


APPENDIX A: AIR QUALITY MODELING RESULTS

Road Construction Emissions Model Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

Version 8.1.0

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.



Project Name	2021_SRErosion_Contract2	
Construction Start Year	2021	Enter a Year between 2014 and 2025 (inclusive)
Project Type	4	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	4.30	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 <small>(for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)</small>	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the lone formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs State or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	1.30	miles
Total Project Area	13.00	acres
Maximum Area Disturbed/Day	5.00	acres
Water Trucks Used?	1	1. Yes 2. No

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd ³) (assume 20 if unknown)	Import Volume (yd ³ /day)	Export Volume (yd ³ /day)
Soil	Grubbing/Land Clearing	15.00	0.00	83.00
	Grading/Excavation	15.00	77.00	0.00
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation	2010 and Newer On-road Vehicles Fleet	Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation	Tier 4 Equipment	Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/ceqa/mitigation.shtml).
Will all off-road equipment be tier 4?	All Tier 4 Equipment	Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County.

http://www.conservation.ca.gov/cgs/information/geologic_mapping/Pages/googlemaps.aspx#regionalSeries

The remaining sections of this sheet contain areas that require modification when 'Other Project Type' is selected.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	0.30	0.43	8/1/2021	1/1/2021
Grading/Excavation	4.00	1.72	8/11/2021	1/11/2021
Drainage/Utilities/Sub-Grade	0.00	1.51		5/13/2021
Paving	0.00	0.65		5/13/2021
Totals (Months)		4		

Note: You have entered a non-default starting date. Please provide starting date for all phases, or default values for other phases will be used.

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing		40.00			6	240.00					
Miles/round trip: Grading/Excavation		10.00			6	60.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.10	0.43	3.65	0.11	0.05	0.02	1,614.50	0.00	0.05	1,630.92
Grading/Excavation (grams/mile)		0.10	0.43	3.65	0.11	0.05	0.02	1,614.50	0.00	0.05	1,630.92
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.05	0.23	1.93	0.06	0.03	0.01	854.25	0.00	0.03	862.94
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.01	0.00	0.00	0.00	2.82	0.00	0.00	2.85
Pounds per day - Grading/Excavation		0.01	0.06	0.48	0.02	0.01	0.00	213.56	0.00	0.01	215.73
Tons per const. Period - Grading/Excavation		0.00	0.00	0.02	0.00	0.00	0.00	9.40	0.00	0.00	9.49
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.03	0.00	0.00	0.00	12.22	0.00	0.00	12.34

Note: Asphalt Hauling emission default values can be overridden in cells D87 through D90, and F87 through F90.

Asphalt Hauling Emissions		User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT					
User Input											
Miles/round trip: Grubbing/Land Clearing					0	0.00					
Miles/round trip: Grading/Excavation					0	0.00					
Miles/round trip: Drainage/Utilities/Sub-Grade					0	0.00					
Miles/round trip: Paving					0	0.00					
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.10	0.43	3.65	0.11	0.05	0.02	1,614.50	0.00	0.05	1,630.92
Grading/Excavation (grams/mile)		0.10	0.43	3.65	0.11	0.05	0.02	1,614.50	0.00	0.05	1,630.92
Drainage/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Worker commute default values can be overridden in cells D113 through D118.

Worker Commute Emissions		User Override of Worker		Default Values		Calculated					
User Input		Commute Default Values		Daily Trips	Daily VMT						
Miles/one-way trip		20									
One-way trips/day		2									
No. of employees: Grubbing/Land Clearing		25		50	1,000.00						
No. of employees: Grading/Excavation		55		110	2,200.00						
No. of employees: Drainage/Utilities/Sub-Grade				0	0.00						
No. of employees: Paving				0	0.00						
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48
Grading/Excavation (grams/mile)		0.02	0.99	0.10	0.05	0.02	0.00	360.03	0.01	0.00	361.48
Draining/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grubbing/Land Clearing (grams/trip)		0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35
Grading/Excavation (grams/trip)		0.93	2.28	0.18	0.00	0.00	0.00	81.88	0.01	0.01	84.35
Draining/Utilities/Sub-Grade (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.14	2.43	0.24	0.10	0.04	0.01	802.76	0.02	0.01	806.23
Tons per const. Period - Grubbing/Land Clearing		0.00	0.01	0.00	0.00	0.00	0.00	2.65	0.00	0.00	2.66
Pounds per day - Grading/Excavation		0.32	5.36	0.54	0.23	0.10	0.02	1,766.07	0.04	0.02	1,773.70
Tons per const. Period - Grading/Excavation		0.01	0.24	0.02	0.01	0.00	0.00	77.71	0.00	0.00	78.04
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.01	0.24	0.02	0.01	0.00	0.00	80.36	0.00	0.00	80.70

Note: Water Truck default values can be overridden in cells D145 through D148, and F145 through F148.

Water Truck Emissions		User Override of		Program Estimate of		User Override of Truck		Default Values		Calculated	
User Input		Default # Water Trucks	Number of Water Trucks	Miles Traveled/Vehicle/Day	Miles Traveled/Vehicle/Day	Miles Traveled/Vehicle/Day	Miles Traveled/Vehicle/Day	Daily VMT			
Grubbing/Land Clearing - Exhaust		1		40.00				40.00			
Grading/Excavation - Exhaust		4		40.00				160.00			
Drainage/Utilities/Subgrade								0.00			
Paving								0.00			
Emission Rates		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)		0.10	0.43	3.65	0.11	0.05	0.02	1,614.50	0.00	0.05	1,630.92
Grading/Excavation (grams/mile)		0.10	0.43	3.65	0.11	0.05	0.02	1,614.50	0.00	0.05	1,630.92
Draining/Utilities/Sub-Grade (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/mile)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing		0.01	0.04	0.32	0.01	0.00	0.00	142.37	0.00	0.00	143.82
Tons per const. Period - Grubbing/Land Clearing		0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.47
Pounds per day - Grading/Excavation		0.04	0.15	1.29	0.04	0.02	0.01	569.50	0.00	0.02	575.29
Tons per const. Period - Grading/Excavation		0.00	0.01	0.06	0.00	0.00	0.00	25.06	0.00	0.00	25.31
Pounds per day - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project		0.00	0.01	0.06	0.00	0.00	0.00	25.53	0.00	0.00	25.79

Note: Fugitive dust default values can be overridden in cells D171 through D173.

Fugitive Dust	User Override of Max		Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day					
Fugitive Dust - Grubbing/Land Clearing	5.00			50.00	0.17	10.40	0.03
Fugitive Dust - Grading/Excavation	2.00			20.00	0.88	4.16	0.18
Fugitive Dust - Drainage/Utilities/Subgrade				0.00	0.00	0.00	0.00

Grading/Excavation	Default	Mitigation Option	Mitigation Option	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Override of	Default										
	Override of Default Number of Vehicles	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier										
	<i>Program-estimate</i>		Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00		Model Default Tier	Cranes	1.62	7.76	18.98	0.77	0.71	0.02	2,186.58	0.71	0.02	2,210.14
0.00		Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00		Model Default Tier	Excavators	0.95	13.50	8.89	0.43	0.40	0.02	2,064.09	0.67	0.02	2,086.34
0.00		Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Generator Sets	0.36	3.68	3.17	0.17	0.17	0.01	623.04	0.03	0.00	625.23
2.00		Model Default Tier	Graders	1.28	9.01	12.25	0.68	0.63	0.01	1,211.11	0.39	0.01	1,224.13
0.00		Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00		Model Default Tier	Off-Highway Trucks	2.41	14.35	20.95	0.77	0.71	0.05	5,088.65	1.65	0.05	5,143.46
1.00		Model Default Tier	Other Construction Equipment	0.42	4.06	4.38	0.23	0.21	0.01	598.52	0.19	0.01	604.99
2.00		Model Default Tier	Other General Industrial Equipment	0.43	3.95	3.92	0.27	0.25	0.01	496.04	0.16	0.00	501.39
1.00		Model Default Tier	Other Material Handling Equipment	0.29	3.77	2.65	0.13	0.12	0.01	556.35	0.18	0.01	562.34
0.00		Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00		Model Default Tier	Rubber Tired Dozers	3.54	29.08	36.56	1.67	1.54	0.04	3,446.74	1.11	0.03	3,483.77
0.00		Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6.00		Model Default Tier	Signal Boards	0.34	1.81	2.16	0.08	0.08	0.00	295.88	0.03	0.00	297.39
4.00		Model Default Tier	Skid Steer Loaders	0.30	5.56	4.01	0.16	0.15	0.01	800.79	0.26	0.01	809.43
0.00		Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Model Default Tier	Sweepers/Scrubbers	0.23	1.95	2.06	0.15	0.14	0.00	246.18	0.08	0.00	248.83
2.00		Model Default Tier	Tractors/Loaders/Backhoes	0.38	4.57	3.83	0.23	0.21	0.01	608.00	0.20	0.01	614.55
2.00		Model Default Tier	Trenchers	0.79	5.41	7.29	0.53	0.49	0.01	678.99	0.22	0.01	686.30
0.00		Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment	If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation		pounds per day	13.34	108.44	131.09	6.28	5.80	0.20	18,900.96	5.88	0.17	19,098.29
	Grading/Excavation		tons per phase	0.59	4.77	5.77	0.26	0.26	0.01	831.64	0.26	0.01	840.32

Drainage/Utilities/Subgrade		Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Mitigation Option Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	Program-estimate					pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00				Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Bore/Dnll Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00				Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
User-Defined Off-road Equipment		If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab				ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Number of Vehicles		Equipment Tier	Type		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00			N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade			pounds per day		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Drainage/Utilities/Sub-Grade			tons per phase		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Paving	Default	Mitigation Option	Mitigation Option	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e	
	Number of Vehicles	Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default											Type
Override of Default Number of Vehicles	Program-estimate		Equipment Tier	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	
0.00			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Bore/Dnll Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
User-Defined Off-road Equipment				If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab										
	Number of Vehicles		Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00		N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		pounds per day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Paving		tons per phase	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions all Phases (tons per construction period) =>					0.59	4.86	5.84	0.28	0.26	0.01	845.70	0.26	0.01	854.52

Equipment default values for horsepower and hours/day can be overridden in cells D391 through D424 and F391 through F424.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		206		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		226		8
Crawler Tractors		208		8
Crushing/Proc. Equipment		85		8
Excavators		163		8
Forklifts		89		8
Generator Sets		84		8
Graders		175		8
Off-Highway Tractors		123		8
Off-Highway Trucks		400		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		167		8
Pavers		126		8
Paving Equipment		131		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		81		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		255		8
Rubber Tired Loaders		200		8
Scrapers		362		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		254		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		98		8
Trenchers		81		8
Welders		46		8

END OF DATA ENTRY SHEET

Barge Emissions Calculations

ARCF 2016

Sacramento River Erosion Protection - Contracts 2, 3, 4

Basic Assumptions

CY per Barge ¹	909
CY Imported	196,750 per year
Miles/ hr per barge	5
Extra Empty Trips	2
Total Hrs per Day	10
lbs/ tons	2000
lbs/MT	2204.62

