western pond turtle. Western will implement the following additional measures to ensure protection of western pond turtles and their nests.

During construction activities:

- A preconstruction survey for western pond turtles will be conducted by an agency-approved biologist in all construction areas identified as potential nesting or dispersal habitat located within 1000 feet (305 meters) of potential aquatic habitat. The survey will be conducted within 48 hours prior to initiation of construction activities. If a western pond turtle is found during pre-construction surveys in an area where it may be affected by construction, it will be relocated by an agency-approved biologist with permission from CDFW if necessary to a site that is a suitable distance from construction activities. If a nest is found within the construction area, construction will not take place within 100 feet (30.5 meters) of the nest until the turtles have hatched and have left the nest or can be safely relocated, as determined through coordination with CDFW.
- Because attempting to locate pond turtle nests will not necessarily result in detection, after completion of pre-construction surveys and relocation as necessary, exclusion fencing will be placed around all construction sites adjacent to suitable aquatic habitats during the nesting season to eliminate the possibility of nest establishment in uplands adjacent to aquatic areas, as necessary.

- If construction activities occur near aquatic areas where turtles have been identified during pre-construction or other surveys, a biological monitor will be present during construction. If a turtle is found, it will be relocated, if necessary, to a site a suitable distance from construction activities.
- If a pond turtle is encountered on the project site, any construction activity that could result in harm of the turtle will immediately cease and will not resume until an agency-approved biologist has moved the turtle to a safe location.

During O&M activities:

- For Category A activities (Appendix A): follow EPMs and BIO-2.
- For Category B and C activities (Appendix A):

  Follow EPMs and BIO-2.

  From April 15 to July 15, any ground-disturbing activity within 400 feet (122 meters) of a permanent pond, lake, creek, river, or slough that could affect the bed, bank, or water quality of any of these features will be prohibited OR an agency-approved biologist will inspect the project area. If adult or juvenile pond turtles are present, an agency-approved biologist will monitor project activities to ensure that no turtles are harmed. If the biologist determines that nests could be adversely affected, potential nesting areas will be avoided between June 1 and October 31.

4.4.4.11 Compensatory Mitigation

Compensatory mitigation is not proposed for giant garter snake as the project area is not considered suitable habitat and is not expected to be occupied. Compensatory mitigation is not proposed for western pond turtle as it is expected that project effects to aquatic and upland habitats will be compensated through measures provided for California red-legged frog and California tiger salamander (section 4.4.5 below).

Measures for compensatory mitigation for other reptiles are provided below.

BIO-18 Western will compensate for permanent and temporary loss of upland scrub habitats that could support Alameda whipsnake by (a) purchasing credits at a conservation bank approved by CDFW and USFWS, (b) purchasing a conservation easement, (c) donating funds to an approved in-lieu fee program, or (d) restoring habitats affected by the project. For onsite creation or restoration, Western will develop and implement a mitigation monitoring and reporting plan with input from and approval by regulatory agencies that outlines performance standards and success criteria for ensuring long-term success of mitigation.

BIO-19 Western will provide compensation for permanent and temporary impacts to blunt-nosed leopard lizard habitat (a) purchasing credits at a conservation bank approved by CDFW and USFWS, (b) purchasing a conservation easement, (c) donating funds to an approved in-lieu fee program, or (d) restoring habitats affected by the project. For onsite creation or restoration, Western will develop and implement a mitigation monitoring and reporting plan with input from and approval by regulatory agencies that outlines performance standards and success criteria for ensuring long-term success of mitigation.

BIO-20 If California legless lizard, coast horned lizard, and/or San Joaquin whipsnake are found during preconstruction surveys and avoidance of habitats is not feasible, Western will

restore habitats temporarily affected. Surveys, fencing, and compensation for BNLL habitat and upland habitats for CRLF and CTS will benefit these species as well.

4.4.4.12 Cumulative Effects

With implementation of avoidance and minimization measures, and successful compensatory mitigation for project effects that cannot be avoided, cumulative effects to special-status reptiles are not expected. If compensatory mitigation in the form of habitat restoration is not successful, the project would contribute to cumulative habitat loss and degradation for these animals.

4.4.5 Amphibians

4.4.5.1 California Red-legged Frog

California red-legged frogs typically occupy and breed along the margins of permanent and near-permanent ponds, lakes, and streams where water is still or slow, shoreline and emergent vegetative cover is dense and extensive, and water depth is at least 2.1 feet (0.7 meters) close to the shoreline (Jennings and Hayes, 1994; Barry, 1999). Suitable breeding sites often have floating rooted vegetation and "grunge" (i.e., algae, particulates, or some form of turbidity) in the water (Barry, 2005; Barry pers. comm.). Such habitats would be considered typical and optimal.

Larvae, tadpoles, and metamorphs, which indicate breeding, have been collected from streams, deep pools, backwaters within streams and creeks, ponds, marshes, sag ponds, dune ponds, and lagoons (USFWS, 2002). They also frequently breed in artificial impoundments such as stock ponds, irrigation ponds, siltation ponds, sewage percolation ponds, and golf course ponds, including some without shoreline vegetative cover (USFWS 2002, 2005b; Rathbun et al., 1997). Following mating, embryos hatch within 6–14 days, and larvae require 4–5 months for metamorphosis. While California red-legged frogs are more likely to breed in permanent ponds than other local amphibians, they will also use temporary ponds that persist for 5–6 months (Jennings and Hayes, 1994). Larvae will perish in ponds that dry before metamorphosis. Subadults and adults often use additional areas including seeps, springs, riparian zones, and other areas that may not otherwise be used or suitable for breeding. An essential habitat element is an abundant forage base of invertebrates, macroinvertebrates, and mice (Barry, 2005). They are aggressive feeders and often look for mouse tunnels for foraging (Barry pers. comm.).

California red-legged frogs may complete their entire life cycle in a particular habitat or they may seek multiple habitat types (USFWS, 2002). They often forage in uplands within 100 feet (30.5 meters) of aquatic sites (J Alvarez pers. comm.), especially at night, and may take shelter in small-mammal burrows and other refugia up to 300 feet (100 meters) from water at any time of the year (USFWS, 2005b). They have been observed to make long-distance movements that are straight-line point-to-point migrations of up to several miles without apparent regard to topography, vegetation type, or riparian corridors (Bulgur 1999, Alvarez pers. comm.); they do not require corridors of appropriate habitat for dispersal or movements. The California red-legged frog occurs in the coast range mountains from Napa and Sonoma Counties south to portions of the Los Angeles Basin, and in the foothills and some higher elevations in the Sierra.

A number of CNDDB records are found within or near the project area. A single 1985 record is from Los Banos Creek upstream of the project area; the remaining records are from 1986 to 2008 within and adjacent to the project area at and north of Corral Hollow. Within the nine-quad search area, CNDDB records of California red-legged frogs are numerous, especially from Corral Hollow north to Tracy

Substation, from west of San Luis Reservoir, and at Los Banos Creek. They were not detected during spring 2014 surveys when many potentially suitable habitats were dry because of drought conditions; however, many stock ponds with little to substantial emergent cover were present and potentially suitable both within and near the project area. Uplands at most stock ponds were marginal, providing little vegetative cover because of heavy grazing, and in many locations few if any small-mammal burrows.

Critical habitat Unit 15 lies adjacent to or overlaps with the project area for the northernmost 16 miles (26 kilometers) of the project; the zone of overlap covers a 5-mile stretch (Figure 5) within which are several stock ponds that could support breeding California red-legged frogs.

4.4.5.2 California Tiger Salamander

California tiger salamanders inhabit grassland and oak savanna habitats in the valleys and low hills of central and coastal California. Having an obligate biphasic life cycle, larvae develop in pools and ponds in which they were born but they are otherwise terrestrial salamanders (Shaffer et al., 2004). They spend most of the year in subterranean refuges dug by California ground squirrels (*Otospermophilus beecheyi*), Botta's pocket gophers (*Thomomys bottae*), California vole (*Microtus californicus*), and other burrowing mammals (Jennings and Hayes, 1994; Trenham, 2001; Trenham and Shaffer, 2005; Bobzein and DiDonato, 2007), and may also be found under buildings (Barry, pers. comm.) and in soil crevices (Loredo et al., 1996). During winter rains between October and April, adults emerge from underground retreats and migrate nocturnally to ponds to breed (Loredo and Van Vuren, 1996). Large vernal pools, stock ponds, and other ephemeral, quiet waters provide typical breeding sites for courtship and egg deposition (Barry and Shaffer 1994; Alvarez, 2004); Bobzein and DiDonato (2007) report that California tiger salamanders breed almost exclusively in seasonal and perennial stock ponds in their study area.

Larvae hatch in 2 to 3 weeks (Bobzein and DiDonato, 2007). Metamorphosis from May to July can occur as quickly as 60 days following deposition of eggs (Feaver, 1971, *in* Laabs et al., 2002) but may take as long as 6 months (Shaffer et al., 2008, *in* YHJPA, 2009) and larvae have even been observed overwintering (Alvarez 2004, Bobzein and DiDonato, 2007). Length and weight vary at metamorphosis because larvae can either accelerate development rapidly in response to drying ponds or delay development to take advantage of ponds that hold water longer (Barry and Shaffer, 1994; Shaffer et al., 2008, *in* YHJPA, 2009). Larvae will die if ponds in which they are developing dry before metamorphosis is complete (Barry and Shaffer, 1994; Searcy et al., 2013). The number of larvae that reach metamorphosis is highly variable (Loredo and Van Vuren, 1996; Trenham, 2000). In addition to a variety of ecological factors, the number of larvae that transform appears to be related to the timing and amount of rainfall during the previous winter (Loredo and Van Vuren, 1996), and Trenham et al. (2000) reported that, contrary to results of other studies (Loredo and Van Vuren, 1996, and others), total juvenile production was positively related to the total biomass of breeding females. It is generally believed that breeding ponds must hold water continuously for at least 10 weeks for successful metamorphosis (USFWS, 2003).

Following transformation, metamorphs leave natal ponds. Loredo et al. (1996) reported that metamorphs may seek temporary shelter in soil crevices the first night before dispersing farther or while waiting for better conditions for migration; and Searcy et al. (2013) report that metamorph and adult densities are negatively correlated with distance from breeding ponds. By contrast, Trenham and Shaffer (2005) and Searcy et al. (2013) report that juvenile density is positively correlated with distance from breeding ponds: adult capture rates began to decrease at 33 feet (10 meters) from ponds, while capture rates of juveniles increased steadily between 33 and 1312 feet (10 and 400 meters). Juveniles are the only age class that is independent of the breeding pond, neither needing it for reproduction nor emerging from it at metamorphosis (Searcy et al., 2013). California tiger salamanders do not breed every year. Females

have been reported to breed an average of just 1.4 times in their lifetimes, and others may breed only once every 2 to 8 years (Trenham et al., 2000). This can cause the species to be undetectable during aquatic surveys (Alvarez et al., 2013).

The underground phase of the California tiger salamander life cycle is often referred to as aestivation; however, aestivation implies a state of dormancy (the summer equivalent of hibernation) and evidence suggests that animals move, feed, and remain active in their burrows (Trenham, 2001; Van Hattem, 2004, *in* USFWS 2012b; Ford et al., 2013).

The central population of California tiger salamander occupies a relatively narrow geographical and ecological range centered in the Central Valley from Sacramento and Solano Counties in the north to Tulare and San Luis Obispo Counties in the south, and from sea level to approximately 3900 feet (1200 meters) elevation (Shaffer et al., 2004).

Many CNDDB records are found in the nine-quad search of the project area, but only two polygons occur within 1 mile (1.6 kilometers) of the project area. One of them is a 2012 record from a location where these animals have been seen since 1975, along West Grant Line Road north of I-205 and just west of the California Aqueduct. The other is a 1992 record from Corral Hollow just east of the project area. CNDDB records from the nine-quad search area show numerous occurrences west of the project area from Corral Hollow north to Tracy Substation, and west of the Billy Wright Road alternative corridor south of O'Neill Forebay. The entire project area lies within its range and the species is likely to occupy more aquatic and upland habitats in the area than are currently known. As noted above, aquatic surveys may fail to detect California tiger salamander even when it is present because it can persist in uplands for years and not breed (Alvarez et al., 2013).

4.4.5.3 Foothill Yellow-legged Frog

Foothill yellow-legged frogs are found in or near rocky streams in a variety of woodland, scrub, and meadow habitats. They require shallow, flowing water in small to moderate streams with some cobble-sized substrate. While they have also been found in streams lacking a cobble or larger-sized substrate (Fitch, 1938; Zweifel, 1955), it is not known if these habitats are regularly used (Hayes and Jennings, 1988). They require sunny and partly shaded banks for basking. Adults are usually found near water and prefer riffle or cascade/pool areas with rocky banks.

Breeding sites are typically in main-stem creeks and rivers near tributary confluences because tributaries, while generally poor for breeding, are relatively advantageous for overwintering (Kupferberg, 1996). Adults are commonly found in tributaries in the early spring before they move into main-stem habitats to breed. Characteristics of successful breeding sites are channels with high width-to-depth ratios, with the presence of cobble, small boulders, and emergent rocks. Adults often bask on exposed rock surfaces along streams; when disturbed, they dive and take refuge among stones, silt, or vegetation (Stebbins, 2003). During periods of inactivity, especially during cold weather, individuals seek cover under rocks in streams or on shore within a few meters of water. They are infrequent or absent in habitats where introduced aquatic predators such as centrarchid fishes and bullfrogs are present (Jennings and Hayes, 1994).

Of the CNDDB records in the nine-quad search area, most records are clustered in Corral Hollow Creek within 1 mile (1.6 kilometers) of the project area, in the higher reaches of Del Puerto Creek well upstream of the project area, and in Los Banos Creek within 1 mile (1.6 kilometers) west of the Billy Wright Road alternative corridor. Suitable habitat was not detected during the spring 2014 surveys. During the dry spring of 2014, a few creeks, such as Corral Hollow Creek and Del Puerto Creek, still

contained drying pockets of water, but even in a wet year, project-area creeks are likely to be too low-gradient, too sluggish to provide suitable habitat for this frog. It is not expected to be present.

4.4.5.4 Western Spadefoot

Western spadefoot is an almost completely terrestrial toad that enters water only to breed. It occurs in grassland settings and occasionally in valley woodlands where it breeds in temporary rain pools and vernal pools that are free from bullfrogs, fishes, and crayfishes (Jennings and Hayes, 1994); it may also breed in stock ponds (CDFW, 2014a). It spends most of the year in underground burrows within a short distance of breeding pools. In the absence of a specific upland distance for western spadefoot, Semlitsch and Brodie (2003) recommend a generic distance of 1112 feet (339 meters) around aquatic sites for a variety of amphibians. Western spadefoot is found in the Central Valley and foothills; in the coast ranges it occurs from Santa Barbara County south to the Mexico border. Breeding pools must remain inundated continuously for at least three weeks for complete metamorphosis (Jennings and Hayes, 1994).

Of the numerous CNDDB records in the nine-quad area, only records from Salado Creek overlap with the project area. Other records are associated with Corral Hollow Creek, Lone Tree Creek, and Del Puerto Creek, as well as numerous stock ponds. Most records are north of O'Neill Forebay and west of the project area.

4.4.5.5 Potential to Occur in Project Vicinity

California red-legged frog, California tiger salamander, and western spadefoot have the potential to occur in suitable habitats throughout the project area. Because these three amphibians breed in similar aquatic habitats and could co-occur in the project area, and because it is known that California red-legged frog and California tiger salamander are often sympatric in breeding pools (Alvarez et al., 2013), it is assumed that any inundated pool could support breeding for any of these three species. They are all known to breed in pools that dry before larvae have metamorphosed; therefore, successful reproduction for each species depends on duration of ponding. During the drought spring of 2014, many shallow aquatic sites were dry in April, as were many smaller stock ponds.

Stock ponds can be locally abundant in the biological study area, if not always present in the project area. Upland suitability, most critical for California tiger salamander but essential for all three, was limited in many parts of the project area by either a lack of or limited number of small-mammal burrows. Long stretches of the project area were devoid of upland burrows. Patches of gopher, mouse, vole, and ground squirrel burrows occurred throughout, but these were often separated by significant distances with no activity. However, this observation was based on a reconnaissance survey and cannot be quantified. Notes were taken on field maps, but field notes were not accurate enough to be presented graphically. Moreover, except in areas that may be entirely unsuitable for small mammals, the distribution of small mammals and their burrows could shift substantially in the years between reconnaissance surveys and construction, possibly related to varying patterns and levels of rodent control, making mapping of existing conditions likely unprofitable.

In the case of California tiger salamander, which may go years without breeding, presence will be assumed with or without protocol aquatic surveys.

Foothill yellow-legged frog is not expected to occur in the project area. Although it has been reported upstream of project reaches in Corral Hollow Creek and Los Banos Creek, no creek within project reaches provides suitable habitat for foothill yellow-legged frog.

4.4.5.6 Project Effects

Three amphibian species could be affected by project activities: California red-legged frog, California tiger salamander, and western spadefoot. Project effects to foothill yellow-legged frog are not expected. Direct effects include temporary or permanent loss of or physical damage to occupied and otherwise suitable breeding, migration, dispersal, and upland retreat habitats, construction-related erosion or runoff into aquatic habitats, mortality during construction or through vehicle ingress/egress, exposure of individuals during excavations, disturbance through human presence and construction noise and vibration, and collapse of occupied burrows. Indirect effects could include post-project erosion or runoff from construction areas and new roads, and degradation or loss of habitat through operation and maintenance such as long-term use of new or existing access roads, tower/line repairs, introduction of human trash, introduction or spread of non-native plants or predators, spread of disease, spill of hazardous materials, disruption, and increased susceptibility to wild fire. Project EPMs provide general protection for aquatic resources, which provide breeding habitat for these three amphibians, but do not provide sufficient protection, especially for upland habitats that may be used outside the breeding season. The project could adversely affect special-status amphibians.

4.4.5.7 Avoidance and Minimization Measures

Implementation of Mitigation Measures BIO-1 through BIO-3 will ensure protection of wetland and aquatic habitats potentially occupied by California red-legged frog, California tiger salamander, and western spadefoot.

Western will consult with SJCOG for impacts to special-status species falling under the jurisdiction of the San Joaquin County Multi-species Conservation and Open Space Plan (SJCOG, 2000) where the project lies within San Joaquin County, as appropriate, and will consult with USFWS and CDFW for other species; any avoidance, minimization, or compensation measures developed during consultation will supersede those listed below.

BIO-21 To protect California red-legged frog, Western will implement the following measures.

During construction activities:

- If the project may affect California red-legged frog, take authorization/permits will be obtained from the USFWS. Upon completion of the authorization/permit process, Western will implement the terms and conditions of the authorizations, which could include but may not be limited to the following.
- California red-legged frog presence will be assumed in all aquatic habitats for which protocol surveys have not been conducted in the year prior to construction. Uplands within 1 mile (1.6 kilometers) will be assumed to be occupied around all aquatic habitats for which protocol surveys have not been conducted.
- Transmission towers and new access roads will be sited as far from aquatic habitats as possible.
- Construction activities will take place as much as possible during the dry season (generally June 1 through September 30) within 1.24 miles (2 kilometers) of aquatic habitats. If construction extends into the wet season (generally October 1 through May 31), temporary exclusion fencing will be installed 100 feet (30.5 meters) out from work areas to prevent California red-legged frogs from entering construction areas.
- Escape ramps will be constructed in all trenches or excavations to allow wildlife to escape.

- Biological monitoring will be provided by an agency-approved biologist during construction in all areas within 1.24 miles (2 kilometers) of aquatic habitats. The biological monitor will identify, capture, and relocate sensitive amphibians present in work areas if necessary.
- A 300-foot (91-meter) setback, incorporating both riparian vegetation and uplands, will be provided on all sides of aquatic habitats identified as occupied or assumed occupied by red-legged frogs as feasible. A setback may be reduced or expanded through consultation with the USFWS depending on whether it would result in adverse impacts to the species or the biological values of the habitat. Setbacks will maintain existing vegetation free of disturbance and new construction, equipment storage, vehicle parking, and other activities that might compact or disturb soils or vegetation or that could introduce contaminants into aquatic habitats. Setbacks will be clearly delineated during the construction.
- Water quality will be maintained through implementation of appropriate erosion-control measures to reduce siltation and contaminated runoff from project sites by maintaining vegetation within buffers and/or through the use of hay bales, filter fences, vegetative buffer strips, or other accepted equivalents.
- Construction and other ground disturbances will be prohibited within setbacks. The use of insecticides, herbicides, rodenticides, and pesticides will occur in accordance with USEPA guidelines addressing the use of these materials in occupied California red-legged frog habitat.
- Where aquatic sites cannot be avoided by 300 feet (91 meters) on all sides, an agency-approved biologist will survey the work site immediately prior to construction activities. If California red-legged frogs, tadpoles, or egg masses are found, the approved biologist will contact USFWS to determine whether moving any of these life-stages is appropriate. In making this determination USFWS will consider whether an appropriate relocation site exists. If USFWS approves moving animals, the approved biologist will be allowed sufficient time to move California red-legged frogs from the work site before work activities begin. Only Service-approved biologists will participate in activities associated with the capture, handling, and monitoring of California red-legged frogs. Bare hands will be used to capture California red-legged frogs. Service-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals. To avoid transferring disease or pathogens from handling the amphibians, agency-approved biologists will follow the Declining Amphibian Populations Task Force Fieldwork Code of Practice.

During O&M activities:

- A Service-approved biologist will identify potential CRLF breeding habitat within the vicinity of O&M activities, and will flag a 500-foot (152-meter) buffer. The following restrictions will apply within the buffer: (1) only manual vegetation removal will be allowed; (2) only direct (e.g., injection and cut-stump) herbicide application methods will be allowed, except when otherwise restricted; (3) no ground disturbance (e.g., digging or auguring) will be allowed; and (4) erosion-control devices will be of a material that will not entrap amphibians.

- If it is not possible to follow the above-stated measures, a pre-activity survey will be conducted no more than 24 hours before project construction or O&M activities begin. If ground disturbance is required, a Service-approved biologist will identify potential CRLF upland refuge habitat within disturbance areas. Areas that may provide suitable upland refuge will be avoided to the extent possible. Ground disturbance will not occur in CRLF aquatic/breeding habitat. If an area that provides suitable upland refuge must be impacted, a Service-approved biologist will determine if CRLF are present using visual surveys, an endoscope, or other accepted detection method. If CRLF are detected, the area will be avoided using a buffer determined appropriate by the biologist, and a Service-approved monitor will remain on site to ensure that CRLF are not impacted during project activities in the vicinity. A Service-approved biologist will remain on site during all activities to ensure protection of CRLF or an exclusion barrier will be constructed around the work site using Service-approved methods and materials. Exclusion materials will be removed at the end of the work activity. Crews will inspect any trenches left open for more than 24 hours for trapped animals. Only a Service-approved biologist will remove trapped animals.
- To comply with the California red-legged frog injunction for herbicide applications, Western will ensure that, in the counties named in the injunction, there will be no ground application of any of the chemicals named in the injunction (http://www.epa.gov/espp/litstatus/redleg-frog/steps-info.htm). Currently, the no-use buffer is 60 feet (18 meters) from any aquatic feature, aquatic breeding habitat, non-breeding aquatic habitat, and upland habitat.

BIO-22 To protect California tiger salamander and western spadefoot, Western will implement the following measures.

During construction activities:

- If the project may affect California tiger salamander, take authorization/permits will be obtained from the USFWS. Upon completion of the authorization/permit process, Western will implement the terms and conditions of the authorizations.
- California tiger salamander presence will be assumed in all aquatic habitats for which protocol surveys have not been conducted in the year prior to construction. Uplands within 1 mile (1.6 kilometers) will be assumed to be occupied around all aquatic habitats for which protocol surveys have not been conducted
- Transmission towers and new access roads will be sited as far from aquatic habitats as possible.
- Construction activities will take place as much as possible during the dry season (generally June 1 through September 30) within 1.24 miles (2 kilometers) of aquatic habitats. If construction extends into the wet season (generally October 1 through May 31), temporary exclusion fencing will be installed 100 feet (30.5 meters) out from work areas to prevent California tiger salamanders and western spadefoots from entering construction areas.
- Escape ramps will be installed in all trenches or excavations to allow wildlife to escape.
- Biological monitoring will be provided by an agency-approved biologist during construction in all areas within 1.24 miles (2 kilometers) of aquatic habitats. The biological monitor will identify, capture, and relocate sensitive amphibians present in work areas if necessary.

- A 300-foot (91-meter) setback, incorporating both riparian vegetation and uplands, will be provided on all sides of aquatic habitats identified as occupied or assumed occupied by California tiger salamanders and western spadefoots. A setback may be reduced or expanded in consultation with the USFWS depending on whether it would (a) affect habitat or (b) result in adverse impacts to the species or the biological values of the habitat. Setbacks will maintain existing vegetation free of disturbance and new construction, equipment storage, vehicle parking, and other activities that might compact or disturb soils or vegetation or that could introduce contaminants into aquatic habitats. Setbacks will be clearly delineated during the construction.
- Water quality will be maintained through implementation of appropriate erosion-control measures to reduce siltation and contaminated runoff from project sites by maintaining vegetation within buffers and/or through the use of hay bales, filter fences, vegetative buffer strips, or other accepted equivalents.
- Construction and other ground disturbances will be prohibited within setbacks. The use of insecticides, herbicides, rodenticides and pesticides will occur in accordance with USEPA guidelines addressing the use of these materials in occupied California tiger salamander and western spadefoot habitat.
- Where aquatic sites cannot be avoided by 300 feet (91 meters) on all sides, an agency-approved biologist will survey the work site immediately prior to construction activities. If California tiger salamanders, tadpoles, or eggs are found, the approved biologist will contact USFWS to determine whether moving any of these life-stages is appropriate. In making this determination USFWS will consider whether an appropriate relocation site exists. If USFWS approves moving animals, the approved biologist will be allowed sufficient time to move California tiger salamanders and western spadefoots from the work site before work activities begin. Only Service-approved biologists will participate in activities associated with the capture, handling, and monitoring of California tiger salamanders. Bare hands will be used to capture salamanders and toads. Service-approved biologists will not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating individuals. To avoid transferring disease or pathogens from handling the amphibians, agency-approved biologists will follow the Declining Amphibian Populations Task Force Fieldwork Code of Practice.

During O&M activities:

- A Service-approved biologist will identify potential California tiger salamander breeding habitat in the vicinity of O&M activities, and will flag a 500-foot buffer. The following restrictions will apply within the buffer: (1) only manual vegetation removal will be allowed; (2) only direct (e.g., injection and cut-stump) herbicide application methods will be allowed, except when otherwise restricted; (3) no ground disturbance (e.g., digging or auguring) will be allowed; and (4) erosion-control devices will be of a material that will not entrap amphibians.
- If it is not possible to follow the above-stated measures, a pre-activity survey will be conducted no more than 24 hours before O&M activities begin. If ground disturbance is required, a Service-approved biologist will identify potential CTS aestivation habitat (burrows, rock piles) within disturbance areas. CTS aestivation habitat will be avoided to the extent possible. Ground disturbance will not occur in CTS breeding/aquatic habitat. If

a burrow or other potential aestivation habitat must be impacted, a Service-approved biologist will determine if CTS are present within the burrow using an endoscope or other accepted detection method. If CTS are detected, the burrow will be avoided using a buffer determined appropriate by the biologist and a Service-approved monitor will remain on site to ensure that CTS are not impacted during project activities in the vicinity. A Service-approved biologist will remain on site during all activities to ensure protection of CTS or an exclusion barrier will be constructed around the work site using Service-approved methods and materials. Exclusion materials will be removed at the end of the work activity. Crews will inspect any trenches left open for more than 24 hours for trapped animals. Only a Service-approved biologist will remove trapped animals.

4.4.5.8 Compensatory Mitigation

BIO-23 Western will provide compensation for permanent and temporary impacts to California tiger salamander and California red-legged frog aquatic and upland habitat through one or more of the following: (a) purchasing credits at a conservation bank approved by CDFW and USFWS, (b) purchasing a conservation easement, (c) donating funds to an approved in-lieu fee program, or (d) restoring habitats affected by the project. For onsite creation or restoration, Western will develop and implement a mitigation monitoring and reporting plan with input from and approval by regulatory agencies that outlines performance standards and success criteria for ensuring long-term success of mitigation.

If Western intends to eliminate aquatic habitat including wetlands, ponds, springs, and other standing water sources, and to create new, onsite habitat, then the newly created habitat will be created and filled with water prior to dewatering and destroying the existing habitat. Dewatering and relocation of aquatic habitats should occur outside of the breeding season for red-legged frogs (approximately January through June).

If Western intends to eliminate aquatic habitat including wetlands, ponds, springs, and other standing water sources, and will not create new, onsite habitat, then dewatering of existing habitat should occur prior to commencement of construction and other site-disturbing activities. Dewatering and relocation of aquatic habitats should occur outside of the breeding season for red-legged frogs (approximately January through June). Preserve lands acquired to offset impacts to the red-legged frog must have occupied habitat of at least equal habitat value as determined by the USFWS.

4.4.5.9 Cumulative Effects

With implementation of avoidance and minimization measures, and successful compensatory mitigation for project effects that cannot be avoided, cumulative effects to special-status amphibians are not expected. If compensatory mitigation in the form of habitat restoration is not successful, the project would contribute to habitat loss and degradation for these animals.

4.4.6 Birds

4.4.6.1 Bald Eagle

The bald eagle is a year-round resident at some higher elevation areas of California, and a winter resident in numerous traditionally used sites throughout much of the state (YHJPA, 2013). Bald eagles that breed in California may make only local winter movements in search of prey (Polite and Pratt, 1999), spending the winter in the vicinity of their nesting areas. Bald eagles that nest in the

northwestern United States migrate south to winter in California (Buehler, 2000, *in* YHJPA, 2013). Wintering areas are used traditionally as indicated by the data from the long-term Mid-Winter Bald Eagle Count (USACE, 2014). Bald eagles hunt on the wing or from perches in tall trees or artificial perches. They are generalized and opportunistic scavengers and predators, commonly taking fish, waterfowl, jackrabbits, and various types of carrion (USFWS, 1986).

Most eagle nesting territories are now found in mountainous habitats in ponderosa pine and mixed conifer forests. In California, most nest sites were within 1 mile (1.6 kilometers) of water (Lehman, 1979). In California, bald eagles typically winter adjacent to nesting grounds (USFWS, 1986) along rivers, lakes, or reservoirs that support abundant fish or waterbird prey and that have large trees or snags for perch and roost sites. This species roosts communally and roost sites typically possess different habitat components than daytime use areas (USFWS, 1986). Night roosts are often in sites that are sheltered from the weather by landforms and in areas of coniferous stands that provide insulation from the weather (USFWS, 1986). The species has been known to forage in rice fields and may occasionally use flooded pasturelands.

About half of the California wintering population is in the Klamath Basin (Polite and Pratt, 1999). Other local wintering populations include Clear Lake, Lake Berryessa, and Folsom Lake. The midwinter bald eagle count documented 430 bald eagles in 2012 at traditionally used wintering sites in California (USACE, 2014).

Bald eagles are not expected to nest anywhere within or near the project area, but have some, if low, potential to visit O'Neill Forebay or other sites in winter. However, bald eagles are not likely to be present because the project area is not a traditional wintering area, the only large bodies of water in the area support few large snags or perch sites for hunting, and the area provides little in the way of thermal cover for night roosting. The only CNDDB record in the nine-quad search area is 1988 observations for two wintering bald eagles in the sycamore alluvial woodland along Orestimba Creek approximately 2.5 miles (4 kilometers) west of the project area.

4.4.6.2 Burrowing Owl

Burrowing owls inhabit dry, open rolling hills, grasslands, desert floors, and open bare ground with gullies and arroyos. They can also inhabit developed areas such as agricultural areas, golf courses, cemeteries, roadsides within cities, airports, vacant lots in residential areas, school campuses, and fairgrounds (Haug et al., 1993, *in* Klute et al., 2003; Gervais et al., 2008). This species typically uses burrows created by fossorial mammals such as the California ground squirrel but may also use man-made structures such as culverts; debris piles of cement, asphalt, or wood; pipes; natural rock cavities; or excavations beneath cement or asphalt pavement (CDFG,[1] 1995; CDFG, 2012). The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation (Haug et al., 1993; in Klute et al., 2003). Burrowing owls are found throughout lowland areas of the state, absent primarily from mountainous and forested regions. Breeding populations have been extirpated locally in certain parts of the Bay area and southern California.

[1] Effective January 1, 2013, California Department of Fish and Game (CDFG) changed its name to California Department of Fish and Wildlife (CDFW). In this report, all literature dated prior to this changeover date is attributed in text and in references to CDFG, California Department of Fish and Game, which was its name at the time of publication.

Current range maps (Gervais et al., 2008; CDFW, 2014a) suggest that the project area skirts the western boundary of the Central Valley breeding range. Several active dens were observed during spring 2014 surveys in and near project corridors just north of Patterson Pass Road, and a single owl was flushed along the California Aqueduct, although its burrow was not discovered. Scattered CNDDB records are found for the grasslands between Patterson Pass Road and Corral Hollow, along Lone Tree Creek, at Hospital Creek, near Del Puerto Creek, and between San Luis Forebay and Dos Amigos Substation. There is a scarcity of eBird (eBird, 2014) records between Patterson Pass Road in the north and the Dos Amigos Substation, but most of that area is private and not accessible to the general public. Burrowing owls are considered potentially present in suitable habitats throughout the project area.

4.4.6.3 California Condor

California condors require suitable habitat for nesting, roosting, and foraging, and currently occur primarily in chaparral, coniferous forest, and oak savanna habitats in southern and central California. They formerly occurred more widely throughout the Southwest and also fed on beaches and large rivers along the Pacific coast (USFWS, 1996). Primarily a cavity nester, nest sites are located in various types of rock formations including crevices and overhung ledges in cliffs and large rock outcrops, as well as, more rarely, in cavities in giant sequoia (*Sequoiadendron gigantea*) (USFWS, 1996). Traditional roosting sites are cliffs or large trees, often near feeding sites. California condors are opportunistic scavengers, feeding only on the carcasses of dead animals. Most foraging occurs in open terrain of foothill grassland and oak savanna habitats. Paired birds tend to forage most frequently in areas relatively close to their nests, not normally venturing more than 31 to 44 miles (50 to 70 kilometers) from their nest sites, although one flight of a member of a pair was documented at 113 miles (180 kilometers) (USFWS, 2013). During the non-breeding season, condors tend to range more widely.

The nearest California condors are known to occur in Pinnacles National Park 35 miles (56 kilometers) southwest of the Dos Amigos Substation. There are no CNDDB records for California condor closer than that, and the nearest eBird record is 20 miles west of Los Banos Reservoir, north of Pinnacles. While there is no evidence of California condors using any part of the project area, potential foraging habitat occurs throughout the project area and potential nesting habitat occurs in the cliffs in and near project corridors between Patterson Pass Road and Corral Hollow. California condor is considered unlikely anywhere in or near the project area currently, but a possible nester in suitable nearby habitat in the event of a range expansion.

4.4.6.4 Golden Eagle

Golden eagles are found in a variety of habitats from rolling foothills, mountain areas, sage-juniper flats, and deserts (CDFW, 2014a). Golden eagles in the interior central coast ranges of California occur primarily in grazed, open grasslands and oak savanna, with lesser numbers in oak woodland and open shrublands. With increasing urbanization, much of the remaining golden eagle habitat in central California is located on private ranches used for livestock grazing (Hunt et al., 1998). Over much of their range they prefer cliffs for nesting, but where trees are more abundant, many will nest in trees and some pairs will even use transmission towers (Hunt et al., 1998; DeLong, 2004).

Golden eagles were observed in several locations either within the project area or within a mile or two during spring 2014 surveys (Figure 3). Most of the project area does not provide suitable nesting trees or cliffs; however, a golden eagle was observed just east of the proposed corridor in an area with steep canyons and high rock faces (Figure 3, map 7). Moreover, as golden eagles are known to nest in transmission structures, potential nesting habitat occurs throughout the project area. One 1996 CNDDB record is for a golden eagle pair nesting on a transmission structure north of Corral Hollow, well to the

west of the project area. Another 1987 CNDDB reports a nest approximately 3 miles (4.8 kilometers) northwest of Dos Amigos Substation, and another record is for 2001 nesting in the sycamore alluvial woodland along Orestimba Creek well west of the project area. Golden eagles are considered potentially present in suitable habitats throughout the project area.

