YOLO 80 CORRIDOR IMPROVEMENT PROJECT

NATURAL ENVIRONMENT STUDY

SACRAMENTO, YOLO, AND SOLANO COUNTIES, CA

USGS Sacramento West, Davis, Merritt, and Dixon, California 7.5-Minute Topographic Quadrangles

04-SOL-80-PM 40.7/R44.7; 03-YOL-80-PM 0.00/R11.72; 03-YOL-50-PM 0.00/3.12; 03-SAC-50-PM 0.00/L0.617; 03-SAC-80-PM M0.00/M1.36

EA: 03-3H900 / EFIS: 0318000085

March 2023

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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STATE OF CALIFORNIA
Department of Transportation

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Summary

The California Department of Transportation (Caltrans) proposes to construct improvements consisting of managed lanes, pedestrian/bicycle facilities, and Intelligent Transportation System (ITS) elements along Interstate 80 (I-80) and United States Route 50 (US-50) from Kidwell Road near the eastern Solano County boundary near the city of Dixon (Dixon), through Yolo County, and to West El Camino Avenue on I-80 and Interstate 5 (I-5) on US-50 in Sacramento County. Caltrans is both the lead agency under the National Environmental Policy Act (as assigned by the Federal Highway Administration) and the California Environmental Quality Act (CEQA) for the 03-3H900 Yolo 80 Corridor Improvement/YOL 80 Bus/Carpool Lanes Project (project). The purpose of this project is to improve multimodal mobility on the I-80 and US-50 corridors in Solano, Yolo, and Sacramento Counties. The project would decrease congestion through the corridor and the effects that congestion has on transit and freight. It would improve transit headway times, reliability, access, and viability through the corridor. The project would also increase people throughput by increasing transit, bicycle and pedestrian, and carpool use. Furthermore, the project would address non-recurrent congestion caused by incidents, including collisions, by improving incident detection, verification, response, and clearing.

This Natural Environment Study (NES) has been prepared by Stantec Consulting Services Inc. (Stantec) to evaluate the potential effects of the project on sensitive biological resources such as special status plant and animal species, nesting migratory birds, and aquatic resources subject to agency jurisdiction (i.e., waters of the United States or waters of the state). For the purposes of this NES, the Biological Study Area (BSA) encompasses all currently proposed project improvements and ancillary construction areas (e.g., staging areas, access roads), totaling approximately 1,147 acres. Field assessments of the BSA were conducted between December 2020 and July 2022 and include general vegetation mapping and wildlife reconnaissance surveys; survey for aquatic resources; protocol level surveys for Swainson's hawk (*Buteo swainsoni*) and burrowing owls (*Athene cunicularia*); botanical surveys; and habitat assessments for giant garter snake (GGS; *Thamnophis gigas*), tricolored blackbird (*Agelaius tricolor*), special status bats, and valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*).

Based on the review of habitat requirements of regionally occurring special status species and the results of the field assessment, the BSA provides habitat for the following 23 special status animal species:

Species	Status	Species	Status
valley elderberry longhorn beetle	federally threatened (FT)	western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT, SE
green sturgeon (*Acipenser medirostris*)	FT, CDFW Species of Special Concern (SSC)	least Bell's vireo (*Vireo bellii pusillus*)	FE, SE
Central Valley distinct population segment (DPS) steelhead (*Oncorhynchus mykiss irideus*)	FT	western burrowing owl	SSC
Chinook salmon–Central Valley spring-run evolutionary significant unit (ESU) (*Oncorhynchus tshawytscha* pop. 6)	FT, State Threatened (ST)	purple martin (*Progne subis*)	SSC
Chinook salmon–Sacramento River winter-run ESU (*Oncorhynchus tshawytscha* pop. 7)	Federally Endangered (FE), State Endangered (SE)	grasshopper sparrow (*Ammodramus savannarum*)	SSC
delta smelt (*Hypomesus transpacificus*)	FT, SE	song sparrow (Modesto population) (*Melospiza melodia*)	SSC
longfin smelt (*Spirinchus thaleichthys*)	Federal Candidate (FC), ST	tricolored blackbird	ST
giant garter snake	FT, ST	yellow-headed blackbird (*Xanthocephalus xanthocephalus*)	SSC
Swainson's hawk	ST	western pond turtle (*Emys marmorata*)	SSC
northern harrier (*Circus hudsonius*)	SSC	pallid bat (*Antrozous pallidus*)	SSC
white-tailed kite (*Elanus leucurus*)	CDFW Fully Protected (FP)	western red bat (*Lasiurus blossevillii*)	SSC
mountain plover (*Charadrius montanus*)	SSC		

Suitable nesting habitat for migratory birds and raptors is also present within the BSA and vicinity. Potential impacts and recommended avoidance and minimization measures for special status animal species and nesting migratory birds and raptors are addressed in Chapter 4 of this NES.

In addition to the special status animal species which have potential to occur within the BSA, the BSA also provides potential habitat for the following 25 special status plant species:

Species	Status	Species	Status
Bogg's Lake hedge hyssop (*Gratiola heterosepala*)	SE, California Rare Plant Rank (CRPR) 1B.1	adobe-lily (*Fritillaria pluriflora*);	CRPR 1B.2
Keck's checkerbloom (*Sidalcea keckii*)	FE, CRPR 1B.1	hogwallow starfish (*Hesperevax caulescens*);	CRPR 4.2
Crampton's tuctoria (*Tuctoria mucronata*)	FE, SE, CRPR 1B.1	wooly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis)*	CRPR 1B.2
heartscale (*Atriplex cordulata* var. *cordulata*)	CRPR 1B.2	Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	CRPR 1B.2
brittlescale (*Atriplex depressa*)	CRPR 1B.2	Mason's lilaeopsis (*Lilaeopsis masonii*)	CRPR 1B.1
bristly sedge (*Carex comosa*)	CRPR 2B.1	Delta mudwort (*Limosella australis*)	CRPR 2B.1
pappose tarplant (*Centromadia parryi* ssp. *parryi*)	CRPR 1B.2	little mousetail (*Myosurus minimus* ssp. *apus*)	CRPR 3.1
Parry's rough tarplant (*Centromadia parryi* ssp. *rudis*)	CRPR 4.2	Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*)	CRPR 1B.1
Bolander's water hemlock (*Cicuta maculate* var. *bolanderi*)	CRPR 2B.1	bearded popcorn flower (*Plagiobothrys hystriculus*)	CRPR 1B.1
dwarf downingia (*Downingia pusilla*)	CRPR 2B.1	California alkali grass (*Puccinellia simplex*)	CRPR 1B.2
Jepson's coyote thistle (*Eryngium jepsonii*)	CRPR 1B.2	Sanford's arrowhead (*Sagittaria sanfordii*)	CRPR 1B.2
stinkbells (*Fritillaria agrestis*)	CRPR 4.2	Suisun Marsh aster (*Symphyotrichum lentum*)	CRPR 1B.2
fragrant fritillary (*Fritillaria liliacea*)	CRPR 1B.2		

Botanical surveys were performed during the appropriate bloom periods for the species, and no special status plants were observed within the BSA. Potential impacts and recommended avoidance and minimization measures for special status plant species are addressed in Chapter 4 of this NES. A delineation of aquatic resources identified approximately 29.013 acres (8,671.87 linear feet) of aquatic resources potentially subject to agency jurisdiction (i.e., waters of United States or waters of the state) within the BSA (Table S-1).

Table S-1. Summary of Aquatic Resources within the Biological Study Area

Feature Type	Acres[1]	Linear Feet
Wetlands		
Fresh Emergent Marsh	0.399	N/A
Seasonal Wetlands	4.002	N/A
Vegetated Ditches	7.553	N/A
Woody Riparian Wetlands	5.058	N/A
Wetlands Total	**17.012**	N/A
Other Waters		
Ephemeral Drainages	0.461	1,654.61
Intermittent Drainages	0.741	2,734.89
Perennial Drainages	5.692	1,148.01
Canals	1.523	3,134.36
Ponds	3.584	N/A
Other Waters Total	**12.001**	**8,671.87**

Implementation of project Alternatives 2a–7a is anticipated to result in approximately 0.022 acre (315.57 linear feet) of permanent impacts and approximately 0.124 acre (58.29 linear feet) of temporary impacts on potential waters of the United States or waters of the state. Implementation of project Alternatives 2b–7b is anticipated to result in approximately 0.055 acre (377.98 linear feet) of permanent impacts and approximately 0.12 acre (58.29 linear feet) of temporary impacts on potential waters of the United States/waters of the state (Table S-2).

Table S-2. Summary of Impacts on Aquatic Resources by Alternative

Feature ID	Water Feature	Acres		Linear Feet	
		Alt 2a-7a	Alt 2b-7b	Alt 2a-7a	Alt 2b-7b
PERMANENT IMPACTS					
Other Waters					
31	Canal		0.033		62.41
33	Ephemeral Drainage	0.022	0.022	315.57	315.57
Total Permanent Impacts on Potential Waters of the United States/waters of the state		**0.022**	**0.055**	**315.57**	**377.98**
TEMPORARY IMPACTS					
Wetlands					
07	Woody Riparian Wetland	0.002	0.002	N/A	N/A
Other Waters					
06	Perennial Drainage	0.005	0.005	12.67	12.67
04	Canal	<0.001	<0.001	3.03	3.03
31	Canal	0.028	0.028	42.59	42.59
46	Pond	0.084	0.084	N/A	N/A
Total Temporary Impacts on Potential Waters of the United States/waters of the state		**0.12**	**0.12**	**58.29**	**58.29**

Pursuant to Sections 404 and 401 of the Clean Water Act, authorizations from the U.S. Army Corps of Engineers (Corps) and the Regional Water Quality Control Board (RWQCB) would be required for impacts on waters of the United States. Impacts on waters of the state are also regulated by the RWQCB under Section 7 of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act). Avoidance and minimization measures 2–4 would be implemented during construction to protect water quality and minimize impacts on waters of the United States and waters of the state. A Lake or Streambed Alteration Agreement may be required from CDFW for project-related disturbance to features that have a bed, bank, or channel, or areas of adjacent riparian habitat. Potential impacts on sensitive aquatic resources subject to the Corps, RWQCB, or CDFW jurisdiction and recommended avoidance and minimization measures are addressed in Chapter 4.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ACRONYM/ ABBREVIATION	DESCRIPTION
%	percent
ºF	degrees Fahrenheit
amsl	above mean sea level
BA	Biological Assessment
BMPs	Best Management Practices
BSA	Biological Study Area
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CIPP	cast-in-place-pipe lining
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	U. S. Army Corps of Engineers
CR	County Road
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships System
Davis	city of Davis
DPS	distinct population segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESL	Environmental Study Limits
ESU	evolutionary significant unit
FC	federal candidate
FE	federally endangered
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FMP(s)	Fishery Management Plan(s)
FP	Fully Protected
FT	Federally Threatened
GGS	giant garter snake
HOT	High-Occupancy Toll
HOV	High-Occupancy Vehicle
I-5	Interstate 5
I-80	Interstate 80

ACRONYM/ ABBREVIATION	DESCRIPTION
ITS	Intelligent Transportation System
MBTA	Migratory Bird Treaty Act
MCV	Manual of California Vegetation
MLRA	Major Land Resource Area
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
PM(s)	Post Mile(s)
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
Project	03-3H900 Yolo 80 Corridor Improvement/YOL 80 Bus/Carpool Lanes Project
RWQCB(s)	Regional Water Quality Control Board(s)
SBI	Swaim Biological Inc.
SE	State Endangered
SNC(s)	Sensitive Natural Community(ies)
SSC	Species of Special Concern
ST	State Threatened
Stantec	Stantec Consulting Services Inc.
TMP	Transportation Management Plan
TMS	Transportation Management Systems
UCD	University of California, Davis
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
US-50	United States Route 50
VELB	valley elderberry longhorn beetle

CHAPTER 1. INTRODUCTION

On behalf of Caltrans, Stantec prepared this Natural Environment Study (NES) to evaluate the potential effects associated with implementing the proposed project on sensitive biological resources.

Caltrans, in collaboration with stakeholders, proposes to construct improvements consisting of managed lanes, pedestrian/bicycle facilities, and ITS elements along I-80 and US-50 from Kidwell Road near the eastern Solano County boundary (near Dixon), through Yolo County, and to West El Camino Avenue on I-80 and I-5 on US-50 in Sacramento County.

The project is programmed in the State Transportation Improvement Program, Caltrans State Highway Operation and Protection Program, Regional Surface Transportation Program, Congestion Management and Air Quality Improvement Program, and California Transportation Commission Trade Corridor Enhancement Program (Caltrans 2019).

1.1. Project Location

The 1,147-acre BSA consists of a linear alignment running a total of approximately 22 miles along I-80 and US-50 in Solano, Yolo, and Sacramento Counties. The west end of the BSA is at latitude 38.4862°, longitude -121.8072°; the northeast end of the BSA is at latitude 38.6166°, longitude -121.5334°; and the southeast end of the BSA is at latitude 38.5672°, longitude -121.5064° (North American Datum 83). The BSA is located within the ranges, townships, and sections (as presented in Table 1) of the Sacramento West, Davis, Merritt, and Dixon, California, U.S. Geological Survey (USGS) 7.5-minute series topographic quadrangles (Figure 1).

Table 1. Project Ranges, Townships, and Sections

Range	Township	Sections
4 East	9 North	22, 27, 28
	8 North	4, 5, 6
3 East	8 North	1, 2, 3, 4, 5, 7, 8, 9
2 East	8 North	11, 12, 14, 15, 21, 22, 31
1 East	8 North	36
	7 North	1

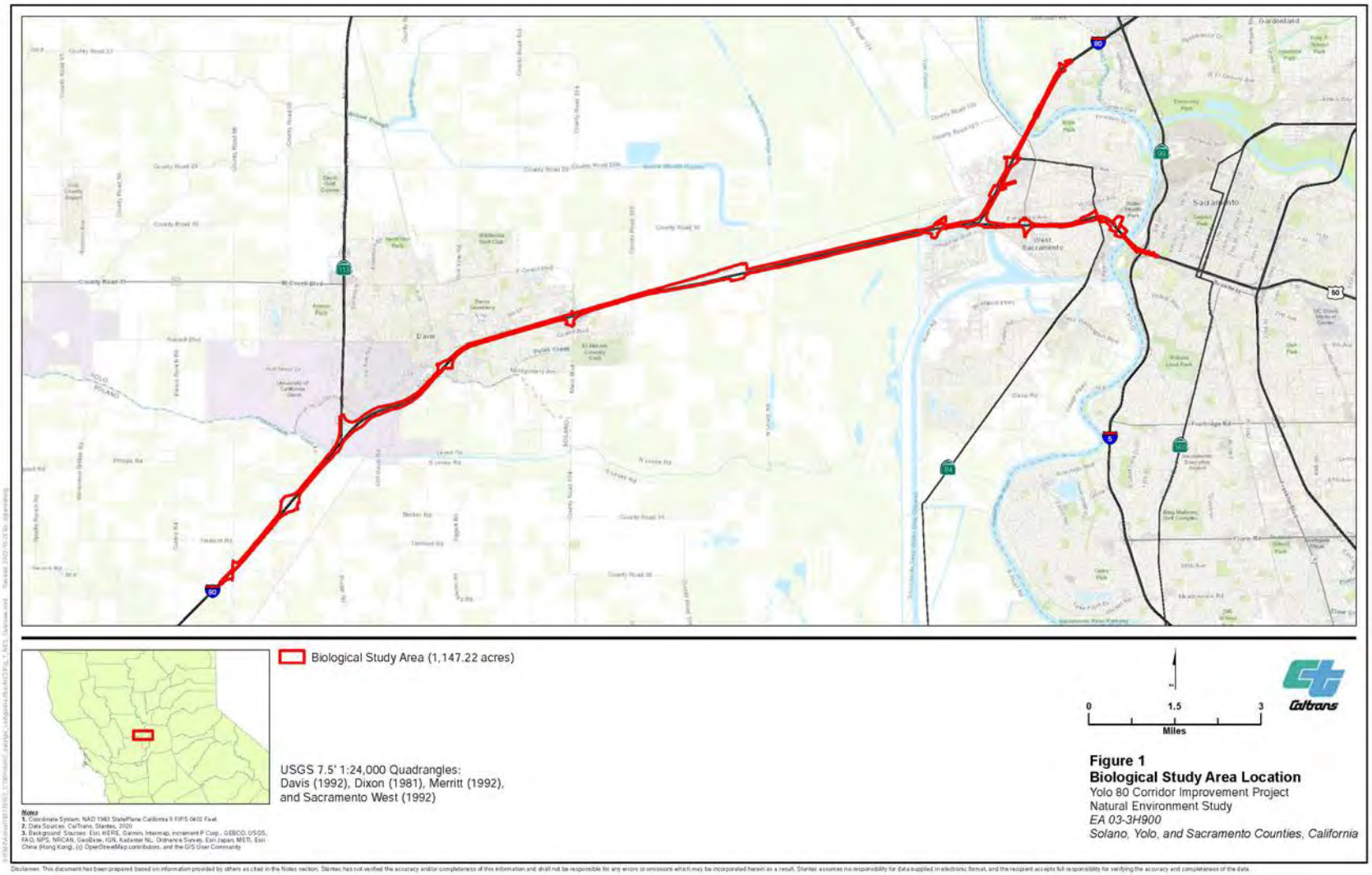


Figure 1. Biological Study Area Location Map

1.2. Project Purpose and Need

1.2.1. Purpose

The purpose of the project is to improve multimodal mobility on the I-80 and US-50 corridors in Solano, Yolo, and Sacramento Counties. The project will decrease congestion through the corridor and the effects congestion has on transit and freight. It will improve transit headway times, reliability, access, and viability through the corridor. The project will also increase people throughput by increasing transit, bicycle/pedestrian, and carpool use. Additionally, the project will address non-recurrent congestion caused by incidents, including collisions, by improving incident detection, verification, response, and clearing.

1.2.2. Need

I-80 and US-50 corridors experience high travel demand, especially during peak commute periods and weekends. The demand has created severe traffic congestion and impaired mobility along the route. Congestion at various locations, specifically I-80 through Davis and along the Yolo Bypass Causeway between Davis and the city of West Sacramento (West Sacramento), can be especially severe and is caused by a combination of high demand and bottleneck design. Traffic congestion along the I-80 and US-50 corridor within the project limits has impacted public transit headway times and reliability, especially during peak commute periods which are critical times for ridership. There is need to improve transit access and viability for Yolo Bus, Solano Transit, and upcoming electric buses between the University of California, Davis (UCD) campus and UCD Medical Center. The congestion also has impacts on freight headway times which can have negative effects on shipments such as produce which is prevalent along this corridor. Additionally, collision patterns and collision time of day is typical for a freeway segment with heavy congestion and stop-and-go conditions, affecting transit headway times and reliability, movement of freight, and commute times.

1.3. Project Description

The project is located in Solano, Yolo, and Sacramento Counties on the I-80 corridor between Post Miles (PMs) 40.7 and 44.7 in Solano County, between PMs 0.00 and 11.72 in Yolo County, and between PMs 0.00 and 1.36 in Sacramento County; and US-50 between PMs 0.00 and 3.12 in Yolo County and between PMs 0.00 and 0.617 in Sacramento County. The total project length is approximately 22 miles.

1.3.1. Project Alternatives

This section describes alternatives that were developed to meet the purpose and need of the project. The No-Build Alternative (Alternative 1) is described below.

Build Alternatives 2a, 2b, 3a, 3b, 4a, 4b, 5a, 5b, 6a, 6b, 7a, 7b

Build Alternatives 2a, 3a, 4a, 5a, and 6a propose the same geometric footprint, but would incorporate different managed lane types. Build Alternatives 2b, 3b, 4b, 5b, and 6b propose the same geometric footprint and include an I-80 managed lane direct connector but would incorporate different managed lane types. Build Alternatives 7a and 7b would not construct new lanes but would repurpose an existing lane instead. However, Build Alternative 7b would include the I-80 managed lane direct connector.

- Build Alternative 2a: Add a High-Occupancy Vehicle (HOV) lane in each direction for use by vehicles with two or more riders (HOV 2+).
- Build Alternative 2b: Add a HOV lane in each direction for use by vehicles with two or more riders (HOV 2+) and build an I-80 managed lane direct connector.
- Build Alternative 3a: Add a High-Occupancy Toll (HOT) lane in each direction for free use by vehicles with two or more riders (HOT 2+). Single-occupied vehicles would pay a fee for the lane usage.
- Build Alternative 3b: Add a HOT lane in each direction for free use by vehicles with two or more riders (HOT 2+) and build an I-80 managed lane direct connector. Single-occupied vehicles would pay a fee for the lane usage.
- Build Alternative 4a: Add a HOT lane in each direction for free use by vehicles with three or more riders (HOT 3+). Vehicles with less than three riders would pay a fee for lane usage.
- Build Alternative 4b: Add a HOT lane in each direction for free use by vehicles with three or more riders (HOT 3+) and build an I-80 managed lane direct connector. Vehicles with less than three riders would pay a fee for lane usage.
- Build Alternative 5a: Add an express lane in each direction (i.e., everyone paying a fee to use the lane, regardless of number of riders).

- Build Alternative 5b: Add an express lane in each direction (i.e., everyone paying a fee to use the lane, regardless of number of riders), and build an I-80 managed lane direct connector.
- Build Alternative 6a: Add a transit-only lane in each direction.
- Build Alternative 6b: Add a transit-only lane in each direction and build an I-80 managed lane direct connector.
- Build Alternative 7a: Repurpose the current number one general-purpose lane for use by vehicles with two or more riders (HOV 2+); no new lanes would be constructed.
- Build Alternative 7b: Repurpose the current number one general-purpose lane for use by vehicles with two or more riders (HOV 2+); no new lanes would be constructed. Build an I-80 managed lane direct connector.

The project also includes a number of standardized project features, which are employed on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the project.

The Build Alternatives consist of the following three geographic segments (Figure 2):

Segment 1: Segment 1 stretches from Kidwell Road in Eastern Solano County through Davis to the eastern end of the Yolo Causeway east of Enterprise Boulevard in West Sacramento. Segment 1 consists of three sub-segments:

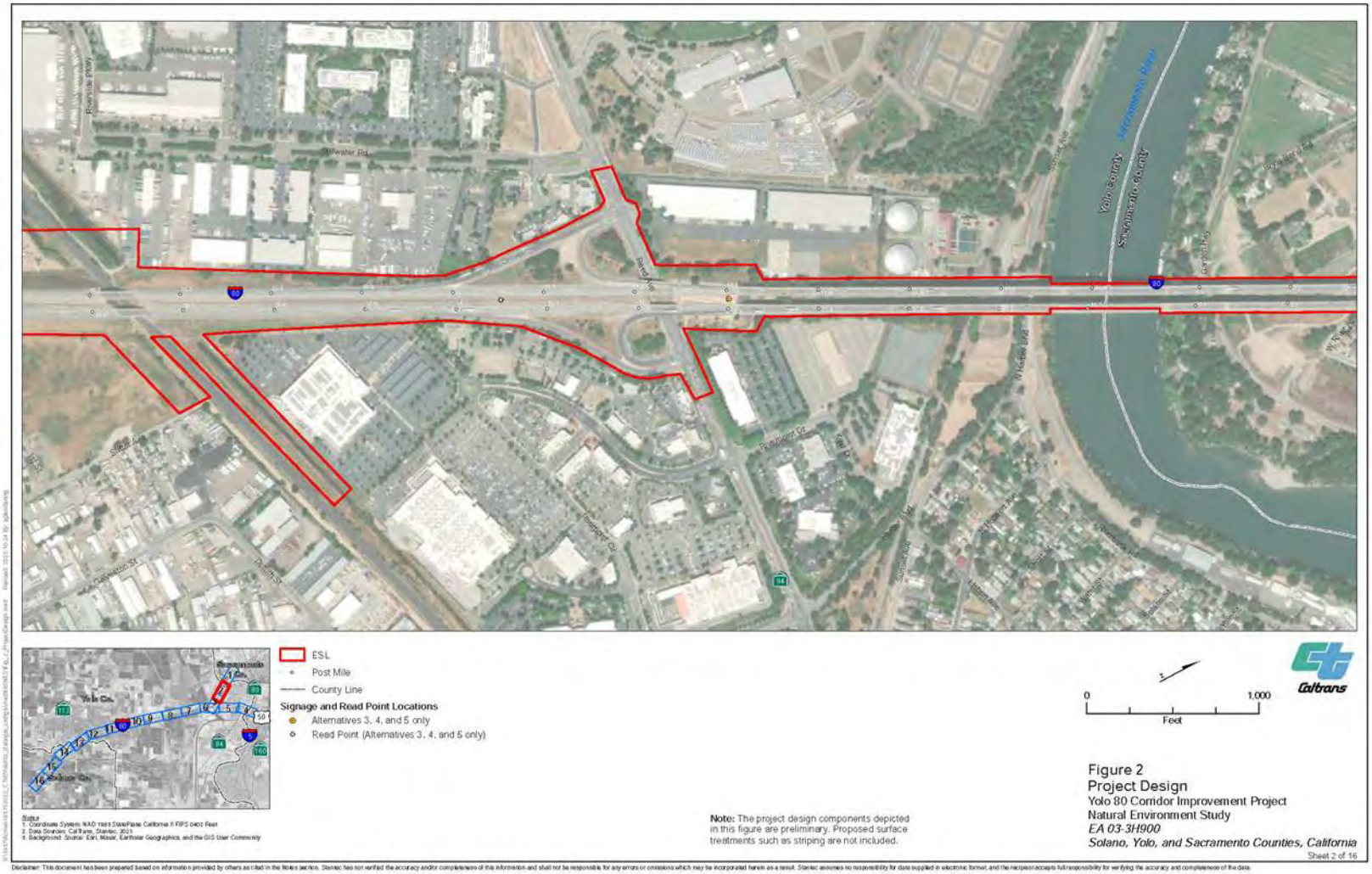
- *Segment 1a* is from Kidwell Road to Solano County/Yolo County Line.
- *Segment 1b* is from the Solano/Yolo County Line to west end of the Yolo Causeway.
- *Segment 1c* is from the start of the Yolo Causeway to east of Enterprise Boulevard.

Segment 2: Segment 2 picks up just east of Enterprise Boulevard and continues north on I-80 to West El Camino Avenue.

Segment 3: Segment 3 starts at the I-80/US-50 Separation and continues east along US-50 to I-5 near downtown Sacramento. Segment 3 consists of two sub-segments:

- *Segment 3a* is the I-80/US-50 Separation to Jefferson Boulevard Undercrossing.
- *Segment 3b* is the Jefferson Boulevard Undercrossing to just east of I-5.

Figure 2. Project Design


ESL
Post Mile
County Line
Signage and Read Point Locations
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
0
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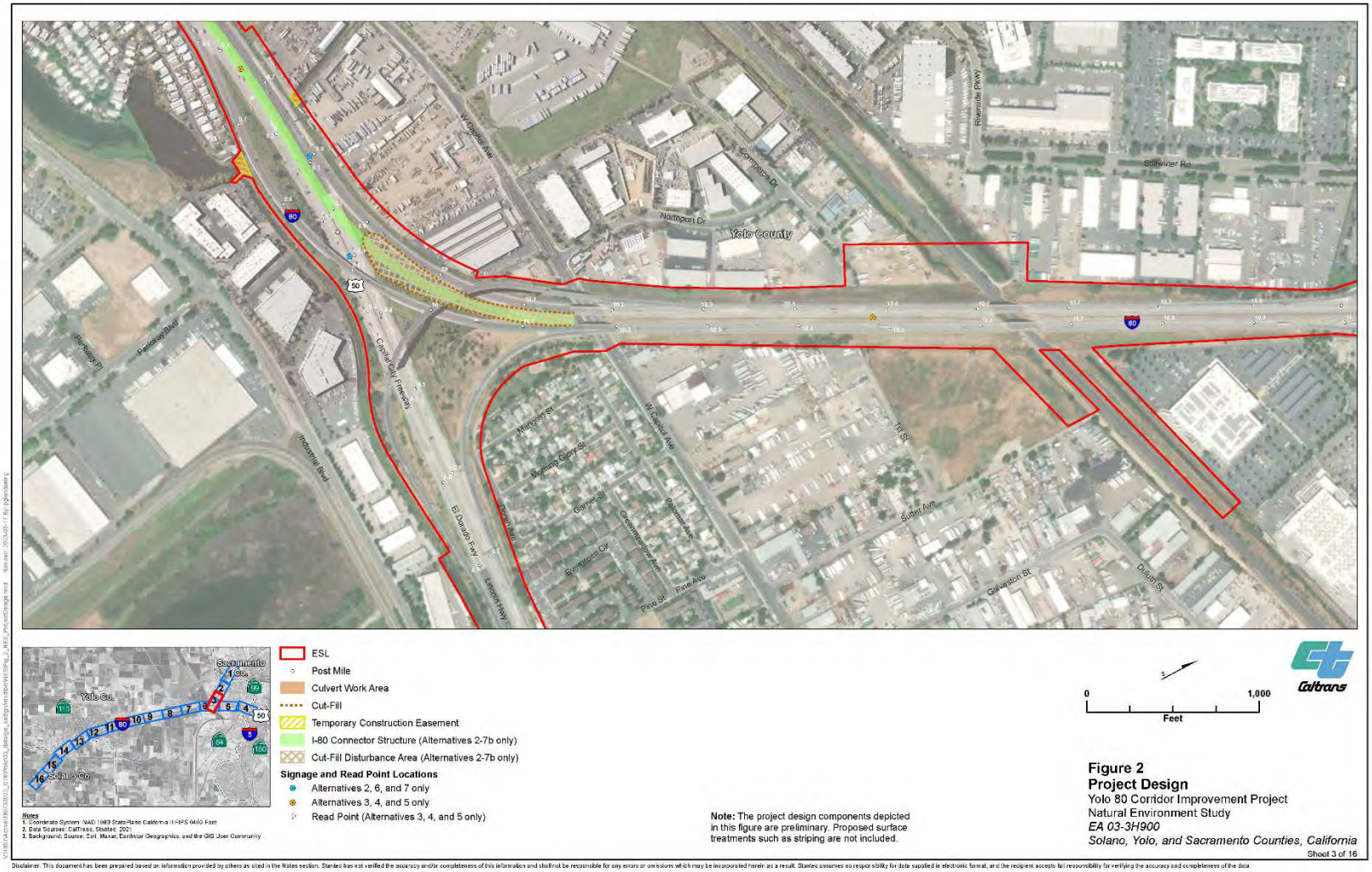
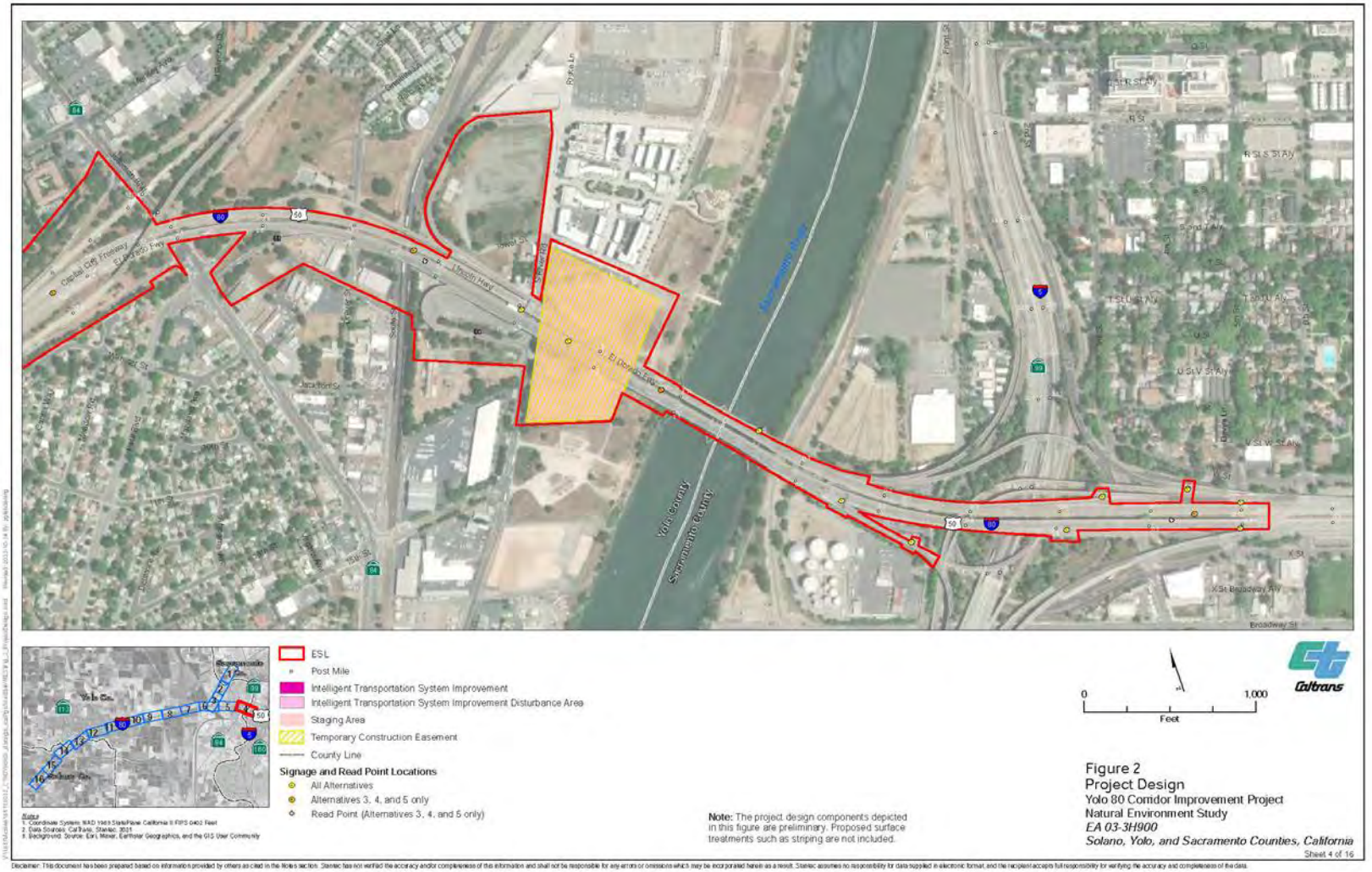
Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 2 of 16




ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Staging Area
Temporary Construction Easement
County Line
Signage and Read Point Locations
All Alternatives
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
Yolo County
Sacramento County
Sacramento River
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Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 4 of 16


ESL
Post Mile
Staging Area
Trash Rack
Signage and Read Point Locations
All Alternatives
Alternatives 2, 6, and 7 only
Alternatives 3, 4, and 6 only
Read Point (Alternatives 3, 4, and 5 only)
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Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
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Project Design
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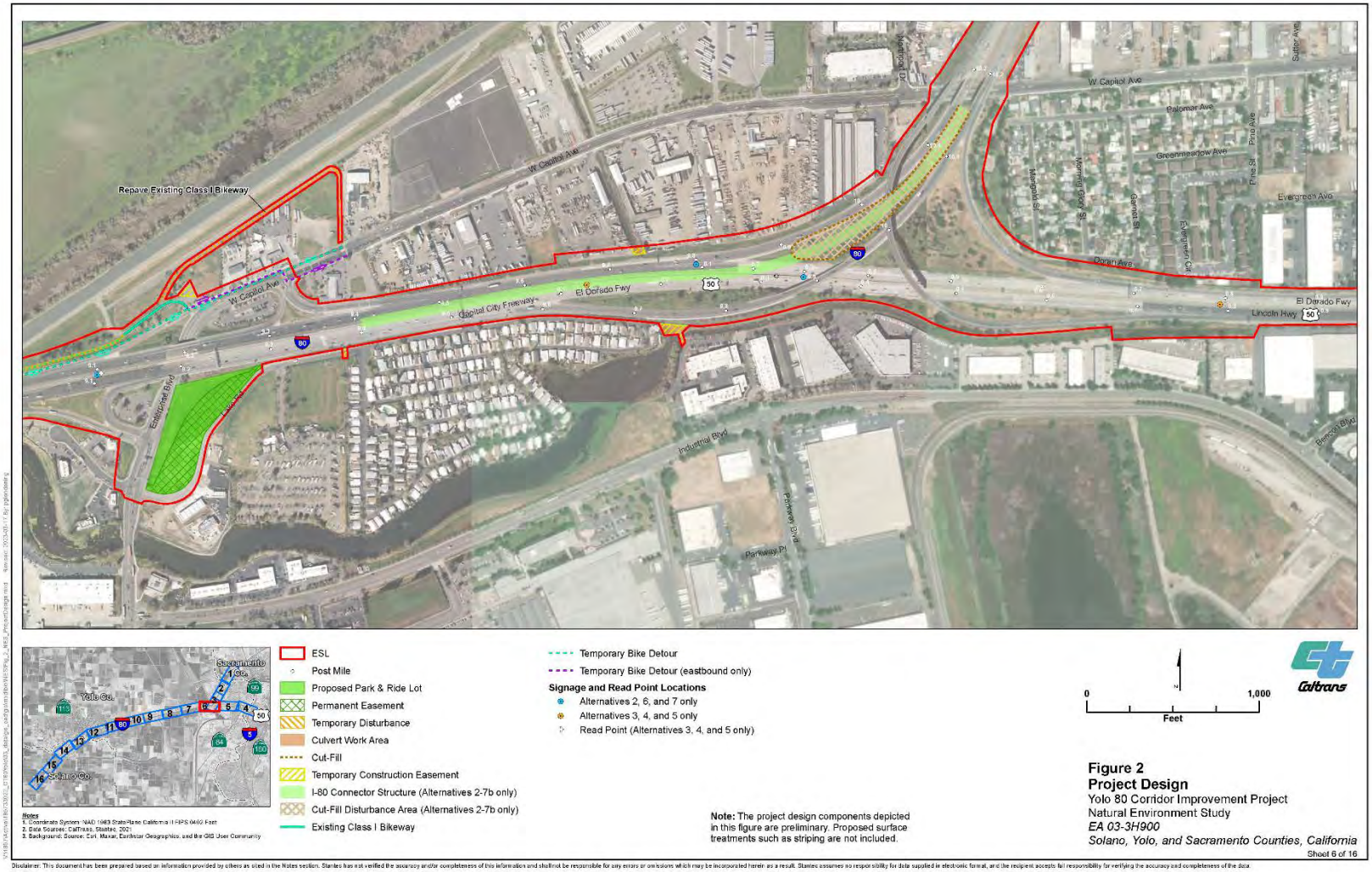
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 5 of 16



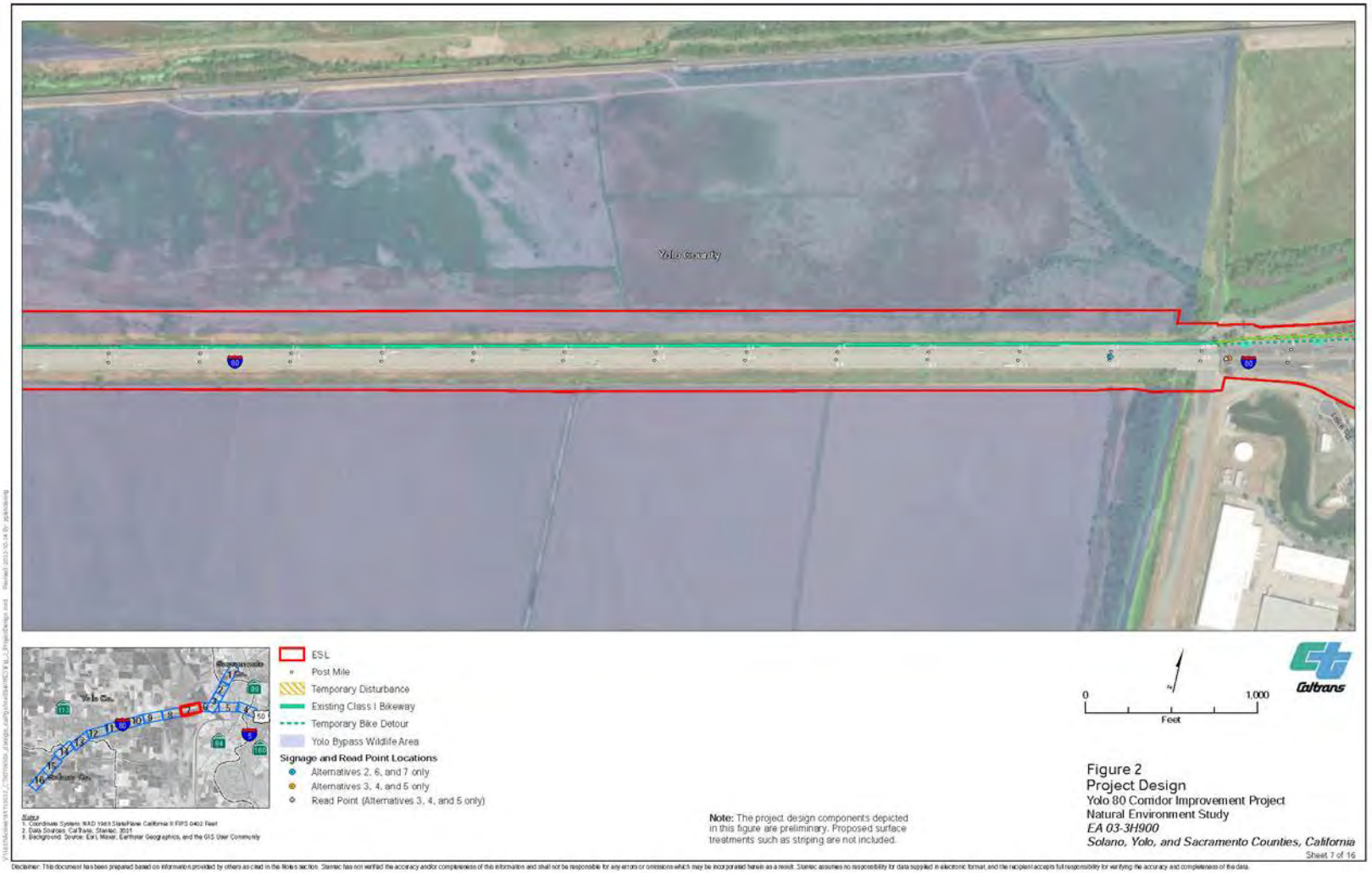

Yolo County
ESL
Post Mile
Temporary Disturbance
Existing Class I Bikeway
Temporary Bike Detour
Yolo Bypass Wildlife Area
Signage and Read Point Locations
Alternatives 2, 6, and 7 only
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
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Figure 2
Project Design
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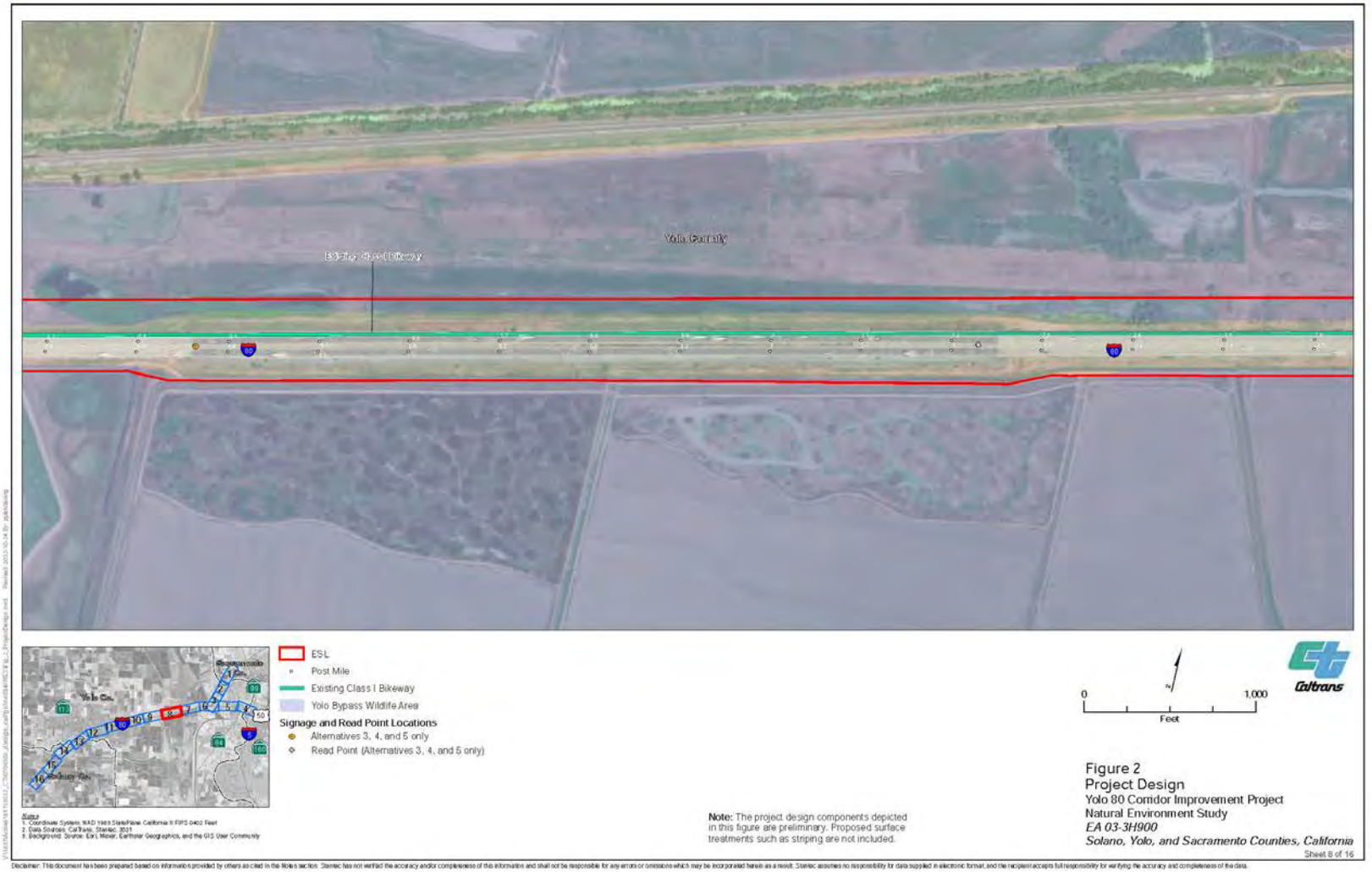
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 7 of 16


Yolo County
ESL
Post Mile
Existing Class I Bikeway
Yolo Bypass Wildlife Area
Signage and Read Point Locations
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
0
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Project Design
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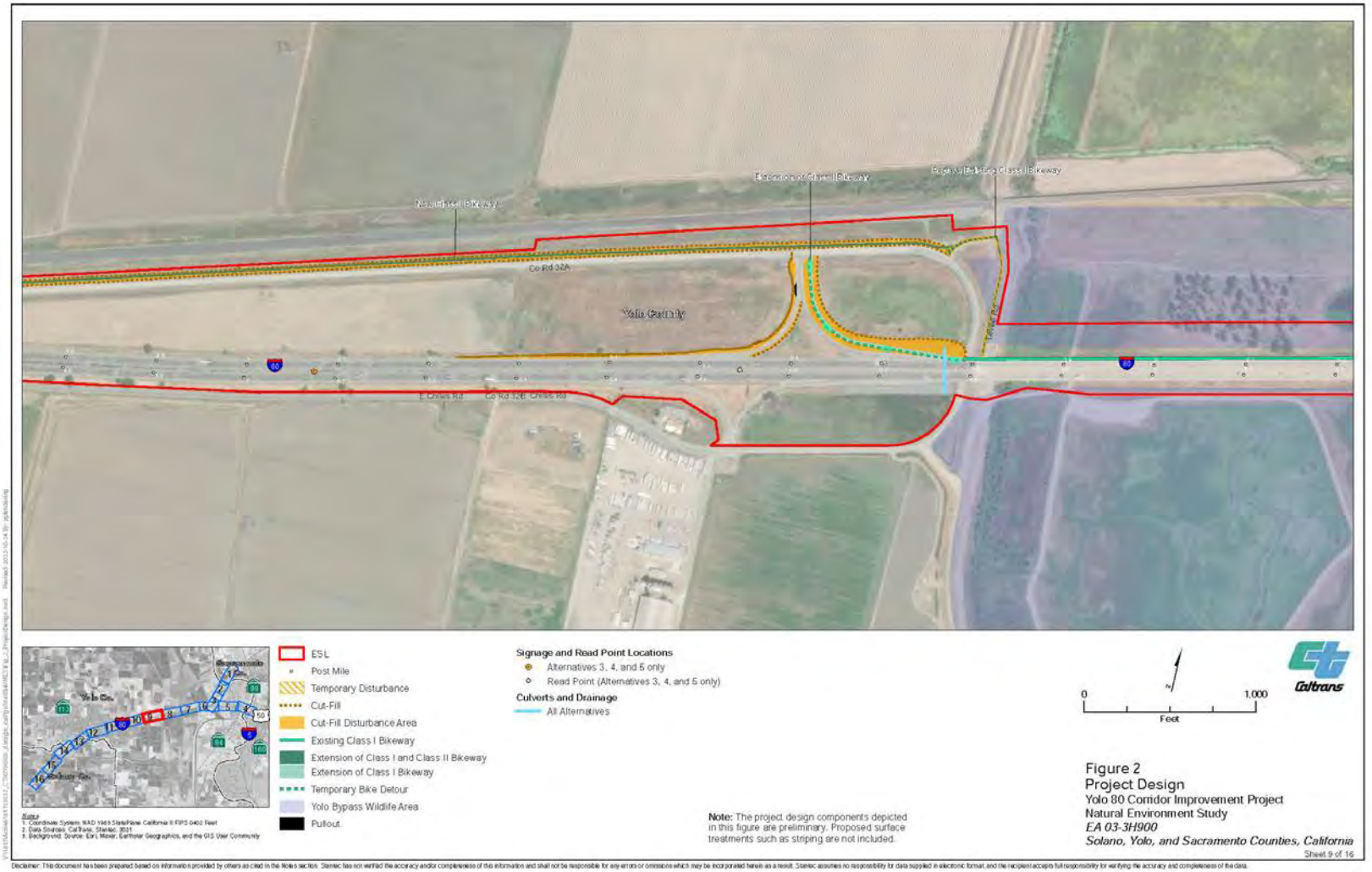
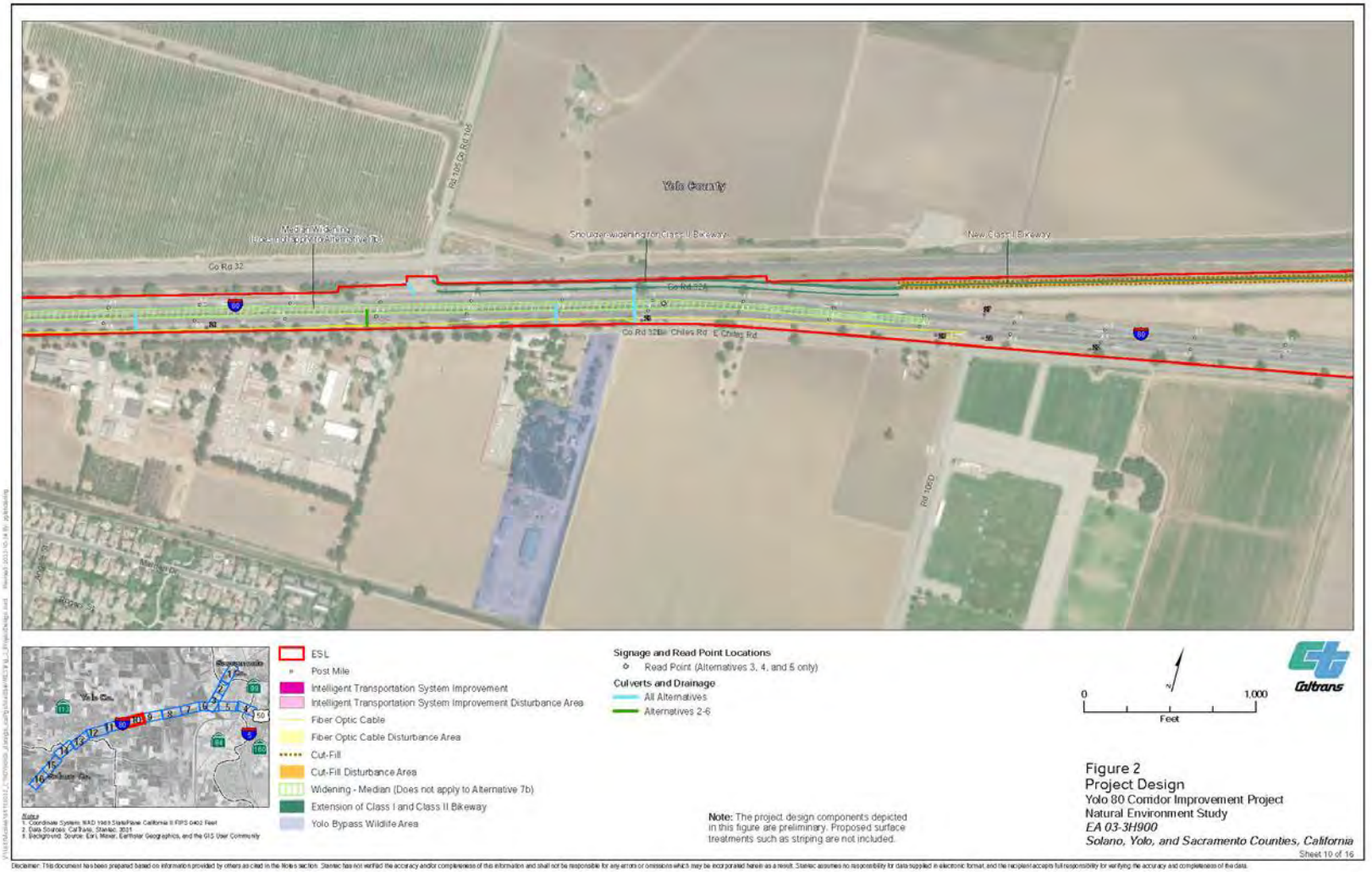
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 8 of 16


Co Rd 32A
Yolo County
E Chiles Rd
Co Rd 32B
ESL
Post Mile
Temporary Disturbance
Cut-Fill
Cut-Fill Disturbance Area
Existing Class I Bikeway
Extension of Class I and Class II Bikeway
Extension of Class I Bikeway
Temporary Bike Detour
Yolo Bypass Wildlife Area
Pullout
Signage and Read Point Locations
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
Culverts and Drainage
All Alternatives
0
1,000
Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 9 of 16


Yolo County
Co Rd 32
Co Rd 32A
Co Rd 32B
Chiles Rd
E Chiles Rd
Rd 105 Co Rd 105
Rd 106D
Median Widening
(Does not apply to Alternative 7b)
Shoulder widening for Class II Bikeway
New Class I Bikeway
ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
Cut-Fill
Cut-Fill Disturbance Area
Widening - Median (Does not apply to Alternative 7b)
Extension of Class I and Class II Bikeway
Yolo Bypass Wildlife Area
Signage and Read Point Locations
Read Point (Alternatives 3, 4, and 5 only)
Culverts and Drainage
All Alternatives
Alternatives 2-6
0
1,000
Feet
Caltrans
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 10 of 16
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.

