

Appendix M
Supporting Biological Resources Information

Appendix M-1
USFWS, CNDDDB, CNPS, and NMFS Species Lists



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2019-SLI-0436
Event Code: 08ESMF00-2019-E-01345
Project Name: TriValley

November 28, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

San Francisco Bay-Delta Fish And Wildlife

650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

Project Summary

Consultation Code: 08ESMF00-2019-SLI-0436

Event Code: 08ESMF00-2019-E-01345

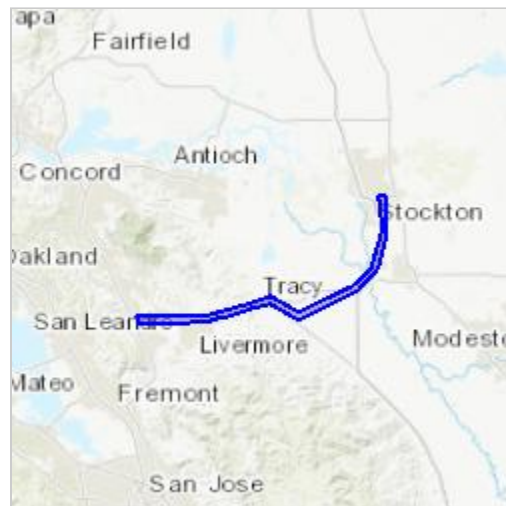
Project Name: TriValley

Project Type: TRANSPORTATION

Project Description: Tri-Valley rail extension

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.827022270206044N121.29203498171742W>



Counties: Alameda, CA | San Joaquin, CA

Endangered Species Act Species

There is a total of 15 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Riparian Brush Rabbit <i>Sylvilagus bachmani riparius</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6189	Endangered
San Joaquin Kit Fox <i>Vulpes macrotis mutica</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Least Tern <i>Sterna antillarum browni</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) <i>Masticophis lateralis euryxanthus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
San Bruno Elfin Butterfly <i>Callophrys mossii bayensis</i> There is proposed critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850 Habitat assessment guidelines: https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Large-flowered Fiddleneck <i>Amsinckia grandiflora</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5558	Endangered
Palmate-bracted Bird's Beak <i>Cordylanthus palmatus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1616	Endangered

Critical habitats

There are 3 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> https://ecos.fws.gov/ecp/species/2891#crithab	Final
Delta Smelt <i>Hypomesus transpacificus</i> https://ecos.fws.gov/ecp/species/321#crithab	Final
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> https://ecos.fws.gov/ecp/species/498#crithab	Final



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Phone: (916) 930-5603 Fax: (916) 930-5654
[http://kim_squires@fws.gov](mailto:kim_squires@fws.gov)

In Reply Refer To:
Consultation Code: 08FBDT00-2019-SLI-0052
Event Code: 08FBDT00-2019-E-00119
Project Name: TriValley

November 28, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

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The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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Sacramento, CA 95825-1846

(916) 414-6600

Project Summary

Consultation Code: 08FBDT00-2019-SLI-0052

Event Code: 08FBDT00-2019-E-00119

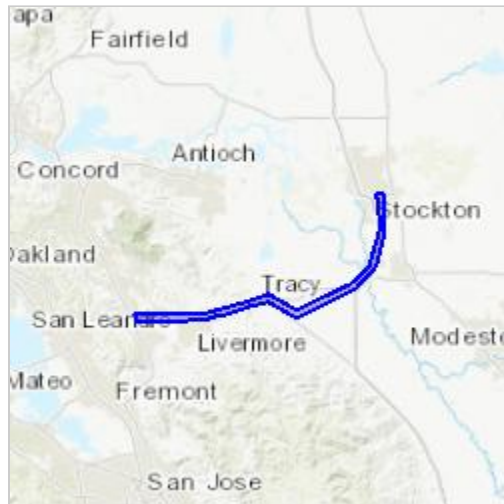
Project Name: TriValley

Project Type: TRANSPORTATION

Project Description: Tri-Valley rail extension

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.827022270206044N121.29203498171742W>



Counties: Alameda, CA | San Joaquin, CA

Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Riparian Brush Rabbit <i>Sylvilagus bachmani riparius</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6189	Endangered

Reptiles

NAME	STATUS
Giant Garter Snake <i>Thamnophis gigas</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander <i>Ambystoma californiense</i> Population: U.S.A. (Central CA DPS) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i> There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp <i>Lepidurus packardii</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Large-flowered Fiddleneck <i>Amsinckia grandiflora</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5558	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Delta Smelt <i>Hypomesus transpacificus</i> https://ecos.fws.gov/ecp/species/321#crithab	Final



Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad IS (Altamont (3712166) OR Dublin (3712168) OR Livermore (3712167) OR Midway (3712165) OR Tracy (3712164) OR Vernalis (3712163) OR Lathrop (3712173) OR Stockton West (3712183) OR Stockton East (3712182) OR Clifton Court Forebay (3712175) OR Manteca (3712172) OR Union Island (3712174) OR Byron Hot Springs (3712176))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Accipiter cooperii</i> Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
<i>Agelaius tricolor</i> tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
<i>Alkali Meadow</i> Alkali Meadow	CTT45310CA	None	None	G3	S2.1	
<i>Alkali Seep</i> Alkali Seep	CTT45320CA	None	None	G3	S2.1	
<i>Ambystoma californiense</i> California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
<i>Ammodramus savannarum</i> grasshopper sparrow	ABPBXA0020	None	None	G5	S3	SSC
<i>Amsinckia grandiflora</i> large-flowered fiddleneck	PDBOR01050	Endangered	Endangered	G1	S1	1B.1
<i>Anniella pulchra</i> northern California legless lizard	ARACC01020	None	None	G3	S3	SSC
<i>Anthicus sacramento</i> Sacramento anthicid beetle	IICOL49010	None	None	G1	S1	
<i>Antrozous pallidus</i> pallid bat	AMACC10010	None	None	G5	S3	SSC
<i>Aquila chrysaetos</i> golden eagle	ABNKC22010	None	None	G5	S3	FP
<i>Arctostaphylos manzanita ssp. laevigata</i> Contra Costa manzanita	PDERI04273	None	None	G5T2	S2	1B.2
<i>Arizona elegans occidentalis</i> California glossy snake	ARADB01017	None	None	G5T2	S2	SSC
<i>Asio flammeus</i> short-eared owl	ABNSB13040	None	None	G5	S3	SSC
<i>Astragalus tener var. tener</i> alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
<i>Athene cunicularia</i> burrowing owl	ABNSB10010	None	None	G4	S3	SSC
<i>Atriplex cordulata var. cordulata</i> heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
<i>Atriplex depressa</i> brittlescale	PDCHE042L0	None	None	G2	S2	1B.2



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Atriplex minuscula</i> lesser saltscare	PDCHE042M0	None	None	G2	S2	1B.1
<i>Balsamorhiza macrolepis</i> big-scale balsamroot	PDAST11061	None	None	G2	S2	1B.2
<i>Blepharizonia plumosa</i> big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
<i>Bombus crotchii</i> Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
<i>Bombus occidentalis</i> western bumble bee	IIHYM24250	None	None	G2G3	S1	
<i>Branchinecta longiantenna</i> longhorn fairy shrimp	ICBRA03020	Endangered	None	G1	S1S2	
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
<i>Branchinecta mesovallensis</i> midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
<i>Brasenia schreberi</i> watershield	PDCAB01010	None	None	G5	S3	2B.3
<i>Buteo regalis</i> ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
<i>Buteo swainsoni</i> Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
<i>Calochortus pulchellus</i> Mt. Diablo fairy-lantern	PMLIL0D160	None	None	G2	S2	1B.2
<i>Caulanthus lemmonii</i> Lemmon's jewelflower	PDBRA0M0E0	None	None	G3	S3	1B.2
<i>Centromadia parryi ssp. congdonii</i> Congdon's tarplant	PDAST4R0P1	None	None	G3T2	S2	1B.1
<i>Chloropyron molle ssp. hispidum</i> hispid salty bird's-beak	PDSCR0J0D1	None	None	G2T1	S1	1B.1
<i>Chloropyron palmatum</i> palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
<i>Circus hudsonius</i> northern harrier	ABNKC11011	None	None	G5	S3	SSC
<i>Cirsium crassicaule</i> slough thistle	PDAST2E0U0	None	None	G1	S1	1B.1
<i>Cismontane Alkali Marsh</i> Cismontane Alkali Marsh	CTT52310CA	None	None	G1	S1.1	
<i>Coccyzus americanus occidentalis</i> western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Deinandra bacigalupii</i> Livermore tarplant	PDAST4R0V0	None	Endangered	G1	S1	1B.1
<i>Delphinium californicum ssp. interius</i> Hospital Canyon larkspur	PDRAN0B0A2	None	None	G3T3	S3	1B.2
<i>Delphinium recurvatum</i> recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
<i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
<i>Elanus leucurus</i> white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
<i>Emys marmorata</i> western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
<i>Eremophila alpestris actia</i> California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
<i>Eryngium racemosum</i> Delta button-celery	PDAP10Z0S0	None	Endangered	G1	S1	1B.1
<i>Eryngium spinosepalum</i> spiny-sepaled button-celery	PDAP10Z0Y0	None	None	G2	S2	1B.2
<i>Eschscholzia rhombipetala</i> diamond-petaled California poppy	PDPAP0A0D0	None	None	G1	S1	1B.1
<i>Eumops perotis californicus</i> western mastiff bat	AMACD02011	None	None	G5T4	S3S4	SSC
<i>Extriplex joaquinana</i> San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
<i>Falco columbarius</i> merlin	ABNKD06030	None	None	G5	S3S4	WL
<i>Falco mexicanus</i> prairie falcon	ABNKD06090	None	None	G5	S4	WL
<i>Fritillaria agrestis</i> stinkbells	PMLIL0V010	None	None	G3	S3	4.2
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
<i>Helianthella castanea</i> Diablo helianthella	PDAST4M020	None	None	G2	S2	1B.2
<i>Hesperolinon breweri</i> Brewer's western flax	PDLIN01030	None	None	G2	S2	1B.2
<i>Hibiscus lasiocarpus var. occidentalis</i> woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
<i>Hygrotus curvipes</i> curved-foot hygrotus diving beetle	IICOL38030	None	None	G1	S1	



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Hypomesus transpacificus</i> Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
<i>Lanius ludovicianus</i> loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
<i>Lasiurus cinereus</i> hoary bat	AMACC05030	None	None	G5	S4	
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
<i>Limosella australis</i> Delta mudwort	PDSCR10030	None	None	G4G5	S2	2B.1
<i>Linderiella occidentalis</i> California linderiella	ICBRA06010	None	None	G2G3	S2S3	
<i>Lytta moesta</i> moestan blister beetle	IICOL4C020	None	None	G2	S2	
<i>Madia radiata</i> showy golden madia	PDAST650E0	None	None	G3	S3	1B.1
<i>Masticophis flagellum ruddocki</i> San Joaquin coachwhip	ARADB21021	None	None	G5T2T3	S2?	SSC
<i>Masticophis lateralis euryxanthus</i> Alameda whipsnake	ARADB21031	Threatened	Threatened	G4T2	S2	
<i>Melospiza melodia</i> song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
<i>Myotis yumanensis</i> Yuma myotis	AMACC01020	None	None	G5	S4	
<i>Navarretia nigelliformis</i> ssp. <i>radians</i> shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
<i>Navarretia prostrata</i> prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	G2	S2	1B.1
<i>Neotoma fuscipes riparia</i> riparian (=San Joaquin Valley) woodrat	AMAFF08081	Endangered	None	G5T1Q	S1	SSC
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
<i>Oncorhynchus mykiss irideus</i> pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
<i>Perognathus inornatus</i> San Joaquin Pocket Mouse	AMAFD01060	None	None	G2G3	S2S3	
<i>Phrynosoma blainvillii</i> coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
<i>Plagiobothrys glaber</i> hairless popcornflower	PDBOR0V0B0	None	None	GH	SH	1A



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Polemonium carneum</i> Oregon polemonium	PDPLM0E050	None	None	G3G4	S2	2B.2
<i>Puccinellia simplex</i> California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
<i>Rana boylei</i> foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
<i>Rana draytonii</i> California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
<i>Sagittaria sanfordii</i> Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
<i>Senecio aphanactis</i> chaparral ragwort	PDAST8H060	None	None	G3	S2	2B.2
<i>Spea hammondii</i> western spadefoot	AAABF02020	None	None	G3	S3	SSC
<i>Spergularia macrotheca var. longistyla</i> long-styled sand-spurrey	PDCAR0W062	None	None	G5T2	S2	1B.2
<i>Spirinchus thaleichthys</i> longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
<i>Sycamore Alluvial Woodland</i> Sycamore Alluvial Woodland	CTT62100CA	None	None	G1	S1.1	
<i>Sylvilagus bachmani riparius</i> riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	
<i>Symphotrichum lentum</i> Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
<i>Taxidea taxus</i> American badger	AMAJF04010	None	None	G5	S3	SSC
<i>Thaleichthys pacificus</i> eulachon	AFCHB04010	Threatened	None	G5	S3	
<i>Thamnophis gigas</i> giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
<i>Trichocoronis wrightii var. wrightii</i> Wright's trichocoronis	PDAST9F031	None	None	G4T3	S1	2B.1
<i>Trifolium hydrophilum</i> saline clover	PDFAB400R5	None	None	G2	S2	1B.2
<i>Tropidocarpum capparideum</i> caper-fruited tropidocarpum	PDBRA2R010	None	None	G1	S1	1B.1
<i>Valley Needlegrass Grassland</i> Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
<i>Valley Sink Scrub</i> Valley Sink Scrub	CTT36210CA	None	None	G1	S1.1	
<i>Vireo bellii pusillus</i> least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	
<i>Xanthocephalus xanthocephalus</i> yellow-headed blackbird	ABPBXB3010	None	None	G5	S3	SSC

Record Count: 104

Plant List

Inventory of Rare and Endangered Plants

55 matches found. [Click on scientific name for details](#)

Search Criteria

Found in Quads 3712168, 3712166, 3712167, 3712165, 3712164, 3712163, 3712173, 3712183, 3712182, 3712175, 3712172 3712174 and 3712176;

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Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Acanthomintha lanceolata	Santa Clara thorn-mint	Lamiaceae	annual herb	Mar-Jun	4.2	S4	G4
Amsinckia grandiflora	large-flowered fiddleneck	Boraginaceae	annual herb	(Mar)Apr-May	1B.1	S1	G1
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	1B.2	S3	G3
Androsace elongata ssp. acuta	California androsace	Primulaceae	annual herb	Mar-Jun	4.2	S3S4	G5? T3T4
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S2	G2T2
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex coronata var. vallicola	Lost Hills crownscale	Chenopodiaceae	annual herb	Apr-Sep	1B.2	S2	G4T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Balsamorhiza macrolepis	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S1S2	G1G2
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	2B.3	S3	G5
Calochortus pulchellus	Mt. Diablo fairy-lantern	Liliaceae	perennial bulbiferous herb	Apr-Jun	1B.2	S2	G2
Caulanthus lemmonii	Lemmon's jewelflower	Brassicaceae	annual herb	Feb-May	1B.2	S3	G3
Centromadia parryi ssp. congdonii	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	1B.1	S2	G3T2
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron molle ssp. hispidum	hispid bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Sep	1B.1	S1	G2T1
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1

<u>Cirsium crassicaule</u>	slough thistle	Asteraceae	annual / perennial herb	May-Aug	1B.1	S1	G1
<u>Clarkia concinna ssp. automixa</u>	Santa Clara red ribbons	Onagraceae	annual herb	(Apr)May-Jun(Jul)	4.3	S3	G5?T3
<u>Convolvulus simulans</u>	small-flowered morning-glory	Convolvulaceae	annual herb	Mar-Jul	4.2	S4	G4
<u>Deinandra bacigalupii</u>	Livermore tarplant	Asteraceae	annual herb	Jun-Oct	1B.1	S1	G1
<u>Delphinium californicum ssp. interius</u>	Hospital Canyon larkspur	Ranunculaceae	perennial herb	Apr-Jun	1B.2	S3	G3T3
<u>Delphinium recurvatum</u>	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
<u>Eryngium racemosum</u>	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	S1	G1
<u>Eryngium spinosepalum</u>	spiny-sepaled button-celery	Apiaceae	annual / perennial herb	Apr-Jun	1B.2	S2	G2
<u>Eschscholzia rhombipetala</u>	diamond-petaled California poppy	Papaveraceae	annual herb	Mar-Apr	1B.1	S1	G1
<u>Extriplex joaquinana</u>	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
<u>Fritillaria agrestis</u>	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	4.2	S3	G3
<u>Helianthella castanea</u>	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	1B.2	S2	G2
<u>Hesperevax caulescens</u>	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3
<u>Hesperolinon breweri</u>	Brewer's western flax	Linaceae	annual herb	May-Jul	1B.2	S2	G2
<u>Hibiscus lasiocarpus var. occidentalis</u>	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
<u>Lasthenia conjugens</u>	Contra Costa goldfields	Asteraceae	annual herb	Mar-Jun	1B.1	S1	G1
<u>Lasthenia ferrisiae</u>	Ferris' goldfields	Asteraceae	annual herb	Feb-May	4.2	S3	G3
<u>Lathyrus jepsonii var. jepsonii</u>	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	1B.2	S2	G5T2
<u>Leptosiphon acicularis</u>	bristly leptosiphon	Polemoniaceae	annual herb	Apr-Jul	4.2	S4?	G4?
<u>Lilaeopsis masonii</u>	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	1B.1	S2	G2
<u>Limosella australis</u>	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	2B.1	S2	G4G5
<u>Madia radiata</u>	showy golden madia	Asteraceae	annual herb	Mar-May	1B.1	S3	G3
<u>Myosurus minimus ssp. apus</u>	little mousetail	Ranunculaceae	annual herb	Mar-Jun	3.1	S2	G5T2Q
<u>Navarretia nigelliformis ssp. nigelliformis</u>	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2	S3	G4T3
<u>Navarretia nigelliformis ssp. radians</u>	shining navarretia	Polemoniaceae	annual herb	(Mar)Apr-Jul	1B.2	S2	G4T2
<u>Navarretia prostrata</u>	prostrate vernal pool navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G2
<u>Plagiobothrys glaber</u>	hairless popcornflower	Boraginaceae	annual herb	Mar-May	1A	SH	GH
<u>Polemonium carneum</u>	Oregon polemonium	Polemoniaceae	perennial herb	Apr-Sep	2B.2	S2	G3G4
<u>Puccinellia simplex</u>	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3

Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	2B.2	S2	G3
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May	1B.2	S2	G5T2
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	2B.1	S1	G4T3
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2
Tropidocarpum capparideum	caper-fruited tropidocarpum	Brassicaceae	annual herb	Mar-Apr	1B.1	S1	G1

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Questions and Comments

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Quad Name/Number	CCC Steelhead	CV Steelhead	Green Sturgeon	EFH
Dublin/37121-F8	X			Coho/Chinook
Livermore/37121-F7				Coho/Chinook
Altamont/37121-F6		X		Coho/Chinook
Midway/37121-F5		X		Coho/Chinook
Tracy/37121-F4		X		Chinook
Lathrop/37121-G3		X/Critical Habitat	X/Critical Habitat	Chinook

NMFS list. Obtained 12/11/2018 from the online system.

https://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html

Appendix M-2
Special-Status Species Accounts

Appendix M-2

Special-Status Species Accounts

Special-Status Plants Species Accounts

Alkali Milk Vetch (*Astragalus tener* var. *tener*) – CRPR 1B.2

Alkali milk vetch is an annual herb in the legume family (*Fabaceae*). It occurs in playas, grassland, and vernal pools below 60 meters. This species is associated with adobe clay and alkaline soils. Alkali milk vetch blooms from March through June and is known to occur in the southern Sacramento Valley, northern San Joaquin Valley, and east of the San Francisco Bay Area. CDFW California Natural Diversity Database (CNDDDB) occurrences of alkali milk vetch have been documented in the east end of the Livermore Valley, near Ulmar, in Alameda County; this record intersects the Tri-Valley Alignment; however, this occurrence record is presumed extirpated (California Department of Fish and Wildlife 2019). Suitable habitat, including alkaline seasonal wetlands, vernal pools, saltgrass flats, and annual grassland is present in the eastern portion of the Tri-Valley and Altamont segments.

Bent-Flowered Fiddleneck (*Amsinckia lunaris*) – CRPR 1B.2

Bent-flowered fiddleneck is an annual herb in the borage family (*Boraginaceae*) known from the inner North Coast Ranges, San Francisco Bay Area, and west-central Great Valley. Bent-flowered fiddleneck is known to occur in coastal bluff scrub, annual grassland, and cismontane woodlands below 500 meters. The species typically blooms from March through June. CNDDDB occurrences have been documented approximately 3 miles of the study area (California Department of Fish and Wildlife 2019). Suitable annual grassland and oak woodland habitat are present throughout the study area.

Big-Scale Balsamroot (*Balsamorhiza macrolepis*) – CRPR 1B.2

Big-scale balsamroot is a perennial herb in the sunflower family (*Asteraceae*) found in chaparral, cismontane woodland, and annual grassland from 90 to 1,555 meters. This species can be associated with serpentine soils and blooms from March through June. Big-scale balsamroot is known to occur in the Coast Ranges and Sierra Nevada foothills. CNDDDB occurrences have been documented within 3 miles of the Altamont segment, however this population is believed to be extirpated (California Department of Fish and Wildlife 2019). Suitable annual grassland and woodland habitat are present in the Tri-Valley and Altamont segments.

Big tarplant (*Blepharizonia plumosa*) – CRPR 1B.1

Big tarplant, an annual herb in the sunflower family (*Asteraceae*), is found in annual grassland from 30 to 505 meters. It blooms from July through October and is known to occur in San Francisco Bay Area and San Joaquin, Stanislaus, and Solano Counties. CNDDDB occurrences have been documented in the Altamont and Tracy to Lathrop segments (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present in the Altamont and Tracy to Lathrop segments.

Brewer's western flax (*Hesperolinon breweri*) – CRPR 1B.2

Brewer's western flax is an annual herb in the flax family (*Linaceae*). It is found in chaparral, cismontane woodland, and annual grassland from 30 to 900 meters. This species is associated with soils derived from serpentinite. Brewer's western flax typically blooms from May through July. The species is known to occur in the southern north inner coast range, northeast San Francisco Bay region (especially Mt. Diablo), and Contra Costa, Napa, and Solano Counties. CNDDDB occurrences have been documented approximately 3 miles south of the study area in the Altamont Hills (California Department of Fish and Wildlife 2019). Suitable cismontane woodland and annual grassland are present the Altamont segment.

Brittlescale (*Atriplex depressa*) – CRPR 1B.2

Brittlescale, an annual herb in the goosefoot family (*Chenopodiaceae*), is found in chenopod scrub, playas, and grassland associated with alkaline clay soils below 320 meters. Scattered occurrences of brittlescale are known throughout California, Oregon, Washington, and elsewhere. This species blooms from April through October. CNDDDB occurrences have been documented in within 0.5 mile of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable saltgrass flats habitat is present in the Tri-Valley segment and annual grassland habitat is present in the Altamont segment.

California alkali grass (*Puccinellia simplex*) – CRPR 1B.2

California alkali grass, an annual herb in the grass family (*Poaceae*), is found in alkaline, vernal mesic chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. It is associated with sinks, flats, and lake margins below 930 meters. This species blooms from March through May. California alkali grass is known to occur in Alameda, Butte, Contra Costa, Colusa, Fresno, Glen, Kern, Lake, Los Angeles, Madera, Merced, Napa, San Bernadino, Santa Clara, Santa Cruz, San Luis Obispo, Solano, Stanislaus, Tulare, and Yolo counties. It is presumed extirpated in Kings County. CNDDDB occurrences have been documented in the Altamont segment near the town of Altamont as well as within 1 mile of Livermore and Clifton Court Forebay (California Department of Fish and Wildlife 2019). Suitable alkali seasonal wetland, alkaline scrub, and annual grassland habitat is present in all three segments.

Caper-Fruited Tropicocarpum (*Tropicocarpum capparideum*) – CRPR 1B.1

Caper-fruited tropidocarpum, an annual herb in the mustard family (*Brassicaceae*), is found in annual grasslands on alkaline hills below 455 meters. This species blooms from March through April. Caper-fruited tropidocarpum is known to occur in Fresno, Monterey, and San Luis Obispo Counties. It is historically known to occur in the northwest San Joaquin Valley. CNDDDB occurrences have been documented in the Altamont and Tracy to Lathrop segments as well as within 3 miles, but are thought to be extirpated (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present in both segments.

Chaparral ragwort (*Senecio aphanactis*) – CRPR 2B.1

Chaparral ragwort, an annual herb in the aster family (*Asteraceae*), is found in oak woodland, coastal scrub, and chaparral in open sandy or rocky areas on alkaline soils from 15 to 800 meters. This species blooms from January through April. Chaparral ragwort is known to occur in scattered locations in central western and southwestern California, from Alameda County to San Diego

County. Two CNDDDB occurrences have been documented within 3 miles of the improvement footprints in the Altamont segment (California Department of Fish and Wildlife 2019). Suitable oak woodland and alkaline soils are present in the Altamont segment.

Congdon's Tarplant (*Centromadia parryi* ssp. *congdonii*) – CRPR 1B.1

Congdon's tarplant is an annual herb in the sunflower family (*Asteraceae*) known from East San Francisco Bay Area, Salinas Valley, and Los Osos Valley. Congdon's tarplant blooms from May through October and occurs in annual grassland on lower slopes, flats, and swales below 230 meters.

There are multiple recorded CNDDDB occurrences documented within 3 miles of the Tri-Valley and Altamont segments and one known from undeveloped grasslands immediately east of Fallon Road and north of I-580 in the study area (California Department of Fish and Wildlife 2019). Potential habitat within these three segments include annual grasslands and ruderal areas with alkaline soils.

Delta button-celery (*Eryngium raemosum*) – State Endangered, CRPR 1B.1

Delta button-celery, an annual/perennial herb in the carrot family (*Apiaceae*), is found in riparian scrub in seasonally inundated depressions on clay soils from 3 to 30 meters. This species blooms from June through October and is known from the San Joaquin River delta, floodplains, and adjacent Sierra Nevada foothills including Calaveras, Contra Costa, Merced, San Joaquin, and Stanislaus Counties. Extant CNDDDB occurrences of delta button-celery have been documented within 3 miles of the Altamont and Tracy to Lathrop segments. One possibly extirpated occurrence is located in the vicinity of the Tracy to Lathrop segment near the I-5 crossing of the San Joaquin River (California Department of Fish and Wildlife 2019). Suitable riparian habitat with the potential to support delta button-celery is present in the Altamont and Tracy to Lathrop segments.

Diablo helianthella (*Helianthella castanea*) – CRPR 1B.2

Diablo helianthella is a perennial herb in the sunflower family (*Asteraceae*). This species is found at chaparral/oak woodland ecotone, coastal scrub, riparian woodland, broadleafed upland forest, and annual grassland from 60 to 1,300 meters. Diablo helianthella blooms from March through June and is known from Alameda, Contra Costa, Marin, San Francisco, and San Mateo Counties. CNDDDB occurrences of Diablo helianthella have been documented within 3 miles of the Altamont segment (California Department of Fish and Wildlife 2019). Suitable woodland habitat and annual grassland is present within all three segments.

Diamond-petaled California poppy (*Eschscholzia rhombipetala*) – CRPR 1B.1

Diamond-petaled California poppy is known from the interior foothills of South Coast Ranges from Alameda County to Stanislaus County and the Carrizo Plain in San Luis Obispo. This species is an annual herb in the poppy family (*Papaveraceae*). Diamond-petaled California poppy is found on alkaline clay soils in grassland and chenopod scrub below 3,200 feet. It blooms from March through April. CNDDDB occurrences of Diamond-petaled California poppy have been documented south of the Altamont and Tracy to Lathrop segments (California Department of Fish and Wildlife 2019). Suitable grassland habitat is present in the Altamont and Tracy to Lathrop segments.

Hairless popcorn-flower (*Plagiobothrys glaber*) – CRPR 1A

Hairless popcorn-flower is an annual herb in the borage family (*Boraginaceae*). This species is found in alkaline meadows and seeps, and tidal salt marsh and swamps from 15-180 meters. Hairless popcorn-flower blooms from March through May. It is known from Marin to San Benito counties in coastal valleys. CNDDDB occurrences of hairless popcorn-flower have been documented within 3 miles of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetland habitat is present within the Tri-Valley and Altamont segments.

Heartscale (*Atriplex cordulata* var. *cordulata*) – CRPR 1B.2

Heartscale is an annual herb in the goosefoot family (*Chenopodiaceae*). Heartscale is found in chenopod scrub, meadows and seeps, and annual grassland below 560 meters. This species blooms from April through October and is associated with saline or alkaline soils. It is known from the Western Central Valley and valleys of adjacent foothills. CNDDDB occurrences of heartscale have been documented within 3 miles of all three segments (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetland and annual grassland habitat is present in the study area.

Hispid bird's-beak (*Chloropyron molle* ssp. *hispidum*) – CRPR 1B.1

Hispid bird's-beak, a hemiparasitic annual herb in the broomrape family (*Orobanchaceae*), is found in meadows and seeps, annual grassland, and playas on alkaline soils from 1-155 meters. This species blooms from June through September and is known from Alameda, Fresno, Kern, Merced, Placer, and Solano Counties and the Central Valley. CNDDDB occurrences of hispid bird's-beak have been documented within 3 miles of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetland and annual grassland habitat is present in the both segments.

Hospital canyon larkspur (*Delphinium californicum* ssp. *interius*) – CRPR 1B.2

Hospital canyon larkspur, a perennial herb in the buttercup family (*Ranunculaceae*), occurs in chaparral and cismontane woodland from 195-1,095 meters. This species blooms from April through June and is known from the Inner South Coast Ranges, eastern San Francisco Bay, and Alameda, Contra Costa, Merced, San Benito, Santa Clara, San Joaquin, San Luis Obispo, and Stanislaus counties. CNDDDB occurrences are documented within 3 miles of the study area (California Department of Fish and Wildlife 2019). Suitable oak forest is present within the in the Altamont segment.

Large-flowered fiddleneck (*Amsinckia grandiflora*) – Federally Endangered, State Endangered, CRPR 1B.1

Large-flowered fiddleneck is an annual herb in the borage family (*Boraginaceae*), found in cismontane woodland and annual grassland from 275-550 meters. This species is historically known from the Mount Diablo foothills in Contra Costa, Alameda, and San Joaquin counties. CNDDDB occurrences are documented within 3 miles of the Altamont and Tracy to Lathrop segments (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present in both segments.

Lemmon's jewelflower (*Caulanthus lemmonii*) – CRPR 1B.2

Lemmon's jewelflower is an annual herb in the mustard family (*Brassicaceae*), commonly found in grasslands and pinyon-juniper woodland on dry exposed slopes from 80-1,220 meters. This species blooms from March through May. It is known from the southeast San Francisco Bay Area, south through the South Coast Ranges, and adjacent San Joaquin Valley to Ventura County. CNDDDB occurrences of Lemmon's jewelflower are documented within 3 miles of the Altamont and Tracy to Lathrop segments (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present in both segments.

Lesser saltscale (*Atriplex minuscula*) – CRPR 1B.1

Lesser saltscale is an annual herb in the goosefoot family (*Chenopodiaceae*). Lesser saltscale is known from the Sacramento and San Joaquin Valleys, Butte County, and from Merced to Kern County. This species is an annual herb in the goosefoot family that occurs in chenopod scrub, playas, and annual grassland from 15-200 meters. It blooms from May through October and is associated with sandy, alkaline soils. CNDDDB occurrences of lesser saltscale are documented within 0.5 mile of the Altamont segment (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetlands and annual grassland habitat are present in all three segments.

Livermore tarplant (*Deinandra bacigalupii*) – CRPR 1B.2

Livermore tarplant, an annual herb in the sunflower family (*Asteraceae*), is found in alkaline meadows and seeps from 15-185 meters. This species blooms from June through October. It is endemic to Alameda County. CNDDDB occurrences of Livermore tarplant are documented within 1 mile of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetland habitat is present within both segments.

Long-styled sand-spurrey (*Spergularia macrotheca var. longistyla*) – CRPR 1B.2

Long-styled sand-spurrey is a perennial herb in the pink plant family (*Caryophyllaceae*). It is associated with wetland-riparian communities and found in alkaline meadows and seeps, marshes and swamps below 255 meters. The sand-spurrey blooms from February through May. A California endemic and it is known from Alameda, Contra Costa, Napa, and Solano counties. CNDDDB occurrences have been reported within 1 mile of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetland habitat is present within both segments.

Mt. Diablo fairy-lantern (*Calochortus pulchellus*) – CRPR 1B.2

Mt. Diablo fairy-lantern is a perennial bulbiferous herb in the lily family (*Liliaceae*), associated with chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands from 30 to 840 meters. It blooms from April through June. Mt. Diablo fairy-lantern is known from the scattered locations in Alameda, Contra Costa, and Solano counties. CNDDDB occurrences of Mt. Diablo fairy-lantern are documented within 3 miles of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable annual grassland, riparian woodland, and oak woodland habitat are present in both segments.

Palmate-bracted bird's-beak (*Chloropyron palmatum*) – Federally Endangered, State Endangered, CRPR 1B.1

Palmate-bracted bird's-beak is an annual herb in the broomrape family (*Orobanchaceae*), commonly found in grassland and chenopod scrub from 5 to 155 meters. This species is associated with alkaline soils. It blooms from May through October. Palmate-bracted bird's beak is known from the Livermore Valley and scattered locations in the Central Valley from Colusa to Fresno counties. CNDDDB occurrences of palmate-bracted bird's-beak are documented within 1 mile of the Tri-Valley and Altamont segments (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present within both segments.