4.4.6.5 Least Bell's Vireo

The least Bell's vireo is endemic to California and northern Baja California and is an obligate riparian species during the breeding season (USFWS, 1998a). It inhabits structurally diverse woodlands along water courses including cottonwood-willow forests, oak woodlands, mulefat scrub, *Baccharis*, and wild blackberry (*Rubus* spp.) (Zeiner et al., 1990; USFWS, 1998a). Two habitat features appear to be essential: the presence of dense cover within 3–6 feet (1–2 meters) of the ground, and a dense stratified canopy for foraging (Thelander et al., 1994; USFWS, 1998a).

Historically, this bird was widespread in riparian woodlands in the Central Valley and low-elevation riverine valleys of California (USFWS, 1998a). Extensive habitat loss and brood parasitism by the brown-headed cowbird (*Molothrus ater*) resulted in a contraction of its range to just eight counties in southern California, with most of the birds occurring in San Diego County (Thelander et al., 1994; USFWS, 1998a).

In 2005, nesting was detected at San Joaquin River National Wildlife Refuge, approximately 7 miles (11 kilometers) east of the project area. Showing high reproductive success, a single pair fledged six young in 2005. The CNDDB occurrence for this location reports successful nesting in 2005 and 2006, an unsuccessful nesting attempt in 2007, and no nesting since. Dettling et al. 2012 confirm that nesting at this location has not resumed.

The single CNDDB record for Del Puerto Creek within the project area is from 1932 and this creek currently does not support suitable nesting habitat within or near the project area. Riparian habitat at Salado Creek (Figure 3, map 23) is narrow with little dense understory, but marginally suitable. Riparian habitat east of O'Neill Forebay (Figure 3, maps 36 and 40) has higher suitability. Willow-cottonwood riparian associated with Los Banos Creek upstream of the reservoir also provides potentially suitable habitat. All other habitat classified as riparian in the project area lacks density in either canopy or understory.

4.4.6.6 Loggerhead Shrike

Loggerhead shrikes breed primarily in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground (CDFW, 2014a). They require shrubs or trees as well as fence posts and power lines for hunting perches, territorial display, and pair maintenance; open area of short grasses, forbs, or bare ground for hunting; and large shrubs or trees for nest placement (Humple, 2008). They also need impaling sites for prey manipulation or storage. In Central California, they are often associated with riparian edges, desert scrub, and sparse riparian woodland (Humple, 2008). Grinnell and Miller (1944) mapped the breeding distribution as most of the state except for primarily forested coastal slope, northern coast ranges, Klamath and Siskiyou mountains of northwestern California, Sierra Nevada and southern Cascades, and high elevations of the Transverse Ranges.

Loggerhead shrikes were observed in the project area and are likely to occur anywhere tall shrubs or trees provide nesting habitat. There are no CNDDB records within 1 mi, but a number of CNDDB records are found on the nine-quad CNDDB search (CDFW, 2015a): a single 2005 record along Mountain House Creek near Tracy, a single 2002 record near Patterson, a cluster of 2009 records near Livermore, and a cluster of 2002 records near Corral Hollow west of the project area. eBird (eBird, 2014) reports of

loggerhead shrike are dense from Clifton Court Forebay south to Patterson Pass Road, along Corral Hollow Road, along Del Puerto Canyon Road, around O'Neill Forebay, and at Los Banos Reservoir.

4.4.6.7 Long-eared Owl

The long-eared owl nests in conifer, oak, riparian, pinyon-juniper, and desert woodlands that are either open or are adjacent to grasslands, meadows, or shrublands (Hunting, 2008). Key habitat components are dense cover for nesting and roosting, suitable nest platforms, and open foraging areas. While they occasionally nest on cliffs, in tree cavities, in orchards or ornamental trees, in man-made structures, or on the ground, they mainly nest in old corvid or hawk nests (Hunting, 2008). They may also nest in old woodrat and squirrel nests, mistletoe brooms, and natural platforms of (or debris piles in) trees. These owls apparently select nesting and roosting sites with dense cover. Limited available evidence suggests that the long-eared owl is a scarce and irregular breeder in the Central Valley (Hunting, 2008)

There are no CNDDB records for long-eared owl within the nine-quad search area for this project. Nests were nests were found in 2005 in the Panoche Hills both at and near Mercey Hot Springs roughly 16 miles southwest of Dos Amigos Substation (Hunting, 2008). An eBird record reports a single long-eared owl detected February 2012 near O'Neill Forebay. There are no other eBird records for this owl anywhere near the project area (eBird, 2014). Suitably dense cover for nesting and roosting occurs around O'Neill Forebay and along Salado Creek. While generally unlikely because of its scarcity, this owl could nest in these areas.

4.4.6.8 Modesto Song Sparrow

There are currently nine subspecies of song sparrow breeding in California, seven of which breed in northern California (Roberson, 2014). Most song sparrows are resident where they occur. The widespread Modesto song sparrow occurs from roughly Suisun Marsh on the west to the Sierra foothills on the east, and from Butte and Glenn Counties south to northwest Baja California (Roberson, 2014). It nests in riparian thickets of willows and other vines, shrubs, and tall herbs, as well as in fresh or saline emergent marshes (CDFW, 2014a).

Song sparrows were not detected during spring 2014 surveys. There are no CNDDB records for song sparrow within 1 mile (1.6 kilometers) of the project area and all CNDDB records within the nine-quad search area are from either 1896 or 1928; however, suitable habitats within the project could support them. They are considered potentially present in suitable habitats throughout the project area.

4.4.6.9 Mountain Plover

Mountain plovers nest in the western Great Plains and are present in California in winter only. They are found on open, flat lands such as xeric shrublands, short-grass or coastal prairie, alkaline flats, barren agricultural fields, and other sparsely vegetated areas, almost never near water (Hunting and Edson 2008, USFWS 2011b, CDFW, 2014a). On grasslands, they often use areas with a history of disturbance by burrowing rodents (kangaroo rats, ground squirrels), native herbivores (tule elk, pronghorn), or domestic livestock (USFWS, 2011b). Hunting et al. (2001) found the majority of wintering mountain plovers in fallow, grazed, and burned (barren) fields, and rarely on active agriculture and non-native grasslands. Currently, the largest numbers occur in the Imperial Valley and the portion of the Central Valley from southern Colusa County south to Kern County. The region supporting the second highest number of wintering mountain plovers encompasses the western Central Valley and adjacent Panoche Valley and Carrizo Plain (Hunting and Edson, 2008). Panoche Valley lies roughly 20 miles (32 kilometers) south of the Dos Amigos Substation.

There are no CNDDB records for mountain plover within 1 mile of the project and all CNDDB records within the nine-quad search area are well east of the project in the Central Valley east of the Dos Amigos Substation. All eBird records are from the basins of the Central and Panoche valleys. While mountain plovers could use any parts of the project area that are sufficiently dry and are sufficiently barren, they are not expected to be present.

4.4.6.10 Northern Harrier

The northern harriers nest and forage in a variety of open, treeless habitats that provide adequate vegetative cover, abundant prey, and scattered hunting, plucking, and lookout perches such as shrubs or fence posts (Davis and Niemela, 2008). They are ground-nesting birds that typically nest in undisturbed patches of emergent wetland/marshes, open grasslands, meadow, weedy borders of lakes, sagebrush flats, or savannah communities usually in areas with dense vegetation (MacWhirter and Bildstein 1996, Davis and Niemela, 2008).

While the entire project area falls within the nesting range of this bird, areas of suitably dense and undisturbed marsh, weeds, or shrubs are found primarily around O'Neill Forebay, which is also where the CNDDB records within 1 mile (1.6 kilometers) are concentrated. Nesting in most of the rest of the project area is unlikely.

4.4.6.11 Short-eared Owl

Nesting short-eared owls require open country that support dense concentrations of rodent prey, and herbaceous cover sufficient to conceal their ground nests from predators. Suitable habitats may include salt and freshwater marshes, irrigated alfalfa or grain fields, and ungrazed grasslands and old pastures (Roberson, 2008). Tule marsh or tall grasslands with cover 12–15 inches (30–50 centimeters) is preferred. In restoration areas in the San Joaquin Valley, appropriate habitat may consist of short weedy vegetation interspersed with native Atriplex or Allenrolfea (Roberson, 2008). In the San Joaquin Valley and adjacent Coast Range valleys, nesting by short-eared owls is generally considered episodic and associated with wet winters (Roberson, 2008). Following a wet winter in 1998, several short-eared owl broods were detected in the Panoche Hills where they are not normally found (Roberson, 2008).

There are no CNDDB records for this owl within the nine-quad search area. An eBird record reports a short-eared owl near O'Neill Forebay in March 2008; there are no other eBird records anywhere near the project (eBird, 2014). Most of the grassland habitats within the project area were either mowed or heavily grazed during April and May site visits, making these areas unsuitable for nesting short-eared owls; however, any grassland or alfalfa field that remains unmowed during the nesting season could support this owl. Most freshwater marshes found within the project area were too small to support nesting, but extensive marshes east of the project along Mountain House Creek provide potential nesting habitat, as do some of the grasslands, open fields, and marshes around O'Neill Forebay. While unlikely in the project area, short-eared owls could nest in suitable habitats.

4.4.6.12 Swainson's Hawk

Swainson's hawks are breeding residents of California, especially the Central Valley, and most winter from Mexico to South America (CDFG, 1994); a small population has been documented to winter in the Sacramento–San Joaquin Delta (Polite, 2006). Generally present in California from early March to late September, they nest in tall trees in riparian forest, oak woodland, roadside landscape corridors, urban parks, and isolated trees in agricultural areas (Woodbridge, 1991; CDFG, 1994). They forage in nearby grasslands, pastures, and suitable grain and alfalfa fields. Prey abundance and accessibility are the most

important features determining the suitability of Swainson's hawk foraging habitat. In addition, agricultural operations (e.g., mowing, flood irrigation) have a substantial influence on the accessibility of prey and thus create important foraging opportunities for Swainson's hawk (City of Sacramento et al., 2006). Crops that are tall and dense enough to preclude the capture of prey do not provide suitable habitat except around field margins, but prey in these habitats may be accessible during and soon after harvest (City of Sacramento et al., 2006). Although the most important foraging habitat for Swainson's hawks lies within a 1-mile (1.6-kilometer) radius of each nest (City of Sacramento, 2003), telemetry studies have shown that they may use in excess of 15,000 ac (6100 ha) of foraging habitat and range up to 18 miles (28 kilometers) from the nest in search of prey (Estep, 1989). Most foraging, however, takes place within 10 miles (16 kilometers) (CDFG, 1994).

CNDDB records within 1 mile (1.6 kilometers) of the project area include a 1936 record associated with Del Puerto Creek, several records within the sycamore woodland along Orestimba Creek, including two from 2012, a number of recent records east and south of O'Neill Reservoir, including three that overlapped with the proposed corridor in 2009 and 2010, and one record on Los Banos Creek dated 2006.

Swainson's hawks were seen in a number of locations during spring 2014 surveys. See Figure 2, maps 4, 17, 21, 27, and 40. The Swainson's hawk pair seen along the Delta-Mendota Canal (map 4) is likely to be nesting in an adjacent patch of large willow trees. Swainson's hawks were sighted several times along Diablo Grande Parkway (map 21) including once in a kettle of six adults. The Swainson's hawk seen in Orestimba Creek (map 27) was expected to be nesting there, and the Swainson's hawk calling defensively from a transmission tower on map 40 was also expected to be nesting. Nesting Swainson's hawks could be present wherever large trees are associated with open, grazed grasslands in the project area. Large trees are primarily associated with larger creeks in the project area and around O'Neill Forebay.

4.4.6.13 Tricolored Blackbird

Tricolored blackbirds nest in colonies that range from several pairs to several thousand pairs depending on prey availability, the presence of predators, and the level of human disturbance (Beedy and Hamilton, 1999). They typically nest near open water in dense cattail, bulrush, willow, blackberry, or other dense vegetation with open grassland or agricultural foraging habitat nearby. Nesting colonies are sensitive to human disturbance (Jones & Stokes, 2006). This bird has experienced dramatic declines in abundance throughout its range (Shuford and Gardali, 2008). Basic requirements for breeding sites are open accessible water, a secure substrate in which to place their nests, and suitable nearby foraging areas that provide adequate food sources.

With the loss of most of the native wetland and upland habitats in the Central Valley, breeding tricolors now forage primarily in managed habitats including agricultural crops such as rice, alfalfa, irrigated pasture, and ripening or cut grain fields (oats wheat, silage, and rice), as well as annual grasslands, cattle feedlots, and dairies, especially with vegetation less than 6 inches (15 centimeters) tall. They also forage in remnant native habitats, including wet and dry vernal pools and other seasonal wetlands, riparian scrub habitats, and open marsh borders (TCBL Working Group, 2007). They often nest 5–6 km (3–3.75 mi) from foraging sites, occasionally farther (TCBL Working Group, 2007).

On December 3, 2014, the California Fish and Game Commission voted to take emergency action to protect the tricolored blackbird by adding it to the list of endangered species. The action took effect December 29, 2014, for an initial term of six months. In March 2015, CDFW published findings that a listing action may be warranted based on the degree and immediacy of a number of threats to the

species' survival (CDFW, 2015b). While the initial term expires roughly June 29, 2015, it is safest to assume for the present that the tricolored blackbird will remain formally listed as endangered under CESA.

From Tracy Substation south to O'Neill Forebay, the nearest CNDDB records are relatively old (1971–1998). The most recent CNDDB records are in the freshwater marsh east of O'Neill Forebay and primarily west of the proposed corridor but also overlapping with it. These records are from 2006 and 2007. The only tricolored blackbirds detected during spring 2014 surveys were heard on a pier structure in the large impoundment immediately west of the proposed corridor on Mountain House Creek (Figure 3, map 3). Nesting was not detected there, but dense freshwater marsh east of the project corridor could support nesting tricolored blackbirds. Potential nesting habitat was also found north of O'Neill Forebay; see Figure 3, map 37). A 2012 eBird (eBird, 2014) record identifies a very large nesting colony within the proposed corridor south of O'Neill Forebay in a patch of nettles along Basalt Road just south of Gonzaga Road. Using the grid markers on Figure 3, map 39, this colony is located at roughly D5/E5. It was not detected during spring 2014 surveys.

Tricolored blackbirds are assumed potentially present in suitable habitats throughout the project area; however, freshwater marsh and other suitably dense patches of habitat are limited to areas with more water than is found in most of the project area.

4.4.6.14 White-tailed Kite

The white-tailed kite is a yearlong resident of coastal and valley lowlands from the east edge of the Central Valley west to the coast, the length of the state. White-tailed kites typically nest in isolated trees with dense canopies, or in similar trees in tree stands and woodlands, that are associated with foraging areas of open grasslands, meadows, farmlands, savannahs, and emergent wetlands. Polite (2005) states that they are rarely found far from agricultural areas and that they have extended their range and increased in numbers in recent years.

There are only three CNDDB records in the nine-quad search area, the nearest of which is from 1993. Similarly, there are few eBird (eBird, 2014) records for the vicinity of the project area, although the numbers increase around O'Neill Forebay. Suitable habitat occurs where medium to large trees with dense canopies occur near open grassland and agricultural areas, including the area from Tracy Substation to Patterson Pass Road and around O'Neill Forebay.

4.4.6.15 Yellow-headed Blackbird

Yellow-headed blackbirds nest almost exclusively in marshes with tall emergent vegetation such as bulrush and cattail, generally in open areas and edges over relatively deep water (Jaramillo, 2008). Males choose territories with ample open water and, within these, females tend to choose edges with moderately dense vegetation and extensive channels (Orians and Wittenberger, 1991). Because of the need for deeper water, breeding marshes are often on the edges of lakes, reservoirs, or larger ponds (Jaramillo, 2008). The Central Valley and northeastern California, as well as other parts of the state, are identified as current breeding range (Jaramillo, 2008).

In the San Joaquin Valley, the species is fairly numerous locally, with the best pockets of suitable habitat along rivers, throughout the wetland complex of the Grasslands Ecological Area near Los Banos, along sloughs of the Kings River, and in the wetlands of the Tulare Lake Basin (Jaramillo, 2008). However, while numerous locally, they are scarce breeders in the western San Joaquin Valley (CDFW, 2015a) and the only CNDDB record in the nine-quad search area is from 1919. This species is potentially present wherever freshwater marsh lies adjacent to deeper water, which in the project area would occur only

around O'Neill Forebay; however, while their presence cannot be ruled out, it appears unlikely given that the only known observation is one eBird report (eBird, 2014) of two that were seen in August 2005 at San Luis Reservoir.

4.4.6.16 Migratory Birds

A migratory bird is any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. There are currently 1007 migratory bird species covered under the MBTA, more than 800 of which occur in the U.S. This act is interpreted to include disturbance through noise and human intrusion that could result in nest abandonment or premature fledging, so implementation typically takes the form of a preconstruction nesting-bird survey and protection of active nests with an appropriate no-disturbance buffer zone until chicks have fledged or the nest is no longer active, as determined by a qualified biologist.

Migratory birds are also protected under section 3503 of California Fish and Game Code, which states that it is unlawful to take, possess, or destroy the nests or eggs of any bird. This code is also interpreted to include disturbance through noise and human intrusion that could result in nest abandonment or forced fledging.

Among the non-special migratory birds observed nesting in the project area were California horned lark (*Eremophila alpestris actia*), common raven (*Corvus corax*), western meadowlark (*Sturnella neglecta*), red-tailed hawk (*Buteo jamaicensis*), red-winged blackbird (*Agelaius phoeniceus*), and cliff swallow (*Petrochelidon pyrrhonota*).

4.4.6.17 Potential to Occur in Project Vicinity

Bald eagle, least Bell's vireo, mountain plover, and yellow-headed blackbird are unlikely to occur in the project area. Bald eagles do not nest within the project area and are not known to winter there, nor does the area contain features preferred for wintering eagles, which include dense thermal cover for night roosting. While mountain plover is known to occur in the project region in winter, i.e., Central Valley lowlands, it is not known to use the project area; however, its presence in winter cannot be ruled out. The yellow-headed blackbird could potentially use dense freshwater marshes adjacent to relatively deep open water, but such habitats are likely to occur only near O'Neill Forebay and may not, because the only CNDDB records in the nine-quad search area are from 1919, and the only sightings from eBird.com (eBird, 2014) include just two seen at San Luis Reservoir in August 2005. Despite the low likelihood of least Bell's vireo occurrence, a protocol survey is recommended because this bird's range is expanding and it could use suitable habitats in the project area.

California condor is not likely to occur in or near the project area as more than an occasional foraging individual, but its nesting range could expand north and east from Pinnacles National Park in the future.

Modesto song sparrow, northern harrier, and tricolored blackbird have nesting requirements that restrict their potential occurrence to dense freshwater wetlands or densely vegetated grasslands, shrublands, or other dense patches within the project area.

Swainson's hawk, golden eagle, and white-tailed kite all nest in trees, transmission towers, or cliffs. While transmission towers are abundant as nesting substrate in the project area and are known to be used by golden eagles, they are not likely nest sites for any of these special-status birds. Trees of suitable size and canopy density are restricted, as are suitable cliffs. The most common nester among these birds is the Swainson's hawk, but golden eagle and white-tailed kite may also nest within the project area.

Burrowing owl is unlikely to nest in or near the steepest terrain in the project area and was only infrequently observed during spring 2014 surveys; however, it could present in parts of the project area. Loggerhead shrike is likewise expected to be present wherever tall shrubs and trees for nesting are present.

Birds protected by the MBTA were observed nesting throughout the project area.

4.4.6.18 Project Effects

With the likely absence of bald eagle and mountain plover, project effects to these species are not expected. These winter visitors could easily move away from disturbing project activities.

California condor is also unlikely to occur in or near the project area, but an expansion of its nesting range could make it vulnerable in the long term to project-related disturbance during the nesting season.

The least Bell's vireo is equally unlikely to occur in the project area; however, because it is expanding its range and has been known to breed within the last 10 years near the project, it could occur in the project area.

Burrowing owl, golden eagle, loggerhead shrike, Modesto song sparrow, northern harrier, Swainson's hawk, tricolored blackbird, white-tailed kite, and yellow-headed blackbird could be directly and indirectly affected by project activities if nesting birds are disturbed, nests are destroyed, nestlings are forced to fledge early because of disturbance, or habitats are permanently destroyed or degraded. Potentially significant indirect effects include avian collision with transmission lines and avian electrocution.

Bald eagle, golden eagle, and white-tailed kite are California fully protected species and as such cannot be taken, nor can take be authorized.

Migratory birds not named above nest throughout the project area.

Project EPMs do not provide protection for these special-status birds and adverse effects are likely without other protections.

4.4.6.19 Avoidance and Minimization Measures

Avoidance and minimization measures were not developed for bald eagle and mountain plover. They are unlikely to occur in the project area and, being winter residents only, will not likely be present during construction, nor will their nests or young be adversely affected by project activities; moreover, for any overlap of construction activities with their presence, they could easily move away from unwanted disturbances. For California condor, least Bell's vireo, and other bird species, Western will consult with USFWS and CDFW. Western will consult with SJCOG for impacts to special-status species falling under the jurisdiction of the San Joaquin County Multi-species Conservation and Open Space Plan (SJCOG, 2000) where the project lies within San Joaquin County, as appropriate. Any avoidance, minimization, or compensation measures developed during consultation with these agencies will supersede those listed below.

BIO-24 The updated CDFW *Staff Report on Burrowing Owl Mitigation* (CDFG, 2012) identifies a number of steps to avoid, minimize, and mitigate impacts to burrowing owls. Western will protect burrowing owls by implementing the following methods derived from the 2012 staff report. To protect burrowing owl, Western will implement the following measures:

During construction activities:

- In coordination with CDFW, a burrowing owl protection and monitoring plan will be developed following guidelines in the updated CDFW staff report (CDFG, 2012). It will include but may not be limited to (a) conducting a protocol survey of the project area the year before construction begins to identify sites of wintering and breeding activity, (b) identifying measures to avoid and minimize impacts, (c) identifying restrictions on construction activities and buffer distances related to time of year, (d) determining whether burrow exclusion or closure will be necessary, and developing a plan for implementation, (e) developing mitigation measures and a compensation plan for unavoidable impacts, (f) conducting a preconstruction survey, and (g) developing a mitigation and monitoring plan to ensure success of mitigation. Compensatory mitigation could include habitat restoration or contribution to a conservation bank.

During O&M activities:

- From February 1 to August 31, project construction, herbicide application (with the exception of direct application), and other O&M activities will be prohibited within 250 feet (76 meters) of potential burrowing owl nesting dens (ground squirrel burrows, culverts, concrete slabs, debris piles that could support nesting burrowing owls). From September 1 through January 31, disturbance will be prohibited within 160 feet (49 meters) of potential burrowing owl dens.
- OR a Department-approved biologist will conduct nesting and wintering surveys using methods described in California Burrowing Owl Consortium 1993, CDFG 2012, or currently accepted method. If nesting or wintering activity is detected, a Department-approved biologist will mark and monitor an appropriate non-disturbance buffer in the vicinity of burrows that have been active within the last three years.
- Within the buffer zone, all project construction and O&M activities and herbicide applications will be prohibited from February 1 to August 31.

BIO-25 To protect the California fully protected golden eagle and white-tailed kite, Western will implement the following measures. The nesting period for these species is March 1 through August 15.

- For ground-breaking activities that begin outside the nesting season, a preconstruction nesting survey will not be necessary. For all ground-breaking activities that begin during the nesting season, a Department-approved biologist will conduct a preconstruction survey in suitable habitats for each species no more than 10 days prior to construction. The survey will encompass 0.5 miles (0.8 kilometers) in all directions from construction areas. If no nesting is detected, no further action will be required.
- During construction, if a golden eagle or white-tailed kite nest is detected, or if it is determined that courtship and nest initiation are underway within the survey distance, Western will establish a 0.5-mile (0.8-kilometer) no-disturbance buffer around the nest or center of activity. The buffer will be maintained until a Department-approved biologist has determined that the young have fledged or the nest is no longer active. If this buffer

cannot feasibly be implemented, CDFW will be consulted well in advance of ground-disturbing activities (CDFW in litt. 2014c).

- During O&M, if a golden eagle or white-tailed kite nest is detected, or if it is determined that courtship and nest initiation are underway within 0.25 mile (0.4 kilometer), Western will establish a 0.25-mile (0.4-kilometer) no-disturbance buffer around the nest or center of activity; a smaller buffer may be established if a Department-approved biologist determines that the O&M activity will not adversely affect adults or young.
- When construction or O&M activities begin in a new area during the nesting season, another preconstruction survey will be completed as described above.

BIO-26 The project area does not provide ideal nesting habitat for least Bell's vireo and this bird is uncommon in this part of its former range. Potential, if marginal, habitat is found at Salado Creek and at a riparian area east of O'Neill Forebay. To protect least Bell's vireo, Western will implement the following measures.

- Where any construction-related activity will take place within 1000 feet (305 meters) of potential least Bell's vireo habitat during the nesting season (mid-March through September), a protocol survey will be conducted by an agency-approved, agency-approved biologist, in coordination with the USFWS. If nesting least Bell's vireos are not detected, no further action is required for this species. If nesting is detected, Western will establish a clearly marked no-disturbance buffer of 1000 feet (305 meters) around the nest, or center of activity if the nest cannot be detected. The buffer will be maintained until the agency-approved biologist has determined that the nest is no longer active or that the young have fledged.
- Biological monitoring will be provided by an agency-approved biologist during construction in all areas within 1000 feet (305 meters) of occupied habitat. The biological monitor will ensure that construction activities do not disturb nesting vireos.

BIO-27 To protect loggerhead shrike, long-eared owl, Modesto song sparrow, northern harrier, short-eared owl, and yellow-headed blackbird, Western will implement the following measures. The nesting season for these species is March 1 through August 15.

- For ground-breaking activities that begin outside the nesting season, a preconstruction nesting survey will not be necessary. For all ground-breaking activities that begin during the nesting season, a Department-approved biologist will conduct a preconstruction survey in suitable habitats for each of these species no more than 10 days prior to construction. The survey will encompass 250 feet (76 meters) in all directions from construction areas for loggerhead shrike, Modesto song sparrow, and yellow-headed blackbird, and 500 feet (152 meters) for long-eared owl, northern harrier, and short-eared owl. If no nesting is detected, no further action will be required.
- During construction, if nests of loggerhead shrike, long-eared owl, Modesto song sparrow, northern harrier, short-eared owl, and/or yellow-headed blackbird are detected, or if it is determined that courtship and nest initiation are underway within the survey distance, Western will establish a clearly marked 250-foot (76-meter) no-disturbance buffer around each nest or center of activity for loggerhead shrike, Modesto song sparrow, and yellow-headed blackbird, and a 500-foot (152-meter) buffer around each nest or center of activity for long-eared owl, northern harrier, and short-eared owl. Buffers will be

maintained until a Department-approved biologist has determined that the young have fledged or the nest is no longer active.

- During O&M, if nests of loggerhead shrike, long-eared owl, Modesto song sparrow, northern harrier, short-eared owl, and/or yellow-headed blackbird are detected, or if it is determined that courtship and nest initiation are underway within the survey distance, Western will establish a clearly marked 250-foot (76-meter) no-disturbance buffer around each nest or center of activity for loggerhead shrike, Modesto song sparrow, and yellow-headed blackbird, and a 500-foot (152-meter) buffer around each nest or center of activity for long-eared owl, northern harrier, and short-eared owl; a smaller buffer may be established if a Department-approved biologist determines that the O&M activity will not adversely affect adults or young.
- When construction begins in a new area during the nesting season, another preconstruction survey will be completed as described above.

BIO-28 To protect nesting Swainson's hawks, Western will implement the following measures pursuant to guidelines from CDFW (CDFG, 1994) and the Swainson's Hawk Technical Advisory Committee (SWTAC, 2000), and pursuant to informal consultation for the project initiated January 2014 (CDFW in litt., 2014c). The nesting season for Swainson's hawks, which encompasses the courtship and nest initiation phase, is considered by CDFW to be February 1 through September 15.

During construction activities:

- An agency-approved biologist will conduct preconstruction surveys according to guidelines presented in SWTAC 2000, which establishes five survey periods. During the first period (January 1 to March 20) potential nest locations are identified. During the second period (March 20 to April 5) Swainson's hawks are returning to traditional nesting territories during a time when most nest trees are leafless and birds and their activities are easier to detect. During the third period (April 5 to April 20) pair bonding, courtship, and nest construction are taking place and while nests may be more difficult to see, they can be inferred from increased activity. During the fourth period (April 20 to June 10) nests are difficult to detect and activity is low because adults are incubating. Surveys should not be initiated during the fourth period. During the fifth period (June 10 to July 30), young birds may be active and visible, and both adults are making many visits to the nest with prey. Three surveys will be completed in at least at least two of the survey periods immediately prior to project imitation. Surveys will encompass the area within 0.5 miles (0.8 kilometers) of construction activities.
- In addition, if ground-disturbing activities are to take place during the breeding season (February 1 through September 15), the CDFW recommends that additional pre-construction surveys for active nests be conducted by a Department-approved biologist no more than 10 days prior to the start of construction.
- If an active Swainson's hawk nest is found, a clearly marked 0.5-mile (0.8-kilometer) no-disturbance buffer will be established around the nest. If such a buffer cannot feasibly be implemented, consultation with CDFW will occur well in advance of ground-disturbing activities and the acquisition of a state incidental take permit pursuant to Fish and Game Code section 2081(b) may be warranted.

During O&M activities:

- From February 1 to September 15, a 0.25-mile buffer zone will be established and maintained around potential Swainson's hawk nest trees, within which there will be no intensive disturbance (e.g., use of heavy equipment, power saws, chippers, cranes, or draglines). This buffer may be adjusted, as assessed by an agency-approved biologist, based on changes in sensitivity exhibited by birds over the course of the nesting season and the type of O&M activity performed (e.g., high noise or human activity such as mechanical vegetation maintenance versus low noise or human activity such as semi-annual patrols), or a Department-approved biologist will conduct nest surveys using methods described in SHTAC 2000 (or more current protocol) to determine absence.
- Within 0.25 miles of an active nest, routine O&M activities will be deferred until after the young have fledged or until it is determined by a Department-approved biologist that the activities will not adversely affect adults or young.

BIO-29 Tricolored blackbird nests colonially in a variety of densely vegetated habitats. The nesting season for tricolored blackbird is March 1 through August 15.

- For ground-breaking activities that begin or take place outside the nesting season, a preconstruction nesting survey will not be necessary. For all ground-breaking activities that begin during the nesting season, a biologist experienced with tricolored blackbirds and their range of habitats will conduct a preconstruction survey no more than 10 days prior to construction. The survey will encompass 500 feet (152 meters) in all directions from construction areas. If no nesting is detected, no further action will be required.
- If nesting is detected, or if it is determined that courtship and nest initiation are underway within 500 feet (152 meters) of a construction or laydown area, Western will establish a clearly marked 500-foot (152-meter) no-disturbance buffer around the outer edges of the habitat. The buffer will be maintained until a Department-approved biologist has determined that the colony is no longer active.
- If tricolored blackbirds begin nesting near construction or laydown areas after construction has started, a clearly marked no-disturbance buffer will be established around the colony that is the maximum size possible for the circumstances. The buffer will be maintained until the colony is no longer active.
- Biological monitoring will be provided by a Department-approved biologist during construction in all areas within 500 feet (152 meters) of occupied habitat. The biological monitor will ensure that construction activities do not disturb the colony.
- When construction begins in a new area during the nesting season, another preconstruction survey will be completed as described above.

BIO-30 For non-listed birds protected by the MBTA and Fish and Game Code, Western will implement the following measures. The nesting season for these birds is March 1 through August 31.

- For ground-breaking activities that begin or take place outside the nesting season, a preconstruction nesting survey will not be necessary. For all ground-breaking activities starting within the nesting season, a preconstruction survey for migratory birds not previously mentioned will be conducted by an agency-approved biologist no more than 10 days prior to project initiation in a sufficient area around the work site to identify nests that are present and determine their status. A sufficient area means any nest within an

area that could potentially be affected by the project. In addition to direct impacts, such as nest destruction, nests might be affected by noise, vibration, odors, and movement of workers or equipment.

- Identified nests will be surveyed within 24 hours prior to construction or O&M activities to establish a behavioral baseline. Once work commences, all nests will be monitored during work activities to detect any behavioral changes as a result of the project. If behavioral changes are observed, the work causing that change will cease and CDFW and USFWS will be consulted for additional avoidance and minimization measures. OR, if monitoring of identified nests by an agency-approved wildlife biologist is not feasible, CDFW and USFWS recommend a minimum no-disturbance buffer of 250 feet (76 meters) around active nests of non-listed passerine-type bird species and a 500-foot (152-meter) no-disturbance buffer around the nests of non-listed raptors until the breeding season has ended, or until an agency-approved biologist has determined that the young have fledged and are no longer reliant upon the nest or parental care for survival. Variance from these no-disturbance buffers may be implemented when there is compelling biological or ecological reason to do so, such as when project activities would be concealed from a nest site by topography. Any variance from these buffers will be supported by an agency-approved biologist and it is recommended that CDFW and USFWS be notified in advance of implementation of a no-disturbance buffer variance.
- When construction or O&M begins in a new area during the nesting season, another preconstruction survey will be completed as described above.

4.4.6.20 Compensatory Mitigation

BIO-31 For unavoidable impacts to burrowing owl habitat known to be occupied within the last 5 years, compensatory mitigation will be required. Compensation may take the form of (a) acquiring and dedicating lands into conservation easements; (b) purchasing mitigation credits at compensation ratios that have been approved by the CDFW; or (c) preserving area contiguous or near the acreage lost.

BIO-32 Compensatory mitigation will be required for loss of Swainson's hawk foraging habitat using compensation ratios provided in CDFG 1994 (or more current document) or a ratio determined through consultation with CDFW. As provided in CDFW 2014c, compensatory mitigation for Swainson's hawk may also be required for loss of nest trees.

4.4.6.21 Cumulative Effects

With implementation of avoidance and minimization measures, and successful compensatory mitigation for project effects that cannot be avoided, cumulative effects to special-status birds are not expected. If compensatory mitigation in the form of habitat restoration is not successful, the project would contribute to cumulative habitat loss and degradation for these animals.

4.4.7 Mammals

4.4.7.1 American Badger

American badgers are found in dry, open grassland, scrub, and forest habitats, usually in areas with sandy loamy soils and where small mammal prey are abundant (Ahlborn, 1988). They occur throughout California. They typically have large home ranges during the breeding season; home range size may be

as little as 5 ac (2 ha) in winter and as high as 1790 ac (725 ha) in summer (Sargeant and Warner 1972, Lindzey, 1978).

Most CNDDB records for American badger in the nine-quad search area are from 1927 to 1998, and the records nearest the project area are all from the late 1980s and 1990s. Two records from 2006 are near O'Neill Forebay. The entire project area is considered potentially occupied by American badger.

4.4.7.2 Bats

Pallid bat. Pallid bat inhabits rocky, arid deserts and canyonlands, shrub-steppe grasslands, and higher-elevation coniferous forests usually below 6500 feet (2000 meters) (Pierson and Rainey, 2002). It is most abundant in xeric habitats, including Great Basin, Mojave, and Sonoran deserts (WBWG, 2014). Day and night roosts crevices in rocky outcrops, and cliffs, caves, mines, trees, and various human structures such as bridges, barns, porches, bat boxes, including human-occupied and vacant buildings (WBWG, 2014). Tree habitats include basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating ponderosa pine and valley oak bark, deciduous riparian trees, and orchard fruit trees. They roost alone or in small or large groups; roosts generally have unobstructed entrances/exits and are high above the ground, warm, and inaccessible to terrestrial predators (WBWG, 2014). At lower elevations, this bat is strongly associated with oak savanna where it feeds primarily on ground-dwelling arthropods such as grasshoppers, scorpions, and Jerusalem crickets, and large, flying insects such as long-horned beetles and katydids (Pierson and Rainey, 2002).

Potential cliff roosting habitat is found in or adjacent to the project area between Patterson Pass Road and Corral Hollow, and potential riparian roosting habitat is found at Corral Hollow, Salado, Orestimba, and Los Banos creeks, and around O'Neill Forebay. There are few if any human structures within 1 mile (1.6 kilometers) of the project area suitable for bat roosting. Two CNDDB records are for pallid bats found in 1941, 1942, and 1956. More recently, a small nursery colony was found in 1991 in a crack in a stable manganese prospect; this site is located 3.5 miles (5.6 kilometers southwest of the project, about 2.5 miles (4 kilometers) south of Corral Hollow Road. A 1999 record is from a riparian area 10 miles east of the project. Roosting pallid bats are assumed potentially present within or near the project area.