	San Rafael to Rio Vista (in SFNA)	San Rafael to Rio Vista (in BAAQMD)	Rio Vista to Sacramento Erosion
No. of Barge in Tow	4	4	1
Miles (one-way)	10.4	45	40
Total Tow-Hours	117	505	1747

	PM10	PM2.5	NOx	ROG	CO	SO2	CO2	CH4	N2O	CO2e (MT)
Two-Engine Push Boat Emissions (lb/hr)	1.61	1.44	35.71	2.09	8.97	0.01	1417.70	0.06	0.01	1422.56
Tug Boat Emissions (lb/hr)	0.37	0.33	6.47	0.54	1.90	0.00	456.06	0.02	0.00	457.63
Total Emissions for Push Boat - In SFNA (Tons)	0.09	0.08	2.08	0.12	0.52	0.00	82.72	0.00	0.00	75.30
Total Emission for Push Boat- In BAAQMD (Tons)²	0.41	0.36	9.02	0.53	2.27	0.00	357.94	0.01	0.00	325.83
Total Emissions for Tug Boat - In SFNA (Tons)	0.33	0.29	5.65	0.48	1.66	0.00	398.46	0.02	0.00	362.72
Sum of Emissions in SFNA (Tons)	0.42	0.37	7.74	0.60	2.18	0.00	481.18	0.02	0.00	438.0

Notes: ¹ <https://ihsmarkit.com/country-industry-forecasting.html?ID=106593483> , one barge has the capacity of 1500 tons and assuming 1.65 tons/cy of quarry rock

² BAAQMD NOx Threshold is 54 lb/day (Not relevant to General Conformity)

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> 2021_SRErosion_Contract2

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.58	36.02	7.92	50.45	0.45	50.00	10.73	0.33	10.40	0.06	6,026.69	1.16	0.08	6,079.38
Grading/Excavation	6.43	125.27	22.39	21.03	1.03	20.00	4.97	0.81	4.16	0.22	21,423.45	5.92	0.22	21,635.86
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day)	6.43	125.27	22.39	50.45	1.03	50.00	10.73	0.81	10.40	0.22	21,423.45	5.92	0.22	21,635.86
Total (tons/construction project)	0.29	5.63	1.01	1.09	0.05	1.05	0.25	0.04	0.22	0.01	962.52	0.26	0.01	972.04

Notes: Project Start Year -> 2021
 Project Length (months) -> 4
 Total Project Area (acres) -> 13
 Maximum Area Disturbed/Day (acres) -> 5
 Water Truck Used? -> Yes

Total Material Imported/Exported Volume (yd3/day)

Phase	Soil	Asphalt
Grubbing/Land Clearing	83	0
Grading/Excavation	77	0
Drainage/Utilities/Sub-Grade	0	0
Paving	0	0

Daily VMT (miles/day)

Phase	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	240	0	1,000	40
Grading/Excavation	60	0	2,200	160
Drainage/Utilities/Sub-Grade	0	0	0	0
Paving	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 2021_SRErosion_Contract2

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.12	0.03	0.17	0.00	0.17	0.04	0.00	0.03	0.00	19.89	0.00	0.00	18.20
Grading/Excavation	0.28	5.51	0.99	0.93	0.05	0.88	0.22	0.04	0.18	0.01	942.63	0.26	0.01	863.63
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (tons/phase)	0.28	5.51	0.99	0.93	0.05	0.88	0.22	0.04	0.18	0.01	942.63	0.26	0.01	863.63
Total (tons/construction project)	0.29	5.63	1.01	1.09	0.05	1.05	0.25	0.04	0.22	0.01	962.52	0.26	0.01	881.83

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs. The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> 2021_SRErosion_Contract2

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	2.53	30.36	21.83	51.22	1.22	50.00	11.45	1.05	10.40	0.06	6,026.69	1.16	0.08	6,079.38
Grading/Excavation	13.69	113.98	132.32	26.56	6.56	20.00	10.07	5.91	4.16	0.22	21,423.45	5.92	0.22	21,635.86
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day)	13.69	113.98	132.32	51.22	6.56	50.00	11.45	5.91	10.40	0.22	21,423.45	5.92	0.22	21,635.86
Total (tons/construction project)	0.61	5.12	5.89	1.34	0.29	1.05	0.48	0.26	0.22	0.01	962.52	0.26	0.01	972.04

Notes: Project Start Year -> 2021
 Project Length (months) -> 4
 Total Project Area (acres) -> 13
 Maximum Area Disturbed/Day (acres) -> 5
 Water Truck Used? -> Yes

Total Material Imported/Exported Volume (yd3/day)

Phase	Soil	Asphalt
Grubbing/Land Clearing	83	0
Grading/Excavation	77	0
Drainage/Utilities/Sub-Grade	0	0
Paving	0	0

Daily VMT (miles/day)

Phase	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	240	0	1,000	40
Grading/Excavation	60	0	2,200	160
Drainage/Utilities/Sub-Grade	0	0	0	0
Paving	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 2021_SRErosion_Contract2

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.10	0.07	0.17	0.00	0.17	0.04	0.00	0.03	0.00	19.89	0.00	0.00	18.20
Grading/Excavation	0.60	5.02	5.82	1.17	0.29	0.88	0.44	0.26	0.18	0.01	942.63	0.26	0.01	863.63
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (tons/phase)	0.60	5.02	5.82	1.17	0.29	0.88	0.44	0.26	0.18	0.01	942.63	0.26	0.01	863.63
Total (tons/construction project)	0.61	5.12	5.89	1.34	0.29	1.05	0.48	0.26	0.22	0.01	962.52	0.26	0.01	881.83

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs. The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 8.1.0

Daily Emission Estimates for -> 2021_SRErosion_Contract2

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	2.56	30.40	23.20	51.22	1.22	50.00	11.46	1.06	10.40	0.06	6,060.60	1.16	0.08	6,113.94
Grading/Excavation	13.70	114.01	133.40	26.56	6.56	20.00	10.08	5.92	4.16	0.22	21,450.10	5.92	0.22	21,663.02
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day)	13.70	114.01	133.40	51.22	6.56	50.00	11.46	5.92	10.40	0.22	21,450.10	5.92	0.22	21,663.02
Total (tons/construction project)	0.61	5.12	5.95	1.34	0.29	1.05	0.48	0.26	0.22	0.01	963.80	0.26	0.01	973.35

Notes: Project Start Year -> 2021
 Project Length (months) -> 4
 Total Project Area (acres) -> 13
 Maximum Area Disturbed/Day (acres) -> 5
 Water Truck Used? -> Yes

Total Material Imported/Exported Volume (yd3/day)

Phase	Soil	Asphalt
Grubbing/Land Clearing	83	0
Grading/Excavation	77	0
Drainage/Utilities/Sub-Grade	0	0
Paving	0	0

Daily VMT (miles/day)

Phase	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	240	0	1,000	40
Grading/Excavation	60	0	2,200	160
Drainage/Utilities/Sub-Grade	0	0	0	0
Paving	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> 2021_SRErosion_Contract2

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.10	0.08	0.17	0.00	0.17	0.04	0.00	0.03	0.00	20.00	0.00	0.00	18.30
Grading/Excavation	0.60	5.02	5.87	1.17	0.29	0.88	0.44	0.26	0.18	0.01	943.80	0.26	0.01	864.71
Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (tons/phase)	0.60	5.02	5.87	1.17	0.29	0.88	0.44	0.26	0.18	0.01	943.80	0.26	0.01	864.71
Total (tons/construction project)	0.61	5.12	5.95	1.34	0.29	1.05	0.48	0.26	0.22	0.01	963.80	0.26	0.01	883.02

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K. CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1, 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs. The CO2e emissions are reported as metric tons per phase.

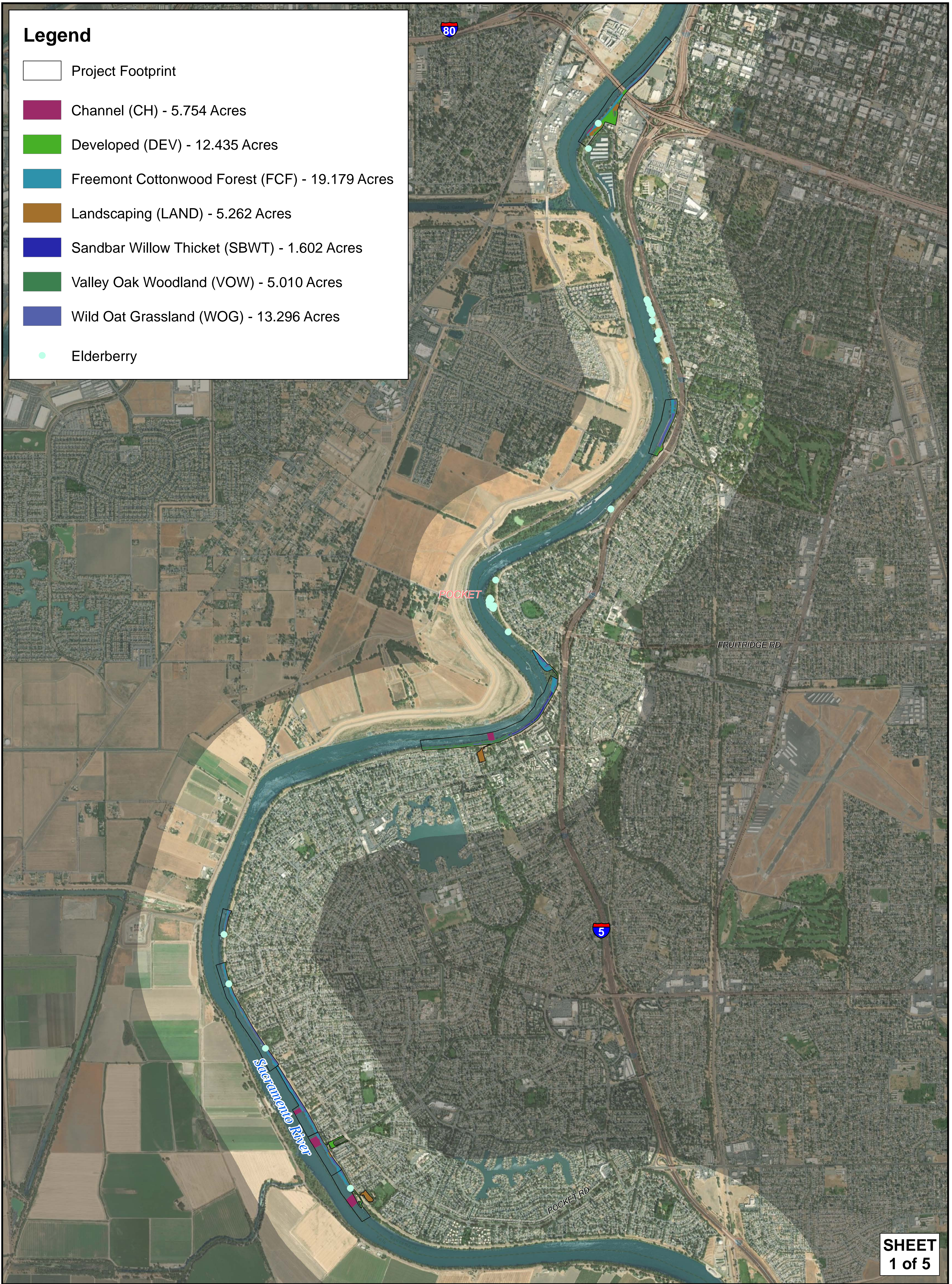
APPENDIX B: BIOLOGICAL RESOURCES DATA

Appendix B-1: Land Cover Maps and Sensitive Biological Resources

Appendix B-2: Species Lists

Legend

- Project Footprint
- Channel (CH) - 5.754 Acres
- Developed (DEV) - 12.435 Acres
- Freemont Cottonwood Forest (FCF) - 19.179 Acres
- Landscaping (LAND) - 5.262 Acres
- Sandbar Willow Thicket (SBWT) - 1.602 Acres
- Valley Oak Woodland (VOW) - 5.010 Acres
- Wild Oat Grassland (WOG) - 13.296 Acres
- Elderberry