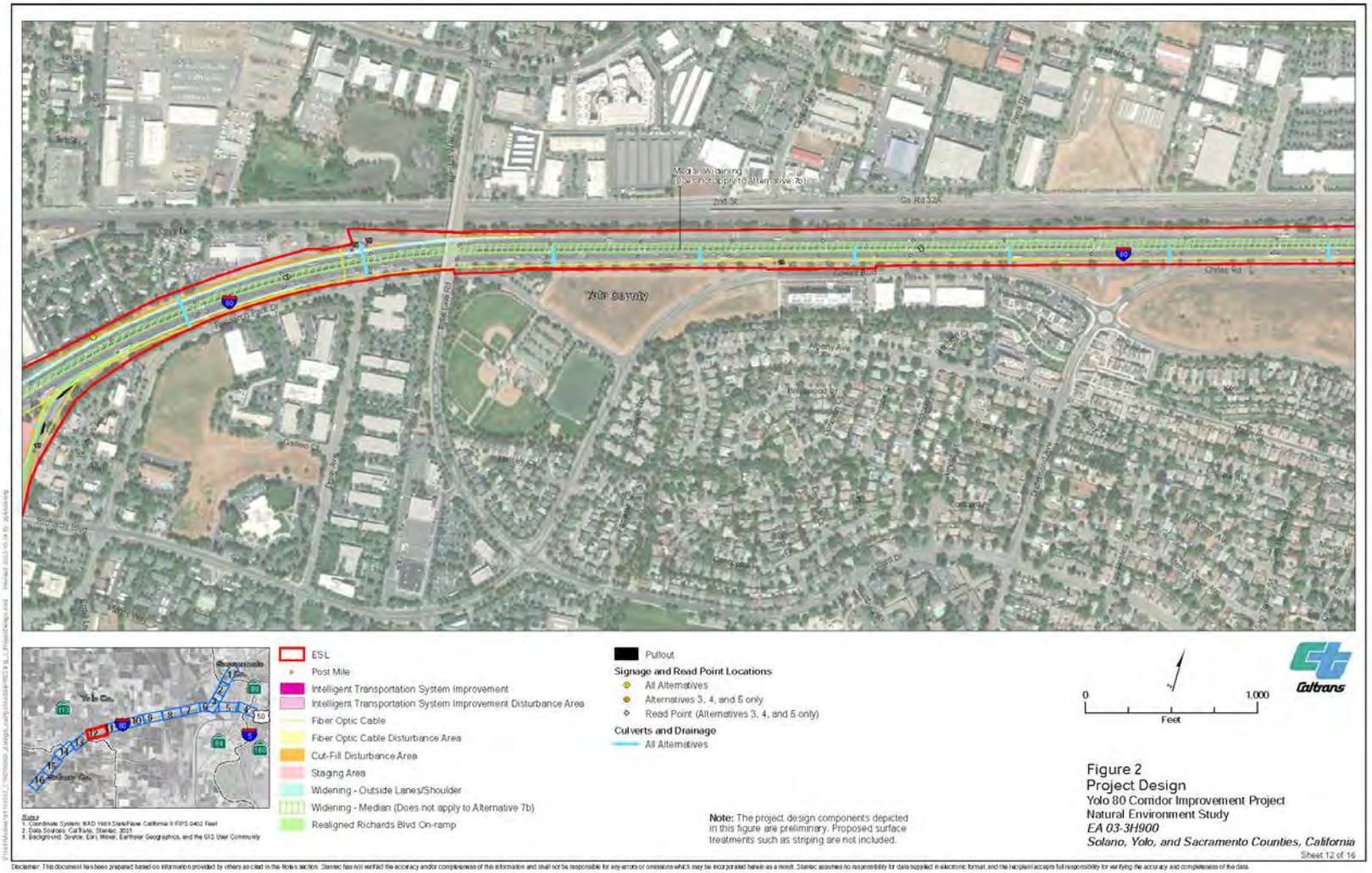

Median Widening
(Does not apply to Alternative 7b)
2nd St
Co Rd 32A
Yolo County
Chiles Rd
Albany Ave
ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
Cut-Fill Disturbance Area
Staging Area
Widening - Outside Lanes/Shoulder
Widening - Median (Does not apply to Alternative 7b)
Realigned Richards Blvd On-ramp
Pullout
Signage and Read Point Locations
All Alternatives
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
Culverts and Drainage
All Alternatives
0
1,000
Feet
Caltrans
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Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 12 of 16

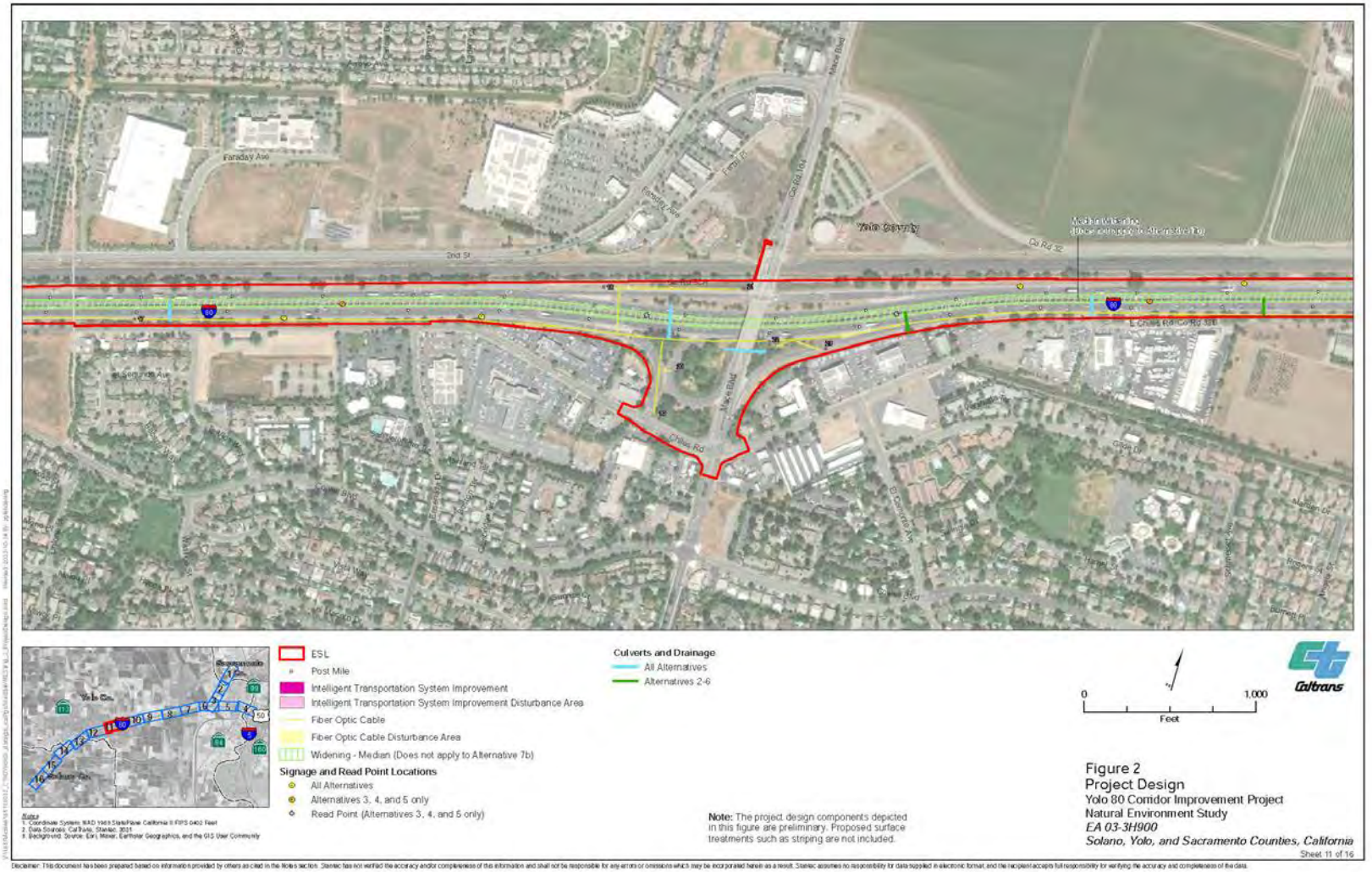
ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
Widening - Median (Does not apply to Alternative 7b)
Signage and Read Point Locations
All Alternatives
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
Culverts and Drainage
All Alternatives
Alternatives 2-6
0
1,000
Feet
Caltrans
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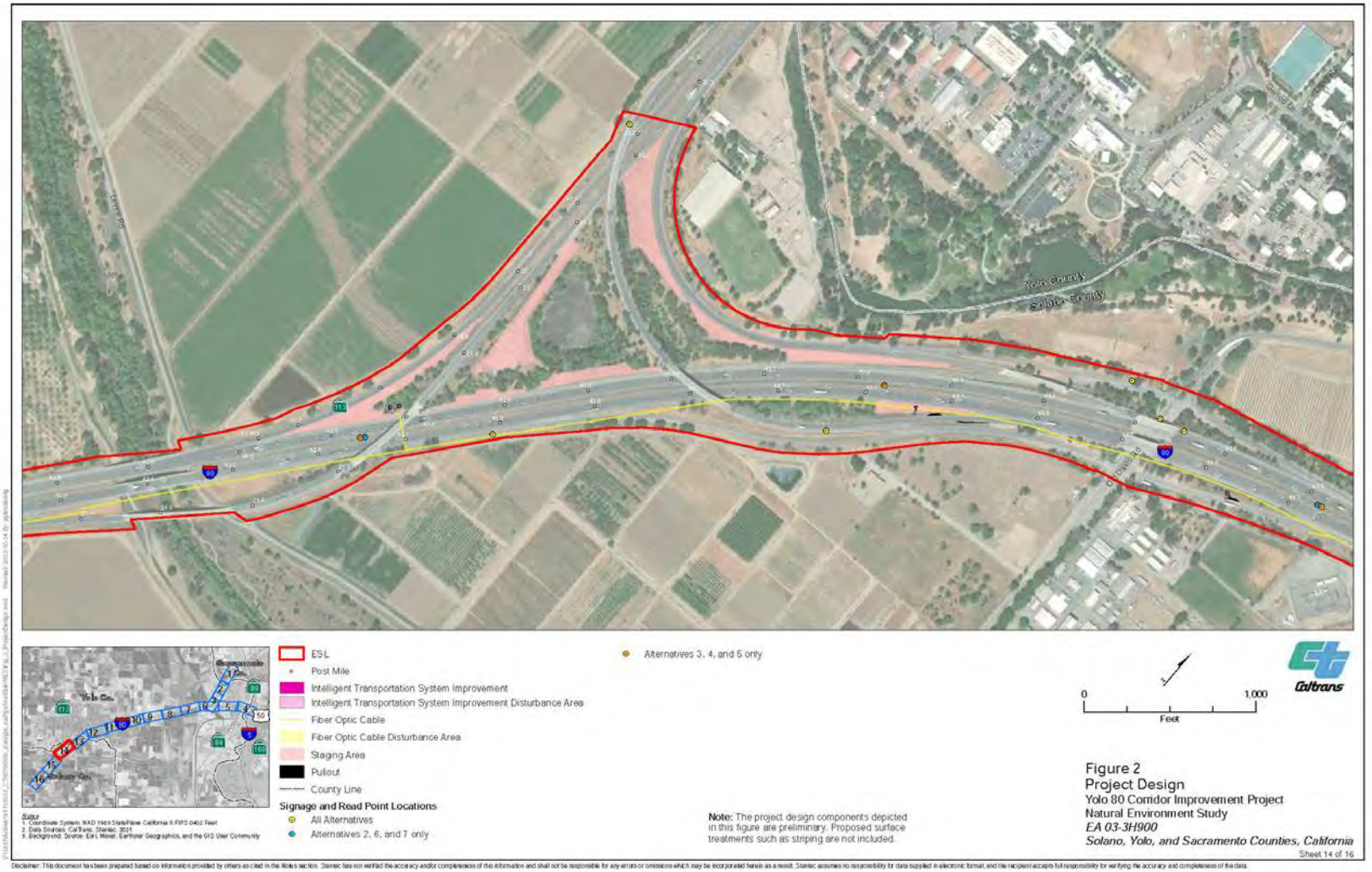
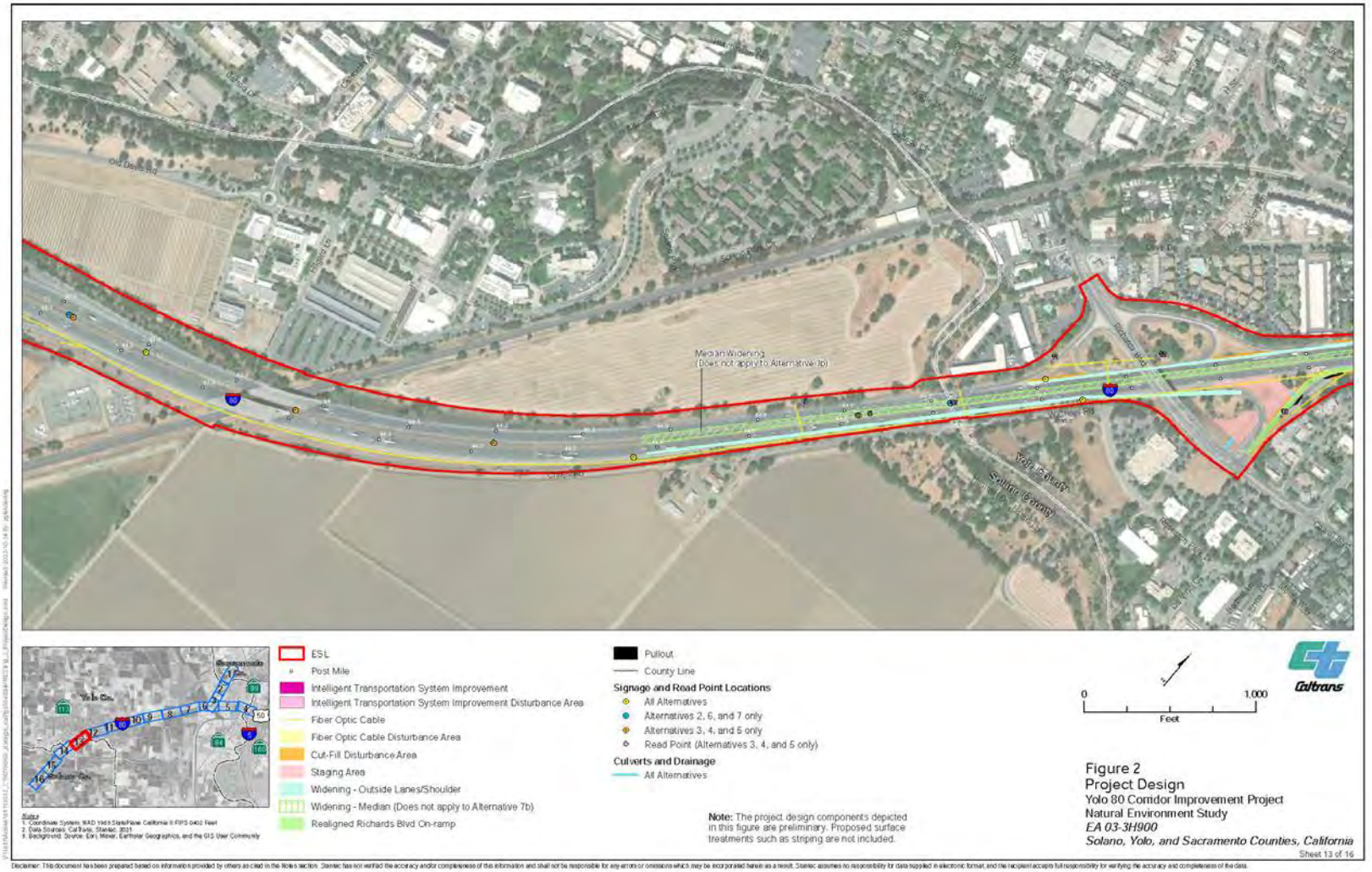
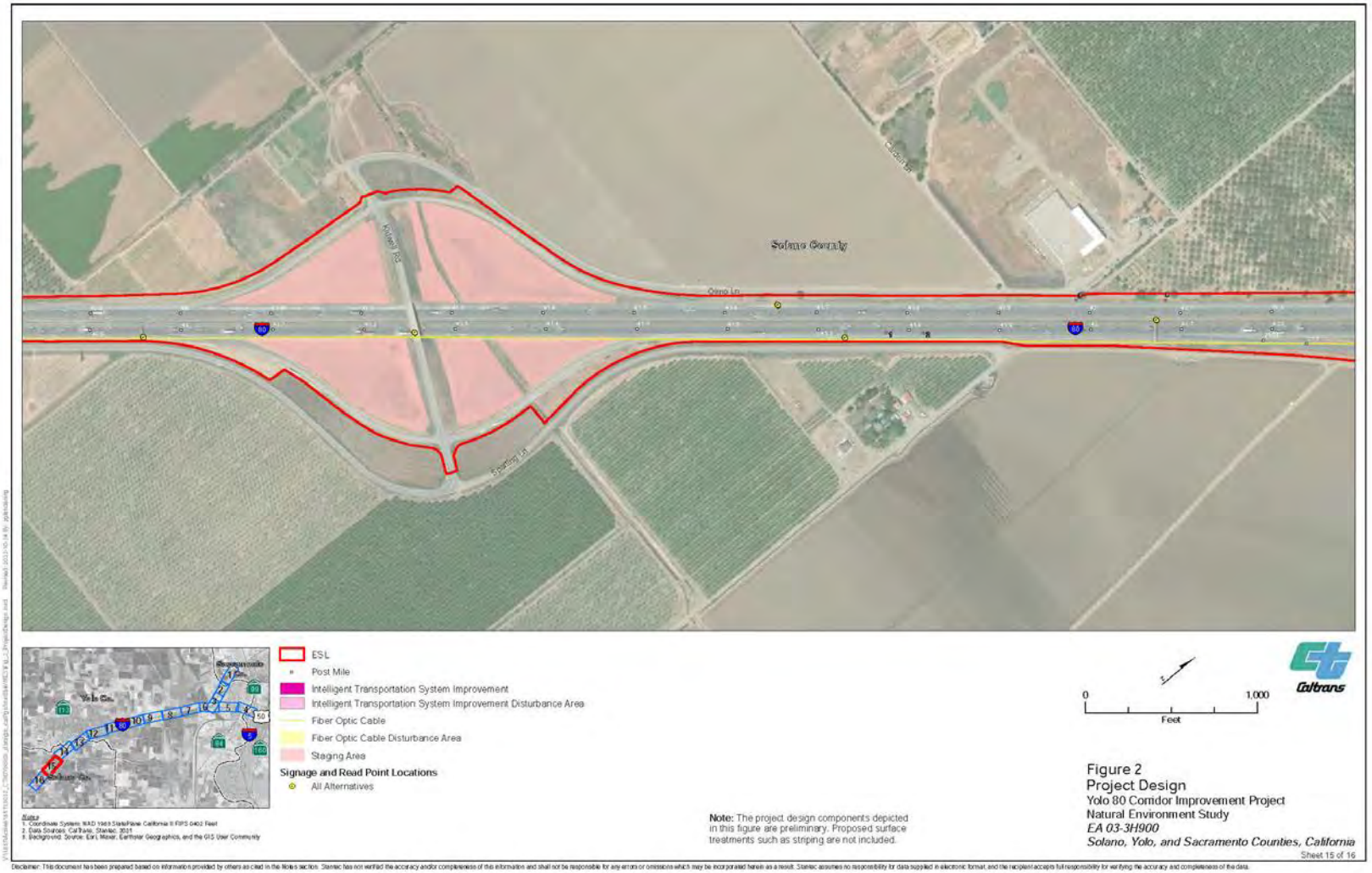
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 11 of 16


Yolo County
Solano County
ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
Staging Area
Pullout
County Line
Signage and Read Point Locations
All Alternatives
Alternatives 2, 6, and 7 only
Alternatives 3, 4, and 5 only
0
1,000
Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 14 of 16


Median Widening
(Does not apply to Alternative 7b)
ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
Cut-Fill Disturbance Area
Staging Area
Widening - Outside Lanes/Shoulder
Widening - Median (Does not apply to Alternative 7b)
Realigned Richards Blvd On-ramp
Pullout
County Line
Signage and Read Point Locations
All Alternatives
Alternatives 2, 6, and 7 only
Alternatives 3, 4, and 5 only
Read Point (Alternatives 3, 4, and 5 only)
Culverts and Drainage
All Alternatives
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
0
1,000
Feet
Caltrans
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 13 of 16


Solano County
Canon Ln
Meridian Rd
E Quarter Ln
ESL
Post Mile
Intelligent Transportation System Improvement
Intelligent Transportation System Improvement Disturbance Area
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
Staging Area
Signage and Read Point Locations
All Alternatives
0
1,000
Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
Figure 2
Project Design
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 15 of 16


Solano County
Sparling Ln
Yolo Co.
ESL
Post Mile
Fiber Optic Cable
Fiber Optic Cable Disturbance Area
0
1,000
Feet
Caltrans
Note: The project design components depicted in this figure are preliminary. Proposed surface treatments such as striping are not included.
Figure 2
Project Design
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Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 16 of 16

1.3.2. Common Design Features of the Build Alternatives

Common design features and standardized measures are shared among the Build Alternatives.

Managed Lanes

Managed lanes are highway facilities or a set of lanes where operational strategies are implemented to manage overall traffic congestion or in response to changing conditions (FHWA 2008). Managed lanes can include pricing, vehicle eligibility, or access control concepts. The lanes have flexibility to be used by different types of vehicles, depending on the need, and can be actively managed to accommodate peak travel demands. Managed lanes would be designated using a striping pattern to distinguish between the mixed-flow lanes.

Intelligent Transportation System/Transportation Management Systems

Each of the Build Alternatives would include placement of ramp meters and other ITS/Transportation Management Systems (TMS) such as closed-circuit television and changeable message signs. Several maintenance pull-outs are proposed adjacent to I-80 on-ramps to accommodate an electrical cabinet for proposed ramp meters or other ITS/TMS infrastructure.

Proposed ITS elements would be installed on a new pole foundation; some existing ITS infrastructure in these locations would be abandoned or replaced. Accordingly, it is assumed that each ITS pole foundation would have up to a 6-foot radius permanent footprint with up to a 10-foot radius temporary area for construction.

Structure Modifications

As summarized in Table 2, Build Alternatives would add improvements to existing structures to accommodate proposed Managed Lanes

Table 2. Structure Modifications

Structure Name	Structure Number	Route	Post Mile	Alternative	Structure Work
South Fork Putah Creek	23-0054 R	Sol 80	42.36	All Build Alternatives	Place fiber optic conduit
Old Davis Rd Undercrossing	23-0155R	Sol 80	R43.5	All Build Alternatives	Place fiber optic conduit
South Davis Overhead	23-0156R	Sol 80	R43.93	All Build Alternatives	Place fiber optic conduit
Putah Creek Pedestrian Undercrossing	22-0194	Yol 80	0.01	All Build Alternatives	Place fiber optic conduit
Richards Boulevard Overcrossing RW NO. 3	TBD	Yol 80	0/0.60	All Build Alternatives	Retaining wall at abutment along eastbound I-80 off-ramp to Richards Boulevard
I-80 Managed Lane Direct Connector	TBD	Yol 80	9.5/10.0	Build Alternatives 2b, 3b, 4b, 5b, 6b, 7b	Proposed managed lane connector retaining wall #1; proposed managed lane connector retaining wall #2

Source: Caltrans Draft Project Report (July 2021)

Ramp Modifications

Within Segment 2, eastbound ramp modifications would be constructed at the I-80 eastbound on-ramp from Richards Boulevard to accommodate realignment within the right-of-way. In addition, ramp modifications would occur at the I-80 westbound off-ramp to County Road (CR)-32A/Chiles Road to accommodate additional bicycle/pedestrian pathway within the right-of-way.

Bicycle/Pedestrian Facilities

The Build Alternatives would replace the existing bicycle pathway pavement behind the gas station located north of West Capitol Avenue from PM 9.15 to PM 9.35. The existing bicycle pathway would be rerouted during repaving activities for up to two months, but repaving activities may occur at nighttime to minimize access disruption. To maintain access, bicycles traveling westbound would be redirected along West Capitol Avenue. Bicycles traveling eastbound would be redirected along a short segment of sidewalk on West Capitol Avenue

and use the crosswalk at the West Capitol Avenue/I-80 westbound off-ramp intersection[1]. Bicyclists would then continue eastbound along West Capitol Avenue using the existing bicycle lane. Caltrans would add crosswalk pavement marking across the westbound I-80 off-ramp to West Capitol Avenue and near the existing West Capitol Avenue crosswalk. In addition, Caltrans would add advanced warning signs to alert the motorists traveling on the westbound I-80 off-ramp to West Capitol Avenue before reaching the proposed crosswalk. Caltrans would place signage as part of the traffic management plan to note the access updates and identify the bicycle/pedestrian detours.

The Build Alternatives would also replace the existing bicycle pathway pavement from PM 9.1 to the Yolo Causeway bridge deck approach at approximately PM 8.9. While the existing Class I bicycle pathway is closed, a temporary bicycle pathway with a K-rail barrier would be placed along the I-80 westbound on-ramp from West Capitol Avenue. Up to 100 linear feet of existing barrier near PM 8.9 would be removed and realigned to allow bicycles to rejoin the existing Class I bicycle pathway along Yolo Causeway. The existing pathway would not require closure during construction activities.

The Build Alternatives would extend the westernmost limit of the existing Class I bicycle pathway from I-80 along Yolo Causeway to connect to CR-32A. The pathway extension would be located adjacent to the I-80 westbound off-ramp to CR 32A and would be approximately 12 feet wide. The area surrounding the pathway extension would be graded to comply with the Americans with Disabilities Act of 1990 regulations. A concrete barrier would separate the pathway extension from westbound off-ramp vehicular traffic. Once construction of the pathway extension along the I-80 westbound off-ramp is complete, the Build Alternatives would conduct pavement rehabilitation from CR 32A to Levee Road. During pavement rehabilitation activities, Levee Road would be closed. Bicycles would be redirected along the newly constructed pathway extension along the I-80 westbound off-ramp to access the existing Class I bicycle pathway along Yolo Causeway, which would be built prior to rehabilitation activities on Levee Road.

The Build Alternatives would include widening the shoulders of CR-32A from the existing Levee Road path to just east of CR-105 to accommodate a standard Class I bicycle path. In addition, the Build Alternatives would include widening the shoulders of CR-32A from CR-105 to the proposed Class I bicycle path along CR-32A to accommodate a standard Class II bicycle lane. Construction of the Class II bicycle lane would involve widening the shoulders by 4 feet for the Class II 6-foot lane on both sides with standard edge line striping. No

[1] City of West Sacramento Municipal Code 10.32.020 states that bicycles are permitted on the public sidewalk but shall yield to any pedestrian.

barriers would be constructed. Caltrans would coordinate with Yolo County Public Works Department to complete this bicycle pathway design along CR 32A.

Park-and-Ride Facility

Within Segment 2 of each of the Build Alternatives, a Park-and-Ride Facility would be constructed on the east side of Enterprise Boulevard in a 4.5-acre lot and would provide for approximately 300 parking spaces. Users of the Park-and-Ride Facility would have the option to park their cars for the day and connect to several counties and regional transit services. The facility would be located partially within existing Caltrans right-of-way and partially outside the existing Caltrans right-of-way. Landscaping and nighttime lighting are proposed at the Park-and-Ride Facility.

Signage

The Build Alternatives would include roadside signs and overhead signs to provide symbolic or text messages that would guide and warn motorists and regulate the flow of traffic. Some of the signs would have hours of operation that restrict certain class of vehicles during peak periods. Other signs would provide motorists with information about the conditions.

Roadside signs would include regulatory and warning signs, route shields, and guide signs. These signs would be located on wood or metal posts. Wood posts would be approximately 6 inches by 6 inches while metal posts would be approximately 2.5 inches by 2.5 inches. Roadside signs would be mounted on the freeway concrete median barrier or placed adjacent to the edge of the travel way up to 30 feet. However, placement of roadway signs would avoid environmentally sensitive areas.

Overhead signs would be mounted on versatile truss structures spanning above the travel lanes. The total height of the overhead sign structure (including the sign) would depend on the type of sign being mounted but would not likely exceed 40 feet in height. Overhead sign structures would have a concrete foundation of up to 6.5 feet diameter and would either be supported on a cast-in-drilled-hole pile foundation or supported by a structure.

Lighting

Street lighting would be added near CR-32A at the proposed bicycle pathway extension adjacent to the I-80 westbound off-ramp. Within Segment 2, bridge deck lighting with Type 21 Barrier-Rail-Mounted Lighting Standards would be constructed. Additional street lighting would be added to the Bryte Bend Bridge (I-80 Sacramento River Bridge Overhead), but it may also be added at proposed auxiliary lane locations if determined necessary during the

design phase. Some nighttime lighting would occur during nighttime construction work activities as well as at the Park-and-Ride facility. Signage would use reflective lettering.

Road Cut/Fill

Some locations would require full structural section reconstruction, and other locations would require cut or fill of the embankment due to road widening.

Grinding

Cold planing—the process of removing part of the surface of a paved area—would be required throughout the project limits, including for ramp conforms at all ramps, and may also be required at other locations along the travel way wherever hot mix asphalt is currently in place. A mill (cold planing) and fill operation may be proposed to repair roadway surface scarring that occurs during temporary restriping associated with some stage construction operations.

Site Preparation

Site preparation would include delineating construction work areas, installing environmentally sensitive area fencing around sensitive habitats and cultural resource areas, installing wildlife exclusion fencing around staging areas, installing Best Management Practices (BMPs) in accordance with the project's Stormwater Pollution Prevention Plan, and removing vegetation.

Vegetation and Tree Removal

Vegetation clearing would be required and would be confined to the area within the project footprint, including construction access routes. Vegetation removal and clearing would be completed with hand tools where possible. Chainsaws, grinders, and excavators would be used for vegetation that cannot be removed by hand.

All vegetation would be removed within proposed cut and fill lines, as well as within temporary impact lines. Within areas of temporary impact, it may be possible to avoid some vegetation removal.

Utilities Relocation

Build Alternatives 2a, 3a, 4a, 5a, 6a, and 7a would not result in potential conflicts with existing utilities that are present along the I-80/US-50 corridor. Utility companies would require verification of facilities and involvement in construction plans. Accordingly, prior to construction, an estimated 15 test hole sites would be drilled at eight different locations for natural gas lines running transversely underneath I-80, the Yolo Causeway, and West Capitol Avenue in Sacramento where the new managed lane would be constructed with retaining walls and columns. In the event of positive findings, it would be determined 1) whether the

gas line(s) required relocation or 2) how to redesign project components to avoid conflicts with existing utilities.

Under all Build Alternatives, removal of an existing overhead sign near Westacre Park, within Caltrans right-of-way, would require an overhead electrical distribution line to be temporarily de-energized. Under Build Alternatives 2b, 3b, 4b, 5b, 6b, and 7b, up to four 115-kilovolt overhead utility towers may be relocated or tower height increased near the new I-80 managed lane direct connector at the I-80/US-50 Separation in West Sacramento.

Fiber Optic Cable

The Build Alternatives would install a fiber optic cable line and associated fiber optic splice boxes within the roadbed at the eastbound outside shoulder of I-80 from west of Kidwell Road in Solano County at PM 440.70 to PM 4.35 in Yolo County. Cut and cover or trenching would be the primary construction method and would require excavation of up to 42 inches deep to install within a 12-foot buffer surrounding the running line. Fiber optic cable may also be placed via directional borings to avoid conflicts with existing utilities.

Right-of-Way and Temporary Construction Easements

The Build Alternatives would require Caltrans to acquire two private fee parcels to construct the proposed park-and-ride facility at Enterprise Boulevard (2.8 acres). A total of five temporary construction easements would be required along the project alignment for a total of 12.24 acres. No displacement of any residences or businesses would be required.

Staging Areas

Staging areas would be located at the I-80/West El Camino Avenue Interchange, South River Road, I-80/Richards Boulevard Interchange, the I-80 and SR-113 Interchange, West Capitol Avenue, and along Kidwell Road. These areas total 53.31 acres and would be used for equipment maintenance and storage of equipment, construction materials, fuels, lubricants, solvents, and other possible contaminants during construction.

Traffic Management

Various Transportation Management Plan elements such as portable changeable message signs and the California Highway Patrol Construction Zone Enhanced Enforcement Program would be used to minimize delays to the traveling public. Flaggers would be used to divert traffic. Prior to construction, a detailed Transportation Management Plan (TMP) would be prepared. Recommendations for the TMP would include items such as no lane, ramp, or shoulder closures during daytime and peak commute hours on weekdays, a minimum of three

paved traffic lanes open in each direction of travel at all times on highways, and other items to maintain traffic connectivity.

Ramp closures are anticipated at all ramp locations adjacent to proposed widening or proposed mainline paving and would occur for up to 15 days. Traffic would be detoured to the next interchange and with an expected delay of 5 minutes.

A temporary, full closure may be needed on westbound US-50. Closures would be during night or during a continuous operation (24 or 48 hours). The primary detour for westbound US-50 traffic would be to use northbound I-5 to westbound I-80. Local traffic would use other interchanges in the area. Any full closures would be scheduled to take place during the hours of the lowest volume of traffic.

Construction Equipment

The construction equipment used for all Build Alternatives would be similar. Center median work would use excavators, scrapers, motor graders, loaders, backhoes, pavers, concrete barrier slip form pavers, truck mounted cranes, 18-wheel trucks, dump trucks, and water trucks. Reconstruction and modification of ramps/gores/shoulder embankments would use excavators, motor graders, loaders, backhoes, pavers, 18-wheel trucks, dump trucks, and water trucks. Road surfacing work, including placement for sensors in the road surface, would use core drillers, trailers containing and dispersing sealant, and water trucks.

Construction of the I-80 managed lane direct connector under Build Alternatives 2b, 3b, 4b, 5b, 6b, and 7b would require pile driving to install the footings to a depth of up to 40 feet. Equipment would also include a crane (for pile driving), excavator, dozer, loader, manlift, articulated 4x4 forklift, truck, dump truck, trailer unit air compressor, and water truck. This construction equipment would also be used for structural sign mounts along with a truck-mounted crane for all Build Alternatives. A truck-mounted auger would be used for installing roadside signs.

Ground Disturbance

The depth of ground disturbance would vary throughout the project limits. At locations where changeable message signs, sign structures, or piles would be installed, disturbance could exceed up to 30 feet. At locations of culverts, depth of ground disturbance could vary from 3 feet to 10 feet (estimated depth to bottom of culvert/inlet). At locations of linear electrical facilities such as fiber optic and conduit installations, the ideal depth is typically 48 inches (assuming 42 inches of cover). However, depth could be increased to avoid conflicts with existing or proposed drainage.

Site Cleanup and Post-Construction Activities

All construction materials and debris would be removed from the construction work areas and recycled or properly disposed of offsite. Caltrans would restore all areas temporarily disturbed by project activities, such as staging areas and access roads, to near or better than pre-construction conditions in accordance with applicable permits and Caltrans requirements.

Construction Schedule

Construction of the project is anticipated to take approximately three years to complete and is expected to commence in spring 2025 following completion of the CEQA process, receipt of all regulatory permits and approvals, and selection of a contractor. Due to high daytime traffic volumes, night work would be expected. Both day and night work should be anticipated throughout the project duration.

Descriptions of the unique features associated with some of the build alternatives are described below.

Site Build Alternatives 2a and 2b: HOV 2+ Managed Lane

Lane Configuration – Build Alternatives 2a and 2b

Build Alternatives 2a and 2b would begin at the Solano/Yolo County Line west of Davis to West El Camino Avenue on I-80 and end at I-5 on US-50 in Sacramento County. Build Alternatives 2a and 2b would include an HOV 2+ managed lane in the eastbound and westbound directions. This would be accomplished by constructing in the median from the Solano/Yolo County line to west of the Yolo Causeway and continuing eastward by restriping to West El Camino Avenue on I-80 and to I-5 on US-50 in Sacramento County.

Build Alternative 2b would involve construction of an I-80 managed lane direct connector in addition to the construction activities planned for Build Alternative 2a. The I-80 managed lane direct connector would provide a direct connection of the HOV 2+ managed lane by flying over US-50 at the I-80/US-50 Interchange. The connector would include a retaining wall on either side and would travel underneath the existing eastbound connector from I-80 to US-50. The proposed managed lane direct connector would be constructed of columns and include concrete barrier type 842 railings.

- **Segment 1:** Segments 1a, 1b, and 1c would be restriped with 6-inch thermoplastic traffic stripes for three mixed-flow lanes and one managed lane in both eastbound and westbound directions.

Within Segment 1b, from just west of the Solano/Yolo County Line to the west end of the Yolo Causeway, the project would involve replacement of the existing inside shoulders and construction of the eastbound and westbound median from around Richards Boulevard to 1.5 miles east of Mace Boulevard to accommodate managed lanes in the eastbound and westbound directions. The new shoulders and construction areas would be asphalt concrete material. The median barriers would be upgraded from a metal beam guard rail to a reinforced concrete barrier.

- **Segment 2:** Within Segment 2, the Bryte Bend Bridge would be restriped to accommodate the HOV 2+ managed lane in each direction. Reducing lane and shoulder widths would accommodate a fourth lane on the Bryte Bend Bridge. The bridge striping would change from three lanes (two 12-foot lanes and one 11.5-foot lane) to four lanes (four 11-foot lanes) with 1-foot inside and 2.5-foot outside shoulders.

- **Segment 3:** Within Segment 3a, from I-80/US-50 Separation to Jefferson Boulevard Undercrossing, the pavement would be restriped to convert one mixed-flow lane in each direction to managed lanes.

  Within Segment 3b, from the Jefferson Boulevard Undercrossing to just east of I-5, the Jefferson Boulevard Undercrossing (Br. No. 22-0106 L/R), and the Sacramento River viaduct (Br. No. 24-0014 R/L) between Jefferson Boulevard and the I-5/US-50 Interchange would be restriped to add an additional managed lane in each direction.

Lane Access – Build Alternatives 2a and 2b

An HOV lane is a type of managed lane that allows qualified users, who meet the minimum number of passengers, to use the managed lane. The number of vehicle occupants required to qualify can vary depending on location. Under Build Alternatives 2a and 2b, vehicles with two or more occupants would be permitted to access the HOV lanes, and all other vehicles would be prohibited from using them. The HOV lanes would be designated using a striping pattern and a diamond marking to distinguish them from mixed-flow lanes and would operate only during peak commute hours.

Signage – Build Alternatives 2a and 2b

Approximately 45 overhead signs would be replaced or proposed within the project area. Several existing overhead signs would be removed and not replaced. In addition, 311 roadside signs would be replaced, and 221 roadside signs are proposed within the median or on the shoulder. Proposed signage would be the same for Build Alternatives 2a and 2b.

Drainage/Culverts – Build Alternatives 2a and 2b

Anticipated work includes extending existing culverts through existing unpaved medians, extending existing culverts at locations where construction may occur outside the existing edge of pavement lining, and possibly abandoning existing culverts where median construction would occur in crowned sections of the roadway. New drainage inlets and culverts are proposed to be replaced or repaired to accommodate areas where existing shoulders are being narrowed, to accommodate additional runoff due to the increased pavement area, or to perpetuate existing drainage patterns. The linings of one pipe would occur using cast-in-place-pipe lining (CIPP), a method by which pipes are repaired by inserting a liner inside the existing culvert pipe, eliminating the need to trench.

Build Alternatives 2a and 2b would construct 5 new culverts and replace or improve 21 existing culverts. As described, many of the proposed drainage features would be located within the construction footprint of the median for the new HOV 2+ managed lane. In addition, proposed culverts would traverse beneath the freeway to convey drainage to a new outlet. In these instances, the freeway would be trenched using an excavator, and the barrel would be installed, after which the trench would be backfilled and compacted back to preconstruction conditions. Trenching across the freeway travel lanes would occur in segments during low peak (nighttime) traffic hours to maintain access. Construction of each new or replaced culvert would occur over approximately 2 nights. However, construction of several culverts could occur concurrently as further described in the construction schedule. It is assumed each of these culvert repair or replacement areas would have a 20-foot by 20-foot temporary construction impact footprint, not to exceed the roadway right-of-way. Proposed drainage features for the I-80 managed lane direct connector, under Build Alternative 2b, would occur within the construction footprint of the I-80 managed lane direct connector.

Construction Schedule – Build Alternatives 2a and 2b

Construction of Build Alternative 2a is anticipated to take approximately 443 construction working days over 22 months. Construction of Build Alternative 2b is anticipated to take approximately 732 construction working days over 36 months. Construction would potentially commence in spring 2025. Due to high daytime traffic volumes, nighttime work would be expected. Both daytime and nighttime work should be anticipated throughout the project duration.

Build Alternatives 3a and 3b: HOT 2+ Managed Lane

Build Alternatives 3a and 3b would be the same as those for Build Alternatives 2a and 2b, respectively, but would include a HOT 2+ managed lane instead of a HOV 2+ lane. Build Alternative 3b would involve construction of the I-80 managed lane direct connector in addition to the construction activities planned for Build Alternative 3a.

The HOT managed lane would allow vehicles with a minimum two-person occupancy to use the lane free of charge, while single-occupied vehicles would pay for lane usage. All other project components would be the same as those for Build Alternatives 2a and 2b, respectively, with the exception of signage locations.

Approximately 79 overhead signs would be replaced or proposed within the project area. Several existing overhead signs would be removed and not replaced. In addition, 311 roadside signs would be replaced, and 373 roadside signs are proposed within the median or on the shoulder.

Build Alternatives 4a and 4b: HOT 2+ Managed Lane

Build Alternatives 4a and 4b would be the same as those for Build Alternatives 2a and 2b, respectively, but would include a HOT 3+ managed lane instead of a HOV 2+ lane. Build Alternative 4b would involve construction of the I-80 managed lane direct connector in addition to the construction activities planned for Build Alternative 4a.

The HOT managed lane would allow vehicles with a minimum three-person occupancy to use the lane free of charge. Vehicles with less than three riders would pay for lane usage. Vehicles with two passengers may pay reduced or full tolls to travel within the HOT lane. All other project components would be the same as those for Build Alternatives 2a and 2b, respectively, with the exception of signage locations.

Proposed signage for Build Alternatives 4a and 4b would be the same as that for Build Alternatives 3a and 3b, respectively.

Build Alternatives 5a and 5b: HOT 2+ Managed Lane

Build Alternatives 5a and 5b would be the same as those for Build Alternatives 2a and 2b, respectively, but would include an express lane instead of an HOV 2+ lane. An express lane is a managed lane that allows vehicles of any occupancy to access a dedicated lane once a toll is paid. Build Alternative 5b would involve construction of the I-80 managed lane direct connector in addition to the construction activities planned for Build Alternative 5a. All other project components would be the same as those for Build Alternatives 2a and 2b, respectively, with the exception of signage locations.

Proposed signage for Build Alternatives 5a and 5b would be the same as that for Build Alternatives 3a and 3b, respectively.

Build Alternatives 6a and 6b: HOT 2+ Managed Lane

Build Alternatives 6a and 6b would be the same as those for Build Alternatives 2a and 2b, respectively, but would include transit-only managed lanes instead of HOV 2+ lanes. A transit-only lane is a managed lane that allows only approved public transit vehicles, such as bus services, to access a dedicated lane. Build Alternative 6b would involve construction of the I-80 managed lane direct connector in addition to the construction activities planned for Build Alternative 6a. All other project components would be the same as those for Build Alternatives 2a and 2b, including the proposed signage for Build Alternatives 6a and 6b, respectively.

Build Alternatives 7a and 7b: HOT 2+ Managed Lane

Build Alternatives 7a and 7b would repurpose the current number one general-purpose lanes to HOV 2+ managed lanes. No new lanes would be constructed. Build Alternative 7b would involve construction of the I-80 managed lane direct connector in addition to the construction activities planned for Build Alternative 7a.

Lane Configuration - Build Alternatives 7a and 7b

Build Alternatives 7a and 7b would maintain the existing median pavement delineation, unpaved median, and add an HOV 2+ lane by repurposing an existing mixed-flow lane (lane number one). As a result, Build Alternatives 7a and 7b would not shift the edge of travel way into the median or require barrier beam removal within the median.

Lane Access - Build Alternatives 7a and 7b

Vehicles with two or more occupants would be permitted to access the HOV 2+ lane, and all other vehicles would be prohibited from using them. The HOV 2+ lanes would be designated using a striping pattern and a diamond marking to distinguish them from mixed-flow lanes. HOV 2+ lanes would operate only during peak commute hours.

Signage – Build Alternatives 7a and 7b

Proposed signage for Build Alternatives 7a and 7b would be the same as that for Build Alternatives 2a and 2b, respectively.

Drainage/Culverts – Build Alternatives 7a and 7b

Build Alternatives 7a and 7b would repurpose the current number one general-purpose lanes to HOV 2+ managed lanes. Therefore, culvert construction associated with Build Alternative 7a would be related only to replacements or improvements to 18 existing culverts. Build Alternative 7b would construct 5 new culverts associated with the I-80 managed lane direct connector. Construction methods would be the same as those for Build Alternatives 2a and 2b, respectively. The lining of one pipe would also occur using CIPP as described under Drainage/Culverts – Build Alternatives 2a and 2b above.

Construction Schedule – Build Alternatives 7a and 7b

Construction of Build Alternative 7a is anticipated to take approximately 180 construction working days over 10 months. Construction of Build Alternative 7b is anticipated to take 732 construction working days over 36 months to complete. Construction would potentially commence in spring 2025. Due to high daytime traffic volumes, nighttime work would be expected. Both daytime and nighttime work should be anticipated throughout the project duration.

1.3.3. No-Build Alternative

The No-Build Alternative would maintain the facility in its current condition and would not meet the purpose and need of the project. Under the No-Build Alternative, no alterations to the existing conditions would occur and the proposed improvements would not be implemented. The No-Build Alternative is not discussed further in this report.

1.4. Standard Measures

Caltrans Standard Measures (standard measures) would be incorporated into the project to minimize the potential for adverse effects on sensitive biological resources. These measures are described below.

Biological Resources

BR-1: General

Before start of work, as required by permit or consultation conditions, a Caltrans biologist would meet with the contractor to brief them on environmental permit conditions and requirements relative to each stage of the proposed project, including, but not limited to, work windows, drilling site management, and how to identify and report regulated species within the project areas.

BR-2: Animal Species

A. To protect migratory and nongame birds (occupied nests and eggs), if possible, vegetation removal would be limited to the period outside of the bird breeding season (removal would occur between September 16 and January 31). If vegetation removal is required during the breeding season, a nesting bird survey would be conducted by a qualified biologist within one week prior to vegetation removal. If an active nest is located, the biologist would coordinate with CDFW to establish appropriate species-specific buffer(s) and any monitoring requirements. The buffer(s) would be delineated around each active nest, and construction activities would be excluded from these areas until birds have fledged, or the nest is determined to be unoccupied.

B. Pre-construction surveys for active raptor nests within one-quarter mile of the construction area would be conducted by a qualified biologist within one week prior to initiation of construction activities. Areas to be surveyed would be limited to those areas subject to increased disturbance because of construction activities (i.e., areas where existing traffic or human activity is greater than or equal to construction-related disturbance need not be surveyed). If any active raptor nests are identified, appropriate conservation measures (as determined by a qualified biologist) would be implemented. These measures may include, but are not limited to, establishing a construction-free buffer zone around the active nest site, biological monitoring of the active nest site, and delaying construction activities near the active nest site until the young have fledged.

C. To prevent attracting corvids (birds of the Corvidae family which include jays, crows, and ravens), no trash or foodstuffs would be left or stored on-site. All trash would be deposited in a secure container daily and disposed of at an approved waste facility at least once a week. Additionally, on-site workers would not attempt to attract or feed any wildlife.

D. Artificial night lighting may be required. To reduce potential disturbance to sensitive resources, lighting would be temporary and directed specifically on the portion of the work area actively under construction. Use of artificial lighting would be limited to Cal/OSHA work area lighting requirements.

E. Protocol surveys would be performed for Swainson's hawk, burrowing owl, and giant garter snake (GGS) during the breeding season for each construction season (every year of construction). If species are discovered during construction, work would stop in the area of discovery, and coordination with the appropriate resource agencies would occur.

F. An Aquatic Giant Garter Snake Habitat Dewatering Plan would be prepared. The plan would include appropriate measures, including the identification of dewatering areas. The Contractor will dewater suitable habitat (e.g., wetlands, drainages, rice fields) and ensure the habitat remains dry for at least 15 consecutive days after April 15 and prior to excavating or filling potential habitat. Dewatering would be limited to April 15 to October 1.

BR-3: Invasive Species

Invasive non-native species control would be implemented. Measures would include:

- Straw, straw bales, seed, mulch, or other material used for erosion control or landscaping which would be free of noxious weed seed and propagules.
- All equipment would be thoroughly cleaned of all dirt and vegetation prior to entering the job site to prevent importing invasive non-native species. Project personnel would adhere to the latest version of the *California Department of Fish and Wildlife Aquatic Invasive Species Cleaning/Decontamination Protocol* (Northern Region) for all field gear and equipment in contact with water.

BR-4: Plant Species, Sensitive Natural Communities, and Environmentally Sensitive Habitat Areas

A. Seasonally appropriate, pre-construction surveys for sensitive plant species would be completed (or updated) by a qualified biologist prior to construction in accordance with *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018).

B. A Revegetation Plan would be prepared and would include a plant palette, establishment period, watering regimen, monitoring requirements, and pest control measures. The Revegetation Plan would d also address measures for wetland and riparian areas temporarily impacted by the project.

C. Prior to the start of work, temporary high-visibility fencing and/or flagging would be installed around Sensitive Natural Communities (SNCs), environmentally sensitive habitat areas, rare plant occurrences, intermittent streams, and wetlands and other waters, where appropriate. No work would occur within fenced/flagged areas.

D. Where feasible, the structural root zone would be identified around each large-diameter tree (>2-foot DBH) directly adjacent to project activities, and work within the zone would be limited.

E. When possible, excavation of roots of large-diameter trees (>2-foot DBH) would not be conducted with mechanical excavator or other ripping tools. Instead, roots would be severed using a combination of root-friendly excavation and severance methods (e.g., sharp-bladed pruning instruments or chainsaw). At a minimum, jagged roots would be pruned away to make sharp, clean cuts.

F. After completion, all superfluous construction materials would be completely removed from the site. The site would then be restored by regrading and stabilizing with a hydroseed mixture of native species along with fast growing sterile erosion control seed, as required by the Erosion Control Plan.

CHAPTER 2 STUDY METHODS

2.1. Regulatory Requirements

Special status habitats, plant and animal species have varying degrees of legal protection under numerous laws and regulations. All federal and state resource agencies require avoidance and minimization of effects to special status species and their habitat.

The federal regulatory requirements and laws related to biological resources that apply to the proposed project include:

2.1.1.Federal Regulatory Requirements

Federal Endangered Species Act

Section 9 of the Federal Endangered Species Act (FESA) of 1973 prohibits acts of disturbance that result in the take of endangered or threatened species. As defined by the ESA, "endangered" refers to any species that is in danger of extinction throughout all or a significant portion of its current range. The term "threatened" is applied to any species likely to become endangered within the foreseeable future throughout all or a significant portion of its current range. "Take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." Violation of this section can result in penalties of up to $50,000 and up to 1 year of imprisonment.

Sections 7 and 10 of the FESA provide a method for permitting an action that may result in incidental take of a federally listed species. "Incidental take" refers to take of a listed species that is incidental to, but not the primary purpose of, an otherwise lawful activity. Incidental take is permitted under Section 7 for projects on federal land or involving a federal action, while Section 10 provides a method for permitting incidental take resulting from a state or private action.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a federal Fishery Management Plan (FMP). The MSA requires federal agencies to consult with National Marine Fisheries Service (NMFS) on all actions, or proposed actions, authorized, funded, or undertaken by the agencies that may adversely affect EFH

(MSAsection 305[b][2]). A component of this consultation process is the preparation and submittal of an EFH Assessment.

The EFH mandate applies to all species managed under an FMP. For the Pacific coast (excluding Alaska), there are three FMPs covering groundfish, coastal pelagic species, and Pacific salmon.

Federal Clean Water Act Sections 404 and 401

The objective of the Clean Water Act (CWA) of 1977, as amended, is to maintain and restore the chemical, physical, and biological integrity of the nation's waters. Discharge of dredged or fill material into waters of the United States, including wetlands, is regulated under Section 404 of the CWA by the Corps. The Corps authorizes the discharge of dredge or fill materials into jurisdictional waterbodies through the issuance of a permit. Applicants for Section 404 permits are also required to obtain Water Quality Certification through the state (State Water Resources Control Board or RWQCB in California) under Section 401 of the CWA.

Rivers and Harbors Act

The placement of structures in, under, or over "navigable waters of the United States" is regulated under Section 10 of the Rivers and Harbors Act of 1899 (33 USC 401 et seq.), and federal permitting is also administered by the Corps.

Federal Migratory Bird Treaty Act

Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703–711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

Executive Order 11990 (Wetlands)

Executive Order 11990 regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as Federal Highway Administration (FHWA) and/or the Department, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

Executive Order 13112 (Invasive Species)

On February 3, 1999, President William J. Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm to human health." FHWA guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

Executive Order 11988 (Floodplain Management)

Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

2.1.2.California Regulatory Requirements

The state regulatory requirements and laws related to biological resources that apply to the proposed project include:

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act authorizes the State Water Resources Control Board to oversee water rights and water quality policy and establishes nine RWQCBs to protect and enhance water quality at the regional and local levels. In addition to preparing water quality control plans to designate beneficial uses of waterbodies in each region, the RWQCBs issue waste discharge requirements for activities that result in pollutant or nuisance discharges that may affect surface or groundwater, including wetlands and other waters not subject to Corps jurisdiction.

Fish and Game Code Section 2081, California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFW is responsible for maintaining a list of endangered and threatened species (California Fish and Game Code Section 2070). Additionally, the CDFW maintains a list of candidate species, which are species that the CDFW has formally recognized as being under review for inclusion on the state's list of endangered and threatened species. The CDFW also maintains lists of SSC, as well as watch lists of previous SSC for which there is concern and a need for additional information to clarify status. Pursuant to the requirements of the CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present and determine whether the project will have a potentially significant impact on that species. In addition, the CDFW encourages informal consultation on any project that may affect a candidate species. Under Section 2081 subdivision (b) of the Fish and Game Code, CESA prohibits take of state-listed species and protects native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, that are threatened with extinction or experiencing a significant decline which, if not halted, would lead to an endangered or threatened designation. "Take" is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill". CESA authorizes CDFW to issue incidental take permits for state-listed species when specific criteria are met.

Fish and Game Code Section 3503, Birds of Prey

Under Section 3503.5 of the Fish and Game Code, it is unlawful to take, possess, or destroy any birds in the orders of Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird, except as otherwise provided by this code or any regulation adopted pursuant thereto.

Fish and Game Code Section 3513, Migratory Birds

Migratory birds are also protected in California. Fish and Game Code Section 3513 states that it is unlawful to take or possess any migratory nongame bird as designated in the MBTA

or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA.

Fish and Game Code, Fully Protected Species

California statutes also afford FP status to some specifically identified birds, mammals, reptiles, amphibians, and fish. These species cannot be taken, even with an incidental take permit (Fish and Game Code, Sections 3505, 3511, 4700, 5050, and 5515).

Fish and Game Code Section 1600, Lake or Streambed Alteration

Any entity proposing an activity that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the CDFW may need a Lake or Streambed Alteration Agreement from the CDFW before proceeding with the activity. As a general rule, this requirement may also apply to any work undertaken within the floodplain of a stream or river containing fish or wildlife.

2.2. Studies Required

2.2.1. Biological Study Area

The BSA includes all currently proposed improvements and ancillary construction areas (e.g., staging areas, access roads) that could potentially be impacted by the project. For this project, the BSA encompasses the same boundary as the Environmental Study Limits (ESL).

2.2.2. Background Research

Special status plant and animal species and sensitive habitats that may occur in the project's BSA were determined, in part, by reviewing natural resource agency databases, literature, and other relevant sources. The following resources were reviewed:

- USGS Sacramento West, Davis, Merritt, and Dixon, California 7.5-minute topographic quadrangles
- Aerial photography of the BSA and vicinity
- U.S. Fish and Wildlife Service (USFWS) list of endangered and threatened species that may occur within the BSA (Appendix A)
- NMFS list of endangered and threatened fisheries resources that may occur within the BSA (Appendix A)
- California Natural Diversity Data Base (CNDDB) and California Native Plant Society (CNPS) records for the Sacramento West, Davis, Merritt, and Dixon California USGS 7.5-minute topographic quadrangles and the ten surrounding adjacent quadrangles (Appendix B) (CDFW 2022a)

- California Wildlife Habitat Relationships System (CWHR) (CDFW 2013)
- Other pertinent databases and literature, including the online *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2022), *The Jepson Manual: Vascular Plants of California* (Baldwin et. al. 2012), and *Jepson eFlora* (Jepson Flora Project (eds.) 2021)

A list of special status species that could occur or are known to occur within the BSA and vicinity was developed based on background research. The list was further refined based on a field assessment to identify those species that could occur within the BSA.

2.2.3.Field Reviews and Survey Methods

A variety of biological surveys were conducted between December 2020 and June 2021 within the BSA to evaluate and assess the potential for sensitive biological resources to occur. Subsequent surveys of additional BSA segments (following minor changes to the ESL) were performed in June and July 2022. These surveys included focused surveys such as botanical surveys during species-specific blooming periods in accordance with CDFW protocols, aquatic resources delineation in accordance with applicable agency guidelines, Swainson's hawk and burrowing owl protocol-level surveys following CDFW guidelines, and VELB surveys following the most recent USFWS guidance. The general timing and methods applied for the protocol-level surveys are further described below. Habitat assessment surveys were also performed to assess the potential for suitable habitat for the remaining special status species to occur within the BSA, including a concerted focus on tricolored blackbird, GGS, and special status bat species. Details on the reconnaissance-level habitat assessments are provided in Section 2.4.