Townsend's big-eared bat. In California, Townsend's big-eared bat occurs from inland deserts to coastal forests, in oak woodlands of the inner coast ranges and Sierra Nevada foothills, and low to mid elevation mixed forests (CDFW, 2013). Distribution is patchy and strongly correlated with the availability of caves and cave-like roosting habitat, with population centers occurring in areas dominated by exposed, cavity-forming rock and/or historic mining districts. It prefers open surfaces of caves or cave-like structures, such as mine adits and shafts, but has also has been reported in buildings, bridges, and water diversion tunnels that offer a cavernous environment. It has also been found in rock crevices and, like a number of bat species, in large hollow trees. Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats (CDFW, 2013). This bat became a state candidate for listing as threatened or endangered under the California Endangered Species Act in June 2013.

There is little roosting and hibernating habitat in the Central Valley for Townsend's big-eared bat and there are no records of maternity colonies there including the central coast ranges (Center for Biological Diversity, 2012); however, there is potential roosting habitat in old-growth sycamores in Orestimba Creek. SJCOG (2000) reports two confirmed records for the Midway quad, one of the quads through which the project passes, but is not more specific about location. There are no CNDDB records for this bat within 1 mile of the project area. A single 1991 CNDDB record reports multiple scattered males associated with an untimbered manganese prospect 3.5 miles (5.6 kilometers) west of the project, about 2.5 miles (4

kilometers) south of Corral Hollow Road (where pallid bats were also found—see above). Given the relative lack of roosting and hibernating habitat and the absence of known maternity colonies in the Central Valley and central coast ranges, this species is likely to occur in the project area only as foraging individuals.

Western mastiff bat. This species is associated with cliff habitat where maternity colonies of 30 to several hundred (typically fewer than 100) roost generally under exfoliating rock slabs such as granite, sandstone, or columnar basalt (Pierson and Rainey, 2002). It has also been found in similar crevices in large boulders and buildings (WBWG, 2014). Roosts are generally high above the ground, usually allowing a clear vertical drop of at least 10 feet (3 meters) below the entrance for flight. It is adapted for fast, long-distance flight and forages in the open air over meadows, grasslands, forests, and open water for large moths and crickets (Pierson and Rainey 2002; WBWG, 2014). Since this species does not hibernate, it needs winter habitat with predominantly nonfreezing temperatures (Pierson and Rainey, 2002). The distribution of this bat is likely geomorphically determined, with the species being present only where there are significant rock features offering suitable roosting habitat (WBWG, 2014). It is found in a variety of habitats, from desert scrub to chaparral to oak woodland and into the ponderosa pine belt and high elevation meadows of mixed conifer forests, and occurs through much of California.

All the CNDDB records for this bat near the project area are associated with just two locations and two years. In 1991, a roost was discovered along Corral Hollow several miles west of the project area, and in 1994, a roost was discovered along Los Banos Creek several miles west of the project area. Potential roosting habitat occurs within the project area (Figure 3, maps 4–8) and south of Crow Creek, best visualized as the northern half of Figure 3, map 25.

Western red bat. The western red bat is strongly associated with riparian habitats, especially mature stands of cottonwood and sycamore in riparian corridors that are at least 165 feet (50 meters) wide (Pierson et al., 2006), primarily at lower elevations (Pierson and Rainey, 2002). It also occurs in narrower riparian stands of suitable age and in orchards (Pierson et al., 2006). Typically solitary, this bat roosts primarily in the foliage of trees or shrubs. Roost sites are generally hidden from view from all directions except below, lack obstruction beneath, allowing the bat to drop downward for flight, lack lower perches that allow visibility by predators, have dark ground cover to minimize solar reflection, have nearby vegetation to reduce wind and dust and are generally located on the south or southwest side of a tree (Bolster, 2005).

This bat may also occasionally use caves, as both dead and live red bats, including a pregnant female, have been collected from Carlsbad Caverns in New Mexico. It is locally common in some areas of California, occurring from Shasta County south to the Mexico border west of the Sierra/Cascade crest and deserts (Harris, 1990). A distribution study by Pierson et al. (2006) showed strong associations with the Central Valley, especially the Sacramento and San Joaquin rivers. In this study, red bats were encountered infrequently or not at all in the coast ranges, along the coast, or in the Sierra Nevada, but were predictably present during the summer at most sites sampled in the Central Valley.

The only CNDDB record in the nine-quad search area is from 1999 along the San Joaquin River. This bat could use riparian habitats along Salado Creek (Figure 3, map 23) and in the riparian forest east of O'Neill Forebay (Figure 3, maps 36 and 40). The sycamore alluvial woodland along Orestimba Creek (Figure 3, map 27) supports large sycamore trees but lacks the canopy density described by Pierson et al. (2006). Presence cannot be ruled out, but is not highly likely.

4.4.7.3 Giant Kangaroo Rat

Giant kangaroo rats inhabit flat or gently sloping terrain dominated by annual grassland in areas with hot, dry summers and average annual precipitation of approximately 12 inches (30 centimeters) or less (Williams et al. 1995, Bean et al. in press,). Found from elevations of 300 to 2900 feet (90 to 885 meters), most extant habitat lies at elevations above 650 feet (200 meters). They mainly inhabit sandy-loam soils located on level and gently sloping ground vegetated with annual grasses and forbs and widely scattered desert shrubs (Williams et al., 1995; ESRP, 2014). Often found in areas that are heavily grazed by cattle and sheep, they prefer semi-arid slopes at the head of draws in barren, shrubless areas, with loose, friable, sandy-loam soils (Williams and Kilburn, 1991, cited in IUCN, 2014). Extant habitat has been fragmented, mostly by irrigated croplands, into six major geographic units, which in turn have been broken into dozens of smaller colonies by agricultural and petroleum developments (ESRP, 2014).

The giant kangaroo rat is not known to occur anywhere within 15 or more miles (24 kilometers) of the project area. The nearest known extant populations occur in the Panoche Hills well south of the project area. However, the private lands north of extant populations in Panoche Hills have not been surveyed for giant kangaroo rat, and other areas may not have been surveyed because of potentially higher precipitation (B Cypher pers. comm., T Bean pers. comm.). Williams et al. 1995 considered the northern part of the range of this kangaroo rat to be western Fresno and eastern San Benito Counties; their study of distribution in the northern segment of the giant kangaroo rat range makes no mention of Merced County. Recent research has been focused on areas farther south where most records exist and where habitat conditions are more suitable. Distribution models based on climate, slope, and soil particle size show the potential for giant kangaroo rat occurrence in small areas north of the Panoche Hills (Bean et al., 2014a; Bean et al., 2014b).

Humboldt State Assistant Professor Tim Bean (pers. comm.), who is using satellite imagery and other habitat models to map giant kangaroo rat habitats and is also conducting trapping studies, stated that to his knowledge there have been no recent surveys north of Panoche Valley, and he suspects the area is too wet. He stated that it would be a surprise to find the species that far north. His 2011 trapping surveys in Panoche Valley resulted in no captures of giant kangaroo rat; he will be trapping there again this summer (July 2014). Bureau of Land Management biologist Mike Westphal (pers. comm.) believes there is no giant kangaroo rat habitat within a 5-mile (8-kilometer) radius of the Dos Amigos Substation. He has superficially surveyed the general area around Arburua Road and found one or two “suspicious” areas, but nothing looked to him like ideal giant kangaroo rat habitat. Brian Cypher with the CSU Stanislaus Endangered Species Recovery Program (pers. comm.) said that with all the private land north of the Panoche Hills, there has been no trapping. These regional giant kangaroo rat experts were equivocal about the potential for this species to occur in the southern portion of the project area.

The only CNDDB record for giant kangaroo rat in the nine-quad search area is a 1932 record for an abundance of this species at a location approximately 2.5 miles (4 kilometers) south of the Dos Amigos Substation. Trapping in that area in 1989 resulted in no captures (CDFW, 2015a). Giant kangaroo rat is considered unlikely to occur in the project area, but its presence cannot be ruled out. There was no evidence of giant kangaroo rat occurrence during reconnaissance surveys in 2014 and 2015. Western has contracted with Humboldt State University and Dr. Tim Bean to apply both satellite imagery and habitat models to the project area south of SR 152 to better assess habitat potential for the giant kangaroo rat. Results, which were unavailable for this report, will be presented in the EIS/EIR and biological assessment for this project.

4.4.7.4 San Joaquin Kit Fox

The San Joaquin kit fox, endemic to the San Joaquin Valley of California, typically occurs in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure such as saltbush scrub, grasslands, and alkali sink in flat or gently rolling terrain (Cypher et al., 2007). In areas where average slopes exceed 15 percent, kit fox abundance usually is considerably lower due to increased predation risk (Cypher et al., 2012); Koopman et al. (2001) noted that kit foxes prefer habitats with slopes less than 6 percent. Within its range, it is associated with areas having open, level, sandy ground (Grinnell et al., 1937, *in* USFWS, 2010c) that is relatively stone-free to depths of about 3–4.5 feet (0.9–1.4 meters).

San Joaquin kit foxes use subterranean dens for temperature regulation, shelter from adverse environmental conditions, reproduction, and escape from predators. Though they are reputed to be poor diggers, the complexity and depth of their dens does not support this assessment (USFWS, 1998b). Kit foxes also modify and use dens constructed by other animals, such as ground squirrels, badgers, and coyotes, and human-made structures such as culverts, abandoned pipelines, banks in sumps or road beds, and rubble piles, as well as dens under sidewalks or buildings, among tree roots in urban areas, and in golf courses (USFWS 1998b; Cypher et al., 2012). Dens may extend to 6 feet (1.8 meter) or more below ground surface (Laughrin, 1970, *in* USFWS, 2010c).

Cypher et al. 2012 report that San Joaquin kit foxes prefer well-drained sandy to loamy soils as such soils support higher abundance of preferred prey (kangaroo rats) and facilitate the excavation of new dens. Although the kit fox was historically thought to subsist primarily on kangaroo rats and kit fox populations appear to be most robust where kangaroo rats persist (Koopman et al., 2001), the kit fox diet currently varies geographically, seasonally, and annually and includes nocturnal rodents such as kangaroo rats and mice, California ground squirrels, rabbits and hares, San Joaquin antelope squirrels, ground-nesting birds, and insects (USFWS, 2010c).

Kit foxes currently persist in a metapopulation consisting of three larger core and a number of smaller satellite populations (USFWS 1998b; Cypher et al., 2005) with areas of suitable habitat linking them. The SLTP project area crosses two satellite (S) areas and links between them: S1, spanning portions of Alameda, Contra Costa, and San Joaquin Counties, and S2, spanning portions of western Merced and Stanislaus Counties. USFWS (2010c:16) characterizes the current trend in S1 as “have declined, no known breeding” and in S2 as “have declined, presence in S. portion.”

Constable et al. (2009) reports results of a multi-year study showing that a persistent but low-density kit fox population is present on lands from a region starting just south of Santa Nella (which lies directly east of northern O’Neill Forebay) and extending south to Little Panoche Road, roughly 10 miles (16 kilometers) south of the Dos Amigos Substation. According to Constable et al. (2009), north of Santa Nella (O’Neill Forebay) evidence indicates that kit foxes may only be intermittently present and may largely be dispersing individuals from farther south. They describe the northern part of the kit fox range this way (Constable et al., 2009:38):

> *In this northern area, the habitat is primarily of medium or low quality and is highly fragmented. This landscape pattern appears to extend northward into and throughout the northern range of the kit fox. Throughout this northern region, steep terrain is common and in some locations this unsuitable terrain extends eastward and abuts Interstate 5 or agricultural lands (CSUS Endangered Species Recovery Program, unpublished data). This not only inhibits occupation by kit foxes, but also severely impedes movement through these areas. Furthermore, the herbaceous ground cover is dominated by relatively tall, dense stands of wild oats (Avena spp.). Steep terrain and dense*

cover increase predation risk for kit foxes (Warrick and Cypher, 1999), and also constitute poor habitat conditions for kangaroo rats, the preferred prey of kit foxes. The heavy clay soils common to this region also are an impediment to kangaroo rats. These factors collectively result in suboptimal conditions for kit foxes and probably are responsible for the intermittent presence of kit foxes in this northern region and the apparent lack of evidence for resident kit fox populations.

Recent evidence indicates that kit foxes are unable to occupy farmland on a long-term basis (Warrick et al., 2007, *in* USFWS, 2010c). Agricultural lands do not provide suitable habitat for the kit fox for a variety of reasons. Although kit foxes may enter the margins of row crops and further into orchards at night from natural lands, Warrick et al. (2007 *in* USFWS, 2010c) found no evidence that kit fox were able to use farmland, even when it was the predominant available habitat.

Currently, the entire range of the kit fox appears to be similar to what it was at the time of the 1998 recovery plan (USFWS, 1998b); however, population structure has become more fragmented, at least some of the resident satellite subpopulations have apparently been locally extirpated, and portions of the range now appear to be frequented by dispersers rather than resident animals (USFWS, 2010c). By 2006, kit foxes were determined to be largely eliminated from the central portion of the San Joaquin Valley. Kit fox presence on the west side of the Central Valley is primarily confined to a relatively narrow band of suitable habitat between coast range foothills and Interstate 5 (Constable et al., 2009; USFWS, 2010c). Within this narrow band, constriction of available habitat and occurrence of barriers such as the San Luis Reservoir, the California Aqueduct, the Delta-Mendota Canal, and several high-traffic roads, potentially limit movements of the kit fox (USFWS, 2010c). However, in late 2008 another kit fox was sighted in the northernmost portion of the range (Mueller in litt., 2008, *in* USFWS, 2010c).

Most CNDDB records from the nine-quad search area are from 1998 or earlier. A 2000 record reports an assumed small population occupying an area directly north of the Tracy Substation within the project area. A number of records from 2003 and 2005 report kit foxes in the southern half of the project area south of O'Neill Forebay and south of Los Banos Reservoir, and continued presence there is supported by Constable et al. (2009).

4.4.7.5 Short-nosed Kangaroo Rat

Short-nosed kangaroo rats were historically found mostly on flat and gently sloping terrain and on hilltops in desert-shrub associations. They generally occupy grasslands with scattered shrubs and desert-shrub associations on friable soils, inhabiting highly saline soils in some areas (ESRP, 2014). Over most of their current range they are generally more numerous in lighter, friable soils such as the sandy bottoms and banks of arroyos and other sandy areas. This species occupies many of the same general areas occupied by giant kangaroo rats, although with a different pattern of use. Occupied habitats have not been completely mapped, and there are relatively large areas that offer potential habitat for this species that have not been surveyed. However, the extant occupied area is unlikely to be more than about 1.5 percent of the estimated historical habitat.

There are no CNDDB records for short-nosed kangaroo rat within the nine-quad search area, and there are no current or historic records within or near the project area (ESRP, 2014). They are known to occur on the valley floor south of Los Banos (ESRP, 2014), and could use the grassland habitats south of O'Neill Forebay.

4.4.7.6 Potential to Occur in Project Vicinity

American badger is assumed present in suitable habitats throughout the project area. Townsend's big-eared bat is expected to be present in the project area only as foraging individuals; suitable roosting

habitat is not likely to occur within the biological study area. Western mastiff bat could roost in cliffs found within or near the project area in the following locations: Figure 3, maps 4–8, and south of Crow Creek, i.e., the northern half of Figure 3, map 25. While western red bat is unlikely to roost in the project area, its presence cannot be ruled out. It could use riparian habitats along Salado Creek (Figure 3, map 23), the riparian forest east of O'Neill Forebay (Figure 3, maps 36 and 40), and, less likely, sycamore alluvial woodland along Orestimba Creek (Figure 3, map 27).

Giant kangaroo rat is not currently known to occur north of portions of Panoche Valley, which is approximately 15 miles (24 kilometers) south of Dos Amigos Substation, but its presence cannot be ruled out without further study. Short-nosed kangaroo rat is not known to occur in or near the project area, but its presence in the grasslands south of O'Neill Forebay cannot be ruled out. San Joaquin kit fox is assumed to be present in suitable grassland and scrub habitats throughout the project area. For reasons described above, kit fox use of most of the project area north of Santa Nella is likely to be limited. Potential kit fox dens, identified on maps in Figure 3 as "PKFs," were noted during spring 2014 surveys; these surveys were conducted at a reconnaissance level, so many areas were not walked or even seen, and not every den was examined for kit fox potential. Large stretches of grassland north of Santa Nella were devoid even of ground squirrel activity. A kit fox carcass was discovered south of Los Banos Reservoir and its location shown on Figure 3, map 49. Constable et al. (2009) have established a low-density kit fox presence in the project area from Santa Nella south. Project alternatives run through areas scoped by Constable et al. (2009) as least-cost corridors for kit fox movement in this area.

4.4.7.7 Project Effects

American badger, giant kangaroo rat, and San Joaquin kit fox could be directly affected in grassland, scrubland, and open woodland habitats by temporary or permanent loss of or physical damage to habitats, mortality during construction or through vehicle ingress/egress, disturbance through human presence and construction noise and vibration, and collapse of burrows. Indirect effects could include post-project erosion at or near construction areas and new roads, and degradation or loss of habitat through operation and maintenance such as long-term use of new or existing access roads, tower/line repairs, introduction of human trash, introduction or spread of non-native plants or predators, spread of disease, spill of hazardous materials, and increased susceptibility to wild fire.

Townsend's big-eared bat is not known or expected to roost within the and the distribution of both western mastiff and western red bats is likely to be limited in the project area. The primary project effects to bats could be direct effects associated with disturbance at roost sites through human presence and construction noise and vibration. Roosting habitats (cliffs, mines, buildings, rock outcrops, and riparian areas) are not expected to be temporarily or permanently affected and the small amounts of grassland lost to tower footings and access roads are not expected to affect availability or use of foraging habitat.

Project EPMs do not provide sufficient protection of habitats and individuals of these species and adverse project effects are likely without additional protections.

4.4.7.8 Avoidance and Minimization Measures

Western will consult with USFWS and CDFW SJCOG for impacts to special-status species falling under the jurisdiction of the San Joaquin County Multi-species Conservation and Open Space Plan (SJCOG, 2000) where the project lies within San Joaquin County, as appropriate. Any avoidance, minimization, or compensation measures developed during consultation will supersede those listed below.

BIO-33 To protect American badger, Western will minimize impacts by implementing the following measures.

- Concurrent with other required surveys (e.g., kit fox and burrowing owl), a Department-approved biologist will conduct a preconstruction survey to identify the presence of American badgers. If this species is not found, no further action will be required. If badgers are identified, they will be passively relocated using burrow exclusion (e.g., installing one-way doors on burrows) or similar CDFW-approved exclusion methods. In unique situations it might be necessary to actively relocate badgers (e.g., using live traps) to protect individuals from potentially harmful situations. Such relocation will be performed with advance CDFW coordination and concurrence. When unoccupied dens are encountered outside of work areas but within 100 feet (30.5 meters) of proposed activities, vacated dens will be inspected to ensure they are empty and temporarily covered using plywood sheets or similar materials.
- If badger occupancy is determined at a given site within a construction area, construction will be halted. Depending on the den type, reasonable and prudent measures to avoid harming badgers will be implemented and may include seasonal limitations on project construction near the site (i.e., restricting the construction period to avoid spring-summer pupping season), establishing a construction exclusion zone around the identified site, or resurveying the den a week later to determine species presence or absence.

BIO-34 To protect Townsend's big-eared bat and other special-status bats, Western will minimize impacts by performing preconstruction surveys and creating no-disturbance buffers around active bat-roosting sites, especially maternity roosts and especially during the bat pupping season (April 1 through August 15) for project construction and O&M activities using the following measures.

- Before construction activities within 250 feet (76 meters) of trees, cliffs, or caves, a Department-approved bat biologist will survey for special-status bats. If no evidence of bats (i.e., direct observation, guano, staining, or strong odors) is observed, no further mitigation will be required. If evidence of bats is observed, Western will implement the following measures to avoid potential impacts on breeding populations:
- A no-disturbance buffer of 250 feet (76 meters) will be created around active bat roosts or occupied roosting habitat during the pupping season (April 1 through August 15). Bat roosts initiated during construction will be presumed to be unaffected by the indirect effects of noise and construction disturbances. However, the direct take of individuals will be prohibited without further consultation with CDFW.
- Removal of trees showing evidence of active bat use will occur during the period least likely to affect bats in winter hibernacula or maternity roosts, as determined by a Department-approved bat biologist (generally between August 15 and October 15, and between February 15 and April 1). If the exclusion of bats from potential roost sites is necessary to prevent indirect impacts due to construction noise and adjacent human activity, bat exclusion activities (e.g., installation of netting to block roost entrances) will be conducted by a Department-approved biologist.

BIO-35 Western will either assume presence of giant and short-nosed kangaroo rats and implement measures to avoid or minimize impacts, or conduct research to assess habitat potential. Research could take the form of (a) evaluating the project area using a model based on

satellite imagery currently being applied to giant kangaroo rat habitats throughout their range (T. Bean, pers. comm.) or other habitat models or (b) conducting protocol trapping in potentially suitable areas immediately prior to construction. If research indicates that kangaroo rats are not likely to be present, no further action will be required. If Western either assumes presence or research indicates that either kangaroo rat species could be present, Western will implement the following measures.

- Prior to construction or O&M activities, any active burrows in the vicinity of work sites will be flagged and marked with a burrow number. Exclusion zones with a 30-foot (9-meter) radius will be established around any active burrow. Construction activities, with the exception of essential vehicle operation on existing roads and foot travel, will be prohibited within this exclusion zone.
- A biological monitor will be on site for all activities within suitable kangaroo rat habitat. Prior to construction or O&M activities each day within suitable habitat, the monitor will conduct a brief ground survey of the site to verify that no kangaroo rats are present within the site. The biological monitor will have the authority to stop and/or redirect project activities in coordination with the project manager and Western's natural resources staff to ensure the protection of giant kangaroo rats. The biological monitor will complete daily reports/logs summarizing activities and environmental compliance.
- Installation of barrier fencing around the work site may be used to further limit the risk of direct impacts to kangaroo rats where necessary. Barrier fencing will at no time inhibit the kangaroo rat's ability to move between its den and other habitats that allow breeding, feeding, and sheltering. All barriers will be removed at the end of project activities.
- If giant kangaroo rats are detected within a disturbance site and if necessary, they may be relocated to a suitable site away from project activities but as close to the disturbance site as feasible. Relocation methods will follow the recommendations in Tennant et al. 2013 or other Service-approved methods.

BIO-36 To protect San Joaquin kit fox, Western will implement the following measures.

- To the extent practical, Western will avoid project construction and O&M activities that require ground disturbance or off-road travel between December 1 and May 31, the kit fox breeding/pupping season.
- Prior to project construction or O&M activities that involve ground disturbance, off-road travel, or vegetation management in suitable kit fox habitat, an agency-approved biologist will conduct habitat/den surveys in accordance with the "Small Projects" recommendations in the 2011 USFWS Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS, 2011c). Any suitable den (i.e., burrow with an entrance greater than 4 inches in diameter) will be monitored for evidence of kit fox use by placing either a tracking medium or wildlife monitoring cameras at the entrance for at least three consecutive nights. Active dens will be marked with a 100-foot (30.5-meter) buffer and natal or pupping dens (December 1 through May 31) will be marked with a 1,000-foot (305-meter) buffer. Construction activities, with the exception of essential vehicle operation on existing roads and foot travel, will be prohibited within this buffer area.
- If activities must occur within 100 feet (30.5 meters) of an active den, San Joaquin kit foxes will be excluded from the den. Methods will follow those outlined in USFWS 2011c. The

den will be monitored for at least five consecutive nights from initial observation to allow the animal to move to another den during its normal activity. Use of this den may be discouraged by partially plugging the den in such a manner that any resident animal can easily escape but may be discouraged from re-entering. Once the kit fox has abandoned the den or is still present after five or more consecutive days of partial plugging and monitoring, the den will be plugged or excavated (by hand as possible) when the qualified biologist determines that the animal is absent due to normal activities. Natal dens will not be destroyed or disturbed during breeding/pupping season (December 1 through May 31).

- A biological monitor will be on site for any work activities within suitable kit fox habitat. Prior to construction activities each day, the monitor will conduct a brief ground survey of the site to verify that no kit foxes are present. The biological monitor will have the authority to stop and/or redirect project activities in coordination with the project manager and Western's natural resources staff to ensure the protection of kit foxes. The biological monitor will complete daily reports/logs summarizing activities and environmental compliance.
- Installation of barrier fencing around the work site may be used to further limit the risk of direct impacts on kit fox. If necessary, barrier fencing will be used to prevent kit foxes from entering the work site and getting injured or killed by equipment but will at no time inhibit the kit fox's ability to move between its den and other habitats that allow breeding, feeding, and sheltering. All barriers will be removed at the end of construction or O&M work.
- Any excavated, steep-walled holes or trenches more than 2 feet (0.6 meter) deep will be covered at the close of each working day with plywood or similar materials or escape ramps will be installed in the hole or trench. Before any hole or trench is filled, it will be inspected for trapped animals.
- All construction pipes, culverts, or similar structures with a diameter of 4 inches (10 centimeters) or more that are stored at a construction site overnight will be thoroughly inspected for kit foxes before the pipe is buried, capped, or moved. If a kit fox is discovered inside a pipe, that section of pipe will not be moved until the kit fox has left the pipe.
- Use of rodenticides and herbicides in the project area will be limited to the extent possible. Use of any such compounds will observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other state and federal legislation. If rodent control must be conducted, zinc phosphide will be used as possible because it presents a lower risk to kit foxes.

4.4.7.9 Compensatory Mitigation

BIO-37 Compensatory mitigation will be required for temporary and permanent impacts to San Joaquin kit fox habitat. Compensation may take the form of (a) acquiring and dedicating lands into conservation easements or (b) purchasing mitigation credits at compensation ratios that have been approved by state and federal agencies.

4.4.7.10 Cumulative Effects

With implementation of avoidance and minimization measures, and successful compensatory mitigation for project effects that cannot be avoided, cumulative effects to special-status mammals are not expected. If compensatory mitigation in the form of habitat restoration is not successful, the project would contribute to cumulative habitat loss and degradation for these animals.

5. Alternatives Analysis

For purposes of comparing biological resources in the proposed and alternative corridors, the project was divided into four distinct segments (see Figure 2 above):

- North Segment: between the Tracy Substation and Patterson Pass Road
- Central Segment: between Patterson Pass Road and Butts Road
- San Luis Segment: between Butts Road and the Los Banos Substation, including the 70-kV routes to San Luis Substation
- South Segment: between Los Banos and Dos Amigos Substations, including the 230-kV routes from San Luis Substation

There is no alternative corridor for the North Segment region, and therefore this segment is not analyzed in this section. Proposed and alternative corridors are compared to each other for the other three segments. For a detailed project description, refer to Appendix A. Table 4 compares habitat types and acreages among proposed and alternative corridors. A list of habitat codes and brief definitions is provided in Appendix C.

Importantly, because large parts of the project area were not visited because of access constraints, the comparisons below are based on a combination of what was encountered and mapped in the field, and what was interpreted to be on the ground based on aerial imagery or long-distance views through binoculars. It would be particularly difficult to accurately identify and map such features as freshwater marsh, seasonal wetland, vernal pool, riparian forest or scrub, elderberries, and coyote brush scrub from aerial images, especially since these habitats occur in such small patches throughout the project area. Their relative scarcity also makes them easier to avoid during construction. The acreage figures in Table 4 and the descriptions of the corridors below are approximations and have not been field verified.

This analysis assumes that all of the creeks and drainages within the segments, including those identified as rivers, would be spanned. For creeks that support Great Valley riparian forest, it is also assumed that spanning the creek would not adversely affect the associated riparian forest or woodland, which would also include a buffer zone as designated by the federal and state agencies.

5.1 Central Segment

In the Central Segment, the 500-kV line would follow either the proposed corridor or the Patterson Pass Road alternative. 500-kV lines require construction of 4 to 5 tower structures per mile. The two routes run essentially parallel to each other on either side of existing PG&E transmission lines, with the proposed corridor on the east. This region is shown on Figure 2-6b, and on Figure 3, maps 4 through 33. Acreages are shown in Table 4 and corridor lengths are provided in Table 5.

Table 4. Comparison of Habitat Types Among Proposed and Alternative Corridors (acres)

Habitat Type	Central Segment: Proposed	Central Segment: Patterson Pass Road Alternative	San Luis Segment: Proposed	San Luis Segment (500-kV): Butts Road Alternative	San Luis Segment (500-kV): West of Cemetery Alternative	South Segment: Proposed	South Segment: Los Banos to Dos Amigos Alternative	South Segment: Billy Wright Road Corridor Alternative	San Luis Segment (70-kV): Proposed	San Luis Segment (70-kV): West of O'Neill Forebay 70-kV Alternative
Ag	43.53	34.23	0.00	0.00	0.00	43.91	38.48	0.00	0.00	0.00
Aggr	71.26	76.65	0.00	0.00	0.00	13.44	7.27	0.00	0.00	0.00
Agor	69.31	28.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agvn	16.92	12.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bar	18.17	29.80	34.11	47.33	43.13	21.61	21.65	20.49	32.46	14.27
Cbsc	0.00	0.00	14.38	26.21	26.21	13.43	13.43	13.43	17.39	6.36
Com	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gnn	2574.13	2525.33	1385.58	902.73	994.65	599.31	611.43	685.08	404.34	472.32
Gnp	0.00	0.00	0.00	0.36	0.36	0.00	0.00	0.00	0.00	0.14
Oth	0.88	0.36	29.75	0.00	0.00	0.00	0.00	0.00	2.04	0.14
Rgf	8.78	10.91	9.53	0.00	0.00	0.00	0.00	1.149	9.53	0.00
Rgs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wace	42.78	38.68	1.13	2.44	0.69	1.28	1.26	3.20	0.32	0.21
Waci	12.59	15.98	1.33	0.55	0.27	1.15	1.15	0.45	0.00	0.37
Wadr	0.00	0.00	0.00	11.34	11.34	11.16	11.16	11.16	11.16	0.37
Waic	0.00	0.00	8.95	3.53	3.53	3.41	3.41	3.41	8.52	3.76
Waim	0.00	0.50	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09
Walk	0.00	0.00	6.28	35.89	35.89	0.00	0.00	0.00	6.28	7.10
Waot	0.00	0.00	0.00	0.00	0.00	0.61	0.61	0.61	0.00	0.00
Wapd	0.00	0.12	0.14	0.07	0.07	0.01	0.01	0.10	0.00	0.07
Warv	11.00	11.22	5.25	0.00	1.21	0.26	0.26	2.87	0.00	3.66
Wfm	1.09	0.60	6.31	3.41	1.66	0.07	0.07	0.07	6.39	1.94
Wldf	25.23	62.86	0.00	0.00	0.00	0.00	0.00	17.54	0.00	0.00
Wot	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00
Wse	0.36	2.61	0.00	3.07	3.07	0.13	1.40	0.00	0.00	1.74
Wvp	0.37	0.02	3.39	3.61	3.61	0.22	0.22	0.22	0.22	0.45
Total	**2896.41**	**2850.77**	**1506.12**	**1040.625**	**1125.679**	**710.08**	**711.90**	**759.79**	**498.64**	**512.49**

5.1.1 Sensitive Habitats and Special-status Plants

The proposed corridor has more non-native grassland, freshwater marsh, and vernal pool habitat than the alternative corridor, but the number of towers would be essentially the same. The vegetation types are potential habitat for a number of special-status plants. In addition, the freshwater marsh qualifies as coastal and valley freshwater marsh and the vernal pool habitat qualifies as northern claypan vernal pool, both of which are special-status vegetation types. Non-native grassland is the most common vegetation type throughout the project area. If populations of special-status plants are found in the non-native grassland type it is likely that the project could avoid those populations. It is also likely that the project could avoid impacting any freshwater marsh and vernal pool areas. Federal and state agencies that regulate wetlands such as the freshwater marsh and vernal pools would also require that these areas be avoided if possible.

The Patterson Pass Road alternative has more wildflower fields, Great Valley cottonwood riparian forest, and seasonal wetlands than the proposed corridor. Great Valley cottonwood riparian forest is a special-status vegetation type in addition to being potential habitat for special-status plants. Seasonal wetlands are a sensitive habitat type regulated by federal and state agencies and can support special-status plants.

At Orestimba Creek, the Great Valley riparian forest qualifies as sycamore alluvial woodland, another special-status vegetation community. Sycamore alluvial woodland has an equal amount of area in both corridors. It could also most likely be avoided.

The wildflower fields within the alternative corridor have more observed populations of the three special-status plants found during surveys. In addition, all areas mapped as wildflower fields, even if no plants were observed in 2014, are considered to be potential habitat for these species.

It is likely that the Great Valley cottonwood riparian forest and seasonal wetland habitats could be avoided, thus avoiding impacts. However, it is less likely that the project would be able to avoid all of the wildflower fields and populations of special-status plants, which makes the alternative corridor more likely to have an adverse impact to sensitive botanical resources than the proposed corridor.

5.1.2 Special-status Wildlife

The proposed and Patterson Pass Road alternative corridors separate just south of Patterson Pass Road, but they traverse similar topographic features, cross all the same creeks, and contain roughly equivalent amounts of each type of habitat. Quantitatively, the proposed corridor is essentially the same length but roughly 0.5 mile (0.8 kilometer) longer, roughly 46 acres (19 hectares) larger in total area, and encompasses about 12 acres (5 hectares) more upland.[1] It contains 2 acres (0.8 hectare) less combined impoundment/pond, freshwater marsh, seasonal wetland, and vernal pool habitat. Given how little impoundment/pond habitat is present in either corridor, however, it is likely that towers can be placed to avoid these sensitive and/or regulated habitats, making impacts to aquatic habitats unlikely. The acreage of riverine habitat is the same in both corridors.

[1] For the alternatives analysis for wildlife, the term upland combines native and non-native grassland, wildflower fields, coyote brush scrub, and intermittent and ephemeral creeks. Intermittent and ephemeral creeks are included because, although they may convey water during rainy periods and may be regulated as waters of the U.S., they almost exclusively supported upland vegetation. While agricultural lands may be used for foraging by some wildlife species, and rice fields have become essential habitats for giant garter snake, they are not equivalent to the native or naturalized habitats that provide the functions and values special-status upland species require.

One feature in the Patterson Pass Road alternative corridor not present in the proposed corridor is a eucalyptus grove (Figure 3, map 12) within the floodplain of Lone Tree Creek, in which at least 10 species of nesting bird were detected during spring 2014 surveys.

Despite the larger absolute size of the proposed corridor, its length and configuration are similar to the Patterson Pass Road alternative. At 0.5 mile (0.8 kilometers) longer, the proposed corridor might require more towers or longer access roads than the alternative corridor, which would minimally increase temporary and permanent project effects to uplands, and would increase the cost of compensatory mitigation for San Joaquin kit fox, burrowing owl, Alameda whipsnake, California tiger salamander, and California red-legged frog. This could also result in a slightly higher cumulative loss of habitats for special-status reptiles, upland-nesting birds, American badger, and the prey animals of golden eagle, Swainson's hawk, and other raptors. Depending on tower placement, construction of the Patterson Pass Road alternative could require avoiding the nesting season for birds nesting at the Lone Tree Creek eucalyptus grove; if the creek were spanned, this impact could be avoided.

5.2 San Luis Segment (500-kV)

In the San Luis Segment (500-kV), the project would follow the proposed corridor, the Butts Road alternative, or the West of Cemetery alternative. This would again be a 500-kV line requiring construction of 4 to 5 tower structures per mile. Relative habitat diversity increases in these corridors because there are more habitat types within shorter distances. These corridors are shown on Figure 2-6c, and on Figure 3, maps 34 through 41. Acreages are shown in Table 4 and corridor lengths are provided in Table 4.

Table 5. Estimated Lengths of Proposed and Alternative Corridors

Common Points	Estimated Length	Number of Alternatives	Alternative Name	Estimated Length
500/230-kV Corridors				
North Segment	7.7	0	None	7.7
Central Segment	48.0	1	Patterson Pass Road	48.0
San Luis Segment (500-kV)	9.1	2	Butts Road	9.6
			West of Cemetery	10.3
South Segment	18.0	2	Los Banos to Dos Amigos	18.0
			Billy Wright Road	19.5
70-kV Corridor				
San Luis Segment (70-kV)	7.0	1	West of O'Neill Forebay 70-kV	7.0

5.2.1 Sensitive Habitats and Special-status Plants

The proposed corridor has more non-native grassland, Great Valley cottonwood riparian forest, and coastal and valley freshwater marsh habitats than the Butts Road and West of Cemetery alternatives. Great Valley cottonwood riparian forest and coastal and valley freshwater marsh are special-status vegetation communities. The proposed corridor has 3.39 acres (1.4 hectares) of vernal pool habitat, which is only 0.22 acres less than the Butts Road and West of Cemetery alternatives, so essentially these three alternatives have the same amount of vernal pool habitat. The vernal pool habitat corresponds to the northern claypan vernal pool vegetation type, which is also a special-status vegetation type.