SHEET
1 of 5

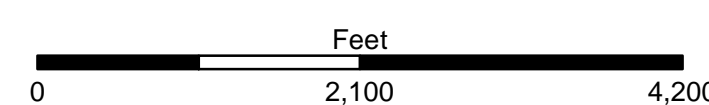
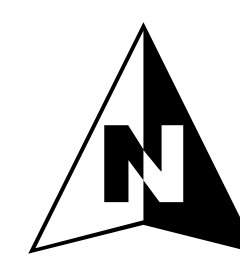


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SR EROSION C2 HABITAT/ELDERBERRY

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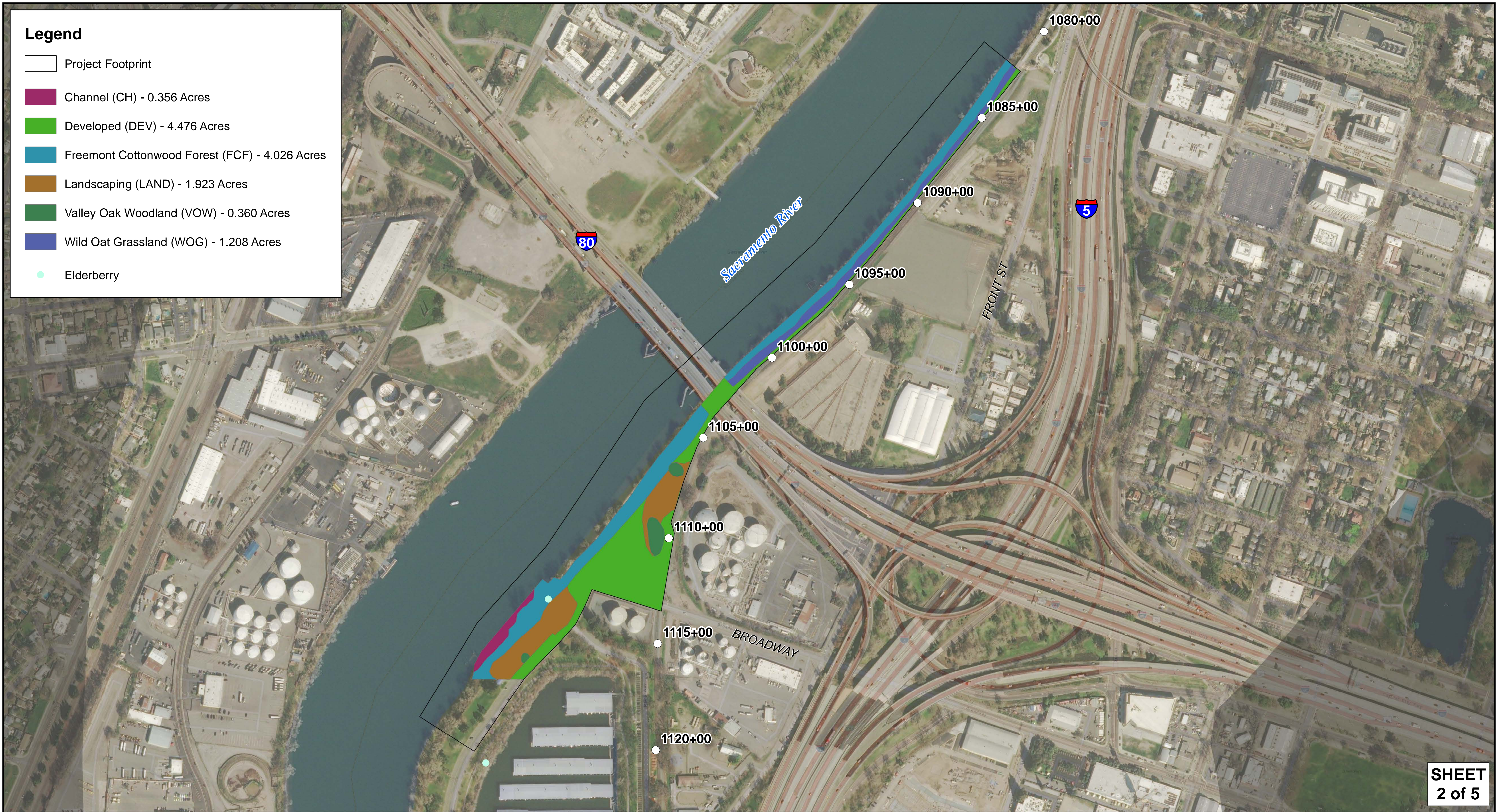


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Legend

- Project Footprint
- Channel (CH) - 0.356 Acres
- Developed (DEV) - 4.476 Acres
- Freemont Cottonwood Forest (FCF) - 4.026 Acres
- Landscaping (LAND) - 1.923 Acres
- Valley Oak Woodland (VOW) - 0.360 Acres
- Wild Oat Grassland (WOG) - 1.208 Acres
- Elderberry

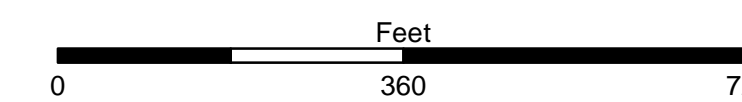
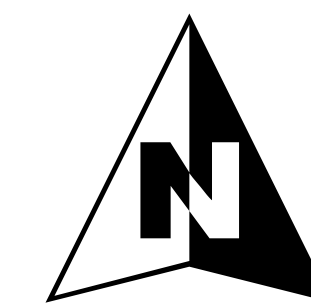


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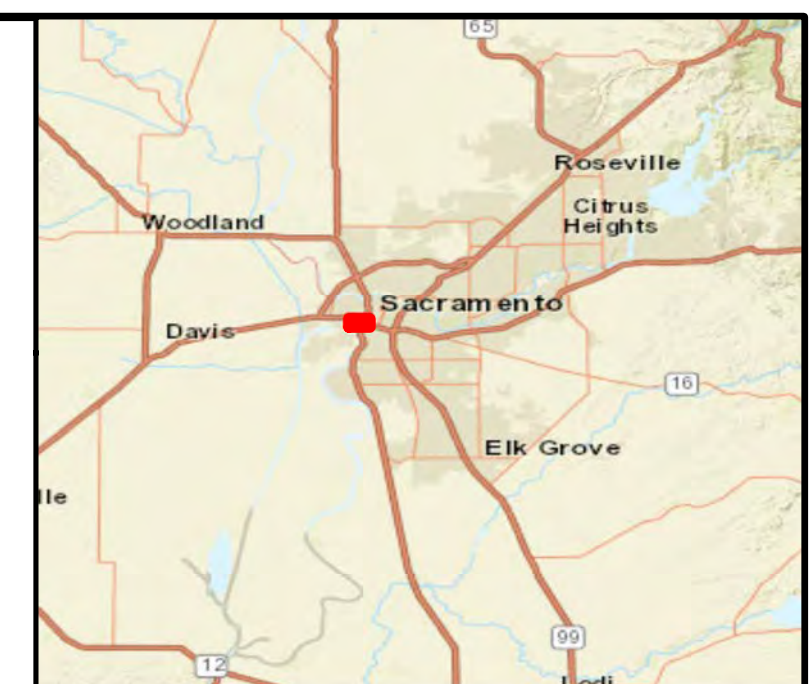


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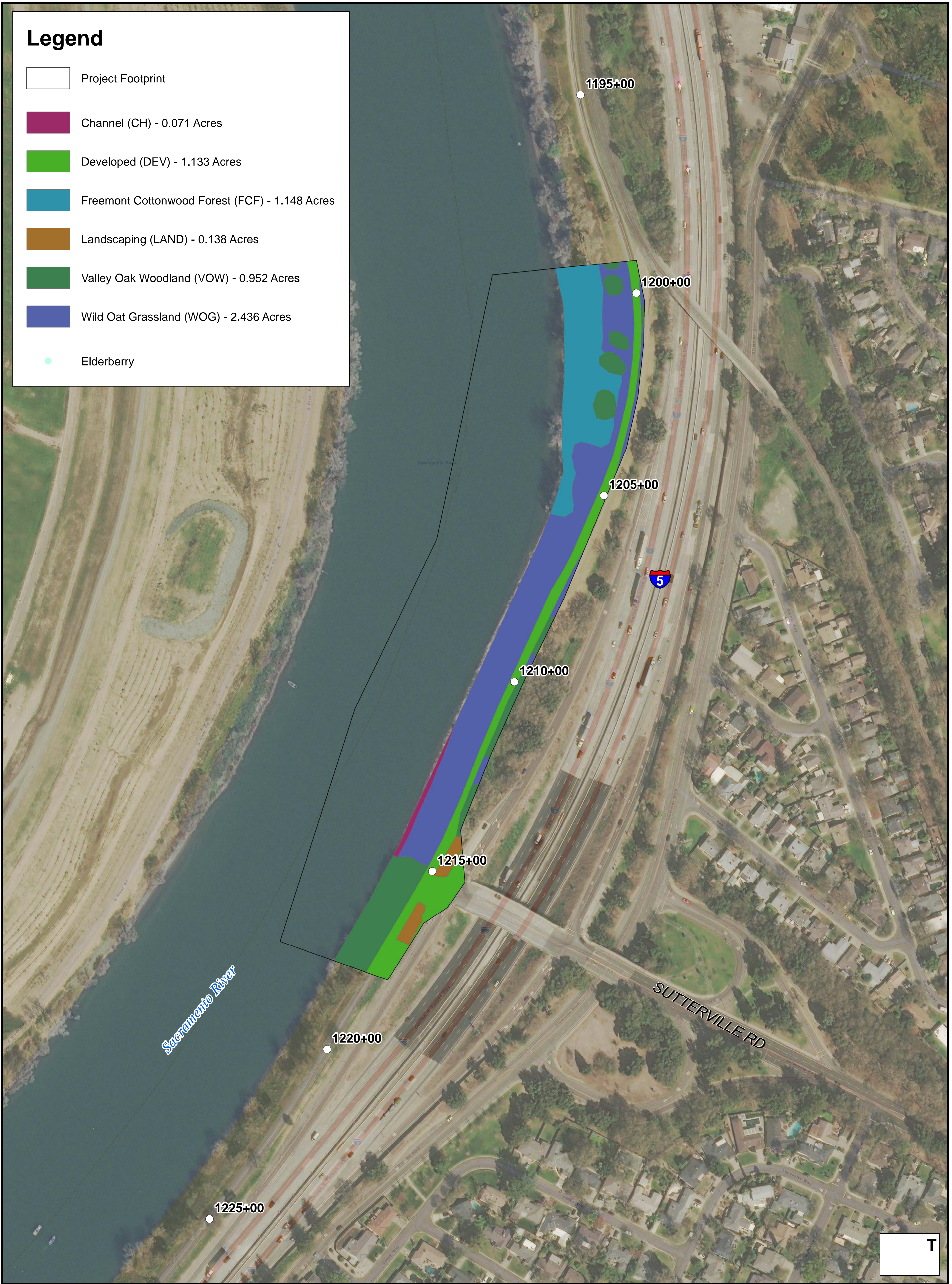