Prostrate vernal pool navarretia (*Navarretia prostrata*) – CRPR 1B.1

Prostrate vernal pool navarretia, an annual herb in the phlox family (*Polemoniaceae*), is found in vernal pools, coastal scrub, and alkali grasslands from 15-1,210 meters. This species blooms from April through July. It is known from western San Joaquin Valley, interior South Coast Ranges, central South Coast, Peninsular Ranges and Alameda, Los Angeles, Merced, Monterey, Orange, Riverside, San Bernardino, San Diego, and San Luis Obispo counties. CNDDDB occurrences of prostrate vernal pool navarretia are documented in fields east of Fallon Road within the Tri-Valley segment (California Department of Fish and Wildlife 2019). Suitable vernal pool, alkali seasonal wetland, and saltgrass flats habitat are present within the Tri-Valley and Altamont segments.

Recurved larkspur (*Delphinium recurvatum*) – CRPR 1B.2

Recurved larkspur, a perennial herb in the buttercup family (*Ranunculaceae*), is found in annual grassland, saltbush scrub, and cismontane woodland from 3 to 790 meters. It blooms from March through June and is often associated with alkaline soils. Recurved larkspur is known from Colusa to Kern counties. CNDDDB occurrences of recurved larkspur are documented within 3 miles of the Altamont and Tracy to Lathrop segments (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present within both segments.

Saline clover (*Trifolium hydrophilum*) – CRPR 1B.2

Saline clover is known from the Sacramento Valley and central western California. This species is an annual herb in the legume family (*Fabaceae*), commonly found in tidal salt marsh, annual grasslands, vernal pools, and marshes and swamps below 300 meters. It blooms from June through August and is associated with alkaline soils. CNDDDB occurrences of saline clover are documented within 3 miles of each of the three segments (California Department of Fish and Wildlife 2019). Suitable annual grassland and vernal pool habitat is present within the study area.

Sanford's arrowhead (*Sagittaria sanfordii*) – CRPR 1B.2

Sanford's arrowhead, a perennial rhizomatous herb in the water-plantain family (*Alismataceae*), is found in freshwater marshes, sloughs, canals, and other slow-moving water below 650 meters. This species blooms from May through October. It is known from scattered locations in the Central Valley and Coast Ranges. No known CNDDDB occurrences are located within 3 miles of the study area (California Department of Fish and Wildlife 2019). Suitable freshwater marsh and canal habitat is present from Tracy to Lathrop.

San Joaquin spearscale (*Extriplex joaquinanai*) – CRPR 1B.2

San Joaquin spearscale is an annual herb in the goosefoot family (*Chenopodiaceae*), commonly found in chenopod scrub, meadows and seeps, playas, and annual grassland from 1 to 835 meters. It blooms from April through October and is associated with alkaline soils. San Joaquin spearscale is known from Glenn to Tulare County on the west edge of the Central Valley. CNDDDB occurrences of San Joaquin spearscale are documented within the study area in the Altamont segment (California Department of Fish and Wildlife 2019). Suitable alkaline seasonal wetland and annual grassland habitat are present within all three segments.

Shining navarretia (*Navarretia nigelliformis* subsp. *radians*) – CRPR 1B.2

Shining navarretia is an annual herb in the family phlox (*Polemoniaceae*) family. It is found in mesic areas with heavy clay soils in swales, clay flats, oak woodland, and grassland from 76 to 1,000 meters. This species blooms from April through July. Shining navarretia is known from the interior foothills of south Coast Ranges from Merced to San Luis Obispo county. CNDDDB occurrences of shining navarretia are documented within 2 miles of the Altamont segment (California Department of Fish and Wildlife 2019). Suitable oak woodland and annual grassland habitats are present within the Altamont and Tracy to Lathrop segments.

Showy golden madia (*Madia radiata*) – CRPR 1B.1

Showy golden madia, an annual herb in the sunflower family (*Asteraceae*), is found in oak woodland and annual grassland from 25 to 1,215 meters. This species blooms from March through May. It is known from scattered populations in the interior foothills of the South Coast Ranges. CNDDDB occurrences of showy golden madia are documented approximately 5 miles south of the Altamont and Tracy to Lathrop segments (California Department of Fish and Wildlife 2019). Suitable annual grassland habitat is present within the Altamont and Tracy to Lathrop segments.

Slough thistle (*Cirsium crassicaule*) – CRPR 1B.1

Slough thistle, an annual/perennial herb in the sunflower family (*Asteraceae*), is found in chenopod scrub, riparian scrub, and sloughs in swamps and marshes from 3 to 100 meters. It blooms from May through August. This species is known from the San Joaquin Valley. CNDDDB occurrences of slough thistle are within 2 miles of the Tracy to Lathrop segment (California Department of Fish and Wildlife 2019). Suitable riparian scrub is present in this segment.

Watershield (*Brasenia schreberi*) – CRPR 2B.3

Watershield is known from scattered occurrences in north and central California. It is a perennial rhizomatous herb in the watershield family (*Cabombaceae*) found in freshwater marshes from 30 to 2,200 meters. This species blooms from June through September. Two CNDDDB occurrence of watershield are documented near Stockton more than 5 miles from the study area (California Department of Fish and Wildlife 2019). Suitable freshwater marsh habitat is in the Tracy to Lathrop segment.

Woolly rose-mallow (*Hibiscus lasiocarpus* var. *occidentalis*) – CRPR 1B.2

Woolly rose-mallow is a perennial rhizomatous herb in the mallow family (*Malvaceae*) found in freshwater marshes and swamps along rivers and sloughs below 120 meters. It is often found in riprap on sides of levees. This species blooms from June through September. Woolly rose-mallow is

known from scattered locations in the Central and southern Sacramento Valley and deltaic Central Valley from Butte to San Joaquin county. CNDDDB occurrences of woolly rose-mallow are documented more than 5 miles from the Tracy to Lathrop segment (California Department of Fish and Wildlife 2019). Suitable habitat is present in the Tracy to Lathrop segment.

Wright's trichocornis (*Trichocoronis wrightii* var. *wrightii*) – CRPR 2B.1

Wright's trichocoronis, an annual herb in the sunflower family, is found in floodplains, meadows and seeps, marshes and swamps, riparian forest, and vernal pools from 5 to 435 meters. It blooms from May through September. This species is known from scattered locations in the Central Valley and Southern Coast. One CNDDDB occurrence is documented within the Tracy to Lathrop (California Department of Fish and Wildlife 2019). Suitable riverine habitat is present within this segment.

Special-Status Wildlife Species Accounts

Invertebrates

Longhorn fairy shrimp (Branchinecta longiantenna)

Longhorn fairy shrimp are rare and known from a small number of widely separated populations (U.S. Fish and Wildlife Service 2005). The species is currently found in pools located within a matrix of alkali sink and alkali scrub plant communities in the Carrizo Vernal Pool Region, in a series of sandstone outcrop pools in the Livermore Vernal Pool Region, and from alkaline grassland vernal pools in the San Joaquin Vernal Pool Region. They are adapted to varied vernal pool habitat conditions. Longhorn fairy shrimp in the Livermore Vernal Pool Region are found in small, clear, sandstone rock outcrop vernal pools; sandstone pools are sometimes no larger than 1 m (3.3 ft) in diameter (U.S. Fish and Wildlife Service 2005). The species has potential to occur within sandstone vernal pools in the study area, particularly within the Altamont Hills, Altamont Alignment. There are no records of this species within 3 miles of the study area. The closest records to the study area are located north of the Altamont Alignment (California Department of Fish and Wildlife 2019).

Vernal Pool Fairy Shrimp (Branchinecta lynchi)

Vernal pool fairy shrimp is a small invertebrate that inhabits vernal pools formed by hardpan, claypan, and sandstone rock outcrops. This species ranges across California's Central Valley and south into the Coast Ranges in Santa Barbara County, with some isolated populations in Riverside County. This species has potential to occur within the seasonal wetlands and vernal pools in the study area, particularly within the Altamont Alignment (Altamont segment) and Tri-Valley Alignment (Tri-Valley segment) areas. There are three records of this species within 3 miles of the study area and all records are in Alameda County; one record is located near the Springtown area, one record is near Frick Lake, and one record is near the South Bay Aqueduct Dyer Canal. The nearest records are approximately 0.5-mile from the study area, located north of Altamont Segment, near Altamont and 0.5-mile north of the Tri-Valley segment, north of the Greenville Station (California Department of Fish and Wildlife 2019).

Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)

Valley elderberry longhorn beetle (VELB) is found only in association with its host plant, blue elderberry (*Sambucus nigra* ssp. *caerulea*), which is commonly found in riparian forests and adjacent uplands in the Central Valley and foothills (U.S. Fish and Wildlife Service 2017). Elderberries often grow vegetatively from rhizomes, resulting in shrubs that frequently have common root systems with multiple main stems (Talley et al. 2006) and multiple root crowns. Adult VELBs feed on elderberry foliage and are present from March through early June, during which time the adults mate. Females lay their eggs in bark crevices or at the junction of stem/trunk or leaf petiole/stem. After hatching, the larva burrows into the stem to feed and develop into pupa and adult. After transforming into an adult, it chews an exit hole and emerges. The life cycle of VELB ranges from 1 to 2 years (Barr 1991:4–5).

This species has potential to occur within the elderberry shrubs primarily within riparian habitat throughout the Central Valley portion of study area, particularly along major river systems. VELB can inhabit individual elderberry shrubs, but generally occur within areas where multiple host plants are present. There are no records of this species within 3 miles of the study area (California Department of Fish and Wildlife 2019). Suitable habitat occurs within riparian land cover in the Tracy to Lathrop Alignment near the San Joaquin River and west of the River Islands Station.

Vernal Pool Tadpole Shrimp (*Lepidurus packardii*)

Vernal pool tadpole shrimp is a small invertebrate that inhabits vernal pools, seasonal wetlands, and ephemeral stock ponds formed by hardpan and claypan. This species ranges across California's Central Valley from Shasta County to Merced County, with some isolate populations in Fresno, Alameda, and Tulare Counties. This species has potential to occur within the seasonal wetlands, vernal pools, and ephemeral stock ponds throughout the study area, particularly within in eastern Alameda County and western San Joaquin County, on the Altamont segment between Greenville station east to Mountain House Station. There are no records of this species within 3 miles of the study area (California Department of Fish and Wildlife 2019).

Crotch bumble bee (*Bombus crotchii*)

Formerly common throughout lower two-thirds of California but is now likely absent from most of its historical range (Xerces Society 2018). In California, the species primarily occurs in the Mediterranean region, Pacific Coast, Western Desert, Central Valley, and adjacent foothills through most of southwestern California (Williams et al. 2014). Crotch bumble bee is also found in Baja California and Baja California sur (Williams et al. 2014). Crotch bumble bee inhabits open grassland and scrub habitats. It nests underground and overwinters in soft, undisturbed soil, under leaf litter, or other debris (Xerces Society 2018; Goulson 2010). Crotch bumble bee are generalist foragers and visit a wide variety of flowering plants and forages at open flowers with short corollas. Plant families most commonly associated with Crotch bumble bee include Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, and Hydrophylloideae, Boraginaceae. The flight period for queens is from late February to late October; the flight period for work and males is from late March through September (Xerces Society 2018; Thorp et al. 1983). This species has potential to occur within annual grassland landcover where suitable foraging resources are present. Crotch bumble bee has been reported in the vicinity of City of Tracy; although the record is from 1959, the record is considered extant (California Department of Fish and Wildlife 2020).

Western bumble bee (*Bombus occidentalis occidentalis*)

Formerly found in much of California, the western bumble bee is now much reduced in abundance and mostly restricted to high meadows of the Sierra Nevada ranges and coastal environments (Xerces Society 2018; Williams et al. 2014). The species has been documented from southern British Columbia, Canada, south to multiple western states, including California. Western bumble bees have three basic habitat requirements: undisturbed nesting sites for colonies (e.g., abandoned rodent burrows, underground cavities, log cavities, dead vegetation/leaf litter, abandoned bird nests), availability of nectar and pollen from floral resources, and suitable overwintering sites for the queen (e.g., friable soil and under plant litter and trees). Western bumble bee nests, forages, and overwinters in meadows and grasslands with abundant floral resources and may be found in some natural areas within urban environments (Williams et al. 2014). The bees are generalist foragers but require floral resources throughout the flight period (from early February to late November). The flight period for the western bumble bee in California is from early February to late November, peaking in late June and late September; the flight period for workers and males is from early April to early November (CDFW 2019b). Little is known about the overwintering sites of the western bumble bee (CDFW 2019b); however Hobbs (1968) reported western bumble bee hibernacula that were two inches deep in a “steep west slope of the mound of earth,” and may also be found in aboveground nests such as log cavities. Overwintering sites are likely in friable soil or under plant litter or debris (CDFW 2019b). There are observations of the western bumble bee northeast of Livermore and southwest of Lathrop (CDFW 2020).

Amphibians**California Tiger Salamander (*Ambystoma californiense*)**

California tiger salamander ranges from Yolo County to Tulare County and San Luis Obispo County in the respective Central Valley and Coast Range [both considered the Central Valley Distinct Population Segment (DPS)]. Two other DPS of the species also occur in Sonoma and Santa Barbara Counties. California tiger salamander spends most of the year underground within Botta’s pocket gopher (*Thomomys bottae*) or California ground squirrel (*Otospermophilus beecheyi*) burrows, typically in grasslands. During the late fall to winter, adults migrate to vernal pools and ephemeral stock ponds to breed. As the pools and ponds begin to dry, adults and metamorphs migrate back to the rodent burrows in the surrounding uplands. Proximity to vernal pools is generally the limiting habitat factor; therefore, the species has potential to occur within grasslands and other natural upland land cover that support rodent burrows within 1.3 miles of suitable aquatic breeding habitat.

There are 79 records of this species within 3 miles of the study area, with all but one occurrence in Alameda County (California Department of Fish and Wildlife 2019). Thirty-two records are along the Altamont Alignment; forty-one records are along the Tri-Valley Alignment; one record is on the Tracy to Lathrop Alignment, south of Lathrop; there are two records on the Altamont Segment near Lawrence Livermore National Laboratories and Corral Hollow; there are three records on the Tri-Valley Segment, near the Greenville Station. The nearest extant record is located within the study area, in the Tri-Valley Alignment, Tri-Valley Segment, near Collier Canyon Road and Doolan Road (California Department of Fish and Wildlife 2019). Suitable habitat occurs within grasslands and other undeveloped upland land cover with ground squirrels or gophers within 1.3 miles of suitable aquatic habitat. This species could occur within suitable habitat in the Tri-Valley segment, east of Fallon Road, through the Altamont Alignment to approximately the Mountain House Station.

Foothill yellow-legged frog (Rana boylei)

Foothill yellow-legged frog is found in the coast ranges from the Oregon border south to Los Angeles County, in most of northern California west of Cascade crest, and western Sierra foothills south to Kern County. An isolated population has been reported in the Central Valley. Elevation range extends from sea level to 6370 feet in the Sierra. The species inhabits in or near rocky streams in a variety of habitats, including valley-foothill hardwood and conifer, valley-foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mix chaparral, and wet meadows; basks on exposed rock surfaces near streams. During periods of inactivity (cold weather), the foothill yellow-legged frog seeks cover under rocks in streams or on shore, but near water. The species can be active year round, but may become inactive in colder areas. There are no records of this species within 3 miles of the study area (California Department of Fish and Wildlife 2019). The nearest records for foothill yellow-legged frog are approximately 3.6 miles south of the Altamont Alignment and the West Tracy OMF Alternative near Corral Hollow Creek.

California Red-legged Frog (Rana draytonii)

California red-legged frog inhabits ponds, streams, other aquatic habitats, and adjacent upland land cover. This species has potential to occur within stock ponds, streams, and riparian habitat; as well as migrate through all undeveloped types of land cover within 1.7 miles of suitable aquatic habitat. The presence of bullfrogs (*Rana castesbeiana*) and mosquito fish (*Gambusia affinis*) in aquatic habitat seriously reduce but do not preclude the potential for California red-legged frog to occur at such locations. There are 85 records of this species within 3 miles of the study area located in on the Tri-Valley and Altamont Alignments (California Department of Fish and Wildlife 2019). Thirty-eight records are located just north or intersect with the Tri-Valley Alignment between Tassajara Road to west of the Southfront Road Station Alternative. There are 3 records south of the Greenville Station. Forty records are along the Altamont Alignment with three records near the West Tracy OMF Alternative; these records generally occur south of the alignment in undeveloped annual grassland hills. The nearest extant records are located within the study area, and intersect with the Tri-Valley Alignment near Cayetano Creek and North Livermore Avenue and intersect the Altamont Alignment at Patterson Pass Road (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat on the Tri-Valley and Altamont segments.