The proposed corridor has no mapped native perennial grasslands, whereas the Butts Road and the West of Cemetery alternatives have 0.36 acres (0.16 hectares) of this type, so the benefit of the proposed alternative is that it would not impact any native perennial grassland areas. However, given the relatively small amount of acreage of this type in the two alternatives, it is possible that these areas could be avoided.

Non-native grassland is the most common vegetation type throughout the project area and cannot be avoided. However, if populations of special-status plants are found, it is likely that the project could avoid those populations. It is also likely that the project could avoid impacting any Great Valley riparian forest, coastal and valley freshwater marsh, and northern claypan vernal pool areas. Federal and state agencies that regulate these creek and wetland types would also require that these areas be avoided as possible. There are no seasonal wetlands within the proposed corridor which means no potential for impact.

Given that the proposed corridor is longer, and has more grassland and other sensitive habitats, there is a higher probability for this corridor to have more impacts than for the two alternative corridors.

The Butts Road alternative has the least amount of non-native grassland habitat and has the same amount of seasonal wetlands and northern claypan vernal pool (a special-status vegetation type) as the West of Cemetery alternative. It also has more freshwater marsh habitat than the West of Cemetery alternative. The federal and state agencies that regulate the wetlands would also require that these areas be avoided. This alternative is the shortest of the three corridors, which means fewer towers and the least probability of impacting sensitive plants and habitats.

The West of Cemetery alternative is shorter in length than the proposed corridor, longer than the Butts Road alternative, and has more non-native grassland than the Butts Road alternative. This alternative would have fewer impacts than the proposed corridor but more than the Butts Road alternative.

5.2.2 Special-status Wildlife

In the San Luis Segment, the proposed corridor is 465 acres (188 hectares) larger than the Butts Road alternative and 380 acres (154 hectares) larger than the West of Cemetery alternative. This is related to the proposed corridor being wider in several places than either alternative, which in turn is likely related more to providing siting options than to a need for the proposed corridor to take more ground. Assuming that each corridor would temporarily and permanently affect the same amount of habitat per tower, the proposed corridor, at 9.1 miles (14.6 kilometers) in length, would require construction of the fewest towers (~46), and the West of Cemetery alternative, at 10.3 miles (16.6 kilometers) in length, would require construction of the most towers (~42). The Butts Road alternative is intermediate in length at9.6 miles (15.4 kilometers) and would require construction of ~48 towers.

Of significance in this segment is the historical and potential current occurrence of blunt-nosed leopard lizard. With the blunt-nosed leopard lizard being a California fully protected species, prohibitions against take pose a particular challenge. For this reason, the corridor that minimizes impacts to blunt-nosed leopard lizard habitat is of greatest benefit for minimizing project and cumulative habitat loss, obtaining an incidental take permit from USFWS, complying with CDFW prohibitions on take, and minimizing the cost of compensatory mitigation—and it would minimize impacts to San Joaquin kit fox, California tiger salamander, burrowing owl, and other species. Figure 6 presents a schematic of general habitat values for blunt-nosed leopard in the proposed corridor and the Butts Road alternative corridor. Habitat potential was not assessed for the West of Cemetery alternative for reasons described in section 4; however, based on aerial imagery seen in figures 6d and 6e, the West of Cemetery alternative appears to be

equivalent to the Butts Road alternative, and both appear to have more habitat of moderate to high quality than the proposed corridor. Both the Butts Road and the West of Cemetery alternative corridors contain more upland habitat potentially suitable for blunt-nosed leopard lizard than the proposed corridor.

The proposed corridor crosses nearly 16 acres (6.5 hectares) of riparian forest and freshwater marsh in a relatively small area east of O'Neill Forebay. Portions of riparian channels in this area meander through the proposed corridor where they connect with patches of freshwater marsh within the corridor. Riparian forest and freshwater marsh, especially where it is extensive, are important habitat elements in an otherwise dry region. CNDDB records show that this area is known to support northern harrier, Swainson's hawk, and tricolored blackbird. It could also support valley elderberry longhorn beetle, least Bell's vireo, loggerhead shrike (along the edges of riparian), Modesto song sparrow, and many migratory songbirds. If there is open water within these channels and wetlands, they could also support special-status amphibians during breeding and non-breeding seasons, as well as pond turtle. There is no riparian forest in either alternative corridor. The West of Cemetery alternative contains roughly half as much freshwater marsh as the proposed corridor, and the Butts Road alternative contains about a quarter as much freshwater marsh. While both alternative corridors contain some seasonal wetland, which the proposed corridor does not, it occurs in such small amounts that it could presumably be avoided. The combination of the importance of riparian and freshwater marsh habitats, their relative abundance and density in the proposed corridor, and the configuration of the proposed corridor (with several bends, it could require more towers), either the Butts Road alternative or the West of Cemetery alternative would be better for avoiding impacts to marsh and riparian.

The proposed corridor crosses less coyote brush scrub than either the Butts Road alternative or the West of Cemetery alternative. This habitat type is important for wildlife because it provides cover diversity in a region of relatively monotypic non-native grassland. The proposed corridor would have less impact on this upland element; however, this is of less concern than potential impacts to uplands and riparian and wetland habitats.

The proposed corridor also includes a large eucalyptus grove, nearly 30 acres (12 hectares) classified as Oth (other), where a Swainson's hawk was seen calling in spring 2014 and was likely nesting, and where CNDDB records show Swainson's hawks nesting in previous years. This grove is also likely to support a number of other nesting migratory bird species. The Butts Road and West of Cemetery alternatives avoid this area by slightly more distance. Construction near the eucalyptus grove would need to accommodate a no-disturbance buffer during the nesting season. Some degree of compensation for loss of Swainson's hawk foraging habitat would be common to all three corridors.

5.3 South Segment

From San Luis Substation, the project would follow the proposed corridor, the Los Banos to Dos Amigos alternative, or the Billy Wright Road alternative. The transmission line in this segment would be 230 kV, which would require construction of 7 to 10 tower structures per mile. These corridors are shown on Figure 2-6e and can be seen in more detail on Figure 3, maps 41 through 54. Acreages are shown in Table 4 and corridor lengths are provided in Table 5.

5.3.1 Sensitive Habitats and Special-status Plants

The proposed corridor has slightly more non-native grassland habitat than the San Luis to Dos Amigos alternative and much less than the Billy Wright Road alternative. The freshwater marsh and vernal pool habitat is the same for all three corridors, whereas the San Luis to Dos Amigos alternative has more

seasonal wetlands. The proposed corridor and San Luis to Dos Amigos alternative are equal in length, whereas the Billy Wright Road alternative is longer.

The San Luis to Dos Amigos alternative has the least amount of non-native grassland habitat, is equal in length to the proposed corridor, and shorter than the Billy Wright Road alternative. Since the proposed alternative has the least amount of non-native grassland area it has a lower probability of adversely affecting any potential special-status plants. Therefore this alternative has the least likelihood to have adverse impacts to sensitive plant and wetland resources.

Northern claypan vernal pool habitat is the same for all three corridors. There were no mapped seasonal wetlands for the Billy Wright Road alternative and the Los Banos to Dos Amigos alternative has the most mapped seasonal wetland habitat. Given that the seasonal wetland areas are small in size and in total acreage, it is likely that the project would be able to avoid any impacts to this wetland type.

The Billy Wright Road alternative has 85 acres (35 hectares) more grassland than the proposed corridor and 73.65 acres (29.8 hectares) more than the Los Banos to Dos Amigos alternative. It is also 1.5 miles (2.5 kilometers) longer than these two corridors. In addition, this is the only one of the three corridors to have mapped wildflower fields, which are known to support at least 3 special-status plant species. These three factors combine to make it the most likely corridor to support, and therefore impact, special-status plants.

5.3.2 Special-status Wildlife

The Billy Wright Road alternative covers roughly 50 acres (20 hectares) more area than the either the Los Banos to Dos Amigos alternative or the proposed corridor, which are roughly the same size. It also contains the highest proportion of upland habitat because, unlike the other two corridors, it contains no agricultural land; both the proposed and Los Banos to Dos Amigos alternative corridors have more land in agriculture and less upland. Each contains roughly equivalent amounts of freshwater marsh, seasonal wetland, pond, and drainage/irrigation canal habitats. The Billy Wright Road alternative corridor contains ~1.15 acres (0.5 hectares) of riparian forest associated with Los Banos Creek.

The uplands in this segment have varying degrees of suitability for blunt-nosed leopard lizard (Figure 6). As with the previous segment, the corridor that minimizes impacts to upland habitats is of benefit for minimizing temporary and permanent loss of habitat, obtaining an incidental take permit from USFWS, complying with CDFW prohibitions on take, minimizing the cost of compensatory mitigation, minimizing cumulative impacts, and minimizing impacts to San Joaquin kit fox and California tiger salamander, as well as to giant and short-nosed kangaroo rats if they are present. Both the proposed and Los Banos to Dos Amigos corridors, which are each18 miles (29 kilometers) long and roughly 86–88 percent upland, affect less upland than the Billy Wright Road alternative, which is 19.5 miles (31 kilometers) long and nearly 95 percent upland. Those additional1.5 miles (2.4 kilometers) would result in construction of as many as 8 additional 230-kV towers in an area of relatively higher potential for blunt-nosed leopard lizard. Either the proposed corridor or the Los Banos to Dos Amigos alternative would be preferred to the Billy Wright Road alternative from that perspective. The Billy Wright Road alternative crosses approximately 1.15 acres of riparian forest, but this is associated with the upper reaches of Los Banos Reservoir, which would likely be spanned.

5.4 San Luis Segment (70-kV)

A single-circuit 70-kV corridor would link San Luis Substation back to O'Neill Substation through either the proposed corridor, which would run east of O'Neill Forebay, or the West of O'Neill Forebay

alternative corridor. A 70-kV line would require construction of 15 to 30 tower structures per mile. These corridors are shown on Figure 2-6d and can be seen in more detail on Figure 3, maps 34 through 41. Acreages are shown in Table 4 and corridor lengths are provided in Table 5.

5.4.1 Sensitive Habitats and Special-status Plants

The proposed corridor has less non-native grassland, seasonal wetland, and northern claypan vernal pool habitat, but more Great Valley cottonwood riparian forest and coastal and valley freshwater marsh habitat than the West of O'Neill Forebay alternative.. The West of O'Neill Forebay alternative has more non-native grassland habitat and has mapped native perennial grassland habitat in addition to seasonal wetlands and more vernal pool habitat than the proposed corridor. The two corridors are the same length with the same number of towers. The proposed corridor overall is less likely to impact special-status plants and special-status vegetation communities, primarily due to having less non-native grassland habitat, which is the type that will be most impacted by development and also likely to support special-status plant species. The Great Valley cottonwood riparian forest and coastal and valley freshwater marsh habitats could presumably be spanned and avoided.

5.4.2 Special-status Wildlife

The West of O'Neill Forebay alternative corridor in this segment covers nearly 14acres (5.6 hectares) more total area and contains 57.4 acres (23.2 hectares) more upland than the proposed corridor. Constructing 15 to 30 more towers per mile in this segment substantially increases the impact of this line in both corridors, but the impact to upland habitat is greater in the West of O'Neill Forebay alternative corridor. Given that uplands support blunt-nosed leopard lizard, as well as San Joaquin kit fox, burrowing owl, and California tiger salamander, among others, and impacts will require compensatory mitigation, the proposed corridor would cause less impact to sensitive species.

The proposed corridor contains approximately 16 acres (6.4 hectares) of riparian forest and freshwater marsh combined, concentrated in a small area south of the O'Neill Substation, in which construction of 15 to 30 towers per mile could result in significant impacts to these regulated and sensitive habitats. The West of O'Neill Forebay alternative contains no riparian forest and less than 2 acres (0.8 hectare) of freshwater marsh. However, permitting and impact considerations for wetlands and riparian for the proposed corridor may be less problematic than those for the West of O'Neill Forebay alternative for this 70-kV line.

The proposed corridor contains less than 1 acre (0.4 hectare) of impoundment, pond, seasonal wetland, and other waters. The West of O'Neill Forebay alternative corridor contains 3.16 acres (1.3 hectares) of these features. With construction of an equal number of towers for each corridor, the difference between 1 acre and 3.16 acres is not likely to be significant in terms of permitting and impacts, especially for features that occur in relatively small patches.

6. Discussion and Conclusions

6.1 Sensitive and Regulated Habitats and Special-status Plants

In general, the project would likely be able to avoid effects to wetlands and waters of the U.S. This would be preferred, and is typically required, by federal and state agencies that regulate these habitats. The Central Segment and the Billy Wright Road Alternative in the South Segment have wildflower fields that support special-status plants, and these areas may not be avoidable. The largest area of wildflower fields is within the Patterson Pass Road alternative corridor. Overall the corridors that have the most non-native grassland and/or wildflower fields are the corridors that have the greatest potential to impact special-status plants and/or special-status grassland communities. All of the other special-status or sensitive habitats could most likely be avoided.

6.2 Special-status Wildlife

The dominant habitat type in the project area is uplands in the form of native and non-native grassland, which includes intermittent and ephemeral creeks because they all support upland plant species. Uplands also include coyote brush scrub and wildflower fields wherever they occur. Most special-status species in the region depend to some degree on uplands like those found in the project area, including blunt-nosed leopard lizard, California red-legged frog, California tiger salamander, western pond turtle, burrowing owl, Swainson's hawk, golden eagle, American badger, and San Joaquin kit fox. The project would affect habitat for all of these species, and could affect habitat for others such as Alameda whipsnake, San Joaquin whipsnake, coast horned lizard, loggerhead shrike, northern harrier, white-tailed kite, and giant kangaroo rat.

Equally important to wildlife but far less common in the project area are impoundments and ponds, riparian forest and scrub, freshwater marsh, seasonal wetlands, and vernal pools. With the exception of the proposed corridor in the San Luis Segment, these habitats occur in such relative isolation from each other that they could presumably be avoided.

The corridor that adversely affects the least upland habitat and avoids the most aquatic and wetland habitat is the corridor that would require the least compensatory mitigation and would be easiest to justify to permitting agencies such as USACE, RWQCB, USFWS, and CDFW.

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7.2 Persons Contacted

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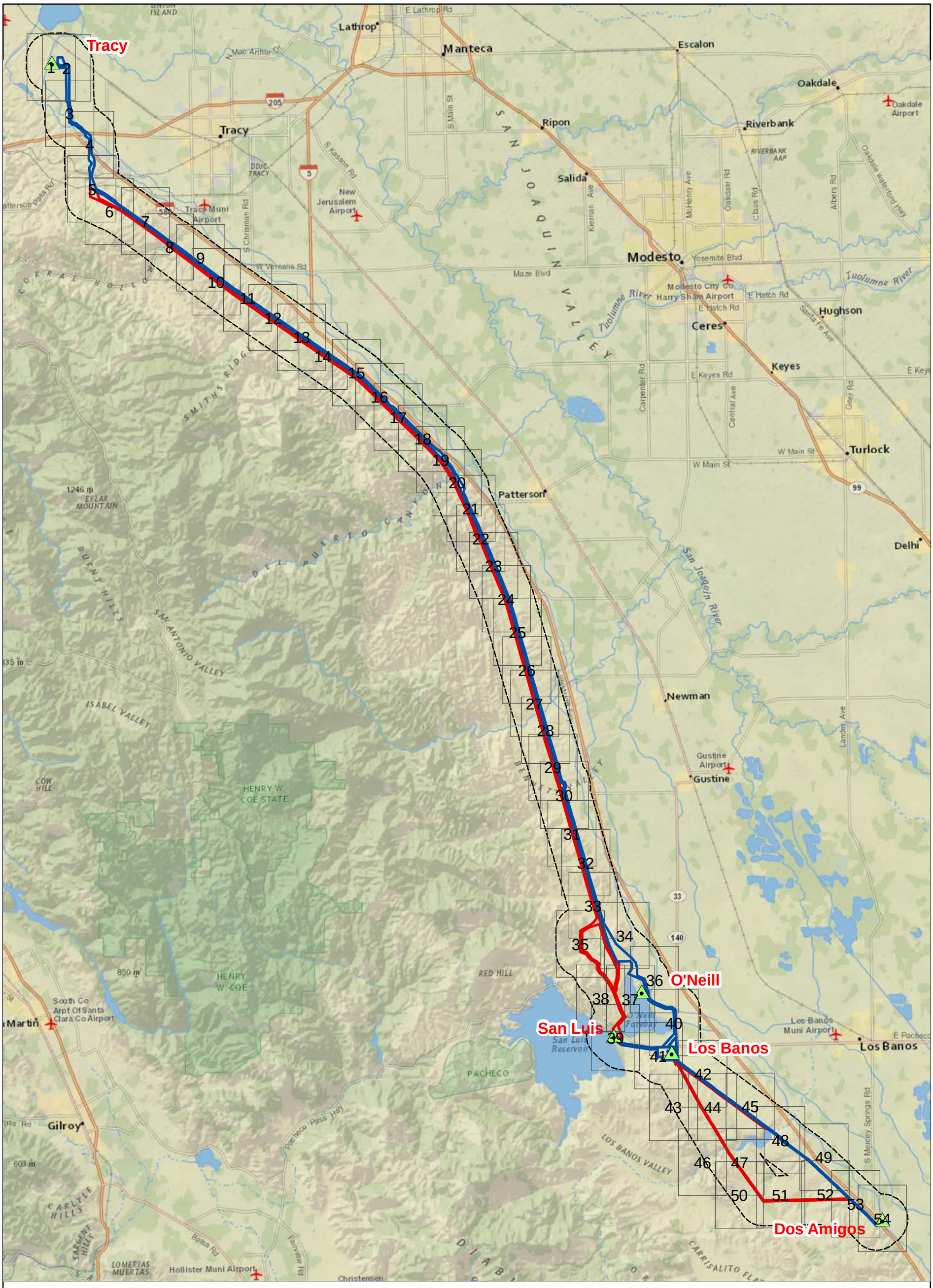
GIS Habitat Maps

Biological Survey Report Figure 3



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Source: WAPA SNR, Aspen EG, ESRI

Map Page

1.25-mile buffer around Project Area

Corridors

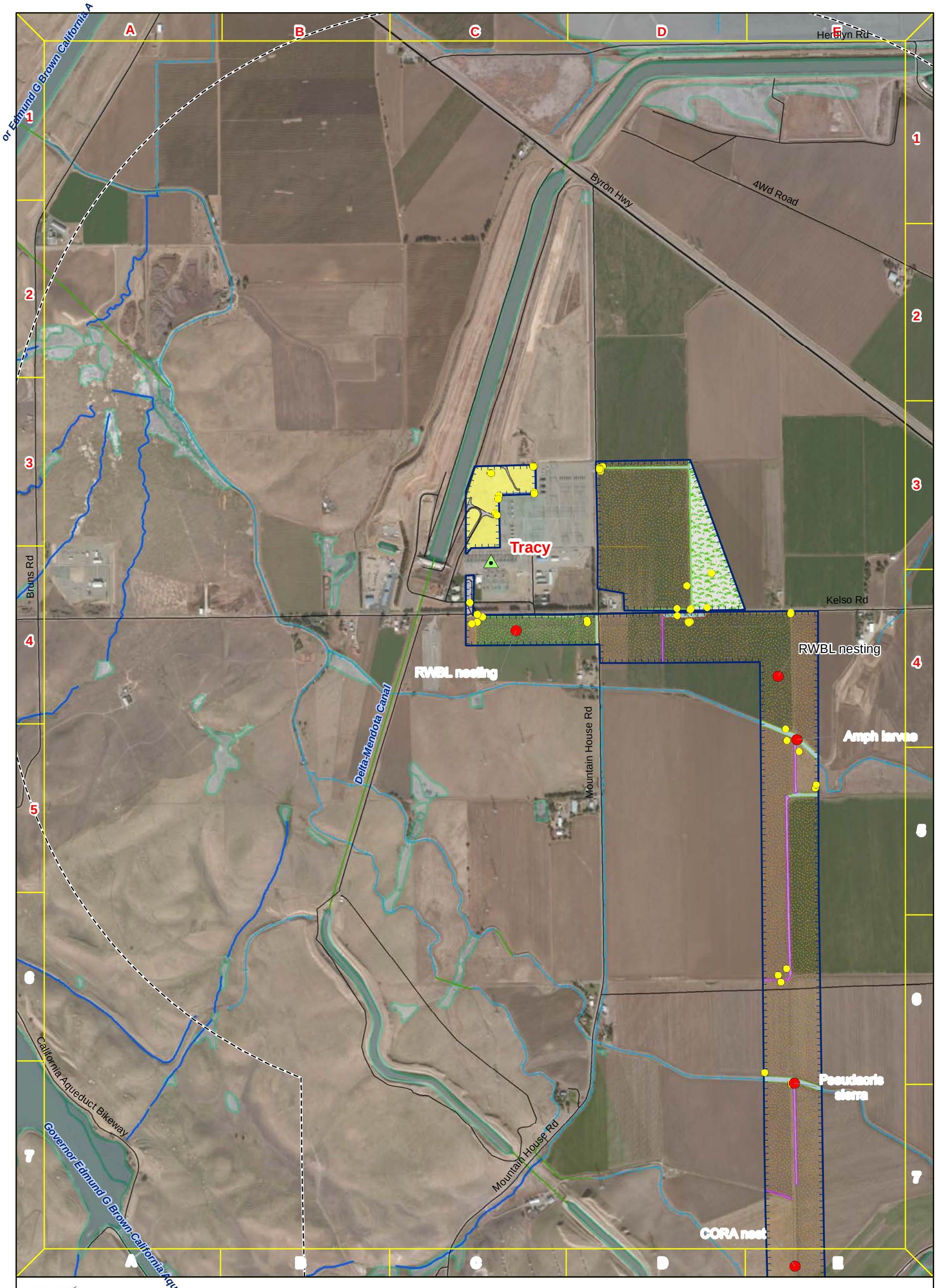
Proposed Project Corridor

Corridor Alternatives

0 3 6 Miles

Figure 3.

Biological Resources


A
B
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1
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Herdlyn Rd
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Kelso Rd
RWBL nesting
RWBL nesting
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CORA nest
Delta-Mendota Canal
Mountain House Rd
Mountain House Rd
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Governor Edmund G Brown California Aqu
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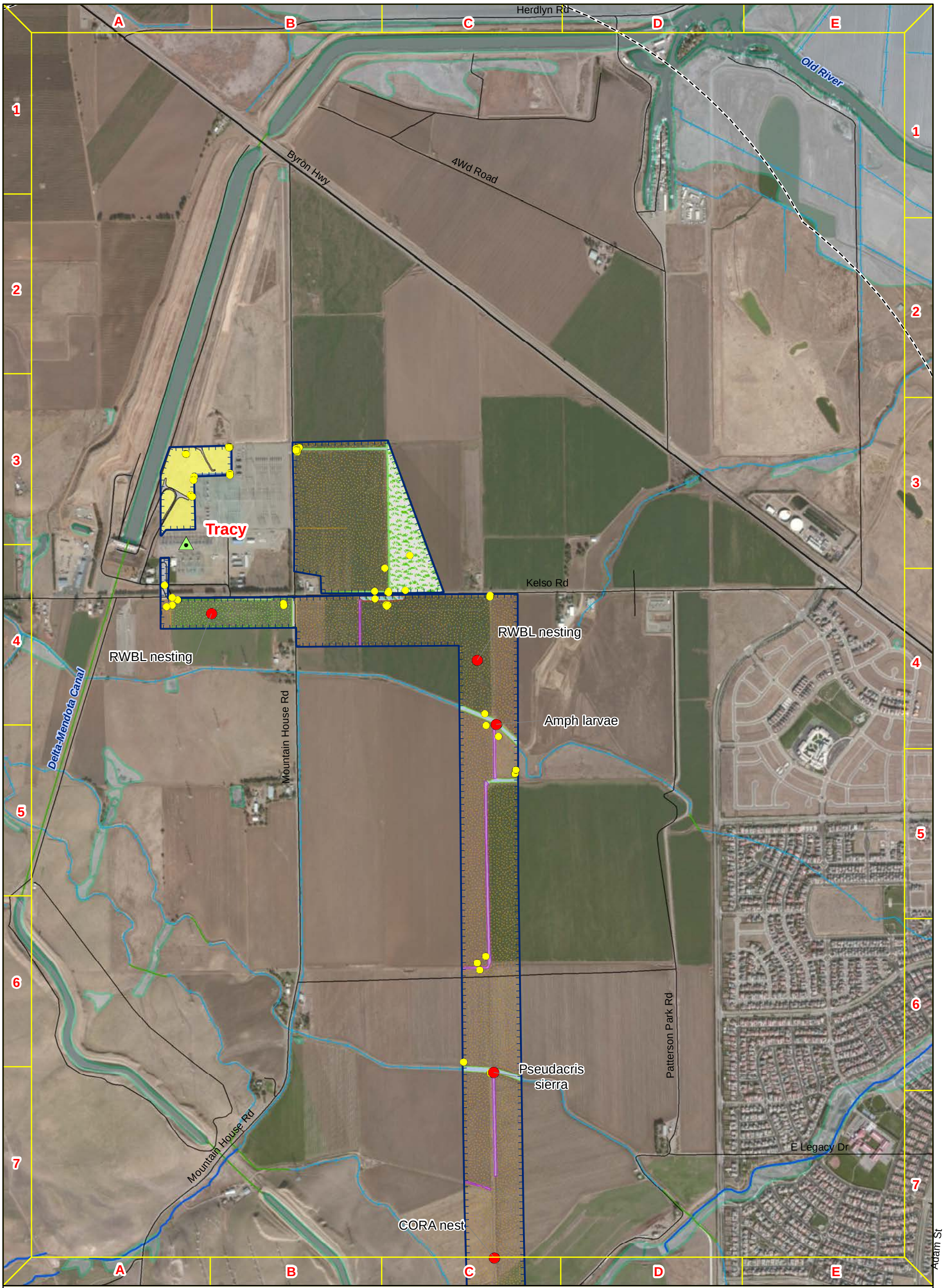
Source: WAPA SNR, Aspen EG, ESRI
Existing Substation
Photo point
Species Occurrence
1.25-mile buffer around Project Area
Elderberry polygon
Corridors
Proposed Project Corridor
Corridor Alternatives
Hydrologic Feature
Canal Ditch
Pipeline
Stream/River
NWI Wetland
Habitat Type
Grain
Orchard
Pasture
Barren
Grassland non-native
Drainage
Irrigation canal
Other waters
Freshwater marsh
Figure 3.
Biological Resources
N
0
750
1,500
Feet

See Page 1



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Source: WAPA SNR, Aspen EG, ESRI

- Existing Substation
- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

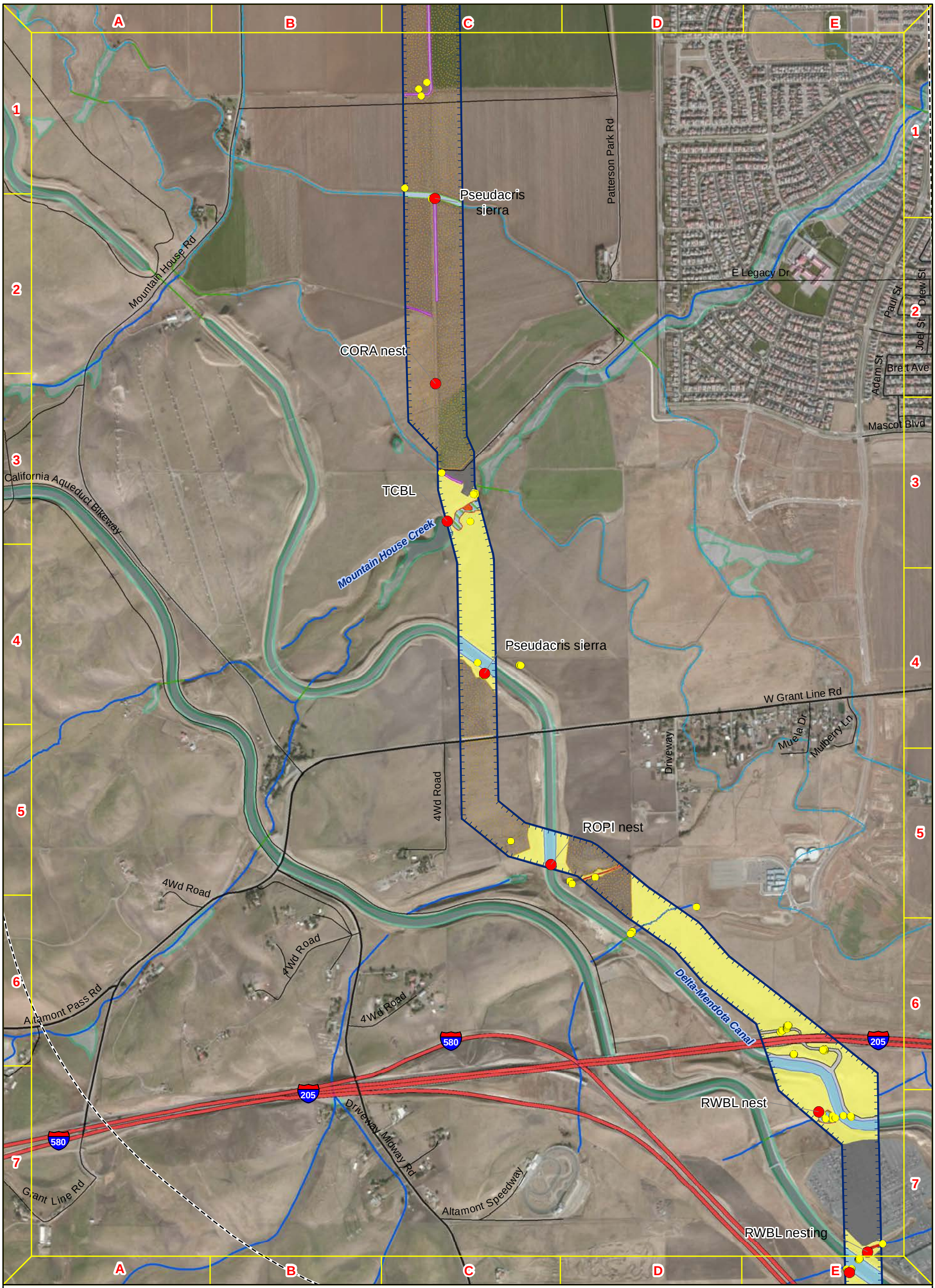
- Grain
- Orchard
- Pasture
- Barren
- Grassland non-native
- Drainage
- Irrigation canal
- Other waters
- Freshwater marsh

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 2



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Source: WAPA SNR, Aspen EG, ESRI

See Page 4

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

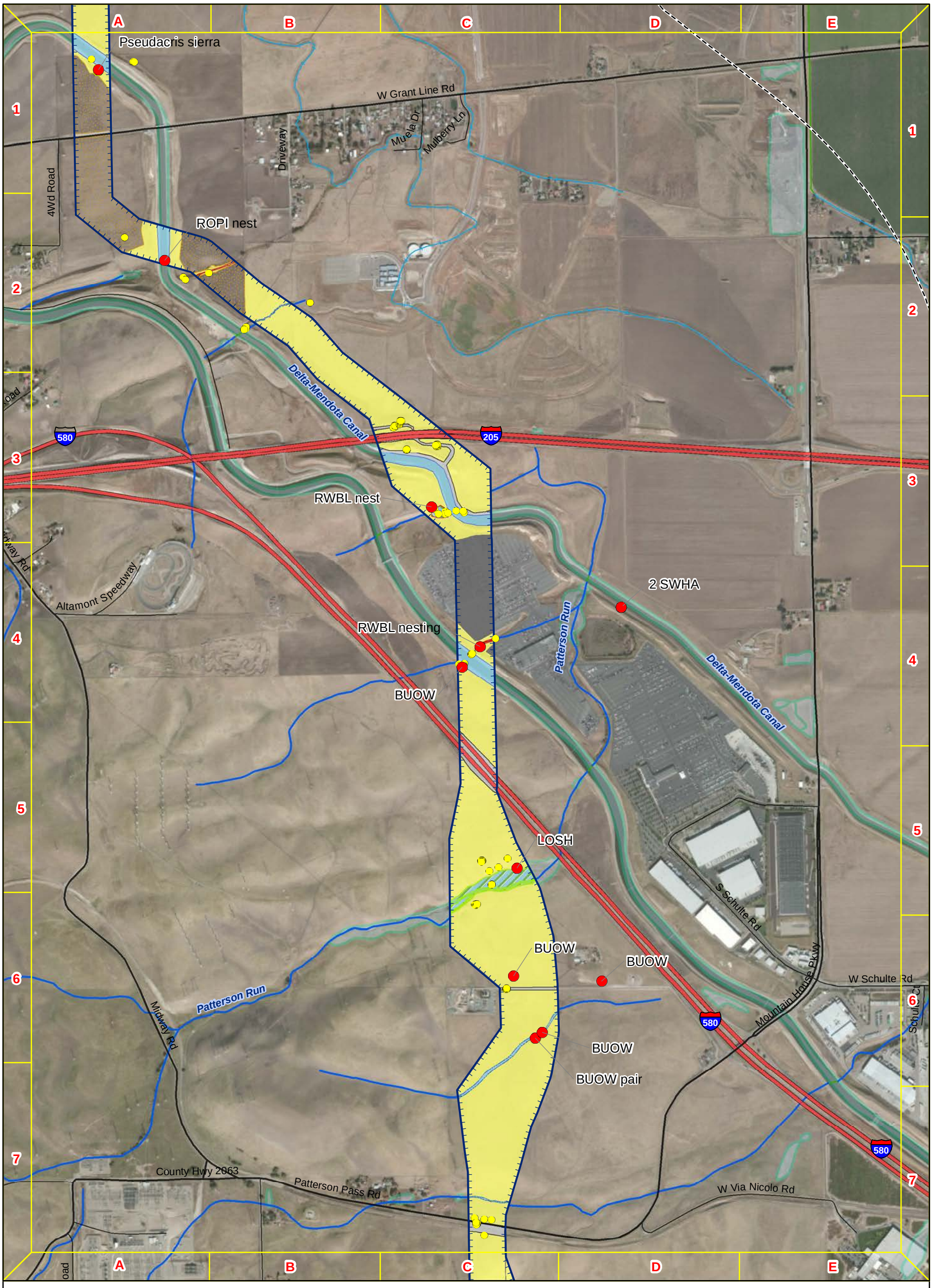
Habitat Type
- Grain
- Barren
- Commercial
- Grassland non-native
- Great Valley riparian scrub
- Ephemeral creek
- Intermittent creek
- Drainage
- Irrigation canal
- Other waters
- Pond
- Freshwater marsh

0 750 1,500 Feet

Figure 3.