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Legend

- Project Footprint
- Channel (CH) - 0.071 Acres
- Developed (DEV) - 1.133 Acres
- Freemont Cottonwood Forest (FCF) - 1.148 Acres
- Landscaping (LAND) - 0.138 Acres
- Valley Oak Woodland (VOW) - 0.952 Acres
- Wild Oat Grassland (WOG) - 2.436 Acres
- Elderberry



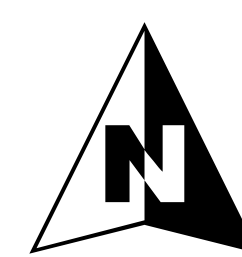
US Army Corps of Engineers
Sacramento District



SR EROSION C2 HABITAT/ELDERBERRY

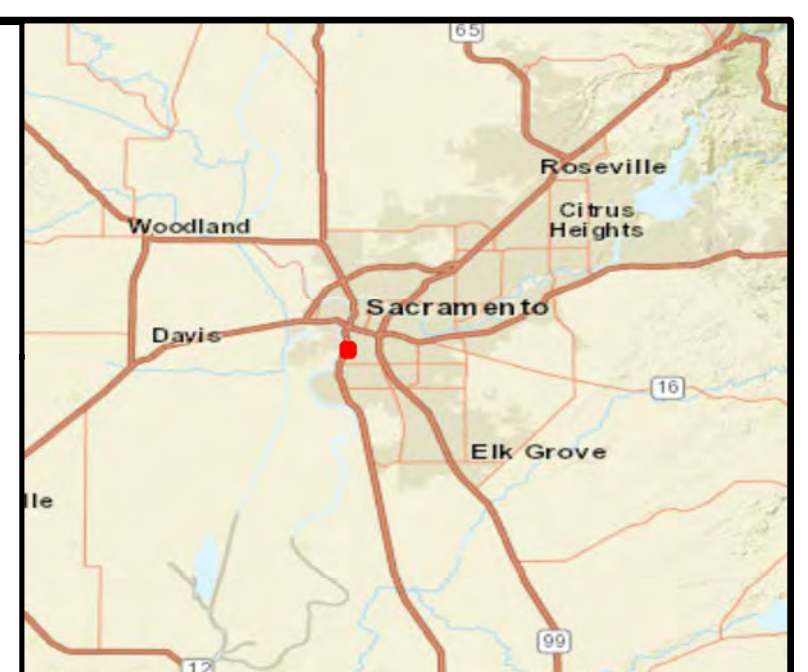
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Legend

-  Project Footprint
-  Channel (CH) - 1.070 Acres
-  Developed (DEV) - 2.856 Acres
-  Freemont Cottonwood Forest (FCF) - 3.405 Acres
-  Landscaping (LAND) - 1.593 Acres
-  Sandbar Willow Thicket (SBWT) - 1.602 Acres
-  Valley Oak Woodland (VOW) - 3.573 Acres
-  Wild Oat Grassland (WOG) - 3.248 Acres
-  Elderberry

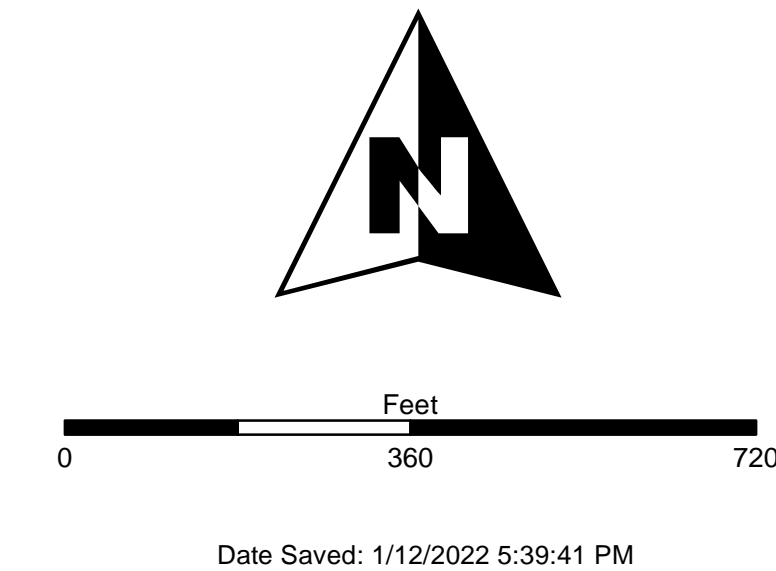


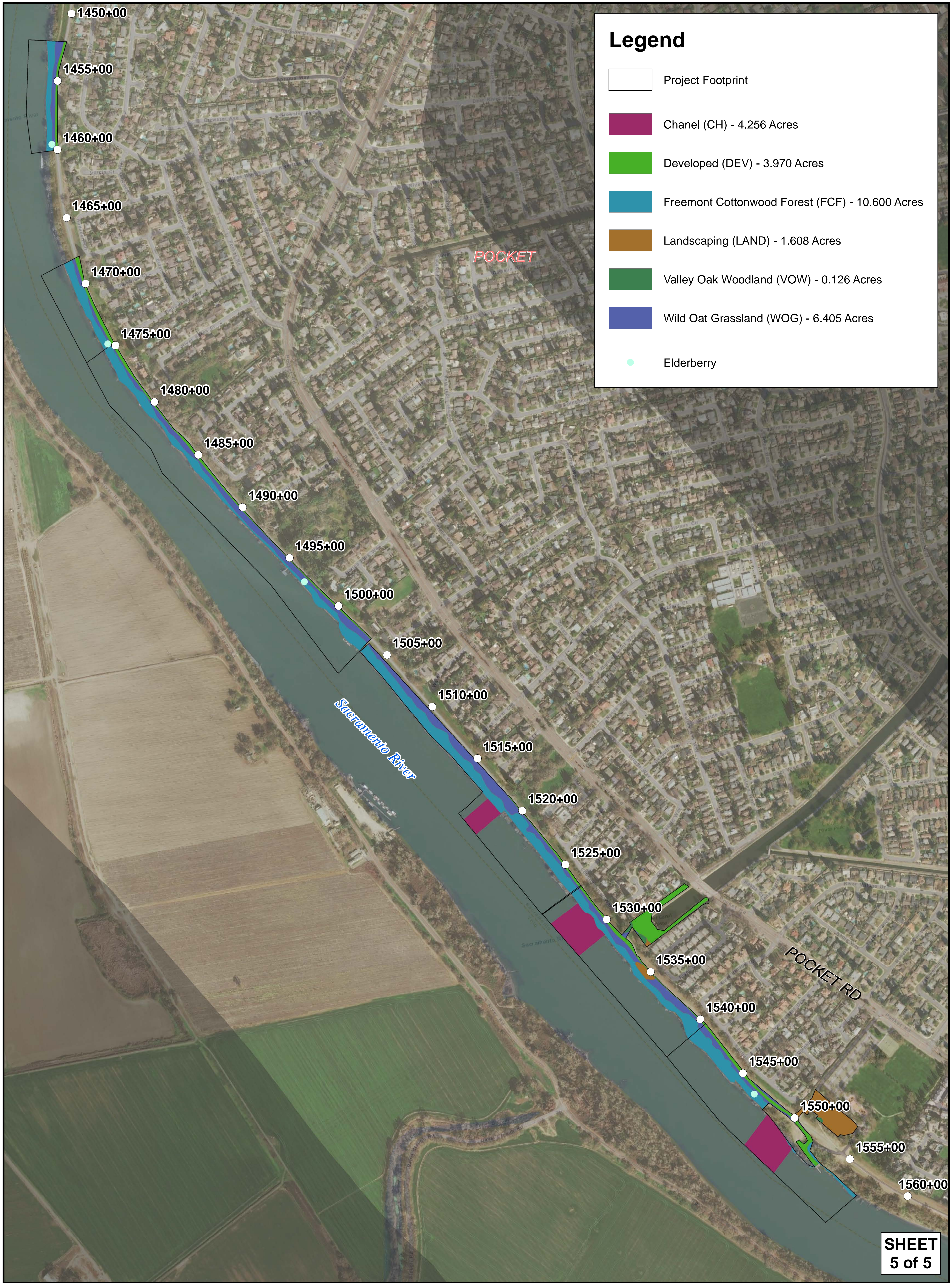
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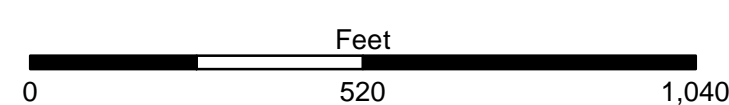
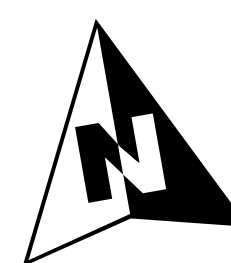
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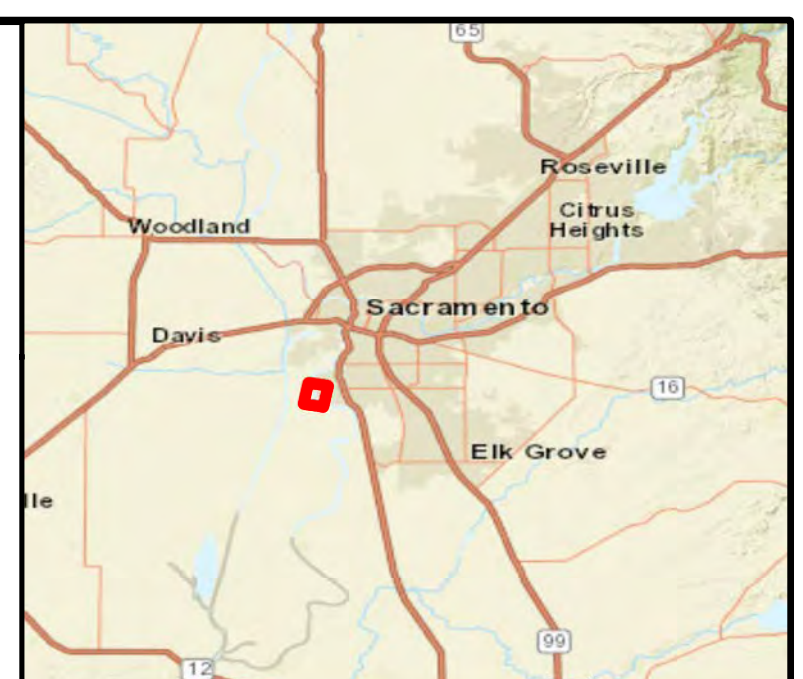
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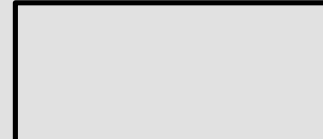