Western Spadefoot Toad (Spea hammondi)

Western spadefoot toad is a small toad that lives underground during the dry season and inhabits seasonal wetlands, ephemeral drainages, and vernal pools during the rainy season. This species occurs throughout much of the Central Valley, from Shasta County to Kern County, and along Central and Southern California Coast. This species has the potential to occur within seasonal wetlands, vernal pools, ephemeral drainages, and associated undeveloped upland land cover throughout east Alameda County and the Central Valley portion of the project. There is two record of this species within 3 miles of the study area located east of Livermore in Alameda County. These records are located approximately 2.4 miles south of the study area, immediately southeast of Lawrence Livermore Laboratory near the Tri-Valley segment (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat in the Tri-Valley Alignment, Tri-Valley segment.

Reptiles

California Legless Lizard (Anniella pulchra pulchra)

Silvery legless lizard is a type of alligator (*Elgaria*) lizard that has no legs and inhabits loose soils and sandy habitat. This species occurs in the Coast, Transverse, and Peninsular Ranges within California from Contra Costa County to San Diego County, with sparse records from the San Joaquin Valley. In the study area, this species has potential to occur within habitat with loose soil, sand, thick leaf litter within ephemeral sandy washes and riparian, woodland, and scrub habitat. There are no records of this species within 3 miles of the study area (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat at in the Tri-Valley and Altamont segments.

California glossy snake (Arizona elegans occidentalis)

California glossy snake is common throughout in southern California and less common to the north. The snakes occur in the interior Coast Ranges as far north as Mount Diablo, Contra Costa County. The species is associated with desert habitats, but also occurs in chaparral, sagebrush, valley-foothill hardwood, pine-juniper, and annual grassland below 6,000 ft. Glossy snake spend inactive periods of the day in small mammal burrows and under rock outcrops, as well as under surface objects such as flat rocks and vegetation. They prefer loose soil for burrowing, open sandy areas with scattered brush, but are also found in rock areas (Zeiner et al. 1988- 1990). There are two records of this species within the project study area located in Alameda County, south of the Altamont Alignment (California Department of Fish and Wildlife 2019). Both records are near Livermore and the nearest extant record is located approximately 1.1 mile from the study area, near Patterson Pass Road (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat in the Altamont segment.

Western Pond Turtle (Emys marmorata)

Western pond turtle is an olive-drab turtle that inhabits a wide variety of water bodies, including ponds, marshes, rivers, streams, and irrigation canals. This species can tolerate full-strength seawater for a short period of time, but normally is found in freshwater. Western pond turtle females migrate away from their water bodies into surrounding uplands, where they construct underground nests and lay eggs from April to August. This species has potential to occur within wetlands, stock ponds, ditches, and other aquatic habitat types including adjacent undeveloped upland habitat within 1,150 feet (0.22-mile) from suitable aquatic habitat (Pilliod *et al.* 2013). There are 12 records of this species within 3 miles of the study area; 10 of the records are located on the Tri-Valley Alignment and two records are along the Altamont Alignment. Along the Tri-Valley Alignment, Western pond turtles have been reported near the Lawrence Livermore National Laboratory; in Las Positas Creek and Cottonwood Creek; Tassajara Creek; various drainages of Doolan Canyon; and riparian drainages northeast of Dublin. Along the Altamont Alignment, Western pond turtle have been reported near Brush Peak and along Mountain House Creek (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat along the Tri-Valley, Altamont, and Tracy to Lathrop segments.

San Joaquin coachwhip (Masticophis flagellum ruddocki)

San Joaquin whipsnake is a slender, fast-moving, non-venomous snake that inhabits open, dry areas lacking tree cover. This species ranges from Colusa County in the Sacramento Valley to the Grapevine at the southern end of the San Joaquin Valley from 65 to 3,000 feet above MSL. In the study area, this species has potential to occur within grassland and scrub dominated land cover types without trees in the Central Valley. There are two records of this species within 3 miles of the study area located in the Altamont Hills, west of Tracy, near Patterson Pass and southeast of the Lawrence Livermore National Laboratory, east of Livermore. The nearest extant record intersects with the Altamont Alignment at Patterson Pass Road/North Midway Road (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat in the Altamont segment.

Coast Horned Lizard (Phrynosoma blainvillii)

Coast horned lizard is a flat-bodied lizard with large spiny scales along its back, head, and sides. This species is found in much of California (throughout the Central Valley to the Sierra Nevada foothills up to 4,000 feet above mean sea level (MSL), coastal areas south of San Francisco, and the deserts in southwestern California) and further south into Baja California. This species has potential to occur within a broad variety of habitat types including brush-dominated land cover and coniferous forest, with open areas for exothermic regulation by exposure to sun and relatively friable soils. There are three records of this species within 3 miles of the study area located the Altamont Hills; two records are along the Altamont Alignment near the Altamont Speedway and the junction of I-580 and Corral Hollow Road; and two records south of the Altamont Alignment, in eastern Alameda County/western San Joaquin County, near Patterson Pass Road and the Lawrence Livermore National Laboratory. The nearest extant record is located approximately 0.7 miles northwest from the study area near southwest of Tracy (California Department of Fish and Wildlife 2019). This species could occur within suitable habitat at Altamont segment.

Giant Gartersnake (Thamnophis gigas)

Giant gartersnakes inhabit agricultural wetlands and other waterways, including irrigation and drainage canals, rice fields, marshes, sloughs, ponds, small lakes, and low-gradient streams, as well as adjacent upland areas. They do not occur in larger rivers and wetlands with sand, gravel, or rock substrates. Giant gartersnake requires permanent water during its active season (early spring through mid-fall) to maintain dense populations of food organisms. The snake also requires herbaceous, emergent vegetation for protective cover and foraging habitat and open areas and grassy banks for basking. In addition, higher elevation upland habitats for cover and refuge from floodwaters are needed during the winter when the snake is inactive. Riparian woodland generally is considered unsuitable habitat because of the lack of basking sites, excessive shade, and lack of prey. Giant gartersnakes begin to search for mates soon after emergence from overwintering sites. The breeding season extends from March through May and females give birth to live young from late July to early September (U.S. Fish and Wildlife Service 2015). There are no records of this species within 3 miles of the study area (California Department of Fish and Wildlife 2019). The nearest records for giant gartersnake are approximately 7.8 miles north of the study area near the northwest end of Moss Tract.

Birds

Tricolored Blackbird (Agelaius tricolor)

Tricolored blackbird is a permanent resident of the Central Valley but breeds in a couple scattered coastal locations from Marin County to San Diego. This species nests colonially, with minimum size of 50 pairs, in dense marsh vegetation such as cattails (*Typha* spp.) and bulrush (*Schoenoplectus* spp.). Tricolored blackbird has potential to nest within dense marsh vegetation and blackberry (*Rubus* spp.) associated with streams, rivers, stock ponds, and other aquatic features. There are 18 records of the species within 3 miles of the study area, located in southwest Livermore, Trevarno, near Lawrence Livermore National Laboratory, vicinity of Tracy, northeast of Ulmar, west of Altamont, south of Bethany Reservoir, near Tom Paine Slough, and west of Manteca. Multiple records of this species are located near the Altamont Alignment (California Department of Fish and Wildlife 2019). This species has potential to occur within riparian, wetland, and aquatic land cover along Altamont and Tracy to Lodi segments.

Golden Eagle (Aquila chrysaetos)

Golden eagle is a large raptor that forages over a variety of open habitats, such as grasslands, chaparral, and oak woodlands, and nests on cliffs, escarpments, or in tall trees overlooking open areas. Several observations have documented golden eagle foraging over grasslands in the areas surrounding the project area. This species has potential to forage within grasslands and other open habitats primarily within the southern portion of the project area. There are no records of this species within 3 miles of the study area, but it is known to occur in the Altamont Hills, Los Vaqueros Reservoir north of the study area, the greater Livermore area, and south of the study area near Del Valle Reservoir. This species has been observed foraging in the Central Valley but it is relatively uncommon and not known to commonly nest within the Valley floor. Known nesting activities are known in the regions surrounding Altamont and the eastern portion of the Tri-Valley segments (California Department of Fish and Wildlife 2019).

Grasshopper sparrow (Ammodramus savannarum)

Grasshopper sparrow is a summer resident in California that breeds in the foothills and lowlands west of Cascade-Sierra Nevada from Mendocino and Trinity counties, south to San Diego counties. The sparrow has also been documented in Shasta and Siskiyou counties. The species occurs in dry, dense, dry grasslands and prefers areas with grass variety, tall forbes, and scattered shrubs. The grasshopper sparrow forages on the ground and in low foliated and builds ground nests hidden by clumps of grasses and forbs (California Department of Fish and Wildlife 2008). There is one record of this species within the study area, just north of Springtown (California Department of Fish and Wildlife 2019). This species has potential to occur within the eastern portion of the Tri-Valley Alignment and along the Altamont Alignment.

Short-Eared Owl (Asio flammeus)

Short-eared owl frequents open habitats including fresh and saltwater marshes, lowland meadows and grasslands, and irrigated alfalfa fields from the California Coast to the foothills of the Sierra Nevada Mountain Range, plains of the Cascade Range, and portions of Mono County. Short-eared owl requires tall grasses or tules (=bulrush) for nesting substrate and day roosts. There is one record of occurrence of this species within 3 miles of the study area near Lawrence Livermore National Laboratory, eastern Alameda County (California Department of Fish and Wildlife 2019), but the

species is widespread and is known to generally occur within regions surrounding the study area. Freshwater marsh, wetlands, grassland, and agricultural fields (especially alfalfa) in the greater Livermore area, east to the Central Valley, east of Tracy in and adjacent to the study area provide suitable nesting and foraging habitat for short-eared owl. Such suitable habitat occurs in or near the eastern portion of the Tri-Valley segment, Altamont Alignment, and the middle portion of the Tracy to Lathrop Alignment.

Burrowing Owl (Athene cunicularia)

Burrowing owl is a small owl that lives in burrows created by ground squirrels and pocket gophers. This species forages over grassland and open salt marsh vegetation for small mammals, insects, and lizards and is most active at dawn and dusk. This species ranges throughout lowland portions of California, but is absent from the southern coastal areas of the state. There are 99 records of burrowing owl occurrences within 3 miles of the study area located in southwestern Contra Costa County northeast of Dougherty (2 records), Dublin, Livermore, Springtown, Tracy, and Altamont Pass in Alameda County (53 records); along the Southern Pacific Railroad, Patterson Pass, southwest of Tracy, east of Banta, and around Lathrop in San Joaquin County (44 records). Multiple records occur within the study area, particularly around the Livermore and Tracy areas (California Department of Fish and Wildlife 2019). Grassland, pastures, scrub, freshwater marsh, and wetlands with populations of California ground squirrels or Botta's pocket gophers provide suitable foraging and nesting habitat. Other open habitats (e.g., agricultural fields) provide suitable foraging habitat. Such land cover in and adjacent to the study area provides suitable habitat for burrowing owl along the Tri-Valley, Altamont, and Tracy to Lathrop segments.

Swainson's Hawk (Buteo swainsoni)

Swainson's hawk forage in grasslands, grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Vineyards, orchards, rice, and cotton crops are generally unsuitable for foraging because of the density of the vegetation (California Department of Fish and Game 1993:41). The majority of Swainson's hawk individuals winter in South America, although some winter in the United States. Swainson's hawk arrives in California in early March to establish nesting territories and breed (California Department of Fish and Game 1994). They usually nest in large, mature trees. Most nest sites (87%) in the Central Valley are found in riparian habitats (Estep 1989:35), primarily because trees are more available there. Swainson's hawk also nest in mature roadside trees and in isolated trees in agricultural fields or pastures. The breeding season is from March through August (Estep 1989:12, 35). Swainson's hawk has nested routinely in the South San Francisco Bay area (in Coyote Valley in Santa Clara County) since 2013.

There are 49 records of Swainson's hawk within 3 miles of the study area and multiple records are located within and immediately adjacent to the study area. One observation is in eastern Alameda County, east of Livermore and southwest of Ulmar. All other records are in San Joaquin County near Tracy, southeast of Banta, southeast of Mossdale, around Lathrop, southwest of Manteca, along the San Joaquin River, Tom Paine Slough, and Paradise Cut (California Department of Fish and Wildlife 2019). The study area and adjacent areas contain numerous suitable nest trees for Swainson's hawks throughout all project and program segments. Grazed or mowed grasslands, low height field and row crops (especially alfalfa) and ruderal areas provide suitable foraging habitat for Swainson's hawks throughout the study area within 10 miles of each active nest. The study area and adjacent areas contain numerous suitable nest trees for Swainson's hawk in the Tracy to Lathrop segment.

Northern Harrier (Circus cyaneus)

Northern harrier is a medium sized raptor that forages primarily for small mammals over open habitats, including grassland, tidal salt marsh, and agricultural fields. This species nests on the ground within grassland habitat. The range of northern harrier encompasses all of lowland California, but this species has been observed at high elevations. Northern harrier are known to forage over grasslands, seasonal wetlands, and agricultural fields within the study area. Although there is only one record of northern harrier within 3 miles of the study area located near Patterson Pass Road in San Joaquin County (approximately 1.5 miles north of the Mountain House Station on the Altamont Alignment) (California Department of Fish and Wildlife 2019), the species is known to occur throughout the San Francisco Bay area, the greater Livermore area, and the Central Valley. Grasslands, marshes, pastures, wetlands, and agricultural fields provide suitable foraging habitat for this species throughout the study area. The study area and adjacent areas contain numerous suitable nesting substrate for northern harrier throughout all project and program segments in undeveloped (excluding agriculture) areas.

White-Tailed Kite (Elanus leucurus)

White-tailed kite is a small raptor that forages primarily for small mammals over open habitats, including grassland, tidal salt marsh, and agricultural fields. The range of this species includes lowland areas west of the Sierra Nevada from the northern extent of the Sacramento Valley south, including coastal foothills to western San Diego County. This species nests within trees suitable of supporting its nest that offer at least partial shade within the canopy. White-tailed kite individuals were observed foraging over the grasslands and agricultural fields within the surveyed portions of study area (Altamont Alignment, near Mountain House Station). There are three records of this species within 3 miles of the study area, located in Livermore (2 records) and Camp Parks (1 record) in Alameda County.

The species is known to occur throughout the East Bay area, the greater Livermore area, and the Central Valley. The nearest records of the species are located south of the Tri-Valley Alignment, near the Lawrence Livermore National Laboratory; white-tailed kite was also observed foraging near I-580 and Patterson Pass Road (California Department of Fish and Wildlife 2019). Grasslands, marshes, pastures, wetlands, and agricultural fields provide suitable foraging habitat for this species throughout the study area. The study area and adjacent areas contain numerous suitable nest trees for white-tailed kite along the Tri-Valley, Altamont, and Tracy to Lathrop segments.

Loggerhead Shrike (Lanius ludovicianus)

Loggerhead shrikes occur in open habitats with scattered trees, shrubs, posts, fences, utility lines, or other types of perches. Nests are built in trees or shrubs with dense foliage and are usually hidden well. Loggerhead shrikes search for prey from perches and frequently impale their prey on thorns, sharp twigs, or barbed-wire. The nesting period for loggerhead shrikes is March through June (Zeiner et al. 1990a:546).

There are three record of loggerhead shrike nests within 3 miles of the study area; two records are in eastern Alameda County near Lawrence Livermore National Laboratory and Mountain House Creek, and another record is near Lathrop (California Department of Fish and Wildlife 2019), but this species is also known to occur in the East Bay Area and throughout much of the Central Valley. Open habitat, such as freshwater marsh, wetlands, grassland, open woodland, and agricultural fields provide suitable foraging habitat for loggerhead shrike, and trees and shrubs near foraging habitat provide suitable nesting substrate for the species. Such land cover is located in and adjacent to the study area along the Tri-Valley, Altamont, and Tracy to Lathrop segments.

Song Sparrow (Melospiza melodia) – Modesto Population

The Modesto Population of song sparrow is a California endemic found in the north-central portion of the Central Valley (from Glenn and Butte Counties to the northern extent of Stanislaus County), with the highest densities occurring in the Butte Sink area of the Sacramento Valley and in the Sacramento-San Joaquin River Delta (Shuford and Gardali 2008). This population of song sparrow is strongly associated with woody riparian habitat (Point Blue 2016). There are two records of this species within 3 miles of the study area, near Banta and along the San Joaquin River, northwest of Lathrop in San Joaquin County (California Department of Fish and Wildlife 2019). Riparian woodland provides suitable nesting and foraging substrate for the species within San Joaquin County. Such land cover is located in and adjacent to the study area along the Tracy to Lathrop Alignment.

Yellow-Headed Blackbird (Xanthocephalus xanthocephalus)

Yellow-headed blackbird is a primarily a migrant and a summer resident in California. This species nests with red-winged blackbirds in dense marsh vegetation such as cattails (*Typha* spp.) and bulrush (*Schoenoplectus* spp.). Yellow-headed blackbird has potential to nest within dense marsh vegetation associated with streams, rivers, stock ponds, and other aquatic features. This species is known to nest in the Central Valley, northeastern California, the east side of the Sierra Nevada and near Lake Tahoe, and in isolated populations in San Bernardino and Riverside Counties. There is one record of the species within 3 miles of the study area, located Lathrop in San Joaquin County approximately 0.45-mile west of the Tracy to Lathrop Alignment near Lathrop (California Department of Fish and Wildlife 2019). This species has potential to occur within riparian, wetland, and aquatic land cover in the Central Valley along Tracy to Lathrop segment.