Biological Resources

See Page 3



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Source: WAPA SNR, Aspen EG, ESRI

See Page 5

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

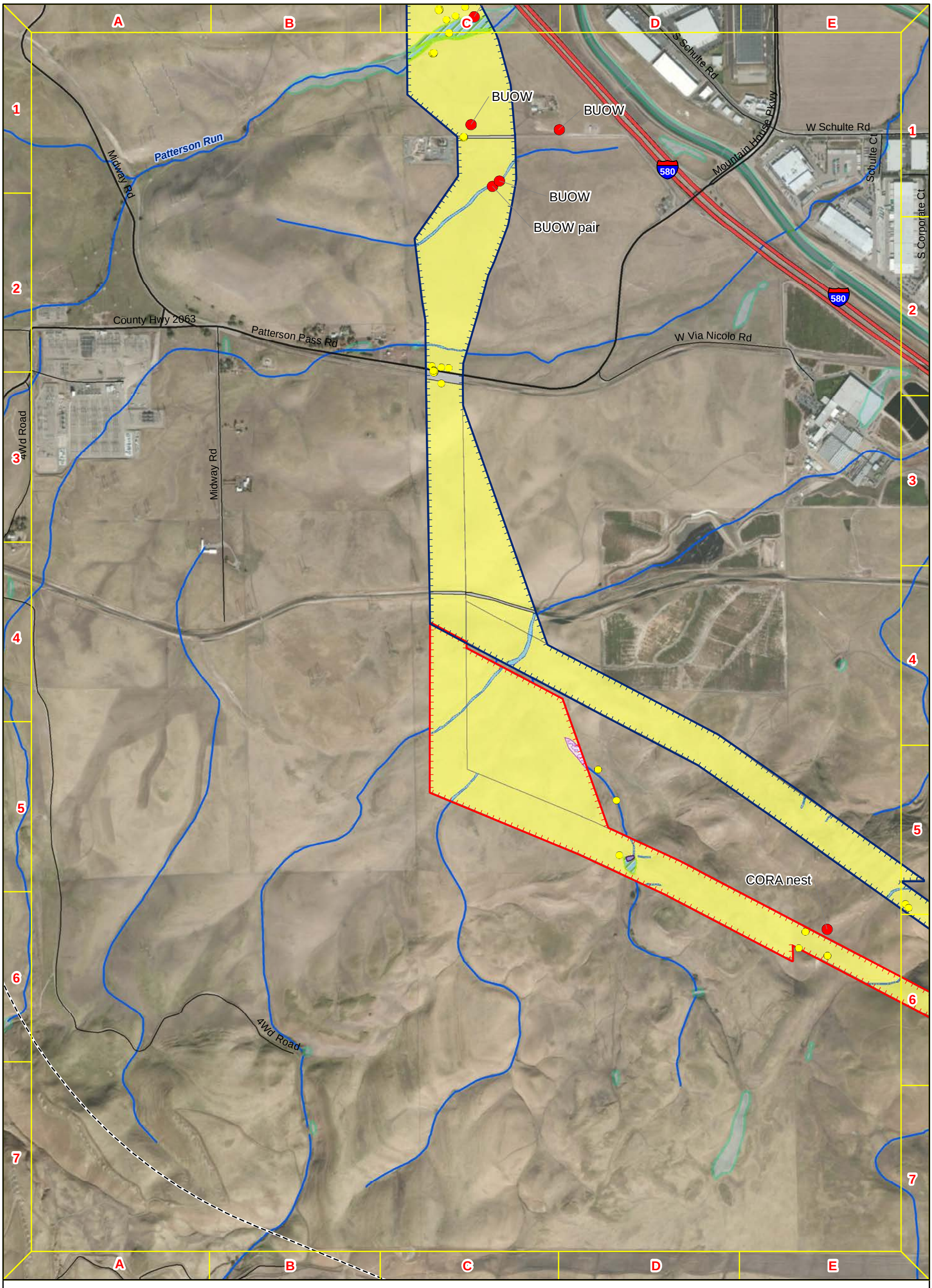
Habitat Type
- Grain
- Barren
- Commercial
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- Other waters
- River
- Freshwater marsh
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 4



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Source: WAPA SNR, Aspen EG, ESRI

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Grassland non-native
- Ephemeral creek
- Impoundment
- River
- Wildflower field
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 5

See Page 7

CORA nest

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Source: WAPA SNR, Aspen EG, ESRI

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Grassland non-native
- Ephemeral creek
- Impoundment
- Wildflower field
- Seasonal wetland

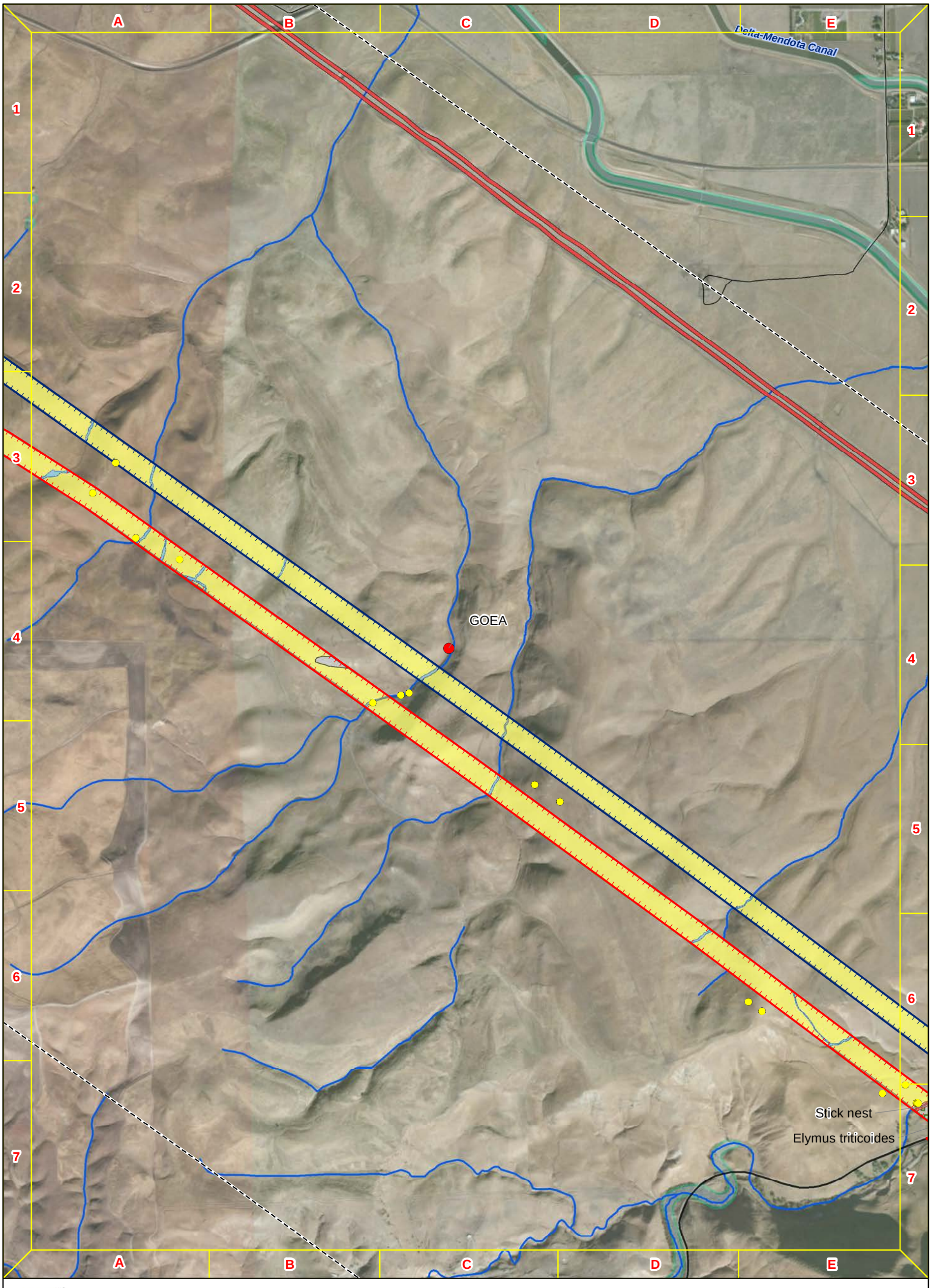
Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 6

See Page 8



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Western AREA POWER ADMINISTRATION

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

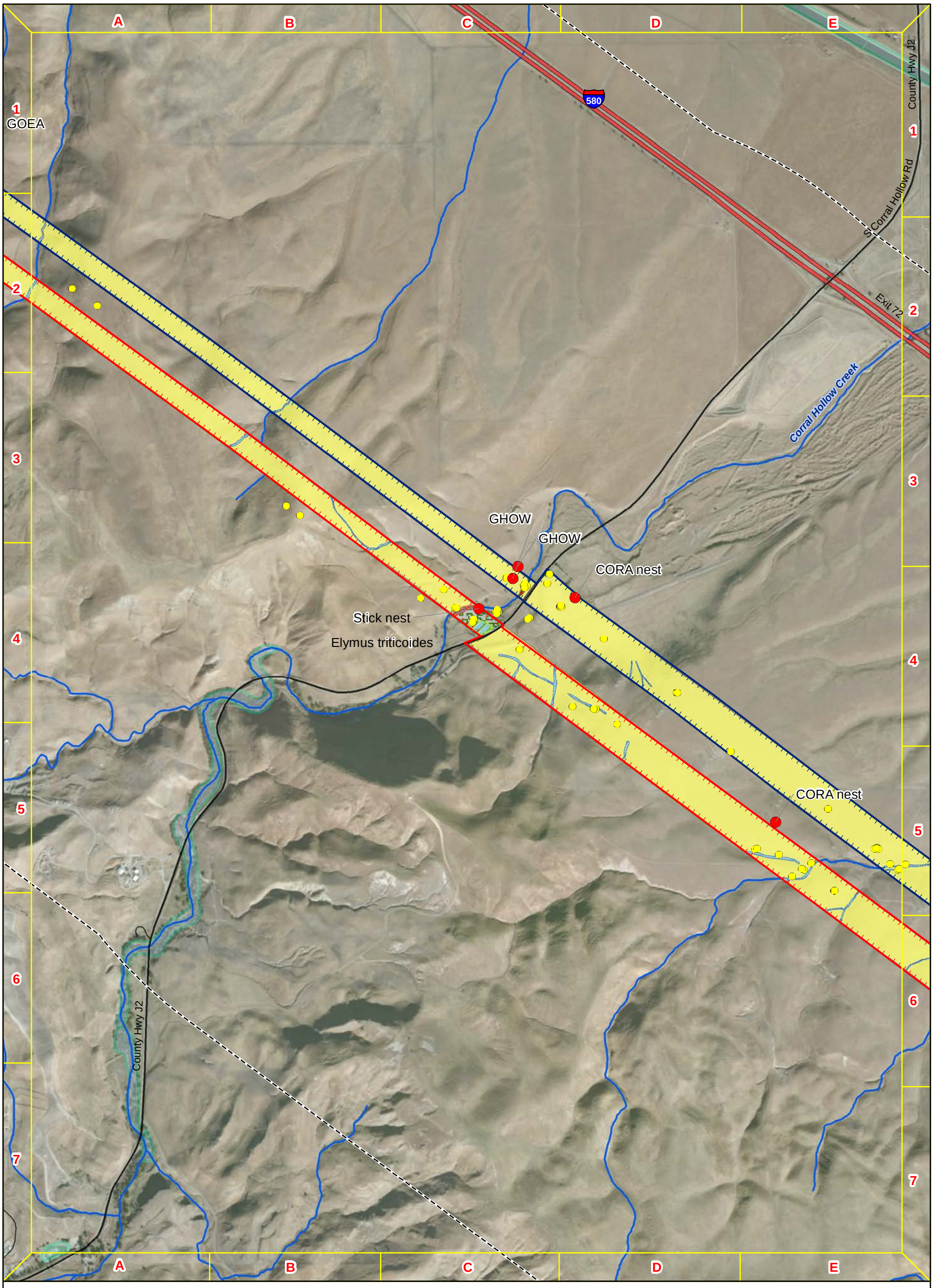
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature	Habitat Type
Canal Ditch	Barren
Pipeline	Grassland non-native
Stream/River	Great Valley riparian forest
NWI Wetland	Ephemeral creek
	Intermittent creek
	River
	Freshwater marsh

Figure 3.

Biological Resources

0 750 1,500 Feet



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

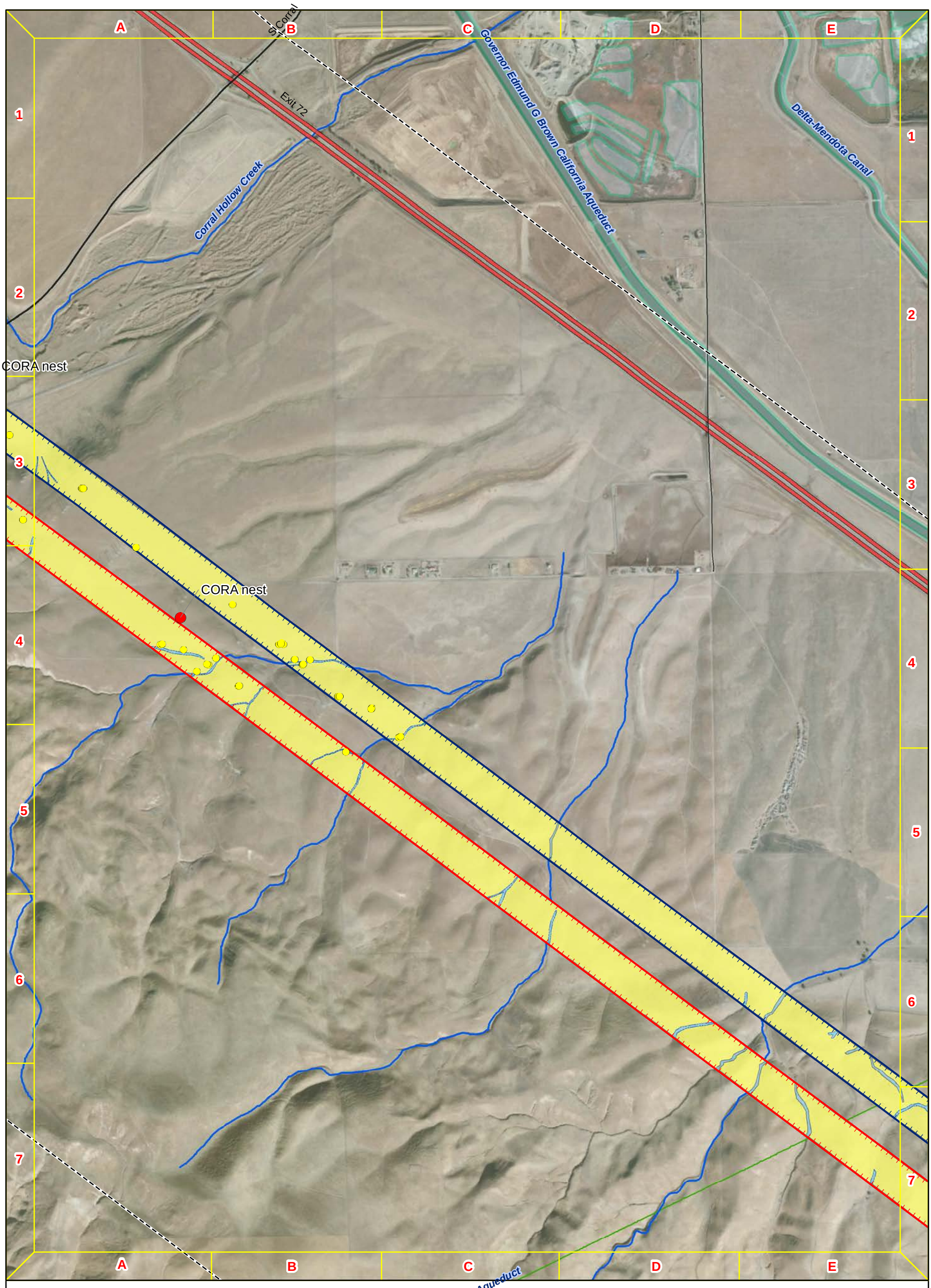
Habitat Type

- Barren
- Grassland non-native
- Great Valley riparian forest
- Ephemeral creek
- Intermittent creek
- River
- Freshwater marsh
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Grassland non-native
- Ephemeral creek
- Intermittent creek

0 750 1,500 Feet

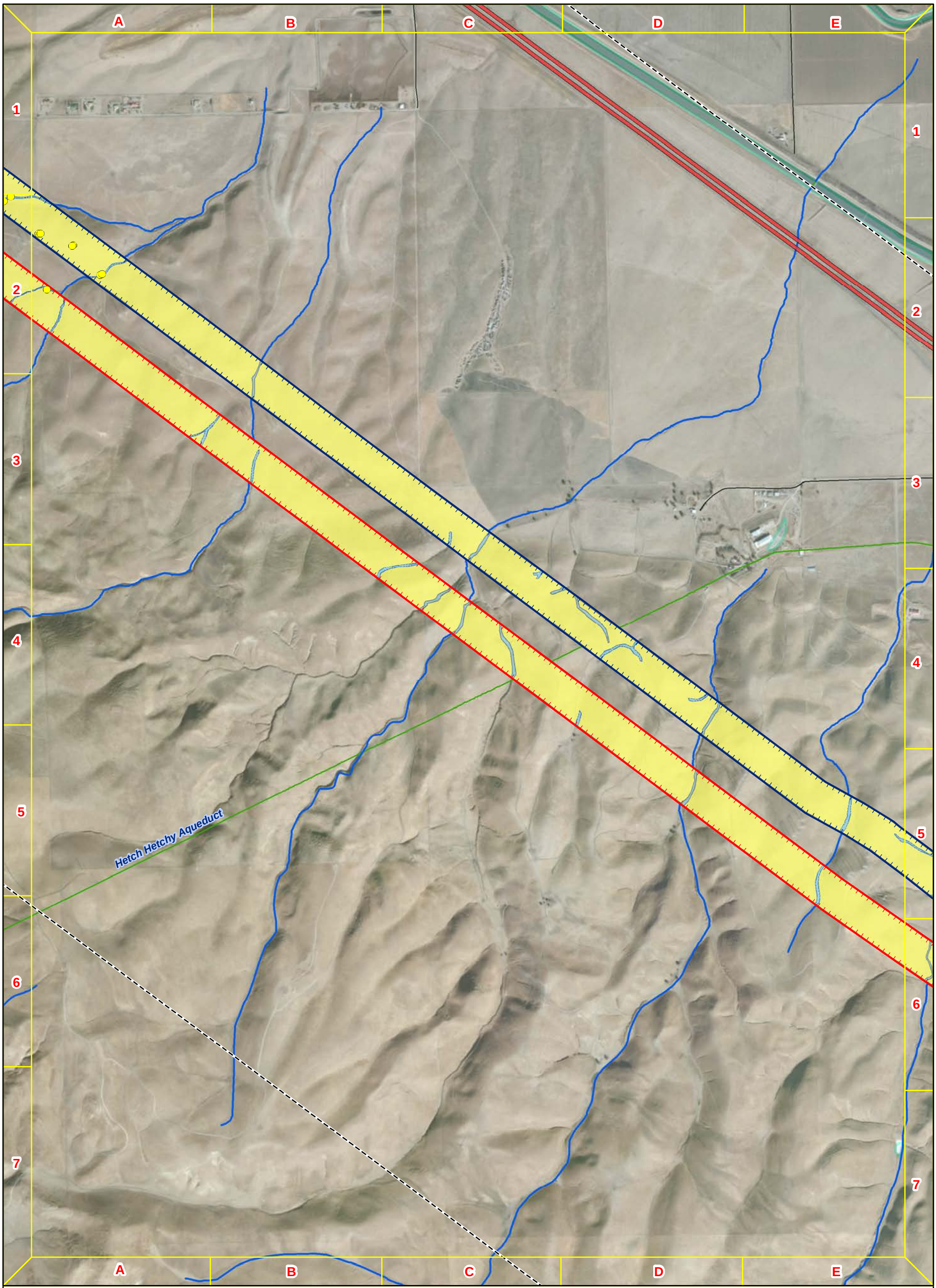
Figure 3.

Biological Resources

See Page 9

See Page 8

See Page 11



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- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Grassland non-native
- Ephemeral creek
- Intermittent creek

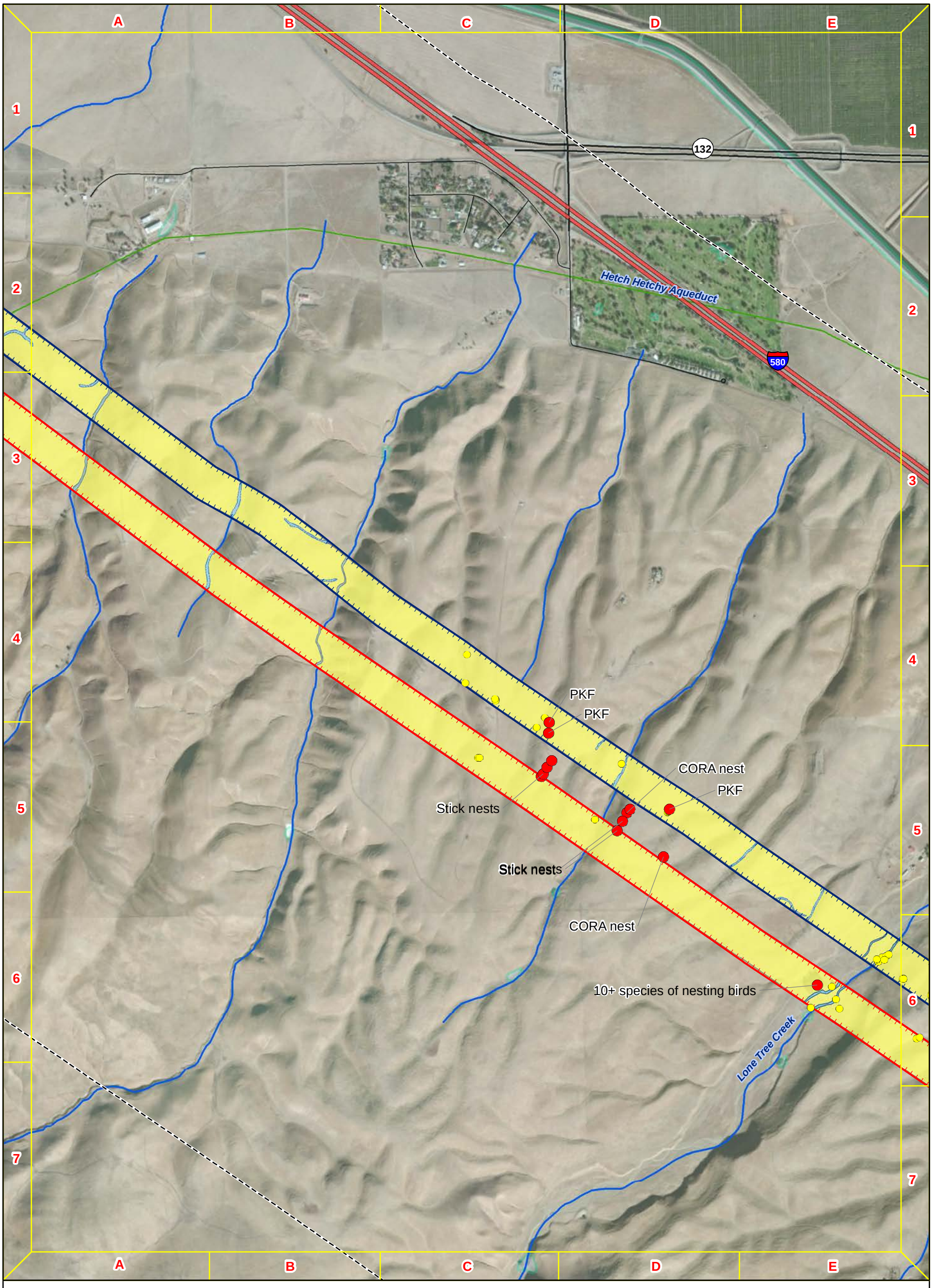
Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 10

See Page 12



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature	Habitat Type
Canal Ditch	Grassland non-native
Pipeline	Ephemeral creek
Stream/River	Intermittent creek
NWI Wetland	River

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 11

See Page 13

PKF
PKF
CORA nest
PKF
sts
Stick nests
CORA nest
10+ species of nesting birds
Lone Tree Creek
Lone Tree Creek
Hospital Creek

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature	Habitat Type
Canal Ditch	Barren
Pipeline	Grassland non-native
Stream/River	Ephemeral creek
NWI Wetland	Impoundment
	River

Figure 3.

Biological Resources

0 750 1,500
Feet

See Page 12

See Page 14

Lone Tree Creek

Hospital Creek

Hospital Creek

Stick nest

Stick nest

Stick nest

Nasella pulchra

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

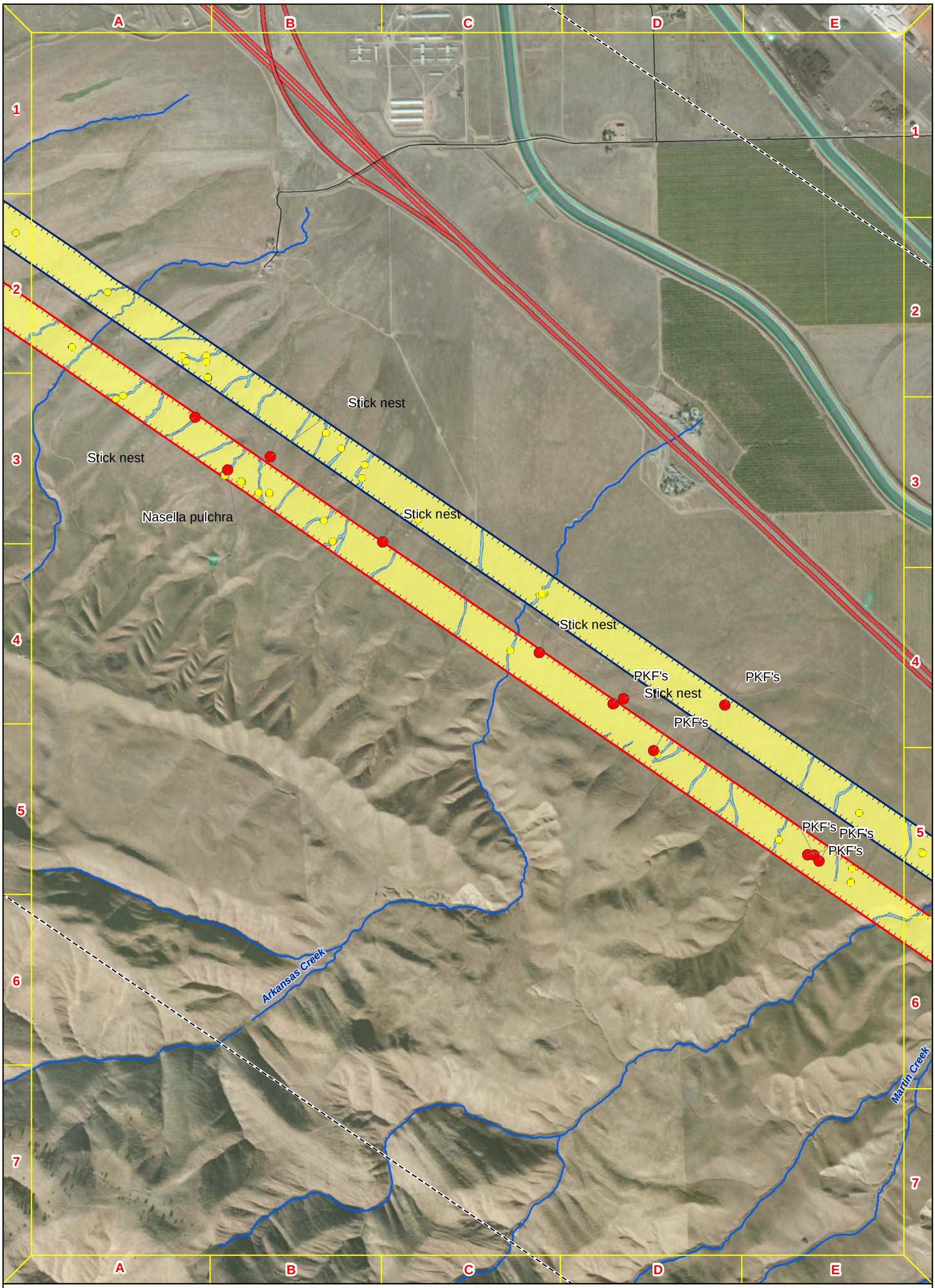
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature	Habitat Type
Canal Ditch	Barren
Pipeline	Grassland non-native
Stream/River	Ephemeral creek
NWI Wetland	Impoundment
	River

0 750 1,500 Feet

Figure 3.

Biological Resources



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

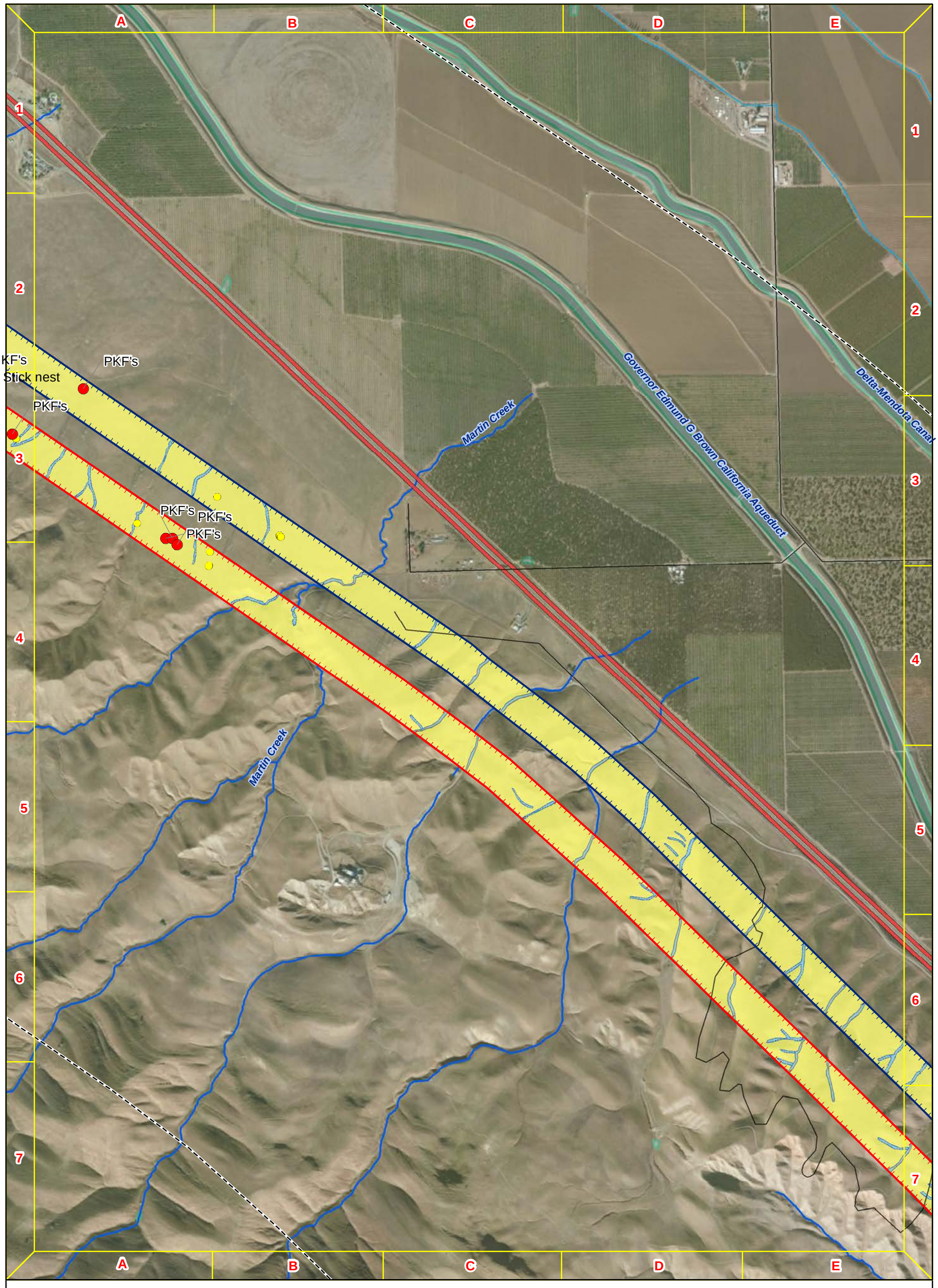
Habitat Type
- Grassland non-native
- Ephemeral creek

Figure 3.

Biological Resources

0 750 1,500
Feet

See Page 14



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

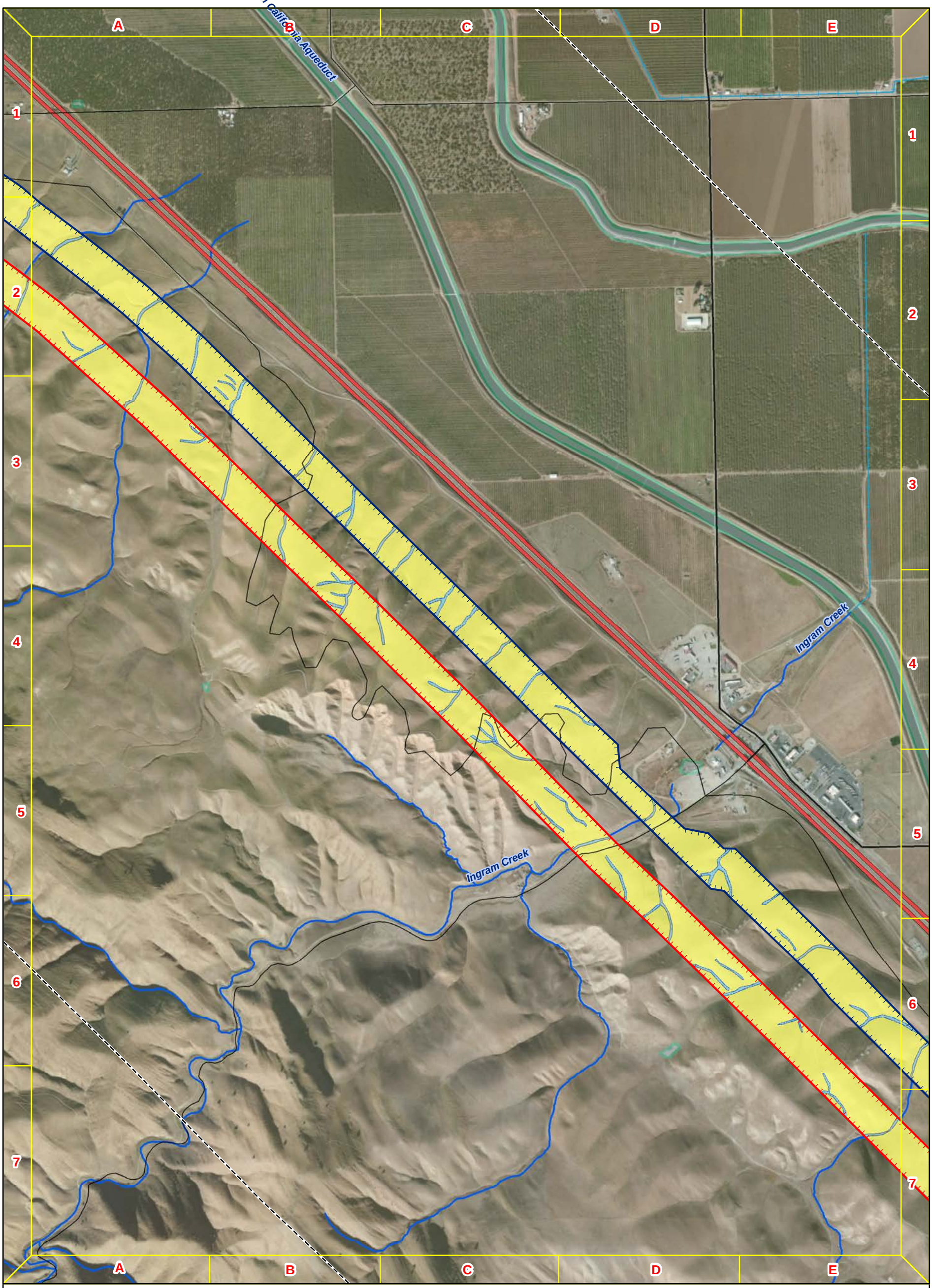
Habitat Type
- Grassland non-native
- Ephemeral creek
- Intermittent creek

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 15



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1.25-mile buffer around Project Area

Corridors

Elderberry polygon

Proposed Project Corridor

Corridor Alternatives

Hydrologic Feature

Canal Ditch

Pipeline

Stream/River

NWI Wetland

Habitat Type

Grassland non-native

Ephemeral creek

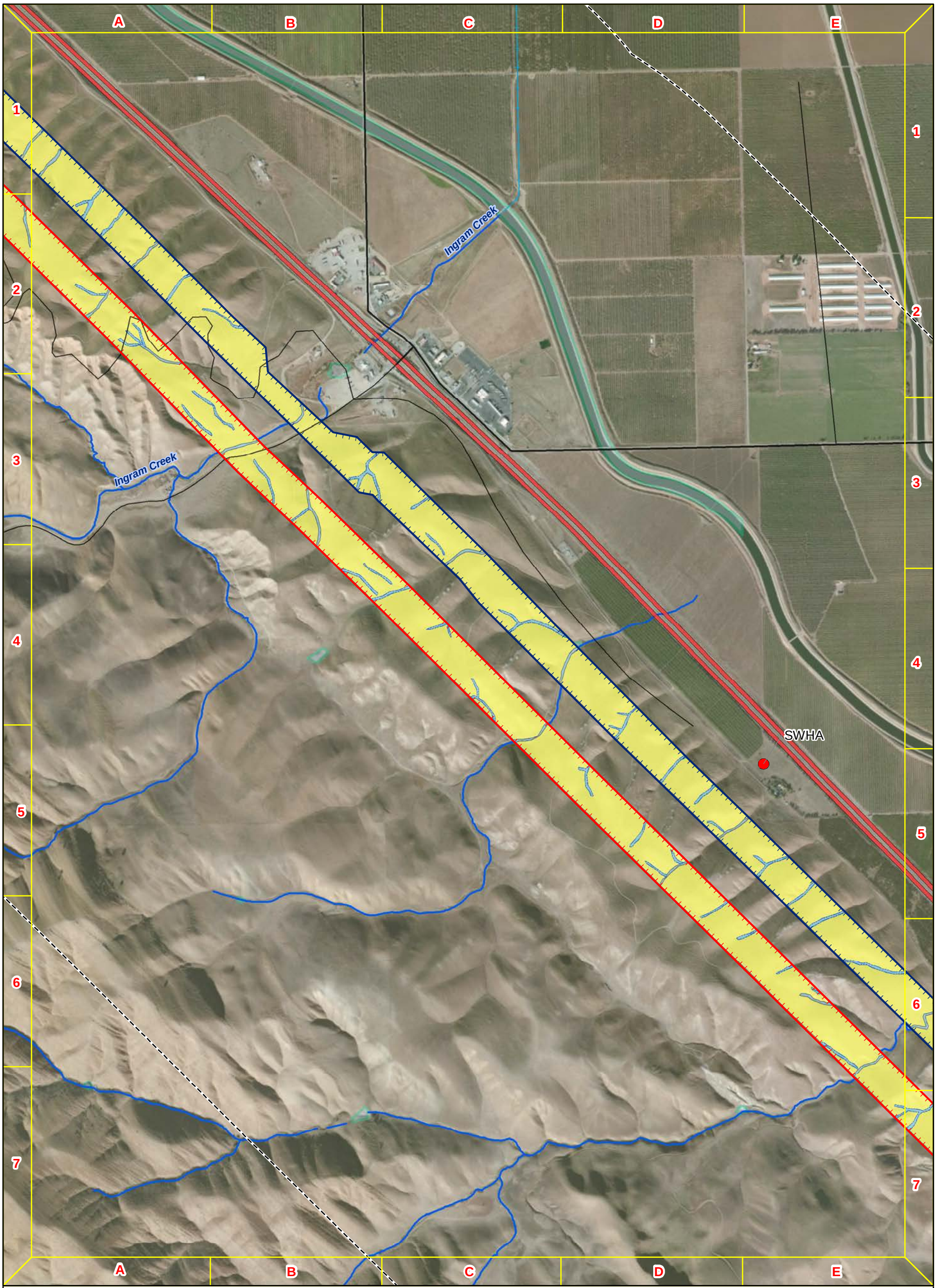
Intermittent creek

Figure 3.