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Legend

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-  Canopy Impact Area (~1.83 Acres)
-  Bank Protect Improvement
-  Remove



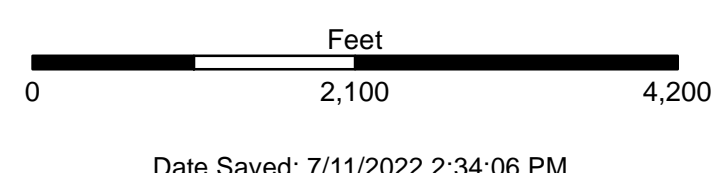
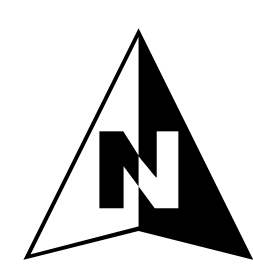
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1 of 9



SR EROSION C2 CANOPY IMPACT (95%)





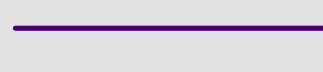

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Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.67 Acres)
-  Bank Protect Improvement
-  Remove



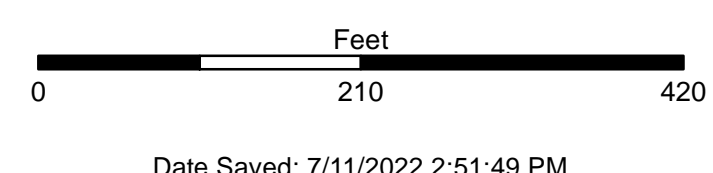
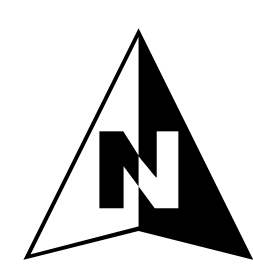
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SR EROSION C2 CANOPY IMPACT (95%)




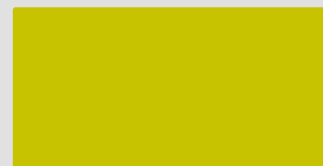
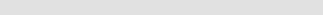

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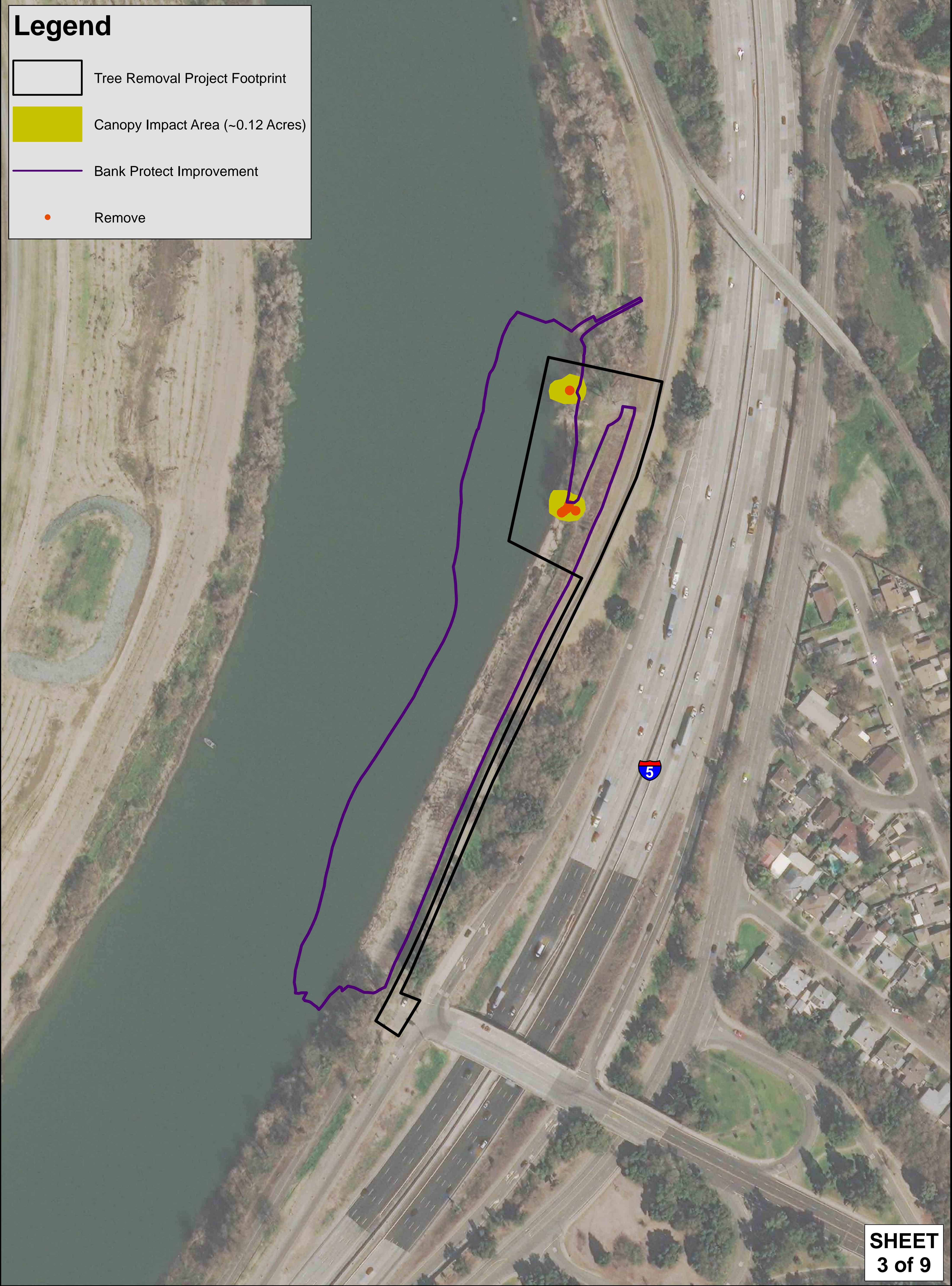


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Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.12 Acres)
-  Bank Protect Improvement
-  Remove



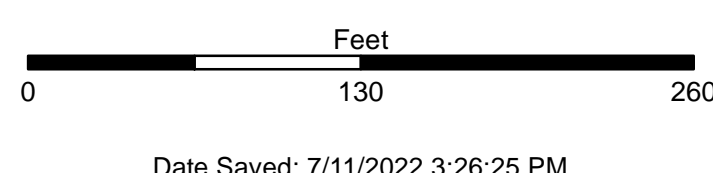
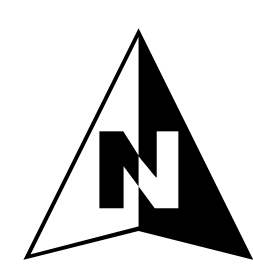
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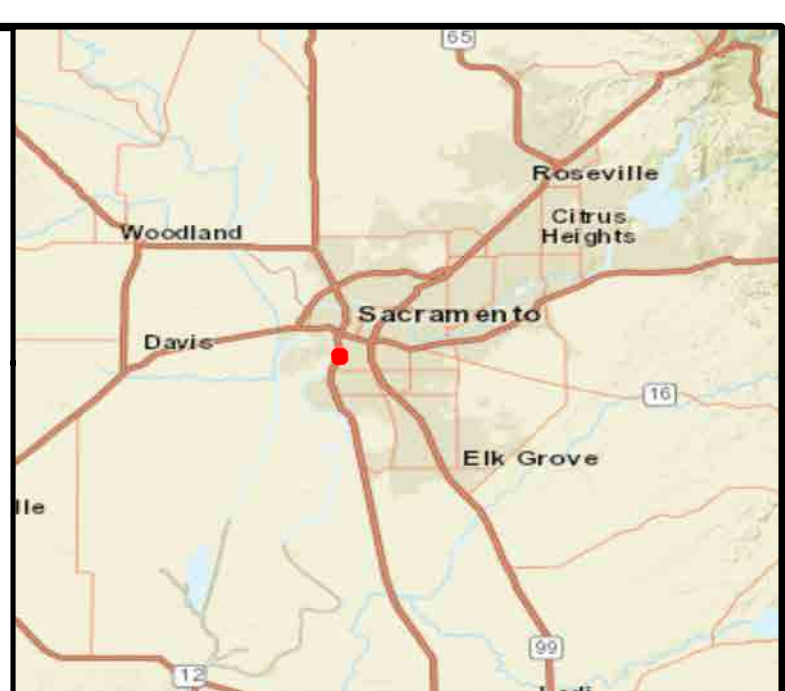
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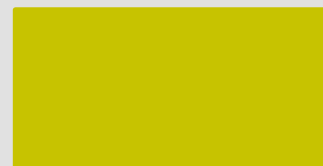