Focused botanical surveys were performed by Stantec on May 10–14 and 18–20, 2021, and August 4–5 and 10–13, 2021. In addition, supplemental surveys were conducted on July 14, 2022, to survey changes to the BSA. All surveys were performed in general accordance with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018). Per the CDFW guidelines, a target list of special status plant species with the potential to occur within the BSA was developed before the surveys through review of the USFWS list (Appendix A), and CNDDB and CNPS query results (Appendix B). The botanical survey results, including a list of all plant species observed, is provided in Appendix C.

A delineation of aquatic resources subject to agency jurisdiction (i.e., Corps, RWQCB, CDFW) was performed by Stantec on December 18, 21, 22, 28, 29, 2020, and February 19, 20–24, 2021. In addition, supplemental surveys were conducted on July 21, 2022, to survey

changes to the BSA. Waters of the United States were delineated in accordance with methodology described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008). A copy of the delineation report is provided in Appendix D.

Surveys of the BSA to assess and map suitable GGS habitat were performed by Swaim Biological Inc. (SBI) on December 18 and 30, 2020, and June 23, 2022. In addition, supplemental surveys were conducted on July 23, 2022, to survey changes to the BSA. Habitat assessments were completed utilizing species habitat suitability criteria adopted from the *USFWS Draft Recovery Plan for Giant Garter Snake* (USFWS 1999). A copy of the survey results is provided in Appendix E.

Surveys of the BSA to identify active roost sites and to assess and map potentially suitable roosting habitat for bat species were performed by SBI on December 18 and 30, 2021. In addition, supplemental surveys were conducted on July 23, 2022, to survey changes to the BSA. A copy of the survey results is provided in Appendix F.

Surveys of the BSA to assess and map potentially suitable nesting habitat for tricolored blackbird were performed by Alluvion Biological Consulting performed on January 5 and 7, 2021. Subsequent surveys of additional BSA segments were performed by Stantec on July 7, 2022. A copy of the survey results is provided in Appendix G.

A protocol-level survey for Swainson's hawk was performed by Stantec on January 12, February 17, March 22–26 and 29, and April 5–9 and 12, in accordance with methodology described in the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (Swainson's Hawk Technical Advisory Committee 2000). A copy of the survey results is provided in Appendix H.

A protocol-level survey for burrowing owl was performed by Stantec on February 10, April 16, May 13, May 20, June 3, 2021, and January 13, 20–21, and 25, 2022, in accordance with methodology described in the *Burrowing Owl Survey Protocol and Mitigation Guidelines* (The California Burrowing Owl Consortium 1993). A copy of the survey results is provided in Appendix I.

Surveys for elderberry shrubs and an assessment of VELB habitat were performed by Stantec on February 19, and 20–24, 2021. In addition, supplemental surveys were conducted on July 7, 2022, to survey changes to the BSA. All surveys were completed in accordance with the

USFWS Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (USFWS 2017). A copy of the survey results is provided in Appendix J.

2.3. Personnel and Survey Dates

The personnel and survey dates associated with the surveys that have been performed within the BSA to date are summarized in Table 3.

Table 3. Summary of Personnel and Survey Dates

Survey	Company	Staff Name(s)	Survey Dates	Appendix
Botanical surveys	Stantec	John Holson, Senior Botanist, Professional Wetland Scientist Sheryl Creer, Senior Botanist	May 10–14 and 18–20, 2021, and July 14, 2022	C
Aquatic resources delineation	Stantec	John Holson, Senior Botanist, Professional Wetland Scientist Sheryl Creer, Senior Botanist	December 18, 21, 22, 28–29, 2020, and February 19, 20–24, 2021, and July 21, 2022	D
GGS habitat assessment	SBI	Eric Britt, Senior Biologist Cole Paris, Biologist Elizabeth Armistead, Biologist	December 18–30, 2020, and June 23, 2022	E
Bat habitat assessment	SBI	Ryan Byrnes, Senior Biologist Jessica Gonzalez, Biologist	December 18, 21, and 22, 2021, and June 29, 2022	F
Tricolored blackbird habitat assessment	Alluvion Biological Consulting	Michael Bumgardner, Senior Biologist	January 5 and 7, 2021, and July 7, 2022	G
Swainson's hawk protocol survey	Stantec	Chariss Femino, Biologist Brendan Cohen, Biologist Scott Elder, Biologist Jaqueline Phipps, Biologist	January 12, February 17, March 22–26 and 29, April 5–9 and 12	H
Burrowing owl protocol survey	Stantec	Chariss Femino, Biologist Brendan Cohen, Biologist Scott Elder, Biologist Jaqueline Phipps, Biologist Sara Cortez, Senior Biologist	February 10, April 16, May 13, May 20, June 3, 2021, and January 13, 20–21, and 25, 2022.	I
VELB surveys	Stantec	John Holson, Senior Botanist, Professional Wetland Scientist Sheryl Creer, Senior Botanist Sara Cortez, Senior Biologist Scott Elder, Biologist	December 18, 21, 22, 28-29, 2020, February 19, 20–24, 2021, and July 7, 2022	J

2.4. Agency Coordination and Professional Contacts

On January 28, 2021, a list of federal listed anadromous fish species with the potential to occur in the Sacramento West, Davis, Merritt, and Dixon, California, USGS 7.5- minute topographic quadrangles was obtained from the NMFS (Appendix A).

On March 27, 2023, a list of federally listed species with the potential to occur within the BSA was obtained from the Sacramento USFWS Office (Project Code: 2023-0006346) (Appendix A).

A Biological Assessment (BA) is being prepared and will be submitted to USFWS for Section 7 consultation under the ESA.

2.5.Limitations That May Influence Results

All field studies were conducted in accordance with applicable protocols. Therefore, no limitations that may influence the results of field studies associated with this project are known to have occurred.

CHAPTER 3. ENVIRONMENTAL SETTING

The environmental setting describes the region in which the project would occur and explains the natural resources present within the Biological Study Area (BSA) to better inform the context and intensity of potential impacts from the proposed project. This chapter describes the project area's physical conditions (including climate, topography, geology/soils, habitat, hydrology, watercourses, and level of human or natural disturbance) and biological conditions (including vegetation, special status species, common wildlife, habitat connectivity, dispersal/migration corridors, aquatic resources, and invasive species).

3.1. Description of Existing Physical and Biological Conditions

3.1.1.Study Area

The BSA is in the USGS Sacramento West, Davis, Merrit, and Dixon, California 7.5-minute topographic quadrangles. The BSA is centered on segments of I-80 and US-50 and is confined to the Caltrans right-of-way which ranges from approximately 300 feet to 800 feet wide, depending on location. The BSA starts in the southwest on I-80 at Pedrick Road (Exit 67) and continues 15 miles to the northwest to the I-80/US-50 split. From there, the BSA follows I-80 to the north, terminating just past El Camino Avenue, and US-50 to the east, terminating at the 5th Street exit. The BSA crosses through a predominance of developed and agricultural lands as well as through Davis and West Sacramento.

3.1.2.Physical Conditions

The primary topographic features within the BSA are the channel of the Sacramento River and the Yolo Bypass. The BSA generally runs parallel to I-80 and US-50 and occurs at elevations of 18 feet above mean sea level (amsl) at the eastern end to 62 feet amsl at the western end of the BSA.

Precipitation within the BSA primarily occurs as rain, with an average annual rainfall of approximately 17.55 inches. Air temperatures range from an average January high of 54 degrees Fahrenheit (ºF) to an average July high of 94ºF. The year-round average high temperature is approximately 75ºF (Western Regional Climate Center 2021).

Thirty-four soil map units occur within the BSA as described in the Custom Soil Resource Reports for Sacramento, County, California; Solano County, California; and Yolo County, California (Natural Resources Conservation Service 2021), and summarized in Table 4.

Table 4. Soil Map Units within the Biological Study Area

Map Unit Name	Map Unit Reference Code	Drainage Class	Depth to Restrictive Layer	Hydric Soils
Sacramento County				
Cosumnes silt loam, partially drained, 0 to 2% slopes	127	Somewhat poorly drained	More than 80 inches	Yes
Sailboat silt loam, partially drained, 0 to 2% slopes, Major Land Resource Area (MLRA) 16	206	Somewhat poorly drained	More than 80 inches	Yes
Urban land	227	N/A	N/A	No
Water	247	N/A	N/A	N/A
Solano County				
Brentwood clay loam, 0 to 2% slopes	BrA	Well drained	More than 80 inches	No
Capay silty clay loam, 0 to 2% slopes, MLRA 17	Ca	Moderately well drained	More than 80 inches	No
Capay clay, 0% slopes, MLRA 17	Cc	Moderately well drained	More than 80 inches	No
Reiff fine sandy loam	Ra	Well drained	More than 80 inches	No
Riverwash	Rw	Excessively drained	N/A	Yes
Sycamore silty clay loam, drained, 0 to 2% slopes, MLRA 14	Ss	Somewhat poorly drained	More than 80 inches	No
Water	W	N/A	N/A	N/A
Yolo loam, 0 to 4% slopes, MLRA 17	Yo	Well drained	More than 80 inches	No
Yolo silty clay loam, 0 to 2% slopes, MLRA 17	Ys	Well drained	More than 80 inches	No

Map Unit Name	Map Unit Reference Code	Drainage Class	Depth to Restrictive Layer	Hydric Soils
Yolo County				
Capay silty clay loam, 0 to 2% slopes, MLRA 17	Ca	Moderately well drained	More than 80 inches	No
Lang sandy loam	La	Somewhat poorly drained	More than 80 inches	No
Lang sandy loam, deep	Lb	Somewhat poorly drained	More than 80 inches	No
Made land	Ma	N/A	N/A	Unranked
Marvin silty clay loam	Mf	Somewhat poorly drained	More than 80 inches	No
Myers clay, 0 to 1% slopes, MLRA 17	Ms	Moderately well drained	More than 80 inches	No
Reiff fine sandy loam	Ra	Well drained	More than 80 inches	No
Rincon silty clay loam	Rg	Well drained	More than 80 inches	No
Riz loam, flooded	Rn	Poorly drained	More than 80 inches	Yes
Sacramento silty clay loam, 0 to 2% slopes, dry, MLRA 16	Sa2	Poorly drained	More than 80 inches	Yes
Sacramento silty clay loam, drained	Sb	Poorly drained	More than 80 inches	Yes
Sacramento clay, drained	Sd	Poorly drained	More than 80 inches	Yes
Sacramento soils, flooded	Sg	Poorly drained	More than 80 inches	Yes
Sycamore silt loam, 0 to 1% slopes, MLRA 17	So	Somewhat poorly drained	More than 80 inches	No
Sycamore silt loam, drained, 0% slopes, MLRA 17	Sp	Somewhat poorly drained	More than 80 inches	No

Map Unit Name	Map Unit Reference Code	Drainage Class	Depth to Restrictive Layer	Hydric Soils
Sycamore silty clay loam, drained, 0 to 1% slopes, MLRA 17	Ss	Somewhat poorly drained	More than 80 inches	No
Sycamore complex, drained	Sv	Somewhat poorly drained	More than 80 inches	Yes
Tyndall very fine sandy loam, drained	Tc	Somewhat poorly drained	More than 80 inches	No
Valdez silt loam, clay substratum, partially drained, 0 to 2% slopes	Vb	Poorly drained	More than 80 inches	Yes
Water	W	N/A	N/A	N/A
Willows soils, overwash, 0% slopes, frequently flooded, MLRA 17	Wg	Poorly drained	More than 80 inches	Yes

3.1.3.Biological Conditions

Vegetation Communities

Habitat types within the BSA were classified based on the CWHR classification scheme which used vegetation descriptions as developed in *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer Jr.1988), which were converted (via crosswalk) from the vegetation alliance classification system described in *A Manual of California Vegetation*, Second Edition (MCV) (Sawyer, et al., 2009) and the web-based version *Manual of California Vegetation Online* (CNPS 2020). A total of 11 CWHR habitat types were identified within the BSA, which include Developed, Ornamental, Cropland, Annual Grassland, Perennial Grassland, Coastal Oak Woodland, Valley Oak Woodland, Valley Foothill Riparian, Saline Emergent Wetland, Fresh Emergent Wetland, and Open Water (Figure 3). A description of these habitat types is detailed below, and a list of the plant species observed during the May and June 2021 and July 2022 surveys is provided in Appendix C.

Developed

Developed areas account for more than half (approximately 596 acres) of the BSA and include highways, on-ramps, off-ramps, frontage roads, commercial areas, and other urbanized areas. Vegetation is absent on the road surface, although sparse opportunistic grasses and forbs are present on the road shoulders.

Ornamental

Ornamental is the most represented vegetation type within the BSA. Non-native ornamental vegetation has been planted as windbreaks near croplands and as landscaping in urban areas. Stands observed include various eucalyptus (*Eucalyptus* spp.), Lombardy poplar (*Populus nigra*), English walnut (*Juglans regia*), Peruvian pepper tree (*Schinus molle*), and Chinese elm (*Ulmus parvifolia*). The MCV includes ornamental vegetation alliances that do not encompass all species encountered within the BSA. For the purposes of this survey, all ornamental stands have been combined in one Ornamental category.

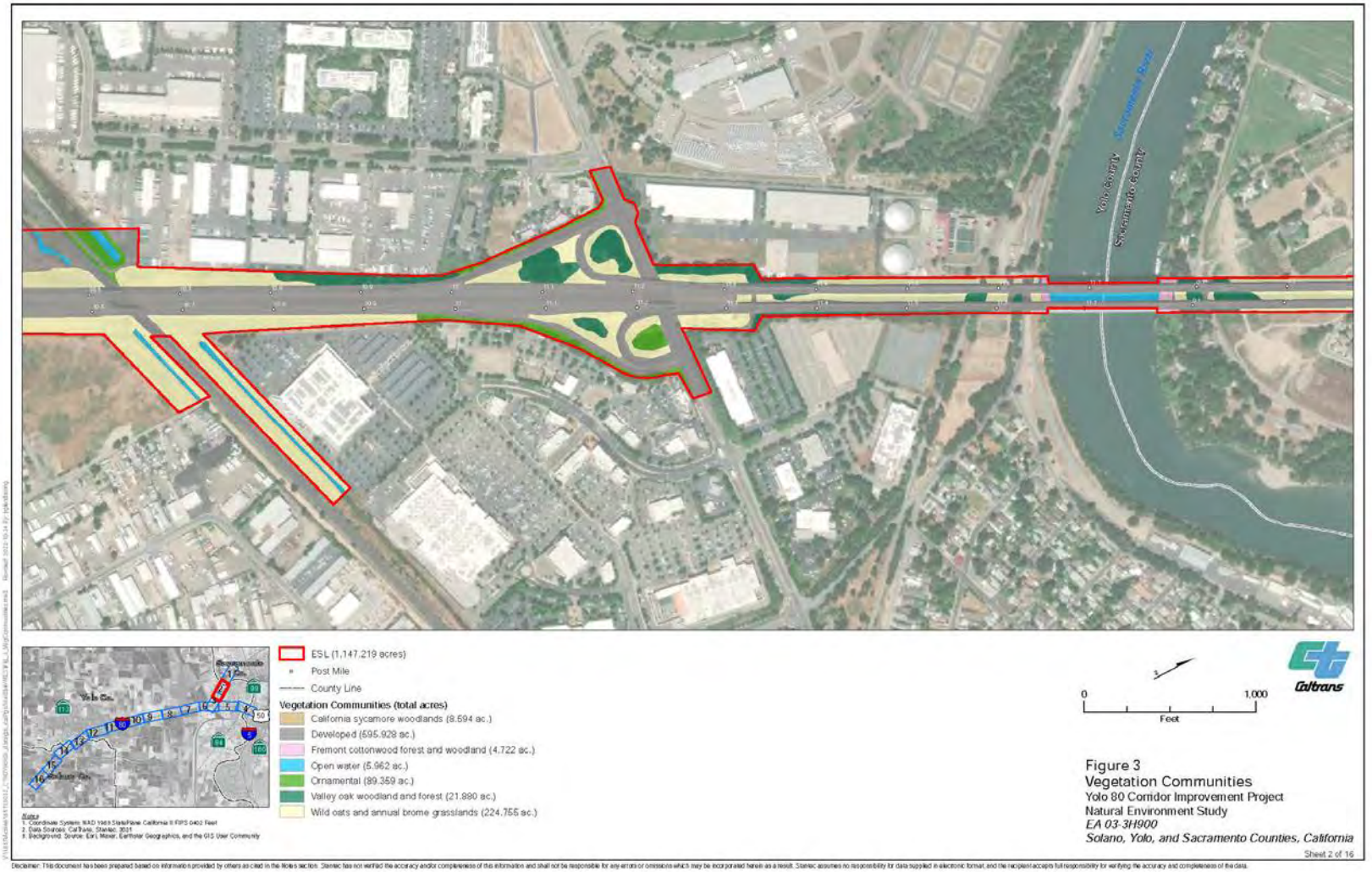
Cropland

Croplands are present in the Yolo Bypass, where there are rice fields that are regularly flooded. There is also a large hayfield just to the west of the Yolo Bypass and adjacent to CR 32A.

Annual Grassland

Annual Grassland is the second largest habitat type within the BSA and occurs throughout, including along the highway, off-ramps, and shoulders, where it is regularly mowed and/or treated with herbicide. Within the BSA, this habitat type is dominated (greater than 30% relative cover) by one of several non-native grass species such as wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), or wall barley (*Hordeum murinum*). Other non-native grasses and forbs include ripgut brome (*Bromus diandrus*), perennial pepper weed (*Lepidium latifolium*), and prickly oxtongue (*Helminthotheca echioides*). Within the Yolo Bypass, this habitat type also includes areas that flood frequently, and support stands of gum plant (*Grindelia hirsutula*), perennial pepper weed, and salt grass (*Distichlis spicata*).

Figure 3. Vegetation Communities


Yolo County
Sacramento County
Sacramento River
ESL (1,147.219 acres)
Post Mile
County Line
Vegetation Communities (total acres)
California sycamore woodlands (8.594 ac.)
Developed (595.928 ac.)
Fremont cottonwood forest and woodland (4.722 ac.)
Open water (5.962 ac.)
Ornamental (89.359 ac.)
Valley oak woodland and forest (21.890 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
1,000
Feet
Caltrans
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 2 of 16


Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Developed (595.928 ac.)
Open water (5.962 ac.)
Ornamental (89.359 ac.)
Valley oak woodland and forest (21.880 ac.)
Water primrose wetlands (4.824 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Feet
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Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 3 of 16

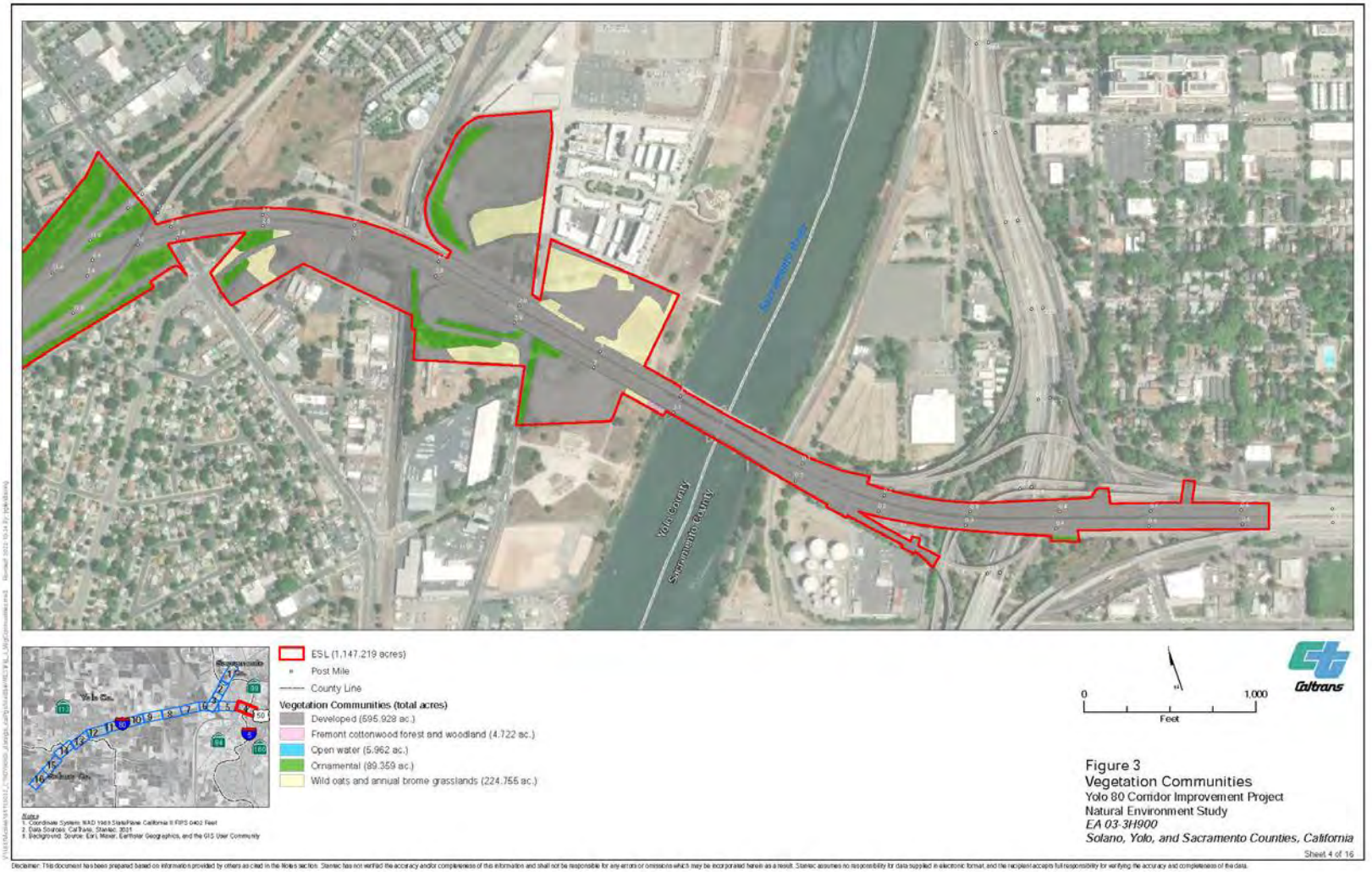
Sacramento River
Yolo County
Sacramento County
ESL (1,147.219 acres)
Post Mile
County Line
Vegetation Communities (total acres)
Developed (595.928 ac.)
Fremont cottonwood forest and woodland (4.722 ac.)
Open water (5.962 ac.)
Ornamental (89.359 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 4 of 16

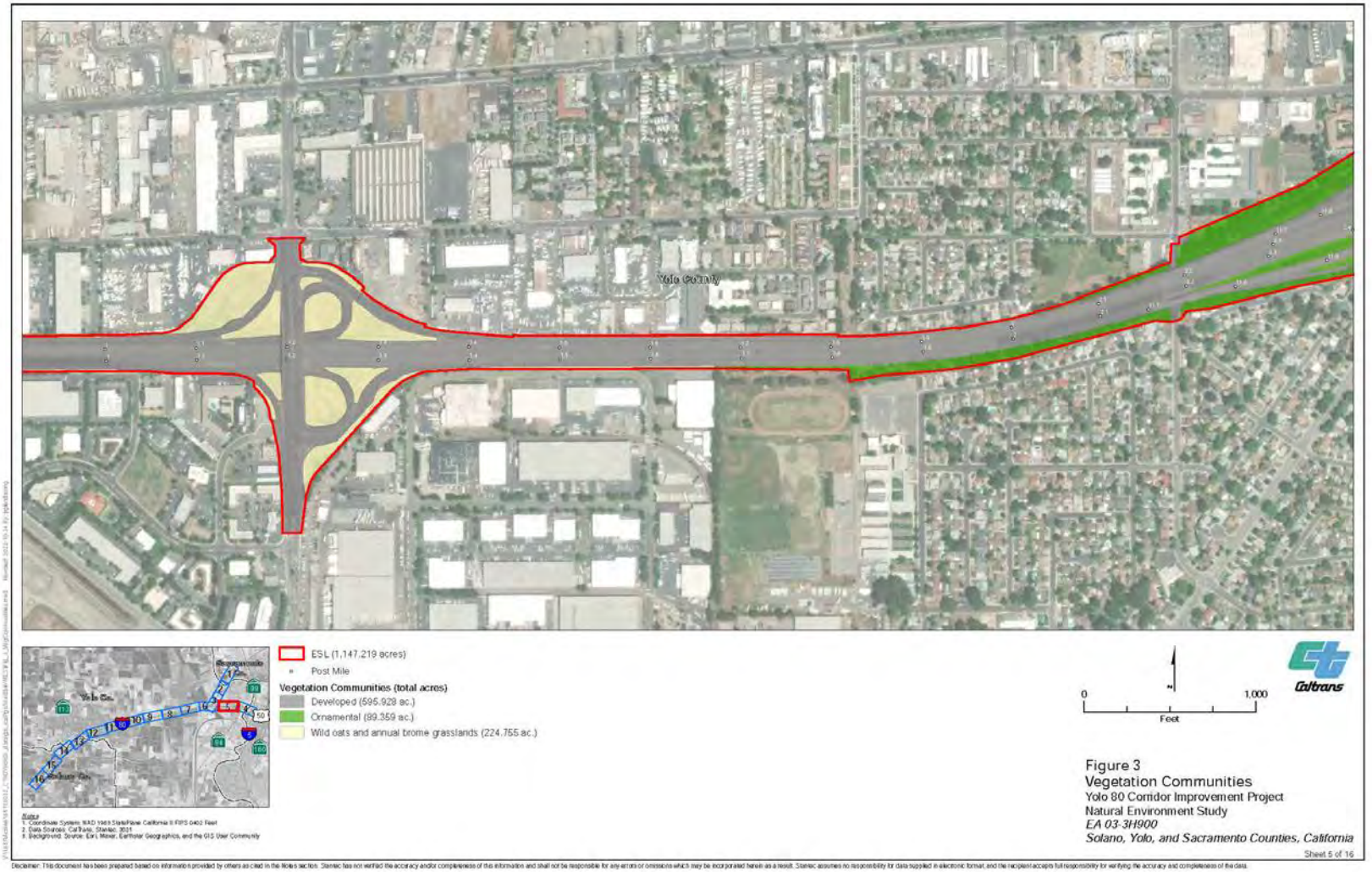
Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Developed (595.928 ac.)
Ornamental (89.359 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 5 of 16

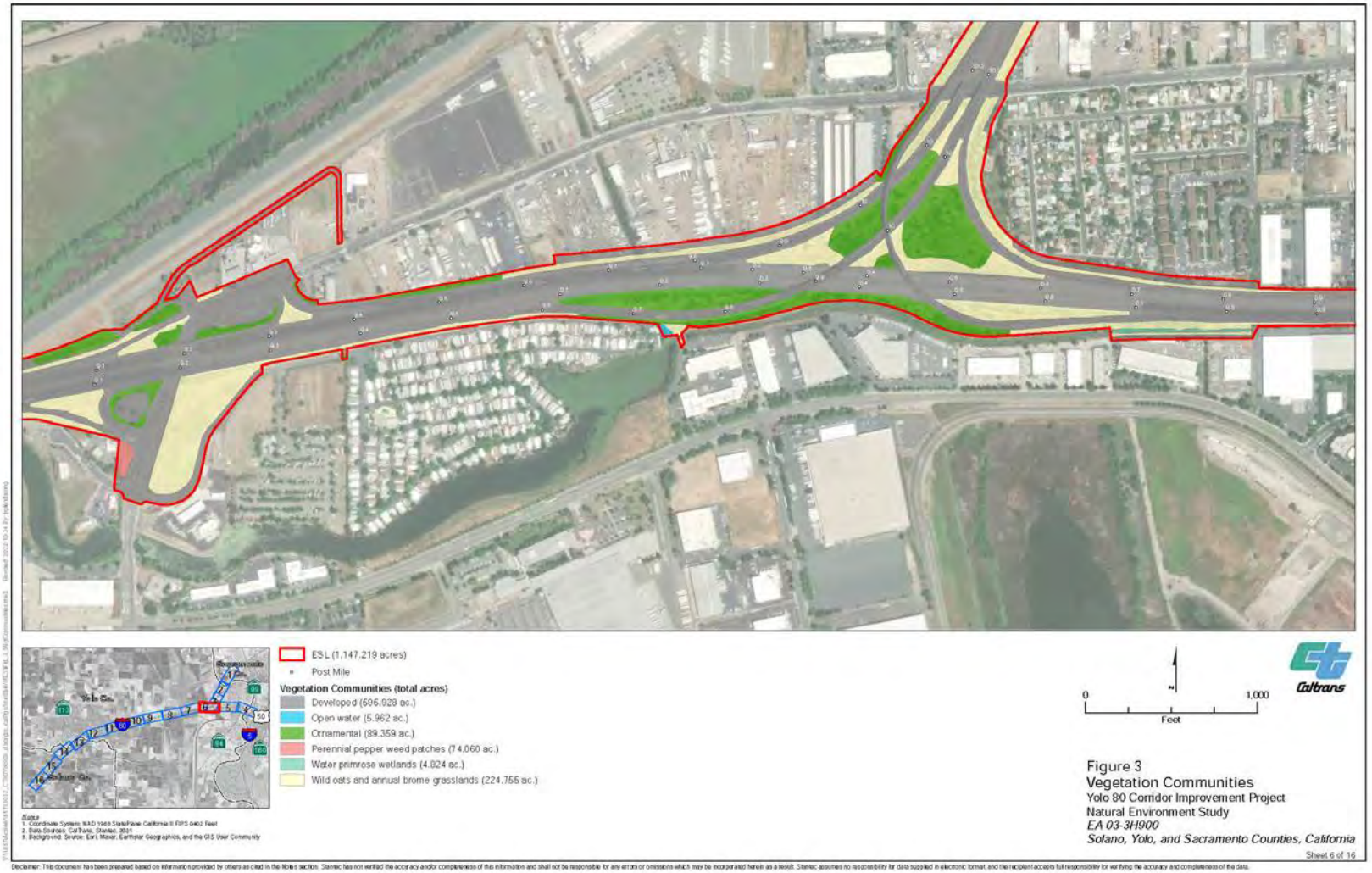
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Developed (595.928 ac.)
Open water (5.962 ac.)
Ornamental (89.359 ac.)
Perennial pepper weed patches (74.060 ac.)
Water primrose wetlands (4.824 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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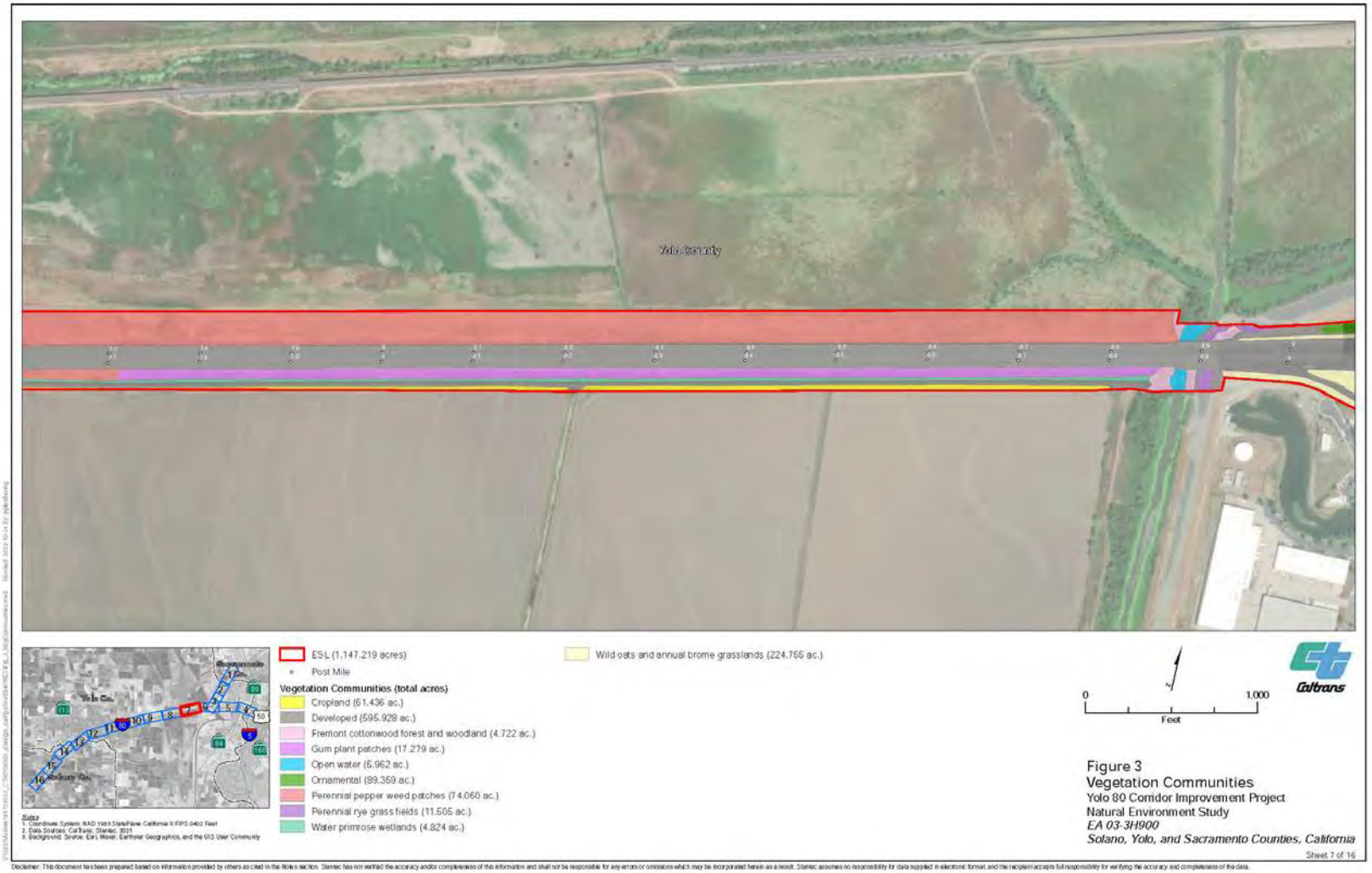
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 6 of 16


Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Cropland (61.436 ac.)
Developed (595.928 ac.)
Fremont cottonwood forest and woodland (4.722 ac.)
Gum plant patches (17.279 ac.)
Open water (5.962 ac.)
Ornamental (89.359 ac.)
Perennial pepper weed patches (74.060 ac.)
Perennial rye grass fields (11.505 ac.)
Water primrose wetlands (4.824 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Feet
Caltrans
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 7 of 16

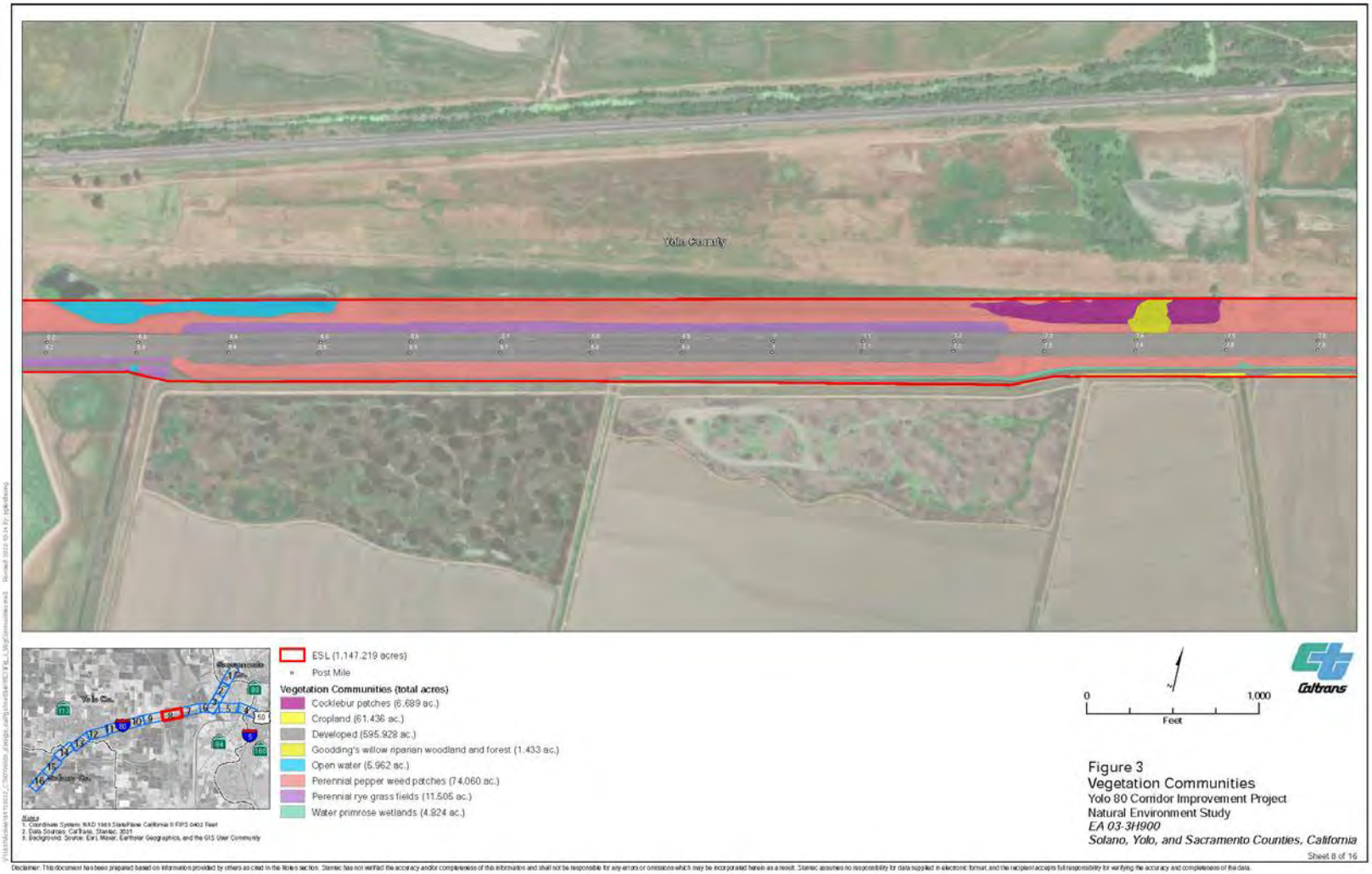
Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Cocklebur patches (6.689 ac.)
Cropland (61.436 ac.)
Developed (595.928 ac.)
Goodding's willow riparian woodland and forest (1.433 ac.)
Open water (5.962 ac.)
Perennial pepper weed patches (74.060 ac.)
Perennial rye grass fields (11.505 ac.)
Water primrose wetlands (4.824 ac.)
0
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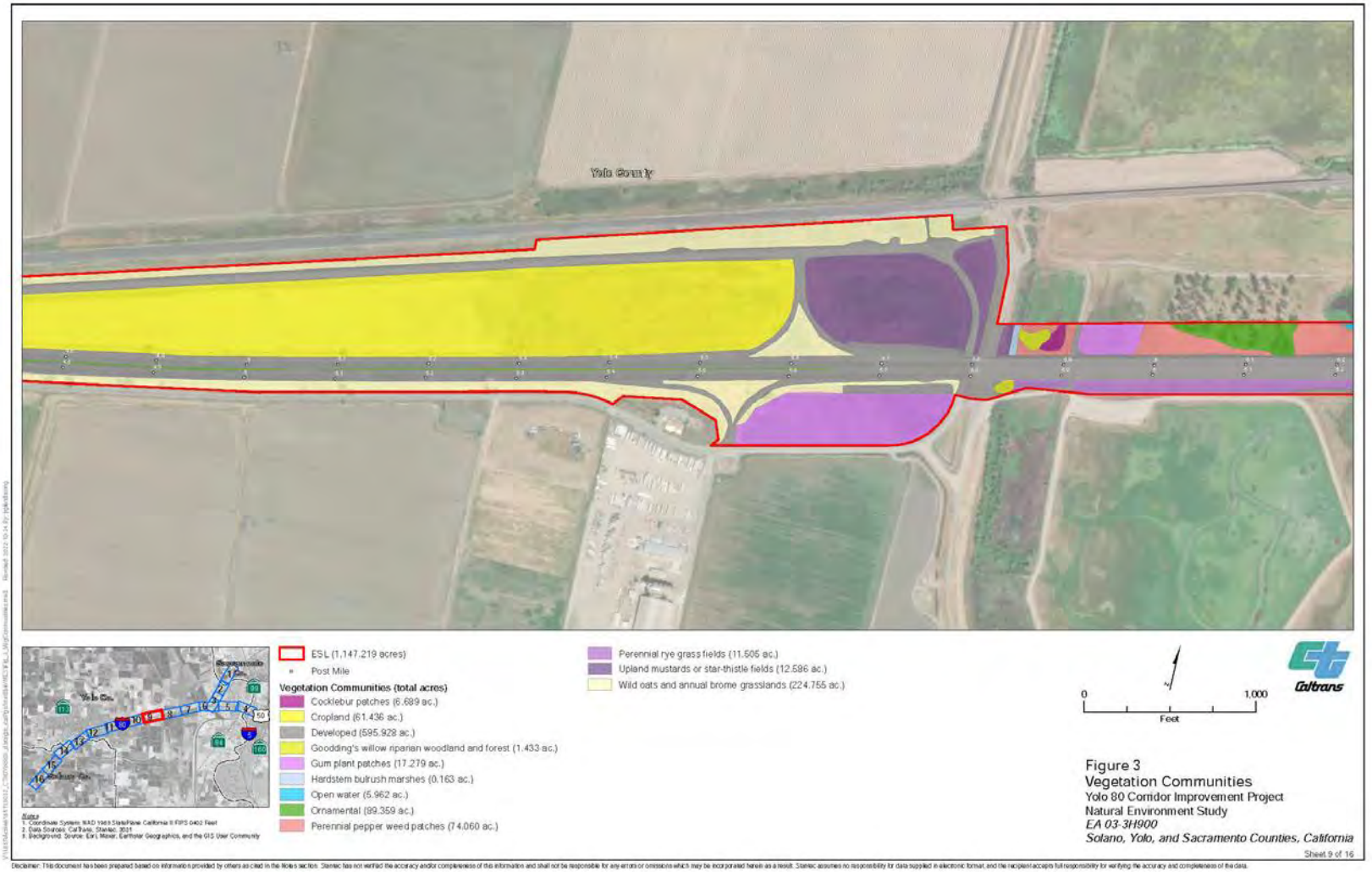
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 8 of 16


Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Cocklebur patches (6.689 ac.)
Cropland (61.436 ac.)
Developed (595.928 ac.)
Goodding's willow riparian woodland and forest (1.433 ac.)
Gum plant patches (17.279 ac.)
Hardstem bulrush marshes (0.163 ac.)
Open water (5.962 ac.)
Ornamental (89.359 ac.)
Perennial pepper weed patches (74.060 ac.)
Perennial rye grass fields (11.505 ac.)
Upland mustards or star-thistle fields (12.586 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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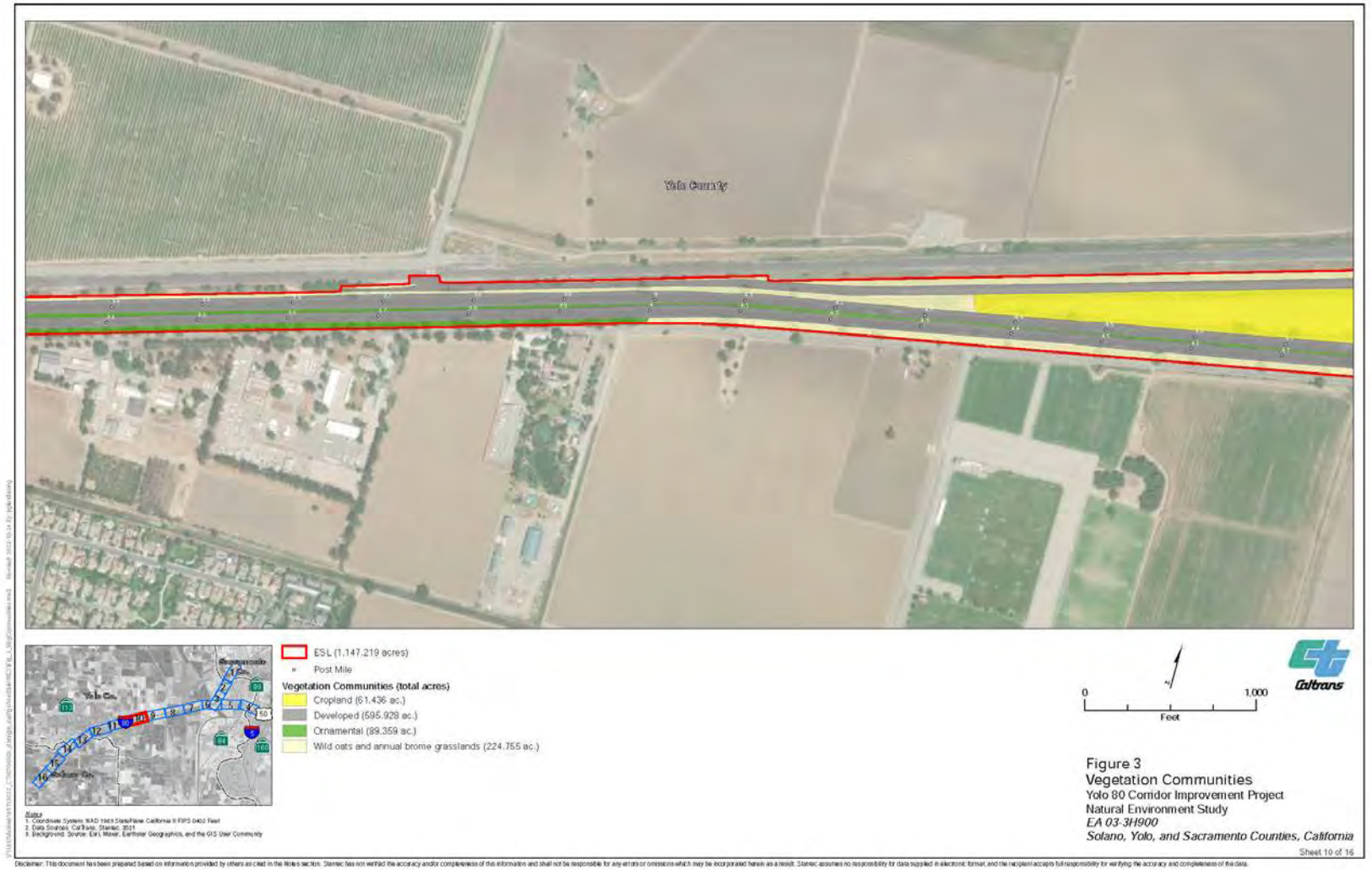
Feet
Caltrans
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 9 of 16


Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Cropland (61.436 ac.)
Developed (595.928 ac.)
Ornamental (89.359 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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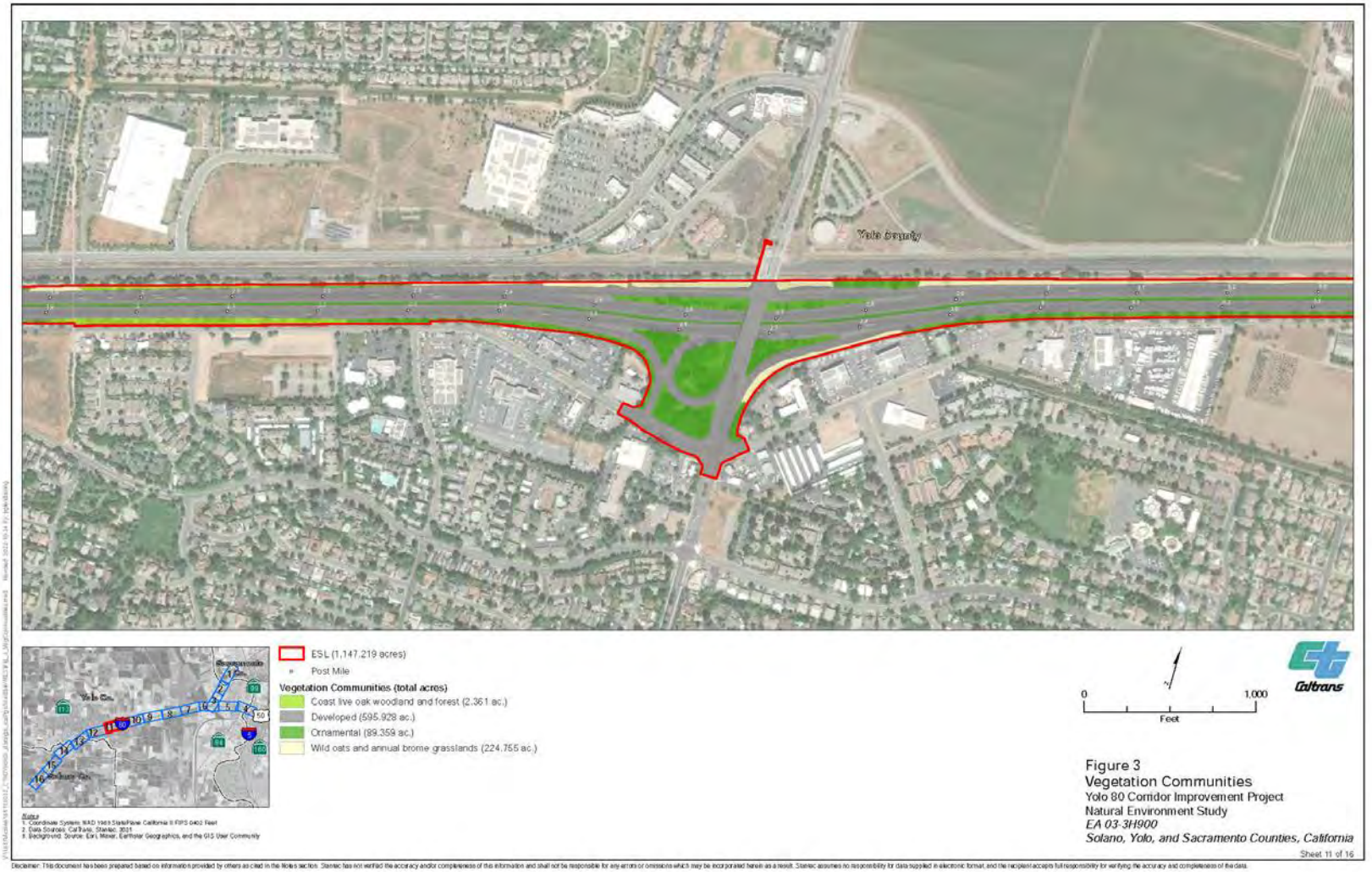
Feet
Caltrans
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 19 of 16


Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Coast live oak woodland and forest (2.361 ac.)
Developed (595.928 ac.)
Ornamental (89.359 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
1,000
Feet
Caltrans
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 11 of 16


Yolo County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Developed (595.928 ac.)
Ornamental (89.359 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Feet
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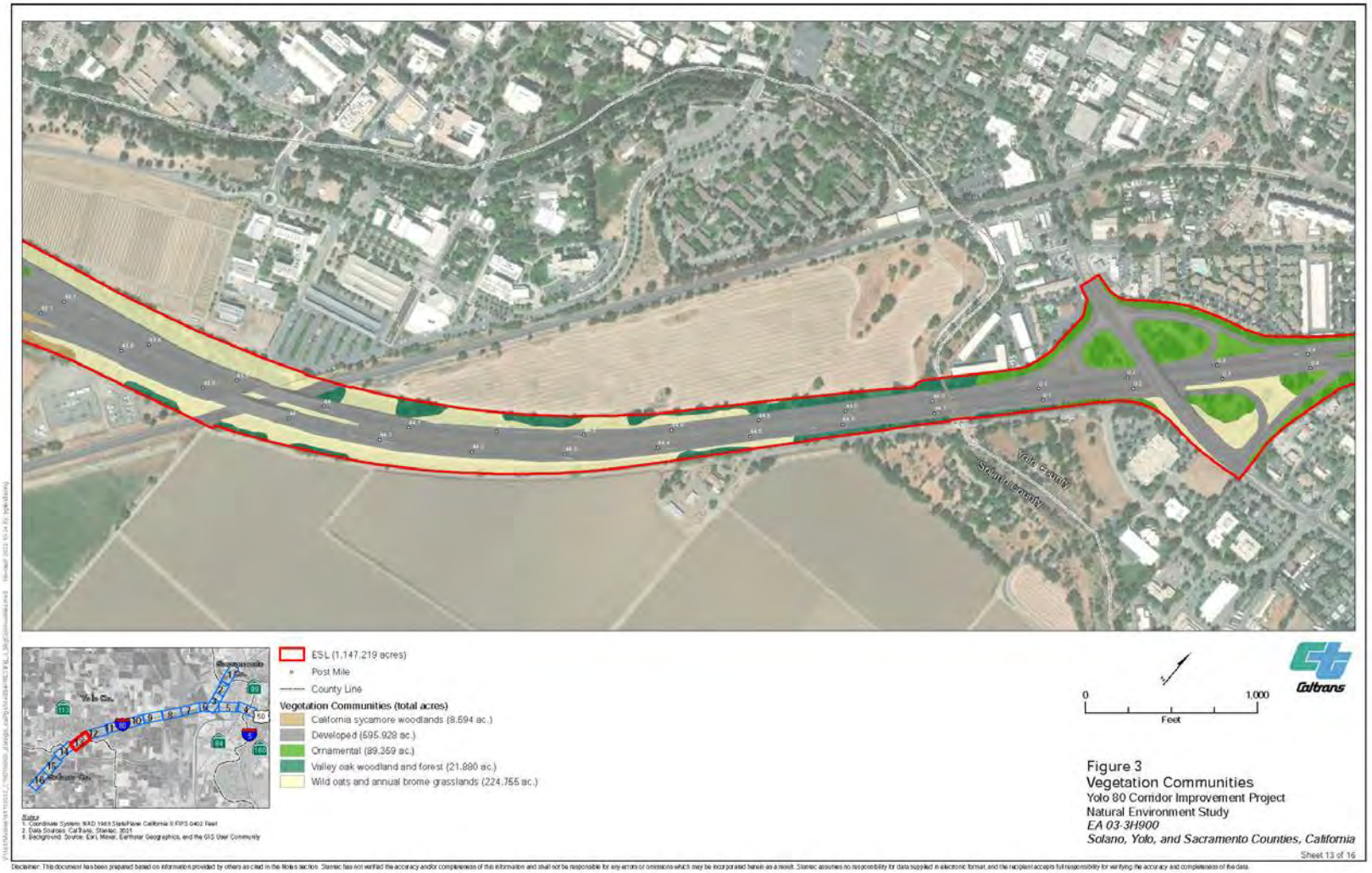
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 12 of 16


ESL (1,147.219 acres)
Post Mile
County Line
Vegetation Communities (total acres)
California sycamore woodlands (8.594 ac.)
Developed (595.928 ac.)
Ornamental (89.359 ac.)
Valley oak woodland and forest (21.890 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
Yolo County
Solano County
0
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Caltrans
Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 13 of 16