Biological Resources

0 750 1,500

Feet



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- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

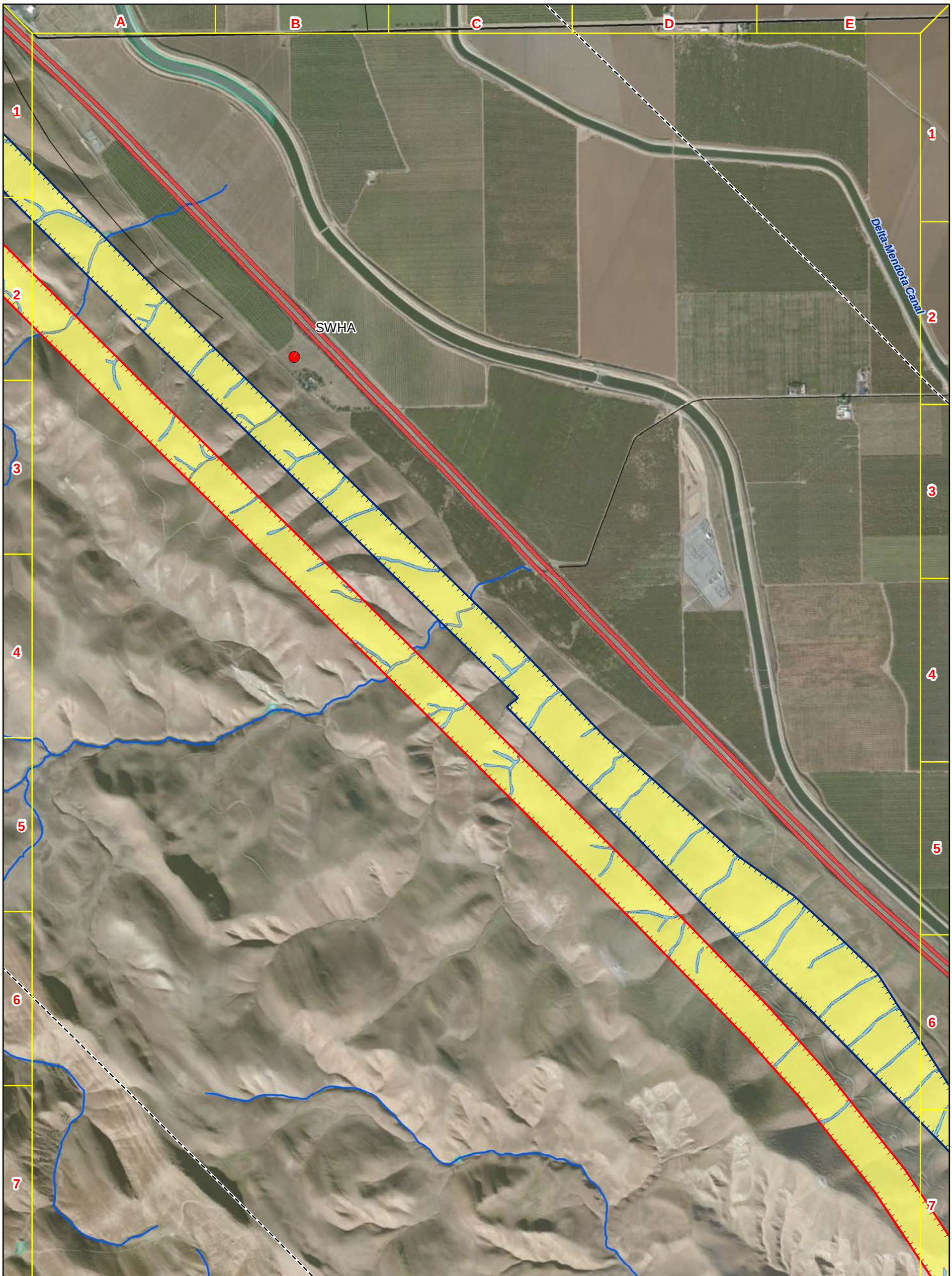
- Grassland non-native
- Ephemeral creek
- Intermittent creek

Figure 3.

Biological Resources

0 750 1,500

Feet



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- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

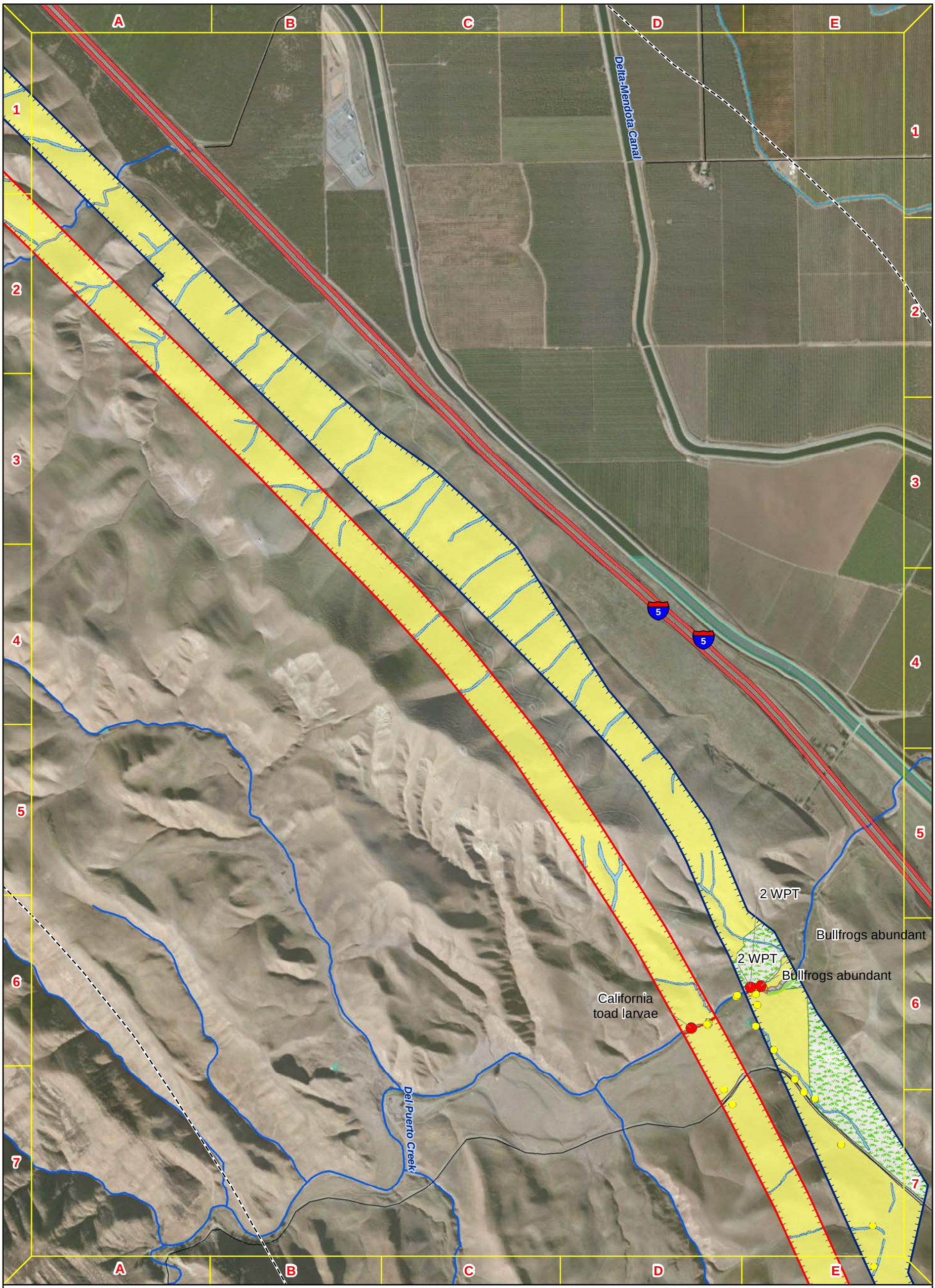
Habitat Type

- Grassland non-native
- Ephemeral creek
- Intermittent creek

Figure 3.

Biological Resources

0 750 1,500 Feet



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

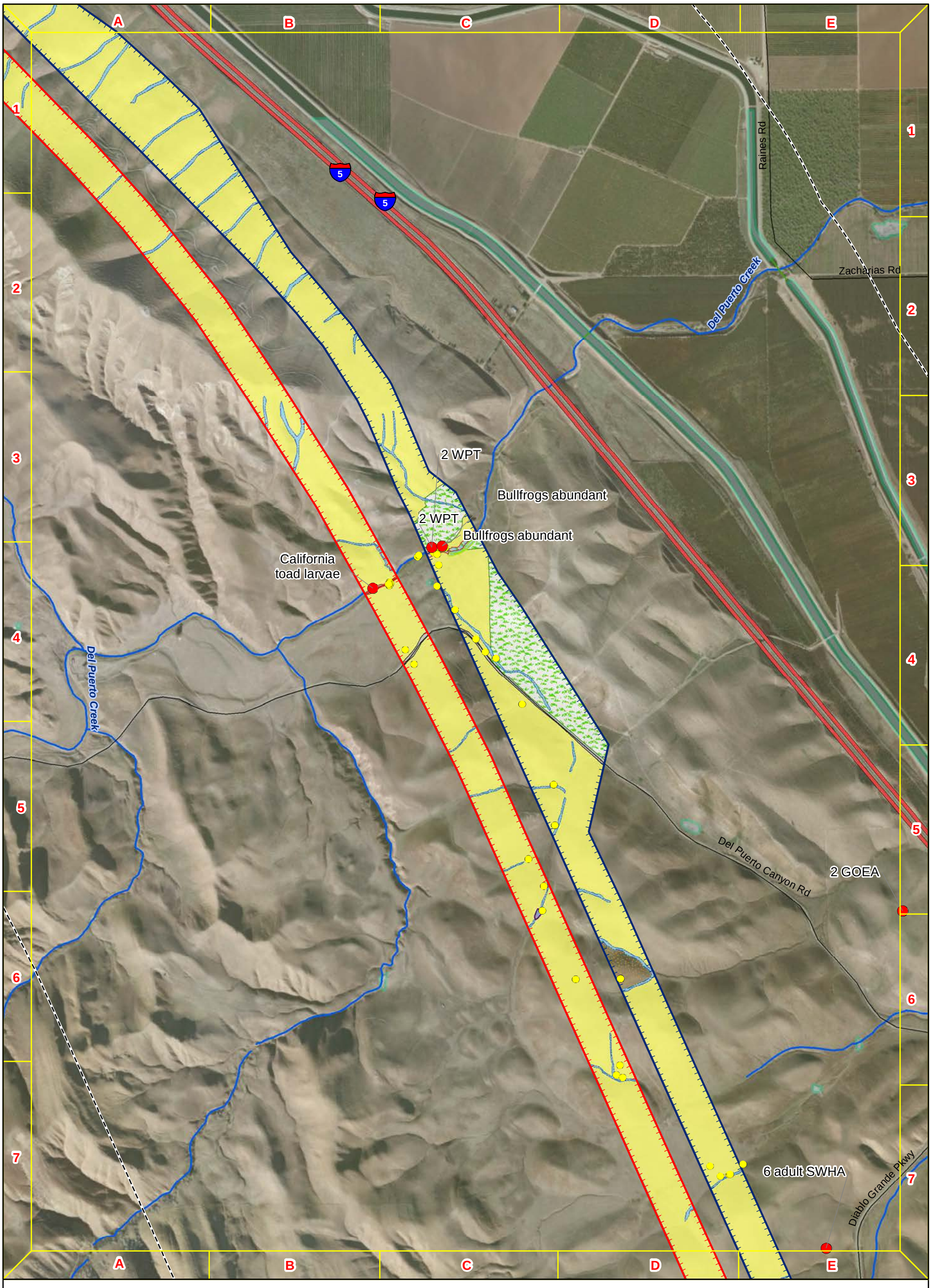
- Orchard
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- River
- Freshwater marsh
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 18



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Grain
- Orchard
- Barren
- Grassland non-native
- Ephemeral creek
- Impoundment
- River
- Freshwater marsh
- Seasonal wetland

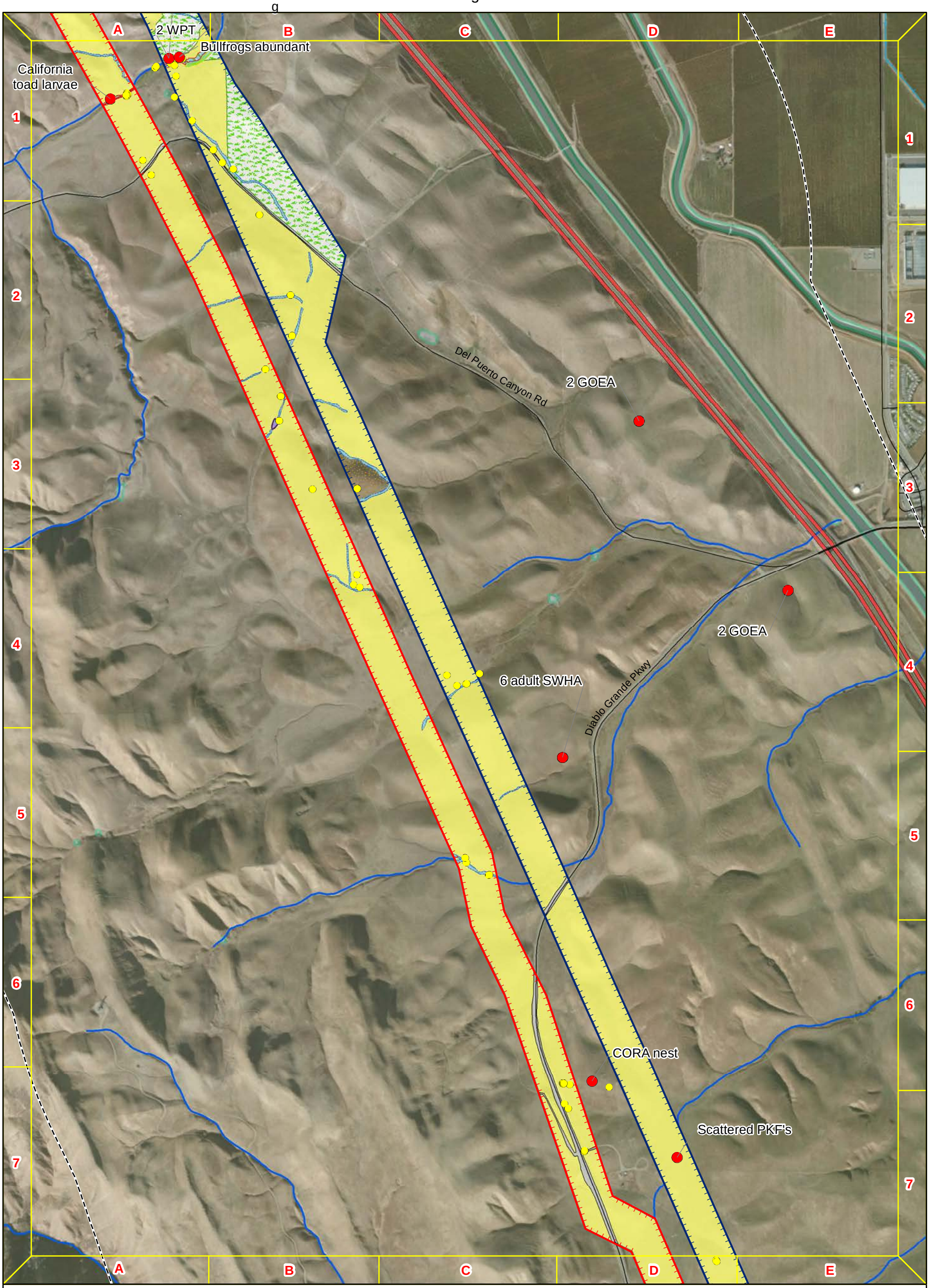
Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 20

g



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See Page 22

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

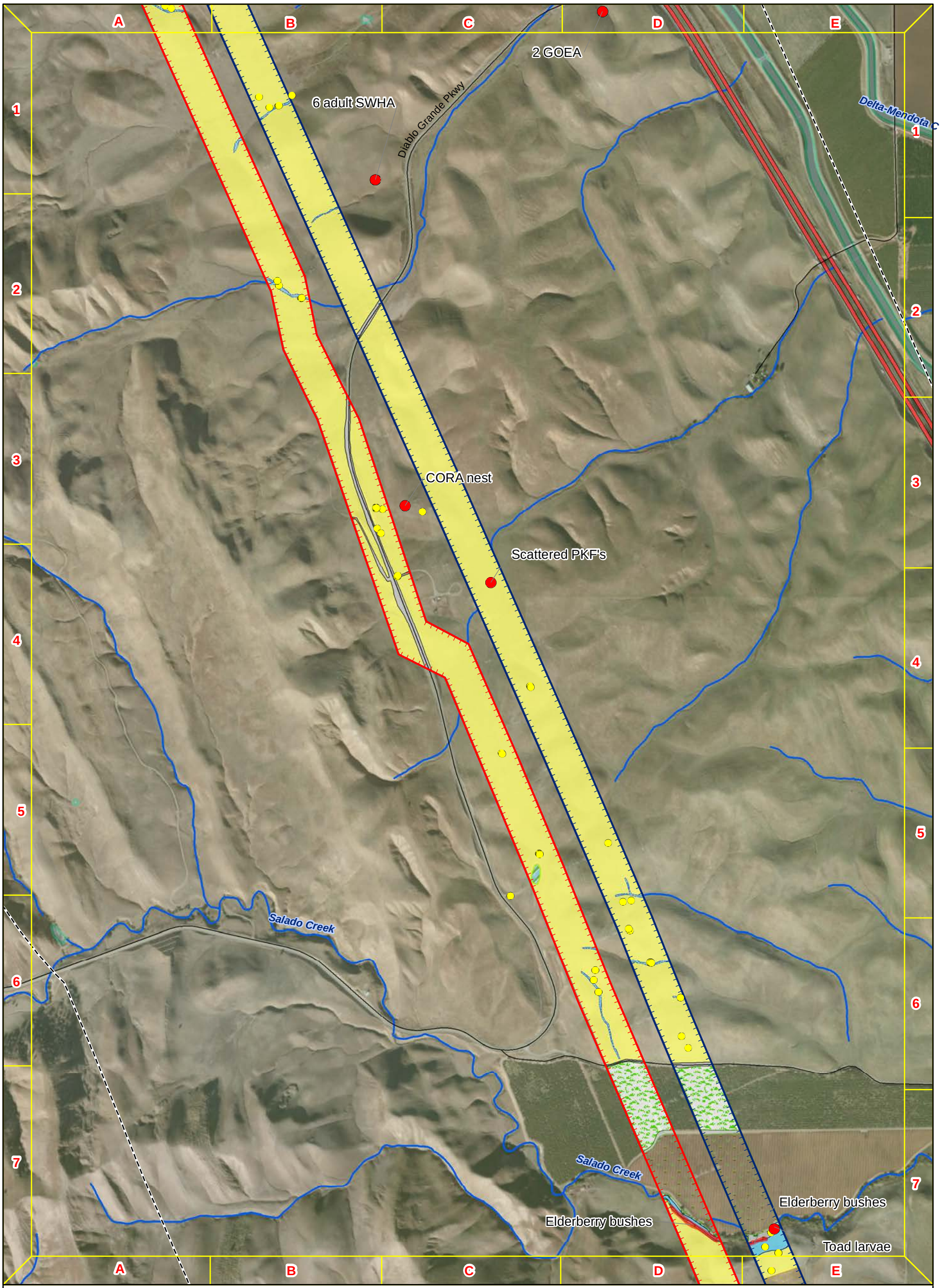
Habitat Type
- Grain
- Orchard
- Barren
- Grassland non-native
- Ephemeral creek
- Impoundment
- River
- Freshwater marsh
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 21



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

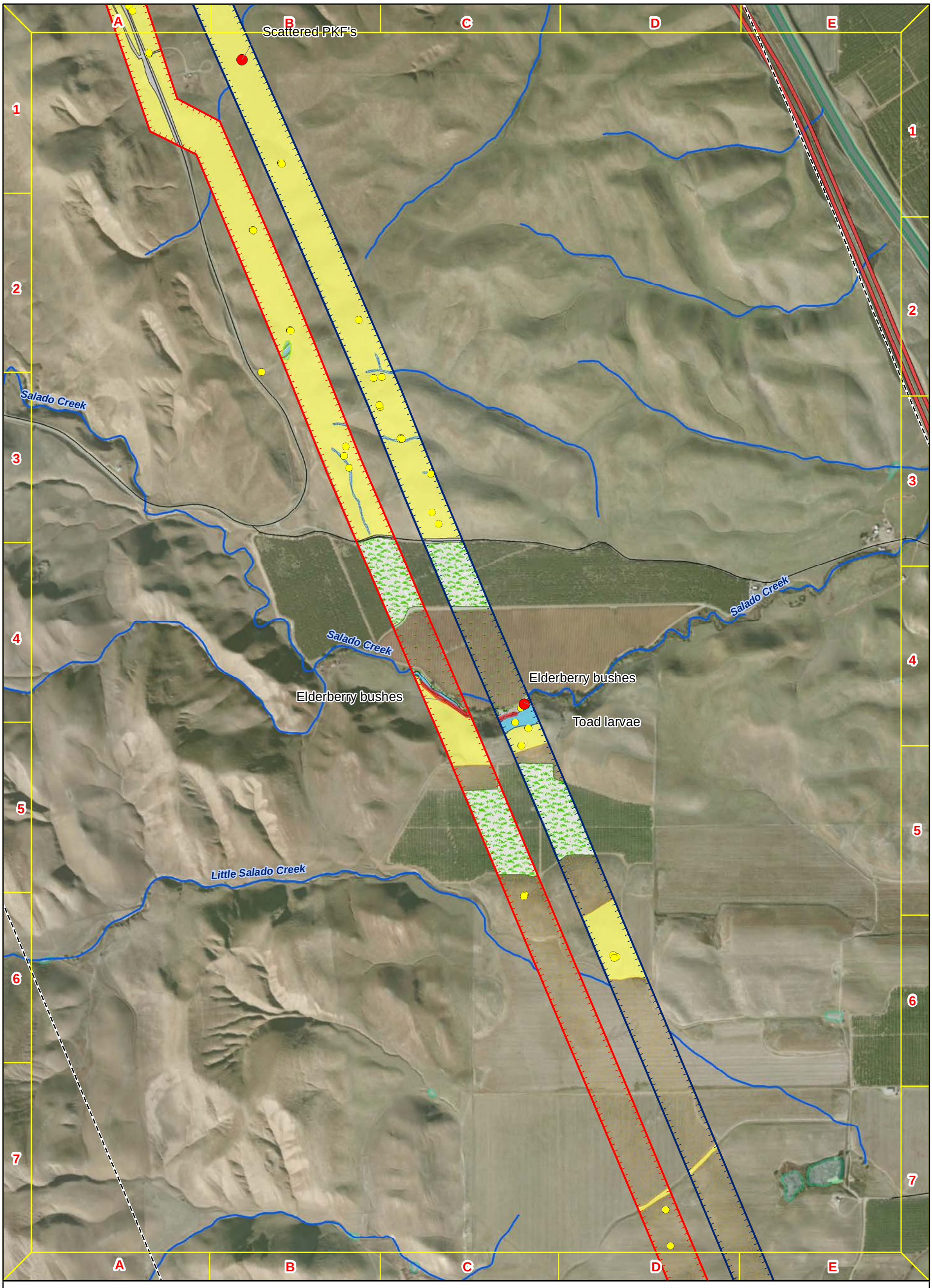
Habitat Type
- Grain
- Orchard
- Vineyard
- Barren
- Grassland non-native
- Great Valley riparian forest
- Ephemeral creek
- River
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 21



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Source: WAPA SNR, Aspen EG, ESRI

See Page 24

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

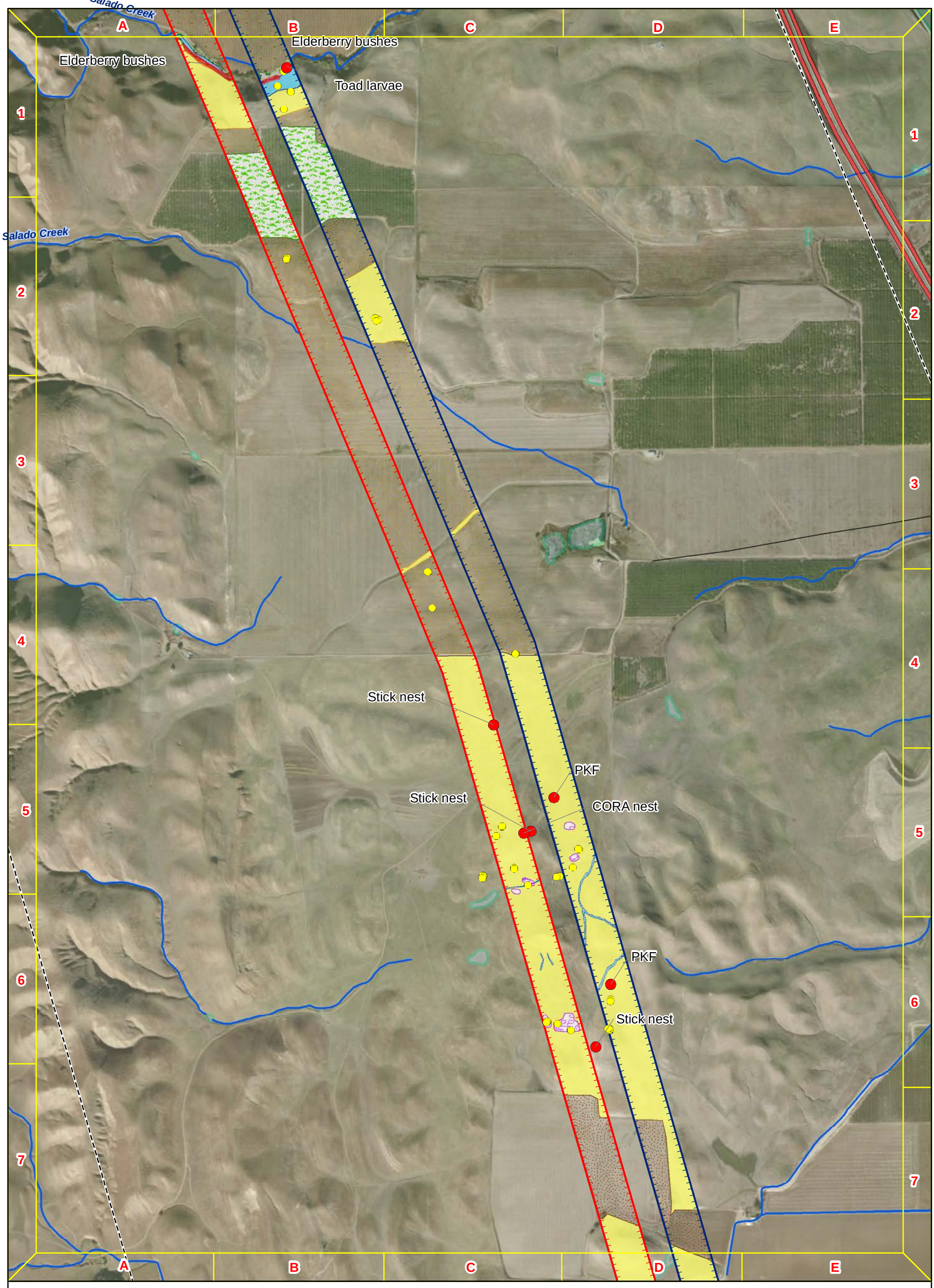
Habitat Type
- Grain
- Orchard
- Vineyard
- Barren
- Grassland non-native
- Great Valley riparian forest
- Ephemeral creek
- River
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 23



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Source: WAPA SNR, Aspen EG, ESRI

See Page 25

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

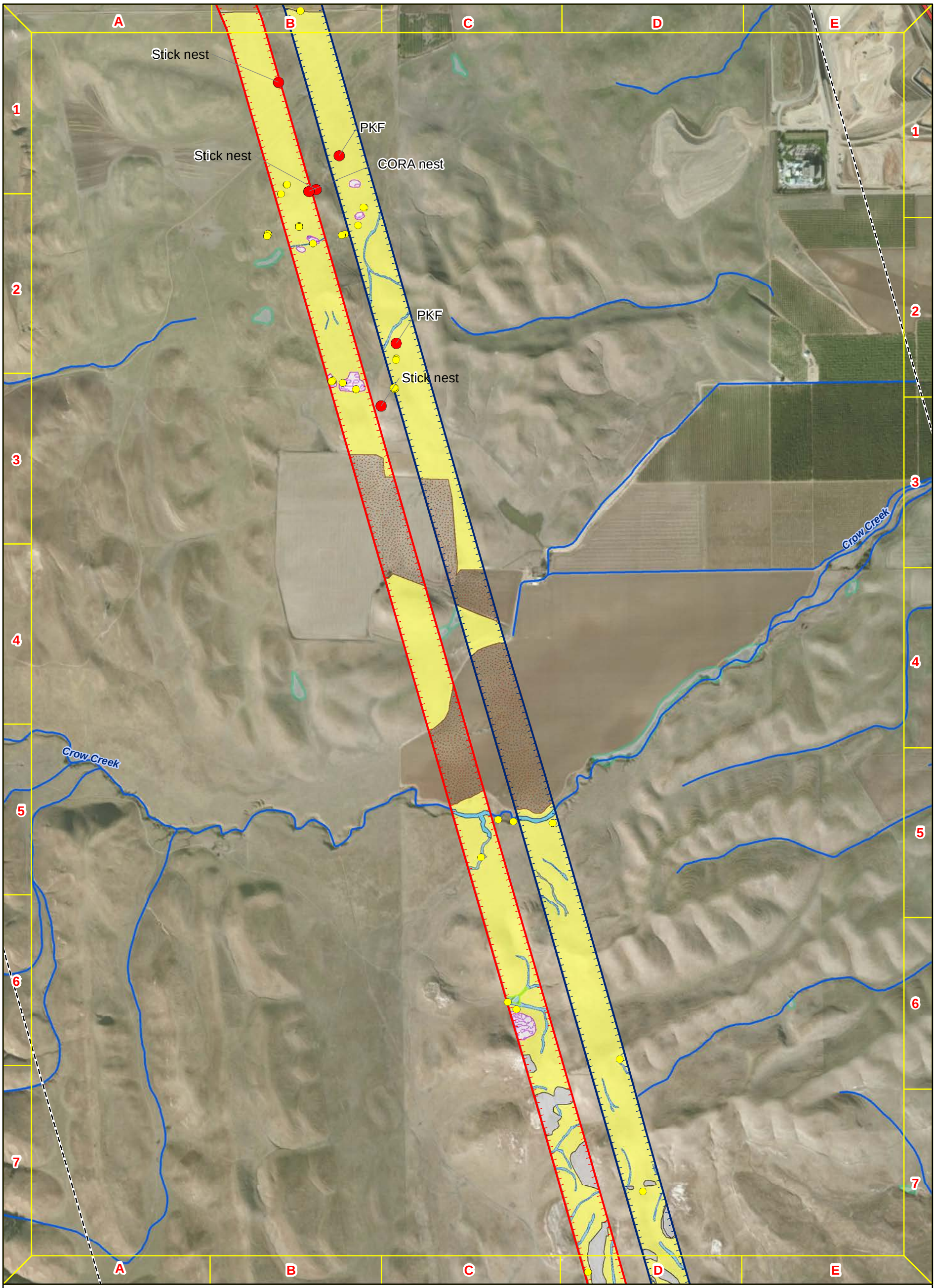
Habitat Type
- Ag
- Grain
- Orchard
- Vineyard
- Barren
- Grassland non-native
- Great Valley riparian forest
- Ephemeral creek
- River
- Wildflower field
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 24



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Source: WAPA SNR, Aspen EG, ESRI

See Page 26

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

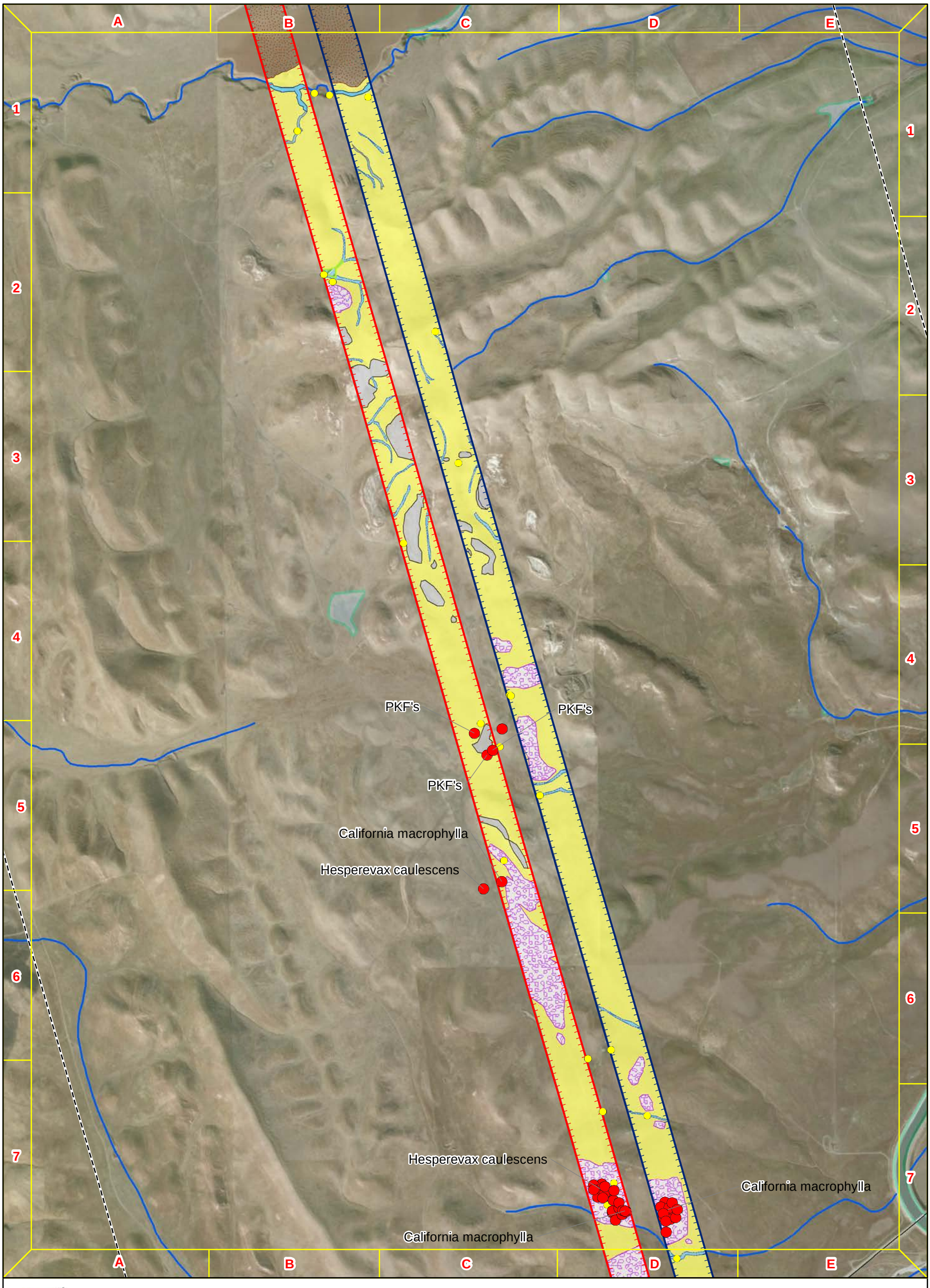
Habitat Type
- Ag
- Grain
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- River
- Wildflower field
- Seasonal wetland
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 25