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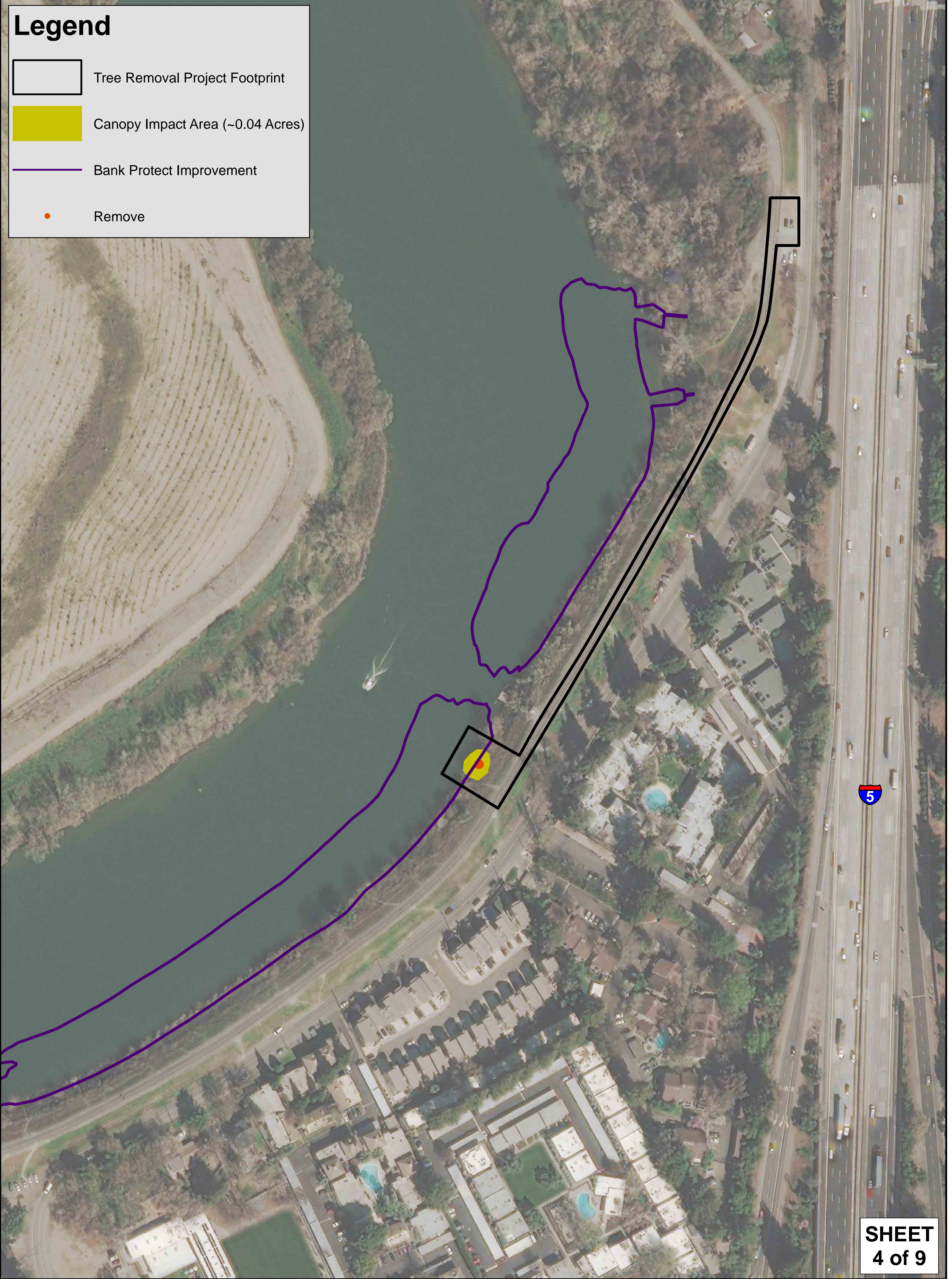


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Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.04 Acres)
-  Bank Protect Improvement
-  Remove



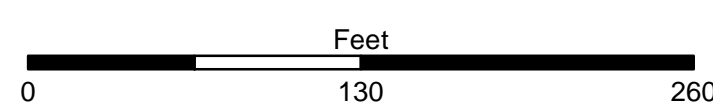
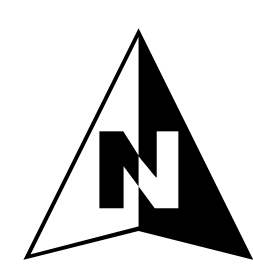
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SR EROSION C2 CANOPY IMPACT (95%)



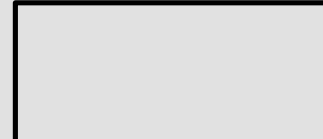

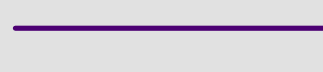

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Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.10 Acres)
-  Bank Protect Improvement
-  Remove



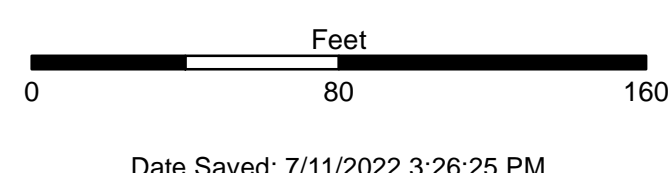
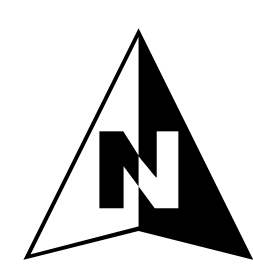
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5 of 9



SR EROSION C2 CANOPY IMPACT (95%)



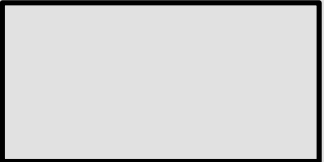
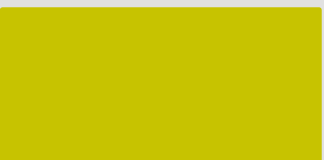
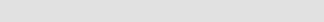

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Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.23 Acres)
-  Bank Protect Improvement
-  Remove



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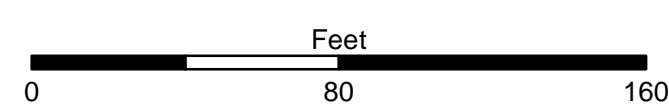
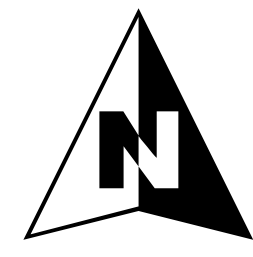


US Army Corps of Engineers
Sacramento District



SR EROSION C2 CANOPY IMPACT (95%)

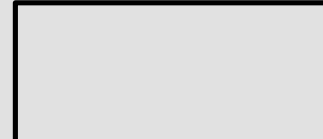

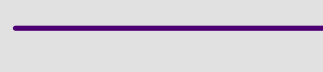

ARCF 2016



Date Saved: 7/11/2022 3:26:25 PM



Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.11 Acres)
-  Bank Protect Improvement
-  Remove



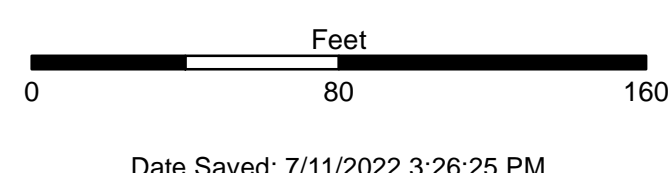
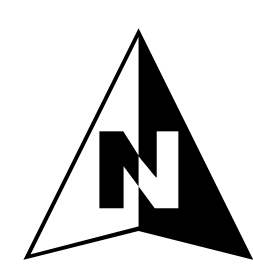
SHEET
7 of 9



SR EROSION C2 CANOPY IMPACT (95%)



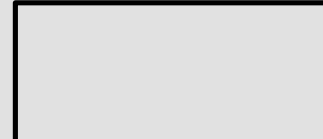

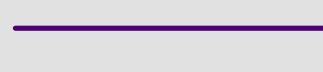

ARCF 2016



Date Saved: 7/11/2022 3:26:25 PM



Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.24 Acres)
-  Bank Protect Improvement
-  Remove



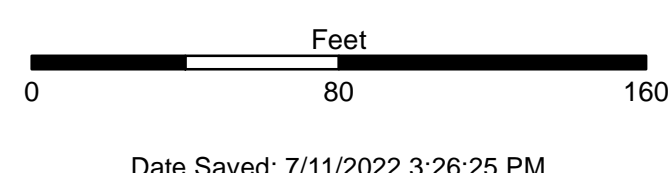
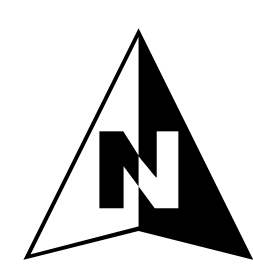
SHEET
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SR EROSION C2 CANOPY IMPACT (95%)



ARCF 2016







Date Saved: 7/11/2022 3:26:25 PM





Legend

-  Tree Removal Project Footprint
-  Canopy Impact Area (~0.33 Acres)
-  Bank Protect Improvement
-  Remove

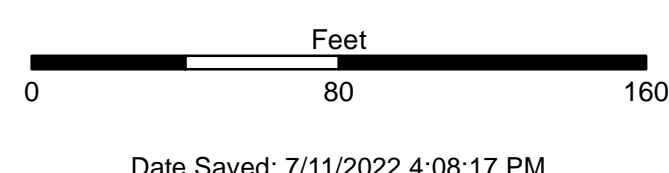
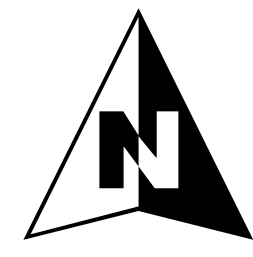
SHEET
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SR EROSION C2 CANOPY IMPACT (95%)









ARCF 2016



Date Saved: 7/11/2022 4:08:17 PM



Legend

-  Project Boundary
-  Delta Smelt Impact Area - 10.94 Acres
-  Planting Bench
-  Bank Protect Improvement
-  MHW 7.66'
-  MLLW -3.17'



SHEET
1 of 7

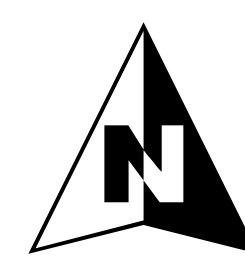


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SR EROSION C2 DELTA SMELT

(ARCF 2016)