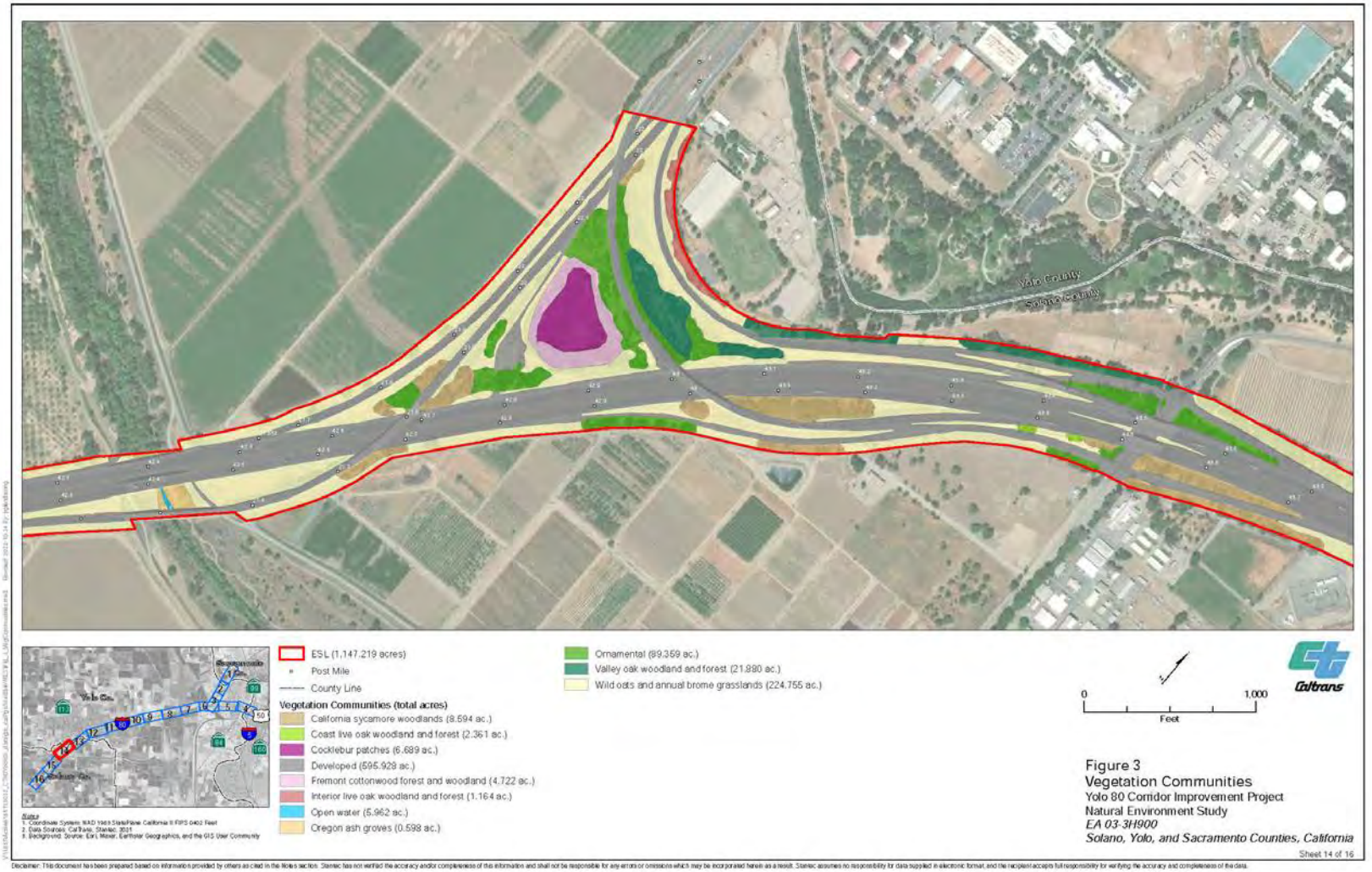
Yolo County
Solano County
ESL (1,147.219 acres)
Post Mile
County Line
Vegetation Communities (total acres)
California sycamore woodlands (8.594 ac.)
Coast live oak woodland and forest (2.361 ac.)
Cocklebur patches (6.689 ac.)
Developed (595.929 ac.)
Fremont cottonwood forest and woodland (4.722 ac.)
Interior live oak woodland and forest (1.164 ac.)
Open water (5.962 ac.)
Oregon ash groves (0.598 ac.)
Ornamental (89.369 ac.)
Valley oak woodland and forest (21.880 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 14 of 16

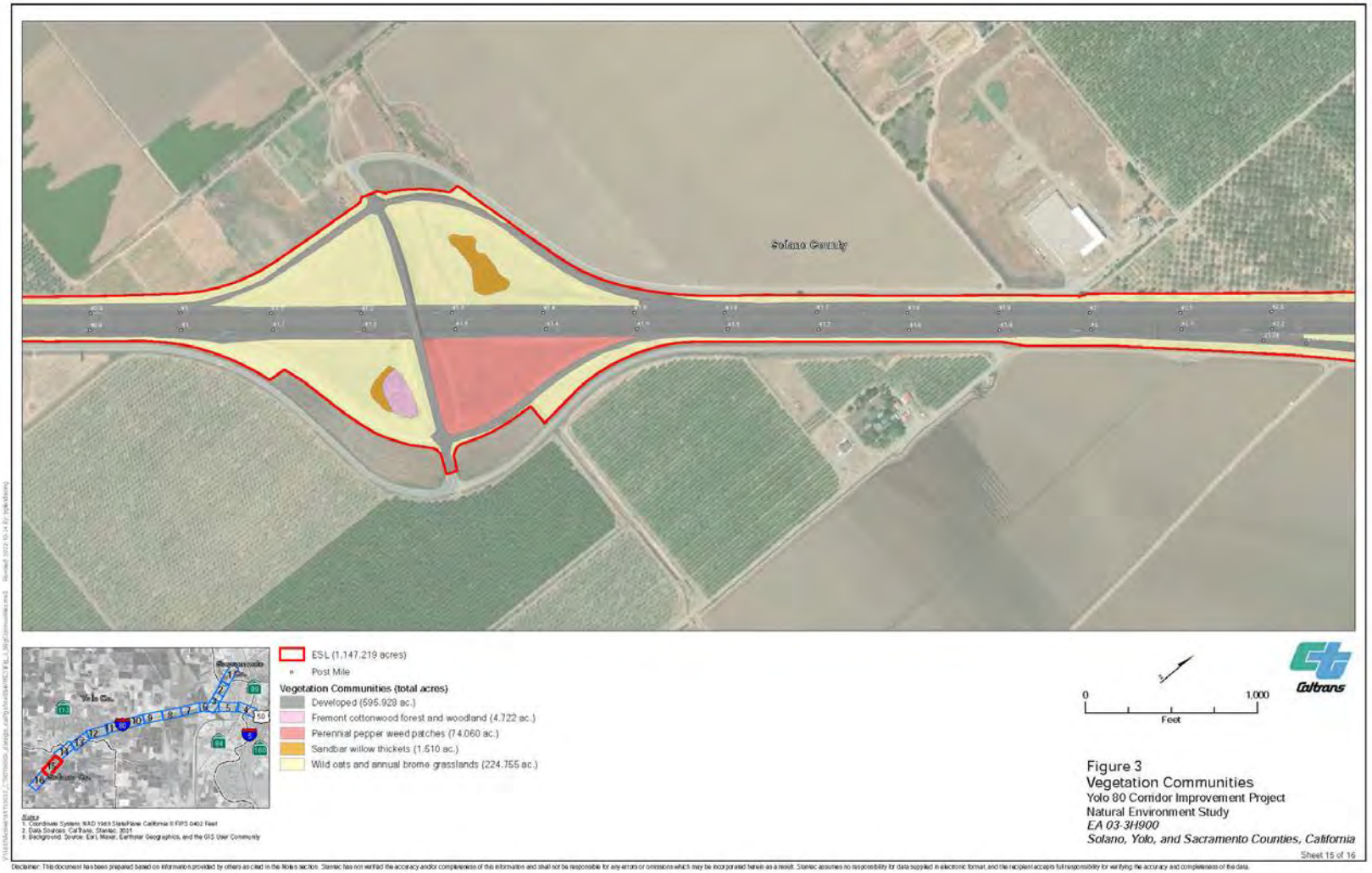
Solano County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Developed (595.928 ac.)
Fremont cottonwood forest and woodland (4.722 ac.)
Perennial pepper weed patches (74.060 ac.)
Sandbar willow thickets (1.510 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
0
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Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 15 of 16

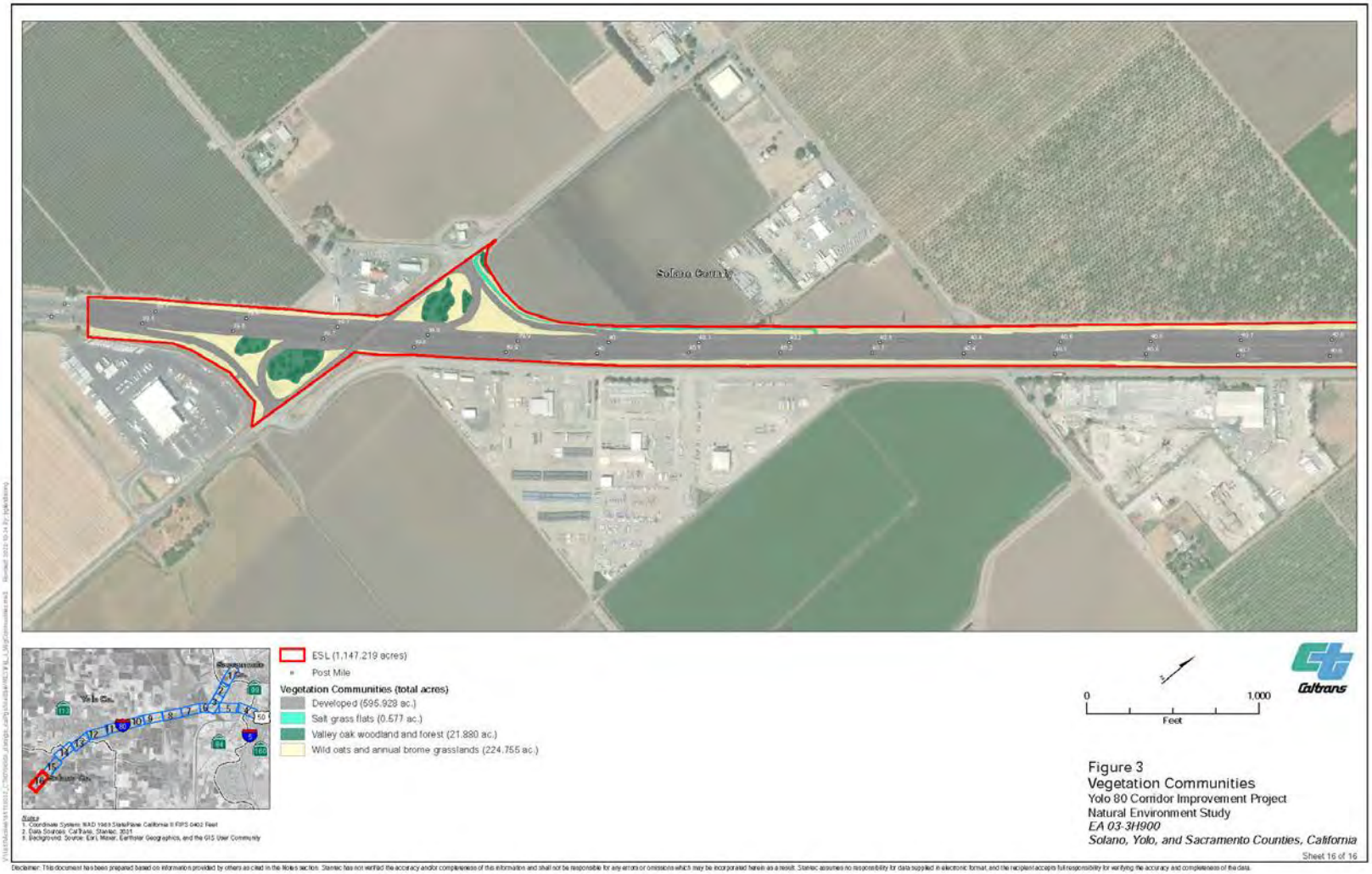
Solano County
ESL (1,147.219 acres)
Post Mile
Vegetation Communities (total acres)
Developed (595.928 ac.)
Salt grass flats (0.577 ac.)
Valley oak woodland and forest (21.880 ac.)
Wild oats and annual brome grasslands (224.755 ac.)
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Figure 3
Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 16 of 16

Perennial Grassland

Perennial Grassland occurs adjacent to the highway in the Yolo Bypass and is dominated (greater than 50% relative cover) by perennial rye grass (*Festuca perennis*). Other non-native grasses and forbs, including ripgut brome, soft chess, perennial pepperweed, and prickly oxtongue, are present as well.

Coastal Oak Woodland

Coastal Oak Woodland occurs adjacent to the highway in the Yolo Bypass and is dominated (greater than 50% relative cover) by perennial rye grass. Other non-native grasses and forbs, including ripgut brome, soft chess, perennial pepperweed, and prickly oxtongue, are present as well.

Valley Oak Woodland

Valley Oak Woodland occurs intermittently within the BSA, with most occurrences near Davis and near the Sacramento River. Many stands associated with I-80 have been planted, while some stands in close proximity to riparian corridors such as Putah Creek appear to be naturally occurring. Valley oak (*Quercus lobata*) is dominant with greater than 35% relative cover and in association with other oak species (*Quercus* sp.), as well as English walnut at lower cover. The herbaceous stratum is typically dominated by non-native grass species such as wild oats and perennial rye grass.

Valley Foothill Riparian

Valley Foothill Riparian habitat occurs in small patches within the BSA and is typically associated with drainages, particularly in the Yolo Bypass, Prospect Slough, and along the Sacramento River. One isolated stand occurs near Sparling Lane south of Davis, and one is associated with a pond. Fremont cottonwood (*Populus fremontii*) is dominant with greater than 50% relative cover and in association with various willows (*Salix* spp.) at low cover, and a sparse herbaceous stratum.

Saline Emergent Wetland

Saline Emergent Wetland occurs in and adjacent to a shallow roadside ditch in Dixon. This alliance is dominated by salt grass at greater than 70% relative cover with other non-native grasses and forbs such as harding grass (*Phalaris aquatica*) and bristly ox tongue. Patchy broadleaf cattail (*Typha latifolia*) and hardstem bulrush (*Schoenoplectus acutus*) are also present.

Fresh Emergent Wetland

Fresh Emergent Wetland occurs in a ditch near the Yolo Bypass and is dominated by hardstem bulrush at greater than 50% relative cover. Other emergent species in this feature such as broadleaf cattail and invasive water primrose (*Ludwigia peploides*) are present as well. Another occurrence of fresh emergent wetland occurs in ditches near the Yolo Bypass and in a ditch west of Sacramento. It is dominated almost exclusively by invasive water primrose, which floats on top of the water and persists on the ground surface when water levels drop. Mosquito fern (*Azolla microphylla*), a native species, is also present at less than 10% relative cover.

Open Water

Open Water is not a vegetation alliance, but for the purposes of this survey, it is included in unvegetated waterbodies. Within the BSA, this includes the Sacramento River, which is crossed twice by the BSA, the South Fork of Putah Creek, Prospect Slough, agricultural ditches, and a pond near the Yolo Bypass.

Invasive Species

Invasive plants (i.e., noxious weeds) are undesirable, non-native plants that commonly invade disturbed sites. Most species have been introduced from Europe and Asia and are known to degrade native wildlife habitat and plant communities. When disturbance results in the creation of habitat openings or in the loss of intact native vegetation, invasive plants may colonize the site and spread, often out-competing native species. Once established, they are very difficult to eradicate and could pose a threat to native species.

All non-native plant species were reviewed to determine their status as invasive plants according to the ratings in the California Invasive Plant Inventory produced by California Invasive Plant Council (Cal-IPC) (Cal-IPC 2021). Cal-IPC categorizes non-native invasive plants into three categories of overall negative ecological impact in California: High, Moderate, and Limited. Of the invasive species found within the BSA, 7 have a Cal-IPC rating of High, 20 have a rating of Moderate, and 18 have a rating of Limited (Table 5).

Table 5. Invasive Plant Species within the Biological Study Area

Cal-IPC Rating	Scientific Name	Common Name
High	*Arundo donax*	giant reed
	Centaurea solstitialis	yellow starthistle
	Hedera helix	English ivy
	Lepidium latifolium	perennial pepperweed
	Ludwigia hexapetala	six petal water primrose
	Rubus armeniacus	Himalayan blackberry
	Tamarix parviflora	tamarisk
Moderate	*Ailanthus altissima*	tree-of-heaven
	Avena fatua	wild oats
	Brassica nigra	black mustard
	Bromus diandrus	ripgut brome
	Centaurea melitensis	tocalote
	Conium maculatum	poison hemlock
	Cynodon dactylon	Bermuda grass
	Dipsacus fullonum	wild teasel
	Festuca arundinacea	reed fescue
	Festuca myuros	rattail sixweeks grass
	Hirschfeldia incana	mustard
	Hordeum marinum ssp. *gussoneanum*	barley
	Hordeum murinum	foxtail barley
	Lythrum hyssopifolia	hyssop loosestrife
	Mentha pulegium	pennyroyal
	Nicotiana glauca	tree tobacco
	Oxalis pes-caprae	Bermuda buttercup
	Phalaris aquatica	harding grass
	Torilis arvensis	field hedge parsley
	Vinca major	vinca
Limited	*Bromus hordeaceus*	soft chess
	Carduus tenuiflorus	slender flowered thistle
	Dactylis glomerata	orchardgrass
	Erodium cicutarium	coastal heron's bill
	Geranium dissectum	wild geranium
	Hypochaeris glabra	smooth cat's ear
	Medicago polymorpha	California burclover
	Phoenix canariensis	Canary Island date palm
	Plantago lanceolata	ribwort
	Polypogon monspeliensis	annual beard grass
	Raphanus sativus	jointed charlock
	Robinia pseudoacacia	black locust
	Rumex crispus	curly dock
	Salsola tragus	Russian thistle

Cal-IPC Rating	Scientific Name	Common Name
	Schinus molle	Peruvian pepper tree
	Silybum marianum	milk thistle
	Stipa miliacea var. *miliacea*	smilo grass
	Trifolium hirtum	rose clover

[1] **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive, but their ecological impacts are minor on a statewide level, or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

3.2. Regional Species and Habitats and Natural Communities of Concern

3.2.1. Sensitive Natural Communities

CDFW maintains a list of California SNCs, which are classified according to the technical approach described in the MCV (Sawyer, et al., 2009) and the CNPS web-based version (CNPS 2020). The MCV describes common to rare vegetation types in California and is the authority on vegetation classification for large- to fine-scale vegetation mapping efforts in the state. The current list of CDFW SNCs (CDFW 2022b) was reviewed to determine if any occur within the BSA. The following seven alliances mapped within the BSA are classified SNCs: Oregon ash groves, California sycamore woodlands, Fremont cottonwood forest and woodland, valley oak woodland and forest, Gooding's willow riparian woodland and forest, gum plant patches, and hardstem bulrush marshes. These alliances correspond to the valley foothill riparian, valley foothill woodland, fresh emergent wetland, and annual/perennial grassland CWHR communities described in the Vegetation Communities section above. Table 6 provides a crosswalk for how these alliances correspond to the CWHR communities.

Table 6. CDFW Sensitive Natural Community to CWHR Communities Crosswalk

CWHR Community Type	CDFW Sensitive Natural Community
Annual/perennial grassland	gum plant patches
Fresh emergent wetlands	hardstem bulrush marshes
Valley foothill riparian	• Oregon ash groves • California sycamore woodlands • Fremont cottonwood forest and woodland • Gooding's willow riparian woodland and forest
Valley oak woodland	valley oak woodland and forest

Riparian Habitat

Riparian habitat is considered an SNC by the Corps, RWQCB, and CDFW, and is present within the BSA. In addition to providing habitat for many wildlife species, riparian areas provide shade, sediment, nutrient or chemical regulation, stream bank stability, and input for large woody debris or organic matter to the channel, which are necessary habitat elements for fish and other aquatic species. Riparian habitat (approximately15.4 acres) occurs in the vicinity of Putah Creek, the Yolo Bypass, as well as along the Sacramento River at both crossings within the BSA.

Sensitive Aquatic Resources

A delineation of aquatic resources within the BSA was conducted on December 18, 21, 22, 28–29, 2020; February 19, 20–24, 2021; and July 21, 2022 (Appendix D). Features identified within the BSA include wetlands consisting of fresh emergent marsh, seasonal wetlands, vegetated ditches, and woody riparian wetlands, as well as other waters comprising ephemeral drainages, intermittent drainages, perennial drainages, canals, and ponds. These features are considered sensitive aquatic resources given they may be regulated under CWA Sections 404 and 401, Porter-Cologne Act, or Fish and Game Code Section 1600 by the Corps, RWQCB, or CDFW, respectively. The acreage and linear feet of each feature type are provided in Table 7 and further described below and in Appendix D.

Table 7. Summary of Aquatic Resources within the Biological Study Area

Feature Type	Acres[1]	Linear Feet
Wetlands		
Fresh Emergent Marsh	0.399	N/A
Seasonal Wetlands	4.002	N/A
Vegetated Ditches	7.553	N/A
Woody Riparian Wetlands	5.058	N/A
Wetlands Total	**17.012**	N/A
Other Waters		
Ephemeral Drainages	0.461	1,654.61
Intermittent Drainages	0.741	2,734.89
Perennial Drainages	5.692	1,148.01
Canals	1.523	3,134.36
Ponds	3.584	N/A
Other Waters Total	**12.001**	**8,671.87**
Total	**29.013**	**8,671.87**

3.2.2. Special Status Plant Species

For the purpose of this NES, special status plant species include plants that are (1) listed as endangered or threatened under the CESA or the ESA; (2) listed as rare by the CDFW; (3) identified as state or federal candidate or proposed species for listing as endangered or threatened; and/or (4) have a CRPR of 1A, 1B, 2A, 2B, 3, or 4.

Regionally occurring special status plant species were identified based on a review of pertinent literature, the USFWS species list, CNDDB and CNPS database records, and the field survey results. The status of each special status plant species was verified using the Special Vascular Plants, Bryophytes, and Lichens List (CDFW 2023c) and the *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (CDFW 2023d). For each species, habitat requirements were assessed and compared to the habitats within the BSA and immediate vicinity to determine if potential habitat occurs in the BSA. Based on the habitat assessment, the BSA provides potential habitat for 25 special status plant species (Table 8). These plant species are further discussed in Chapter 4.

Table 8. Special Status Plant Species Potentially Occurring or Known to Occur within the Biological Study Area

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
palmate-bracted bird's-beak	*Chloropyron palmatum*	FT/SE/1B.1	Found in valley and foothill grassland with alkaline soil. Blooms: May–Oct. Elevation: 85 to 90 feet.	A	No suitable alkaline soils are present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Bogg's Lake hedge-hyssop	*Gratiola heterosepala*	—/SE/1B.2	Found in marshes and swamps (lake margins) and vernal pools. Clay soil. Blooms: Apr.–Aug. Elevation: 33 to 7,800 feet.	HP	Suitable habitat may be present in the fresh emergent marsh wetlands. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Colusa grass	*Neostapfia colusana*	FT/SE/1B.1	Found in vernal pools. Blooms: May–Aug. Elevation: 16-656 feet.	A	No vernal pool habitat is present within the BSA to support the species. The most recent CNDDB occurrence is from 2013 approximately 4 miles southwest of the BSA. This species was not observed during the May 2021 botanical surveys.
Keck's checkerbloom	*Sidalcea keckii*	FE/—/1B.1	Found in valley and foothill grassland and cismontane woodland. Serpentinite, clay soil. Blooms: Apr.–May(Jun). Elevation: 245 to 2,100 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 2019 approximately 5 miles west of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
Crampton's tuctoria or Solano grass	*Tuctoria mucronata*	FE/SE/1B.1	Found in valley and foothill grassland (mesic) and vernal pools. Blooms: Apr.–Aug. Elevation: 15 to 33 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 2011 approximately 4 miles southwest of the BSA within created vernal pools. This species was not observed during the May 2021 botanical surveys.
Other Special Status Species					
depauperate milk-vetch	*Astragalus pauperculus*	—/—/4.3	Found in chaparral, cismontane woodland, and valley and foothill grassland with vernally mesic, volcanic soil. Blooms: Mar.–Jun. Elevation: 200 to 4,000 feet.	A	The BSA is not within elevational range of the species. Vernally mesic, volcanic soils are not present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Ferris' milk-vetch	*Astragalus tener* var. *ferrisiae*	—/—/1B.1	Found in valley and foothill grassland (subalkaline flats) and meadows and seeps (vernally mesic). Blooms: Apr.–May Elevation: 5 to 245 feet.	A	No suitable subalkaline flats within valley and foothill grassland or meadows and seeps are present within the BSA. The most recent CNDDB occurrence is from 1954 at an unknown location along the Yolo Bypass. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
alkali milk-vetch	*Astragalus tener* var. *tener*	—/—/1B.2	Found in playas, valley and foothill grassland (adobe clay), and vernal pools. Blooms: Mar.–Jun. Elevation: 5 to 200 feet.	A	No suitable abode clay or vernal pools are present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
heartscale	*Atriplex cordulata* var. *cordulata*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands. Alkaline and clay soils. Blooms: Apr.–Oct. Elevation: 1–1,050 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 1952 approximately 1.5 miles northwest of the BSA and is presumed extirpated. This species was not observed during the May 2021 botanical surveys.
brittlescale	*Atriplex depressa*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands. Alkaline and clay soils. Blooms: Apr.–Oct. Elevation: 1–1,050 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 1996 approximately 2 miles northwest of the BSA in highly disturbed (plowed) alkali sink habitat. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
vernal pool smallscale	*Atriplex persistens*	—/—/1B.2	Found in vernal pools (alkaline). Blooms: Jun, Aug–Oct Elevation: 30–375 feet.	A	No suitable vernal pool habitat is present within the BSA. No CNDDB occurrences within 5 miles of the BSA. Species not observed during May 2021 botanical surveys.
valley brodiaea	*Brodiaea rosea* ssp. *vallicola*	—/—/4.2	Found in swales within valley and foothill grassland and vernal pools on old alluvial terraces with silty, sandy, and gravelly loam. Blooms: Apr.–May (Jun). Elevation: 30–1,100 feet.	A	No suitable alluvial terraces are present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
bristly sedge	*Carex comosa*	—/—/2B.1	Found in coastal prairie, marshes and swamps (lake margins), and vernal pools. Blooms: May–Sep. Elevation: 0 to 2,050 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
pappose tarplant	*Centromadia parryi* ssp. *parryi*	—/—/1B.2	Found in coastal prairie, marshes and swamps (coastal salt), meadows and seeps, chaparral, and valley and foothill grassland (vernally mesic). Blooms: May–Nov. Elevation: 0 to 1,375 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands within the BSA in the Yolo Bypass area. However, the wetlands within the BSA have altered hydrological regimes. There is also suitable grassland habitat within the BSA. One CNDDB occurrence from 2015 along I-80 and the east side of the Yolo Bypass. This species was not observed during the May 2021 botanical surveys.
Parry's rough tarplant	*Centromadia parryi* ssp. *rudis*	—/—/4.2	Found in valley and foothill grassland and vernal pools in areas that are alkaline, vernally mesic, in seeps, and sometimes roadsides. Blooms: May–Oct. Elevation: 0 to 330 feet.	HP	Suitable habitat is present within the BSA along roadsides and habitats. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Bolander's water-hemlock	*Cicuta maculata* var. *bolanderi*	—/—/2B.1	Found in marshes and swamps with coastal, fresh, or brackish water. Blooms: Jul.–Sep. Elevation: 0 to 650 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
recurved larkspur	*Delphinium recurvatum*	—/—/1B.2	Found in chenopod scrub, valley and foothill grassland, and cismontane woodland. Alkaline soils. Blooms: Mar.–Jun. Elevation:10–2,600 feet.	A	No alkaline grasslands are present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
dwarf downingia	*Downingia pusilla*	—/—/2B.2	Found in valley and foothill grassland (mesic) and vernal pools. Blooms: Mar.–May. Elevation: 3 to 1,460 feet.	HP	Marginal habitat is present within the grasslands, which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Jepson's coyote-thistle	*Eryngium jepsonii*	—/—/1B.2	Found in valley and foothill grassland and vernal pools. Blooms: Apr.–Aug. Elevation: 10 to 985 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species; no vernal pools are present. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
San Joaquin spearscale	*Extriplex joaquinana*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, valley and foothill grassland, and playas. Alkaline soils. Blooms: Apr.–Oct. Elevation: 2–2,740 feet.	A	No grasslands with alkaline soils are present within the BSA. The most recent CNDDB occurrence is from 2001 approximately 4 miles southwest of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
stinkbells	*Fritillaria agrestis*	—/—/4.2	Found in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Clay and sometimes serpentine soils. Blooms: Mar.–Jun. Elevation: 30–5,100 feet.	HP	Marginal habitat is present within the grasslands, which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
fragrant fritillary	*Fritillaria liliacea*	—/—/1B.2	Found in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. Often serpentine soils. Blooms: Feb.–Apr. Elevation: 10–1,350 feet.	HP	Marginal habitat is present in the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
adobe-lily	*Fritillaria pluriflora*	—/—/1B.2	Found in cismontane woodland, chaparral, and valley and foothill grassland. Often adobe soils. Blooms: Feb.–Apr. Elevation:195–2,310 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
hogwallow starfish	*Hesperevax caulescens*	—/—/4.2	Found in valley and foothill grassland (mesic clay) and shallow vernal pools. Blooms: Mar.–Jun. Elevation: 0 to 1,650 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
wooly rose-mallow	*Hibiscus lasiocarpos* var. *occidentalis*	—/—/1B.2	Found in marshes and swamps (freshwater). Often in riprap on sides of levees. Blooms: Jun.–Sep. Elevation: 0–390 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. One CNDDB occurrence from 1994 was identified within the BSA in Natomas near the eastbound El Camino Avenue/I-80 on-ramp. This species was not observed during the May 2021 botanical surveys.
Carquinez goldenbush	*Isocoma arguta*	—/—/1B.1	Found in valley and foothill grassland (alkaline). Blooms: Aug.–Dec. Elevation: 3 to 65 feet.	A	No alkaline grasslands are present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
alkali-sink goldfields	*Lasthenia chrysantha*	—/—/1B.1	Found in vernal pools and wet saline flats. Blooms: Feb.–Apr. Elevation: 0–325 feet.	A	No suitable vernal pool habitat is present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
Coulter's goldfields	*Lasthenia glabrata* ssp. *coulteri*	—/—/1B.1	Found in marshes and swamps (coastal salt), playas, and vernal pools. Blooms: Feb.–Jun. Elevation: 0–4,000 feet.	A	No suitable coastal salt marsh or swamp, playas, or vernal pool habitat is present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Delta tule pea	*Lathyrus jepsonii* var. *jepsonii*	—/—/1B.2	Found in marshes and swamps (freshwater and brackish). Blooms: May–Jul. (Aug.–Sep.) Elevation: 0–16 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
legenere *Legenere limosa*	*Legenere limosa*	—/—/1B.1	Found in vernal pools. Blooms: Apr.–Jun. Elevation: 3–2,900 feet.	A	No suitable vernal pool habitat is present within the BSA. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Heckard's pepper-grass	*Lepidium latipes* var. *heckardii*	—/—/1B.2	Found in valley and foothill grassland (alkaline flats). Blooms: Mar.–May. Elevation: 5 to 670 feet.	A	No alkaline flats are present within the BSA. The most recent CNDDB occurrence is form 1957 approximately 3 miles northeast of Davis. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
woolly-headed lessingia	*Lessingia hololeuca*	—/—/3	Found in broadleaved upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland. Clay, serpentine soil. Blooms: Jun.–Oct. Elevation: 50 to 1,000 feet.	A	Habitat with suitable clay, serpentine soil is not present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Mason's lilaeopsis	*Lilaeopsis masonii*	—/—/1B.1	Found in marshes and swamps (freshwater or brackish) and riparian scrub. Blooms: Apr.–Nov. Elevation: 0–33 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands and willow thickets within the BSA. However, the wetlands within the BSA have altered hydrological regimes. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Delta mudwort	*Limosella australis*	—/—/2B.1	Found in marshes and swamps (freshwater or brackish) and riparian scrub. Usually mud banks Blooms: May–Aug. Elevation: 0–10 feet.	HP	Marginal habitat is present in the fresh emergent marsh wetlands and willow thickets within the BSA. However, the wetlands within the BSA have altered hydrological regimes No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
Heller's bush-mallow	*Malacothamnus helleri*	—/—/3.3	Found in chaparral on sandstone and riparian woodland on gravel. Blooms: May–Jul. Elevation:1,000–2,080 feet.	A	The BSA is not within elevational range of this species. No CNDDB occurrences within 5 miles of the BSA.
little mousetail	*Myosurus minimus* ssp. *apus*	—/—/3.1	Found in valley and foothill grassland and vernal pools (alkaline). Blooms: Mar.–Jun. Elevation: 65 to 2,100 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	—/—/1B.1	Found in cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland and vernal pools. Mesic. Blooms: Apr.–Jul. Elevation: 15–5,700 feet.	HP	Marginal habitat is present within the grasslands and woodlands which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.
bearded popcornflower	*Plagiobothrys hystriculus*	—/—/1B.1	Found in valley and foothill grassland (mesic) and vernal pool margins. Blooms: Apr.–May Elevation: 0 to 900 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
California alkali grass	*Puccinellia simplex*	—/—/1B.2	Found in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools. Alkaline, vernally mesic; sinks, flats, and lake margins. Blooms: Mar.–May Elevation: 5–3,050 feet.	HP	Marginal habitat is present within the grasslands which have limited distribution within the BSA and are dominated by non-native and invasive species. The most recent CNDDB occurrence is from 1962 at an unknow location north of Davis and is presumed extirpated. This species was not observed during the May 2021 botanical surveys.
Sanford's arrowhead	*Sagittaria sanfordii*	—/—/1B.2	Found in marshes and swamps (assorted shallow freshwater). Blooms: May–Oct. (Nov) Elevation: 0–2,130 feet	HP	Marginal habitat is present in the fresh emergent marsh wetlands within the BSA. However, the wetlands within the BSA have altered hydrological regimes. The most recent CNDDB occurrence is from 1993 approximately 3 miles northeast of the BSA along the American River bike trail. This species was not observed during the May 2021 botanical surveys.
Suisun Marsh aster	*Symphyotrichum lentum*	—/—/1B.2	Found in marshes and swamps (brackish and freshwater). Blooms: (Apr)May–Nov. Elevation: 0–10 feet	HP	Marginal habitat is present in the fresh emergent marsh wetlands within the BSA in the Yolo Bypass area. However, the wetlands within the BSA have altered hydrological regimes. A single CNDDB occurrence from 2013 was identified within the Yolo Bypass less than one mile south of the BSA. This species was not observed during the May 2021 botanical surveys.

Common Name	Scientific Name	Status[1] (Fed/State/ CRPR)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
saline clover	*Trifolium hydrophilum*	—/—/1B.2	Found in marshes and swamps, valley and foothill grassland (mesic, alkaline), and vernal pools. Blooms: Apr.–Jun. Elevation: 0 to 985 feet.	A	Suitable habitat with alkaline soil is not present within the BSA to support the species. No CNDDB occurrences within 5 miles of the BSA. This species was not observed during the May 2021 botanical surveys.

[1] Status Codes: Federal Endangered (FT); Federal Threatened (FT); State Endangered (SE).
1 CRPR Codes and Extensions:
1A Plants presumed extirpated in California and either rare or extinct elsewhere.
1B Plants rare, threatened, or endangered in California and elsewhere.
2A Plants presumed extirpated in California, but more common elsewhere.
2B Plants rare, threatened, or endangered in California, but more common elsewhere.
3 Review list: Plants about which more information is needed.
4 Watch List: Plants of limited distribution.
xx.3 Not very endangered in California
xx.2 Fairly endangered in California
xx.1 Seriously endangered in California

[2] Assessment Codes. Absent (A): No habitat present and no further work needed. Not observed during botanical surveys. Habitat Present (HP): Habitat is or may be present. The species may be present.

3.2.3. Special Status Animal Species

Special status animal species include species that are (1) listed as endangered or threatened under the CESA or the ESA; (2) proposed for federal listing as endangered or threatened; (3) identified as state or federal candidates for listing as endangered or threatened; and/or (4) identified as SSC or California FP by the CDFW.

Regionally occurring special status animal species were identified based on a review of pertinent literature, the USFWS species list, CNDDB database records, a query of the California Wildlife Habitats Relationship system, and the field survey results. The status for each special status animal species was verified using the Special Animals List (CDFW 2023e) and the *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2023f). For each species, habitat requirements were assessed and compared to the habitats within the BSA and immediate vicinity to determine the species' potential to occur in or near the BSA. Based on the habitat assessment, 23 special status animal species were determined to potentially occur within the BSA (Table 9). These special status animal species are further discussed in Chapter 4.

Table 9. Special Status Animals and Critical Habitat Potentially Occurring or Known to Occur within the Biological Study Area

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
Federal or State Listed Species					
INVERTEBRATES					
conservancy fairy shrimp	*Branchinecta conservatio*	FE/—	Large to very large vernal pools with turbid water in grasslands on old alluvial soils underlain by hardpan.	A	Not expected to occur. Species occurs in large vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. No CNDDB recorded occurrences within 5 miles of the BSA.
vernal pool fairy shrimp	*Branchinecta lynchi*	FT/—	Vernal and intermittent freshwater pools.	A	Not expected to occur. Species occurs in large vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. The most recent CNDDB occurrence is from 1995 approximately 5 miles northeast of the BSA documenting 10 adults in a seasonal pond near the Natomas East Main Drainage Canal in Sacramento.
vernal pool tadpole shrimp	*Lepidurus packardi*	FE/—	Vernal and intermittent freshwater pools.	A	Not expected to occur. Species occurs in large vernal pools and are not currently known to occur in any waters or wetlands that intersect the BSA. No suitable habitat is present within the BSA. The most recent CNDDB occurrence is from 1979 approximately 2 miles northwest of the BSA documenting specimens found in a vernal pool adjacent to agricultural land on the north side of the city of Davis.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT/—	Life cycle depends on elderberry shrubs (*Sambucus* spp.), which are typically associated with riparian forests that occur along rivers and streams.	HP	Sixty-seven suitable elderberry shrubs were mapped within 165-feet of the BSA; 52 of which are located within the BSA. Three CNDDB occurrences within 2,526 feet of the BSA.
Delta green ground beetle	*Elaphrus viridis*	FT/—	Found in the vicinity of vernal pools within Solano County.	A	Not expected to occur. Suitable vernal pool habitat is not present within the vicinity of the BSA in Solano County. No CNDDB occurrences within 5 miles of the BSA.
crotch bumble bee	*Bombus crotchii*	—/CE	Open grasslands and scrub areas in hot and dry climates. Requires underground nesting habitat, abundant flowering plants for foraging, and overwintering habitat (soft, disturbed soil or leaf litter). Crotch bumble bee has been nearly extirpated from the Central Valley.	A	The BSA is within highly disturbed right-of-way and adjacent land use is mostly urban and agriculture. The floristic resources and underground nesting habitat required for the species are not present within or adjacent to the BSA. In addition, the adjacent agriculture provides competition with managed bees, disease, and pesticides that are detrimental to and been a factor in the decline of the species. The most recent CNDDB occurrence is from 1998 approximately 0.5 mile north of the BSA along Putah Creek.
western bumble bee *Bombus occidentalis*	*Bombus occidentalis*	—/CE	Blooming flowers along streams, meadows, roadsides, and burned or logged areas. Nests found underground in abandoned rodent burrows.	A	The BSA is not within the current range of the species. Most recent CNDDB occurrence is from 1965 in the general vicinity of the City of Davis.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
FISH					
green sturgeon-southern DPS	*Acipenser medirostris*	FT/SSC	Spawn in mainstem Sacramento and Feather rivers; juveniles are thought to rear mainly throughout the San Francisco Bay estuary.	HP, CH	Suitable spawning habitat is present within the BSA in the Sacramento River. No CNDDB occurrences within 5 miles of the BSA. The BSA is in designated critical habitat.
steelhead-Central Valley DPS	*Oncorhynchus mykiss irideus* pop. *11*	FT/—	Spawn and rear in the Sacramento River and its tributaries. Requires cool, swift shallow water; clean, loose gravel for spawning.	HP, CH	Suitable habitat is present within the BSA in the Sacramento River and Prospect Slough. The most recent CNDDB documented occurrence is from 2011 approximately 0.5 mile east of the BSA documenting many migrating and stranded steelhead between 1998–2011 at the eastern edge of the Yolo Bypass; including the toe drain, Sacramento Deep Water Ship Channel, and Sacramento Bypass. The BSA is in designated critical habitat.
chinook salmon-Central Valley spring-run ESU	*Oncorhynchus tshawytscha* pop. *11*	FT/ST	Sacramento and San Joaquin Rivers and tributaries with cool summer water temperatures, deep pools, and suitable spawning substrate.	HP, CH	Suitable habitat is present within the BSA in the Sacramento River. The most recent CNDDB documented occurrence is from 2004 less than 1 mile east of the BSA documenting one adult and 26 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
chinook salmon-Sacramento River winter-run ESU	*Oncorhynchus tshawytscha* pop. 7	FE/SE	Adults and juveniles occur in the Sacramento River during seasonal migration periods.	HP, CH	Suitable habitat is present within the BSA in the Sacramento River. The most recent CNDDB documented occurrence is from 2004 less than 1 mile east of the BSA documenting 36 adults and 11 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.
delta smelt	*Hypomesus transpacificus*	FT/SE	Estuarine systems in the Sacramento-San Joaquin Delta, in reaches with slow flow.	HP, CH	The BSA contains suitable habitat for the species within the Sacramento River. There are no CNDDB occurrences within 5 miles of the BSA. The BSA overlaps designated critical habitat for the species.
longfin smelt	*Spirinchus thaleichthys*	FC/ST	Open-water channels and bays in salinities ranging from freshwater to seawater.	HP	The BSA contains suitable habitat for the species within the Sacramento River. One CNDDB occurrence was identified in the Sacramento River within the BSA, where a single adult was collected in 2004.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
HERPETOFAUNa					
California tiger salamander	*Ambystoma californiense*	FT/ST	Breeding habitat consists of vernal or temporary pools in annual grasslands, or open stages of woodlands. Requires underground refugia, such as mammal burrows, within 1 mile of breeding habitat.	A	The BSA does not contain suitable breeding habitat or underground refugia (e.g., small mammal burrows) within annual grassland habitat. The seasonal wetlands within the BSA are not inundated for a sufficient duration to support breeding and development of the species in the features. Further, the BSA is within a highly disturbed right-of-way and adjacent land use is mostly urban and agriculture with frequent anthropogenic disturbances. The most recent CNDDB occurrence is from 1993 approximately 2.5 miles northwest of the BSA documenting a live individual captured in the parking lot of an apartment complex at the north edge of the city of Davis.
California red-legged frog	*Rana draytonii*	FE/SSC	Requires aquatic habitat for breeding, also uses a variety of other habitat types, including riparian and upland areas. Adults prefer dense, shrubby, or emergent vegetation associated with deep-water pools with fringes of cattails and dense stands of overhanging vegetation. This species also breeds in ephemeral ponds that support little or no vegetation.	A	The BSA is not within the current range of the species.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
giant garter snake	*Thamnophis gigas*	FT/ST	Freshwater marshes and low gradient streams with emergent vegetation. Adapted to drainage canals and irrigation ditches with mud substrate.	HP	Suitable aquatic and upland habitat is present within the Yolo Bypass, and other areas throughout the BSA. There are five CNDDB occurrences within 5 miles of the BSA.
BIRDS					
Swainson's hawk	*Buteo swainsoni*	—/ST	Breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah; forages in adjacent livestock pasture, grassland, or grain fields.	P	Protocol-level Swainson's hawk surveys revealed 132 potential nests within 0.5 mile of the BSA; 24 of which were active Swainson's hawk nests during the 2021 nesting season. There are 75 CNDDB occurrences within 0.5 mile of the BSA. Tall trees throughout the BSA provide suitable nesting habitat. In addition to nesting, seven observations of overwintering Swainson's hawks were made during the January 12,and February 17, 2021, surveys in the vicinity of the city of Davis.
white-tailed kit	*Elanus leucurus*	—/FP	Nests in tall shrubs and trees. Forages in grasslands, agricultural fields, and marshes.	P	White-tailed kite was observed foraging at the eastern end of the BSA during the January 12, 2021, survey. The most recent CNDDB occurrence is from 1993 approximately 3 miles northwest of the BSA documenting an active nest near the city of Davis.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
bald eagle	*Haliaeetus leucocephalus*	—/SE, FP	Breeds and winters in riparian woodland with large trees, often old growth or open canopy. Typically nests near large bodies of permanent water or perennially flowing rivers with abundant fish.	A	One bald eagle was observed flying through the BSA during SWAINSON'S HAWK surveys. However, no suitable nesting habitat for the species was identified within 0.5 mile of the BSA during the surveys.
California black rail	*Laterallus jamaicensis coturniculus*	—/ST, FP	Resides in saline, brackish, and freshwater wetlands in the San Francisco Bay area, Sacramento-San Joaquin Delta, coastal southern California at Morro Bay.	A	The BSA is not within the current range of the species.
western snowy plover	*Charadrius nivosus*	FT/SSC	Nests in sandy marine and estuarine shores. Inland nesting areas include the Salton Sea, Mono Lake, and at isolated sites on the shores of alkali lakes in northeastern California, in the Central Valley, and the southeastern deserts.	A	The BSA is not within the current range of the species.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FT/SE	Requires dense deciduous riparian thickets or woodland with dense, low-level or understory foliage adjacent to slow-moving watercourses, backwaters, or seeps.	HP	The BSA is not within the current breeding range of the species. However, migratory stopover habitat is present within the riparian habitat within the BSA. A single CNDDB occurrence documents observances made September 2012 and August 2013 along Putah Creek less than two miles west of the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
least Bell's vireo	*Vireo bellii pusillus*	FE/SE	Riparian forest, scrub, or woodland; nests along margins of bushes or twigs projecting; usually willow, mulefat, or mesquite. Requires dense cover within 3-6 feet of the ground for nesting and a dense, stratified canopy for foraging.	HP	Although the BSA is within the current breeding range of the species, breeding habitat (i.e., the riparian vegetation lacks the structure and vegetative density required by the species for nesting) is not present within the BSA. The most recent CNDDB occurrence is from 2011 approximately 3.5 miles south of the BSA in the Yolo Bypass documenting a nesting pair in undisturbed riparian scrub habitat. The species may use riparian habitat within the BSA for foraging or migratory stopover habitat.
bank swallow	*Riparia*	—/ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	A	The BSA does not contain suitable habitat for the species. Vertical banks and cliffs are not present within the BSA. The most recent CNDDB occurrence is from 1986 along the American River approximately 3.5 miles east of the BSA.
tricolored blackbird	*Agelaius tricolor*	—/ST	Breeds in large colonies in freshwater marshes in dense stands of cattails or bulrushes. Forages in open habitats such as farm fields and pastures.	HP	Potential habitat for nesting colonies mostly between the east end of the Yolo Bypass and city of Davis city limits. The most recent CNDDB occurrence is from 2014 approximately 5 miles south of the BSA in the Yolo Bypass and documents approximately 100 individuals within a nesting colony.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
OTHER SPECIAL STATUS SPECIES					
Sacramento splittail	*Pogonichthys macrolepidotus*	—/SSC	Estuaries and deltas, endemic to California's Central Valley.	A	The BSA does not contain suitable habitat for the species.
Sacramento perch	*Archoplites interruptus*	—/SSC	Warm, turbid reservoirs and ponds.	A	The BSA does not contain suitable habitat for the species.
western spadefoot	*Spea hammondii*	—/SSC	Breeds and lays eggs in shallow, temporary pools formed by heavy winter rains, often in grasslands. Requires underground refugia, such as mammal burrows, near breeding habitat.	A	The BSA does not contain suitable breeding habitat. The seasonal wetlands within the BSA are heavily vegetated and are not inundated for a sufficient amount of time during the breeding season to support the species. The BSA is within highly disturbed right-of-way and adjacent land use is mostly urban and agriculture with frequent anthropogenic disturbances. No CNDDB occurrences within 5 miles of the BSA.
western pond turtle	*Emys marmorata*	—/SSC	Slow water aquatic habitat with available basking sites. Hatchlings require shallow water with dense submergent or short emergent vegetation. Requires an upland oviposition site near the aquatic site.	HP	The BSA contains suitable aquatic habitat for the species in Putah Creek, vegetated ditches, and canals throughout the BSA. The most recent CNDDB occurrence is from 2001 approximately 0.25 mile north of the BSA documenting 76 individuals (only one hatchling and eight juveniles) captured between 1996 to 2001 in a disturbed portion of the UC Davis Arboretum waterway.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
northern harrier	*Circus hudsonius*	—/SSC	Nests on the ground in shrubby vegetation in emergent wetlands, along rivers or lakes, in grasslands, grain fields, or on sagebrush flats.	P	Species was observed foraging in the Yolo Bypass during the January 12, 2021, survey of the BSA. Most recent CNDDB occurrence from 2015 approximately 3 miles northwest of the BSA documenting an active nest in a wheat field.
mountain plover	*Charadrius montanus*	—/SSC	Winter resident from September through March inhabiting grasslands and plowed fields in the Central Valley. Does not nest in California.	HP	The BSA contains suitable wintering habitat for the species within plowed fields and grassland habitat. No CNDDB occurrences within 5 miles of the BSA.
western burrowing owl	*Athene cunicularia*	—/SSC	Grasslands, agricultural fields, and ruderal habitats with mammal burrows.	HP	The BSA contains ruderal areas with suitable nesting and foraging habitats. There are five CNDDB occurrences within approximately 500 feet of the BSA.
grasshopper sparrow	*Ammodramus savannarum*	—/SSC	Breeds in dry, dense grasslands with a variety of grasses and tall forbs and scattered shrubs for singing perches.	HP	The BSA contains suitable habitat for the species within grassland habitat. No CNDDB occurrences within 5 miles of the BSA.
purple martin	*Progne subis*	—/SSC	Colonial nester in tree cavities, under bridges and culverts, and occasionally nesting boxes. Often nests in tall, old trees near a body of water.	HP	The BSA contains suitable habitat within tree cavities, bridges, and culverts. One CNDDB occurrence from 2003 documents 29 pairs observed nesting in weep holes under I-5 freeway and street overpasses within one mile of the BSA.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale
song sparrow (Modesto population)	*Melospiza melodai*	—/SSC	Extensive wetlands and riparian forests.	HP	Habitat is present within the BSA within the Yolo Bypass, Sacramento River, Putah Creek, and agricultural areas. One CNDDB occurrence from 2013 approximately 3.5 miles south of the BSA within the Yolo Bypass.
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	—/SSC	Nests in colonies located in dense emergent wetland of cattails, tules, etc., often along the border of the lake or pond.	HP	The BSA contains suitable habitat for the species mostly between the east end of the Yolo Bypass and city of Davis city limits. No CNDDB occurrences within 5 miles of the BSA.
pallid bat	*Antrozous pallidus*	—/SSC	Day roosts typically include rocky outcrops, cliffs, large diameter live and snag trees, and crevices. Also roost in caves, mines, bridges, culverts, barns, porches, and bat boxes.	HP	Suitable winter hibernation and maternity roost habitat is present in the bridges throughout the BSA. The most recent CNDDB occurrence is from 1964 one mile north of the BSA in the city of Davis.
western red bat	*Lasiurus blossevillii*	—/SSC	Typically roost solitarily in dense tree foliage, particularly in willows, cottonwoods, and sycamores. Strongly associated with riparian habitats, particularly mature stands of cottonwood/sycamore.	HP	Suitable roost habitat within the BSA located along the Sacramento River, Putah Creek, and South Fork Putah Creek. No recorded CNDDB occurrences within 5 miles of the BSA.
American badger	*Taxidea taxus*	—/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Several hundred undisturbed acres are required for home range.	A	Suitable undisturbed habitat is not present within or adjacent to the BSA. The most recent CNDDB occurrence was approximately 3.5 miles northeast of the BSA documenting a dead badger collected in 1997.

Common Name	*Scientific Name*	Status[1] (Fed/State)	General Habitat Description	Habitat Present/ Absent[2]	Rationale

[1] Status Codes: Federal Endangered (FE); Federal Threatened (FT); State Endangered (SE); State Threatened (ST); Candidate Endangered (CE) State Fully Protected (FP); CDFW Species of Special Concern (SSC).
[2] Assessment Codes. Absent (A): No habitat present and no further work needed. Habitat Present (HP): Habitat is or may be present. The species may be present. Present (P): The species is present. Critical Habitat (CH): BSA is located within a designated critical habitat unit but does not necessarily mean that appropriate habitat is present.

CHAPTER 4. BIOLOGICAL RESOURCES, DISCUSSION OF IMPACTS AND MITIGATION

This section evaluates potential effects of project construction activities on sensitive biological resources within the BSA. Habitats are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special status plants or animals occurring on-site.

4.1.Habitats and Natural Communities of Concern

4.1.1Sensitive Natural Communities and Riparian Habitats

Survey Results

Based on the vegetation communities mapped within the BSA (Appendix C), the following seven alliances are considered CDFW SNCs: Oregon ash groves, California sycamore woodlands, Fremont cottonwood forest and woodland, valley oak woodland and forest, Gooding's willow riparian woodland and forest, gum plant patches, and hardstem bulrush marshes. These alliances correspond to the valley foothill riparian, valley foothill woodland, fresh emergent wetland, and annual/perennial grassland CWHR communities described in Section 3.1.3. The valley foothill riparian communities are also considered sensitive riparian habitat by the Corps and the RWQCB.

Project Impacts

Impacts on CDFW SNCs would occur only on those within the valley foothill riparian, valley oak woodland, and annual/perennial grassland CWHR communities (Figure 4). All alternatives would result in the same impacts on sensitive natural communities. Temporary and permanent impacts on CDFW SNCs and the riparian communities considered sensitive by the Corps and the RWQCB are summarized in Table 10.