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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

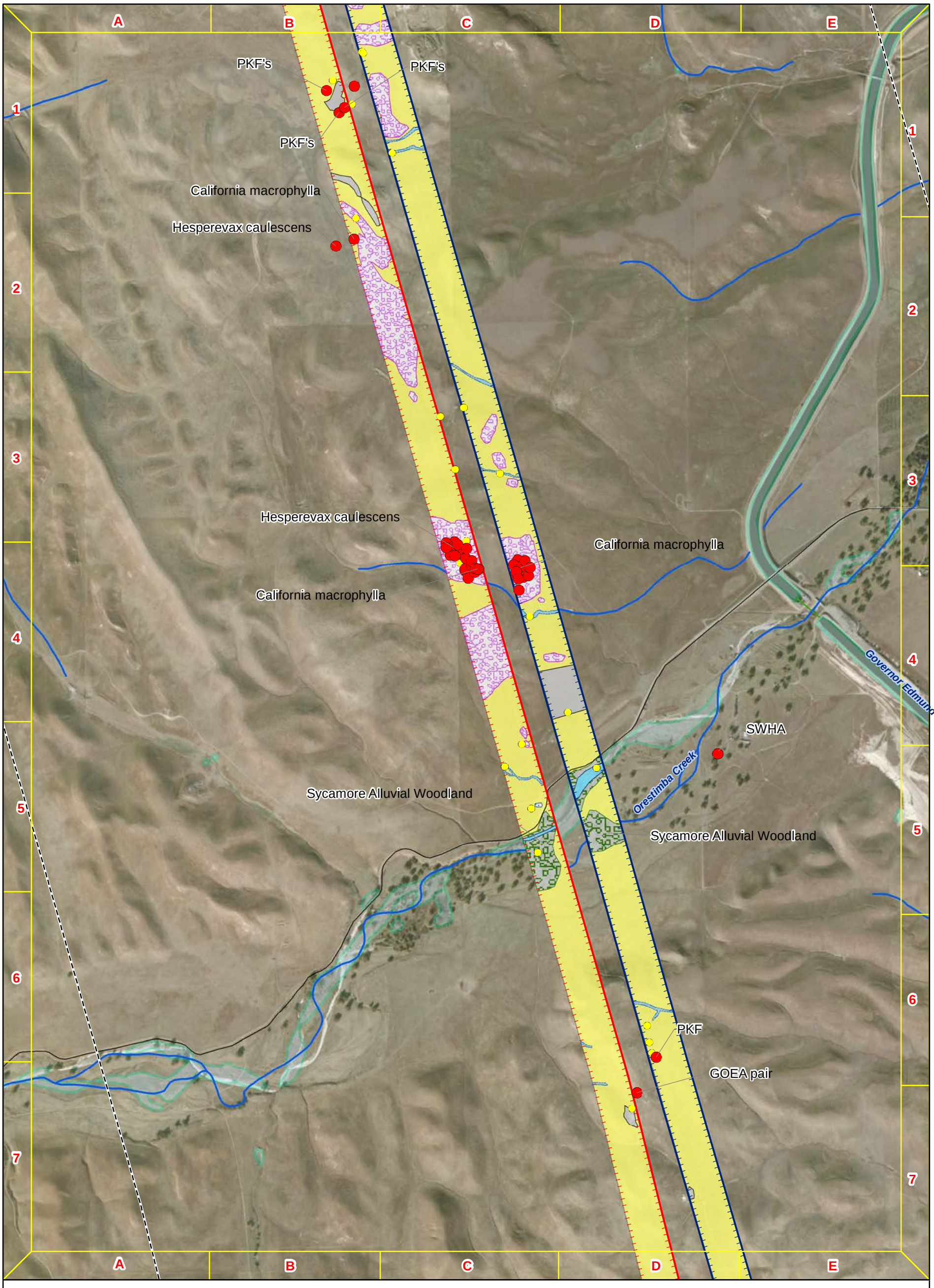
Habitat Type
- Ag
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- River
- Wildflower field
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 26



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See Page 29

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Barren
- Grassland non-native
- Great Valley riparian forest
- Ephemeral creek
- Pond
- River
- Wildflower field

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 26

Hesperevax caulescens

California macrophylla

California macrophylla

Sycamore Alluvial Woodland

Orestimba Creek

SWHA

Governor Edmund G Brown California Aqueduct

Sycamore Alluvial Woodland

PKF

GOEA pair

California macrophylla

California macrophylla

See Page 29

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

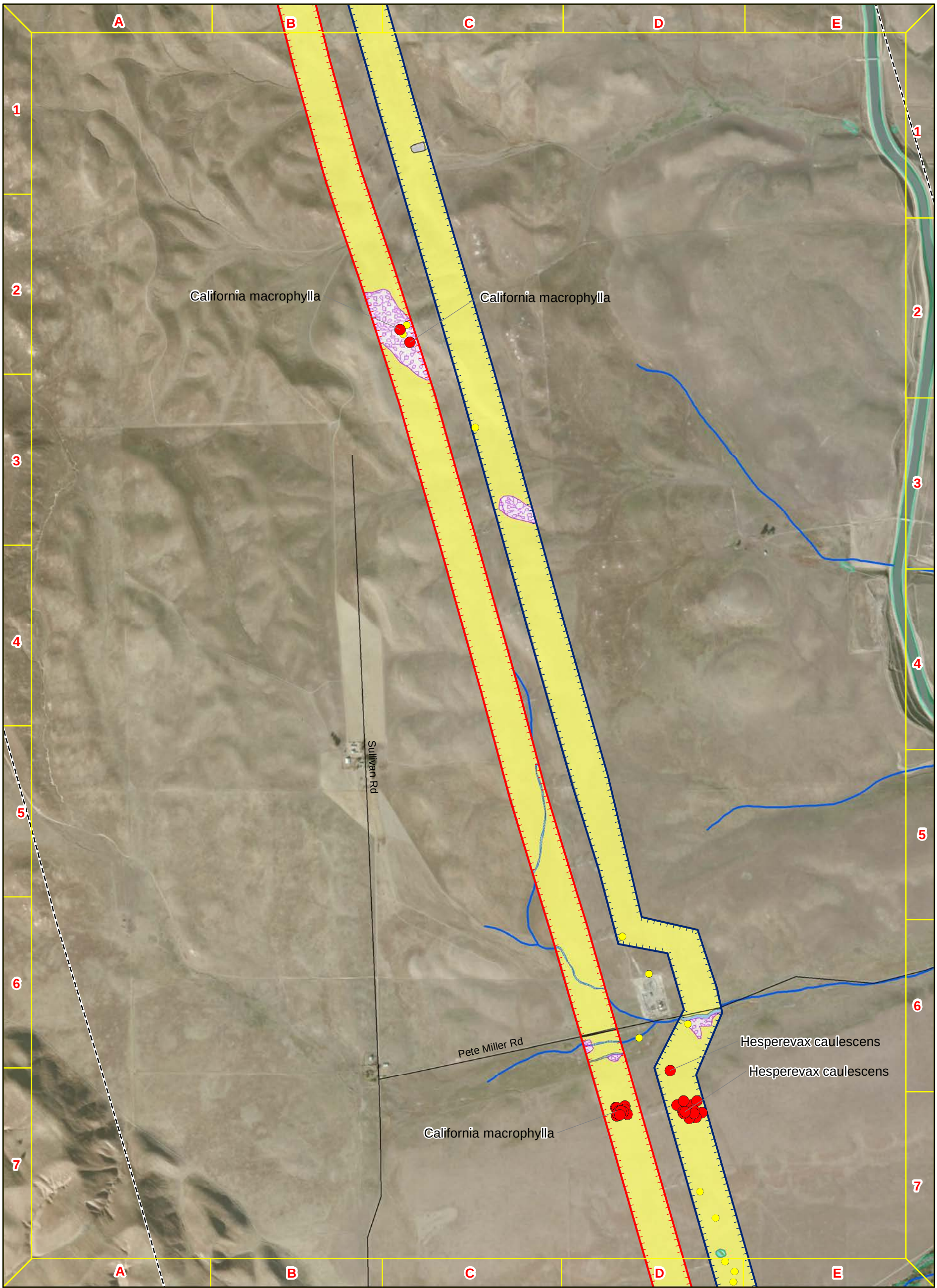
- Barren
- Grassland non-native
- Great Valley riparian forest
- Ephemeral creek
- Pond
- River
- Wildflower field

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 28



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Source: WAPA SNR, Aspen EG, ESRI

See Page 31

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- Wildflower field
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 28

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See Page 31

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

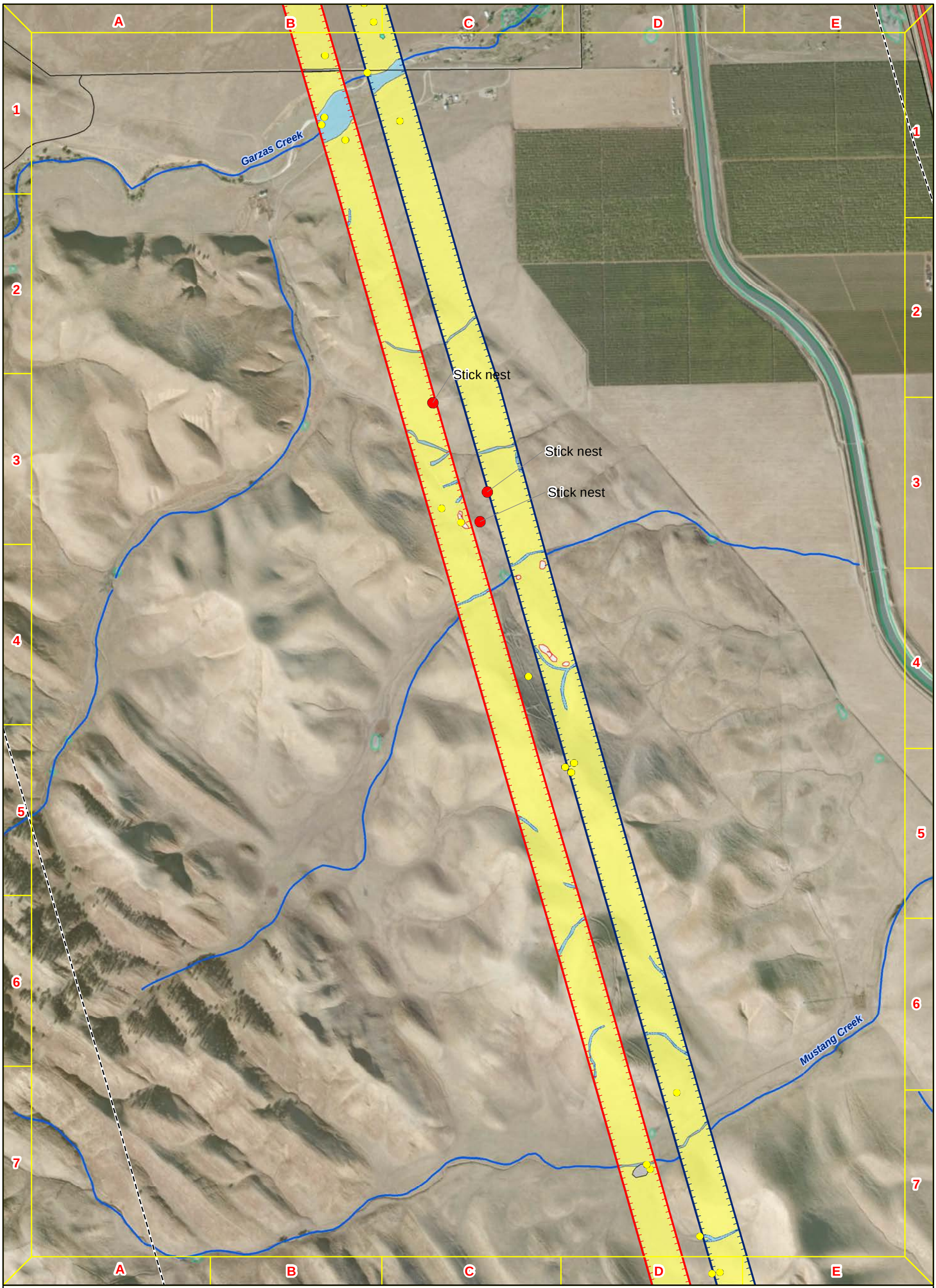
Habitat Type
- Barren
- Grassland non-native
- Other
- Ephemeral creek
- Intermittent creek
- Wildflower field
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 30



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See Page 32

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature	Habitat Type
Canal Ditch	Barren
Pipeline	Grassland non-native
Stream/River	Other
NWI Wetland	Ephemeral creek
	Intermittent creek
	Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 31

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Source: WAPA SNR, Aspen EG, ESRI

See Page 33

- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Grassland non-native
- Other
- Ephemeral creek
- Intermittent creek

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 32

See Page 34

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Source: WAPA SNR, Aspen EG, ESRI

See Page 35

- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Barren
- Grassland non-native
- Intermittent creek

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 35

See Page 37

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

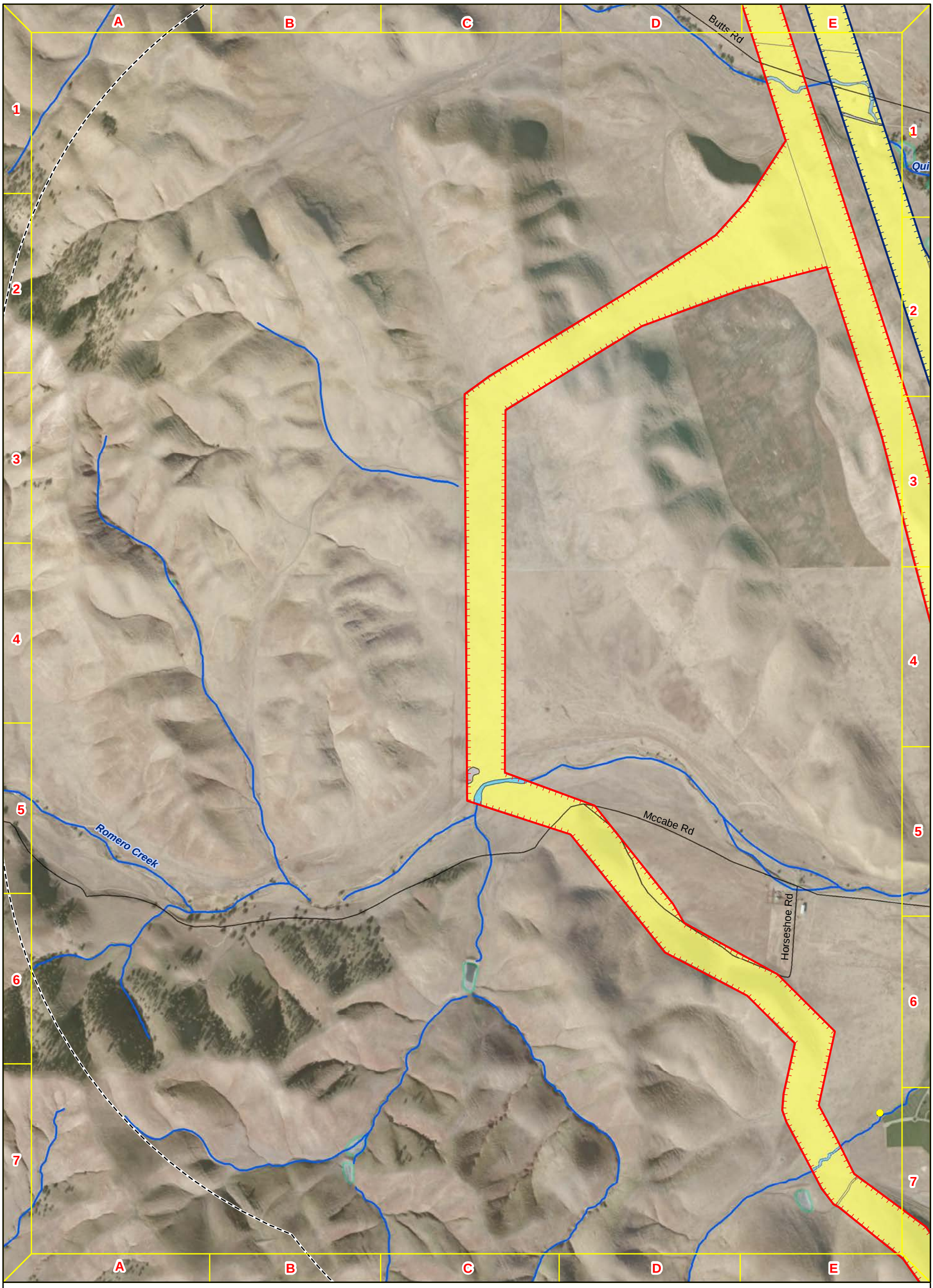
Habitat Type
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- Irrigation canal
- Pond
- River
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 33



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See Page 38

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- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- River

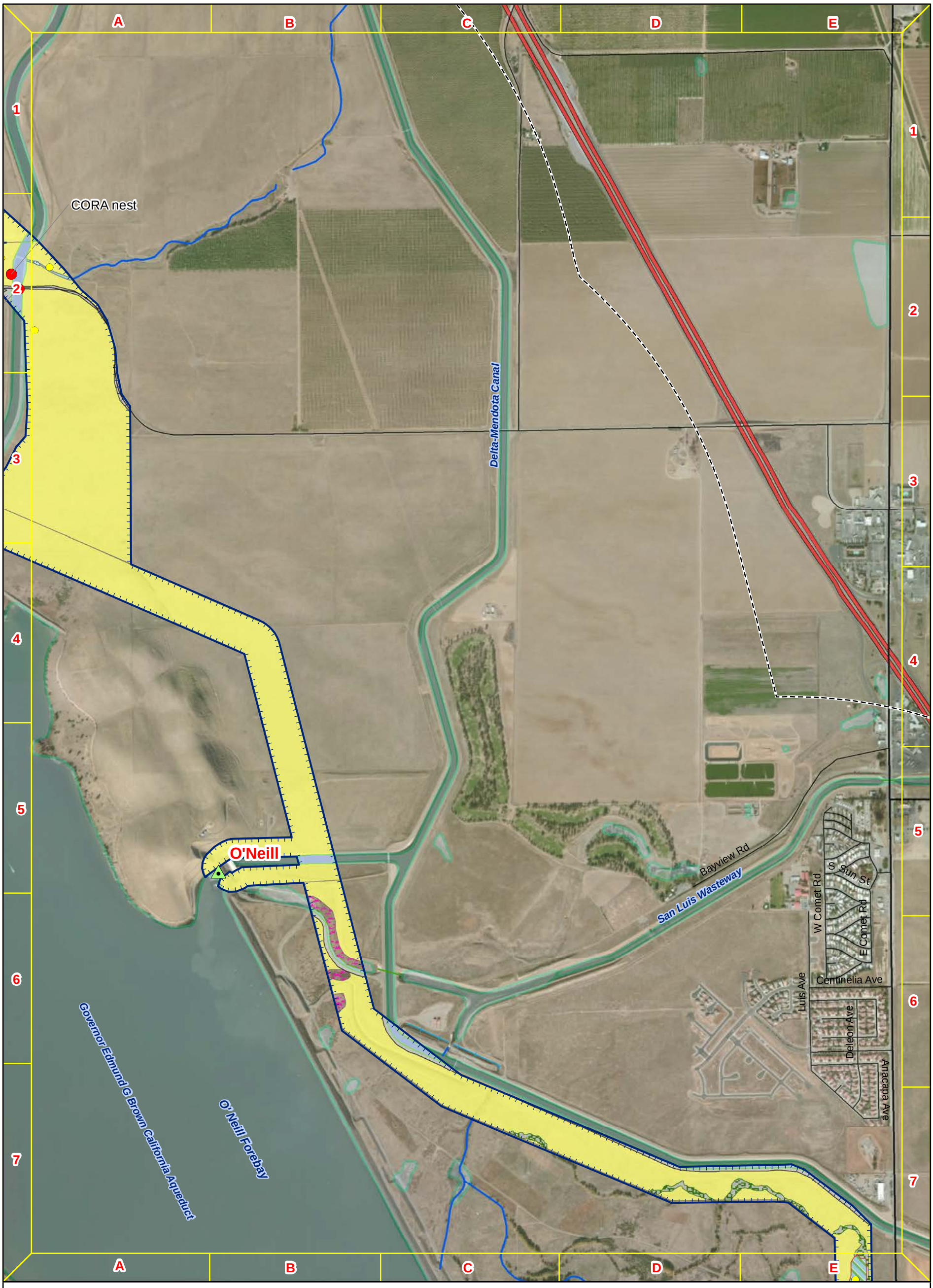
Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 34

See Page 37



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See Page 40

- Existing Substation
- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Coyote brush scrub
- Grassland non-native
- Great Valley riparian forest
- Intermittent creek
- Irrigation canal
- Pond
- River
- Freshwater marsh

Figure 3.

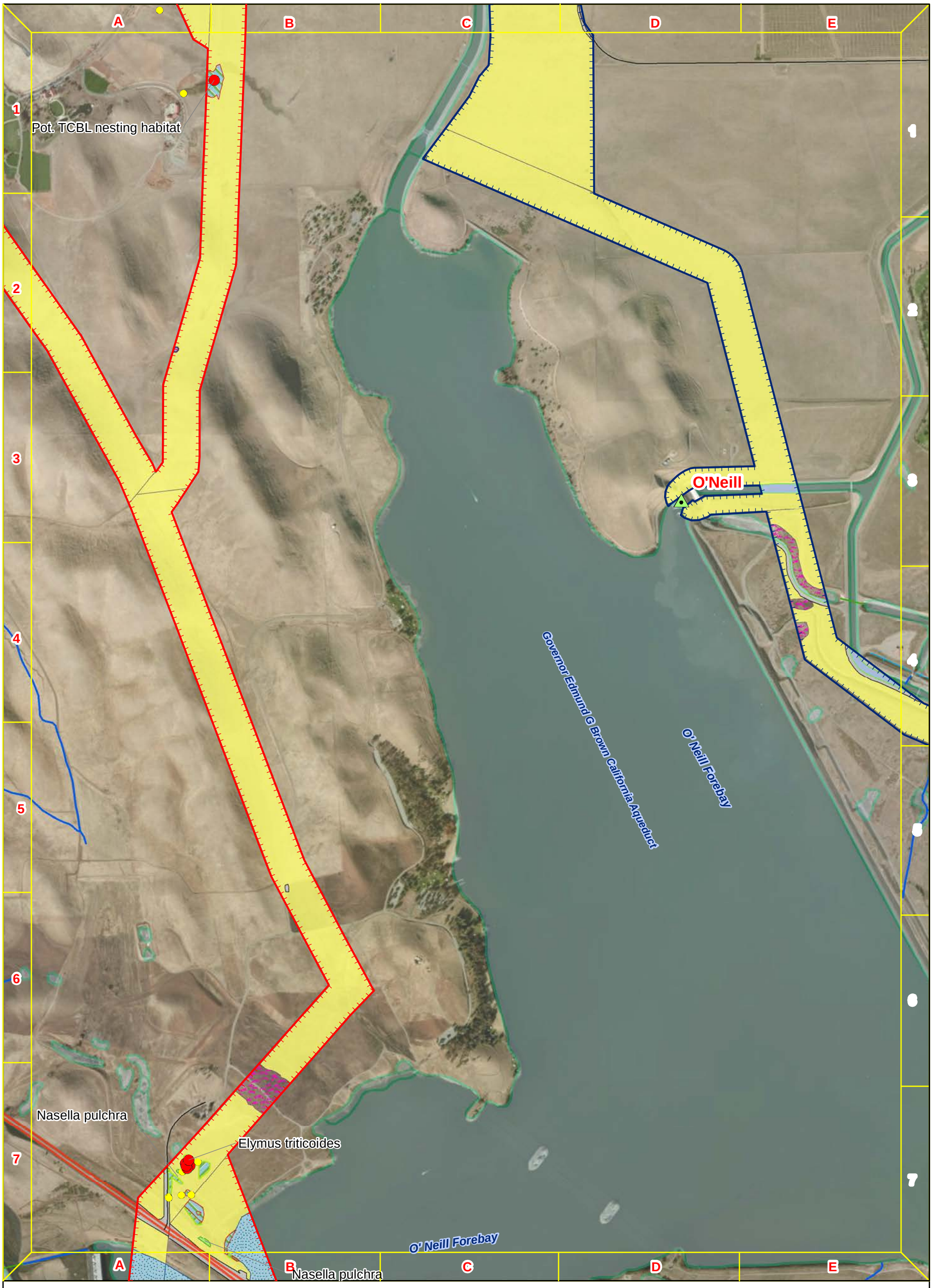
Biological Resources

0 750 1,500 Feet

See Page 34

See Page 38

See Page 40



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See Page 39

- Existing Substation
- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Coyote brush scrub
- Grassland non-native
- Grassland native
- Irrigation canal
- Impoundment
- Lake
- Freshwater marsh
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 35

See Page 37

See Page 39

Nasella pulc

Figure 3.

Biological Resources

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Barren
- Coyote brush scrub
- Grassland non-native
- Grassland native
- Ephemeral creek
- Intermittent creek
- Impoundment
- Lake
- Freshwater marsh
- Seasonal wetland

0 750 1,500 Feet

See Page 38

See Page 41

Western AREA POWER ADMINISTRATION

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- Existing Substation
- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

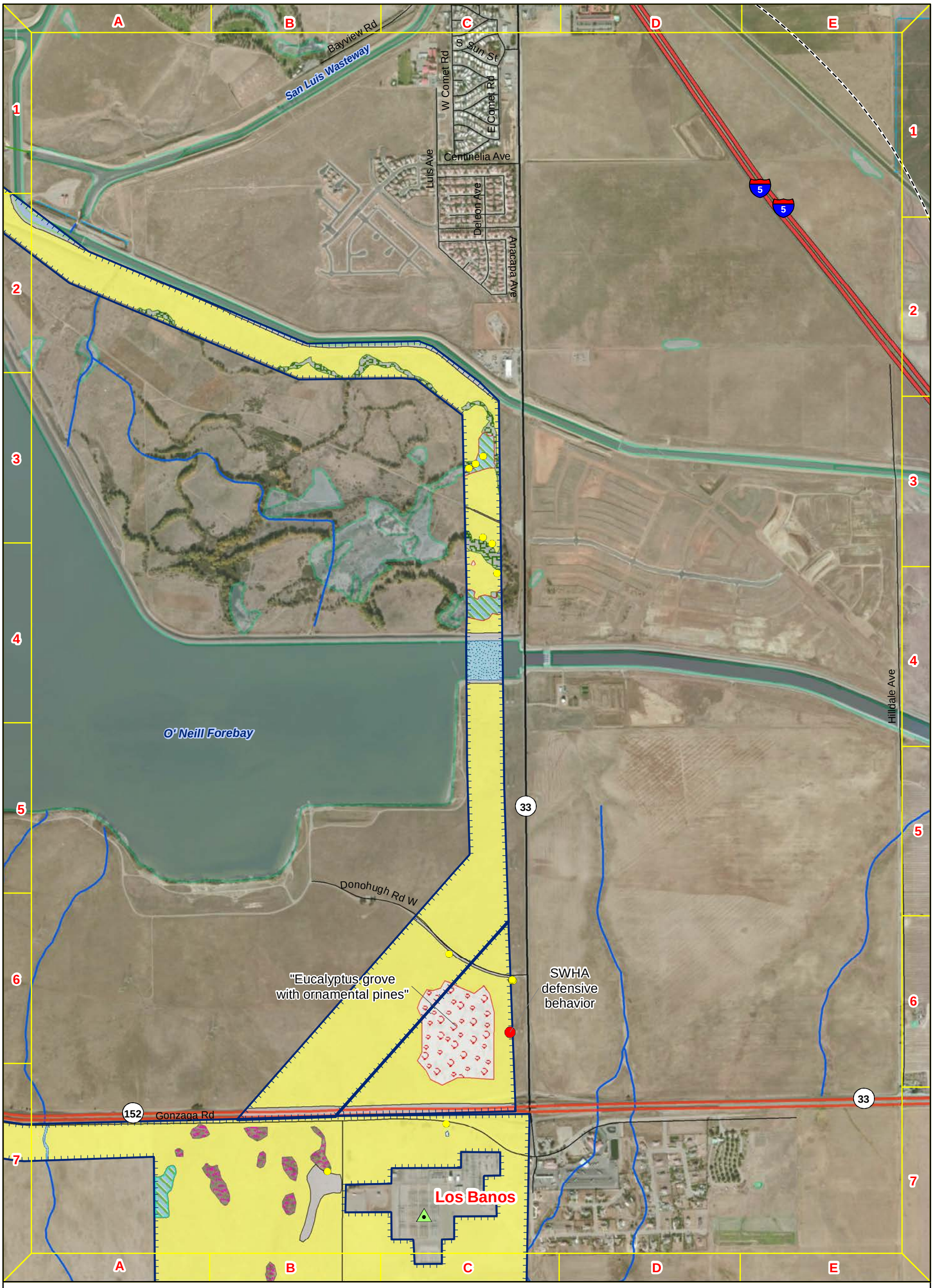
Habitat Type
- Barren
- Coyote brush scrub
- Grassland non-native
- Grassland native
- Drainage
- Irrigation canal
- Lake
- Freshwater marsh
- Seasonal wetland
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 36



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Source: WAPA SNR, Aspen EG, ESRI

See Page 41

- Existing Substation
- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

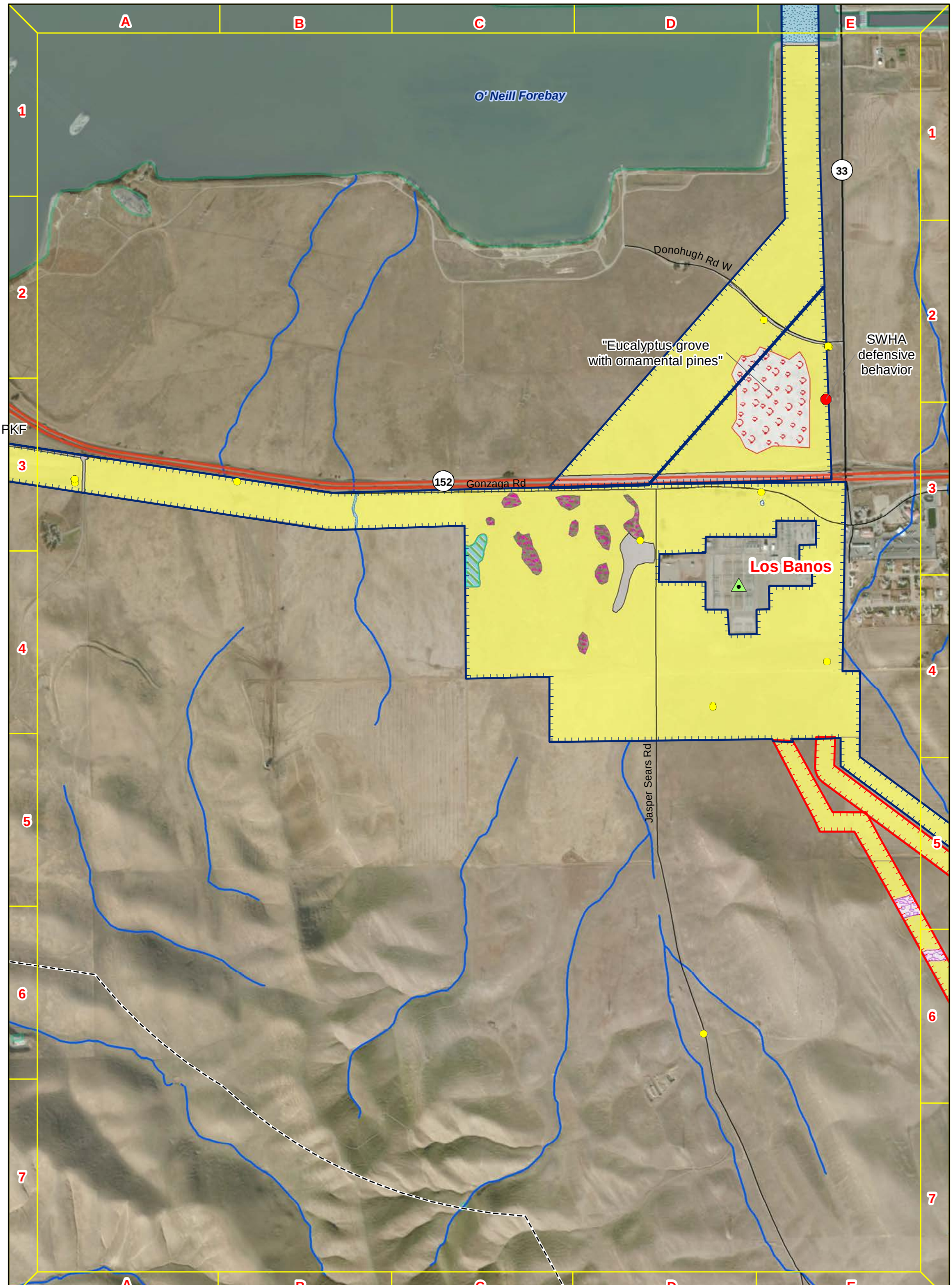
Habitat Type
- Barren
- Coyote brush scrub
- Grassland non-native
- Other
- Great Valley riparian forest
- Ephemeral creek
- Irrigation canal
- Lake
- Pond
- Freshwater marsh
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 40



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See Page 43

- Existing Substation
- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Barren
- Coyote brush scrub
- Grassland non-native
- Other
- Ephemeral creek
- Lake
- Pond
- Wildflower field
- Vernal pool

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 40

fensive
havior

Malva parviflora

San Joaquin
kit fox dens (2)

San Joaquin kit fox scat

San Joaquin kit fox scat

See Page 44

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- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Ag
- Grain
- Barren
- Grassland non-native
- Ephemeral creek
- Pond
- Wildflower field

Figure 3.

Biological Resources

0 750 1,500
Feet

See Page 41

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Source: WAPA SNR, Aspen EG, ESRI

See Page 46

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Grassland non-native
- Pond
- Wildflower field

Figure 3.