Feet
0 2,100 4,200

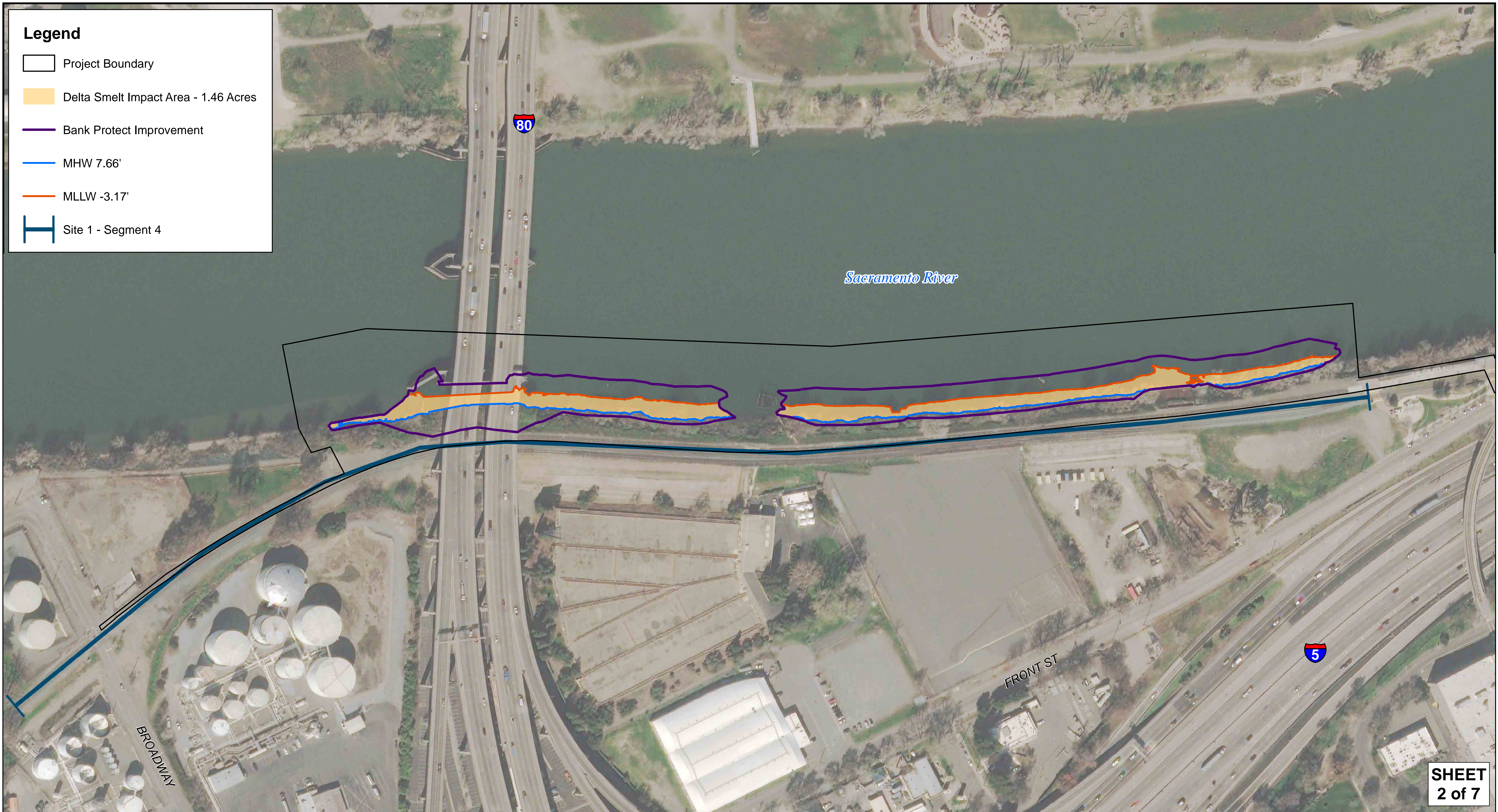
Date Saved: 7/10/2022 5:37:27 PM



Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area

Legend

-  Project Boundary
-  Delta Smelt Impact Area - 1.46 Acres
-  Bank Protect Improvement
-  MHW 7.66'
-  MLLW -3.17'
-  Site 1 - Segment 4

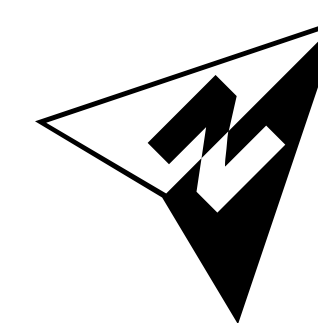


SHEET
2 of 7



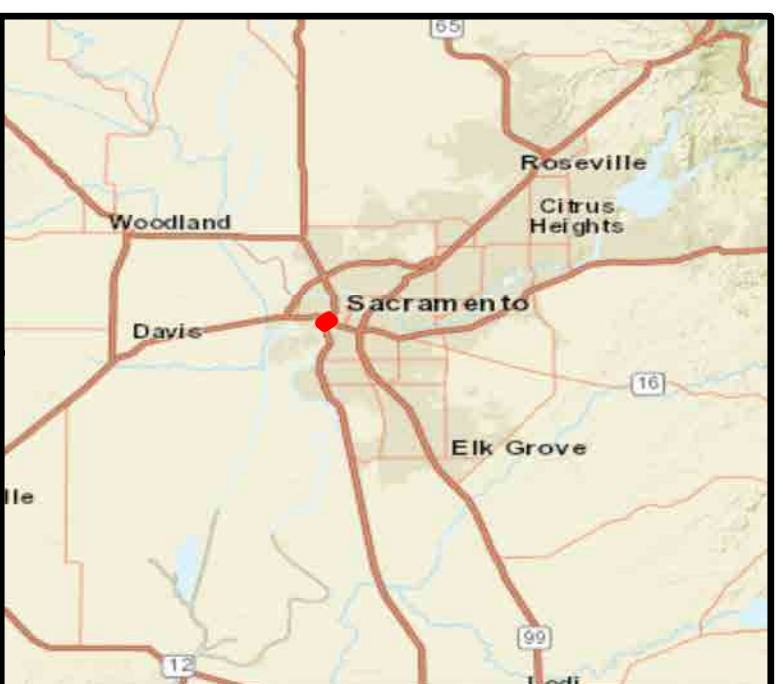
SR EROSION C2 DELTA SMELT

(ARCF 2016)



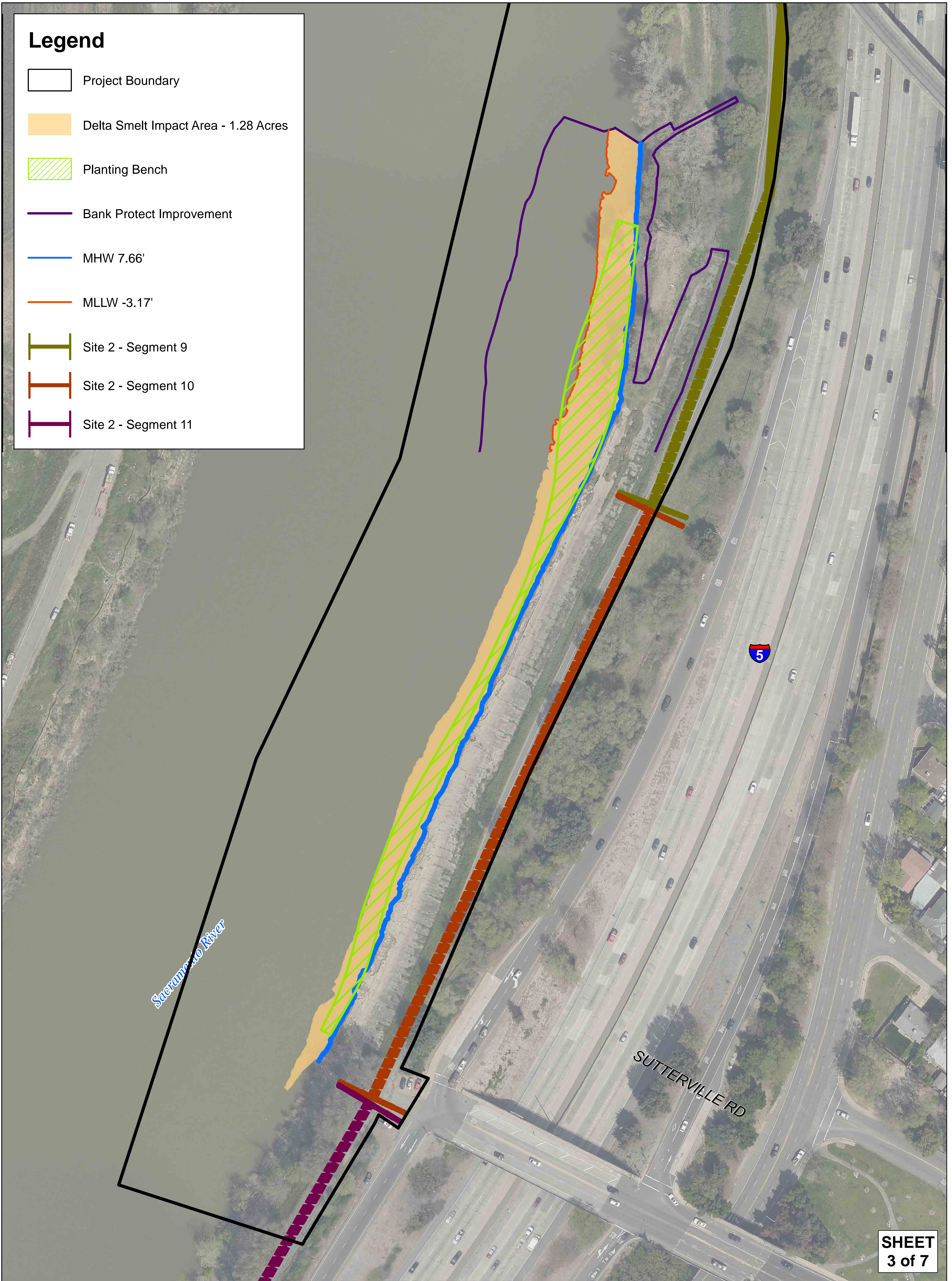
Date Saved: 7/10/2022 6:30:58 PM

Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



Legend

- Project Boundary
- Delta Smelt Impact Area - 1.28 Acres
- Planting Bench
- Bank Protect Improvement
- MHW 7.66'
- MLLW -3.17'
- Site 2 - Segment 9
- Site 2 - Segment 10
- Site 2 - Segment 11



SHEET
3 of 7

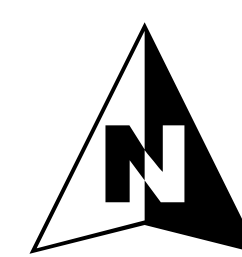


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SR EROSION C2 DELTA SMELT

(ARCF 2016)