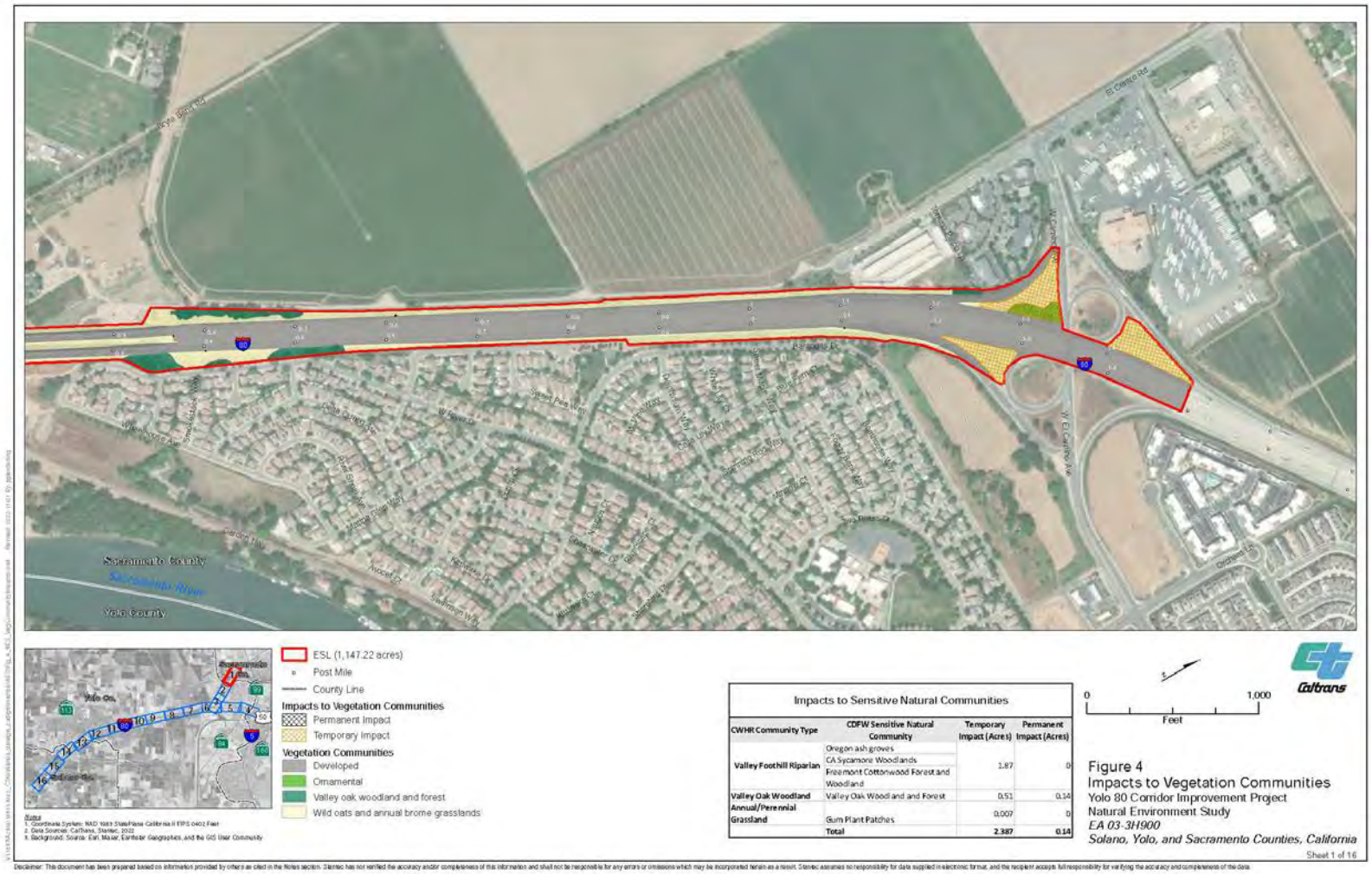
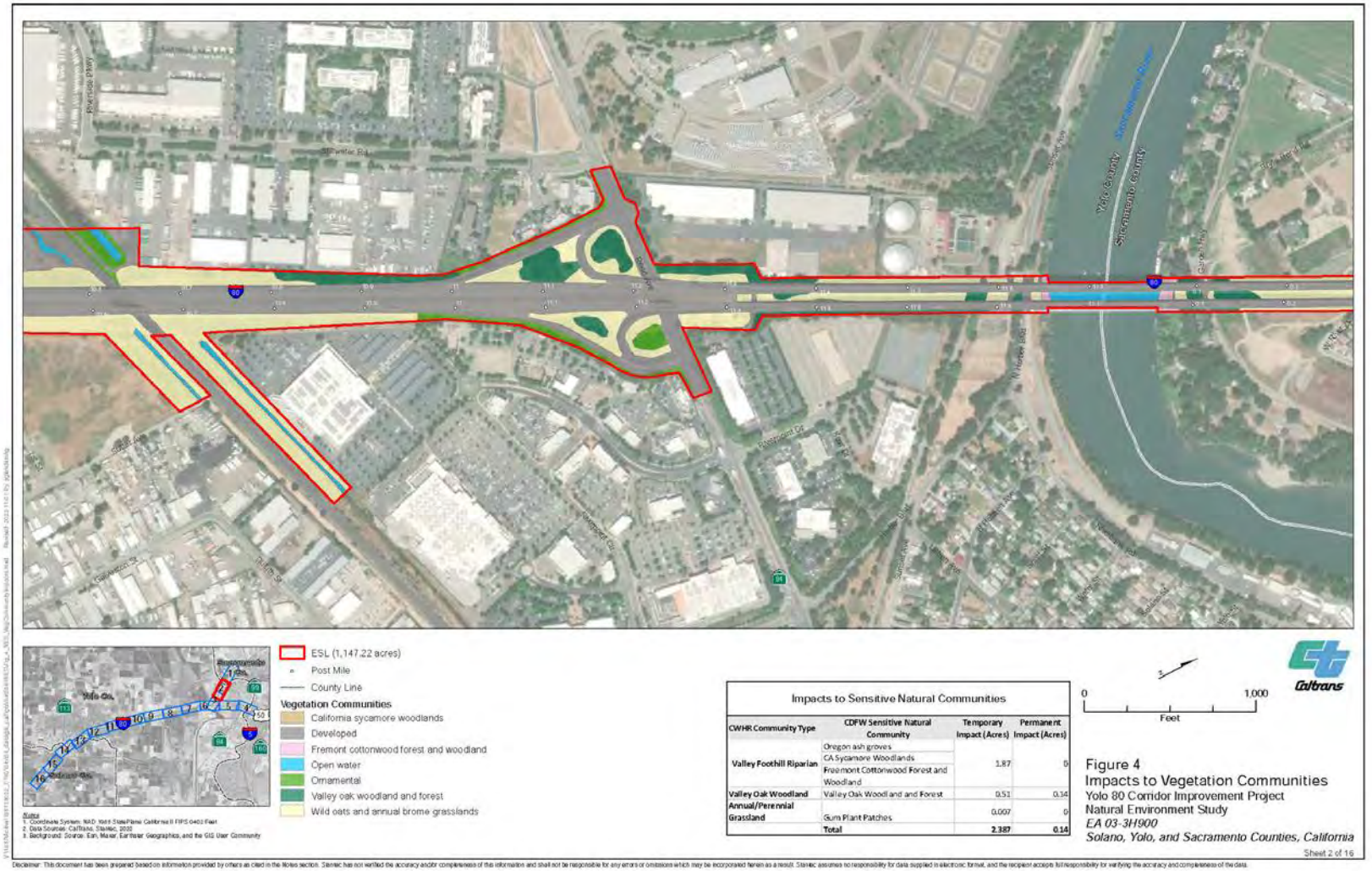


Figure 4. Impacts to Vegetation Communities

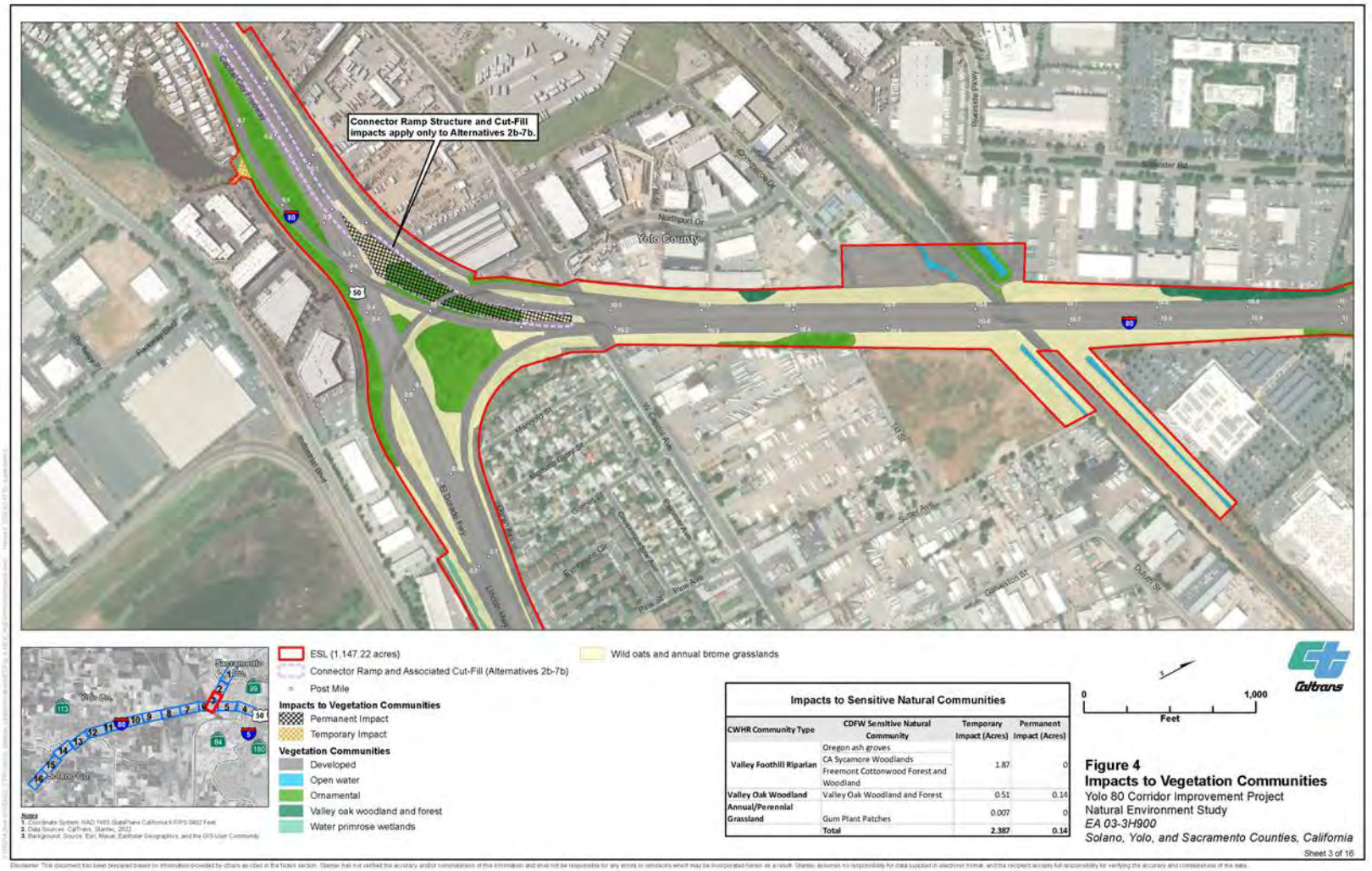


Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

Figure 4
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 2 of 16



Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Freemont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	**2.387**	**0.14**

Figure 4
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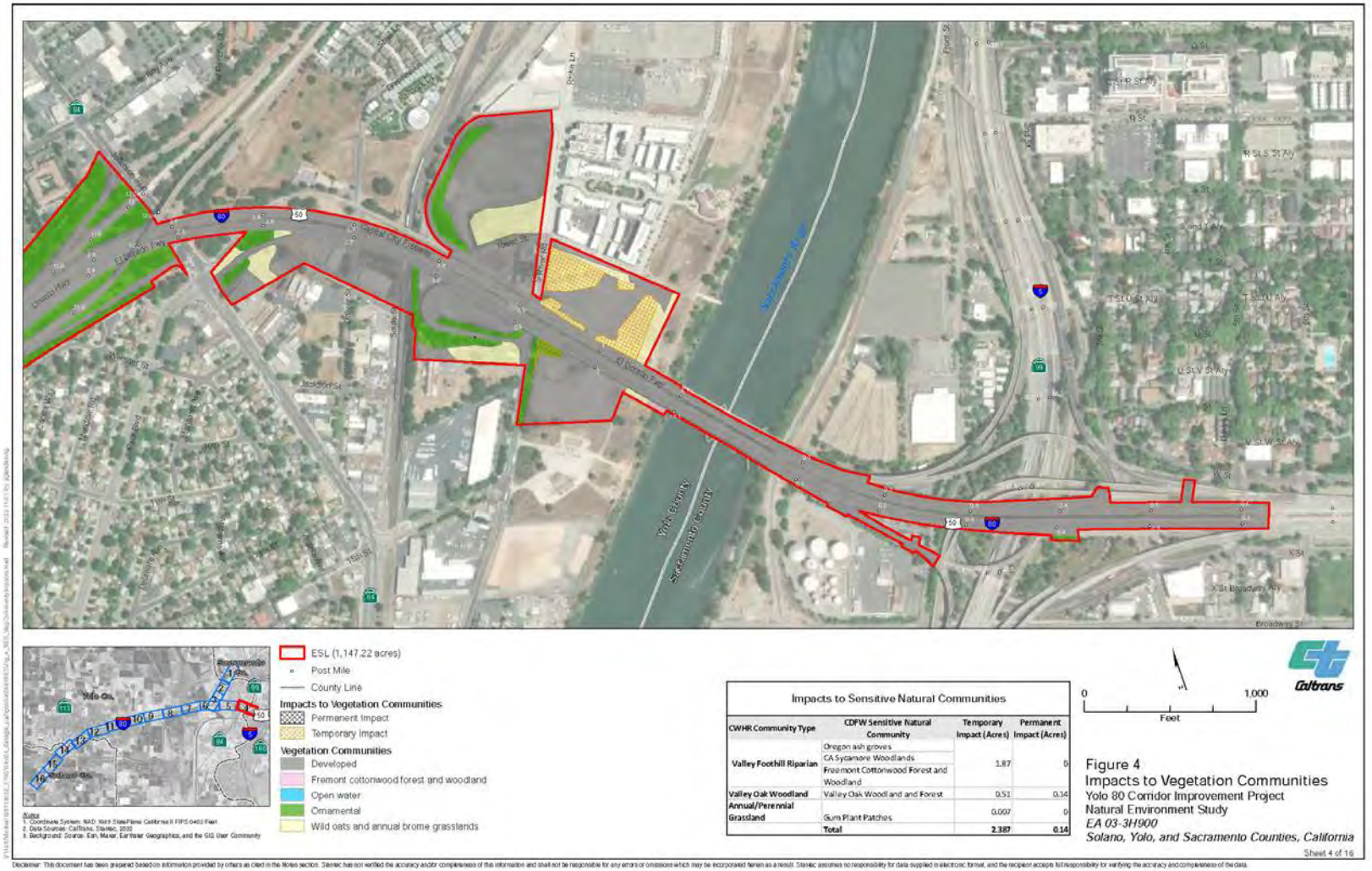
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 3 of 16



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	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

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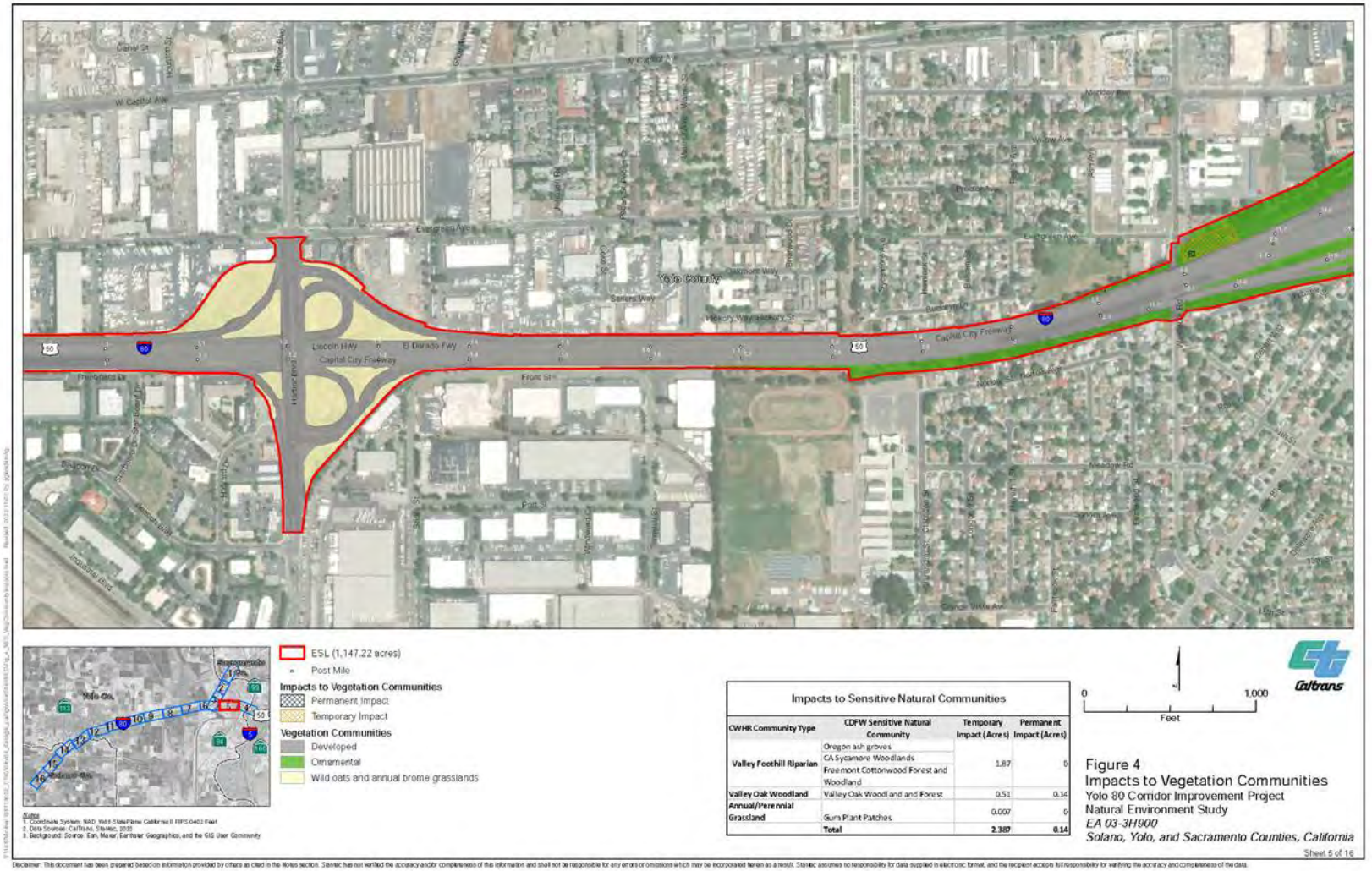
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 4 of 16



Impacts to Sensitive Natural Communities

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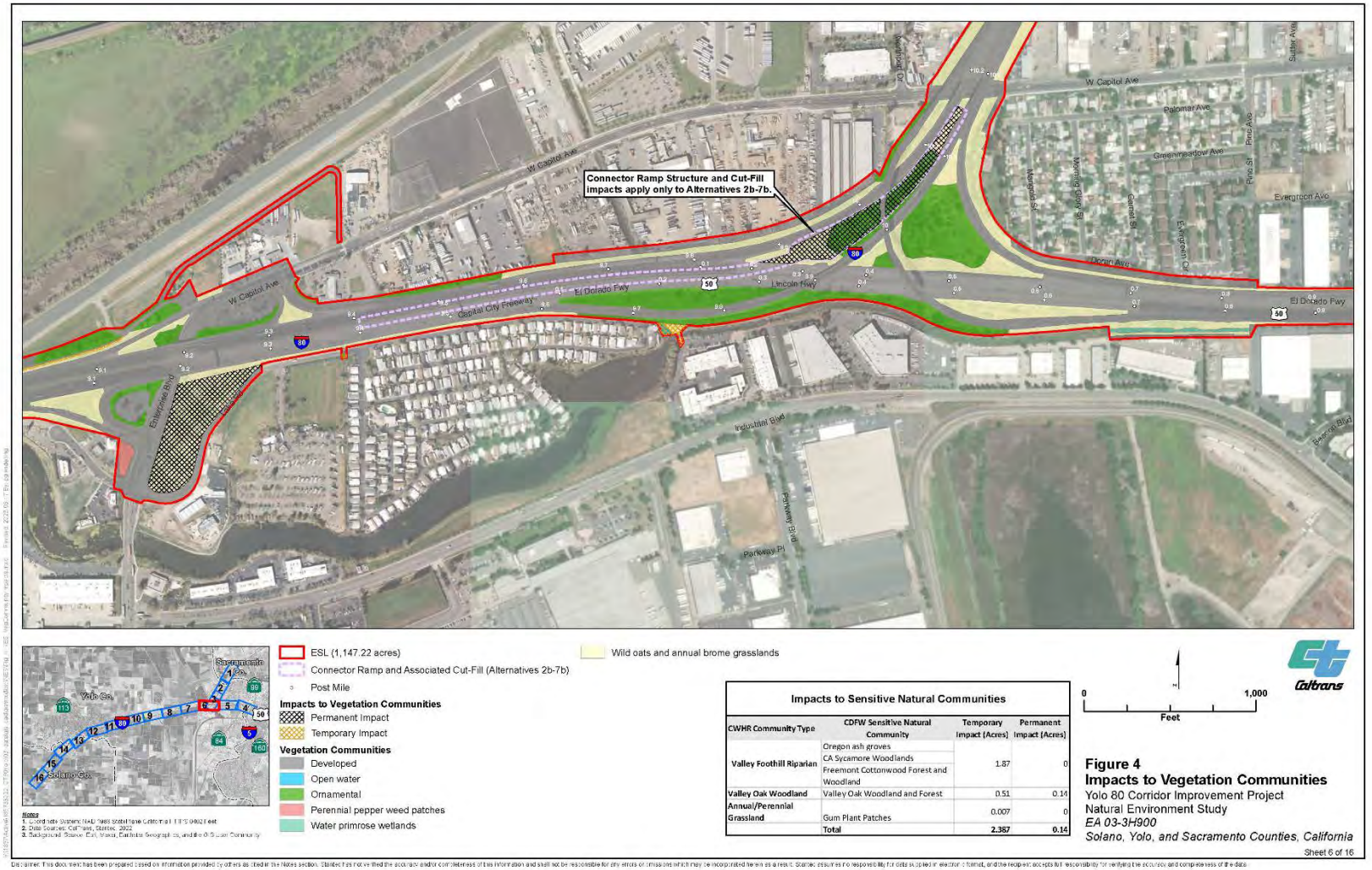
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 5 of 16



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Annual/Perennial Grassland	Gum Plant Patches	0.007	0
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Figure 4
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Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 6 of 16

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

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Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 7 of 16

Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
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Figure 4
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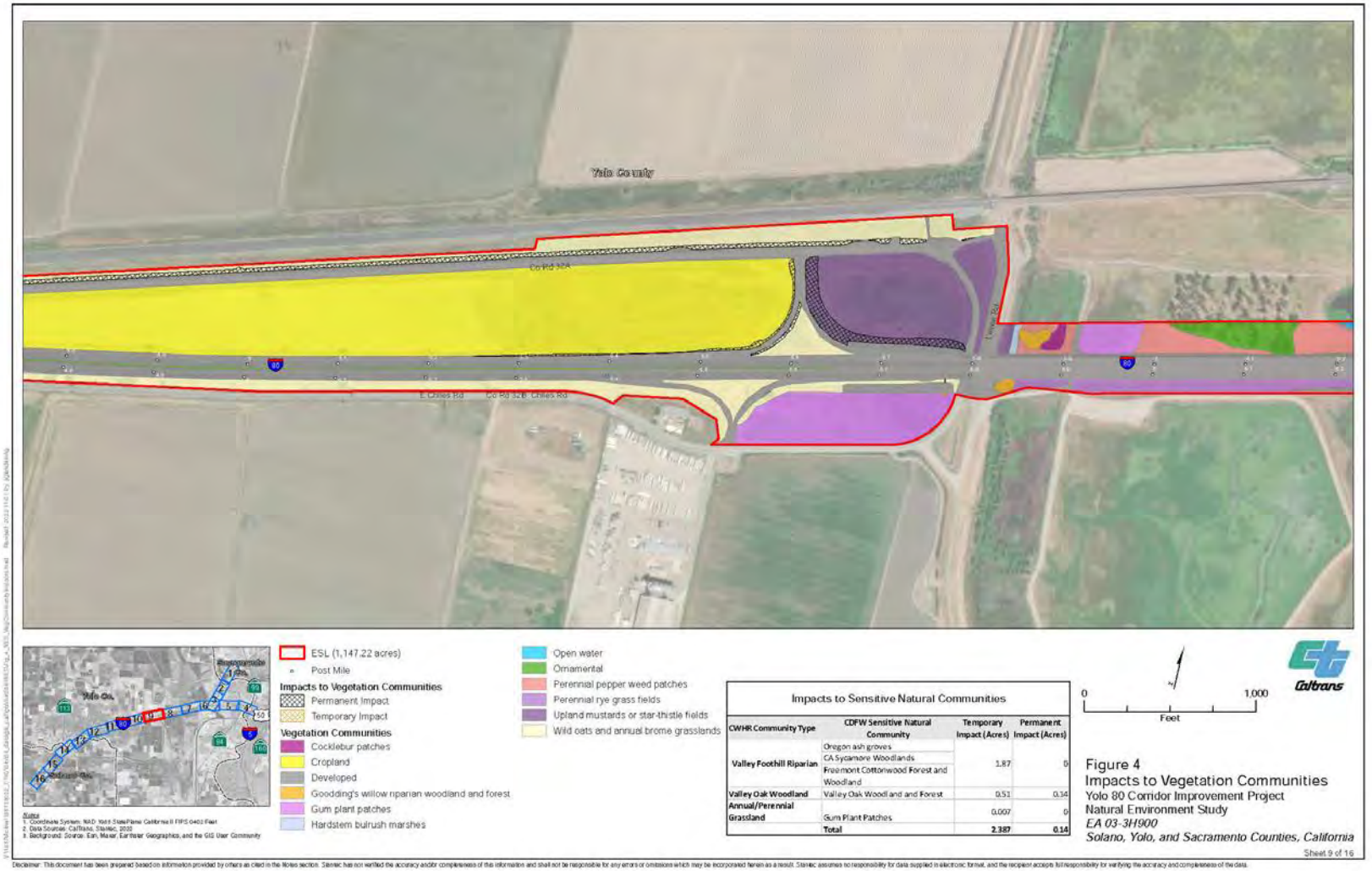
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 8 of 16



Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
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	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
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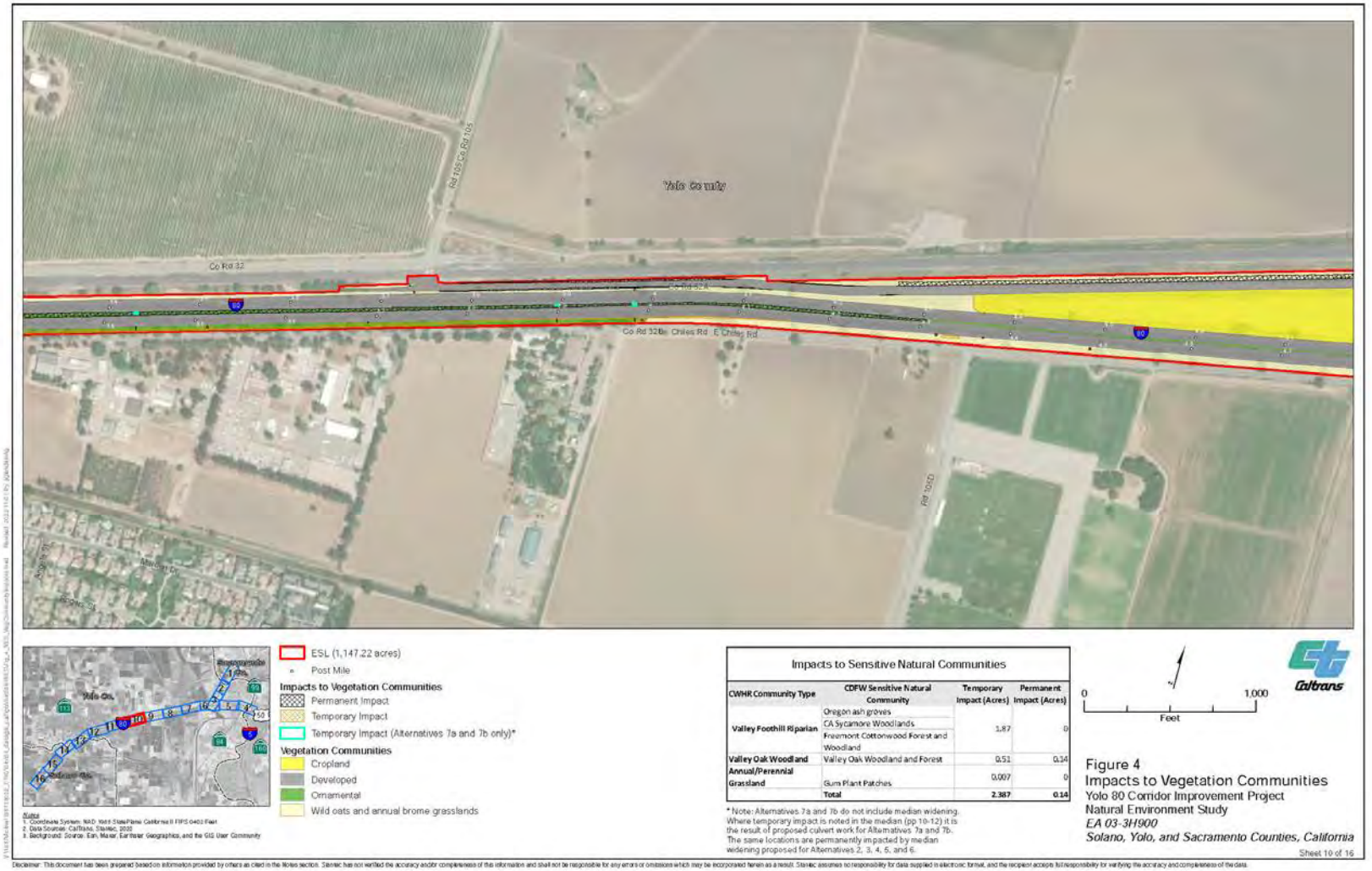

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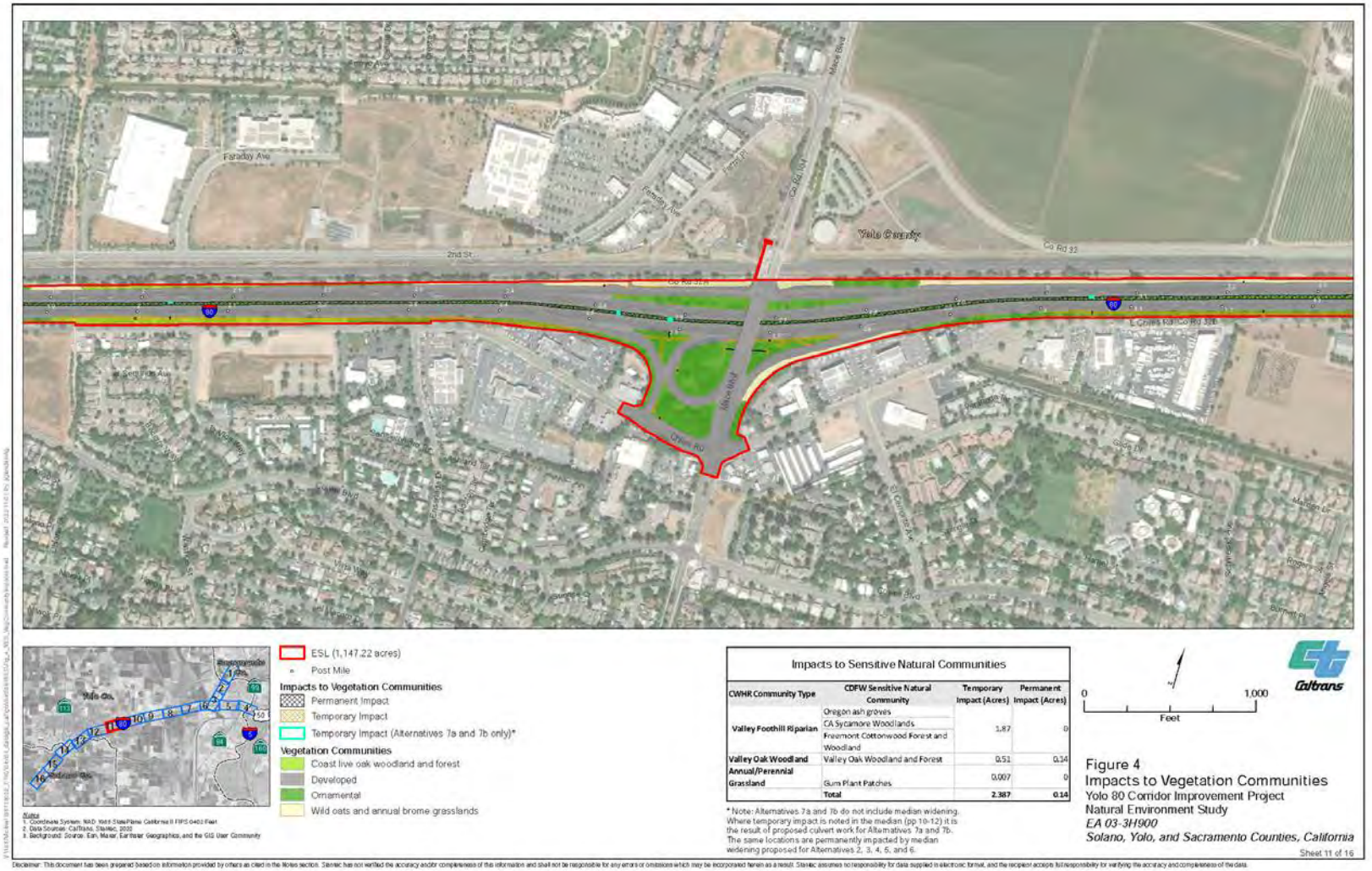
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

* Note: Alternatives 7a and 7b do not include median widening. Where temporary impact is noted in the median (pp 10-12) it is the result of proposed culvert work for Alternatives 7a and 7b. The same locations are permanently impacted by median widening proposed for Alternatives 2, 3, 4, 5, and 6.


Faraday Ave
2nd St
Yolo County
Co Rd 32
Co Rd 32A
Co Rd 102
Mace Blvd
Chiles Rd
E Chiles Rd
Co Rd 32B
ESL (1,147.22 acres)
Post Mile
Impacts to Vegetation Communities
Permanent Impact
Temporary Impact
Temporary Impact (Alternatives 7a and 7b only)*
Vegetation Communities
Coast live oak woodland and forest
Developed
Ornamental
Wild oats and annual brome grasslands
Impacts to Sensitive Natural Communities
CWHR Community Type | CDFW Sensitive Natural Community | Temporary Impact (Acres) | Permanent Impact (Acres)
Valley Foothill Riparian | Oregon ash groves; CA Sycamore Woodlands; Fremont Cottonwood Forest and Woodland | 1.87 | 0
Valley Oak Woodland | Valley Oak Woodland and Forest | 0.51 | 0.14
Annual/Perennial Grassland | Gum Plant Patches | 0.007 | 0
Total | | 2.387 | 0.14
* Note: Alternatives 7a and 7b do not include median widening. Where temporary impact is noted in the median (pp 10-12) it is the result of proposed culvert work for Alternatives 7a and 7b. The same locations are permanently impacted by median widening proposed for Alternatives 2, 3, 4, 5, and 6.
0
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Feet
Caltrans
Figure 4
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 11 of 16

Impacts to Sensitive Natural Communities

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Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
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Annual/Perennial Grassland	Gum Plant Patches	0.007	0
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Figure 4
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Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 12 of 16

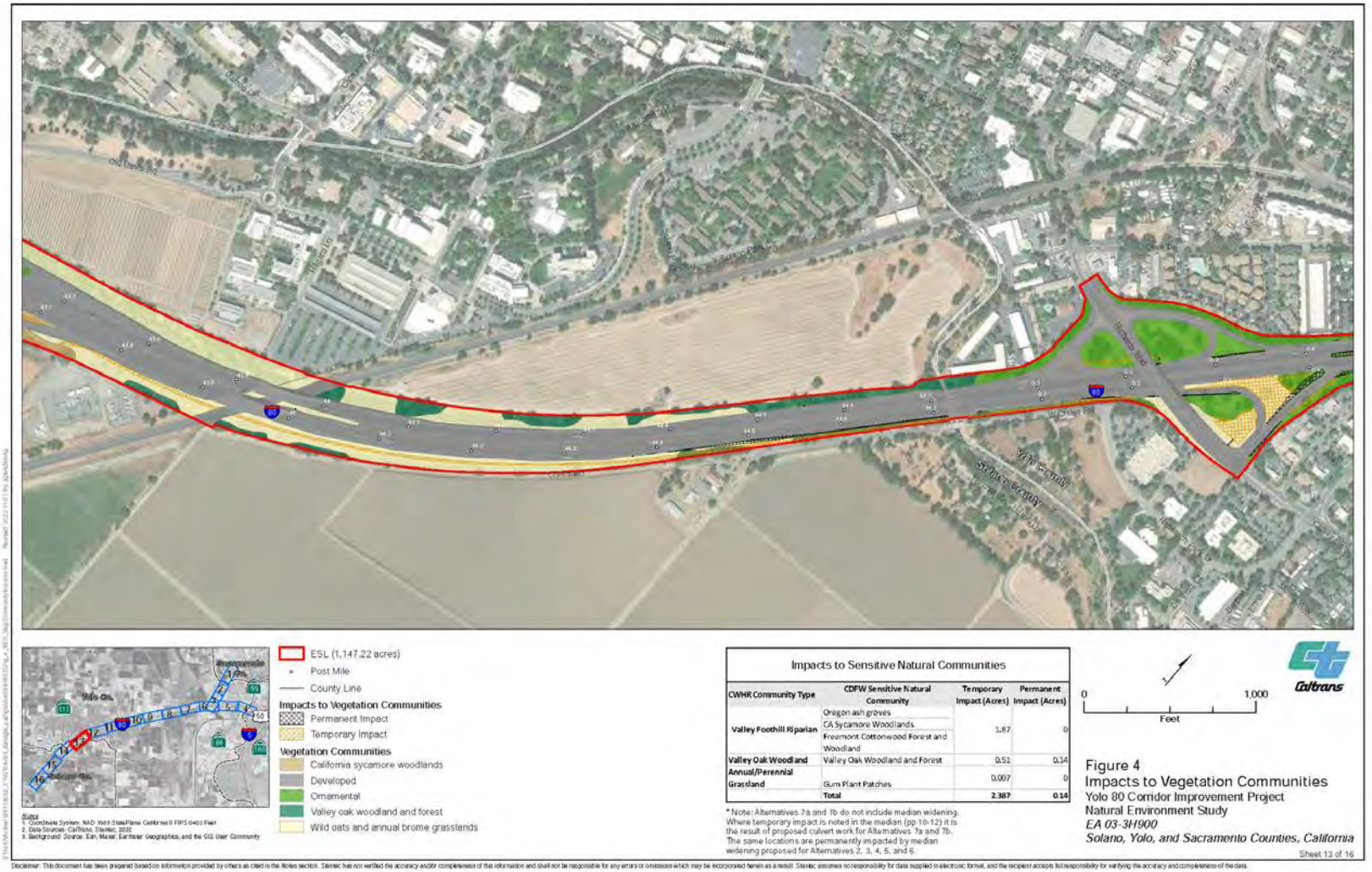

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Figure 4
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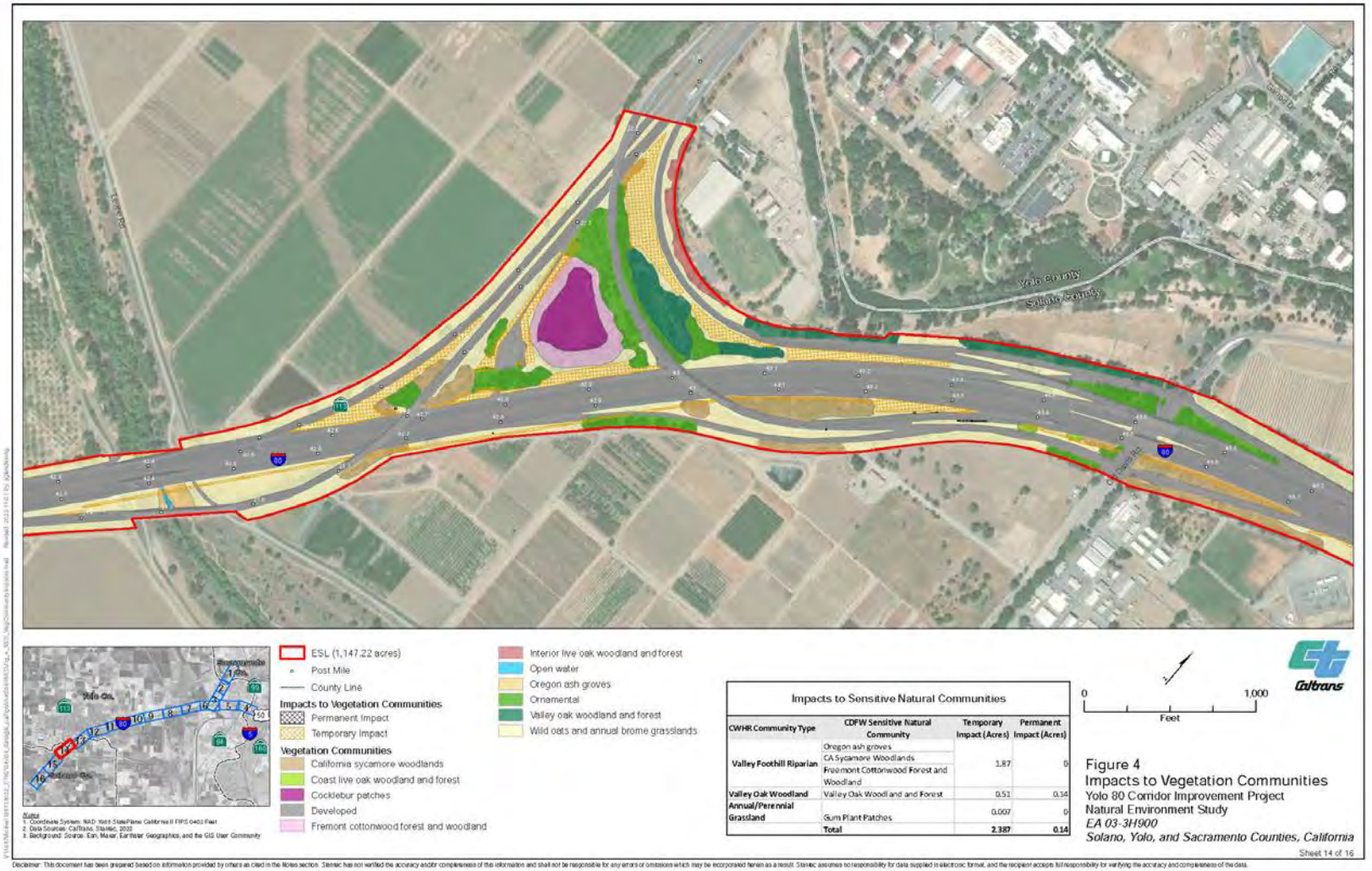
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 13 of 16

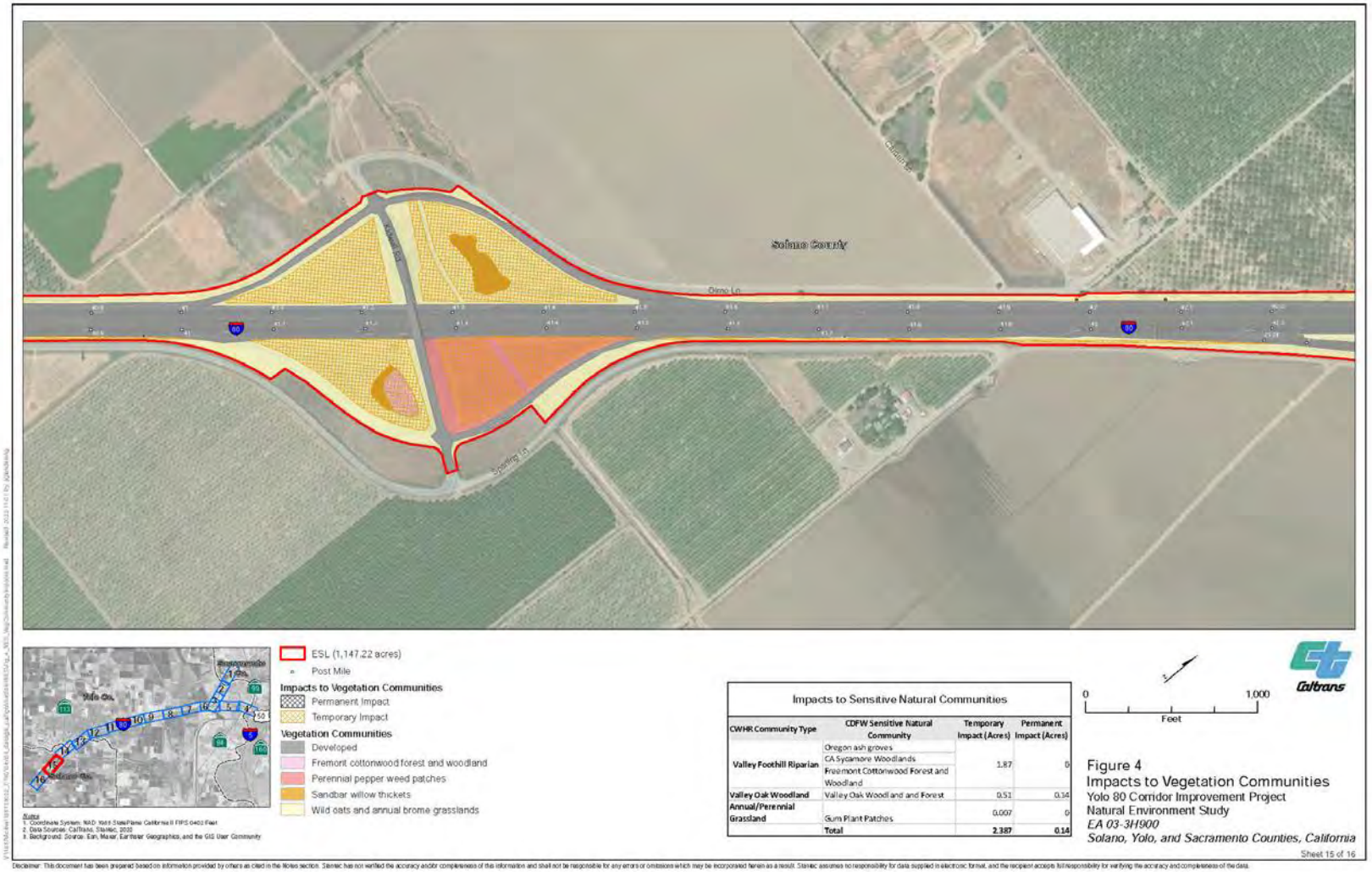


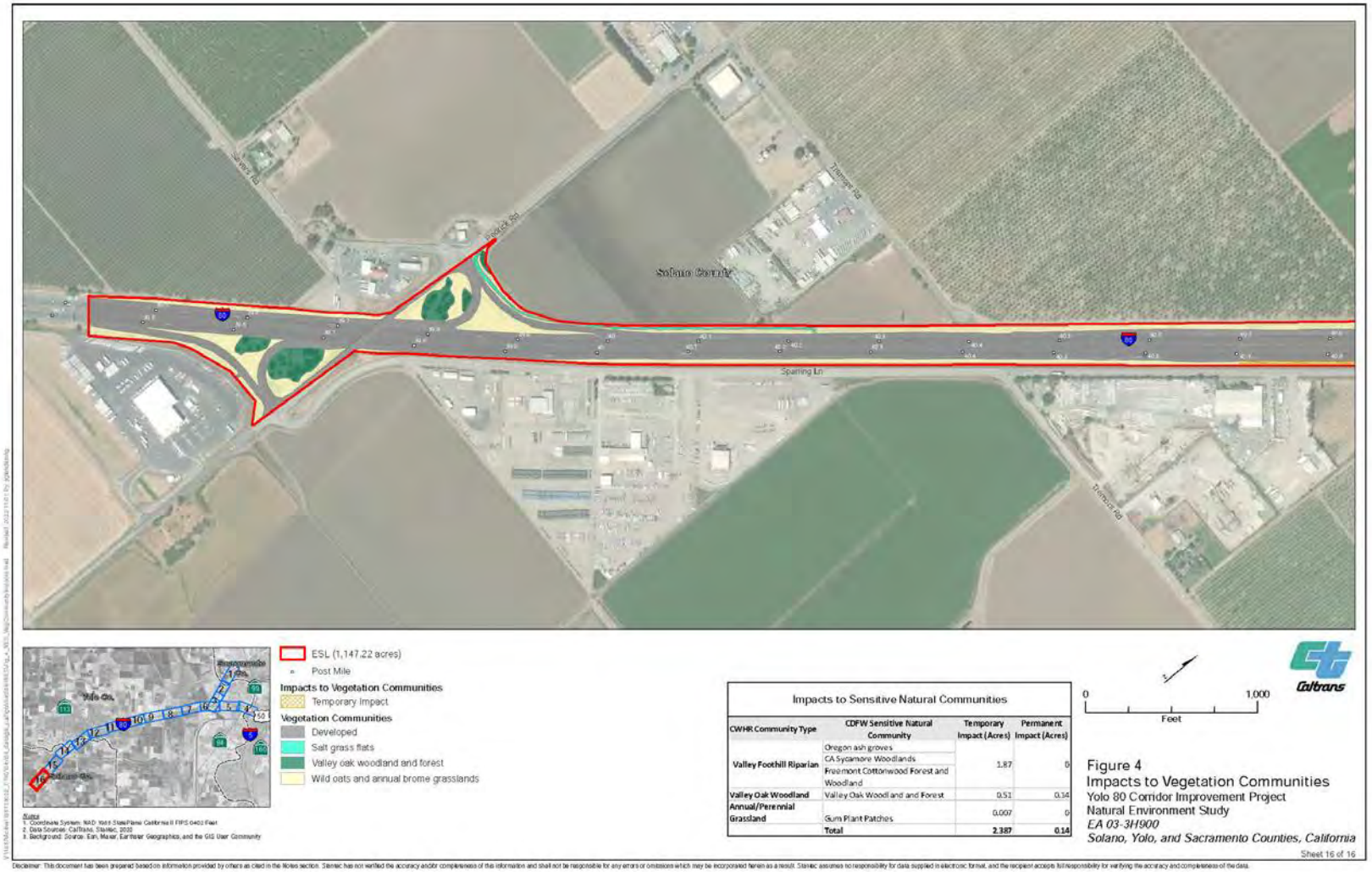
Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves CA Sycamore Woodlands Fremont Cottonwood Forest and Woodland	1.87	0
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

Figure 4
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 14 of 16


Solano County
Dixon Ln
Pedrick Rd
Chadwick Rd
Yolo Co.
Solano Co.
ESL (1,147.22 acres)
Post Mile
Impacts to Vegetation Communities
Permanent Impact
Temporary Impact
Vegetation Communities
Developed
Fremont cottonwood forest and woodland
Perennial pepper weed patches
Sandbar willow thickets
Wild oats and annual brome grasslands
Impacts to Sensitive Natural Communities
CWHR Community Type | CDFW Sensitive Natural Community | Temporary Impact (Acres) | Permanent Impact (Acres)
Valley Foothill Riparian | Oregon ash groves | 1.87 | 0
Valley Foothill Riparian | CA Sycamore Woodlands | 1.87 | 0
Valley Foothill Riparian | Fremont Cottonwood Forest and Woodland | 1.87 | 0
Valley Oak Woodland | Valley Oak Woodland and Forest | 0.51 | 0.14
Annual/Perennial Grassland | Gum Plant Patches | 0.007 | 0
Total | | 2.387 | 0.14
0
1,000
Feet
Caltrans
Figure 4
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 15 of 16



Impacts to Sensitive Natural Communities

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	Oregon ash groves	1.87	0
	CA Sycamore Woodlands		
	Fremont Cottonwood Forest and Woodland		
Valley Oak Woodland	Valley Oak Woodland and Forest	0.51	0.14
Annual/Perennial Grassland	Gum Plant Patches	0.007	0
	Total	2.387	0.14

Figure 4
Impacts to Vegetation Communities
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 16 of 16

Table 10. Summary of Sensitive Natural Community Impacts on All Build Alternatives within the Biological Study Area

CWHR Community Type	CDFW Sensitive Natural Community	Temporary Impact (Acres)	Permanent Impact (Acres)
Valley Foothill Riparian	• Oregon ash groves • California sycamore woodlands • Fremont cottonwood forest and woodland	1.87	N/A
Valley Oak Woodland	valley oak woodland and forest	0.51	0.14
Annual/Perennial Grassland	gum plant patches	0.007	
	Total	**2.39**	**0.14**

Avoidance and Minimization Efforts

Implementation of Standard Measure BR-4 in Section 1.4 will minimize the potential for adverse impacts on SNCs. No other avoidance and minimization measures are required.

Compensatory Mitigation

Compensatory mitigation for CDFW SNCs and sensitive riparian areas is not expected given the small number of permanent impacts (i.e., less than 0.2 acre) within already disturbed areas (i.e., along existing road shoulders within Caltrans right-of-way).

Cumulative Impacts

With implementation of the avoidance and minimization measures, the project would not result in cumulatively considerable adverse effects on CDFW SNCs and sensitive riparian areas.

4.1.2.Sensitive Aquatic Resources

Survey Results

A delineation of aquatic resources within the BSA was conducted on December 18, 21, 22, 28, 29, 2020; February 19, 20–24, 2021; and July 21, 2022. A total of approximately 29.013 acres (8,671.87 linear feet) of aquatic resources potentially subject to agency jurisdiction (i.e., waters of the United States and/or waters of the state) were identified within the BSA (Table 11). See Appendix D for a complete description of the features identified during the aquatic resources survey.

Table 11. Summary of Aquatic Resources within the Biological Study Area

Feature Type	Acres[1]	Linear Feet
Wetlands		
Fresh Emergent Marsh	0.399	N/A
Seasonal Wetlands	4.002	N/A
Vegetated Ditches	7.553	N/A
Woody Riparian Wetlands	5.058	N/A
Wetlands Total	**17.012**	N/A
Other Waters		
Ephemeral Drainages	0.461	1,654.61
Intermittent Drainages	0.741	2,734.89
Perennial Drainages	5.692	1,148.01
Canals	1.523	3,134.36
Ponds	3.584	N/A
Other Waters Total	**12.001**	**8,671.87**
Total	**29.013**	**8,671.87**

A total of three fresh emergent marsh wetlands were mapped within the Yolo Bypass portion of the BSA. Vegetation was dominated by obligate perennial species such as water primrose, broad-leaved cattail, and tule (*Schoenoplectus acutus* var. *occidentalis*). Hydric soil indicators observed include redox dark surface and redox depressions. Positive field indicators of being frequently ponded and/or flooded for long durations or very long durations during the growing season included water marks, drift deposits, and sediment deposits.

Eleven woody riparian wetlands were mapped intermittently throughout the BSA, in particular in the Yolo Bypass, as well as along the Sacramento River. Woody riparian wetlands exhibit signs of frequent ponding and/or flooding for long durations or very long durations during the growing season and were dominated by woody deciduous shrubs and trees, including dominant species such as Fremont cottonwood, black willow (*Salix gooddingii*), and narrow-leaved willow (*Salix exigua*).

Six seasonal wetlands were mapped in the western portion of the BSA, starting in the Yolo Bypass area and intermittently occurring west toward Dixon. The seasonal wetland exhibited positive field indicators of long-duration saturation during the growing season, as well as hydrophytic vegetation characteristic of this wetland type. Dominant species observed in seasonal wetlands include umbrella sedge (*Cyperus eragrostis*), dallis grass (*Paspalum dilatatum*), and perennial rye grass.

Six vegetated ditches were mapped throughout the BSA. Vegetated ditches generally consist of constructed drainage ditches that exhibit positive indicators for all three wetland parameters. Dominant species observed in the vegetated ditches include broad-leaved cattail, tule, and salt grass.

Two ephemeral drainages and three intermittent drainages were mapped within the BSA. The two ephemeral drainages are both located in the urban sections adjacent to the Sacramento River. Both drainages are subject to flow from rainfall, are seasonally inundated, and are connected through storm drains to the Sacramento River. The three intermittent drainages and drainage segments were mapped within the BSA in the more urban sections of West Sacramento. All of three of the drainage/drainage segments are hydrologically connected to the Yolo Bypass Toe Drain, either directly or indirectly with a culverted connection.

Perennial drainages within the BSA occur as part of the Sacramento River, which intersects the BSA in two locations, at Prospect Slough as part of the Yolo Bypass, and in one segment of South Putah Creek. The Sacramento River originates outside the BSA and is fed by the intermittent and ephemeral drainages mapped within the BSA before draining into the Sacramento-San Joaquin Delta. South Putah Creek originates at Lake Berryessa outside the BSA, flowing east before draining into the Yolo Bypass and subsequently the Sacramento River.

Eight segments of canal were mapped within the BSA. Canal segments are man-made drainages that generally have steep sides and move water either away from West Sacramento and/or to irrigate croplands.

Three ponds with open water were mapped within the BSA. Two ponds are on the north side of the Yolo Bypass and connect via culvert to a vegetated ditch within the Yolo Bypass. The third is connected to a canal (Feature 31) and is on the south side of I-80. These perennial ponds are open water features that are part of the tributary system connected to the Yolo Bypass.

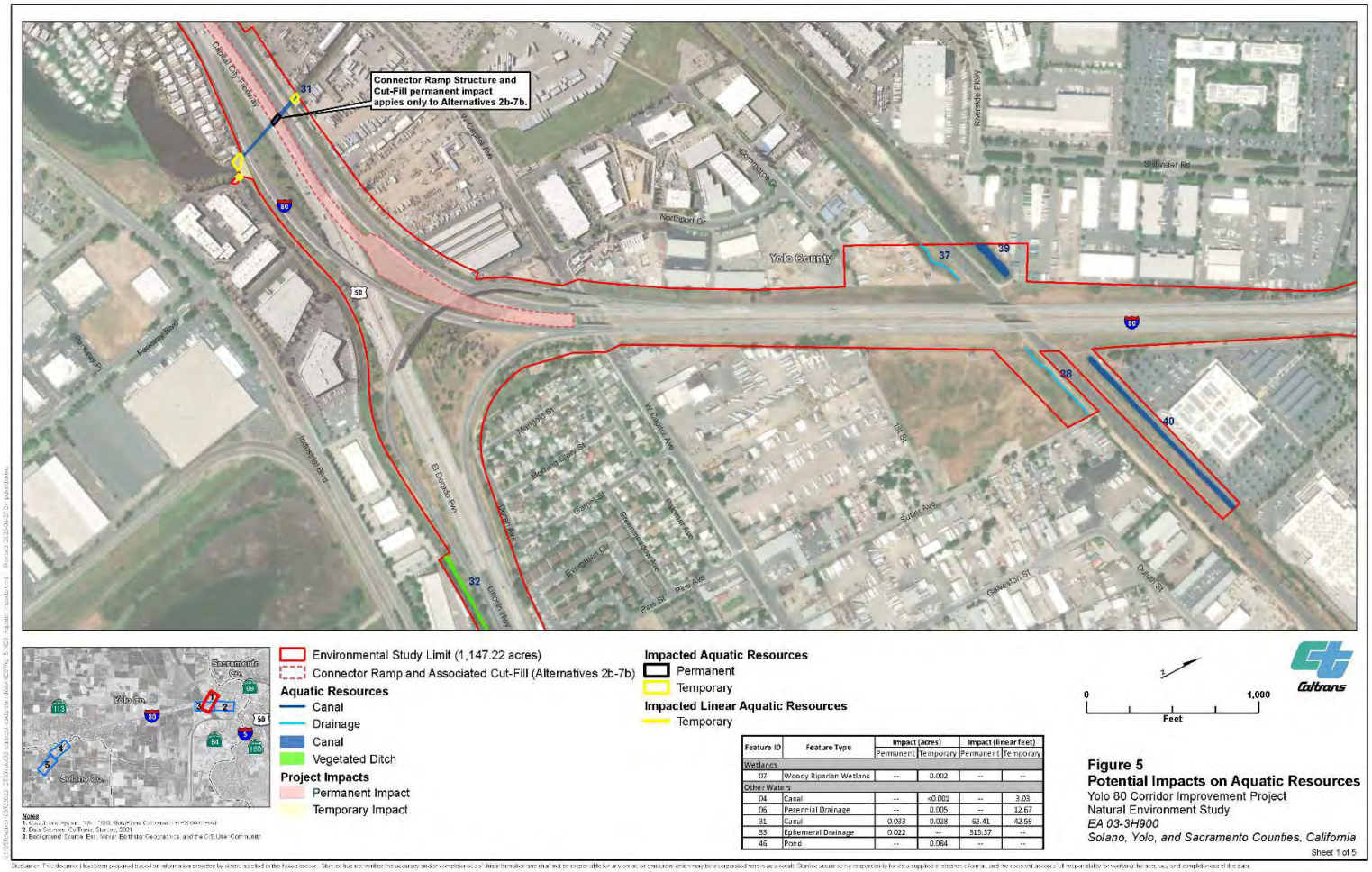
Potential Impacts

The project includes roadway improvements such as replacing culverts, and installing a fiber optic line and vaults. Direct impacts associated with the proposed improvements on aquatic resources are summarized in Table 12 and shown in Figure 5. All alternatives would result in the same impacts on aquatic resources with the exception of Alternatives 2b–7b. Construction of the connector ramp would result in permanent impacts on Canal 31 that would not result from implementation of Alternatives 2a–7a.