Biological Resources

0 750 1,500

Feet


N
Western
AREA POWER
ADMINISTRATION

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Source: WAPA SNR, Aspen EG, ESRI

See Page 47

- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

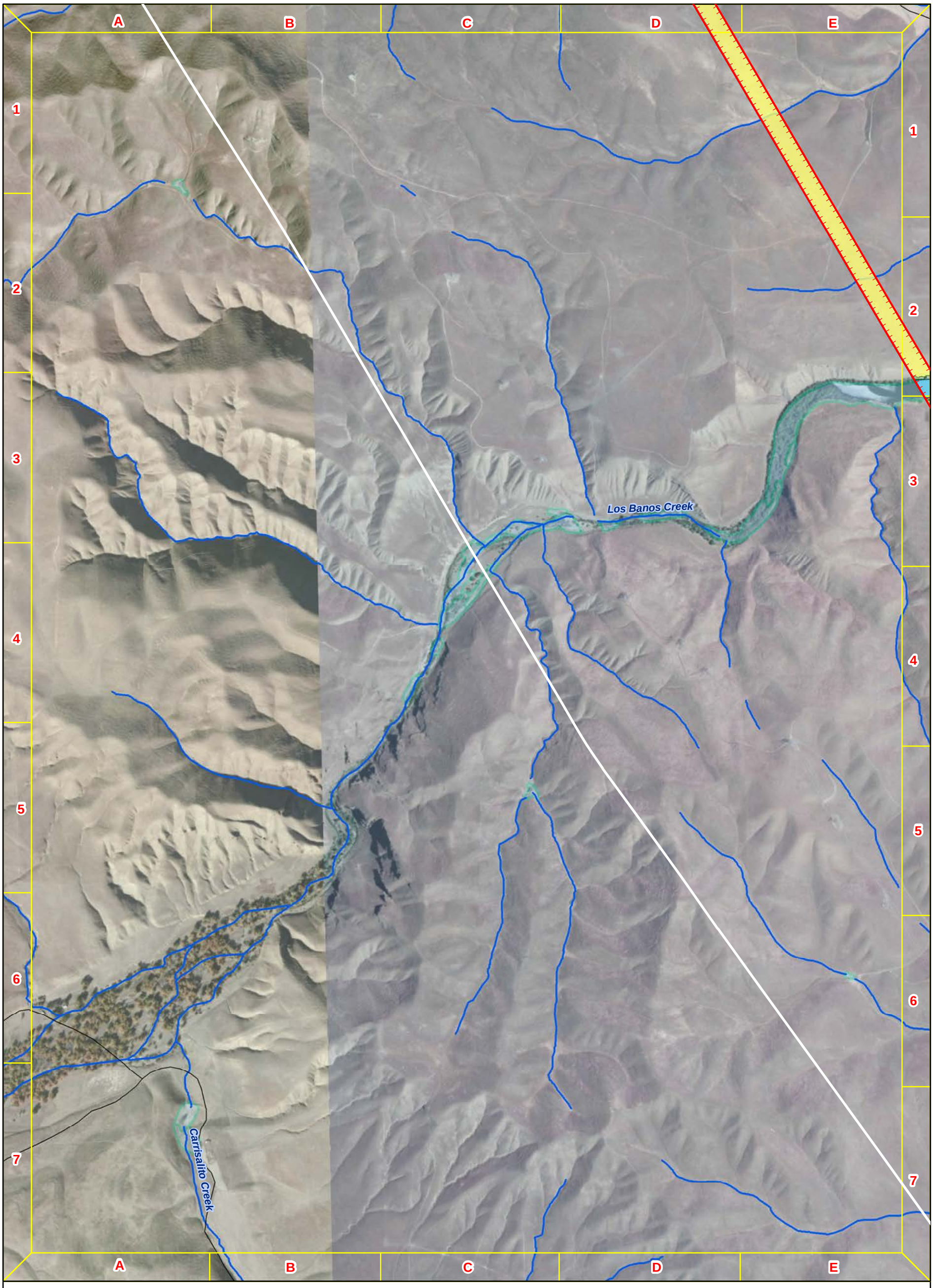
- Ag
- Barren
- Grassland non-native
- Ephemeral creek
- River
- Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 44



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Name/Org: SNR Date: 4/15/2015

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Source: WAPA SNR, Aspen EG, ESRI

1.25-mile buffer around Project Area

Elderberry polygon

Corridors

Proposed Project Corridor

Corridor Alternatives

Hydrologic Feature

Canal Ditch

Pipeline

Stream/River

NWI Wetland

Habitat Type

Grassland non-native

Great Valley riparian forest

River

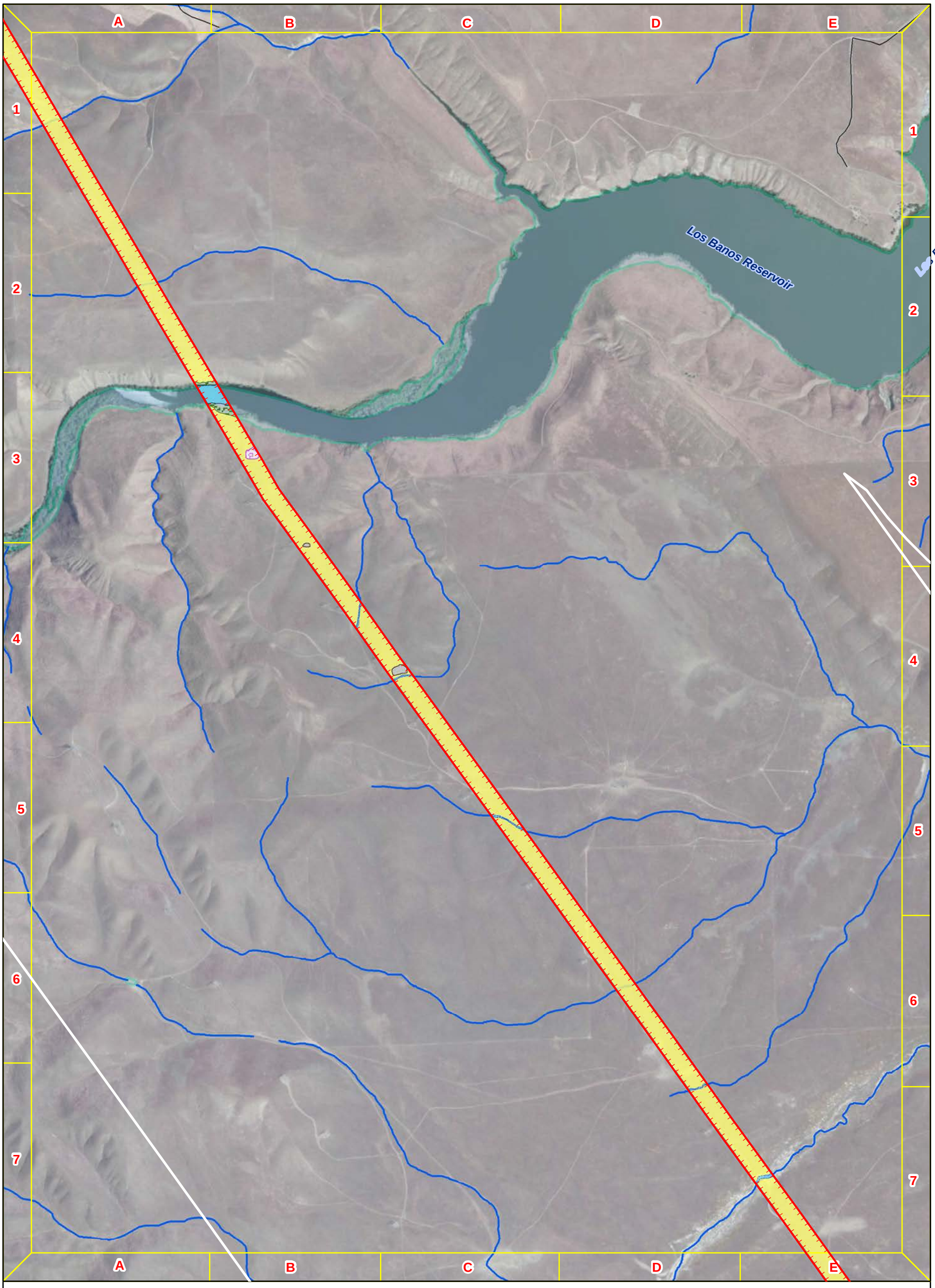
Figure 3.

Biological Resources

0 750 1,500

Feet

See Page 45



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Source: WAPA SNR, Aspen EG, ESRI

See Page 50

1.25-mile buffer around Project Area

Corridors

Proposed Project Corridor

Corridor Alternatives

Hydrologic Feature

Canal Ditch

Pipeline

Stream/River

NWI Wetland

Habitat Type

Barren

Grassland non-native

Great Valley riparian forest

Ephemeral creek

River

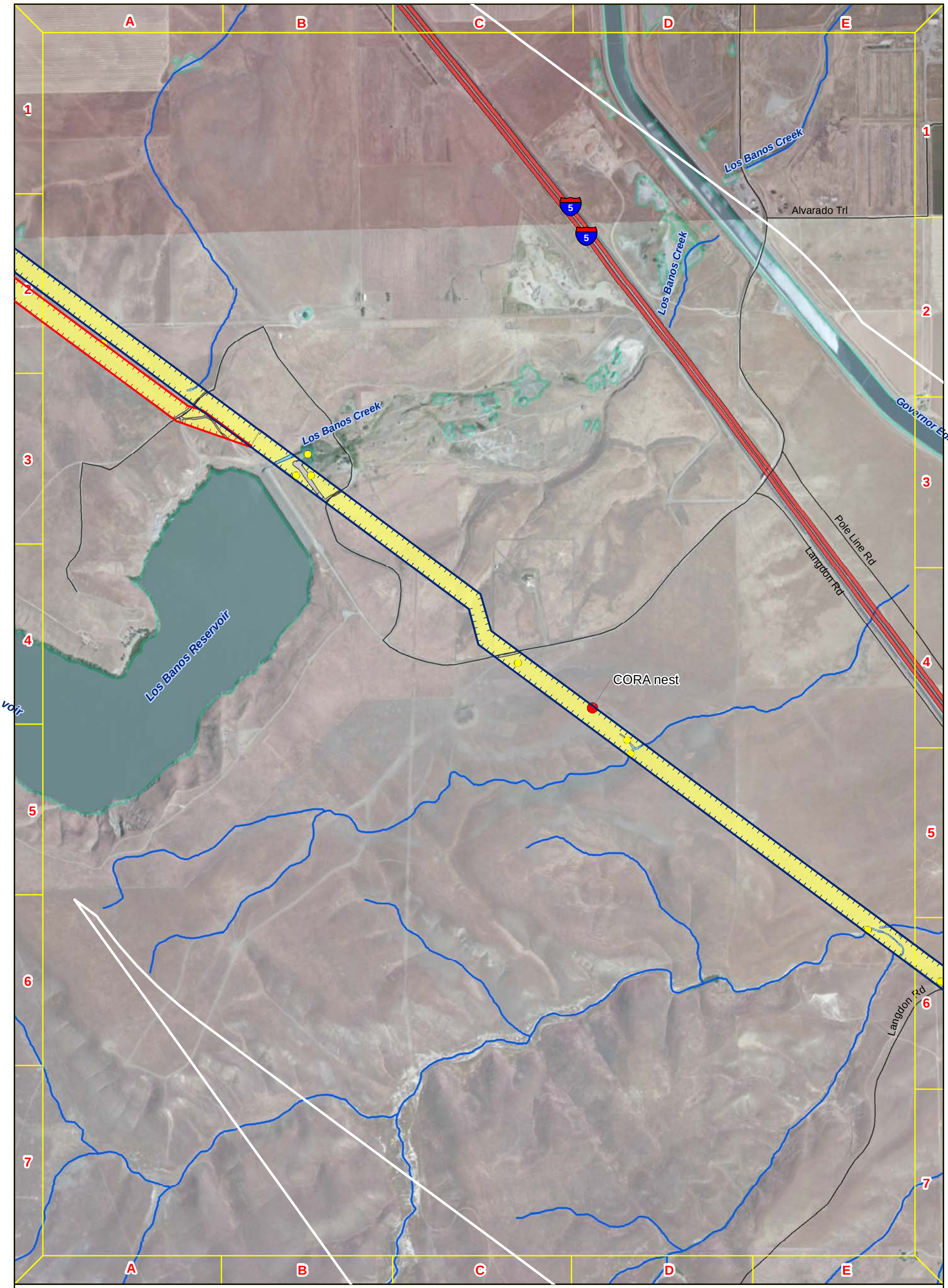
Wildflower field

Figure 3.

Biological Resources

0 750 1,500

Feet



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Source: WAPA SNR, Aspen EG, ESRI

See Page 51

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

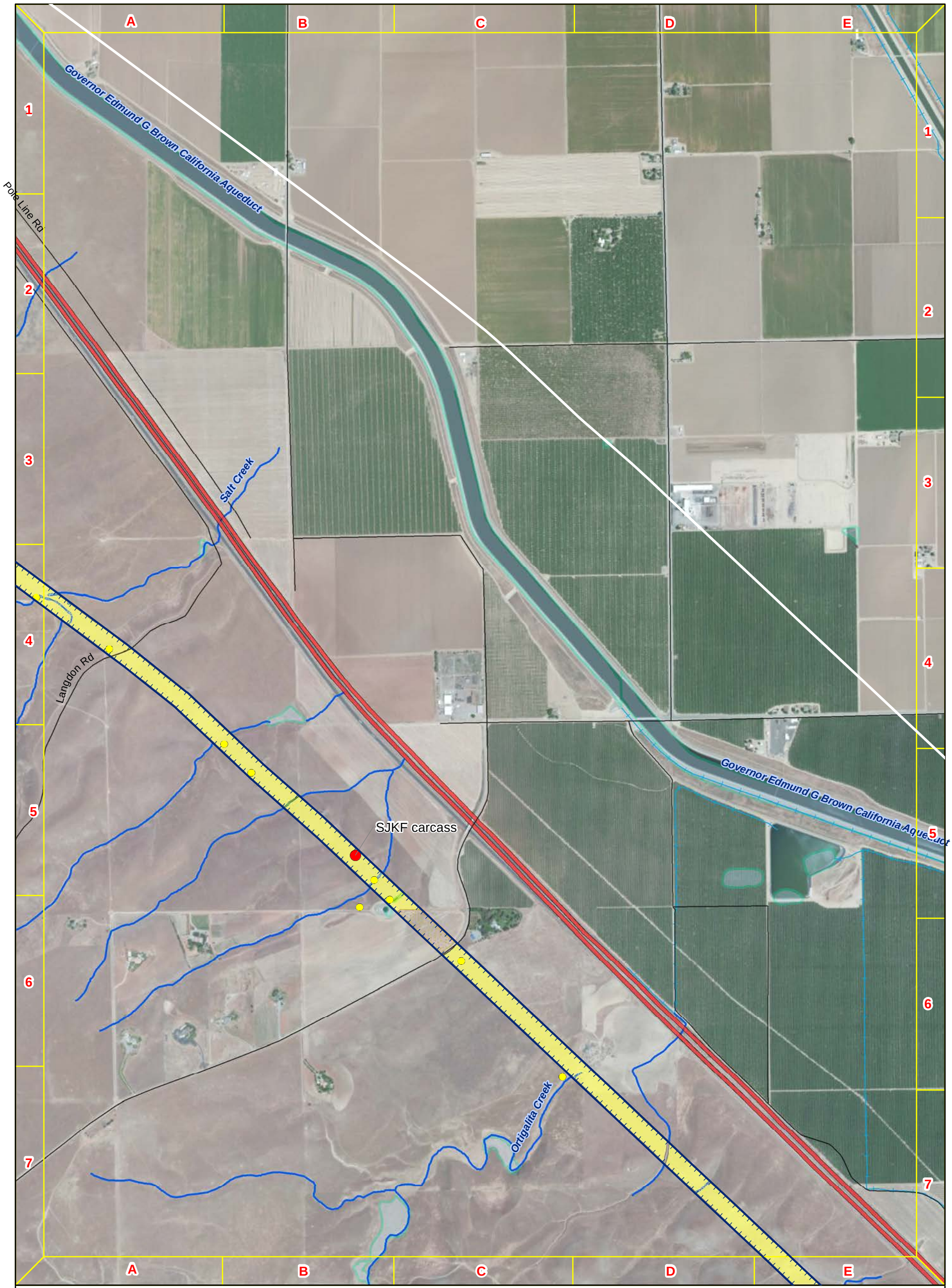
Habitat Type

- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- Pond
- River

Figure 3.

Biological Resources

0 750 1,500 Feet



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Source: WAPA SNR, Aspen EG, ESRI

See Page 52

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

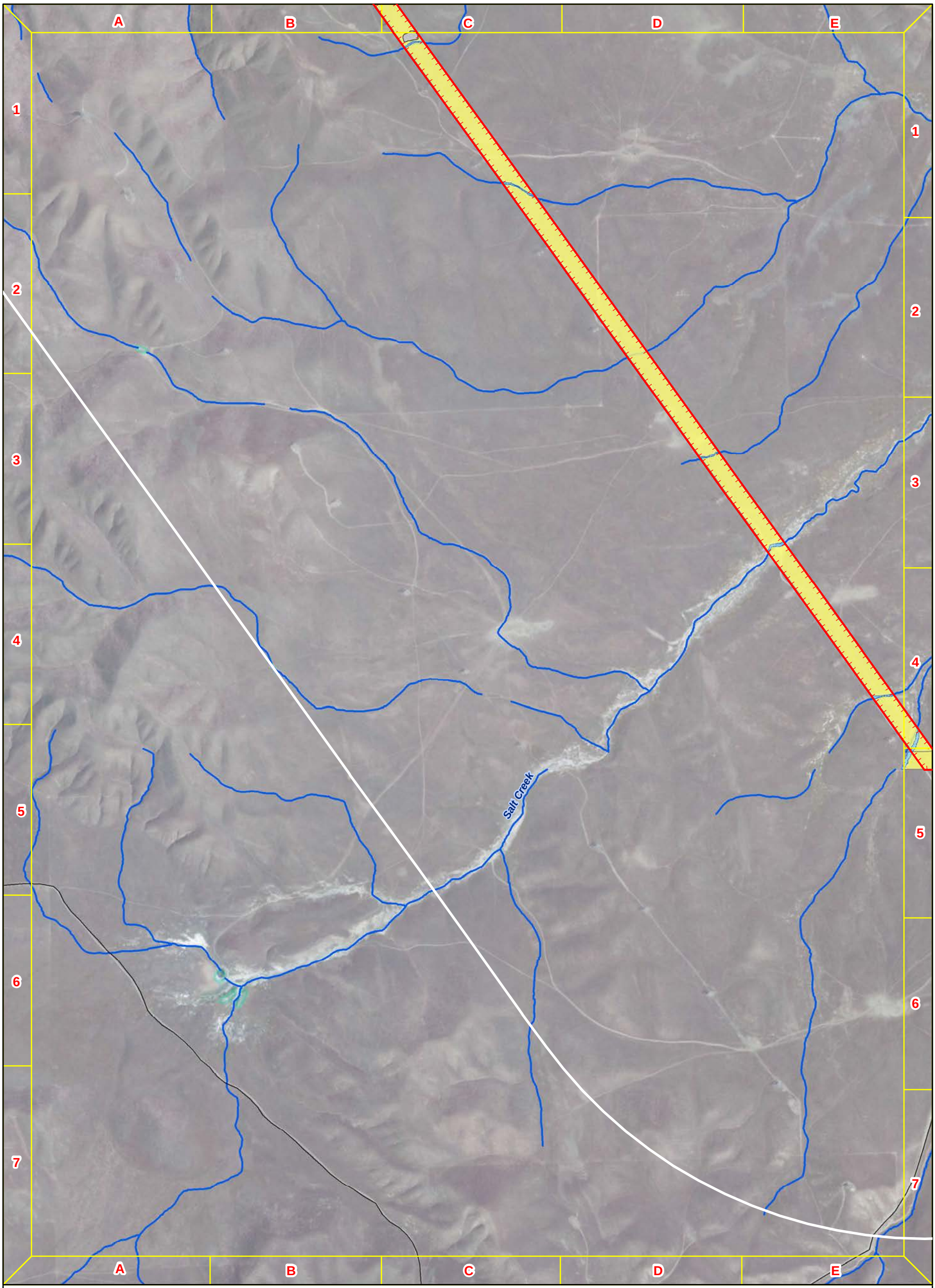
Hydrologic Feature	Habitat Type
Canal Ditch	Grain
Pipeline	Barren
Stream/River	Grassland non-native
NWI Wetland	Ephemeral creek
	Pond
	Other wetlands
	Seasonal wetland

Figure 3.

Biological Resources

0 750 1,500 Feet

See Page 47



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1.25-mile buffer around Project Area

Corridors

Proposed Project Corridor

Corridor Alternatives

Hydrologic Feature

Canal Ditch

Pipeline

Stream/River

NWI Wetland

Habitat Type

Barren

Grassland non-native

Ephemeral creek

Elderberry polygon

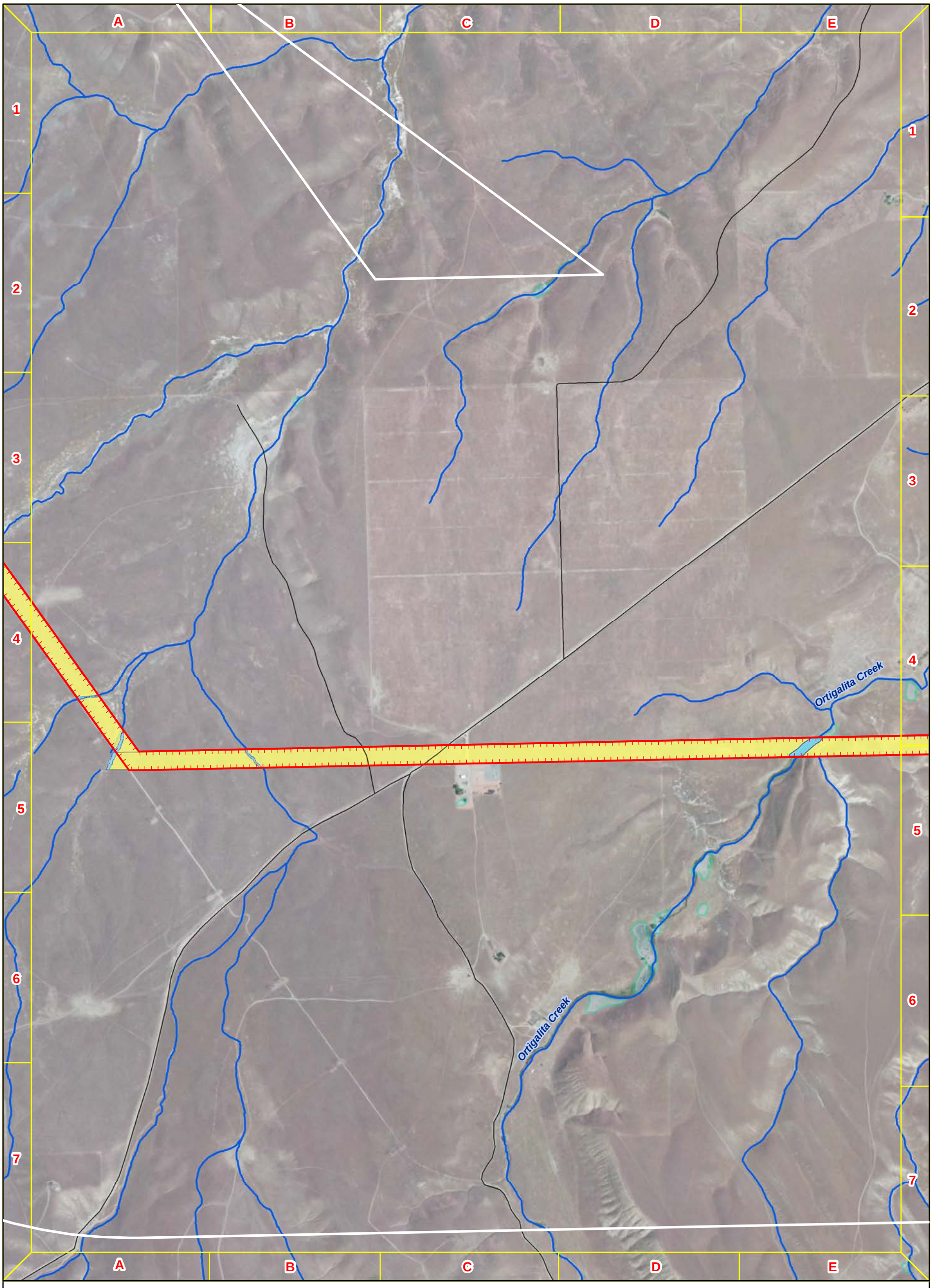
Figure 3.

Biological Resources

0 750 1,500

Feet

See Page 48



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Source: WAPA SNR, Aspen EG, ESRI

1.25-mile buffer around Project Area

Elderberry polygon

Corridors

Proposed Project Corridor

Corridor Alternatives

Hydrologic Feature

Canal Ditch

Pipeline

Stream/River

NWI Wetland

Habitat Type

Grassland non-native

Ephemeral creek

River

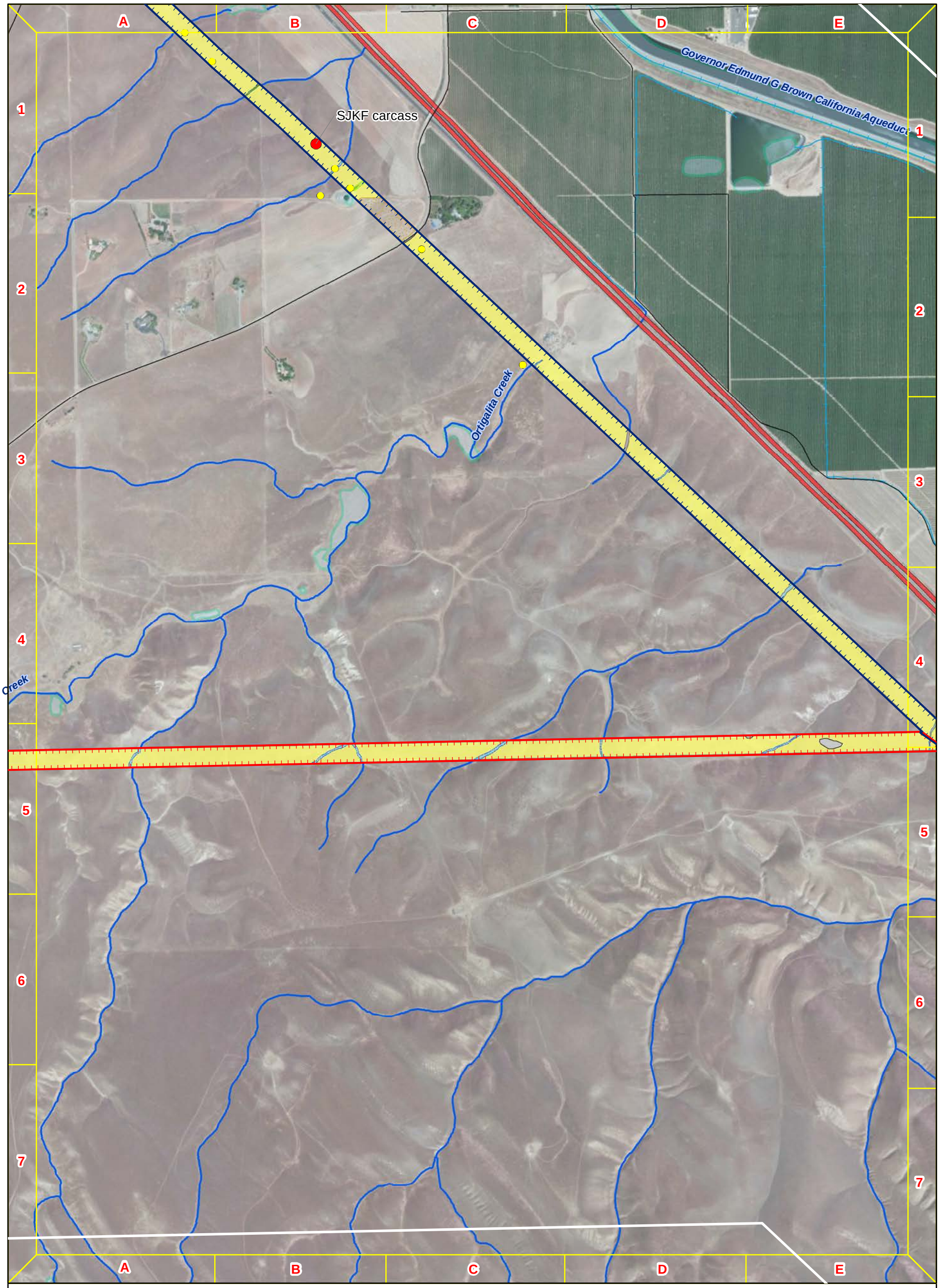
Figure 3.

Biological Resources

0 750 1,500

Feet

See Page 49



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Western AREA POWER ADMINISTRATION

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Source: WAPA SNR, Aspen EG, ESRI

- Photo point
- Species Occurrence
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Grain
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- Other wetlands
- Seasonal wetland

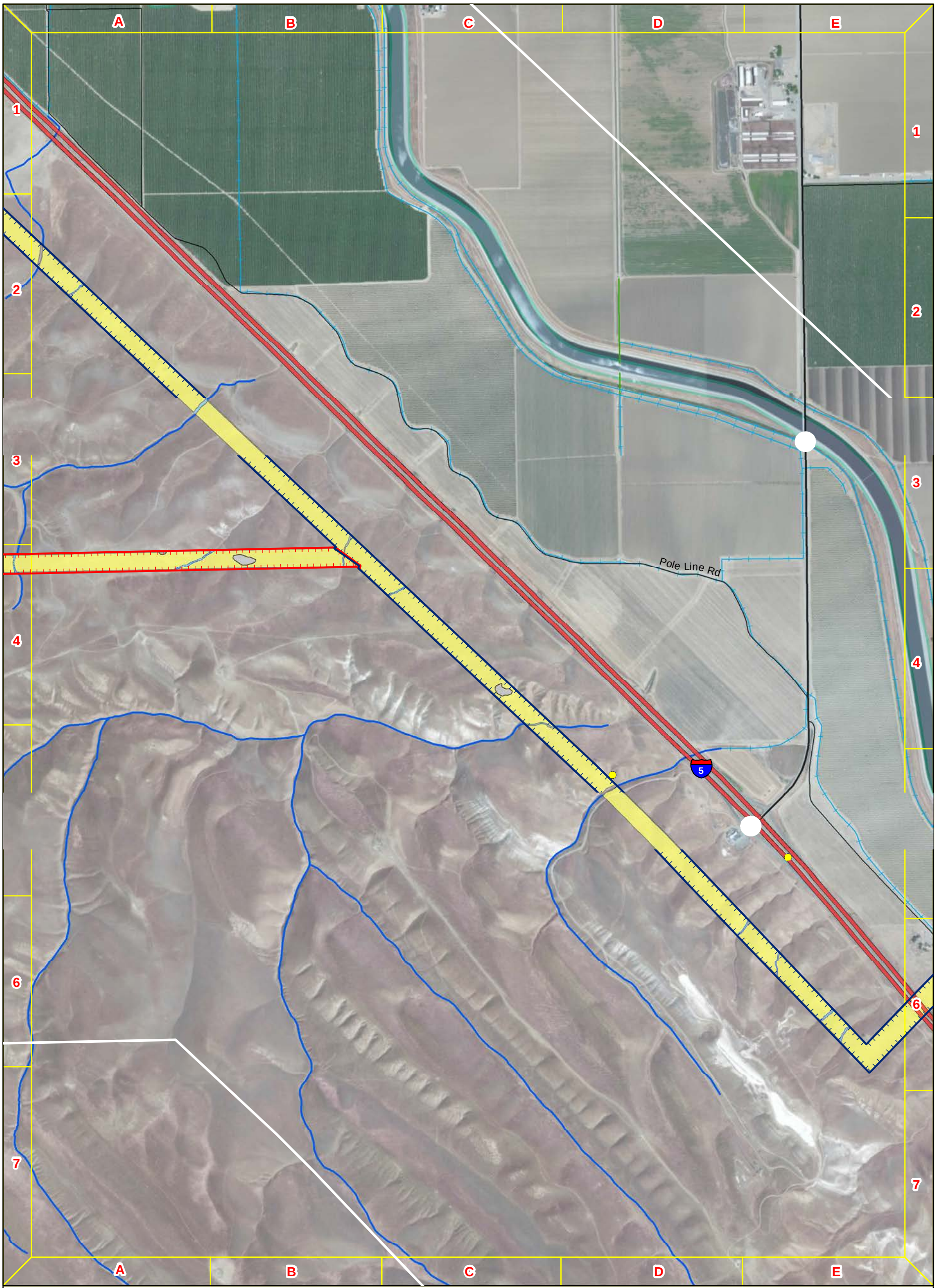
Figure 3.

Biological Resources

N

0 750 1,500 Feet

See Page 49



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- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors
- Proposed Project Corridor
- Corridor Alternatives

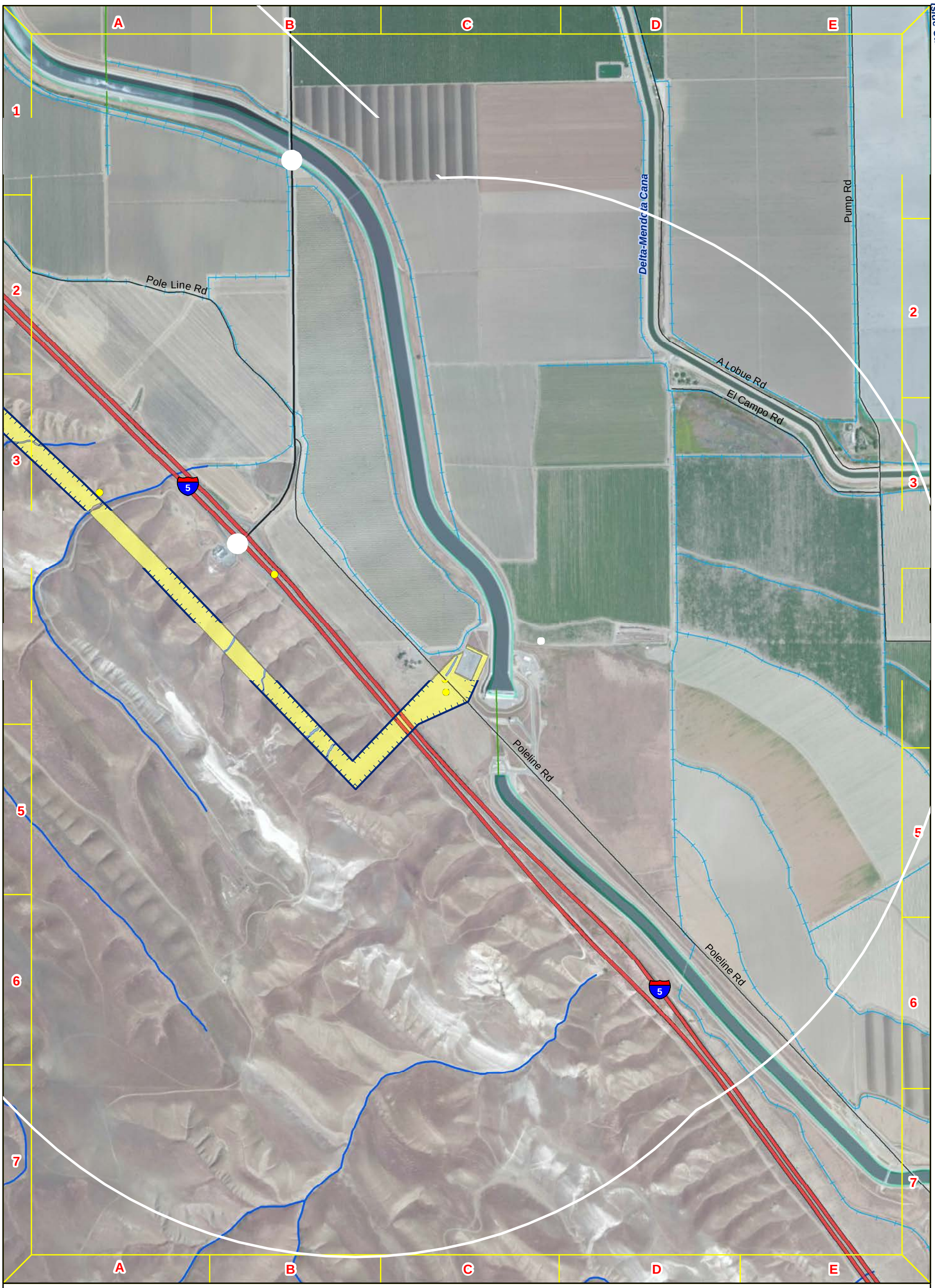
Hydrologic Feature
- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type
- Barren
- Grassland non-native
- Ephemeral creek
- Intermittent creek
- Other waters

Figure 3.

Biological Resources

0 750 1,500 Feet



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Source: WAPA SNR, Aspen EG, ESRI

- Existing Substation
- Photo point
- 1.25-mile buffer around Project Area
- Elderberry polygon

Corridors

- Proposed Project Corridor
- Corridor Alternatives

Hydrologic Feature

- Canal Ditch
- Pipeline
- Stream/River
- NWI Wetland

Habitat Type

- Grassland non-native
- Intermittent creek
- Other waters

Figure 3.

Biological Resources

0 750 1,500 Feet