Mammals

Pallid Bat (Antrozous pallidus)

Pallid bat is found throughout most of California at low to middle elevations (6,000 feet). Pallid bats are found in a variety of habitats, including desert, brushy terrain, coniferous forest, and non-coniferous woodlands. In central and northern California, the species is associated with oak, ponderosa pine, redwood, and giant sequoia land cover. Pallid bats forage among vegetation and above the ground surface, eating large ground-dwelling arthropods and large moths. Daytime roost sites include rock outcrops, mines, caves, hollow trees, buildings, and bridges. Night roosts are commonly under bridges but are also in caves and mines (Brown and Pierson 1996). Hibernation may occur during late November through March. Pallid bats breed from late October through February (Zeiner et al. 1990b:70), and one or two young are born in May or June (Brown and Pierson 1996).

There is one record of occurrence for pallid bat within three miles of the study area near Santa Rita in Alameda County (California Department of Fish and Wildlife 2019). There are two other records southeast of Livermore near Arroyo Mocho and Corral Hollow, but these records are outside of the study area. Woodland, riparian woodland, caves, and anthropogenic structures (e.g. bridges, buildings) with stable thermal regimes in the study area offer suitable roosting habitat for this species. Such habitat is located along the Tri-Valley, Altamont, and Tract to Lathrop segments.

Townsend's Big-Eared Bat (Corynorhinus townsendii)

Townsend's big-eared bat was proposed for listing under CESA as threatened or endangered on June 26, 2013 and is therefore treated as a state listed species during the review period. This species is currently listed as a species of special concern and by CDFW and also listed as a species with high regional priority by Western Bat Working Group (Western Bat Working Group 2018). Townsend's big-eared bat occurs throughout California in a wide variety of habitats ranging from sea level to 10,800 feet above MSL from Del Norte County to Santa Barbara County. This species is typically associated with coniferous forests, mixed meso-phytic forests, deserts, native prairies, riparian communities, active agricultural areas, and coastal habitat types. Species distribution is also strongly correlated with availability of caves or cave-like roosting habitat. Townsend's big-eared bats have been observed utilizing buildings, bridges, rock crevices, and hollow trees as roost sites (Western Bat Working Group 2018). Due to relatively cool climate of the San Francisco Bay area, suitable roosts with stable thermal regimes are expected to be found under or within bridges or other man-made structures in this region of the study area. Townsend's big-eared bats are highly sensitive to disturbance and therefore are highly unlikely to roost within suitable habitat along highly developed portions of the study area. There are no records of the species within three miles of the study area (California Department of Fish and Wildlife 2019). The nearest record to the study area are located in Alameda County, south of Livermore and near the Fenestra Winery and there is another record in San Joaquin County, southwest of I-580 near Corral Hollow Road (California Department of Fish and Wildlife 2019). This species could occur within woodland, riparian, scrub, and agricultural land cover and anthropogenic structures with stable thermal regimes in the study area offer suitable roosting habitat for this species. Suitable habitat is located along the Tri-Valley, Altamont, and Tracy to Lathrop Alignments.

Western Mastiff Bat (Eumops perotis californicus)

Western mastiff bat occupies a wide variety of habitat types and roosts and breeds in deep, narrow rock crevices, and possibly crevices in trees, buildings, and tunnels. This species is known to occur from central Mexico to across the southwestern U.S. from California to Texas; however, the individuals have been found near the Oregon border. Western mastiff bat has potential to forage in open land cover near suitable roost and breeding habitat in the study area. There are no records of this species within three miles of the study area (California Department of Fish and Wildlife 2019). The closest record to the study area is located in San Joaquin County near Castle Rock, south southwest of Tracy. Hoary bat has the potential to occur within grassland, woodland, riparian, scrub, and anthropogenic structures with stable thermal regimes in the study area offer suitable roosting habitat for this species. Such habitat is located along the Altamont and Tracy to Lathrop Alignments.

Hoary Bat (Lasiurus cinereus)

Hoary bat's range covers all of California. This species roosts in trees that are typically within forests or various types. Hoary bat has potential to occur within the woodland and riparian woodland land cover study area. There are no records of this species within three miles of the study area (California Department of Fish and Wildlife 2019). The closest report occurrence is south of Livermore, northwest of Lake Del Valle in Alameda County (California Department of Fish and Wildlife 2019). Hoary bat has the potential to occur within woodland and riparian land cover in the study area, where woodland and riparian habitat occur.

Riparian Brush Rabbit (Sylvilagus bachmani riparius)

Riparian brush rabbit require riparian habitat with a relatively dense understory. The species is only known to occur at Caswell Memorial State Park on the Stanislaus River in southern San Joaquin County, and is historically known from Stanislaus County to the Sacramento-San Joaquin Delta. This species has potential to occur within the study area in riparian habitat along the Stanislaus River, San Joaquin River, and similar habitat from central San Joaquin County to northern Stanislaus County. There are eleven records of this species all located along the San Joaquin River and Paradise Cut, northeast of Banta and southwest of Lathrop. Multiple records of the species intersect with the Tracy to Lathrop Alignment, particularly near the River Islands Station (California Department of Fish and Wildlife 2019). Suitable habitat is located along the Tracy to Lathrop segment.

American Badger (Taxidea taxus)

American badgers occur in a wide variety of open, arid habitats but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub (Stephenson and Calcarone 1999). In California, American badgers occur throughout the state except in humid coastal forests of northwestern California in Del Norte and Humboldt Counties (Williams 1986). The primary factor that determines whether habitat is suitable for American badger is the presence of a sufficient prey-base, typically consisting of California ground squirrel and/or pocket gopher. American badger has potential to occur within the open areas of grassland habitat throughout the project area. There are 14 records of this species within three miles of the study area; 1 record is in southwestern Contra Costa County near Camp Parks along the Tri-Valley Alignment; 10 records are in Alameda County near Lawrence Livermore National Laboratory, near Patterson Pass Road, west southwest of Tracy, along Altamont Pass Road, and southwest of the California Aqueduct; and there are 3 records in San Joaquin County southeast of Midway and near Tracy (California Department of Fish and Wildlife 2019). Suitable habitat is located in undeveloped open areas along the Tri-Valley, Altamont Alignments.

San Joaquin Kit Fox (Vulpes macrotis mutica)

San Joaquin kit foxes occur in a variety of land cover types, including grasslands, scrublands, vernal pool areas, alkali meadows and playas, and an agricultural matrix of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands (U.S. Fish and Wildlife Service 1998). San Joaquin foxes occur in some areas of suitable habitat on the floor of the San Joaquin Valley and in the surrounding foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains from Kern County north to Contra Costa, Alameda, and San Joaquin Counties (U.S. Fish and Wildlife Service 1998). San Joaquin kit fox has potential to occur within the grassland, wetland (including vernal pool and alkali wetlands), agricultural land in the western portion of the Central Valley region and Altamont hills. There are 19 records of this species within three miles of the study area, primarily in eastern Alameda County in the Altamont Hills, and in San Joaquin County, near Lawrence Livermore National Laboratories, Tracy, east of Midway, between I-580 and the California Aqueduct, and near Patterson Run (California Department of Fish and Wildlife 2019). Suitable habitat is located along Altamont Alignment, generally east of Livermore and west of Tracy.

Mammal***Mountain Lion (Puma concolor)***

The Central Coast North evolutionary significant unit (ESU) subpopulation of mountain lion includes mountain lions in the Santa Cruz Mountains and the East Bay. Mountain lions require large areas of relatively undisturbed habitats with adequate connectivity to allow for dispersal, movement, to search for prey items. Home ranges are in heterogeneous habitats and consist of pine forests, riparian and oak woodlands, streams, chaparral, and grasslands; they are also known to occur in desert habitat (Center for Biological Diversity and the Mountain Lion Foundation 2019). Riparian habitat tends to be preferred over grassland habitat and human-disturbed areas during the day; however, nocturnal movement patterns show that mountain lions utilize a broad range of habitats. Although mountain lions generally avoid areas with human disturbance, they will use moderately disturbed areas as they travel and hunt, particularly if the developed area borders open spaces (Wilmers et al. 2013, Wang et al. 2015, Gray et al. 2016; Center for Biological Diversity and the Mountain Lion Foundation 2019). Home range size varies by sex, season, and geographic area. Large ungulates, especially deer, are the preferred prey; however, mountain lions will eat other prey items, including wild hog, coyotes, bobcats, badgers, rabbits, turkeys, and livestock (Currier 1983, Iriarte et al. 1990). Mountain lions can reproduce at any time of year and timing of reproduction may be affected by prey abundance or climate; in California, kitten births are most common in spring (Zeiner et al. 1990b). Dens are located in rocky terrain or in dense vegetation (Young and Goldman 1946). Caves and other natural cavities and thickets in brush and forest provide cover. The Bay Area Puma Project (2020) reports sightings of mountain lion near the Dublin, Pleasanton, and south Livermore area.

Fish***Delta Smelt (Hypomesus transpacificus)***

The United States Fish & Wildlife Service (USFWS) listed Delta Smelt as threatened on March 5, 1993 (58 FR 12854), and designated critical habitat on December 19, 1994 (59 FR 65256). Delta Smelt are endemic to the San Francisco Estuary, found nowhere else in the world. Overall, the Delta Smelt life cycle is completed in the brackish and tidal freshwater reaches of the upper San Francisco Estuary. However, salinity requirements vary by life stage (Bennett 2005). Apart from spawning and egg-embryo development, the distribution and movements of all life stages are influenced by transport

processes associated with water flows in the estuary, which also affect the quality and location of suitable open water habitat (Dege and Brown 2004; Feyrer et al. 2007; Nobriga et al. 2008).

Adult Delta Smelt move to spawning habitats (mostly upstream) during the late winter and spring months (Grimaldo et al. 2009), with most spawning occurring during April through mid-May (Moyle 2002). Spawning usually commences when water temperatures reach 12 °C, which typically occurs in early March. Although hatching has been detected from late February to June, peak hatching occurs in April. The distribution of Delta Smelt larvae initially follows that of the spawners because larvae emerge near where they were spawned. During high outflow periods, smaller larvae are distributed more widely and mostly downstream of the Delta (Hobbs et al. 2007, Dege and Brown 2004, Sommer and Mejia 2013). In drier years, larval delta smelt are mostly distributed in North Delta and lower Sacramento River.

Around mid-June, when water temperatures reach approximately 20 °C, juvenile smelt shift their distribution from freshwater to the low salinity zone, downstream of the Delta (Nobriga et al. 2008; Sommer and Mejia 2013). A small subset of the juvenile smelt population will remain in the Cache Slough Complex through the summer and fall (Sommer et al. 2011; Sommer and Mejia 2013)

By fall, the centroid of Delta Smelt distribution is tightly coupled with X2¹ (Sommer et al. 2011; Sommer and Mejia 2013). As X2 moves upstream, so does the centroid of distribution and vice versa for when X2 is downstream. In drier years, when X2 is located above 81 km, sub-adult Delta Smelt are found near Decker Island on the Lower Sacramento River (Feyrer et al. 2007; Feyrer et al. 2011).

There are two records of Delta Smelt within the project vicinity. One record is near Clifton Court Forebay in Contra Costa County and another record is in the San Joaquin River upstream of the Calaveras River, San Joaquin County. There are no occurrences within 2 miles of the project alignment. Delta smelt critical habitat occurs in Paradise Cut. Suitable habitat is located along the Tracey to Lathrop Alignment.

River Lamprey (Lampetra ayresi)

River lamprey is designated as a California Species of Special Concern. River lamprey is an anadromous species that occurs from near Juneau, Alaska, to San Francisco Bay, California (Moyle 2002). In California, river lamprey is found in the Central Valley, Napa River, Sonoma Creek, Alameda Creek, Salmon Creek, and in tributaries of the lower Russian River. In the Central Valley, river lamprey is found in small numbers in the lower Sacramento and San Joaquin River drainages, including the Stanislaus and Tuolumne Rivers. They may exist in other tributaries of these rivers, but are often overlooked and have been the subject of few targeted sampling efforts (Moyle 2002). Population trends are unknown in California, although declines are thought to have occurred concurrently with freshwater habitat degradation (Moyle 2002).

River lamprey individuals outmigrating from Sacramento and San Joaquin River watersheds pass through the Sacramento–San Joaquin River Delta (Delta) on their way to the Pacific Ocean, and emigrating adults pass through the Delta on their way upstream towards spawning grounds. Outmigrating lamprey macropthalmia (juveniles) in the final stages of metamorphosis to adults hold just upstream of salt water until late spring.

River lamprey are anadromous, but spend most of their lives in fresh water. Adults spend only 3 to 4 months in the ocean, migrating to freshwater in fall in search of suitable spawning sites, often

¹ Position of the 2 PSU Isohaline from the Golden Gate Bridge (Jassby et al. 1995)

returning to their natal streams (Moyle et al. 1995; Moyle 2002). Exact spawning locations are not known, although spawning habitat requirements are thought to be similar to those of salmonids. Spawning occurs from February through June in gravelly riffles in which individuals dig saucer-shaped depressions (Moyle 2002). Adults die after spawning.

The habitat requirements of river lamprey are not well documented. It is thought that adults need clean, gravelly riffles in permanent streams to spawn successfully. These requirements are thought to be similar to those of salmonids. Ammocoetes live in silty backwaters and eddies with muddy or sandy substrate into which they burrow (Moyle et al. 1995). Ammocoetes require water temperatures lower than 25°C (77°F) (Moyle et al. 1995).

River lamprey could occur in Paradise Cut and San Joaquin River. They would use the San Joaquin River for spawning and ammocoete rearing. There are no CNDDDB records. Suitable habitat is located along the Tracey to Lathrop Alignment.

Green Sturgeon (Acipenser medirostris)

The Southern distinct population segment (DPS) of green sturgeon was listed as federally threatened on April 7, 2006 (71 FR 17757). Included in the listing are the spawning population in the Sacramento River and fish living in the Sacramento River, the Sacramento–San Joaquin River Delta (Delta), and the San Francisco Estuary. NMFS made a final critical habitat designation for the Southern DPS on October 9, 2009 (74 FR 52300). Designated areas in California include the Sacramento River, lower Feather River, and lower Yuba River; the Delta; and Suisun, San Pablo, and San Francisco Bays (National Marine Fisheries Service 2012).

No juvenile green sturgeon have been documented in the San Joaquin River. Moyle (2002) suggested that reproduction may have taken place in the San Joaquin River because adults have been captured at Santa Clara Shoal and Brannan Island. However, given the low flow conditions and resulting water quality that exist in the San Joaquin River today, they are probably extirpated (Israel and Klimley 2008).

Green sturgeon are anadromous and pass through the San Francisco Bay to the ocean at about 1 to 3 years of age. In the ocean they primarily move northward and commingle with other sturgeon populations, spending much of their lives in the ocean or in Oregon and Washington estuaries (California Department of Fish and Game 2002; Kelly et al. 2007).

Adult green sturgeon begin their upstream spawning migrations into the San Francisco Bay in March, reach Knights Landing during April, and spawn between March and July in the Sacramento River (Heublein et al. 2009). Kelly et al. (2007) reported that green sturgeon enter the San Francisco Estuary during the spring and remain until fall. Juvenile and adult green sturgeon enter coastal marine waters after making significant long-distance migrations with distinct directionality thought to be related to resource availability.

In the project area, green sturgeon critical habitat is designated in Paradise Cut and the San Joaquin River where the track would cross over the river between River Islands Station and the North Lathrop Station. As discussed above, it is unlikely green sturgeon occur in the project area. There are no CNDDDB records for green sturgeon. Suitable habitat is located along the Tracey to Lathrop Alignment.

Central Valley Steelhead (*Oncorhynchus mykiss*)

The Central Valley steelhead DPS was listed as a threatened species under the federal Endangered Species Act (ESA) on March 19, 1998. This DPS includes all naturally spawned populations of steelhead in the Sacramento and San Joaquin Rivers and their tributaries, including the San Francisco Bay/Sacramento–San Joaquin River Delta (Bay-Delta) (63 FR 13347).

Information on the status and geographic distribution of Central Valley steelhead is extremely limited (The Nature Conservancy et al. 2008). Adult steelhead typically migrate upstream and spawn during the winter months when river flows are high and water clarity is low. Unlike Chinook salmon, adult steelhead do not necessarily die after spawning and can return to coastal waters. Adult Central Valley steelhead migrating into the San Joaquin River and its tributaries use the central, southern, and eastern edge of the Delta.