Table 12. Impacts on Aquatic Resources

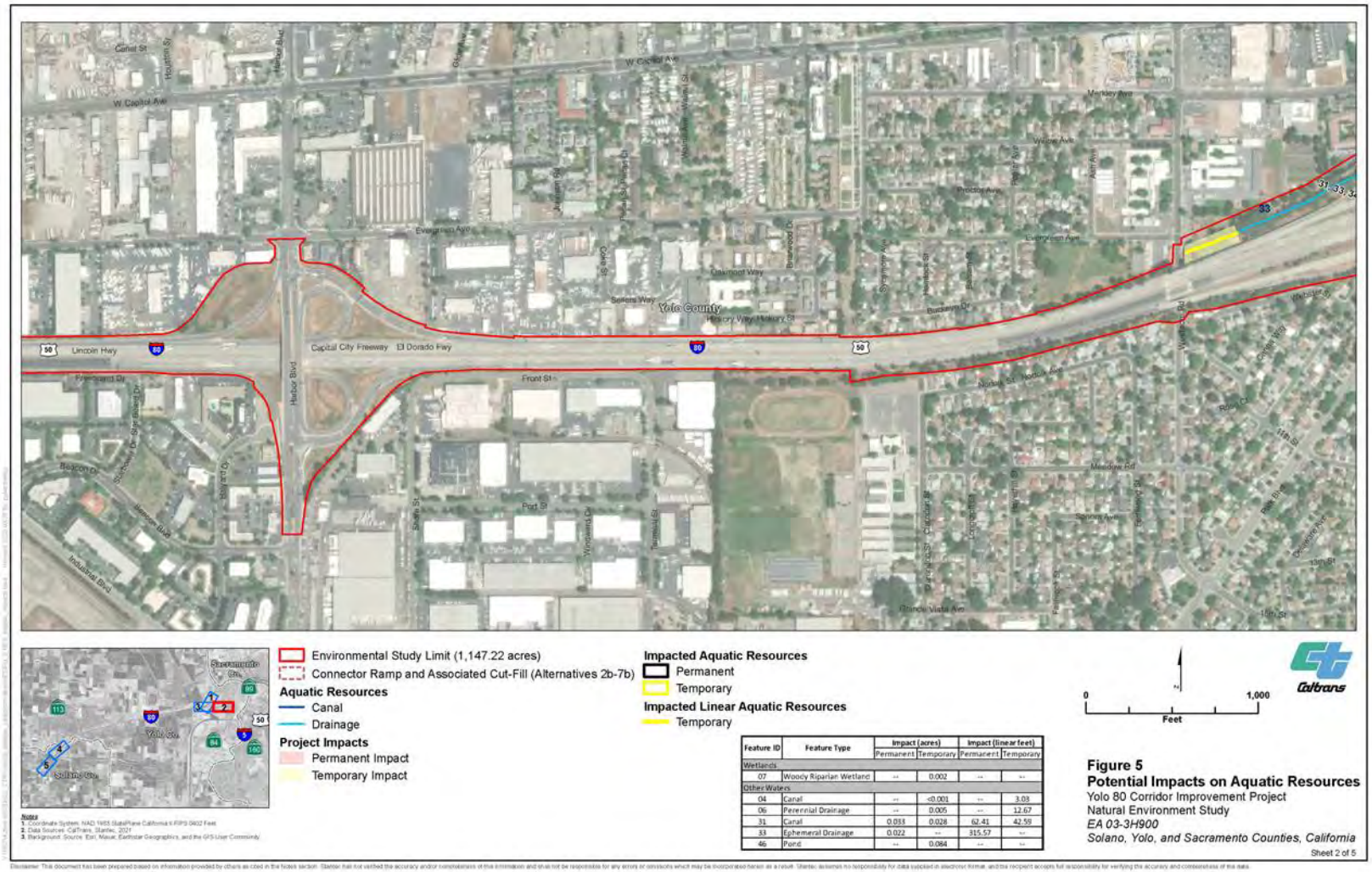
Feature ID	Water Feature	Acres		Linear Feet	
		Alt 2a-7a	Alt 2b-7b	Alt 2a-7a	Alt 2b-7b
PERMANENT IMPACTS					
Other Waters					
31	Canal		0.033		62.41
33	Ephemeral Drainage	0.022	0.022	315.57	315.57
	Total Permanent Impacts	**0.022**	**0.055**	**315.57**	**377.98**
TEMPORARY IMPACTS					
Wetlands					
07	Woody Riparian Wetland	0.002	0.002	N/A	N/A
Other Waters					
06	Perennial Drainage	0.005	0.005	12.67	12.67
04	Canal	<0.001	<0.001	3.03	3.03
31	Canal	0.028	0.028	42.59	42.59
46	Pond	0.084	0.084	N/A	N/A
	Total Temporary Impacts	**0.12**	**0.12**	**58.29**	**58.29**

Indirect impacts on aquatic resources could include the reduction in quality and/or function of the aquatic resources as a result of an incidental release of sediments or chemicals into surface waters, or the introduction or spread of non-native species into features. Standard Measure BR-1 identified in Section 1.4 would minimize and avoid the potential for these indirect impacts on sensitive aquatic resources as a result of construction activities associated with the project.



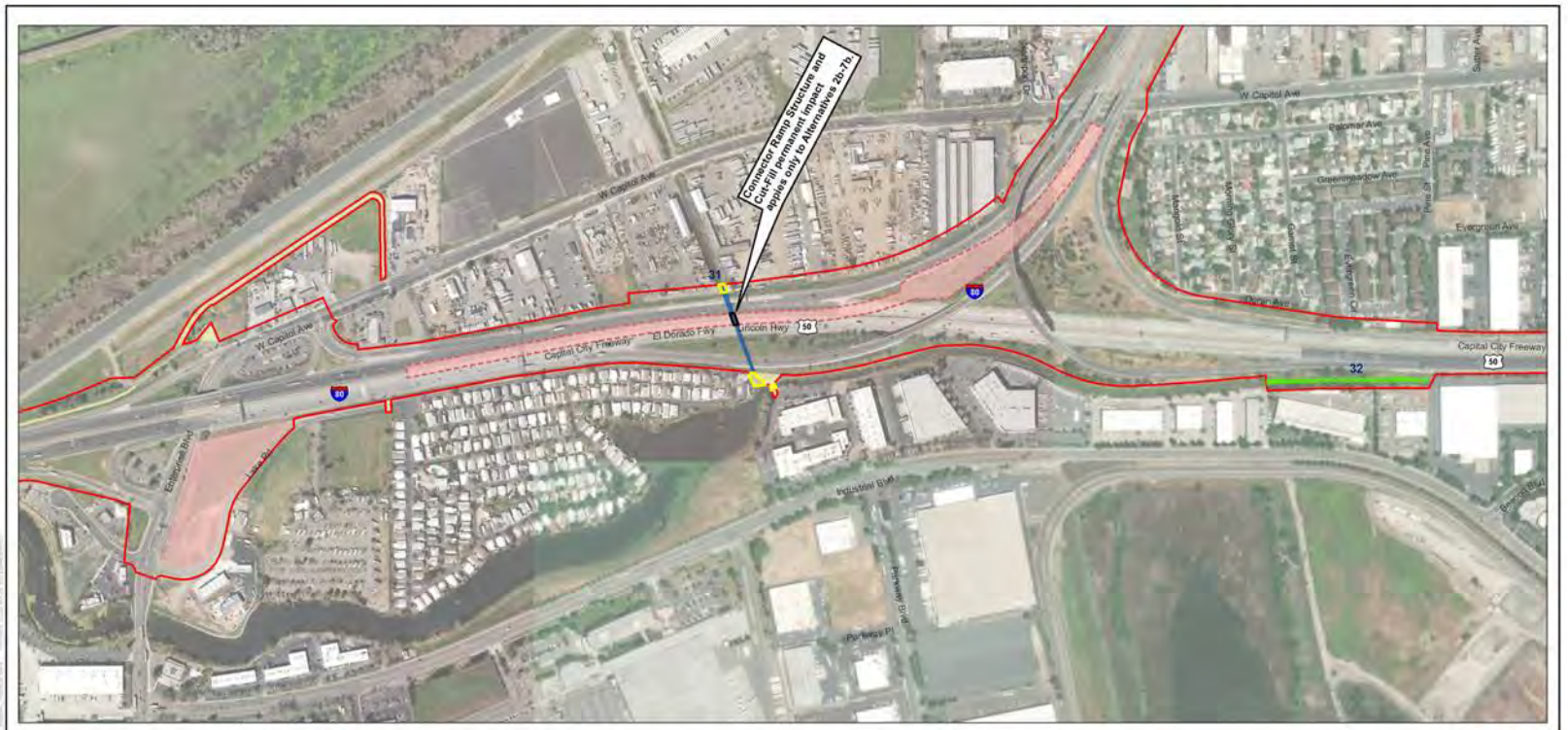
Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	0.033	0.028	62.41	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

Figure 4. Potential Impacts on Aquatic Resources



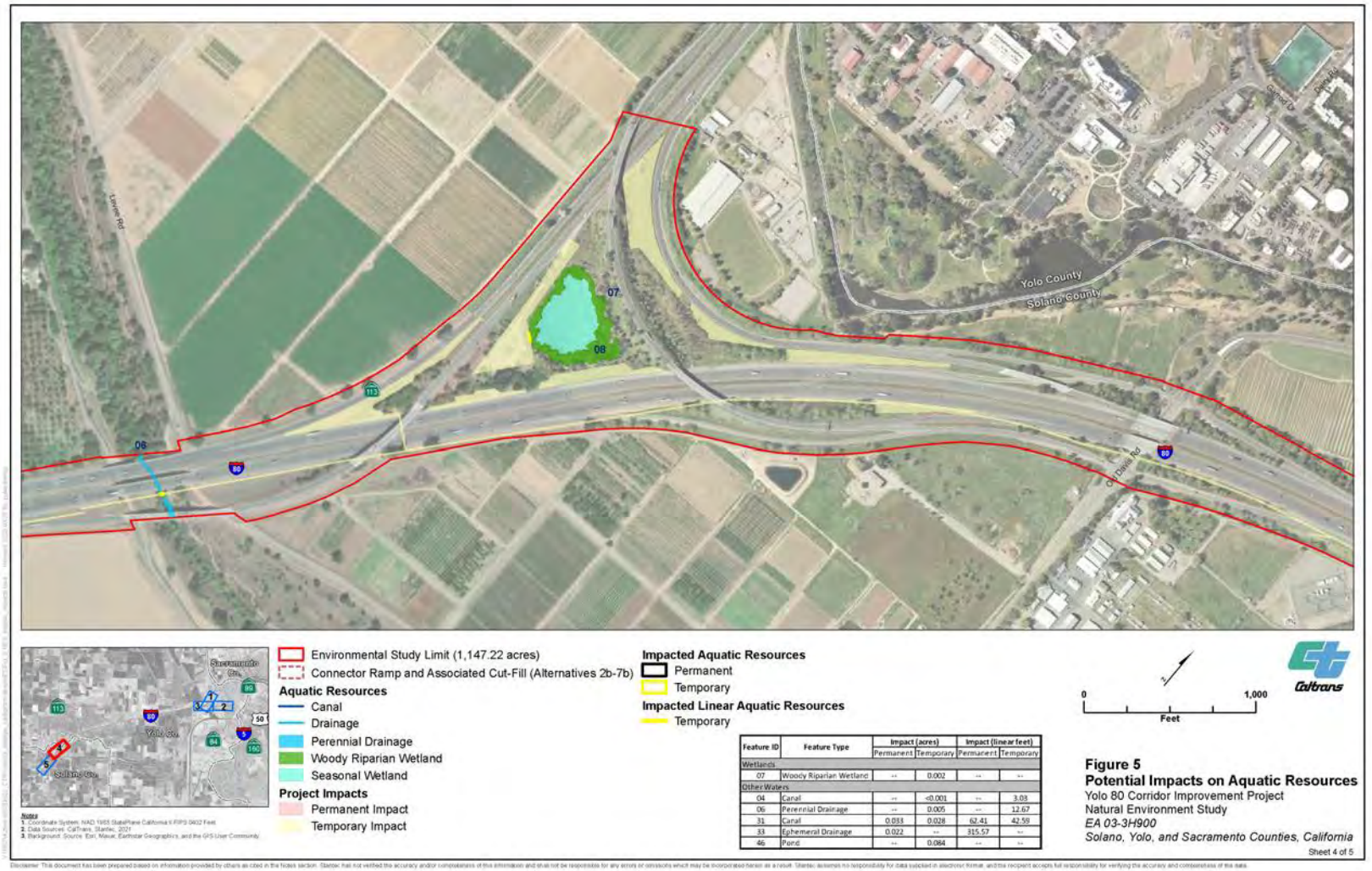
Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	0.033	0.028	62.41	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

Figure 5
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 2 of 5



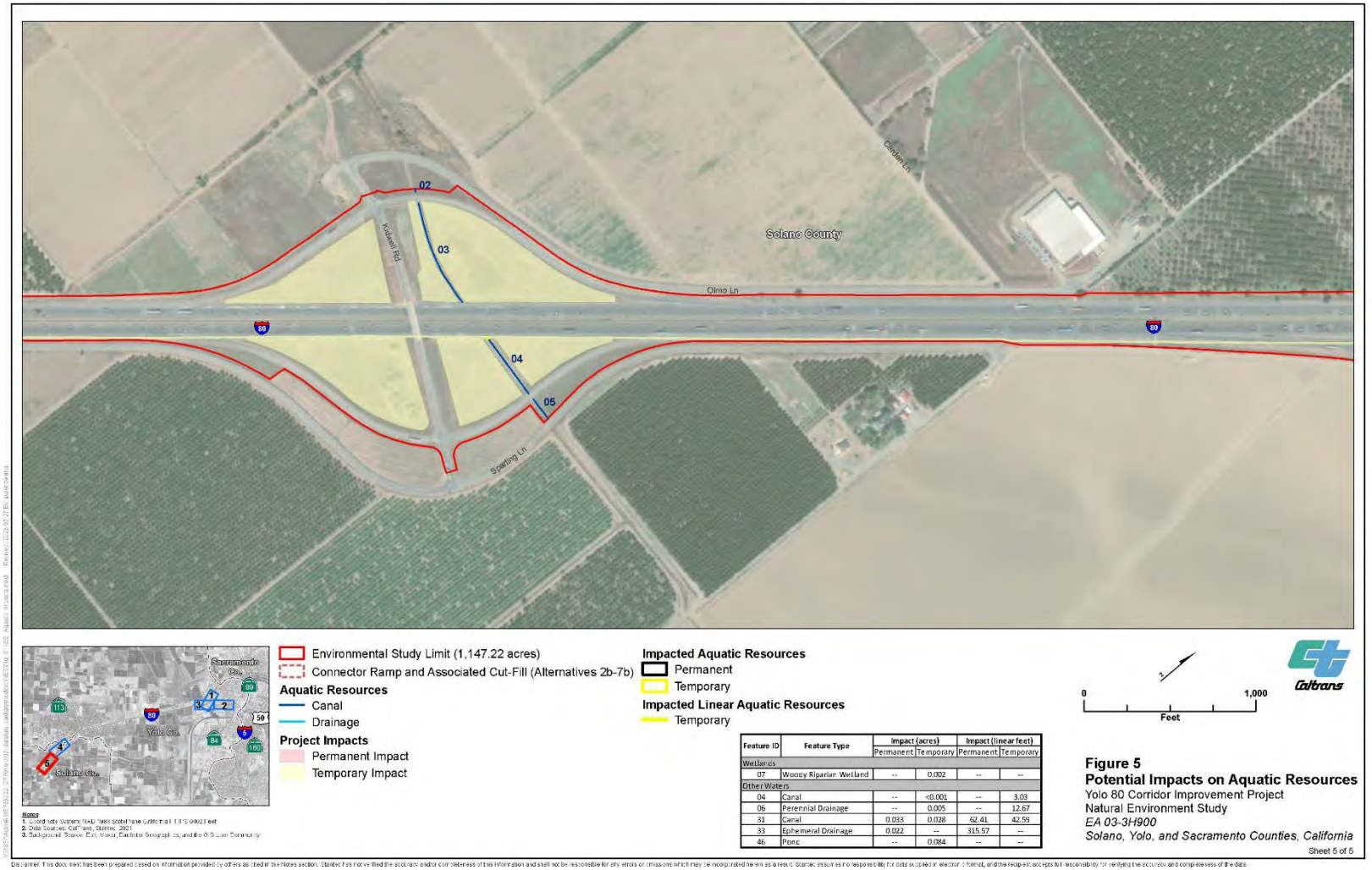
Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	0.033	0.028	62.41	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

Figure 5
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 3 of 5



Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	0.033	0.028	62.41	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

Figure 5
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 4 of 5



Feature ID	Feature Type	Impact (acres)		Impact (linear feet)	
		Permanent	Temporary	Permanent	Temporary
Wetlands					
07	Woody Riparian Wetland	--	0.002	--	--
Other Waters					
04	Canal	--	<0.001	--	3.03
06	Perennial Drainage	--	0.005	--	12.67
31	Canal	0.033	0.028	62.41	42.59
33	Ephemeral Drainage	0.022	--	315.57	--
46	Pond	--	0.084	--	--

Figure 5
Potential Impacts on Aquatic Resources
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 5 of 5

Avoidance and Minimization Efforts

In addition to the standard measures provided in Section 1.4, the following measures (AMM BIO-1 to AMM BIO-3) will be implemented to avoid or minimize the potential for adverse impacts on aquatic resources subject to agency jurisdiction.

AMM BIO-1 Before any discharge of dredge or fill material into waters of the United States or waters of the State, the required permits/authorizations will be obtained from the Corps and the RWQCB. All terms and conditions of the required permits/authorizations will be implemented.

AMM BIO-2 Before any activities would obstruct the flow or alter the bed, channel, or bank of any feature subject to Fish and Game Code Section 1600, notification of streambed alteration will be submitted to CDFW. If required, a streambed alteration agreement will be obtained from CDFW, and all conditions of the agreement will be implemented.

AMM BIO-3 Aquatic resources subject to agency jurisdiction that are temporarily affected by project construction will be restored as close as practicable to their original contour and conditions within 10 days of the completion of construction activities.

Compensatory Mitigation

None required.

Cumulative Impacts

With implementation of the avoidance and minimization measures, the project would not result in cumulatively considerable adverse effects on sensitive aquatic resources.

4.2.Special Status Plant Species

Special status plant species are considered to be of special concern and are assessed for the purposes of this NES based on (1) federal and state regulations; (2) species with limited distributions; and (3) whether potential habitat for the special status plant species is present within the BSA and/or the species is detected during focused botanical surveys.

The BSA contains potential habitat for 25 special status plant species:

- Bogg's Lake hedge hyssop
- Keck's checkerbloom
- Crampton's tuctoria
- heartscale
- brittlescale
- bristly sedge
- pappose tarplant
- Parry's rough tarplant
- Bolander's water hemlock
- dwarf downingia
- Jepson's coyote thistle
- stinkbells
- fragrant fritillary
- adobe-lily
- hogwallow starfish
- wooly rose-mallow)
- Delta tule pea
- Mason's lilaeopsis
- Delta mudwort
- little mousetail
- Baker's navarretia
- bearded popcorn flower
- California alkali grass
- Sanford's arrowhead
- Suisun Marsh aster

4.2.1.Special Status Plant Species

Survey Results

Focused botanical surveys were conducted in May and August 2021 and July 14, 2022, by Stantec biologists. Surveys were performed within the appropriate bloom periods, but no special status plant species were observed within the BSA.

Project Impacts

Construction activities associated with the project would not result in permanent or temporary disturbances of potential habitat for special status plant species. Indirect impacts associated with the implementation of the project may include the reduction in habitat suitability and quality from the introduction or spread of non-native plant species within the BSA. Standard Measures BR-4 and BR-5 (Section 1.4) would prevent the potential for indirect impacts on special status plant species to occur as a result of the project, including the spread or introduction of non-native plants within the BSA

Avoidance and Minimization Efforts

None.

Compensatory Mitigation

None required.

Cumulative Impacts

The project would not result in cumulatively considerable impacts on special status plants.

4.3. Special Status Animal Species

Special status animal species are considered to be of special concern and are assessed for the purposes of this NES based on (1) federal and state regulations; (2) species with limited distributions; and (3) whether potential habitat for the special status animal species is present within the BSA. Based on the surveys performed, Swainson's hawk, white-tailed kite, and northern harrier were found to be present within the BSA.

The following 23 species could use habitats within the BSA or immediate vicinity:

- valley elderberry longhorn beetle
- green sturgeon
- Central Valley DPS steelhead
- Chinook salmon- Central Valley spring-run ESU
- Chinook salmon- Sacramento River winter-run ESU
- delta smelt
- longfin smelt
- giant garter snake
- Swainson's hawk
- northern harrier
- white-tailed kite
- mountain plover
- least Bell's vireo
- western yellow-billed cuckoo
- western burrowing owl
- purple martin
- grasshopper sparrow
- song sparrow (Modesto population)
- tricolored blackbird
- yellow-headed blackbird
- western pond turtle
- pallid bat
- western red bat

Swainson's hawk, white-tailed kite, and northern harrier were identified within the BSA during the protocol-level Swainson's hawk and burrowing owl surveys. One bald eagle (*Haliaeetus leucocephalus*) was incidentally observed flying over the BSA during the field surveys. No other species were incidentally observed within the BSA during the field surveys to date.

4.3.1. Valley Elderberry Longhorn Beetle

VELB is listed as federally threatened. VELB is an insect endemic to California's Central Valley that inhabits riparian and associated upland habitats where elderberry (*Sambucus* spp.), its host plant, grows. Specifically, its range includes the upper Sacramento Valley from the vicinity of Redding to the central San Joaquin Valley, and generally below 500 feet elevation (U.S. Fish and Wildlife Service 1991). VELB habitat typically consists of riparian forests.

Survey Results

On February 19 and 21–24, 2021, and July 7, 2022, Stantec performed a survey to identify the location of elderberry shrubs within 165 feet of the BSA. Sixty-nine elderberry shrubs were identified, 53 of which were located within the BSA. Of the 53 shrubs observed, exit holes were observed in eight (Appendix J). Based on a review of the CNDDB, there are three occurrences of VELB within 2,526 feet of the BSA. The project falls within the Sacramento River Management Unit and the Putah Creek Management Unit (USFWS 2019).

Based on the findings of the surveys, occupancy has been established by the presence of exit holes in both riparian and non-riparian shrubs present within the BSA. The findings also demonstrate that the project is likely to affect VELB, as there is suitable habitat within the BSA, and there is evidence of VELB presence (i.e., bore or exit holes) observed in elderberry shrubs within the BSA.

Project Impacts

A total of six shrubs would be directly affected by the project, and 28 shrubs, located within 165 feet of impact areas, would be indirectly affected (Figure 6). Table 13 shows the stem counts for elderberry shrubs directly affected within the BSA. This corresponds with approximately 2.4 acres of temporary impacts and 3.1 acres of permanent impacts to suitable non-riparian VELB habitat. All alternatives would result in the same impacts to VELB.

Table 13. Summary of Stem Counts for Elderberry Shrubs Affected by the Project

Shrub ID	Presence of Exit Holes?	Riparian Habitat?	Direct/ Indirect Impact?	No. of 1- to 3-inch stems	No. of 3- to 5-inch stems	No. of stems greater than 5 inches
1	N	N	Direct	2	0	0
11	Y	N	Direct	0	0	1
12	N	N	Direct	0	1	3
15	N	N	Direct	2	1	1
16	N	N	Direct	0	1	0
17	N	N	Direct	1	0	0
2	N	N	Indirect	2	5	2
3	N	N	Indirect	6	0	1
4	N	N	Indirect	20	3	0
5	N	N	Indirect	24	0	0
6	Y	N	Indirect	0	0	3
7	N	N	Indirect	0	1	0
8	N	N	Indirect	0	1	2
9	N	N	Indirect	2	2	2
10	N	N	Indirect	0	0	2
13	N	N	Indirect	0	0	2
14	N	N	Indirect	0	0	1
18	N	N	Indirect	1	0	0
19	N	N	Indirect	2	0	0
20	N	N	Indirect	28	18	3
21	N	N	Indirect	2	2	0
B-02	N	N	Indirect	0	1	0
B-03	N	N	Indirect	0	0	1
B-04	N	N	Indirect	0	0	1
B-05	N	N	Indirect	0	1	0
B-06	N	N	Indirect	0	0	2
B-07	N	N	Indirect	0	0	1
B-08	N	N	Indirect	2	5	2
B-09	N	N	Indirect	0	0	8
B-10	N	N	Indirect	4	4	5
B-11	N	N	Indirect	2	0	0
B-12	N	N	Indirect	12	6	1
B-13	N	N	Indirect	0	0	1
B-14	N	N	Indirect	4	1	0
Totals				**116**	**53**	**45**

Indirect impacts could result in dust from removal of terrestrial vegetative cover which could increase microclimate temperatures; increase in hazardous materials; and potentially introduce invasive plant species by construction equipment.

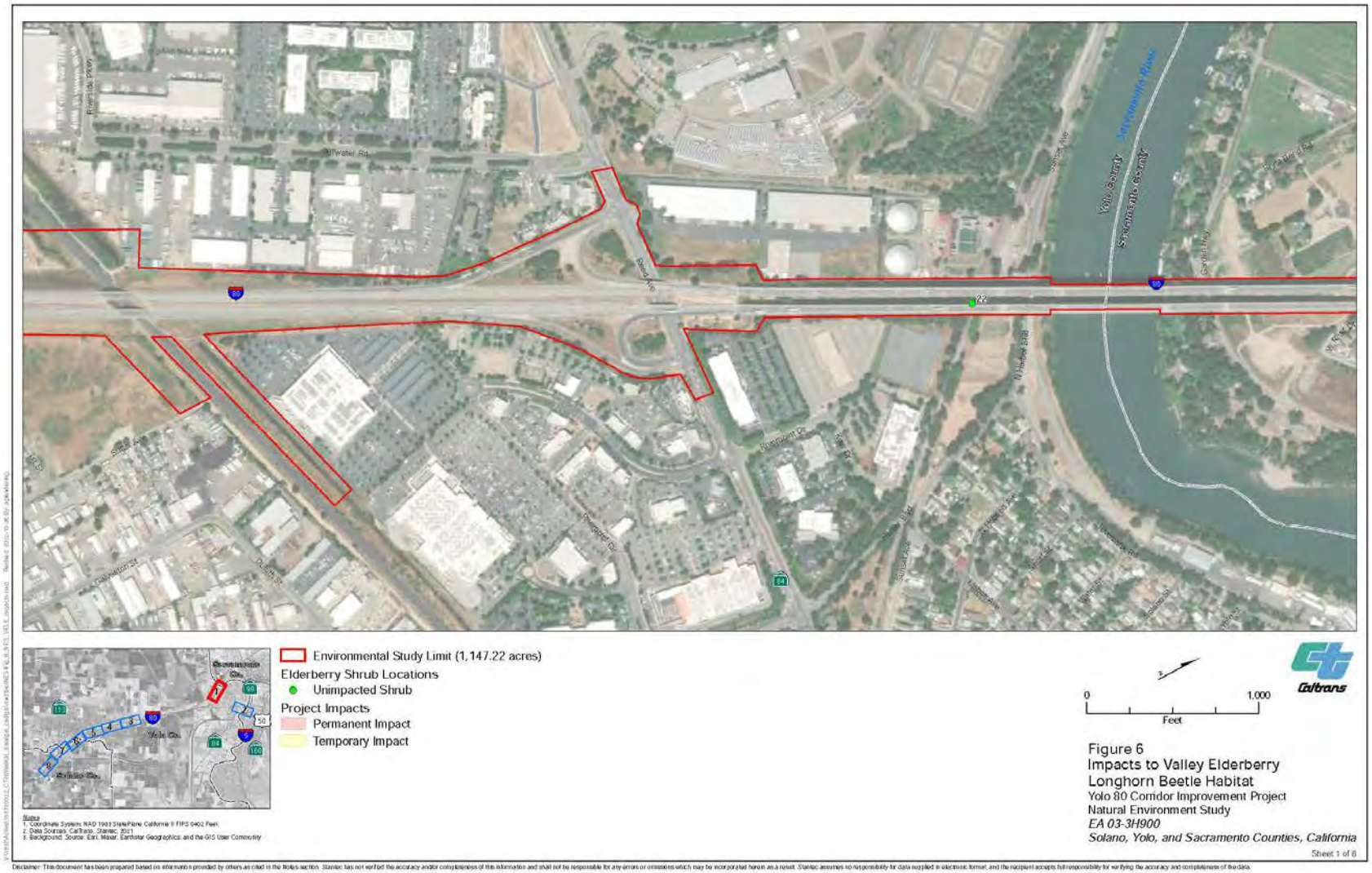
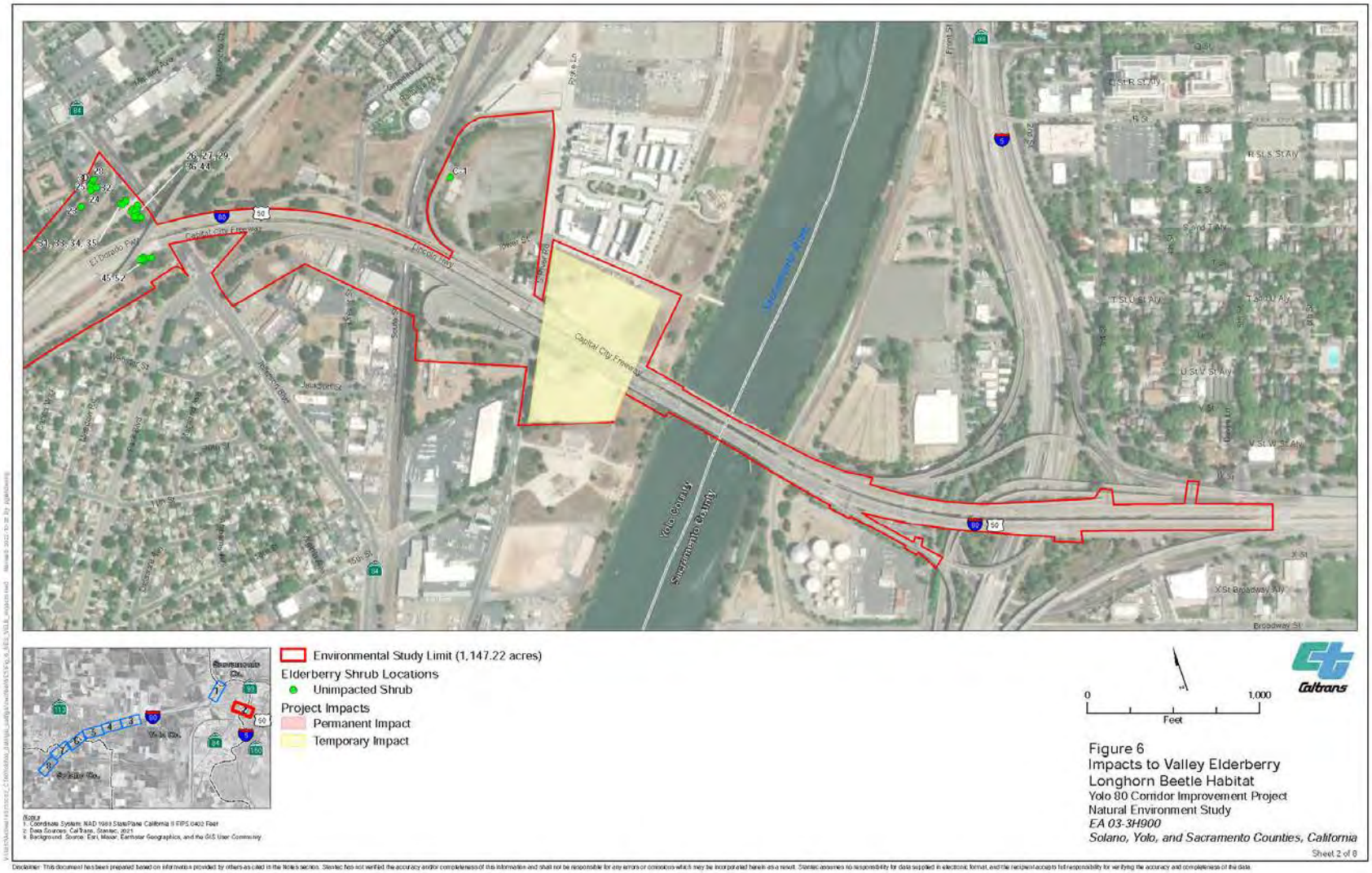
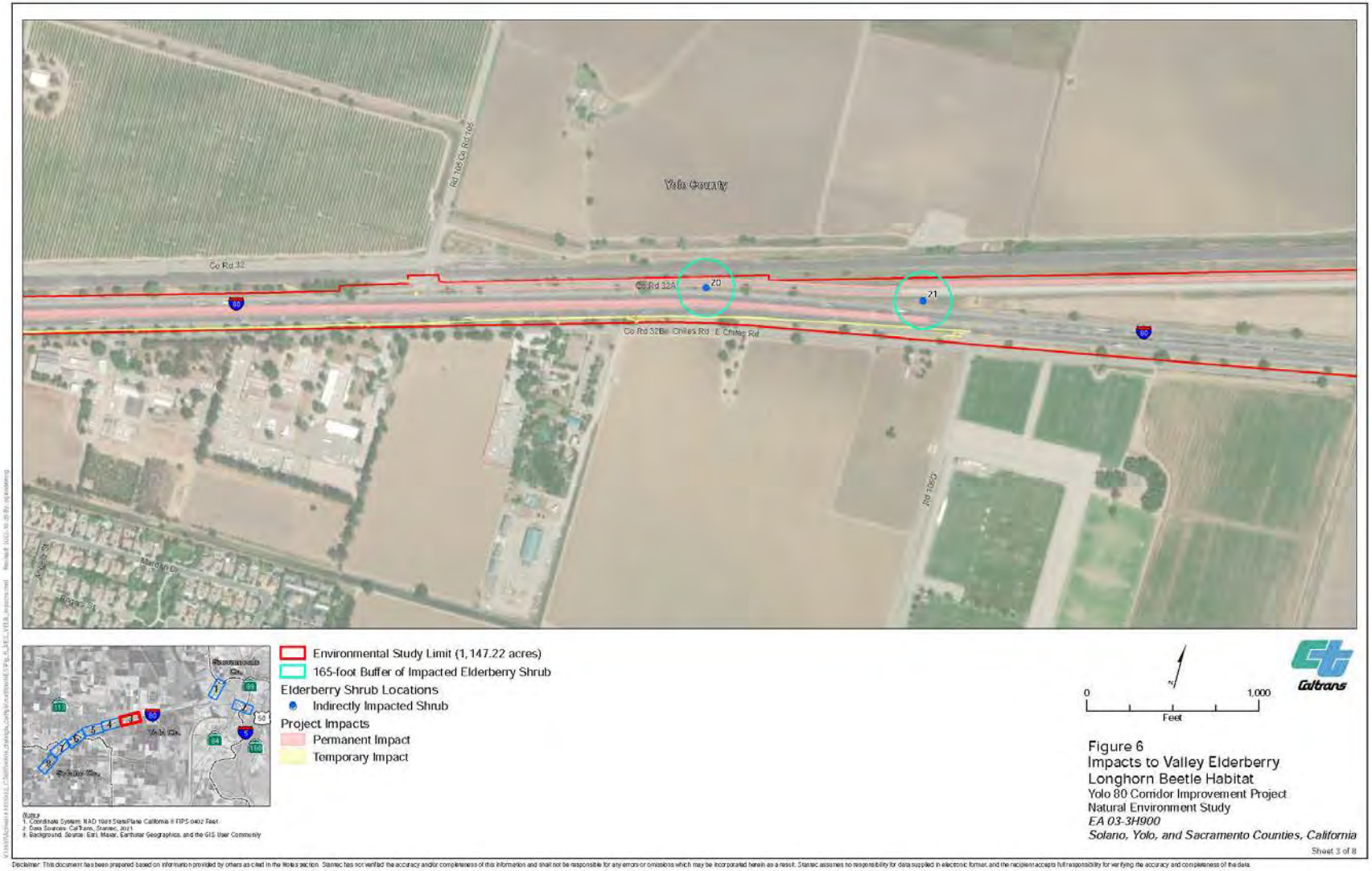


Figure 5. Impacts to Valley Elderberry Longhorn Beetle Habitat


Environmental Study Limit (1,147.22 acres)
Elderberry Shrub Locations
Unimpacted Shrub
Project Impacts
Permanent Impact
Temporary Impact
0
1,000
Feet
Caltrans
Figure 6
Impacts to Valley Elderberry Longhorn Beetle Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 2 of 8


Yolo County
Co Rd 32
Co Rd 32A
Co Rd 32B
Chiles Rd
E Chiles Rd
Rd 19B
Co Rd 19B
20
21
Environmental Study Limit (1,147.22 acres)
165-foot Buffer of Impacted Elderberry Shrub
Elderberry Shrub Locations
Indirectly Impacted Shrub
Project Impacts
Permanent Impact
Temporary Impact
0
1,000
Feet
Caltrans
Figure 6
Impacts to Valley Elderberry Longhorn Beetle Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 3 of 8

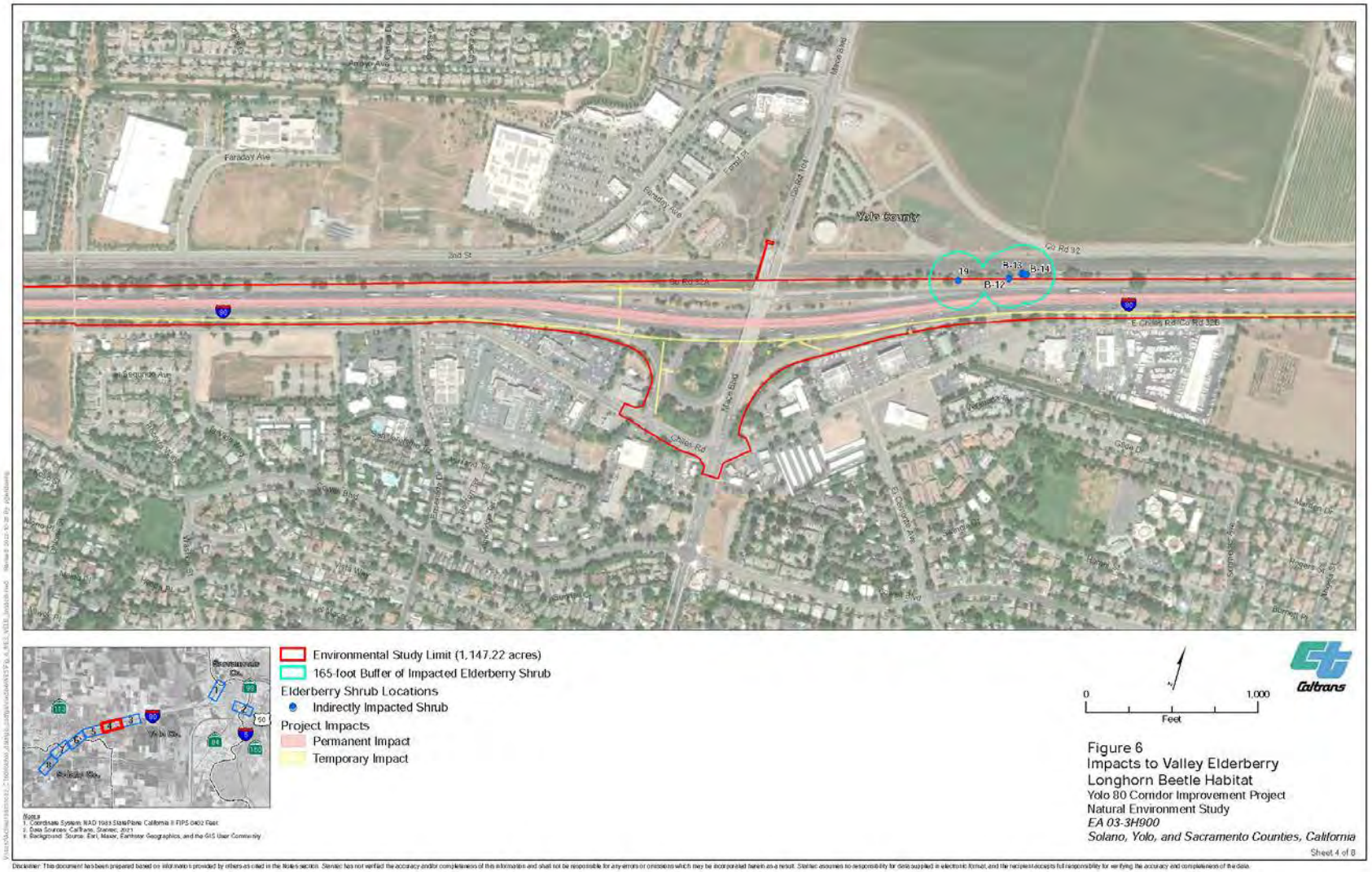
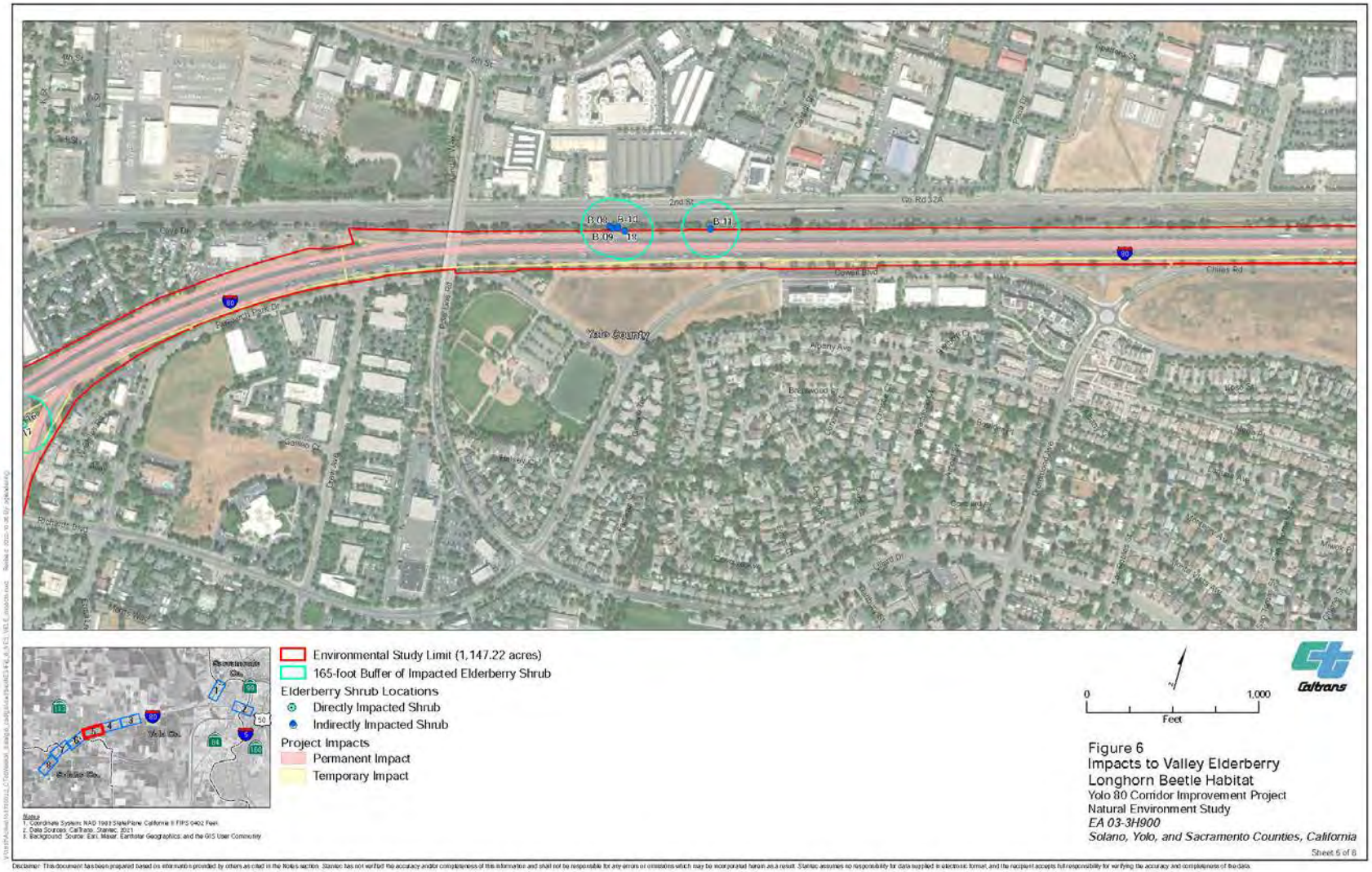


Figure 6
Impacts to Valley Elderberry Longhorn Beetle Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California

Sheet 4 of 8


B-08
B-10
B-09
B-11
Environmental Study Limit (1,147.22 acres)
165-foot Buffer of Impacted Elderberry Shrub
Elderberry Shrub Locations
Directly Impacted Shrub
Indirectly Impacted Shrub
Project Impacts
Permanent Impact
Temporary Impact
0
1,000
Feet
Caltrans
Figure 6
Impacts to Valley Elderberry Longhorn Beetle Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 6 of 6

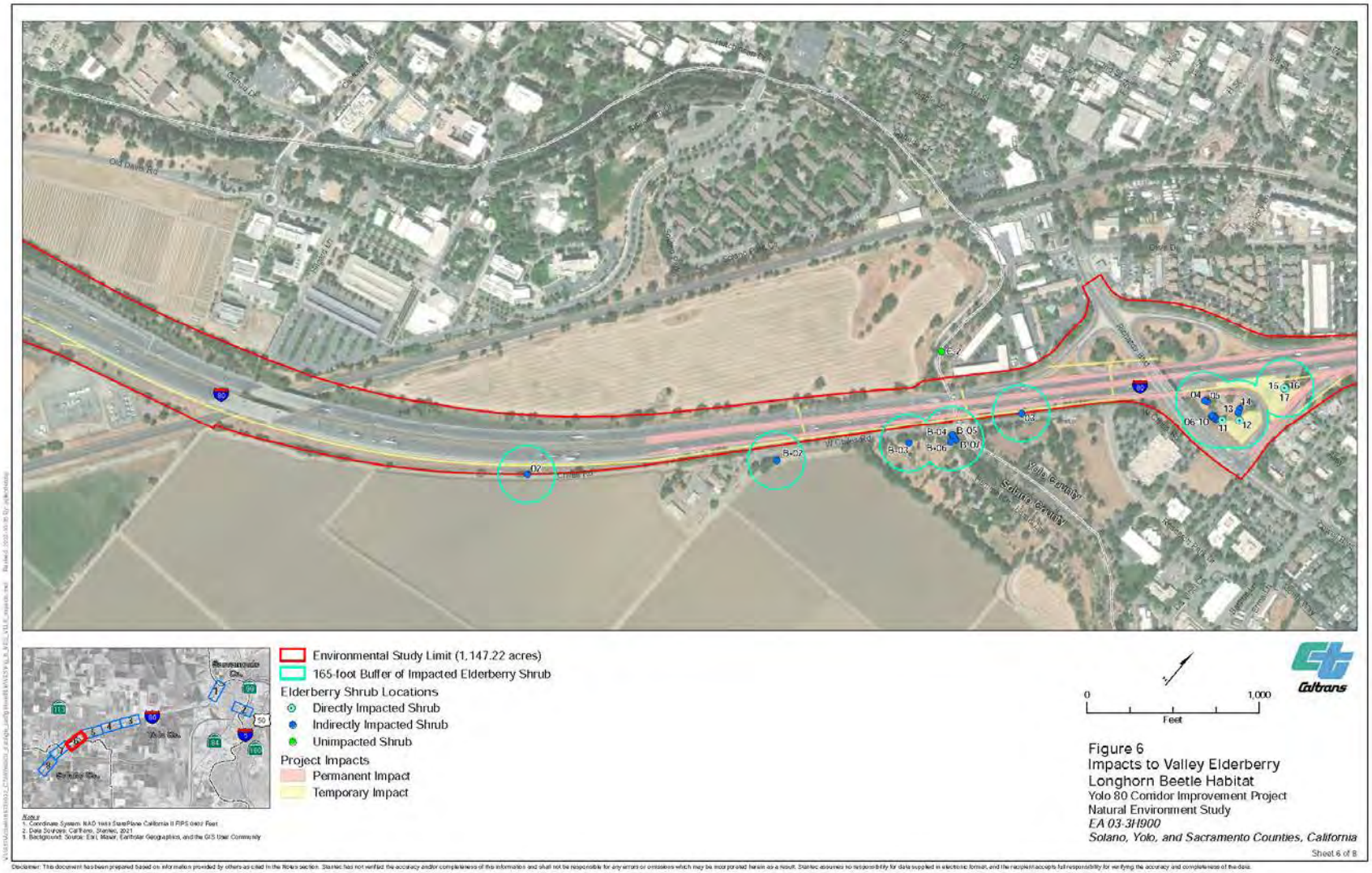

Environmental Study Limit (1,147.22 acres)
165-foot Buffer of Impacted Elderberry Shrub
Elderberry Shrub Locations
Directly Impacted Shrub
Indirectly Impacted Shrub
Unimpacted Shrub
Project Impacts
Permanent Impact
Temporary Impact
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Figure 6
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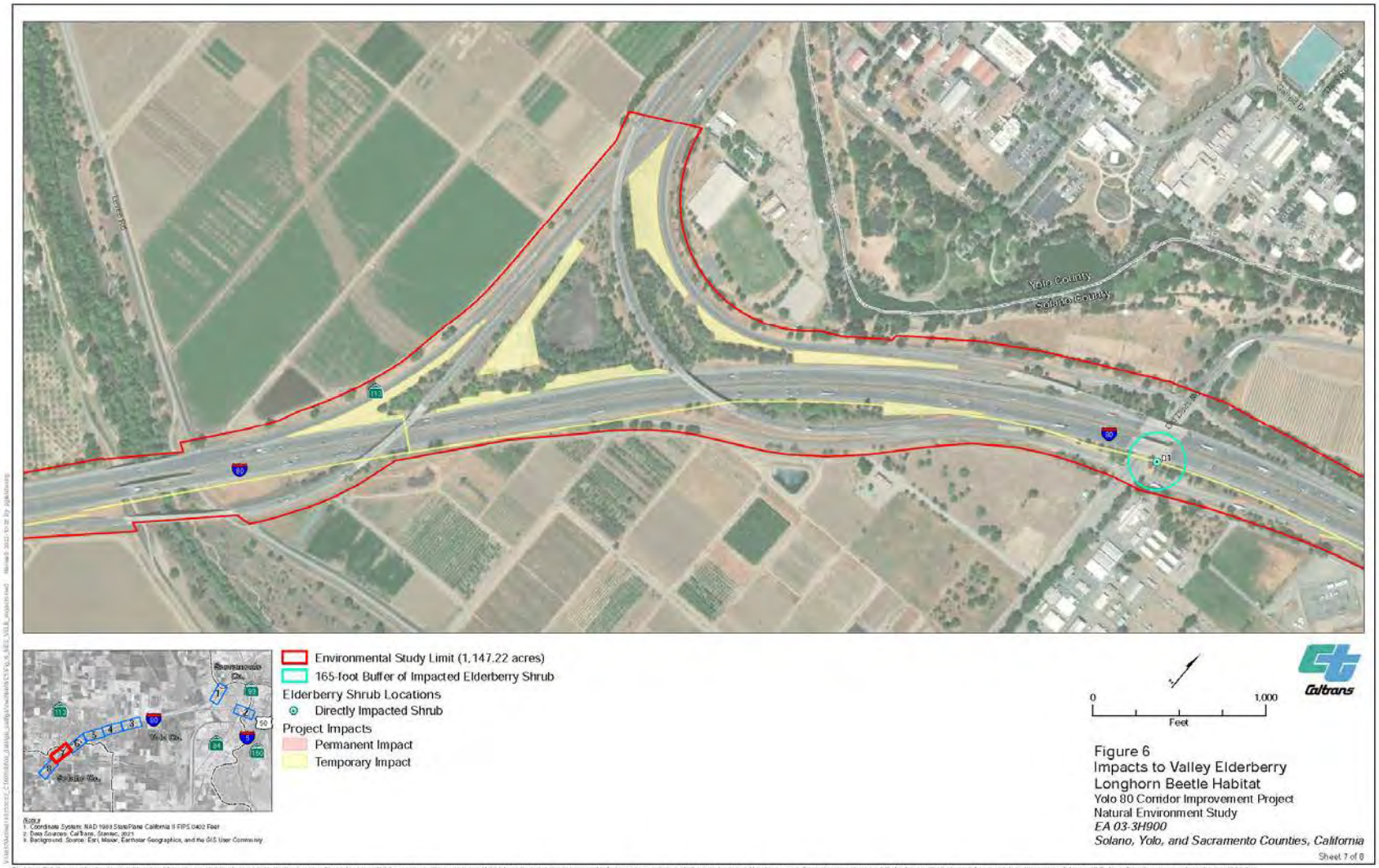
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 6 of 8


Yolo County
Solano County
01
Environmental Study Limit (1,147.22 acres)
165-foot Buffer of Impacted Elderberry Shrub
Elderberry Shrub Locations
Directly Impacted Shrub
Project Impacts
Permanent Impact
Temporary Impact
0
1,000
Feet
Caltrans
Figure 6
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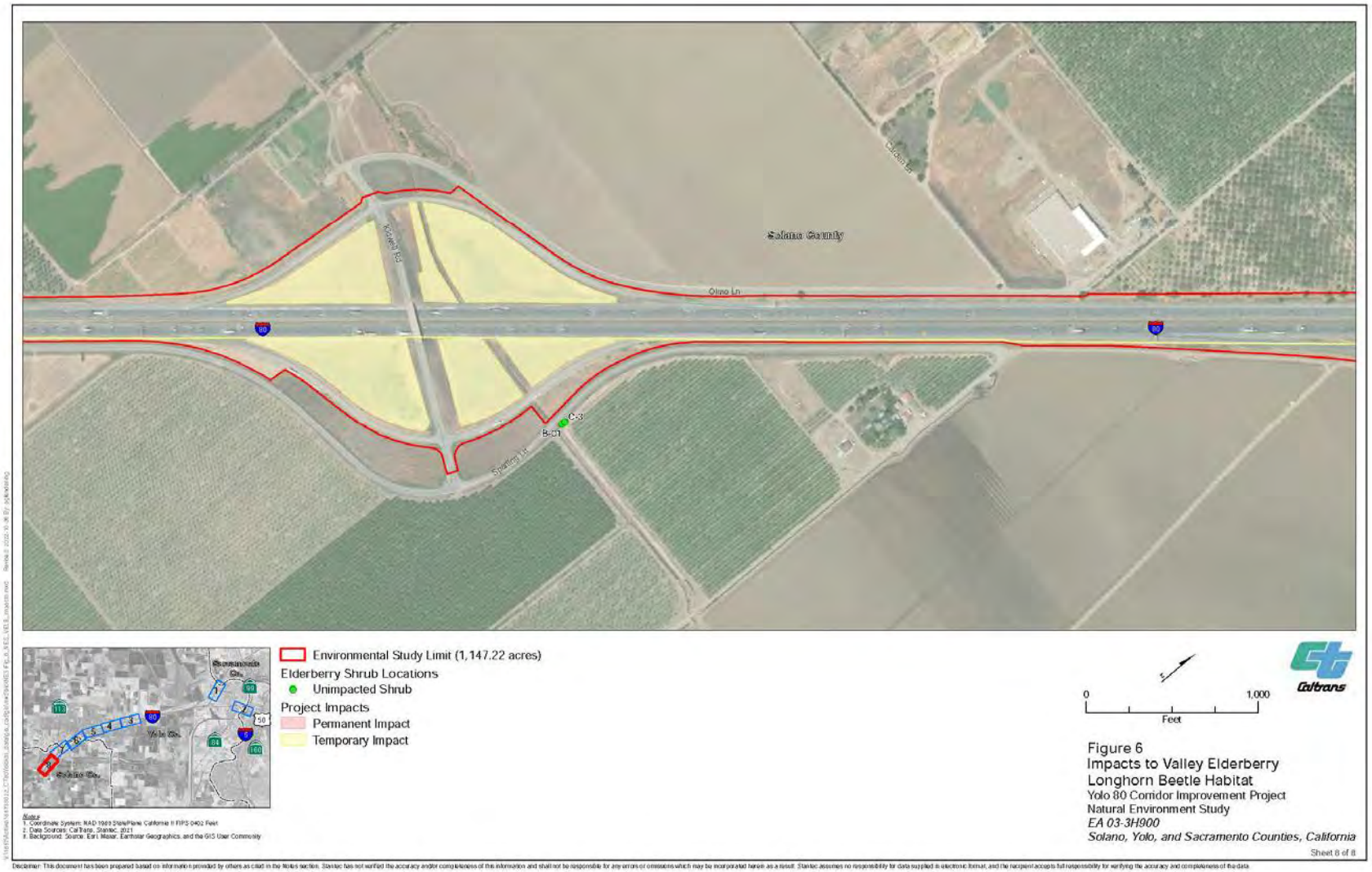
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 7 of 8


Solano County
Olmo Ln
Knowles Rd
Stanley Rd
C-3
B-01
Environmental Study Limit (1,147.22 acres)
Elderberry Shrub Locations
Unimpacted Shrub
Project Impacts
Permanent Impact
Temporary Impact
0
1,000
Feet
Caltrans
Figure 6
Impacts to Valley Elderberry Longhorn Beetle Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 8 of 8

Avoidance and Minimization Efforts

For construction that takes place near elderberry shrubs, the project-specific AMMs described below (AMM BIO-4 to AMM BIO-9), in accordance with the *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (USFWS 2017), would serve to avoid or minimize potential effects on VELB.

AMM BIO-4 **Fencing.** All areas to be avoided during construction activities will be fenced and/or flagged as close to construction limits as feasible.

AMM BIO-5 **Avoidance Area.** Activities that may damage or kill an elderberry shrub (e.g., trenching, paving) may need an avoidance area of at least 6 meters (20 feet) from the drip-line, depending on the type of activity.

AMM BIO-6 **Worker Education.** A qualified biologist will provide all contractors, work crews, and any onsite personnel with training on the status of the VELB, its host plant and habitat, the need to avoid damaging the elderberry shrubs, and the possible penalties for noncompliance.

AMM BIO-7 **Timing**. As much as practicable, all activities that could occur within 50 meters (165 feet) of an elderberry shrub, will be conducted outside of the flight season of the VELB (March–July).

AMM BIO-8 **Erosion Control and Re-vegetation.** Erosion control will be implemented, and the affected area will be re-vegetated with appropriate native plants.

AMM BIO-9 **Transplanting.** If the elderberry shrub cannot be avoided, or if indirect effects will result in the death of stems or the entire shrub, then it should be relocated following the transplanting guidelines:

- Monitor. A qualified biologist will be on-site for the duration of transplanting activities to ensure compliance with avoidance and minimization measures and other conservation measures.
- Exit Holes. Exit-hole surveys will be completed immediately before transplanting. The number of exit holes found, GPS location of the plant to be relocated, and the GPS location of where the plant is transplanted will be reported to the USFWS and to the CNDDB.
- Timing. Elderberry shrubs will be transplanted when the shrubs are dormant (November through the first two weeks in February) and after they have lost their leaves. Transplanting during the non-

growing season will reduce shock to the shrub and increase transplantation success.

- Transplanting Procedure. Transplanting will follow the most current version of the ANSI A300 (Part 6) guidelines for transplanting (http://www.tcia.org/).
- Trimming Procedure. Trimming will occur between November and February and should minimize the removal of branches or stems that exceed 1 inch in diameter.

Compensatory Mitigation

To mitigate for the loss of 3.1 acres of non-riparian VELB habitat and associated elderberry shrubs, Caltrans will purchase credits at a 1:1 ratio at a USFWS-approved conservation bank (MM BIO-1).

MM BIO-1 Prior to construction, Caltrans will purchase credits at a 1:1 ratio at a USFWS-approved conservation bank for non-riparian VELB habitat and associated elderberry shrubs.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on VELB. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on VELB.

4.3.2. Central Valley DPS Steelhead, Central Valley Spring-Run ESU Chinook Salmon, Sacramento River Winter-Run ESA Chinook Salmon, and Green Sturgeon

Central Valley DPS steelhead is listed as threatened under the ESA. Central Valley steelhead generally leave the ocean from August through April and spawn from December through April in small streams and tributaries of the Sacramento River where cool, well oxygenated water is available year-round. Timing of upstream migration is correlated with higher flow events, such as freshets or seasonal flow increases, and associated lower water temperatures. Steelhead spawn in gravel and small cobble substrates usually associated with riffle and run habitat types.

Central Valley spring-run ESU Chinook salmon is listed as threatened under the ESA and CESA. Adult spring-run Chinook salmon migrate upstream from the ocean during spring, beginning in March, and hold over in deep pools of the mainstem Sacramento River and its large perennial tributaries, where fish can access cold headwaters during the summer months, and then spawn in Mill, Deer, Clear, and Butte creeks and the Feather River from mid-August through mid-October.

Sacramento River winter-run ESA Chinook salmon is listed as endangered under the ESA and CESA. Adult winter-run Chinook salmon begin their migration from the ocean in December and may spawn from mid-April through mid-August. Spawning primarily occurs in the upper mainstem Sacramento River near Redding. Most of each year's young winter-run salmon migrate downstream for rearing in the Delta and portions of the Yolo Bypass before emigrating to the ocean.

Green sturgeon is listed as threated under the ESA and is designated an SSC by CDFW. Adults begin spawning migrations from the ocean in March and typically reach their destinations in the Sacramento River from roughly Colusa to above Red Bluff and in the Feather River near Oroville between March and July (Heublein, et al., 2006; Seeholtz, et al., 2015). Spawning takes place between April and June in deep, turbulent pools and fast water, when temperatures range from 46°F to 60°F (Adams, et al., 2002). Following reproduction, some adults promptly migrate downstream back to the estuary and ocean, while others may over-summer and move out of the river during the first fall freshets (Heublein, et al., 2006). Juveniles may rear in the river for one to three years, before emigrating downstream to the estuary, primarily during the summer and fall.

Survey Results

Suitable migration habitat is present for all four species in the Sacramento River at the eastern end of the BSA and in Prospect Slough within the Yolo Bypass. The following is a summary of the general timing each species is expected to occur within the BSA and the CNDDB documented occurrences within 5 miles.

- Central Valley DPS steelhead could be present within the BSA from August to April. The most recent CNDDB documented occurrence is from 2011, approximately 0.5 mile east of the BSA, recording many migrating and stranded steelhead between 1998–2011 at the eastern edge of the Yolo Bypass, including the toe drain, Sacramento Deep Water Ship Channel, and Sacramento Bypass. The BSA is in designated critical habitat.

- Central Valley spring-run ESU Chinook salmon could be present within the BSA between March and April. The most recent CNDDB documented occurrence is from 2004, less than one mile east of the BSA, recording one adult and 26 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.
- Sacramento River winter-run ESA chinook could be present within the BSA in December during fall upstream migration and potentially year-round for rearing before returning to the ocean. The most recent CNDDB documented occurrence is from 2004, less than one mile east of the BSA, recording 36 adults and 11 juveniles captured in the Sacramento Deep Water Ship Channel in West Sacramento. The BSA is in designated critical habitat.
- Green sturgeon could be present within the BSA between March and April and again during the late summer and fall months. No CNDDB occurrences have been documented within 5 miles of the BSA. The BSA is in designated critical habitat.

Project Impacts

The project would not involve work within Sacramento River at the eastern end of the BSA or in Prospect Slough. There would be no direct or indirect impacts on listed salmonids or green sturgeon.

Avoidance and Minimization Efforts

None required.

Compensatory Mitigation

None required.

Cumulative Impacts

The project would not result in cumulatively considerable impacts on listed salmonids or green sturgeon.

4.3.3. Delta Smelt and Longfin Smelt

Delta smelt is listed as threatened under the ESA. Delta smelt are weakly anadromous and undergo a spawning migration from brackish water to freshwater annually (Moyle 2002). In early winter, mature delta smelt migrate from brackish, downstream rearing areas in and around Suisun Bay and the confluence of the Sacramento and San Joaquin rivers upstream to freshwater spawning areas in the Sacramento-San Joaquin Delta. They are found only from Suisun Bay upstream through the Delta in Contra Costa, Sacramento, San Joaquin, and Yolo Counties. Their historic range is thought to have extended from Suisun Bay upstream to at least the City of Sacramento on the Sacramento River and Mossdale on the San Joaquin River.

Longfin smelt is listed as a candidate species under FESA and as threatened under CESA. Longfin smelt reside in the Bay Delta and spawn yearly in the Delta, Suisun Marsh, and Suisun Bay. In dry years, longfin smelt can spawn in the upper Sacramento River and have been observed as far up as Colusa State Park (Baxter 2010).

Survey Results

Suitable habitat is present for both smelt species in the Sacramento River at the eastern end of the BSA and Prospect Slough within the Yolo Bypass. Prospect Slough may provide suitable spawning habitat for longfin smelt. The BSA is within designated critical habitat for Delta smelt.

Project Impacts

The project would not involve work within Sacramento River at the eastern end of the BSA or in Prospect Slough. There would be no direct or indirect impacts on listed smelt species.

Avoidance and Minimization Efforts

None required.

Compensatory Mitigation

None required.

Cumulative Impacts

The project would not result in cumulatively considerable impacts on listed Delta smelt or longfin smelt.

4.3.4. Giant Garter Snake

GGS is listed as threatened under the FESA and CESA. This species is found in a wide range of aquatic habitats with emergent structure for basking and feeding. GGS also use adjacent upland sites for nesting and hibernation. The species is generally considered active from May 1 to September 30 and hibernates during the period from October 1 to April 30, typically moving to underground refugia (e.g., burrows, riprap, debris piles) during this time.

Survey Results

SBI performed habitat assessment surveys between December 18 and 30, 2020, and June 12, 2022, to identify the location of potential GGS habitat within 200 feet of the BSA. A total of 101.2 acres of suitable aquatic habitat and 87 acres of marginal aquatic habitat were identified within 200 feet of the BSA (Appendix E). No GGS were observed during the surveys.

As described in Appendix E, there are several areas within the BSA where suitable GGS habitat is present and GGS have the potential to occur. In order from east to west, the sites with suitable GGS aquatic habitat included water canals that pass underneath the railroad overpass in West Sacramento, a water canal and drainage basin south of the I-80 and US-50 Interchange in West Sacramento, the eastern boundary of the Yolo Bypass Wildlife Area including Prospect Slough and containment levee uplands, the western boundary area and middle sections of the Yolo Bypass Wildlife Area, and a rice field on the southern side of I-80 and west of the Yolo Bypass Wildlife Area.

The most suitable habitat locations are within the Yolo Bypass Wildlife Area where nearly continuous wetlands stretch from west to east across the southern side of I-80, and mixed ephemeral and permanent wetlands with grazed upland that occur on the north side of I-80. While GGS populations and records are relatively sparse adjacent to I-80 within the Yolo Bypass Wildlife Area, these areas are within dispersal distances of known locations of GGS. Given the proximity of I-80 in the Yolo Bypass Wildlife Area to known GGS sightings to the north and south and surrounding suitable habitat, the BSA was determined to provide suitable habitat for GGS.

Project Impacts

Approximately 4.265 acres of GGS habitat would be permanently impacted. Permanent habitat impacts would result from the bike path improvements. Approximately 3.669 acres of temporary habitat impacts would result from installation of the fiber optic line, bike path improvements, and staging areas. Impacts are in areas identified as suitable and marginal GGS habitat. Impacts to GGS habitat are shown in Figure 7. Direct impacts on GGS could result from the increase in hazardous materials, habitat loss, and the crushing of individuals from construction equipment. Indirect impacts could result from removal of terrestrial vegetative cover which could increase microclimate temperatures and the potential introduction of invasive plant species by construction equipment. All alternatives would result in the same impacts on GGS.

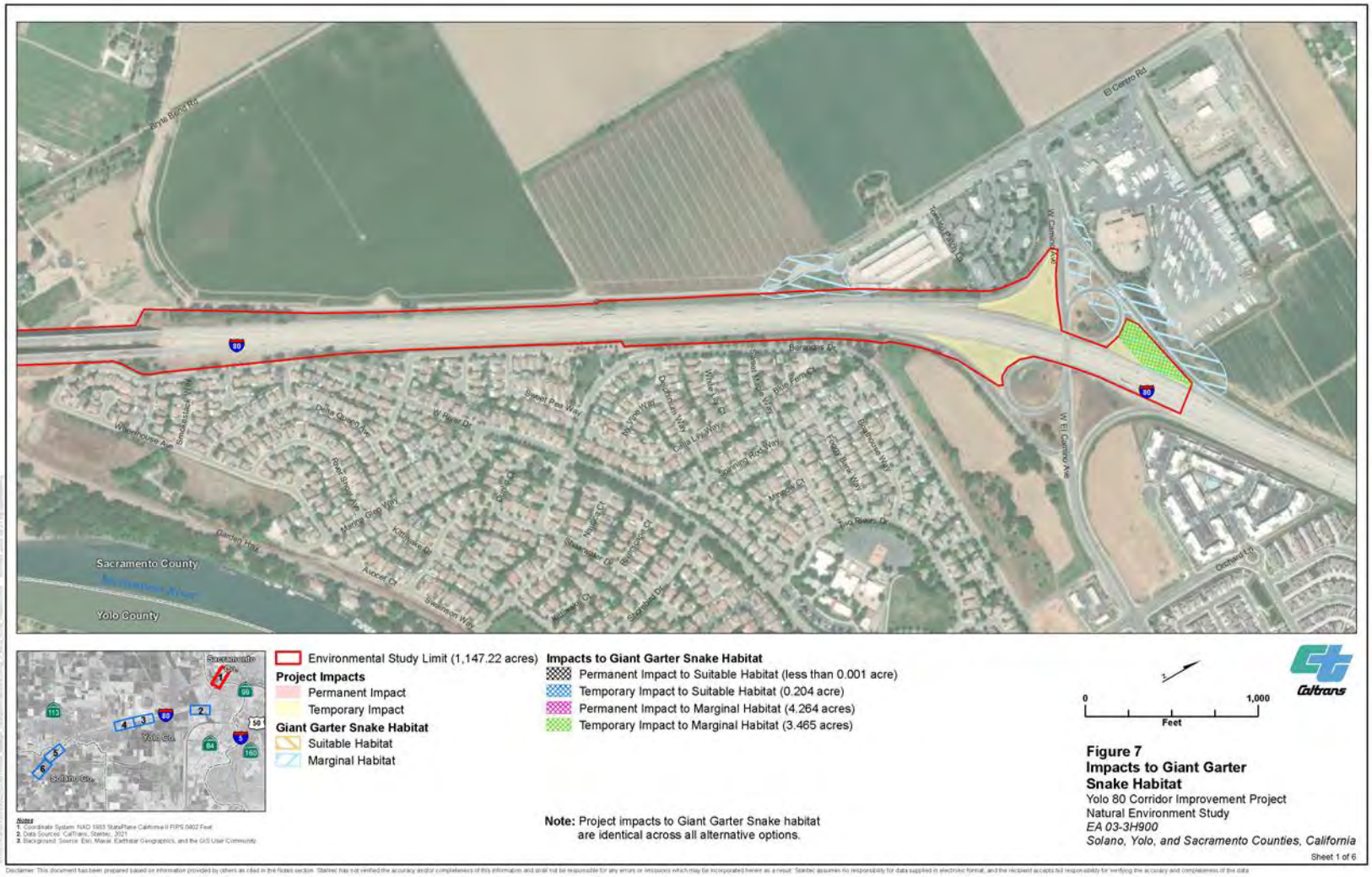
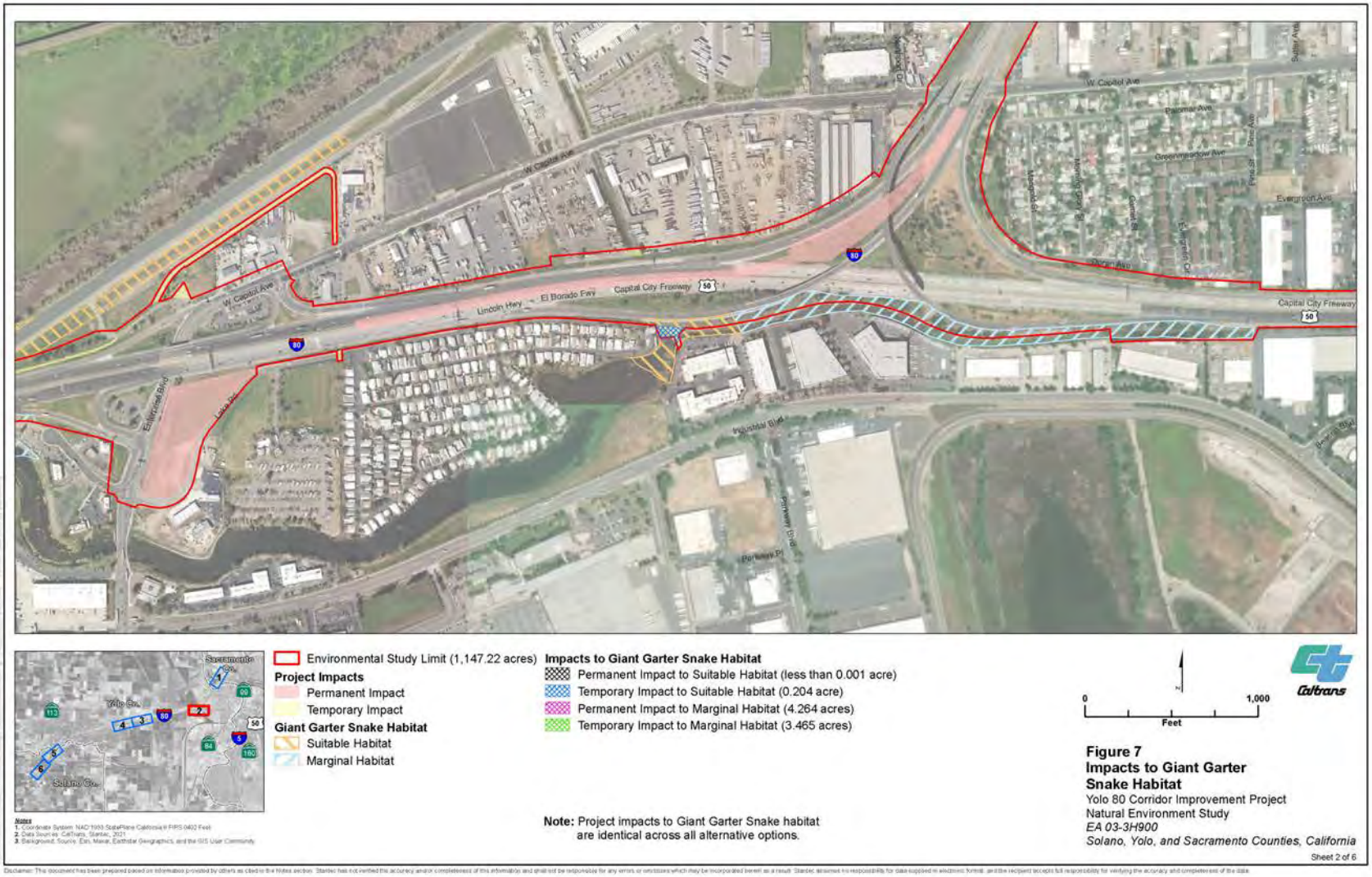
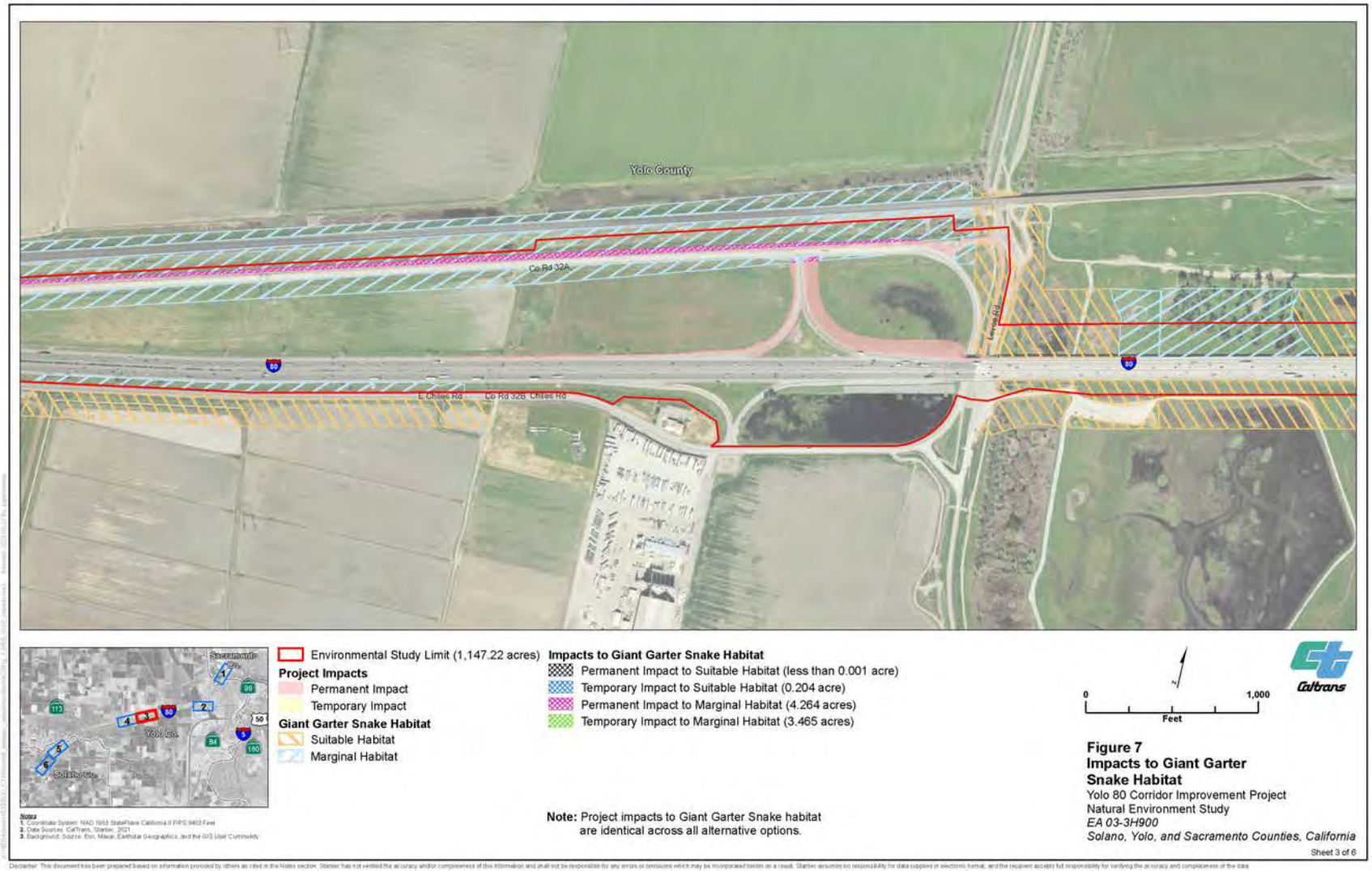


Figure 6. Impacts to Giant Garter Snake Habitat


W Capitol Ave
Lincoln Hwy
El Dorado Fwy
Capital City Freeway
50
80
Evergreen Ave
Industrial Blvd
Lake Dr
Environmental Blvd
Sacramento Co.
Yolo Co.
Solano Co.
Environmental Study Limit (1,147.22 acres)
Project Impacts
Permanent Impact
Temporary Impact
Giant Garter Snake Habitat
Suitable Habitat
Marginal Habitat
Impacts to Giant Garter Snake Habitat
Permanent Impact to Suitable Habitat (less than 0.001 acre)
Temporary Impact to Suitable Habitat (0.204 acre)
Permanent Impact to Marginal Habitat (4.264 acres)
Temporary Impact to Marginal Habitat (3.465 acres)
Note: Project impacts to Giant Garter Snake habitat are identical across all alternative options.
0
1,000
Feet
Caltrans
Figure 7
Impacts to Giant Garter Snake Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 2 of 6


Yolo County
Co Rd 32A
E Chiles Rd
Co Rd 32B Chiles Rd
Lewis Rd
80
Environmental Study Limit (1,147.22 acres)
Project Impacts
Permanent Impact
Temporary Impact
Giant Garter Snake Habitat
Suitable Habitat
Marginal Habitat
Impacts to Giant Garter Snake Habitat
Permanent Impact to Suitable Habitat (less than 0.001 acre)
Temporary Impact to Suitable Habitat (0.204 acre)
Permanent Impact to Marginal Habitat (4.264 acres)
Temporary Impact to Marginal Habitat (3.465 acres)
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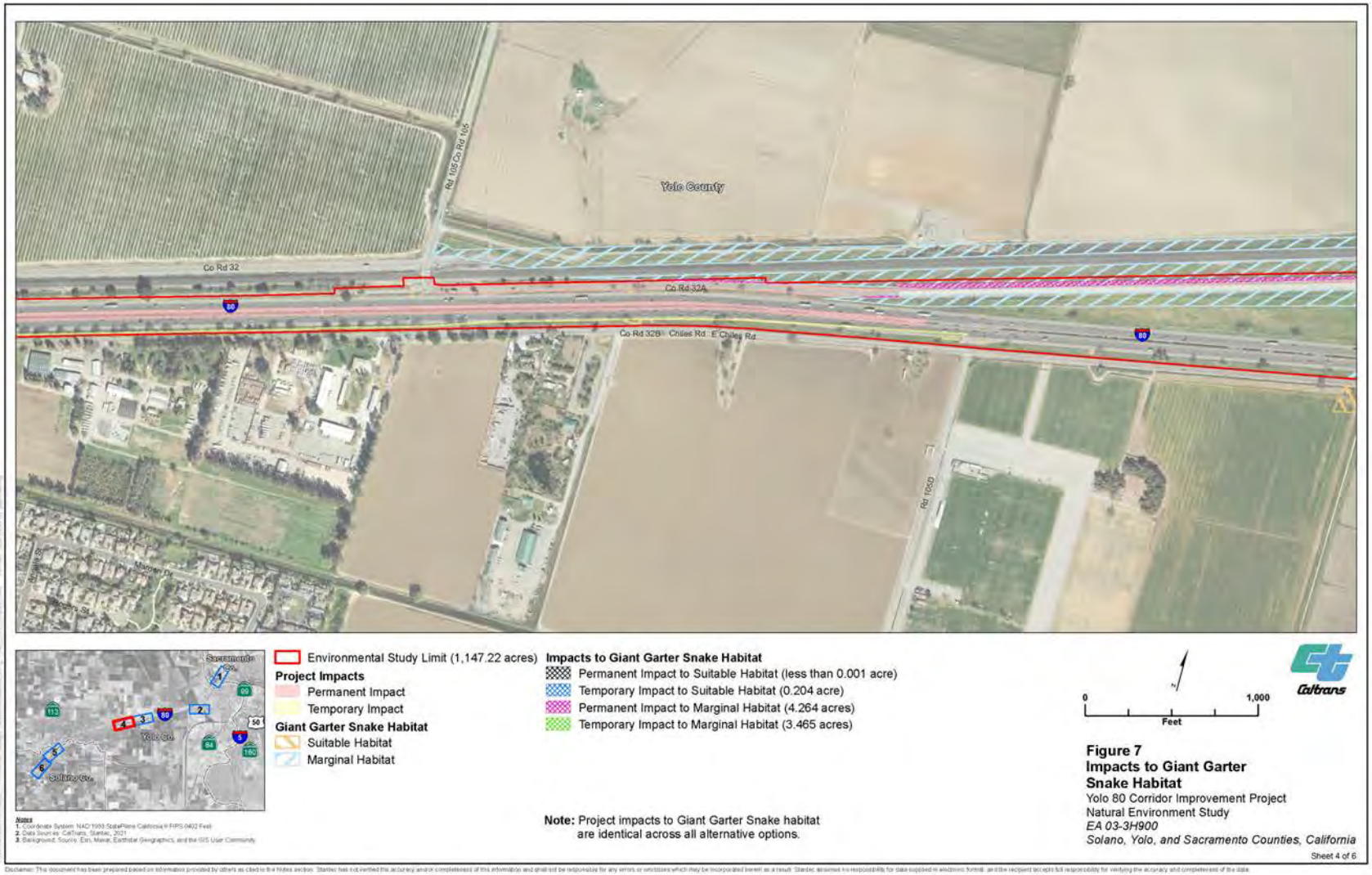
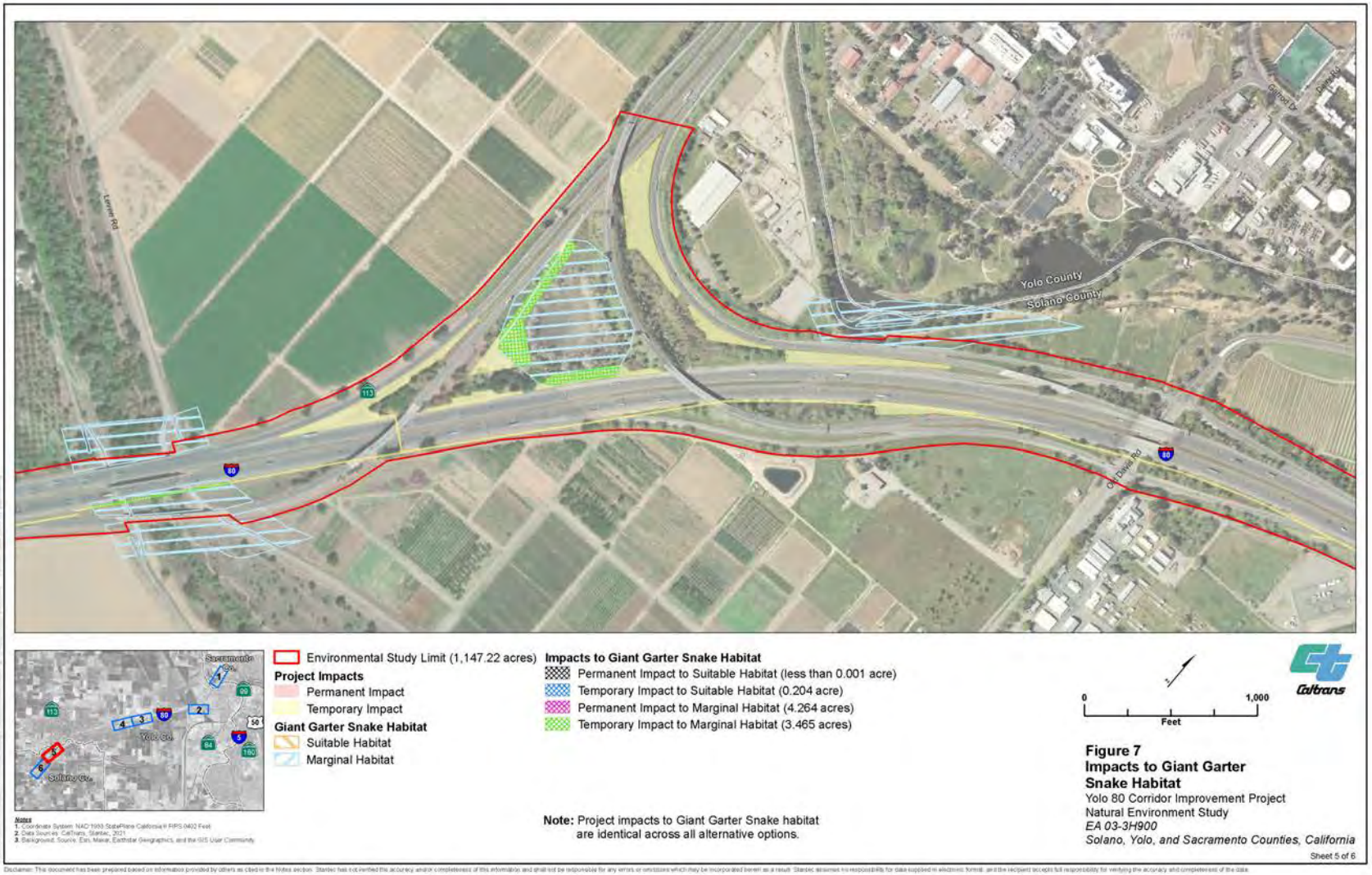
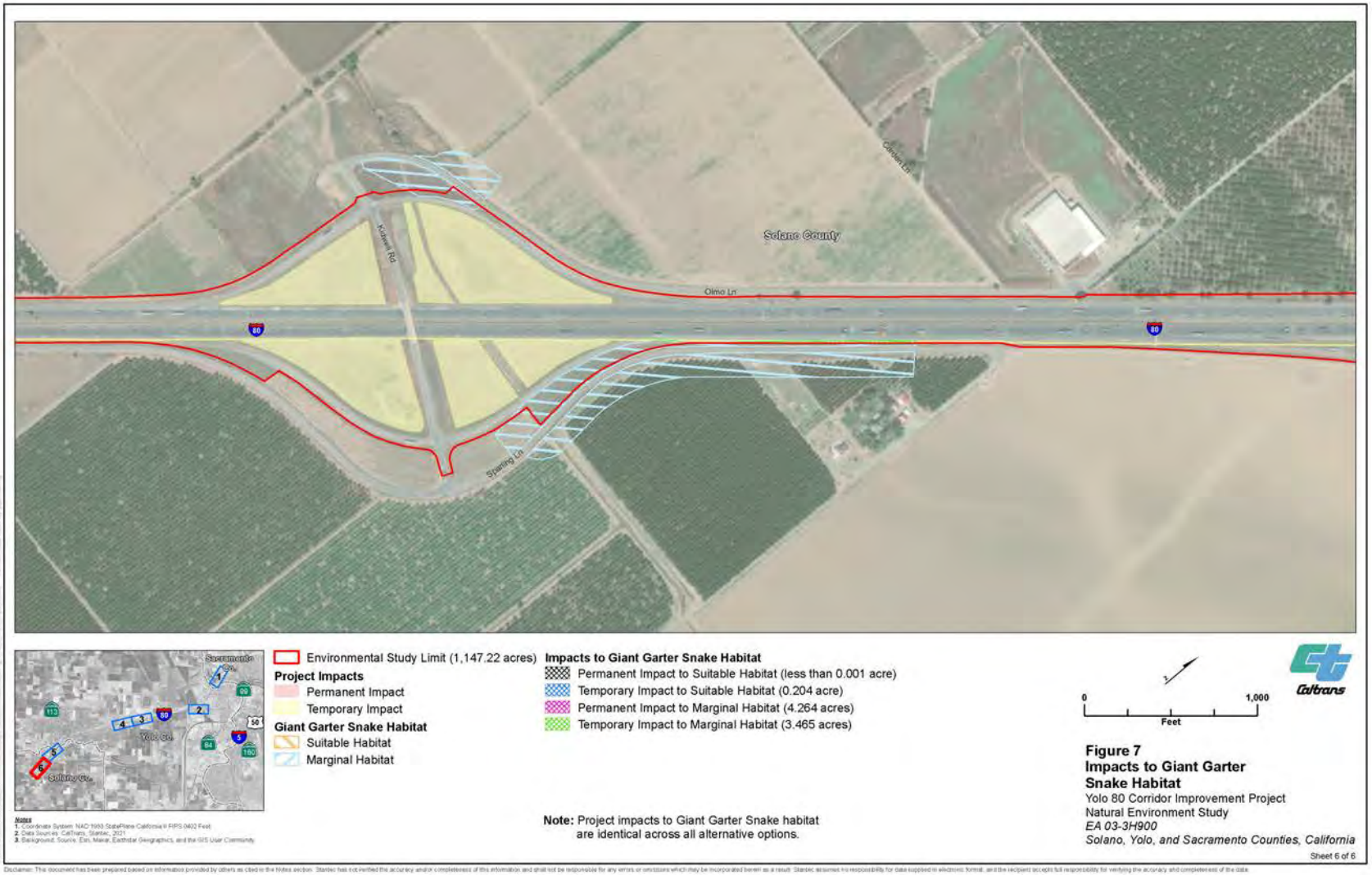
0
1,000
Feet
Caltrans
Figure 7
Impacts to Giant Garter Snake Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 3 of 6


Yolo County
Co Rd 32
Co Rd 32A
Co Rd 32B
Chiles Rd
E Chiles Rd
Rd 105
Rd 100
Environmental Study Limit (1,147.22 acres)
Project Impacts
Permanent Impact
Temporary Impact
Giant Garter Snake Habitat
Suitable Habitat
Marginal Habitat
Impacts to Giant Garter Snake Habitat
Permanent Impact to Suitable Habitat (less than 0.001 acre)
Temporary Impact to Suitable Habitat (0.204 acre)
Permanent Impact to Marginal Habitat (4.264 acres)
Temporary Impact to Marginal Habitat (3.465 acres)
0
1,000
Feet
Caltrans
Note: Project impacts to Giant Garter Snake habitat are identical across all alternative options.
Figure 7
Impacts to Giant Garter Snake Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 4 of 6


Yolo County
Solano County
Lorenz Rd
Old Davis Rd
Environmental Study Limit (1,147.22 acres)
Project Impacts
Permanent Impact
Temporary Impact
Giant Garter Snake Habitat
Suitable Habitat
Marginal Habitat
Impacts to Giant Garter Snake Habitat
Permanent Impact to Suitable Habitat (less than 0.001 acre)
Temporary Impact to Suitable Habitat (0.204 acre)
Permanent Impact to Marginal Habitat (4.264 acres)
Temporary Impact to Marginal Habitat (3.465 acres)
Note: Project impacts to Giant Garter Snake habitat are identical across all alternative options.
0
1,000
Feet
Caltrans
Figure 7
Impacts to Giant Garter Snake Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 5 of 6


Solano County
Olmo Ln
Kidwell Rd
Spaulding Ln
Environmental Study Limit (1,147.22 acres)
Project Impacts
Permanent Impact
Temporary Impact
Giant Garter Snake Habitat
Suitable Habitat
Marginal Habitat
Impacts to Giant Garter Snake Habitat
Permanent Impact to Suitable Habitat (less than 0.001 acre)
Temporary Impact to Suitable Habitat (0.204 acre)
Permanent Impact to Marginal Habitat (4.264 acres)
Temporary Impact to Marginal Habitat (3.465 acres)
Note: Project impacts to Giant Garter Snake habitat are identical across all alternative options.
0
1,000
Feet
Caltrans
Figure 7
Impacts to Giant Garter Snake Habitat
Yolo 80 Corridor Improvement Project
Natural Environment Study
EA 03-3H900
Solano, Yolo, and Sacramento Counties, California
Sheet 6 of 6

Avoidance and Minimization Efforts

In addition to the standard measures provided in Section 1.4, the following measures (AMM BIO-10 to AMM BIO-17) will be implemented to avoid or minimize the potential for adverse impacts on GGS.

AMM BIO-10 Construction activity will be conducted between May 1 and October 1, which is the active season for GGS.

AMM BIO-11 Where practicable, snake exclusion fencing will be placed around the BSA (fenced area) before construction during the active season for GGS (May 1–October 1) and be maintained through the construction period until the project has been completed.

AMM BIO-12 Caltrans will notify CDFW and the USFWS one week prior to when construction is scheduled to commence.

AMM BIO-13 Prior to the start of construction activities, a USFWS/CDFW-approved biologist will conduct a Worker Environmental Awareness Training Program, instructing all construction personnel, including contractors, how to recognize GGS and their habitats.

AMM BIO-14 Twenty-four hours prior to initiation of construction activities, the BSA shall be surveyed for GGS by a USFWS/CDFW-approved biologist. Surveys of the BSA should be repeated if a 2-week or greater lapse in construction activity occurs. If GGS is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined that the GGS will not be harmed. Any sightings and any incidental take will be reported to the USFWS and CDFW immediately by phone at (916) 414-6600 and (916) 358-2900, respectively, and e-mail or written letter addressed to the Chief, Sacramento Division (USFWS) and North Central Region (CDFW), within one working day of the incident.

AMM BIO-15 The canals and rice fields adjacent to the BSA will be flagged and designated an Environmentally Sensitive Area during the construction period.

AMM BIO-16 Upon completion of the project, all disturbed areas within the BSA will be revegetated using native plant species, and post-monitoring work and photos will be reported to USFWS and CDFW showing that temporary impacts have been restored to pre-construction conditions.

AMM BIO-17 At the end of each workday, permittee shall place an escape ramp at each end of any open trenches. This will allow any animals that may have been entrapped in the trench overnight to climb out. The escape ramp may be constructed of dirt fill, wood planking, or other suitable material and placed at an angle no greater than 30 degrees.

Compensatory Mitigation

Caltrans will mitigate for the permanent loss of GGS habitat through the purchase of GGS mitigation bank credits (MM BIO-2). These mitigation credits will be purchased from a USFWS- and CDFW-approved GGS mitigation bank and will be purchased prior to the habitat impacts. Caltrans will provide a bill of sale acceptable to and approved by USFWS and CDFW before construction begins. To compensate for the permanent loss of approximately 4.299 acres of GGS habitat, Caltrans will purchase 12.897 acres (a 3:1 ratio) of GGS credits.

MM BIO-2 Prior to construction, Caltrans will purchase GGS mitigation bank credits from a USFWS- and CDFW-approved GGS mitigation bank and will be purchased prior to the habitat impacts. Caltrans will provide a bill of sale acceptable to and approved by USFWS and CDFW before construction begins. Caltrans will purchase at 3:1 ratio of GGS credits.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on GGS. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on GGS.

4.3.5. Western Pond Turtle

Western pond turtle is designated an SSC by CDFW. This species is found in a wide range of aquatic habitats with emergent structure for basking and feeding. Western pond turtles also use adjacent upland sites for nesting, often travelling great distances over land to reach suitable nesting sites.

Survey Results

Aquatic habitat for western pond turtle is present in Putah Creek, the vegetated ditches, and canals identified throughout the BSA. Suitable nesting, upland, and basking habitats (e.g., open banks, exposed logs, rocks) for the species were also identified within the BSA within or immediately adjacent to these features. The most recent CNDDB documented occurrence is from 2001 approximately 0.25 mile north of the BSA, recording 76 individuals, with one hatchling and eight juveniles captured between 1996 to 2001 in a disturbed portion of the UC Davis Arboretum Waterway.

Project Impacts

Installation of the fiber optic line at Putah Creek has the potential to temporarily impact aquatic and upland habitat for western pond turtle. Impacts would result from temporary habitat loss, noise disturbance, increase in hazardous materials, and potential introduction of invasive plant species by construction equipment. All alternatives would result in the same impacts to western pond turtle.

Avoidance and Minimization Efforts

In addition to the standard measures provided in Section 1.4, the following measures (AMM BIO-18 and AMM BIO-19) shall be implemented to avoid or minimize the potential for impacts on western pond turtle.

AMM BIO-18 If western pond turtles are encountered within the BSA during construction, work activity in the immediate vicinity will cease until any turtles have left the work area.

AMM BIO-19 Prior to initiation of construction activities, workers shall participate in environmental awareness training provided by a qualified biologist. The training shall instruct workers regarding: (1) how to identify the turtle; (2) the habitats used by the turtle; (3) the potential for turtle egg clutches (i.e., nest sites) to be discovered during vegetation clearing; and (4) what to do if a turtle or suspected egg clutch is encountered during construction activities.

Compensatory Mitigation

None required.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on western pond turtle. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on western pond turtle.

4.3.6. Tricolored Blackbird and Yellow-Headed Blackbird

Tricolored blackbird is listed as ST, and yellow-headed blackbird is designated as SSC by CDFW. Both species are colonial nesters, with tricolored blackbirds forming the largest colonies of any North American passerine bird. Thousands of birds may occur at a single site. Breeding for both species typically occurs from mid-April through July with nests built in dense vegetation such as cattails (*Typha* sp.), tules (*Scirpus* sp.), willow thickets, and blackberry (*Rubus* sp.). The average clutch size is three to four 4 eggs, and two clutches may be produced per year. Yellow-headed blackbird typically forages on insects, spiders, and seeds. Tricolored blackbirds forage on insects, cultivated grains, seeds, and fruits, depending on the season (Beedy and Hamilton 1999).

Survey Results

Alluvion Biological Consulting performed habitat assessment surveys on January 5 and 7, 2021, to identify potential tricolored blackbird nesting habitat within 500 feet of the BSA. Subsequent surveys of additional BSA segments were performed by Stantec on July 7, 2022. A total of 498.7 acres of potentially suitable habitat for tricolored blackbird is present within 500 feet of the BSA (Appendix G). Potentially suitable habitat was identified as lands that are planted in alfalfa, natural or semi-natural lands (e.g., grassland, ruderal/grassland, willow scrub, emergent marsh) on larger parcels (generally greater than approximately 20 acres) that border other open lands. The most suitable nesting habitat identified during the assessment is the patch of willows, labeled as valley foothill riparian at the northwest corner of the Kidwell Road Interchange at the western end of the BSA. No tricolored blackbirds or yellow-headed blackbirds were observed during the surveys. The most recent CNDDB documented occurrence of tricolored blackbird is from 2014, approximately 5 miles south of the BSA in the Yolo Bypass, recording approximately 100 individuals within a nesting colony. There are no CNDDB occurrences of yellow-headed blackbird within 5 miles of the BSA. All alternatives would result in the same potential impacts on tricolored blackbird and yellow-headed blackbird.

Project Impacts

Nesting habitat identified for both species within and adjacent to the BSA is minimal and in small, isolated patches. Both species typically nest in more extensive patches of vegetation. With limited habitat available, the likelihood of either species nesting with or adjacent to the BSA is low. However, if nesting tricolored blackbird or yellow-headed blackbird are present within or adjacent to construction areas, they could be disturbed and abandon their nests.

Avoidance and Minimization Efforts

AMM BIO-20 Pre-construction surveys for tricolored blackbird and yellow-headed blackbird will be conducted prior to any ground-disturbing activities within 500-feet of mapped potentially suitable habitat. Pre-construction surveys will be conducted in mid-March, mid-April, mid-May, and mid-June given that the dates of nesting in Northern California are not consistent from year to year and the species may nest twice in the same nesting season at the same or different locations. The recommendation of a survey every 30 days during the nesting season is based on the potential length of the nesting season in the Sacramento Valley (i.e., mid-March to mid-July) and total time required for incubation and fledging (i.e., 21 to 25 days). Note that the full complement of four survey visits can be reduced accordingly if work starts after mid-March and surveys can be avoided entirely if work starts between August 1 and March 1 (outside the nesting season). If a nest is found, avoidance measures will be implemented (Standard Measure BR-2, Section 1.4).

Compensatory Mitigation

None required.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on tricolored blackbird and yellow-headed blackbird. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on tricolored blackbird and yellow-headed blackbird.

4.3.7. Western Yellow-Billed Cuckoo and Least Bell's Vireo

Western yellow-billed cuckoo is listed as FT and SE. It is a migratory bird wintering in South America. Within California, breeding populations are rare and scattered through the state, with the closest breeding habitat along the Sacramento River, approximately 40 miles north of the BSA. Western yellow-billed cuckoo breeds in dense wooded riparian habitat, typically large, contiguous areas of undisturbed habitat (79 FR 59991 60038).

Least Bell's vireo is listed as FE under the ESA, and SE under CESA. It is a migratory bird wintering in southern Baja California. Within California, breeding populations are mostly in the southern portion of the state with a small breeding habitat in the Yolo Bypass, approximately 3.5 miles south of the BSA. Least Bell's vireo is known to nest in riparian woodlands dominated by willow and Fremont's cottonwood. Suitable willow woodlands are typically dense with well-defined vegetative strata or layers. The most critical structural component of nesting habitat in California is a dense shrub layer 2 to 10 feet above the ground. Ideal Least Bell's vireo nesting habitat consist of a riparian corridor at least 800 feet wide. Individuals may forage in adjacent scrub or chaparral habitat, and during winter they utilize scrub vegetation adjacent to watercourses or riparian gallery forests along the west coast of northern and Central Mexico. Foraging typically takes place within riparian habitat, but may also extend into adjacent upland vegetation, elderberry in particular, may be important food sources for the species (USFWS 1998).

Survey Results

Based on the reconnaissance-level survey efforts, the riparian habitats present within the BSA may provide potential foraging and migratory stopover habitat for western yellow-billed cuckoo and least Bell's vireo. Below is a summary of the survey findings and CNDDB occurrence records for each species.

- The BSA is not within the current breeding range of western yellow-billed cuckoo, and the species is unlikely to breed in the vicinity. However, there is a CNDDB-recorded occurrence that documents observances made in September 2012 and August 2013 along Putah Creek less than two miles west of the BSA. Western yellow-billed cuckoo could utilize the riparian habitat surrounding Putah Creek, Sacramento River, and portions of the Yolo Bypass within and adjacent to the BSA as migratory stopover habitat.

- The BSA is within the current breeding range of least Bell's vireo. However, specific habitat requirements for breeding are not present within the riparian habitat identified within the BSA since the riparian areas lack the vegetative

density and cover required by the species for nesting; however, the riparian habitat within the BSA may serve as foraging habitat for the species. The most recent CNDDB documented occurrence is from 2011 approximately 3.5 miles south of the BSA in the Yolo Bypass Wildlife Area, recording a nesting pair in undisturbed riparian scrub habitat. Least Bell's vireo may utilize the riparian habitat within and adjacent to the BSA as migratory stopover or foraging habitat.

Project Impacts

The suitable migratory stopover and foraging habitat (i.e., riparian vegetation) for western yellow-billed cuckoo and least Bell's vireo is located within the existing Caltrans right-of-way where there are frequent anthropogenic disturbances from vehicles. The riparian vegetation within these areas would not be removed, and the activities proposed in the staging areas would be similar to those already occurring in the area (e.g., high volumes of traffic and other disturbances associated with the highway). Therefore, there will be no impact on western yellow-billed cuckoo or least Bell's vireo.

Avoidance and Minimization Efforts

None.

Compensatory Mitigation

None required.

Cumulative Impacts

The project would not result in cumulatively considerable impacts on western yellow-billed cuckoo or least Bell's vireo.

4.3.8. Burrowing Owl

Burrowing owl is designated an SSC by CDFW. It is a year-round resident typically wintering in the same locations as their breeding territory. The species nests in dry grassland, desert, and ruderal habitats. They often nest on the banks of canals and levees. They inhabit small mammal burrows or other suitable underground cavities for nesting. Breeding typically takes place from March to August. The BSA occurs within the range of burrowing owl. There are five CNDDB occurrences within approximately 500 feet of the BSA.

Survey Results

Protocol-level burrowing owl surveys were performed by Stantec on February 10, April 16, May 13 and 20, June 3, 2021, and January 13, 20–21, and 25, 2022. The survey efforts identified grassland and ruderal areas within 150 meters of the BSA that provide suitable nesting and foraging habitat for burrowing owl. Approximately 10.3 acres of suitable habitat and 0.3 acre of concentrated burrows where burrowing owl have the potential to nest were identified and mapped during the surveys (Appendix I). No burrowing owls were observed during the surveys.

Project Impacts

None of the potential burrowing owl habitat identified is located within the permanent construction footprint and approximately 0.03 acre of concentrated burrows is located within the staging area adjacent to Kidwell Road at the west end of the BSA. However, if burrowing owls are present within the 500-foot buffer during construction activities, the project could result in temporary displacement due to project activities affecting potential burrow sites. Although no burrowing owl were observed during the 2021 nesting season, burrowing owl have a potential to nest in the areas mapped as suitable habitat and concentrated burrows, as well as other areas, depending on site conditions, in the future. All alternatives would result in the same potential impacts on burrowing owl.

Avoidance and Minimization Efforts

AMM BIO-21 A minimum of one pre-construction survey for occupied burrowing owl burrows within 500 feet of the BSA in suitable habitat (e.g., grasslands) will be conducted by a qualified biologist within 15 days prior to the initiation of construction activities, regardless of the timing of construction. If any occupied burrows are identified, appropriate conservation measures (as determined by a qualified biologist) will be implemented. No disturbance will occur within 150 feet of occupied burrows during the non-breeding season (September 1–January 31) or within 250 feet during the breeding season (February 1–August 31). These measures may also include establishing a construction-free buffer zone around the active nest site in coordination with the CDFW, biological monitoring of the active nest site, and delaying construction activities in the vicinity of the active nest site until the young have fledged.

AMM BIO-22 If burrowing owls are detected within the BSA during the non-breeding season and maintaining a 150-foot no-disturbance buffer is not practicable, a

qualified biologist will submit an exclusion plan to CDFW. The exclusion plan will generally follow the guidelines outlined in Appendix E of the Staff Report on Burrowing Owl Mitigation (CDFG 2012). The exclusion plan will consist of installing one-way doors in potential burrows, daily monitoring, and collapsing burrows once it is determined that the burrows are unoccupied. Exclusion may only take place during the non-breeding season (September 1 to January 31) and may be an ongoing effort during this time period. This will allow the owls to exit burrows if they are present, but not return.

AMM BIO-23 If occupied burrows are detected during the breeding season and maintaining a 250-foot no-disturbance buffer is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for disturbance to occupied burrows and nesting activities. Measures may include, but are not limited to, continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest for parental care or survival, or the construction is complete. No direct disturbance of burrows with eggs or young can be conducted without written authorization from the CDFW.

Compensatory Mitigation

None required.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on western burrowing owl. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on western burrowing owl.

4.3.9. Swainson's Hawk

Swainson's hawk is listed as ST under CESA. Swainson's hawk nest in stands with few trees in juniper-sage flats, riparian areas, oak savannah, and open agricultural habitats. They require adjacent open fields for foraging including livestock pastures, grasslands, alfalfa, or grain fields. According to a study performed by Estep (2009) regarding the suitability of vegetation structure on Swainson's hawk foraging habitat, different habitats offer either high, moderate, or low suitability for Swainson's hawk foraging. Their preferred prey are voles

(*Microtus* sp.), pocket gophers (*Thomomys bottae*), birds, and insects such as grasshoppers (*Caelifera* sp.) (Estep 1989). Swainson's hawks are migratory and typically begin arriving in their breeding territory in the Central Valley in early March to April and immediately begin reconstructing previously used nests or constructing new ones (Estep 2009). They typically begin their southerly migration in early August to mid-September (Estep 2009). The BSA occurs within the current range of Swainson's hawk.

Survey Results

Protocol-level Swainson's hawk surveys were performed by Stantec on January 12, February 17, March 22–26 and 29, and April 5–9 and 12, 2021. The surveys identified 132 potential nests that Swainson's hawk and other raptor species (e.g., white-tailed kite) could use for nesting and 24 active Swainson's hawk nests within 0.5 mile of the BSA (Appendix H). A total of seven observations of overwintering Swainson's hawk were made during the January 12 and February 17, 2021, surveys. During the March and April 2021 surveys, 194 Swainson's hawk observations were made during the protocol-level surveys. Suitable nesting and foraging habitat is present for Swainson's hawk throughout the BSA. The survey efforts identified Fremont cottonwoods, valley oaks, and other tall trees within and immediately adjacent to the BSA that provide suitable nest trees for Swainson's hawk and white-tailed kite. The annual grassland, agriculture, and ruderal habitat within the BSA provides potential foraging habitat for both species. The wetland, agriculture, and annual grassland habitats within the BSA provide potential nesting and foraging habitats for northern harrier.

Project Impacts

The project could result in a temporary and permanent loss of foraging habitat and displacement due to project activities affecting potential nesting sites. Direct disturbance from construction activities, such as pile driving, operation of vehicles, heavy equipment operation, and earth-moving operations around active nests could result in stress, injury, or mortality to individuals. The project would have temporary impacts on foraging habitat through the staging of equipment, temporary construction access, and other construction activities. Permanent loss of foraging habitat would result from the proposed Park and Ride, proposed bike path improvements, connector ramp, and other road widening. A total of approximately 10.0 acres of Swainson's hawk foraging habitat consisting of grassland and croplands (hayfield) would be permanently lost. Based on current project designs and the survey results presented in Appendix H, no trees with active Swainson's hawk nests have been slated for removal. All alternatives would result in the same potential impacts on Swainson's hawk.