Central Valley steelhead generally leave the ocean and migrate upstream from June through March (Busby et al. 1996; Hallock et al. 1957; National Marine Fisheries Service 2009), and spawn from October through April (Newton and Stafford 2011; U.S. Bureau of Reclamation 2008). Peak spawning typically occurs from January through March in small streams and tributaries where cool, well-oxygenated water is available year-round (Hallock et al. 1961; McEwan and Jackson 1996). Timing of upstream migration corresponds with higher flow events (e.g., freshets), associated lower water temperatures, and increased turbidity.

Some juvenile steelhead may use brackish tidal marsh areas, nontidal marshes, and other shallow water areas in the Delta and estuary as rearing areas for short periods prior to their emigration to the ocean.

There are four CNNDDB records for steelhead within the project vicinity and one record within 2 miles. The species has been reported in the Lower Calaveras River below New Hogan Dam, Lower San Joaquin River, south of the Clifton Court Forebay, and in the Sacramento-San Joaquin River Delta (California Department of Fish and Wildlife 2018). Central Valley steelhead use the San Joaquin River and its tributaries for migration and spawning. Critical habitat for Central Valley steelhead is located in Paradise Cut and the San Joaquin River. Suitable habitat is located along the Tracey to Lathrop Alignment.

Central Valley Chinook Salmon (Fall-Run) (*Oncorhynchus tshawytscha*)

The Central Valley fall-run Chinook salmon evolutionary significant unit (ESU) includes all naturally spawned populations of fall-run Chinook salmon in the Sacramento and San Joaquin River basins and their tributaries east of Carquinez Strait, California (64 Federal Register [FR] 50394). On April 15, 2004, the Central Valley fall-run Chinook salmon ESU was identified by NMFS as a Species of Concern (69 FR 19975) and are also a California Species of Concern.

Central Valley fall-run Chinook salmon historically spawned in all major tributaries, as well as the mainstem of the Sacramento and San Joaquin Rivers. A large percentage of fall-run Chinook spawning areas in the Sacramento and San Joaquin Rivers historically inhabited the lower gradient reaches of the rivers downstream of sites now occupied by major dams, such as Shasta and Friant Dams. Long-term trends in adult fall-run Chinook salmon escapement indicate that abundance in the Sacramento River has been consistently higher than abundance in the San Joaquin River. Adult escapement in the San Joaquin River appears to be cyclical and may be related to hydrology during the juvenile rearing and migration period, among other factors (San Joaquin River Group Authority 2010; California Department of Fish and Game 2008).

Central Valley fall-run Chinook salmon exhibit an ocean-type life history. Ocean-type Chinook salmon spend significantly less time in fresh water, spawning soon after entering fresh water as adults and migrating to the ocean as juvenile fry or parr in their first year. Adult fall-run Chinook salmon migrate through the Delta and into Central Valley rivers from June through December and spawn from September through December. Peak spawning activity usually occurs in October and November. Chinook salmon spawn in clean, loose gravel in swift, relatively shallow riffles, or along the margins of deeper river reaches where suitable water temperatures, depths, and velocities favor redd construction and oxygenation of incubating eggs. Chinook salmon spawning typically occurs in gravel beds located at the tails or downstream ends of holding pools (U.S. Fish and Wildlife Service 1995).

Fall-run Chinook salmon are present in the San Joaquin River. Suitable habitat is located along the Tracey to Lathrop Alignment.

Central Valley Spring-Run Chinook Salmon (Oncorhynchus tshawytscha)

Central Valley spring-run Chinook salmon was designated as federally threatened on September 16, 1999 (64 FR 50394) and state threatened in 1999.

Adult Central Valley spring-run Chinook salmon leave the ocean to begin their upstream migration in late January and early February (CDFG 1998) and enter the Sacramento River between March and September, primarily in May and June (Yoshiyama et al. 1998, Moyle 2002) (Table 7). Lindley et al. (2004) indicates adult Central Valley spring-run Chinook salmon enter native tributaries from the Sacramento River primarily between mid-April and mid-June. Typically, spring-run Chinook salmon utilize mid- to high-elevation streams that provide appropriate temperatures and sufficient flow, cover, and pool depth to allow over-summering while conserving energy and allowing their gonadal tissue to mature (Yoshiyama et al. 1998). Habitat requirements are the same as discussed above under fall-run Chinook salmon.

Spring-run Chinook salmon spawning occurs between September and October depending on water temperatures. Spring-run Chinook salmon fry emerge from the gravel from November to March (Moyle 2002) and the emigration timing is highly variable, as they may migrate downstream as young-of-the-year or as juveniles or yearlings.

An experimental population of spring-run Chinook salmon has been designated under Section 10(j) of the ESA in the San Joaquin River from Friant Dam downstream to its confluence with the Merced River (78 FR 79622), and spring-run Chinook salmon are currently being reintroduced to the San Joaquin River. A conservation stock of spring-run Chinook is being developed at the San Joaquin River Conservation and Research Facility at Friant Dam and individuals have been released annually since 2014 to the lower San Joaquin River (United States Fish and Wildlife Service 2017). In 2016, the San Joaquin River Restoration Program released 57,320 Feather River Hatchery and 47,560 San Joaquin River Conservation and Research Facility spring-run Chinook salmon juveniles to the San Joaquin River just upstream of the confluence with the Merced River (National Marine Fisheries Service 2017). The first year in which the fish released in 2014 may have returned was 2016. No fish have been detected returning to the San Joaquin River to spawn from the initial 2014 release (National Marine Fisheries Service 2017).

In addition, observations in the last decade suggest that spring-running populations may currently occur in the Stanislaus and Tuolumne rivers, tributary rivers to the mainstream San Joaquin River. Although the exact number of spring-running Chinook salmon in the San Joaquin basin is unknown, juvenile and adult spring-run use the portion of the lower San Joaquin River within the Delta as a

migratory pathway (National Marine Fisheries Service 2017). Suitable habitat is located along the Tracey to Lathrop Alignment.

Longfin Smelt (Spirinchus thaleichthys)

Longfin smelt is a small, euryhaline, anadromous, and semelparous fish with a life cycle of approximately 2 years (Rosenfield 2010). Young longfin smelt occur from the estuary's low-salinity zone (LSZ), where brackish and fresh waters meet, seaward and into the coastal ocean. The San Francisco Bay/Sacramento–San Joaquin River Delta (Bay-Delta) population is the southernmost and largest spawning population in California. Longfin smelt have been historically sampled at numerous locations in the Sacramento–San Joaquin River Delta (Delta). The population has shown extremely low abundance in recent years as part of the pelagic organism decline (POD) (Sommer et al. 2007; Baxter et al. 2010). On June 26, 2009, the California Fish and Game Commission ruled to list the status of longfin smelt as threatened under the CESA.

Longfin smelt generally spawn at age 2 in fresh water in the Delta from December to April (Moyle 2002; Rosenfield and Baxter 2007), with some individuals possibly spawning at age 1 and some at age 3 (reviewed by California Department of Fish and Game 2009). Spawning occurs at temperatures that range from 7.0 to 14.5°C, with larvae hatching in 40 days at 7°C (Moyle 2002). Movement patterns based on catches in CDFW fishery sampling suggest that longfin smelt actively avoid water temperatures greater than 22°C (72°F) (California Department of Fish and Game 2009). Longfin smelt do not occupy areas with temperatures greater than 22°C (72°F) in combination with salinities greater than 26 parts per thousand (ppt). These conditions occur between August and September almost annually in South San Francisco Bay and periodically in shallower portions of San Pablo Bay. Larval longfin smelt have been found concentrated off the mouth of Coyote Creek, indicating that spawning can take place in tributaries of South San Francisco Bay when runoff and Delta outflow are high, such as conditions that occurred in 1982 and 1983 (Baxter 1999). Longfin smelt in their second year of life (age 1) are typically distributed from the west Delta through South San Francisco Bay from January through March. Their distribution then moves toward the central San Francisco Bay, such that by August and September few, if any, are collected outside of central San Francisco Bay (Baxter 1999).

There are three CNDDDB records within the project vicinity – one record is near the Clifton Court Forebay in Contra Costa County and two records are along the San Joaquin River in San Joaquin County. The San Joaquin River record is the most upstream San Joaquin River occurrence for longfin smelt and is from 1996 and 2012. Suitable habitat is located along the Tracey to Lathrop Alignment.

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Appendix M-3
**Special-Status Plant Species Known or with Potential to
Occur in the Study Area**

Appendix M-3

Special-Status Plant Species Known or with Potential to Occur in the Study Area

Table M-3-1. Special-Status Plant Species Known or with Potential to Occur in the Study Area

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Alkali milk vetch <i>Astragalus tener</i> var. <i>tener</i>	-/-/1B.2	Southern Sacramento Valley, northern San Joaquin Valley, east San Francisco Bay Area	Playas, on adobe clay in valley and foothill grassland, vernal pools on alkaline soils; 1-60 meters; blooms Mar-Jun	Present	Suitable alkaline seasonal wetland and alkali grassland present in all three segments.
Bent-flowered fiddleneck <i>Amsinckia lunaris</i>	-/-/1B.2	Inner North Coast Ranges, San Francisco Bay Area, west-central Great Valley	Coastal bluff scrub, valley and foothill grasslands, cismontane woodlands; 3-500 meters; blooms Mar-Jun	Present	Suitable annual grassland and oak woodland present in all three segments.
Big-scale balsamroot <i>Balsamorhiza macrolepis</i>	-/-/1B.2	Scattered occurrences in the Coast Ranges and Sierra Nevada Foothills	Sometimes on serpentine soils in chaparral, cismontane woodland, valley and foothill grassland; 90-1,555 meters; blooms Mar-Jun	Present	Suitable annual grassland present in the Tri-Valley and Altamont segments. Altamont occurrence believed to be extirpated.
Big tarplant <i>Blepharizonia plumosa</i>	-/-/1B.1	San Francisco Bay area, with occurrences in Alameda, Contra Costa, San Joaquin*, Stanislaus, and Solano Counties	Valley and foothill grassland; 30-505 meters; blooms Jul-Oct	Present	Suitable annual grassland present in the study area. Species known from the Altamont segment near the proposed Mountain House Station.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Brewer's western flax <i>Hesperolinon breweri</i>	-/-/1B.2	Southern north inner Coast Range, northeast San Francisco Bay region, especially Mt. Diablo: Contra Costa, Napa, and Solano Counties	Chaparral, cismontane woodland, valley and foothill grassland, usually on soils derived from serpentinite; 30-900 meters; blooms May-Jul	Present	Suitable oak woodland and annual grassland present in the Tri-Valley and Altamont segments.
Brittlescale <i>Atriplex depressa</i>	-/-/1B.2	Western and eastern Central Valley and adjacent foothills on west side of Central Valley	Alkaline clay soils in chenopod scrub, playas, valley and foothill grasslands; 1-320 meters; blooms Apr-Oct	Present	Suitable alkaline seasonal wetland and alkali grassland present in all three segments.
California alkali grass <i>Puccinellia simplex</i>	-/-/1B.2	Tehachapi Mountain Area Subregion, Great Central Valley Region, San Francisco Bay Area Subregion, west Mojave Desert Region	Alkaline, vernal mesic; sinks, flats, and lake margins; chenopod scrub; meadows and seeps; valley and foothill grassland; vernal pools; (Saline flats, mineral springs) below 900 meters; blooms Mar-May	Present	Suitable alkali annual grassland present in all three segments. Species known from the Altamont segment near the town of Altamont.
Caper-fruited trepidocarpum <i>Trepidocarpum capparideum</i>	-/-/1B.1	Historically known from the northwest San Joaquin Valley and adjacent Coast Range foothills; currently known from Fresno, Monterey, and San Luis Obispo Counties	Grasslands on alkaline hills; below 455 meters; blooms Mar-Apr	Present	Suitable habitat in the Altamont and Tracy to Lathrop segments. Most populations in the Altamont Hills are likely extirpated.
Chaparral ragwort <i>Senecio aphanactis</i>	-/-/2B.2	Scattered locations in central western and southwestern California, from Alameda County to San Diego County	Oak woodland, coastal scrub, chaparral, open sandy or rocky areas, on alkaline soils; 15-800 meters; blooms Jan-Apr	Present	Suitable oak woodland and alkaline soils are present in the Altamont segment.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Congdon's tarplant <i>Centromadia parryi</i> ssp. <i>congdonii</i>	-/-/1B.1	East San Francisco Bay Area, Salinas Valley, Los Osos Valley	Alkaline soils in annual grassland, on lower slopes, flats, and swales, sometimes on saline soils; below 230 meters; blooms May-Oct (Nov)	Present	Suitable alkaline soils in annual grassland present in the Tri-Valley and Altamont segments. Species known from fields east of Fallon Road in the Tri-Valley segment.
Contra Costa manzanita <i>Arctostaphylos manzanita</i> ssp. <i>laevigata</i>	-/-/1B.2	Endemic to Contra Costa County	Rocky soils in chaparral; 430-1100 meters; blooms Jan-Mar	Absent	Suitable chaparral habitat absent from study area.
Delta button-celery <i>Eryngium racemosum</i>	-/E/1B.1	San Joaquin River delta, floodplains, and adjacent Sierra Nevada Foothills: Calaveras, Contra Costa, Merced, San Joaquin*, and Stanislaus Counties	Riparian scrub in seasonally inundated depressions on clay soils; 3-30 meters; blooms Jun- Oct	Present	Suitable riparian habitat present in the Altamont and Tracy to Lathrop segments.
Delta mudwort <i>Limosella subulata</i>	-/-/2B.1	Deltaic Central Valley: Contra Costa, Sacramento, San Joaquin, and Solano Counties; Oregon	Muddy or sandy intertidal flats and marshes, streambanks in riparian scrub generally at sea level; blooms May-Aug	Absent	Suitable habitat absent from the study area.
Delta tule pea <i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	-/-/1B.2	San Francisco Bay region, also part of Central Valley in Alameda, Contra Costa, Napa, Santa Clara*, San Joaquin, Solano, and Sonoma Counties	Coastal and estuarine marshes (freshwater and brackish); below 4 meters; blooms May-Jul (Sep)	Absent	Suitable habitat absent from the study area.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Diablo helianthella <i>Helianthella castanea</i>	-/-/1B.2	San Francisco Bay area: Alameda, Contra Costa, Marin*, San Francisco*, and San Mateo Counties	At chaparral/oak woodland ecotone, often in partial shade, on rocky soils, also coastal scrub, riparian woodland, broadleafed upland forest, valley and foothill grassland; 60-1300 meters; blooms Mar-Jun	Present	Suitable oak woodland, riparian woodland, and annual grassland present in all three segments of the study area.
Diamond-petaled California poppy <i>Eschscholzia rhombipetala</i>	-/-/1B.1	Interior foothills of South Coast Ranges from Alameda County to Stanislaus Counties, Carrizo Plain in San Luis Obispo County	On alkaline clay soils in grassland, chenopod scrub, where grass cover is sparse enough to allow growth of low annuals; below 975 meters; blooms Mar-Apr	Present	Suitable annual grassland present in Altamont and Tracy to Lathrop segments.
Hairless popcorn-flower <i>Plagiobothrys glaber</i>	-/-/1A	Coastal valleys from Marin County to San Benito Counties	Alkaline meadows and seeps, coastal salt marsh and swamps; 15-180 meters; blooms Mar-May	Present	Suitable alkaline seasonal wetland habitat present in the Tri-Valley and Altamont segments.
Heartscale <i>Atriplex cordulata</i> var. <i>cordulata</i>	-/-/1B.2	Western Central Valley and valleys of adjacent foothills	Saline or alkaline area in chenopod scrub, meadows and seeps, sandy soils in valley and foothill grassland; below 560 meters; blooms Apr-Oct	Present	Suitable alkaline seasonal wetland and annual grassland present in the all three segments.
Hispid bird's-beak <i>Chloropyron molle</i> ssp. <i>hispidum</i>	-/-/1B.1	Central Valley: Alameda, Fresno, Kern, Merced, Placer, and Solano Counties	Meadow and seeps, valley and foothill grassland, playa, on alkaline soils; 1- 155 meters; blooms Jun- Sep	Present	Suitable alkali annual grassland present in all three segments.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Hospital canyon larkspur <i>Delphinium californicum</i> ssp. <i>interius</i>	-/-/1B.2	Inner South Coast Ranges, eastern San Francisco Bay: Alameda, Contra Costa, Merced, San Benito, Santa Clara, San Joaquin, San Luis Obispo, and Stanislaus Counties	Openings in chaparral, mesic cismontane woodland, on moist slopes and ravines; 195-1095 meters; blooms Apr-Jun	Present	Suitable openings in oak woodland/grassland habitat present in the Altamont segment.
Large-flowered fiddleneck <i>Amsinckia grandiflora</i>	E/E/1B.1	Historically known from Mount Diablo foothills in Contra Costa, Alameda, and San Joaquin counties; currently known from three natural occurrences	Cismontane woodland, valley and foothill grassland slopes; 275-550 meters; blooms Apr-May	Present	Suitable annual grassland habitat present in the Altamont and Tracy to Lathrop segments.
Lemmon's jewelflower <i>Caulanthus lemmonii</i>	-/-/1B.2	Southeast San Francisco Bay Area, south through the South Coast Ranges and adjacent San Joaquin Valley to Ventura County	Dry, exposed slopes in grasslands and pinyon-juniper woodland; 80-1220 meters; blooms Mar-May	Present	Suitable annual grassland habitat present in the Altamont and Tracy to Lathrop segments.
Lesser saltscale <i>Atriplex minuscula</i>	-/-/1B.1	Sacramento and San Joaquin Valley, Butte County and from Merced County to Kern County	Sandy alkaline soils in chenopod scrub, playas, valley and foothill grassland; 15-200 meters; blooms May-Oct	Present	Suitable alkaline seasonal wetlands and alkali grassland present in the study area.
Livermore tarplant <i>Deinandra bacigalupii</i>	-/E/1B.2	Endemic to Alameda County (Livermore Valley)	Alkaline meadows and seeps, not in Jepson Manual; 150-185 meters; blooms Jun-Oct	Present	Suitable alkaline seasonal wetland habitat present in the Tri-Valley and Altamont segments.
Long-styled sand-spurrey <i>Spergularia macrotheca</i> var. <i>longistyla</i>	-/-/1B.2	Endemic to Alameda, Contra Costa, Napa and Solano counties.	Perennial herb. Alkaline meadows and seeps, marshes and swamps; 0-255 meters; blooms Feb-May	Present	Suitable alkaline seasonal wetland habitat present in the Tri-Valley and Altamont segments.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Mason's lilaeopsis <i>Lilaeopsis masonii</i>	-/R/1B.1	Southern Sacramento Valley, Sacramento - San Joaquin River Delta, northeast San Francisco Bay area in Alameda, Contra Costa, Marin, Napa, Sacramento, San Joaquin, Solano, and Yolo Counties	Freshwater or brackish marsh, riparian scrub, in tidal zone; blooms Apr-Nov	Absent	Suitable habitat absent from the study area.
Mt. Diablo fairy-lantern <i>Calochortus pulchellus</i>	-/-/1B.2	Known from Alameda, Contra Costa, and Solano Counties	Chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland; 30-840 meters; blooms Apr-Jun	Present	Suitable annual grassland, riparian woodland, and oak woodland present in the Tri-Valley and Altamont segments.
Oregon polemonium <i>Polemonium carneum</i>	-/-/2B.2	Alameda, Del Norte, Humboldt, Marin, San Francisco, Siskiyou, San Mateo, Sonoma Counties; also Oregon, Washington	Coastal prairie, Coastal scrub, Lower montane coniferous forest; 0-1830 meters; blooms Apr-Sep	Absent	Suitable habitat absent in the study area.
Palmate-bracted bird's-beak <i>Cordylanthus palmatus</i>	E/E/1B.1	Livermore Valley and scattered locations in the Central Valley from Colusa County to Fresno County	Alkaline sites in grassland and chenopod scrub; 5-155 meters; blooms May-Oct	Present	Suitable alkali grassland present in all three segments.
Prostrate vernal pool navarretia <i>Navarretia prostrata</i>	-/-/1B.1	Western San Joaquin Valley, interior South Coast Ranges, central South Coast, Peninsular Ranges: Alameda, Los Angeles, Merced, Monterey, Orange, Riverside, San Bernardino*?, San Diego, and San Luis Obispo Counties	Vernal pools and mesic areas in coastal scrub and alkali grasslands; 15-1210 meters; blooms Apr-Jul	Present	Suitable vernal pool and alkaline seasonal wetland present in all three segments. Species known from fields east of Fallon Road in the Tri-Valley segment.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Recurved larkspur <i>Delphinium recurvatum</i>	-/-/1B.2	Central Valley from Colusa* to Kern Counties	Alkaline soils in valley and foothill grassland, saltbush scrub, cismontane woodland; 3-790 meters; blooms Mar-Jun	Present	Suitable alkali grassland present in all three segments.
Saline clover <i>Trifolium hydrophilum</i>	-/-/1B.2	Sacramento Valley, central western California	Salt marsh, mesic alkaline areas in valley and foothill grasslands, vernal pools, marshes and swamps; below 300 meters; blooms Apr-June	Present	Suitable alkali grassland habitat present in all three segments.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	-/-/1B.2	Scattered locations in Central Valley and Coast Ranges	Freshwater marshes, sloughs, canals, and other slow-moving water habitats; below 650 meters; blooms May-Oct	Present	Suitable freshwater marsh and canal habitat present in all three segments.
San Joaquin spearscale <i>Extriplex joaquinana</i>	-/-/1B.2	West edge of Central Valley from Glenn County to Tulare County	Alkaline soils in chenopod scrub, meadows and seeps, playas, valley and foothill grassland; 1-835 meters; blooms Apr-Oct	Present	Suitable alkali grassland present in the study area. Known from the Altamont segment.
Shining navarretia <i>Navarretia nigelliformis</i> ssp. <i>radicans</i>	-/-/1B.2	Interior foothills of South Coast Ranges from Merced County to San Luis Obispo County	Mesic areas with heavy clay soils, in swales and clay flats, in oak woodland, grassland; 76-1000 meters; blooms Apr-Jul	Present	Suitable mesic annual grasslands and vernal pools present in all three segments.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Showy golden madia <i>Madia radiata</i>	-/-/1B.1	Scattered populations in the interior foothills of the South Coast Ranges: Contra Costa*, Fresno, Kings*, Kern, Monterey*, Santa Barbara*, San Benito, Santa Clara, San Joaquin*, San Luis Obispo, and Stanislaus Counties	Oak woodland, valley and foothill grassland, slopes; 25-1215 meters; blooms Mar-May	Present	Suitable annual grassland present in all three segments.
Slough thistle <i>Cirsium crassicaule</i>	-/-/1B.1	San Joaquin Valley: San Joaquin, Kings and Kern Counties	Chenopod scrub, riparian scrub, sloughs in swamps and marshes; 3-100 meters; blooms May-Aug	Present	Suitable riparian scrub habitat present in the Tracy to Lathrop segment.
Suisun marsh aster <i>Symphotrichum lentum</i>	-/-/1B.2	Sacramento - San Joaquin Delta, Suisun Marsh, Suisun Bay: Contra Costa, Napa, Sacramento, San Joaquin, and Solano Counties	Brackish and freshwater marshes and swamps; below 3 meters; blooms May-Nov	Absent	Suitable habitat absent from the study area.
Watershield <i>Brasenia schreberi</i>	-/-/2B.3	Scattered occurrences in north and central California; widespread across US	Freshwater marshes; 30-2200 meters; blooms Jun-Sep	Present	Suitable freshwater marsh habitat present in all three segments.
Woolly rose-mallow <i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	-/-/1B.2	Scattered locations in central California in the Central and southern Sacramento Valley, deltaic Central Valley, from Butte to San Joaquin County	Freshwater marshes and swamps along rivers and sloughs, often in riprap on sides of levees; below 120 meters; Jun-Sep	Present	Suitable freshwater marsh and riverine habitat present in the Tracy to Lathrop segment.