Avoidance and Minimization Efforts

AMM BIO-24 If construction is to occur between February 1 and August 31, a qualified biologist will conduct pre-construction surveys for nesting Swainson's hawk. The pre-construction surveys will include the project footprint and a 0.5-mile buffer for Swainson's hawk. The survey will be conducted no more than 15 days prior to the initiation of construction to avoid disturbance to active nests.

AMM BIO-25 If a no-disturbance buffer around an active Swainson's hawk nest is not practicable, CDFW will be consulted to determine alternative measures to minimize the potential for project-related disturbance to the nest site that could result in nest abandonment or other forms of take. Measures may include, but are not limited to, continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest or parental care for survival, or the construction is complete. If the nesting pair shows signs of distress (i.e., adults leaving the nest when eggs or young chicks are present) as a result of project-related activities, the monitoring biologist will have authority to stop work until it is determined that the adults have returned and are no longer showing signs of distress.

Compensatory Mitigation

Compensatory mitigation for the removal of approximately 10.0 acres of moderate-quality foraging habitat for Swainson's hawk is not recommended given the habitat is located in areas with high levels of anthropogenic disturbances within and near the Caltrans right-of-way and the abundance of foraging and nesting habitat in the vicinity of the BSA.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on nesting Swainson's hawk. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on nesting Swainson's hawk.

4.3.10 White-Tailed Kite and Northern Harrier

White-Tailed Kite

White tailed kite is listed as FP by CDFW. They typically nest in dense stands of tall shrubs and trees located adjacent to foraging habitat (i.e., undisturbed open grasslands, meadows, farmlands, and emergent wetlands) and are seldom observed more than 0.5 mile from an active nest during the breeding season (Zeiner, et al., 1990). The BSA occurs within the range of white-tailed kite.

Northern Harrier

Northern harrier is designated an SSC by CDFW. They nest on the ground and forages in and near wet habitats such as freshwater marsh, wet meadows, grasslands, lightly grazed pastures, some croplands, and weedy borders of lakes, rivers, and streams (Zeiner, et al., 1990). The BSA occurs within the range of northern harrier.

Survey Results

During protocol Swainson's hawk surveys, white-tailed kite and northern harrier were both observed throughout the BSA and Swainson's hawk survey study area (i.e., 0.5-mile buffer around the BSA). However, no active nests for white-tailed kite or northern harrier were identified during the surveys.

Project Impacts

The project could result in a temporary and permanent loss of foraging habitat and displacement due to project activities affecting potential nesting sites. Direct disturbance from construction activities, such as pile driving, operation of vehicles, heavy equipment operation, and earth-moving operations around active nests could result in stress, injury, or mortality to individuals. The project would have temporary impacts on foraging habitat through the staging of equipment, temporary construction access, and other construction activities. All alternatives would result in the same potential impacts on white-tailed kite and northern harrier.

Avoidance and Minimization Efforts

In addition to the standard measures provided in Section 1.4 and AMM BIO-24 (above), the following measures will be implemented to avoid or minimize the potential for adverse impacts on white-tailed kite and northern harrier.

AMM BIO-26 If an active white-tailed kite nest is observed, CDFW will be consulted to determine measures to minimize the potential for project-related disturbance to the nest site that could result in nest abandonment or other forms of take. Measures may include, but are not limited to, continuous biological monitoring by a qualified biologist until it has been determined that the young have fledged and are no longer reliant on the nest or parental care for survival, or the construction is complete. If the nesting pair shows signs of distress (i.e., adults leaving the nest when eggs or young chicks are present) as a result of project-related activities, the monitoring biologist shall have authority to stop work until it is determined that the adults have returned and are no longer showing signs of distress.

AMM BIO-27 If consultation with CDFW results in a determination that take of a white-tailed kite nest may not be avoidable, then all activities that are likely to result in such take will be delayed until a qualified biologist has determined that the young have fledged and are no longer reliant on the nest or parental care for survival. Because white-tailed kite is a fully protected species, CDFW is not able to provide an Incidental Take Permit.

Compensatory Mitigation

None required.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on nesting white-tailed kite and northern harrier. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on nesting white-tailed kite and northern harrier.

4.3.11. Other Special Status and Migratory Birds and Raptors

Grasshopper sparrow is designated an SSC by CDFW. They nest in dense grasslands with thick cover of grasses and forbs. Nests are built in a slight depression in the ground hidden at the base of overhanging vegetation for concealment. Grasshopper sparrow also requires a mix of taller vegetation for singing perches. Breeding season is typically from early April to July (Zeiner, et al., 1990).

Song sparrow (Modesto population) is designated an SSC by CDFW. They reside year-round in the Sacramento Valley, Sacramento-San Joaquin Delta, and northern San Joaquin Valley. They nest in emergent freshwater marshes and riparian forests, along vegetated irrigation canals and levees, and in recently planted valley oak restoration sites. Breeding season is typically from early April to July (Zeiner, et al., 1990).

Mountain plover is designated an SSC by CDFW. They winter in California's Central Valley from Sutter and Yuba Counties southward. The BSA is within the winter range (September–March) for the species. Mountain plover prefers habitats with open grassland, plowed fields with little vegetation, and open sagebrush areas (Zeiner, et al., 1990).

Purple martin is designated an SSC by CDFW. Their current breeding range within California includes the coastal mountains, Sierra Nevada Mountains, Cascades, and two locations in the Central Valley. The Yolo and Sacramento portions of the BSA are located within one of these breeding ranges. Purple martin is a migratory bird typically arriving in their breeding range from South America in late March and departing by late September. They typically nest in old woodpecker cavities and human-made structures such as nesting boxes, under bridges, and culverts. Nests are typically located in open forest or woodland; and foraging occurs over riparian areas and woodland habitats. Breeding season is typically from early April to August (Zeiner, et al., 1990).

In addition to the special status species, a variety of other migratory birds and raptors protected under the MBTA and Fish and Game Code have potential to occur within the BSA during the typical avian breeding season (e.g., February to August/September).

Survey Results

Based on the reconnaissance-level habitat assessment surveys the grasslands, shrubs, trees, and structures present throughout the BSA provide potential nesting and foraging habitat for special status and migratory birds and raptors, such as: grasshopper sparrow, mountain plover, purple martin, song sparrow, red-tailed hawk, red-shouldered hawk, and other birds and raptors protected under the MBTA and Fish and Game Code. The following provides a summary of the potential habitat identified within the BSA for the other special status bird species that have potential to occur (i.e., grasshopper sparrow, song sparrow (Modesto population), mountain plover, purple martin) and a summary of the CNDDB occurrences.

- The BSA contains suitable breeding habitat for grasshopper sparrow within grassland habitat. There are no CNDDB occurrences within 5 miles of the BSA.

- The BSA contains suitable habitat for song sparrow (Modesto population) within the fresh emergent wetlands and riparian habitats within and adjacent to the Yolo Bypass, Sacramento River, Putah Creek, and agricultural areas. There is a CNDDB-recorded occurrence from 2013, approximately 3.5 miles south of the BSA within the Yolo Bypass.
- The BSA contains suitable wintering habitat for mountain plover within plowed fields and grassland habitat. There are no CNDDB occurrences within 5 miles of the BSA.
- The BSA contains suitable habitat for purple martin within tree cavities, bridges, and culverts. The most recent CNDDB-recorded occurrence is from 2003, with 29 pairs observed nesting in weep holes under I-5 and street overpasses within one mile of the BSA.

Project Impacts

Construction activities (e.g., vegetation removal, bridge and road construction, earth-moving, equipment noise) may be scheduled during the nesting season (i.e., February 1 to September 31, depending on the species) and could disturb nesting birds in or adjacent to the BSA. Construction-related disturbance could result in the incidental loss of fertile eggs or nestlings or nest abandonment, which could affect local or regional populations of affected birds. Impacts on nesting birds could result from the following:

- Tree and shrub removal, which would be necessary to accommodate the construction of road widening
- Ground-disturbing activities (e.g., grubbing and grading) in annual grasslands that could affect ground-nesting birds (e.g., killdeer [*Charadrius vociferous*] and western meadowlark [*Sturnella neglecta*])
- Noise from construction activities
- Construction activities near the existing bridges that could disturb or remove active cliff swallow (*Petrochelidon pyrrhonota*) or purple martin nests if they are present

All alternatives would result in the same potential impacts on special status and migratory birds and raptors.

Avoidance and Minimization Efforts

Implementation of Standard Measure BR-2 in Section 1.4 will minimize the potential for adverse impacts on other special status and migratory birds and raptors. No other avoidance and minimization measures are required.

Compensatory Mitigation

None required.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on special status and migratory birds and raptors including grasshopper sparrow, song sparrow (Modesto population), mountain plover, purple martin, and other birds and raptors protected under the MBTA and Fish and Game Code within the BSA. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on special status and migratory birds and raptors.

4.3.12. Special Status Bat Species

Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*), and western red bat (*Lasiurus blossevillii*) are all designated an SSC by CDFW. Bat species may roost individually or in small groups in tree cavities, rock crevices, riparian vegetation, or man-made structures (e.g., bridges). Townsend's big-eared bat and pallid bat typically roost in cavities such as caves, tree basal hollows, mines, tunnels, buildings, bridges, or other human-made structures (Zeiner, et al., 1990). Pallid bat typically roost in rocky outcrops, cliffs, large-diameter live and snag trees, and spacious crevices with access to open habitats for foraging. Pallid bats may also roost in caves, mines, bridges, barns, porches, tree crevice roosts, and bat boxes, and even on the ground in stone piles, debris piles, baseboards, and rocks (Zeiner, et al., 1990). Western red bats typically roost in dense riparian tree foliage (Zeiner, et al., 1990). Although not a special status species, Mexican free-tailed bat (*Tadarida brasiliensis*) is a species of local importance to the public and communities within/near the BSA (i.e., will need to be considered as part of the environmental evaluation under CEQA). Mexican free-tailed bats commonly roost in caves and rock crevices on cliff faces. They will also roost in abandoned mines and tunnels, highway bridges and large culverts, buildings, and bat houses.

Survey Results

Surveys were performed by SBI on December 18, 21, and 22, 2020, and July 23, 2022, to identify suitable roosting habitat for special status bats within the BSA. Foliage roost habitat for western red bat and man-made structures (i.e., bridges, culverts) that contain suitable roosting habitat for Townsend's big-eared bat and pallid bat are present within the BSA. The BSA contains trees, specifically within the riparian areas along the Sacramento River, Putah Creek, and South Fork Putah Creek that may contain suitable roosting habitat (e.g., cavities, exfoliating bark) for bats. In addition, the existing bridge over the Yolo Bypass contains one of the largest maternal colonies of Mexican free-tailed bats in the state of California, which is well known by the residences and non-governmental agencies in the region. The most recent CNDDB-recorded occurrence of pallid bat is from 1964 one mile north of the BSA in Davis. There are no CNDDB occurrences of western red bat within 5 miles of the BSA. A report summarizing the potential roosting habitat for the bat species which may occur within the BSA is provided in Appendix F.

Project Impacts

The project will involve replacing culverts which has the potential to remove a large portion of bat roosting habitat. In addition, trees that provide roosting habitat for individual bats are slated for removal. If culvert work or tree removal takes place during the reproductive season (early May to late August), there is a potential for direct mortality of young bats to occur. Bats typically give birth to young in May but form maternity colonies as early as March. Permanent impacts could occur from bat mortality resulting from the removal of maternity roost habitat. No construction would occur on the existing bridge over the Yolo Bypass, therefore the maternity colony that roosts under the bridge would not be directly impacted. Temporary impacts on bats would result from construction-related noise, lights during night work, and vibration disturbance to bats roosting adjacent to active construction. These impacts have the potential to impact the bats by disturbing their behavior, growth, reproduction, or survival. All alternatives would result in the same potential impacts on special status bat species.

Avoidance and Minimization Efforts

In addition to the standard measures provided in Section 1.4, the following measures will be implemented to avoid or minimize the potential for adverse effects on Townsend's big-eared bat, pallid bat, western red bat, and other bat species. To the extent practicable, the tree roosting habitat identified in Appendix F would be removed during the fall preceding construction in order to avoid affecting maternal colonies. If removal during this time period is not practicable, the following measures will be implemented:

AMM BIO-28 To the extent practicable, removal of large trees with cavities shall occur before maternity colonies form (i.e., prior to March 1) or after young are volant (i.e., after August 31).

AMM BIO-29 If construction (including the removal of large trees) occurs during the non-volant season (March 1 through August 31), a qualified biologist shall conduct a pre-construction survey of affected portions of the BSA for maternity colonies. The pre-construction survey will be performed no more than 14 days prior to the implementation of construction activities (including staging and equipment access). If a lapse in construction activities for 14 days or longer occurs between those dates, another pre-construction survey will be performed. If any maternity colonies are detected, appropriate conservation measures (as determined by a qualified biologist) will be implemented. These measures may include, but are not limited to, establishing a construction-free buffer zone around the maternity colony site, biological monitoring of the maternity colony, and delaying construction activities in the vicinity of the maternity site.

AMM BIO-30 A bat species protection survey plan will be developed. The plan will include items such as having a qualified biologist present on-site to conduct monitoring during construction in/near bat roosting habitat.

AMM BIO-31 To the greatest extent practicable, structural changes may be made to any known roost proposed for removal (determined by pre-construction surveys) to create conditions in the roost that are undesirable to roosting bats and encourage them to leave on their own (e.g., open additional portals so that temperature, wind, light, and precipitation regime in the roost change). Structural changes to the roost would be performed during the appropriate exclusion timing (listed above) to avoid harming bats.

AMM BIO-32 To the greatest extent practicable, trees would be removed in pieces rather than felling entire trees. It is recommended that removal be done late in the day or in the evening to reduce the likelihood of evicted bats falling prey to diurnal predators, and that it take place during warm weather conditions conducive to bat activity.

Compensatory Mitigation

None required.

Cumulative Impacts

Other road improvement projects may be undertaken by Caltrans in the future. These projects have the potential to result in cumulative impacts on special status bat species or Mexican free-tailed bats. Caltrans would be expected to implement similar measures as those described above to avoid direct impacts on individuals and protect habitat for roosting bats to the extent practicable. With implementation of the avoidance and minimization measures identified above, the project would not result in cumulatively considerable impacts on special status bat species or Mexican free-tailed bats.

CHAPTER 5. CONCLUSIONS AND REGULATORY DETERMINATIONS

5.1.Federal Endangered Species Act Consultation

A USFWS species list was acquired on March 27, 2023, from the Sacramento Fish and Wildlife Office (Appendix A). A BA was prepared for the project and concluded that the project may affect, and is likely to adversely affect, GGS and VELB. The BA also includes proposed avoidance and minimization measures. Caltrans will submit the BA to the USFWS to initiate consultation under Section 7 of the ESA.

The project would have no effect on Colusa grass, Keck's checkerbloom, Crampton's tuctoria, western yellow-billed cuckoo, least Bell's vireo, western snowy plover, California red-legged frog, California tiger salamander, Delta smelt, green sturgeon, Central Valley DPS steelhead, Chinook salmon- Central Valley spring-run ESU, Chinook salmon- Sacramento River winter-run ESU, conservancy fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Delta green ground beetle, and least Bell's vireo. Designated critical habitat for Delta smelt, green sturgeon, Central Valley DPS steelhead, Chinook salmon- Central Valley spring-run ESU, Chinook salmon- Sacramento River winter-run ESU occurs within the BSA, but it would not be affected by the project.

5.2.Essential Fish Habitat Consultation

EFH for Chinook salmon occurs within the BSA. However, the project does not involve work within or adjacent to EFH. No EFH would be affected by the project. No MSA consultation with the NMFS is anticipated to be required.

5.3.Wetlands and Other Waters Coordination

The project would comply with terms of Nationwide Permit No. 14 for Linear Transportation Projects. Permanent impacts on aquatic resources would be less than 0.1 acre. A preconstruction notification will be required due to the discharge of fill into a riparian wetland (special aquatic site). The aquatic resources report has not yet been submitted to Corps or RWQCB for verification, therefore, the delineation results are considered preliminary until verified. Caltrans should submit the delineation to the Corps for verification prior to submittal to the RWQCB. Project authorization under the CWA requires that Section 401 Water Quality Certification be obtained from the RWQCB. The RWQCB would also

need to authorize impacts for features subject to the Porter-Cologne Act. Table 14 shows the estimated impacts on aquatic resources.

Table 14. Summary of Impacts on Aquatic Resources

Feature ID	Water Feature	Acres		Linear Feet	
		Alt 2a-7a	Alt 2b-7b	Alt 2a-7a	Alt 2b-7b
PERMANENT IMPACTS					
Other Waters					
31	Canal		0.033		62.41
33	Ephemeral Drainage	0.022	0.022	315.57	315.57
	Total Permanent Impacts	**0.022**	**0.055**	**315.57**	**377.98**
TEMPORARY IMPACTS					
Wetlands					
07	Woody Riparian Wetland	0.002	0.002	n/a	n/a
Other Waters					
06	Perennial Drainage	0.005	0.005	12.67	12.67
04	Canal	<0.001	<0.001	3.03	3.03
31	Canal	0.028	0.028	42.59	42.59
46	Pond	0.084	0.084	n/a	n/a
	Total Temporary Impacts	**0.12**	**0.12**	**58.29**	**58.29**

5.4.Migratory Bird Treaty Act

With implementation of the standard measures provided in Section 1.4 and the measures identified in Chapter 4 to avoid impacts on nesting migratory birds, the project would comply with the MBTA and not adversely affect migratory birds.

5.5.California Endangered Species Act Consultation

The project has the potential to adversely affect GGS. CESA consultation with the CDFW is required for this species. If consultation with CDFW results in a determination that take of an active Swainson's hawk nest may not be avoidable, then an Incidental Take Permit pursuant to CESA will be obtained from CDFW prior to initiation of any activities that are likely to result in such take.

5.6.California Fish and Game Code

The project would involve work within Putah Creek, a perennial stream. Prior to any activities that would obstruct the flow of, or alter the bed, channel, or bank of any streams, Caltrans will provide notification of streambed alteration to the CDFW. If required by the CDFW, Caltrans will obtain a streambed alteration agreement and will implement all conditions of the agreement.

During construction, it may be necessary to relocate aquatic animals considered SSC, including western pond turtle. Per CDFW guidelines, the relocation of SSC or other animals for movement "out of harm's way" is permitted via a letter from the CDFW regional office.

The proposed project would comply with other sections of the Fish and Game Code (i.e., birds of prey, migratory birds, fully protected species) with implementation of standard measures and avoidance and minimization measures.

5.7.Invasive Species

Implementation of Standard Measure BR-3—Prevention of Spread of Invasive Species (Section 1.4)—would avoid or minimize the potential for the spread of invasive species, as required by Executive Order 13112.

5.8.Floodplain Management

The proposed project would maintain floodway conveyance within the BSA. Therefore, the project complies with Executive Order 11988.

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Appendix A USFWS and NMFS 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:
Project Code: 2023-0006346
Project Name: Yolo 80 Corridor Improvement Project

March 27, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location 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, 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.*).

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

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

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 Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Note: IPaC has provided all available attachments because this project is in multiple field office jurisdictions.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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

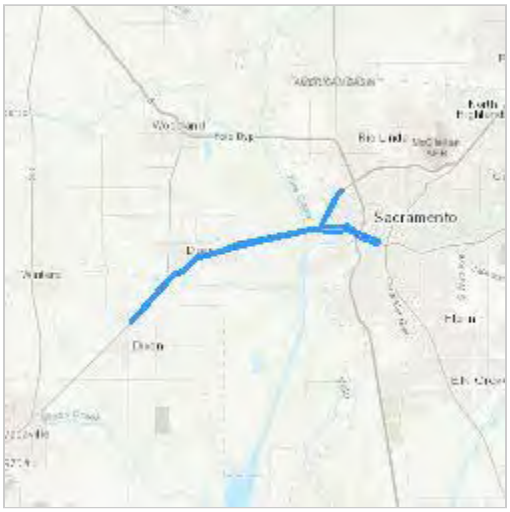
This project's location is within the jurisdiction of multiple offices. However, only one species list document will be provided for all offices. The species and critical habitats in this document reflect the aggregation of those that fall in each of the affiliated office's jurisdiction. Other offices affiliated with the project:

San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

PROJECT SUMMARY

Project Code: 2023-0006346
Project Name: Yolo 80 Corridor Improvement Project
Project Type: Road/Hwy - Maintenance/Modification
Project Description: The purpose of the project is to relieve traffic congestion on the I-80 and US-50 corridors in Solano, Yolo, and Sacramento Counties. The project will involve widening the road in some areas, adding a new bike path across the Yolo Bypass, and realigning ramps associated with road widening.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.5482996,-121.7146110685155,14z



Counties: Sacramento, Solano, and Yolo counties, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 12 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 Fisheries[1], 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.

BIRDS

NAME	STATUS
Least Bell's Vireo *Vireo bellii pusillus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5945	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

REPTILES

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

AMPHIBIANS

NAME	STATUS
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

FISHES

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Longfin Smelt *Spirinchus thaleichthys* Population: San Francisco Bay-Delta DPS No critical habitat has been designated for this species.	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7850	Threatened

CRUSTACEANS

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

CRITICAL HABITATS

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

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

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird *Selasphorus sasin* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31

NAME	BREEDING SEASON
Belding's Savannah Sparrow *Passerculus sandwichensis beldingi* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Black Swift *Cypseloides niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Black Tern *Chlidonias niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3093	Breeds May 15 to Aug 20
Black-chinned Sparrow *Spizella atrogularis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9447	Breeds Apr 15 to Jul 31
Bullock's Oriole *Icterus bullockii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 21 to Jul 25
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
California Thrasher *Toxostoma redivivum* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Cassin's Finch *Carpodacus cassinii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Common Yellowthroat *Geothlypis trichas sinuosa* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch *Carduelis lawrencei* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Long-eared Owl *asio otus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Mountain Plover *Charadrius montanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3638	Breeds elsewhere
Nuttall's Woodpecker *Picoides nuttallii* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20
Oak Titmouse *Baeolophus inornatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9656	Breeds Mar 15 to Jul 15
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Tricolored Blackbird *Agelaius tricolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3910	Breeds Mar 15 to Aug 10

NAME	BREEDING SEASON
Western Grebe *aechmophorus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit *Chamaea fasciata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10
Yellow-billed Magpie *Pica nuttalli* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9726	Breeds Apr 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

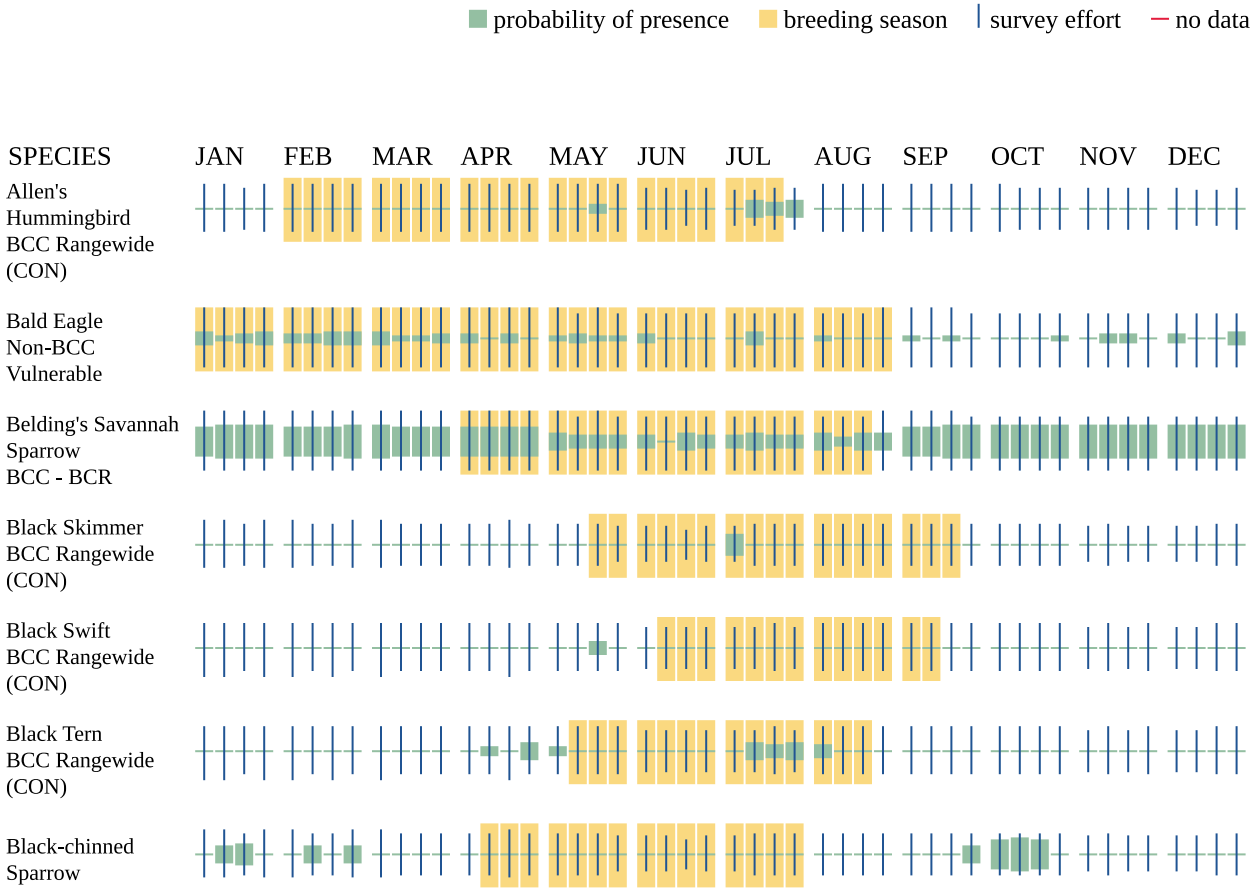
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

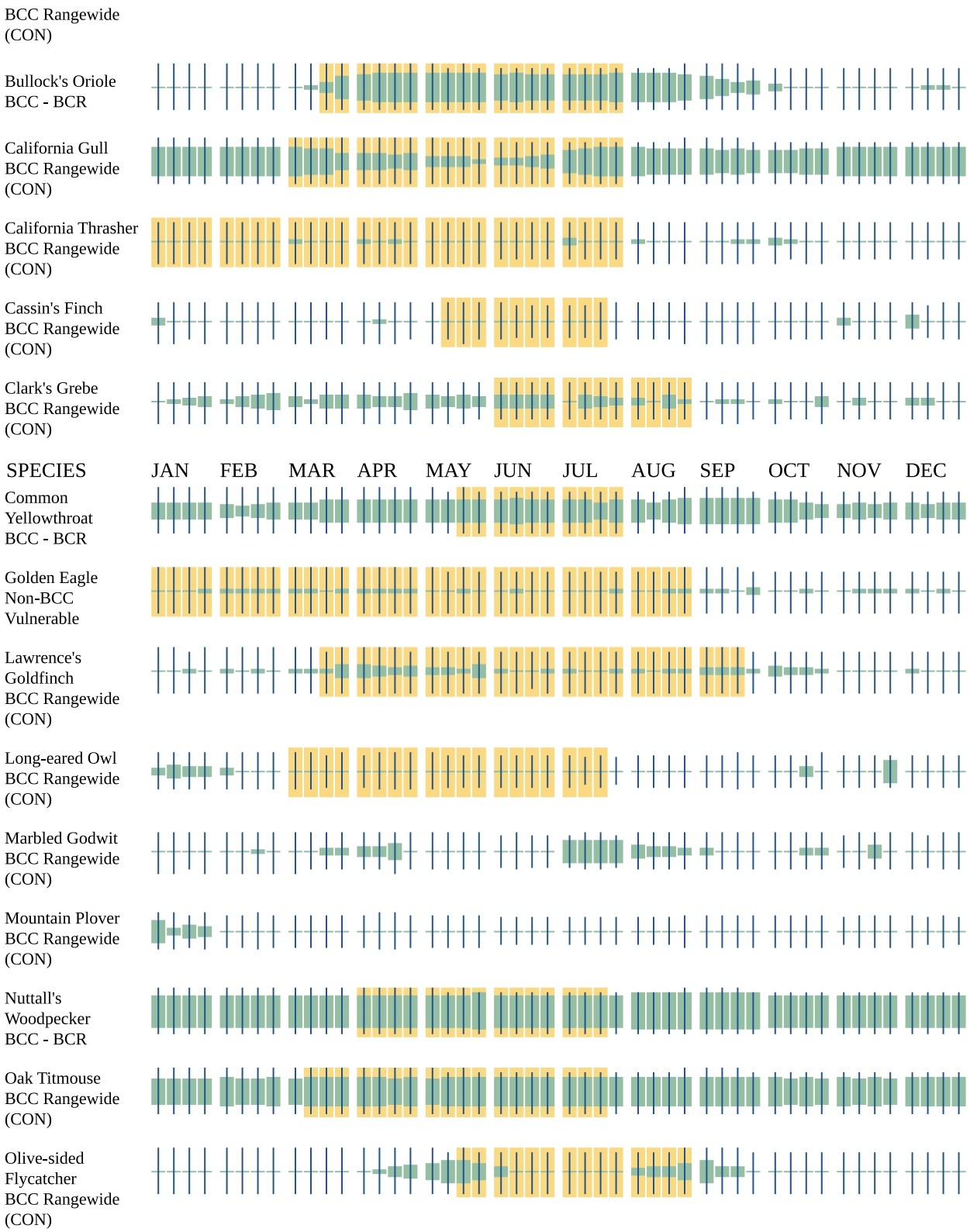
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

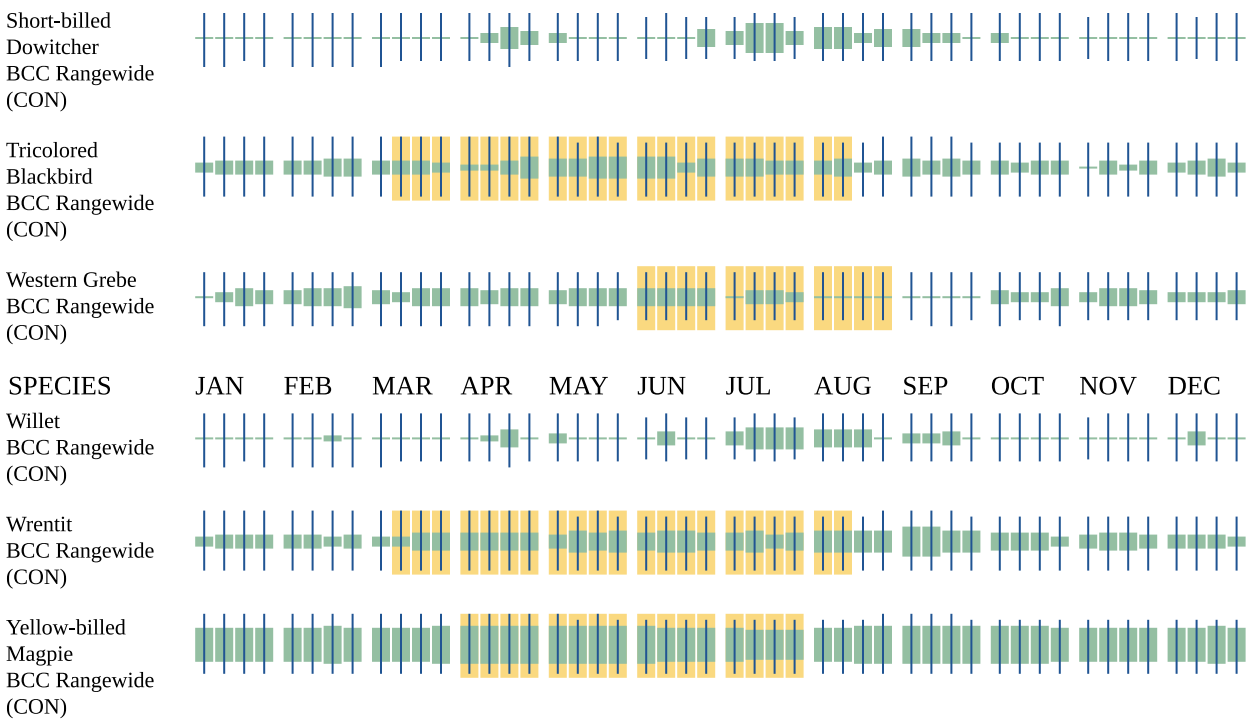
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.




BCC Rangewide (CON)
Bullock's Oriole BCC - BCR
California Gull BCC Rangewide (CON)
California Thrasher BCC Rangewide (CON)
Cassin's Finch BCC Rangewide (CON)
Clark's Grebe BCC Rangewide (CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Common Yellowthroat BCC - BCR
Golden Eagle Non-BCC Vulnerable
Lawrence's Goldfinch BCC Rangewide (CON)
Long-eared Owl BCC Rangewide (CON)
Marbled Godwit BCC Rangewide (CON)
Mountain Plover BCC Rangewide (CON)
Nuttall's Woodpecker BCC - BCR
Oak Titmouse BCC Rangewide (CON)
Olive-sided Flycatcher BCC Rangewide (CON)



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- Palustrine

RIVERINE

- Riverine

Quad Name Dixon
Quad Number 38121-D7

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - X
SRWR Chinook Salmon ESU (E) - X
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name Merritt
Quad Number 38121-E7

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - X
SRWR Chinook Salmon ESU (E) - X
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Davis**
Quad Number **38121-E6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

uad Name Sacramento West
Quad Number 38121-E5

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - X
SRWR Chinook Salmon ESU (E) - X
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) - X

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - X
SRWR Chinook Salmon Critical Habitat - X
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - X

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH - X
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Appendix B California Natural Diversity Database and California Native Plant Society Queries

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Sacramento West (3812155) OR Davis (3812156) OR Merritt (3812157) OR Dixon (3812147) OR Rio Linda (3812164) OR Taylor Monument (3812165) OR Grays Bend (3812166) OR Woodland (3812167) OR Winters (3812158) OR Allendale (3812148) OR Dozier (3812137) OR Saxon (3812146) OR Clarksburg (3812145) OR Sacramento East (3812154))

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Accipiter cooperii Cooper's hawk	G5 S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	23 25	118 S:2	1	0	1	0	0	0	1	1	2	0	0
Acipenser medirostris pop. 1 green sturgeon - southern DPS	G2T1 S1	Threatened None	AFS_VU-Vulnerable IUCN_EN-Endangered	10 32	14 S:2	0	0	1	0	0	1	0	2	2	0	0
Agelaius tricolor tricolored blackbird	G1G2 S1S2	None Threatened	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_EN-Endangered NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	5 213	955 S:26	1	0	0	0	8	17	19	7	18	6	2
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	G2G3T3 S3	Threatened Threatened	CDFW_WL-Watch List IUCN_VU-Vulnerable	15 50	1271 S:14	6	1	0	0	1	6	6	8	13	0	1
Ammodramus savannarum grasshopper sparrow	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	25 240	27 S:3	0	2	1	0	0	0	0	3	3	0	0
Andrena blennospermatis Blennosperma vernal pool andrenid bee	G2 S1	None None		20 30	15 S:2	0	0	0	0	0	2	2	0	2	0	0
Antrozous pallidus pallid bat	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	50 70	420 S:2	0	0	0	0	0	2	2	0	2	0	0
Archoplites interruptus Sacramento perch	G1 S1	None None	AFS_TH-Threatened CDFW_SSC-Species of Special Concern IUCN_EN-Endangered	10 10	5 S:1	0	0	0	0	0	1	1	0	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Ardea alba great egret	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	15 35	43 S:5	4	1	0	0	0	0	4	1	5	0	0
Ardea herodias great blue heron	G5 S4	None None	CDF_S-Sensitive IUCN_LC-Least Concern	25 35	156 S:5	3	1	1	0	0	0	3	2	5	0	0
Astragalus tener var. ferrisiae Ferris' milk-vetch	G2T1 S1	None None	Rare Plant Rank - 1B.1	15 20	18 S:5	1	0	0	0	0	4	4	1	5	0	0
Astragalus tener var. tener alkali milk-vetch	G2T1 S1	None None	Rare Plant Rank - 1B.2 SB_UCSC-UC Santa Cruz	10 50	65 S:23	1	15	0	0	6	1	16	7	17	5	1
Athene cunicularia burrowing owl	G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	10 135	2011 S:123	6	22	48	8	13	26	74	49	110	9	4
Atriplex cordulata var. cordulata heartscale	G3T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	10 35	66 S:5	2	1	1	0	1	0	4	1	4	0	1
Atriplex depressa brittlescale	G2 S2	None None	Rare Plant Rank - 1B.2	18 40	60 S:8	0	1	1	1	0	5	6	2	8	0	0
Atriplex persistens vernal pool smallscale	G2 S2	None None	Rare Plant Rank - 1B.2	25 30	41 S:3	0	1	1	0	0	1	1	2	3	0	0
Bombus crotchii Crotch bumble bee	G2 S2	None Candidate Endangered	IUCN_EN-Endangered	50 182	437 S:2	0	0	0	0	0	2	1	1	2	0	0
Bombus occidentalis western bumble bee	G3 S1	None Candidate Endangered	IUCN_VU-Vulnerable USFS_S-Sensitive	20 100	306 S:3	0	0	0	0	0	3	3	0	3	0	0
Branchinecta conservatio Conservancy fairy shrimp	G2 S2	Endangered None	IUCN_EN-Endangered	10 35	53 S:8	6	0	0	0	0	2	0	8	8	0	0
Branchinecta lynchi vernal pool fairy shrimp	G3 S3	Threatened None	IUCN_VU-Vulnerable	10 150	796 S:52	2	13	8	6	1	22	26	26	51	1	0
Branchinecta mesovallensis midvalley fairy shrimp	G2 S2S3	None None		15 45	144 S:10	3	2	1	0	0	4	7	3	10	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Buteo swainsoni Swainson's hawk	G5 S3	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	0 180	2561 S:620	91	187	83	19	8	232	137	483	611	5	4
Carex comosa bristly sedge	G5 S2	None None	Rare Plant Rank - 2B.1 IUCN_LC-Least Concern	5 5	31 S:1	0	1	0	0	0	0	0	1	1	0	0
Centromadia parryi ssp. parryi pappose tarplant	G3T2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	5 20	39 S:2	0	0	0	0	1	1	1	1	1	0	1
Charadrius montanus mountain plover	G3 S2S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened NABCI_RWL-Red Watch List USFWS_BCC-Birds of Conservation Concern	35 40	90 S:4	0	2	1	0	1	0	3	1	3	1	0
Charadrius nivosus nivosus western snowy plover	G3T3 S3	Threatened None	CDFW_SSC-Species of Special Concern NABCI_RWL-Red Watch List	40 55	138 S:2	0	0	0	0	0	2	2	0	2	0	0
Chloropyron palmatum palmate-bracted bird's-beak	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	30 40	25 S:3	0	1	0	0	1	1	2	1	2	0	1
Cicindela hirticollis abrupta Sacramento Valley tiger beetle	G5TH SH	None None		2 50	6 S:2	0	0	0	0	2	0	2	0	0	0	2
Cicuta maculata var. bolanderi Bolander's water-hemlock	G5T4T5 S2?	None None	Rare Plant Rank - 2B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden		17 S:1	0	0	0	0	0	1	1	0	1	0	0
Circus hudsonius northern harrier	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	48 48	54 S:1	0	1	0	0	0	0	0	1	1	0	0
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	G3 S2.1	None None		10 10	60 S:1	0	1	0	0	0	0	1	0	1	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T2T3 S1	Threatened Endangered	BLM_S-Sensitive NABCI_RWL-Red Watch List USFS_S-Sensitive	5 70	165 S:3	0	0	0	0	2	1	2	1	1	0	2
Delphinium recurvatum recurved larkspur	G2? S2?	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_SBBG-Santa Barbara Botanic Garden		119 S:1	0	0	0	0	0	1	1	0	1	0	0
Desmocerus californicus dimorphus valley elderberry longhorn beetle	G3T2T3 S3	Threatened None		10 185	271 S:31	0	2	3	1	0	25	15	16	31	0	0
Downingia pusilla dwarf downingia	GU S2	None None	Rare Plant Rank - 2B.2	5 95	132 S:23	0	14	4	0	1	4	18	5	22	0	1
Egretta thula snowy egret	G5 S4	None None	IUCN_LC-Least Concern	15 15	20 S:1	1	0	0	0	0	0	1	0	1	0	0
Elanus leucurus white-tailed kite	G5 S3S4	None None	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_LC-Least Concern	19 80	184 S:23	5	8	2	2	1	5	20	3	22	1	0
Elaphrus viridis Delta green ground beetle	G1 S1	Threatened None	IUCN_CR-Critically Endangered	15 30	7 S:3	1	1	0	0	1	0	3	0	2	0	1
Elderberry Savanna Elderberry Savanna	G2 S2.1	None None		25 35	4 S:3	0	0	1	0	0	2	3	0	3	0	0
Emys marmorata western pond turtle	G3G4 S3	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_VU-Vulnerable USFS_S-Sensitive	32 127	1424 S:6	0	1	2	0	0	3	3	3	6	0	0
Eryngium jepsonii Jepson's coyote-thistle	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	10 20	19 S:2	0	0	0	0	0	2	1	1	2	0	0
Extriplex joaquinana San Joaquin spearscale	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	5 40	127 S:10	0	2	4	1	0	3	6	4	10	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Falco columbarius merlin	G5 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	40 40	37 S:1	0	1	0	0	0	0	0	1	1	0	0
Fritillaria agrestis stinkbells	G3 S3	None None	Rare Plant Rank - 4.2	40 40	32 S:2	0	0	1	0	1	0	2	0	1	1	0
Fritillaria liliacea fragrant fritillary	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden USFS_S-Sensitive	15 30	82 S:5	1	2	0	0	0	2	4	1	5	0	0
Fritillaria pluriflora adobe-lily	G2G3 S2S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley		114 S:1	0	0	0	0	0	1	1	0	1	0	0
Gonidea angulata western ridged mussel	G3 S2	None None	IUCN_VU-Vulnerable	20 127	157 S:2	0	0	0	0	0	2	2	0	2	0	0
Gratiola heterosepala Boggs Lake hedge-hyssop	G2 S2	None Endangered	Rare Plant Rank - 1B.2 BLM_S-Sensitive	15 65	99 S:7	0	4	0	1	1	1	6	1	6	1	0
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	G2 S2.1	None None		15 15	56 S:1	0	0	0	0	0	1	1	0	1	0	0
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	G5T3 S3	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_UCBG-UC Botanical Garden at Berkeley	5 40	173 S:8	0	0	5	1	0	2	2	6	8	0	0
Hydrochara rickseckeri Ricksecker's water scavenger beetle	G2? S2?	None None		15 60	13 S:3	1	1	0	0	0	1	2	1	3	0	0
Hypomesus transpacificus Delta smelt	G1 S1	Threatened Endangered	AFS_TH-Threatened IUCN_CR-Critically Endangered	7 7	29 S:1	0	0	0	0	0	1	0	1	1	0	0

Summary Table Report

California Department of Fish and Wildlife

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Isocoma arguta Carquinez goldenbush	G1 S1	None None	Rare Plant Rank - 1B.1 SB_UCBG-UC Botanical Garden at Berkeley	16 25	14 S:3	0	1	1	0	0	1	2	1	3	0	0
Lasionycteris noctivagans silver-haired bat	G3G4 S3S4	None None	IUCN_LC-Least Concern		139 S:2	0	0	0	0	0	2	2	0	2	0	0
Lasiurus cinereus hoary bat	G3G4 S4	None None	IUCN_LC-Least Concern		238 S:3	0	0	0	0	0	3	3	0	3	0	0
Lasiurus frantzii western red bat	G4 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	128 128	128 S:1	0	1	0	0	0	0	0	1	1	0	0
Lasthenia chrysantha alkali-sink goldfields	G2 S2	None None	Rare Plant Rank - 1B.1	15 30	55 S:3	0	0	0	0	0	3	2	1	3	0	0
Lasthenia glabrata ssp. coulteri Coulter's goldfields	G4T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_SBBG-Santa Barbara Botanic Garden	35 35	111 S:1	0	0	0	0	0	1	0	1	1	0	0
Laterallus jamaicensis coturniculus California black rail	G3T1 S1	None Threatened	BLM_S-Sensitive CDFW_FP-Fully Protected IUCN_EN-Endangered NABCI_RWL-Red Watch List	1 15	303 S:4	2	1	0	0	0	1	0	4	4	0	0
Lathyrus jepsonii var. jepsonii Delta tule pea	G5T2 S2	None None	Rare Plant Rank - 1B.2 SB_BerrySB-Berry Seed Bank SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	0 5	133 S:2	0	1	0	1	0	0	2	0	2	0	0
Legenere limosa legenere	G2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive SB_UCBG-UC Botanical Garden at Berkeley	8 75	83 S:11	0	6	2	0	1	2	10	1	10	0	1

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Lepidium latipes var. heckardii Heckard's pepper-grass	G4T1 S1	None None	Rare Plant Rank - 1B.2	5 35	14 S:8	2	4	0	0	0	2	3	5	8	0	0
Lepidurus packardi vernal pool tadpole shrimp	G4 S3	Endangered None	IUCN_EN-Endangered	10 50	329 S:26	6	6	3	2	0	9	8	18	26	0	0
Lilaeopsis masonii Mason's lilaeopsis	G2 S2	None Rare	Rare Plant Rank - 1B.1	5 5	198 S:2	0	2	0	0	0	0	0	2	2	0	0
Limosella australis Delta mudwort	G4G5 S2	None None	Rare Plant Rank - 2B.1	0 0	59 S:1	0	1	0	0	0	0	1	0	1	0	0
Linderiella occidentalis California linderiella	G2G3 S2S3	None None	IUCN_NT-Near Threatened	10 110	508 S:38	1	3	8	5	1	20	27	11	37	1	0
Melospiza melodia pop. 1 song sparrow ("Modesto" population)	G5T3?Q S3?	None None	CDFW_SSC-Species of Special Concern	0 20	92 S:9	0	0	0	0	0	9	2	7	9	0	0
Myotis yumanensis Yuma myotis	G5 S4	None None	BLM_S-Sensitive IUCN_LC-Least Concern	128 128	265 S:1	0	1	0	0	0	0	0	1	1	0	0
Myrmosula pacifica Antioch multilid wasp	GH SH	None None		50 50	4 S:1	0	0	0	0	1	0	1	0	0	1	0
Navarretia leucocephala ssp. bakeri Baker's navarretia	G4T2 S2	None None	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	10 100	64 S:12	2	2	0	0	0	8	2	10	12	0	0
Neostapfia colusana Colusa grass	G1 S1	Threatened Endangered	Rare Plant Rank - 1B.1	18 35	66 S:7	0	4	1	2	0	0	1	6	7	0	0
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	G1 S1.1	None None		20 40	21 S:3	0	0	0	0	0	3	3	0	3	0	0
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	G3 S3.1	None None		50 70	126 S:2	0	0	0	0	0	2	2	0	2	0	0
Nycticorax nycticorax black-crowned night heron	G5 S4	None None	IUCN_LC-Least Concern	15 15	37 S:1	1	0	0	0	0	0	1	0	1	0	0
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	G5T2Q S2	Threatened None	AFS_TH-Threatened		31 S:5	0	0	0	2	0	3	0	5	5	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Oncorhynchus tshawytscha pop. 11 chinook salmon - Central Valley spring-run ESU	G5T2Q S2	Threatened Threatened	AFS_TH-Threatened	20 20	13 S:1	0	0	0	1	0	0	0	1	1	0	0
Oncorhynchus tshawytscha pop. 7 chinook salmon - Sacramento River winter-run ESU	G5T1Q S2	Endangered Endangered	AFS_EN-Endangered	20 20	2 S:1	0	0	0	1	0	0	0	1	1	0	0
Plagiobothrys hystriculus bearded popcornflower	G2 S2	None None	Rare Plant Rank - 1B.1	13 115	15 S:9	3	2	0	0	0	4	2	7	9	0	0
Plegadis chihi white-faced ibis	G5 S3S4	None None	CDFW_WL-Watch List IUCN_LC-Least Concern	30 30	20 S:1	0	1	0	0	0	0	1	0	1	0	0
Pogonichthys macrolepidotus Sacramento splittail	G3 S3	None None	AFS_VU-Vulnerable CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	20 20	15 S:1	0	1	0	0	0	0	1	0	1	0	0
Progne subis purple martin	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	23 50	71 S:10	0	0	1	0	0	9	9	1	10	0	0
Puccinellia simplex California alkali grass	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	15 50	80 S:11	0	0	0	0	5	6	10	1	6	4	1
Riparia riparia bank swallow	G5 S2	None Threatened	BLM_S-Sensitive IUCN_LC-Least Concern	30 30	299 S:1	0	0	0	0	0	1	1	0	1	0	0
Sagittaria sanfordii Sanford's arrowhead	G3 S3	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive	18 70	143 S:12	1	5	3	0	3	0	4	8	9	3	0
Sidalcea keckii Keck's checkerbloom	G2 S2	Endangered None	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	12 115	50 S:6	0	0	0	0	0	6	5	1	6	0	0
Spea hammondii western spadefoot	G2G3 S3S4	None None	BLM_S-Sensitive CDFW_SSC-Species of Special Concern IUCN_NT-Near Threatened	93 93	1425 S:1	0	0	0	1	0	0	1	0	1	0	0
Spirinchus thaleichthys longfin smelt	G5 S1	Candidate Threatened	IUCN_LC-Least Concern	0 20	46 S:2	0	0	0	0	0	2	0	2	2	0	0

Summary Table Report

California Department of Fish and Wildlife

California Natural Diversity Database

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Symphyotrichum lentum Suisun Marsh aster	G2 S2	None None	Rare Plant Rank - 1B.2 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden SB_USDA-US Dept of Agriculture	0 10	175 S:4	1	2	0	0	0	1	1	3	4	0	0
Taxidea taxus American badger	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	5 70	594 S:5	0	0	0	0	0	5	5	0	5	0	0
Thamnophis gigas giant gartersnake	G2 S2	Threatened Threatened	IUCN_VU-Vulnerable	5 50	373 S:83	6	35	13	6	7	16	29	54	76	7	0
Trifolium hydrophilum saline clover	G2 S2	None None	Rare Plant Rank - 1B.2	10 38	56 S:7	0	2	1	0	0	4	1	6	7	0	0
Tuctoria mucronata Crampton's tuctoria or Solano grass	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	15 35	4 S:4	0	1	2	0	0	1	0	4	4	0	0
Valley Needlegrass Grassland Valley Needlegrass Grassland	G3 S3.1	None None		20 30	45 S:2	0	1	0	0	1	0	2	0	1	0	1
Valley Oak Woodland Valley Oak Woodland	G3 S2.1	None None		50 50	91 S:1	0	0	0	0	0	1	1	0	1	0	0
Vireo bellii pusillus least Bell's vireo	G5T2 S2	Endangered Endangered	NABCI_YWL-Yellow Watch List	15 15	504 S:2	0	1	0	0	0	1	1	1	2	0	0
Xanthocephalus xanthocephalus yellow-headed blackbird	G5 S3	None None	CDFW_SSC-Species of Special Concern IUCN_LC-Least Concern	5 5	13 S:1	0	0	0	0	0	1	1	0	1	0	0

Search Results

43 matches found. Click on scientific name for details

Search Criteria: Quad is one of
[3812154:3812155:3812156:3812157:3812147:3812164:3812165:3812166:3812167:3812158:3812148:3812137:3812146:3812145]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G4	S4	4.3	Yes	1974-01-01	 ©2012 Tim Kellison
Astragalus tener var. *ferrisiae*	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	None	None	G2T1	S1	1B.1	Yes	1994-01-01	No Photo Available
Astragalus tener var. *tener*	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	Yes	1994-01-01	No Photo Available
Atriplex cordulata var. *cordulata*	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G3T2	S2	1B.2	Yes	1988-01-01	 © 1994 Robert E. Preston, Ph.D.
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1994-01-01	 © 2009 Zoya Akulova
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	annual herb	Jun-Oct	None	None	G2	S2	1B.2	Yes	2001-01-01	No Photo Available
Brodiaea rosea ssp. *vallicola*	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	Yes	2019-01-07	 © 2011 Steven Perry
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1		1994-01-01	 Dean Wm. Taylor 1997
Centromadia parryi ssp. *parryi*	pappose tarplant	Asteraceae	annual herb	May-Nov	None	None	G3T2	S2	1B.2	Yes	2004-01-01	No Photo Available

Centromadia parryi ssp. *rudis*	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	G3T3	S3	4.2	Yes	2007-05-22	No Photo Available
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	FE	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	None	None	G5T4T5	S2?	2B.1		1974-01-01	No Photo Available
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	None	None	G2?	S2?	1B.2	Yes	1988-01-01	No Photo Available
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2		1980-01-01	No Photo Available
Eryngium jepsonii	Jepson's coyote-thistle	Apiaceae	perennial herb	Apr-Aug	None	None	G2	S2	1B.2	Yes	2016-09-13	No Photo Available
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	Yes	1988-01-01	No Photo Available
Fritillaria agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	G3	S3	4.2	Yes	1980-01-01	 © 2016 Aaron Schusteff
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2004 Carol W. Witham
Fritillaria pluriflora	adobe-lily	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2G3	S2S3	1B.2	Yes	1974-01-01	 © 2015 Steve Matson
Gratiola heterosepala	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2		1974-01-01	 ©2004 Carol W. Witham
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2	Yes	2001-01-01	 © 2017 John Doyen

Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2	Yes	1974-01-01	 © 2020 Steven Perry
Isocoma arguta	Carquinez goldenbush	Asteraceae	perennial shrub	Aug-Dec	None	None	G1	S1	1B.1	Yes	1994-01-01	No Photo Available
Lasthenia chrysantha	alkali-sink goldfields	Asteraceae	annual herb	Feb-Apr	None	None	G2	S2	1B.1	Yes	2019-09-30	 © 2009 California State University, Stanislaus
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	Asteraceae	annual herb	Feb-Jun	None	None	G4T2	S2	1B.1		1994-01-01	 © 2013 Keir Morse
Lathyrus jepsonii var. *jepsonii*	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	Yes	1974-01-01	 © 2003 Mark Fogiel
Legenere limosa	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	Yes	1974-01-01	 ©2000 John Game
Lepidium latipes var. *heckardii*	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	None	None	G4T1	S1	1B.2	Yes	1994-01-01	 2018 Jennifer Buck
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	annual herb	Jun-Oct	None	None	G2G3	S2S3	3	Yes	1994-01-01	 © 2015 Aaron Schusteff
Lilaeopsis masonii	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	Yes	1974-01-01	No Photo Available
Limosella australis	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	None	None	G4G5	S2	2B.1		1994-01-01	 © 2020 Richard Sage

Malacothamnus helleri	Heller's bush-mallow	Malvaceae	perennial deciduous shrub	May-Jul	None	None	G2Q	S2	3.3	Yes	1974-01-01	 © 2017 Keir Morse
Myosurus minimus ssp. *apus*	little mousetail	Ranunculaceae	annual herb	Mar-Jun	None	None	G5T2Q	S2	3.1		1980-01-01	No Photo Available
Navarretia cotulifolia	cotula navarretia	Polemoniaceae	annual herb	May-Jun	None	None	G4	S4	4.2	Yes	2001-01-01	 © 2020 Zoya Akulova
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	None	None	G4T2	S2	1B.1	Yes	1994-01-01	 © 2018 Barry Rice
Neostapfia colusana	Colusa grass	Poaceae	annual herb	May-Aug	FT	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Plagiobothrys hystriculus	bearded popcornflower	Boraginaceae	annual herb	Apr-May	None	None	G2	S2	1B.1	Yes	1974-01-01	No Photo Available
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	None	None	G2	S2	1B.2		2015-10-15	No Photo Available
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	Yes	1984-01-01	 ©2013 Debra L. Cook
Sidalcea keckii	Keck's checkerbloom	Malvaceae	annual herb	Apr-May(Jun)	FE	None	G2	S2	1B.1	Yes	1974-01-01	No Photo Available
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	Yes	2001-01-01	No Photo Available
Tuctoria mucronata	Crampton's tuctoria or Solano grass	Poaceae	annual herb	Apr-Aug	FE	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available

Showing 1 to 43 of 43 entries

Suggested Citation:

Appendix C Botanical Survey Results and Plant Species Observed

Appendix D Aquatic Resources Survey Report

Appendix E Giant Garter Snake Habitat Assessment

Appendix F Bat Species of Special Concern Habitat Assessment

Appendix G Tricolored Blackbird Nesting Habitat Assessment

Appendix H Swainson's Hawk Protocol Survey Results

Appendix I Burrowing Owl Protocol Survey Results

Appendix J Valley Elderberry Longhorn Beetle Habitat Assessment