Common Name Scientific Name	Status^a Federal/State /CNPS	Geographic Distribution	General Habitat Description	Habitat Present/ Absent	Rationale
Wright's trichocoronis <i>Trichocoronis wrightii</i> var. <i>wrightii</i>	-/-/2B.1	Scattered locations in the Central Valley and Southern Coast; Texas	On alkaline soils in floodplains, meadows and seeps, marshes and swamps, riparian forest, vernal pools; 5-435 meters; blooms May-Sep	Present	Suitable riparian habitat present in the Tracy to Lathrop segment.

* = populations extirpated in the county.

^a Status explanations:

Federal

E = listed as endangered under the federal Endangered Species Act (ESA).

T = listed as threatened under ESA.

- = no listing.

State

E = listed as endangered under the California Endangered Species Act (CESA).

R = listed as rare under CESA

- = no listing.

California Native Plant Society (CNPS) California Rare Plant Rank

1A = List 1A species: plants presumed extirpated in California and either rare or extinct elsewhere.

1B = List 1B species: plants rare, threatened, or endangered in California and elsewhere.

2B = List 2B species: plants rare, threatened, or endangered in California, but more common elsewhere.

CNPS Code Extensions:

0.1 = seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat).

0.2 = fairly endangered in California (20-80% of occurrences threatened).

0.3 = not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known.)

Appendix M-4
**Special-Status Wildlife Known or with Potential to Occur
in the Study Area**

Appendix M-4

Special-Status Wildlife and Fish Species Known or with Potential to Occur in the Study Area

Table M-4-1. Special-Status Wildlife Known or with Potential to Occur in the Study Area

Common Name Scientific Name	Status ^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Invertebrates					
Conservancy fairy shrimp <i>Branchinecta conservatio</i>	FE/-/-	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large, deep vernal pools in annual grasslands	Absent	Study area located outside of species range.
Longhorn fairy shrimp <i>Branchinecta longiantenna</i>	FE/-/-	Eastern margin of central Coast Ranges from Contra Costa County to San Luis Obispo County; disjunct population in Madera County	Small, clear pools in sandstone rock outcrops of clear to moderately turbid clay- or grass-bottomed pools	Present	The species is known to occur within eastern Alameda County. Vernal pools and similar habitat occurs within the Altamont portions of study area.
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT/-/-	Central Valley, central and south Coast Ranges from Tehama to Santa Barbara County; isolated populations in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	Present	Study area is within the range of the species. Vernal pools and similar habitat occurs within portions of the Livermore and Altamont study area.
San Bruno elfin butterfly <i>Callophrys mossii bayensis</i>	FE/-/-	San Bruno Mountains, Montara Mountains, and northern end of Santa Cruz Mountains in San Mateo County	North-facing slopes and ridges facing Pacific Ocean from 600 to 1,100 feet that support <i>Sedum spathulifolium</i>	Absent	Study area located outside of species' known range.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Valley elderberry longhorn beetle <i>Desmocerus</i> <i>californicus</i> <i>dimorphus</i>	FT/-/-	Riparian habitats below 3,000 feet throughout the Central Valley	Valley elderberry longhorn beetle (VELB) is found only in association with its host plant, blue elderberry, which is commonly found in riparian forests and adjacent uplands in the Central Valley and foothills	Present	Study area is within the range of the species and the species is known to occur along the Stockton River. There are no CNDDB records for VELB within 3-miles of the study area; however, elderberry shrubs were observed within the Altamont section on the March 2019 field visit. VELB has been documented west of I-580 and north of W. Corral Hollow Road (California Department of Fish and Wildlife 2019).
Vernal pool tadpole shrimp <i>Lepidurus</i> <i>packardi</i>	FE/-/-	Shasta County south to Merced County	Found in vernal pools and ephemeral stock ponds	Present	Vernal pools and similar habitat occurs within portions of study area – a seasonal wetland is located 0.5 mile north of the proposed Mountain House Station. There are no CNDDB records for tadpole shrimp within 3- miles of the study area.

Common Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Crotch bumble bee <i>Bombus crotchii</i>	-/SC/-	Limited distribution in California, including Pacific Coast, Western Desert, Central Valley, and adjacent foothill of southwestern California. Population decline pronounced in the Central Valley and is now largely absent (California Department of Fish and Wildlife 2020).	Inhabits open grasslands and shrublands. Requires floral resources, undisturbed nest sites (e.g. abandoned rodent burrows, aboveground and belowground cavities - logs, dead vegetation/leaf litter, abandoned bird nests), and overwintering sites (e.g. soft loose soil and under leaf litter or plant debris). Uses wide variety of flowering plants and most commonly visits – Fabaceae, Apocynaceae, Lamiaceae, Hydrophyllaceae, Asclepiadaceae and Boraginaceae.	Present	Study area contains suitable open grasslands with potentially suitable foraging plants, particularly in the Altamont segment. Crotch bumble bee has been reported in the vicinity of City of Tracy (California Department of Fish and Wildlife 2020); the historic record (from 1959) is considered extant. Low potential for occurrence - Species has been largely extirpated from the Central Valley due to loss of open grassland scrub habitat from agricultural and urban expansion and fragmentation of native grasslands and now appears to be absent from most of historic range (Xerces Society 2019).

Common Name Scientific Name	Status ^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Western bumble bee <i>Bombus occidentalis occidentalis</i>	-/SC/-	Historically from the Pacific coast to the Colorado Rocky Mountains; severe population decline west of the Sierra-Cascade Crest, but populations are known from the Great Basin, Rocky Mountains, Alaska. From sea level to 2,000 m.	Open grassy areas, urban parks and gardens, chaparral and shrub areas, mountain meadows. Nests are generally underground. Requires floral resources, undisturbed nest sites (e.g. abandoned rodent burrows, aboveground and belowground cavities - logs, dead vegetation/leaf litter, abandoned bird nests), and overwintering sites (e.g. soft loose soil and under leaf litter or plant debris). Uses wide variety of flowering plants and commonly visits – <i>Melilotus, Ceanothus, Centaurea, Cirsium, Trifolium, Centaurea, Chrysothamnus, Eriogonum, Lupines, Rubus, Solidago</i>	Present	Study area contains suitable open grasslands with potentially suitable foraging plants, particularly in the Altamont segment. Western bumble bee has been reported northeast of Livermore and just southwest of Lathrop; the occurrence records are considered extant (California Department of Fish and Wildlife 2020). Low potential for occurrence - Populations from central California north to southern British Columbia and west of Sierra-Cascade Ranges have declined sharply (Williams et al. 2014) and populations are currently largely restricted to high elevation sites in the Sierra Nevada (Xerces Society 2012). Rare throughout much of its range (Koch et al. 2012).
Amphibians					
California tiger salamander <i>Ambystoma californiense</i>	FT/ST/-	Central Valley, including Sierra Nevada foothills, up to approximately 1,000 feet in elevation, and coastal region from Sonoma County south to Santa Barbara County	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for breeding; rodent burrows, rock crevices, or fallen logs for upland cover during dry season	Present	Study area includes suitable aquatic habitat (seasonal wetlands, stock ponds, cattle ponds) and upland habitat within 1.2 miles of suitable aquatic habitat is present in the study area.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Foothill yellow- legged frog <i>Rana boylei</i>	-/SCT/SSC	Klamath, Cascade, north Coast, south Coast, Transverse, and Sierra Nevada Ranges up to approximately 6,000 feet	Streams in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby	Present	The Livermore and Altamont portion of the study area is within the range of the species and suitable aquatic habitat (seasonal creek, intermittent streams) adjacent to woodland habitat is present.
California red- legged frog <i>Rana draytonii</i>	FT/-/SSC	Along the coast and coastal mountain ranges of California from Mendocino County to San Diego County and in the Sierra Nevada from Butte County to Stanislaus County	Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation; may aestivate in rodent burrows or cracks during dry periods.	Present	The Livermore and Altamont portion of the study area is within the range of the species. Suitable aquatic (streams and stock ponds) and upland habitat present in study area.
Western spadefoot toad <i>Spea hammondi</i>	-/-/SSC	Sierra Nevada foothills, Central Valley, Coast Ranges, coastal counties in southern California	Shallow streams with riffles and seasonal wetlands, such as vernal pools in annual grasslands and oak woodlands	Present	Species is known to occur in eastern Alameda and San Joaquin Counties. Aquatic (seasonal wetlands and seasonal pools) and upland habitat occurs within the study area and may provide suitable habitat.
Reptiles					
California legless lizard <i>Anniella pulchra pulchra</i>	-/-/SSC	Along the Coast, Transverse, and Peninsular Ranges from Contra Costa County to San Diego County with spotty occurrences in the San Joaquin Valley	Habitats with loose soil for burrowing or thick duff or leaf litter; often forages in leaf litter at plant bases; may be found on beaches, sandy washes, and in woodland, chaparral, and riparian areas	Present	Study area is within the range of the species and open, natural grassland and oak woodland habitat is present along the Altamont and portions of the Tracy to Lathrop segment of the study area.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
California glossy snake <i>Arizona elegans occidentalis</i>	-/-/SSC	From the eastern part of the San Francisco Bay Area south to northwestern Baja California. Absent along central coast. From sea level to 7,218 ft (2,200 m)	Nocturnal. Inhabits arid scrub, rocky washes, grasslands, and chaparral. Microhabitat of open areas with loose soil for burrowing. Shelters under rocks and in burrows.	Present	Suitable grassland habitat present in the study area, particularly north and south of the alignment along the Altamont portion.
Western pond turtle <i>Emys marmorata</i>	-/-/SSC	From the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of Sierra Nevada	Ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests	Present	The species is known to occur within and/or adjacent to the study area. Study area includes several creeks, stock ponds, and canals that provide suitable aquatic habitat; also known to occur in Tassajara Creek, Arroyo Las Positas Creek, Cottonwood Creek, canals near Brushy Peak, and along San Joaquin River.
San Joaquin coachwhip <i>Masticophis flagellum ruddocki</i>	-/-/SSC	From Colusa County in the Sacramento Valley southward to the grapevine in the San Joaquin Valley and westward into the inner Coast Ranges. An isolated population occurs at Sutter Buttes. Known elevational range from 20 to 900 meters	Occurs in open, dry, vegetative associations with little or no tree cover (e.g., valley grassland and saltbush scrub associations); often occurs in association with mammal burrows	Present	Study area located within the species range and suitable grassland habitat is present, along the Tracy and Altamont segments of the corridor.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Alameda whipsnake <i>Masticophis lateralis euryxanthus</i>	FT/ST/-	Restricted to Alameda and Contra Costa Counties; fragmented into 5 disjunct populations throughout its range. Absent from Central Valley floor	Valleys, foothills, and low mountains associated with northern coastal scrub or chaparral habitat; requires rock outcrops for cover and foraging	Absent	Although the study area is within the range of the species and a suppressed CNDDB record for the species overlaps with the eastern portion of the Altamont portion of the study area, the study area lacks suitable chaparral habitat and is not located within one of the 5 known populations.
Coast horned lizard <i>Phrynosoma blainvillii</i>	-/-/SSC	Sacramento Valley, including foothills, south through Transverse and Peninsular Ranges from Ventura to San Diego County in southern California; Coast Ranges south of Sonoma County; below 4,000 feet in northern California	A variety of habitats, from brush-lands to coniferous forests; requires open areas for sunning	Present	Suitable open habitat occurs within eastern Alameda County and in the San Joaquin County where natural, open land cover and friable substrate exists in the study area. Multiple CNDDB records are located near the study area along the Altamont portion.
Giant gartersnake <i>Thamnophis gigas</i>	FT/ST/-	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low gradient streams and freshwater marsh habitats where there is a prey base of small fish and amphibians; also found in irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	Present	Suitable aquatic habitat (canals, sloughs, marsh, and ditches) occurs in the Tracy to Lathrop portion of study area that overlap with species' known range. Generally, potentially suitable aquatic habitat occurs from Banta to west of San Joaquin River.

Common Name Scientific Name	Status ^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Birds					
Bank Swallow <i>Riparia riparia</i>	-/ST/-	Neotropical migrant. Found in California in the spring to fall in Sacramento Valley, less common on coast, uncommon summer resident. Casual in So. Cal in winter. Breeds in northern Central Valley.	In summer, restricted to riparian, lacustrine, and other lowland habitats with vertical banks, bluffs, and cliffs with sandy soils for digging nesting holes. In migration, found over many open habitats. Feeds over brushland, grassland, wetlands, water, and cropland.	Absent	Study area is outside of the known breeding range of the species. There are no CNDDDB records for this species within the study area. Species may be found moving through the study area on migration to breeding or wintering grounds but does not breed within the study area.
Tricolored blackbird (nesting colony) <i>Agelaius tricolor</i>	-/ST/SSC	Permanent resident in the Central Valley from Butte County to Kern County; breeds at scattered coastal locations from Marin County south to San Diego County, and at scattered locations in Lake, Sonoma, and Solano Counties; rare nester in Siskiyou, Modoc, and Lassen Counties	Nests in dense colonies in emergent marsh vegetation, such as tules and cattails, or upland sites with blackberries, nettles, thistles, and grainfields; habitat must be large enough to support 50 pairs; probably requires water at or near the nesting colony.	Present	Study area is within the range of the species. Suitable freshwater wetland habitat (breeding habitat) and open agricultural cropland (foraging habitat) is present in the study area. Suitable nesting upland bramble habitat likely also present in the project area. CNDDDB records for the species intersect with the corridor, on the Tracy to Lathrop segment. There is potential for the species to occur in the study area.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Golden eagle (nesting) <i>Aquila chrysaetos</i>	PR/-/FP	Foothills and mountains throughout California. Uncommon nonbreeding visitor to lowlands such as the Central Valley	Nest on cliffs and escarpments or in tall trees overlooking open country. Forages in annual grasslands, chaparral, and oak woodlands with plentiful medium and large-sized mammals	Present	Foraging habitat is present within and/or near study area, but study area does not include suitable nesting habitat due to the limited, confined nature of the oak woodland. The species has potential to occur along the Altamont portion of the study area.
Grasshopper sparrow <i>Ammodramus savannarum</i>	-/-/SSC	Summer resident from Humboldt, Del Norte, Trinity and Tehama counties south, west of Cascade-Sierra Nevada and deserts to San Diego County. Reduced numbers in Central Valley. From sea level to 4,900 ft (1494 m).	Ecology varies substantially within its range. Generally prefers edges and low foothill grasslands with scattered shrubs, prairies and pastures scattered in forested landscape, alfalfa fields, bunchgrass, and alkaline meadow covered with saltgrass. Absent from areas with extensive shrubs.	Present	Study area is within the species range and known occurrences are in eastern Alameda County. Suitable foraging and nesting habitat is within and or adjacent to the study area.
Short-eared owl <i>Asio flammeus</i>	-/-/SSC	Permanent resident along the coast from Del Norte County to Monterey County although very rare in summer north of San Francisco Bay, in the Sierra Nevada north of Nevada County, in the plains east of the Cascades, and in Mono County; small, isolated populations	Freshwater and salt marshes, lowland meadows, and irrigated alfalfa fields; needs dense tules or tall grass for nesting and daytime roosts	Present	The study area is within the species range and stands of freshwater marsh, grassland, and wet cropland that the species uses for nesting is present in the study area. There is potential for the species to occur.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Burrowing owl <i>Athene cunicularia</i>	-/-/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast	Level, open, dry, heavily grazed or low stature grassland or desert vegetation to forage in with available burrows for refuge and nesting	Present	Study area is within the species range and includes suitable annual grassland (nesting and foraging) habitat. There are multiple CNDDB records for the species within and adjacent to the study area.
Swainson's hawk <i>Buteo swainsoni</i>	-/ST/-	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley; highest nesting densities occur near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain fields	Present	Suitable riparian and woodland trees (nesting habitat) and grassland and open agricultural fields (foraging habitat), located within and/or near study area.
Northern harrier <i>Circus cyaneus</i>	-/-/SSC	Throughout lowland California, but species has been recorded in fall at high elevations	Grasslands, meadows, marshes, and seasonal and agricultural wetlands; nests on the ground within a thicket of vegetation	Present	Suitable foraging and nesting habitat is present in grassland, seasonal wetlands, and open agricultural fields located within and/or near study area.
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	FT/SE/-	Neotropical migrant. Nests along upper Sacramento, lower Feather, south fork of the Kern, Amargosa, Santa Ana, and Colorado Rivers	Wide, dense riparian forests with a thick understory of willows for nesting; sites with a dominant cottonwood overstory are preferred for foraging; may avoid valley-oak riparian habitats where scrub jays are abundant	Absent	Study area lacks extensive tracts of dense riparian habitat required for foraging and nesting. Does not nest within the Study Area but may migrate through from breeding grounds to wintering grounds. There are no CNDDB occurrence for this species within the study area.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
White-tailed kite <i>Elanus leucurus</i>	-/-/FP	Lowland areas west of Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County at the Mexico border	Dense-topped trees or shrubs for nesting, open grasslands, marshes, or agricultural fields for foraging	Present	Study area occurs within the species' range. Suitable nesting and foraging habitat occurs within and/or near study area.
Loggerhead shrike <i>Lanius ludovicianus</i>	-/-/SSC	Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter	Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches	Present	Study area is within the species range and includes suitable foraging and nesting habitat for the species.
Song sparrow (Modesto population) <i>Melospiza melodia</i>	-/-/SSC	Stanislaus, eastern Contra Costa, eastern Alameda, San Joaquin, Sacramento, eastern Solano, Yolo, eastern Colusa, Sutter, western Yuba, and western Placer Counties	Emergent freshwater marshes, valley oak dominated riparian forests (including recent restoration sites), vegetated irrigation canals and levees	Present	Study area is within the species range. Suitable riparian habitat, and vegetated canals and levees within the study area provide suitable nesting and foraging habitat.
California least tern <i>Sternula antillarum</i> (= <i>Sterna</i> , = <i>albifrons</i>) <i>browni</i>	FE/SE/FP	Along the Pacific Coast of California from San Francisco to Baja California	Nests on sandy, upper ocean beaches, and occasionally uses mudflats; forages on adjacent surf line, estuaries, or the open ocean	Absent	Study area located outside sandy beach or suitable exposed mudflat habitat in the San Francisco Bay Area. The species is not known to occur in eastern Alameda County and does not occur in San Joaquin County.

Common Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Least Bell's vireo <i>Vireo bellii pusilus</i>	SE/SE/-	Small populations remain in southern Inyo, southern San Bernardino, Riverside, San Diego, Orange, Los Angeles, Ventura, and Santa Barbara Counties	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons	Absent	Study area located outside of the species' range. The species does not nest within the study area.
Yellow-headed blackbird <i>Xanthocephalus xanthocephalus</i>	-/-/SSC	Central Valley and southeastern California year-round; spends winter in southern Arizona, Texas, New Mexico, and Mexico; spends summer in the Great Basin to Canada	Wetlands in prairies, meadows, aspen stands, marshes, pond shallows, and river banks with emergent vegetation	Present	The study area is within the species range. Suitable wetland and riparian habitat along the San Joaquin River and vegetated stock ponds and seasonal wetlands scattered throughout the study area may provide suitable habitat.
Mammals					
Pallid bat <i>Antrozous pallidus</i>	-/-/SSC, WBWG-High	Widespread throughout California	Occurs in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California; relies heavily on trees for cavity roosts, but will use crevices in man-made structures	Present	Study area is within the species range. Suitable woodland habitat and man-made structures (such as buildings, bridges, and railroad overcrossing) are present. Foraging habitat is present throughout the study area.

Common Name Scientific Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	-/SCT/ WBWG-High	Coastal regions from Del Norte County south to Santa Barbara County	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings; very sensitive to disturbances and may abandon a roost after one onsite visit	Present	The study area is within the species range. Man-made structures (freeway overpasses, buildings, barns etc.) within the study area may provide suitable roosting habitat for the species.
Western mastiff bat <i>Eumops perotis californicus</i>	-/-/SSC, WBWG-High	Occurs along the western Sierra primarily at low to mid elevations and widely distributed throughout the southern coast ranges; recent surveys have detected the species north to the Oregon border	Found in a wide variety of habitats from desert scrub to montane conifer; roosts and breeds in deep, narrow rock crevices, but may also use crevices in trees, buildings, and tunnels	Present	Study area is within the range of the species. Suitable woodland habitat and man-made structures (such as buildings, bridges, and railroad overcrossing) are present in the study area and may provide suitable habitat.
Hoary bat <i>Lasiurus cinereus</i>	-/-/WBWG- Medium	Widespread throughout California	Roosts in trees, typically within forests	Present	Study area is within the range of the species. Suitable woodland habitat scattered throughout the study area may provide suitable habitat.
Riparian (=San Joaquin Valley) woodrat <i>Neotoma fuscipes riparia</i>	FE/-/SSC	Historical distribution along the San Joaquin, Stanislaus, and Tuolumne Rivers, and Caswell State Park in San Joaquin, Stanislaus, and Merced Counties; presently limited to San Joaquin County at Caswell State Park and a possible second population near Vernalis	Riparian habitats with dense shrub cover, willow thickets, and an oak overstory	Absent	Study area is located outside of known species range (Caswell Memorial State Park).

Common Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Riparian brush rabbit <i>Sylvilagus bachmani riparius</i>	FE/SE/-	Limited to San Joaquin County at Caswell State Park near the confluence of the Stanislaus and San Joaquin Rivers and Paradise Cut area on Union Pacific right-of-way lands	Native valley riparian habitats with large clumps of dense shrubs, low-growing vines, and some tall shrubs and trees	Present	Study area is located within the species range. There are CNDDDB records for the species that overlap with the project alignment along the Tracy to Lathrop segment. Riparian habitat along waterways, such as Paradise Cut and San Joaquin River, provides suitable habitat.
American badger <i>Taxidea taxus</i>	-/-/SSC	The majority of the northern, western, and central United States south to Baja California	Grasslands, savannas, mountain meadows, and open areas of desert scrub that support small mammal burrow complexes	Present	The study area is within the species range and grasslands and other open habitat for the species is present along the alignment. There are multiple CNDDDB records that intersect with and or adjacent to the alignment.
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	FE/ST/-	San Joaquin Valley and adjacent open foothills to the west; recent records from 17 counties extending from Kern County north to Contra Costa County	Saltbush scrub, grassland, oak, savanna, and freshwater scrub	Present	Study area is located in the northern distributional range of the species. Suitable grassland and migratory habitat is present along the Tracy and Altamont segment of the corridor.

Common Name	Status^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Mountain Lion, Central Coast North ESU <i>Puma concolor</i>	-/SC/-	Widespread, ranging from sea level to alpine meadows, except in Mojave and Colorado desert and agricultural lands in the Central Valley. Seasonal movements within fixed range.	Requires extensive areas of riparian vegetation and brushy stages of most habitats (pine forest, riparian and oak woodland, streams, chaparral, grassland, and desert) with interspersions of irregular terrain, rocky outcrops, and tree/brush edges. Generally, avoid areas with human disturbance, but will use it for traveling or hunting. Uses caves and natural cavities for cover. Closely associated with deer population.	Present	Study area is located in the Central Coast - North ESU range. Suitable undisturbed grassland habitat is present in the Altamont segment. Bay Area Puma Project (2020) reports sighting of mountain lion in the Dublin, Pleasanton, and south Livermore areas.

Notes:

^a Status Codes

- no listing.
- FE listed as endangered under the federal Endangered Species Act.
- FT listed as threatened under the federal Endangered Species Act.
- PD proposed for delisting under the federal Endangered Species Act.
- PR protected by the federal Bald and Golden Eagle Protection Act.
- D delisted.
- SE listed as endangered under the California Endangered Species Act.
- ST listed as threatened under the California Endangered Species Act.
- SSC listed as a Species of Special Concern by the State of California.
- SC candidate species under the California Endangered Species Act.
- SCT candidate for state threatened listing under the California Endangered Species Act.
- FP California fully protected species.
- WBWG Western Bat Working Group conservation priority (High or Medium)

Table M-4-2. Special-Status Fish Species Known or with Potential to Occur in the Study Area

Common Name Scientific Name	Status ^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Fish					
River lamprey <i>Lampetra ayresi</i>	-/-/SSC	San Francisco Bay to just north of Juneau, Alaska	Adults live in the ocean and migrate into larger fresh water river systems to spawn	Present	Study area located in species' known range in the San Joaquin River
Green sturgeon <i>Acipenser medirostris</i>	FT, CH/- /-	Upper Sacramento River and Feather River	Spawn in large river systems with well- oxygenated water, with temperatures from 8.0 to 14°C	Present	May occur in the San Joaquin River
Delta smelt <i>Hypomesus transpacificus</i>	FT, CH/SE/-	Primarily in the Sacramento– San Joaquin Estuary, but has been found as far upstream as the mouth of the American River on the Sacramento River and Mossdale on the San Joaquin River; range extends downstream to San Pablo Bay	Occurs in estuary habitat in the Delta where fresh and brackish water mix in the salinity range of 2–7 parts per thousand (Moyle 2002)	Present	May occur in the San Joaquin River but not in large numbers.
Central Valley steelhead <i>Oncorhynchus mykiss</i>	FT, CH/--	Sacramento and San Joaquin River and their tributaries	Occurs in the Sacramento and San Joaquin Rivers and their tributaries in well- oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18°C (Moyle 2002); habitat types are riffles, runs, and pools	Present	Migratory habitat present in the San Joaquin River. Numerous records of steelhead using San Joaquin River tributaries for spawning.

Common Name	Status ^a Federal/ State/ Other	Geographic Range	General Habitat Description	Habitat Presence/ Absence in Study Area	Rationale
Central Valley Chinook salmon <i>Oncorhynchus tshawytscha</i>	SC/SSC/ (fall-run)	Sacramento and San Joaquin River and their tributaries	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C; habitat types are riffles, runs, and pools (Moyle 2002)	Present	Study area includes the San Joaquin River.
Central Valley Chinook salmon <i>O. tshawytscha</i>	FT/ST/-- (spring- run)	Sacramento and San Joaquin River and their tributaries	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C; habitat types are riffles, runs, and pools (Moyle 2002)	Present	Experimental spring-run Chinook salmon population introduced into the San Joaquin River.
Longfin smelt <i>Spirinchus thaleichthys</i>	FC/ST/SS C	San Francisco Bay-Delta to north of the Cook Inlet in Alaska	Salt or brackish estuary waters with freshwater inputs for spawning	Present	May occur in the San Joaquin River, although not in large numbers.

Notes:

^a Status Codes

- no listing.
- FE listed as endangered under the federal Endangered Species Act.
- FT listed as threatened under the federal Endangered Species Act.
- FC candidate for federal listing under the Endangered Species Act.
- CH critical habitat designated under the federal Endangered Species Act.
- SE listed as endangered under the California Endangered Species Act.
- ST listed as threatened under the California Endangered Species Act.
- SSC listed as a Species of Special Concern by the State of California.
- SCT candidate for state threatened listing under the California Endangered Species Act.