0 90 180
Feet

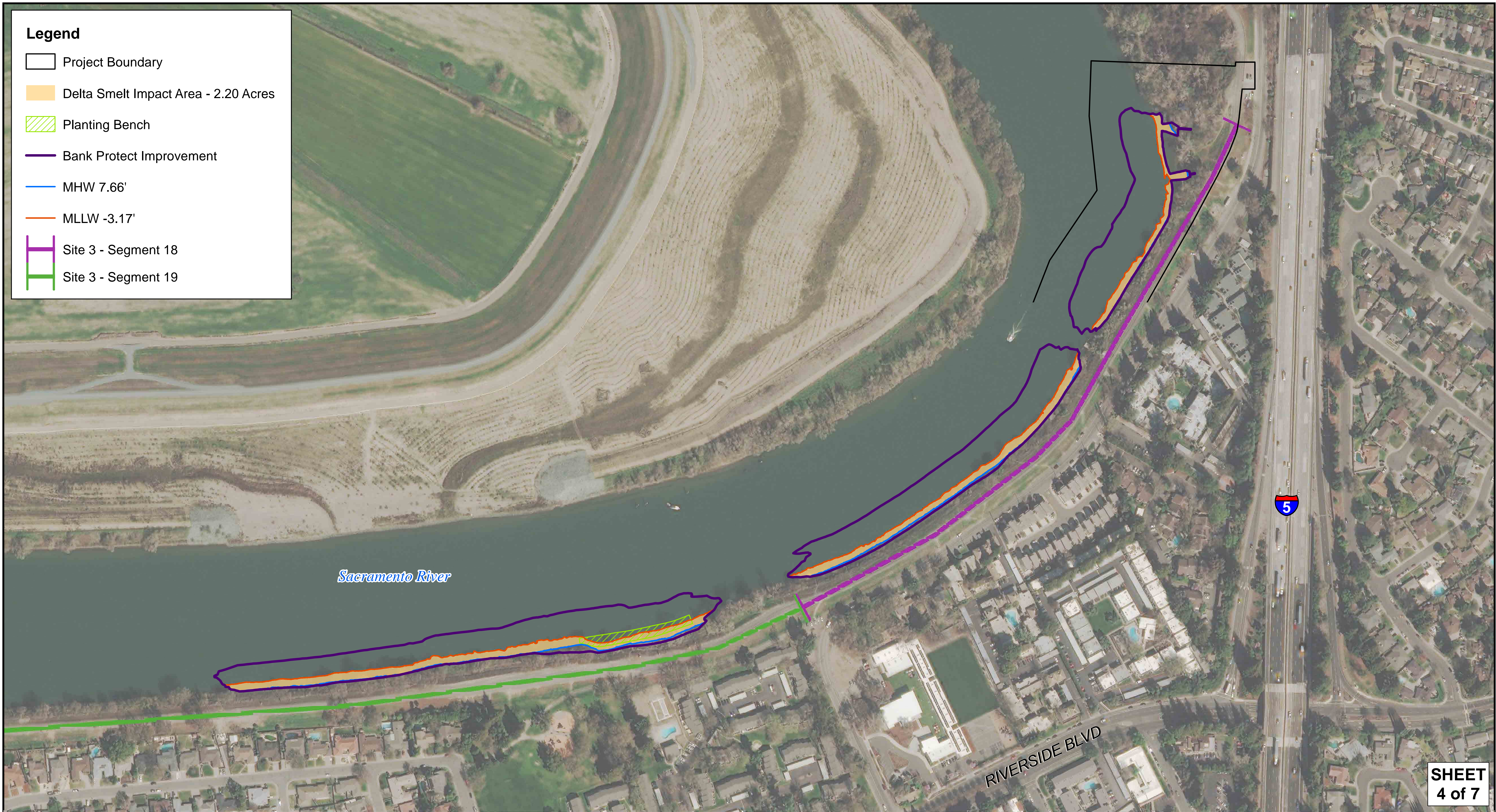
Date Saved: 7/10/2022 6:37:42 PM

Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



Legend

- Project Boundary
- Delta Smelt Impact Area - 2.20 Acres
- Planting Bench
- Bank Protect Improvement
- MHW 7.66'
- MLLW -3.17'
- Site 3 - Segment 18
- Site 3 - Segment 19

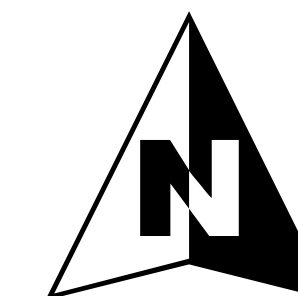


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SR EROSION C2 DELTA SMELT

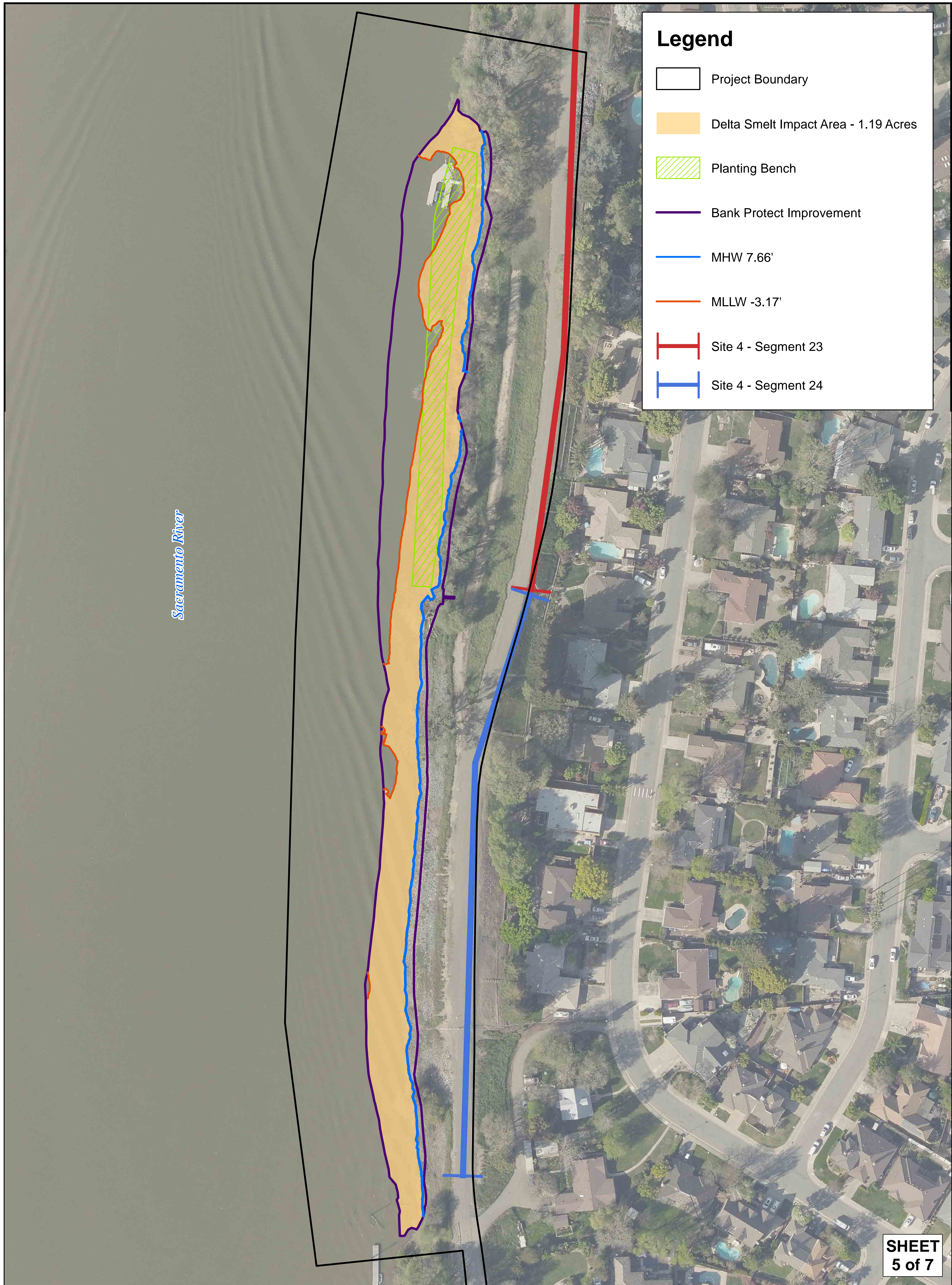
(ARCF 2016)



Date Saved: 7/10/2022 6:46:30 PM

Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



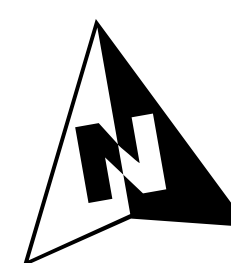


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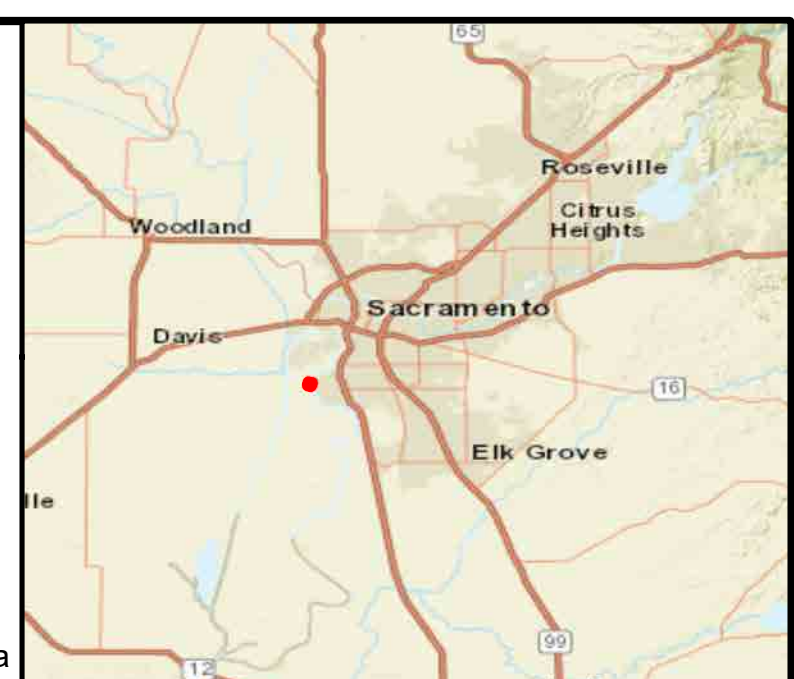
SR EROSION C2 DELTA SMELT

(ARCF 2016)



Feet
0 80 160










Date Saved: 7/10/2022 6:15:47 PM



Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



Legend

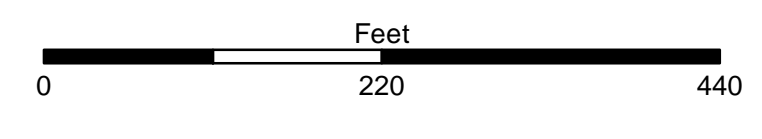
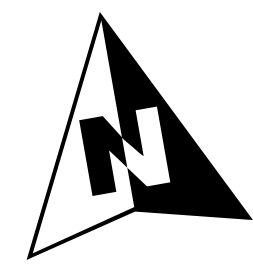
-  Project Boundary
-  Delta Smelt Impact Area - 3.28 Acres
-  Planting Bench
-  Bank Protect Improvement
-  MHW 7.66'
-  MLLW -3.17'
-  Site 5 - Segment 25
-  Site 5 - Segment 26
-  Site 5 - Segment 27

SHEET
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SR EROSION C2 DELTA SMELT

(ARCF 2016)



Date Saved: 7/10/2022 6:11:58 PM



Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area

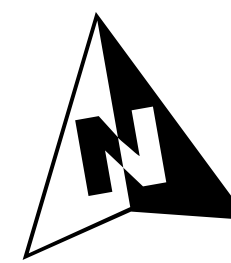


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Sacramento District



SR EROSION C2 DELTA SMELT

(ARCF 2016)



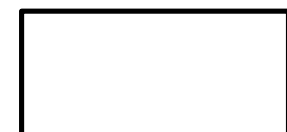
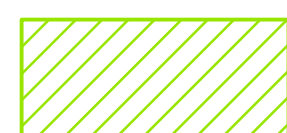



Feet
0 190 380

Date Saved: 7/10/2022 6:06:36 PM



Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area

Legend

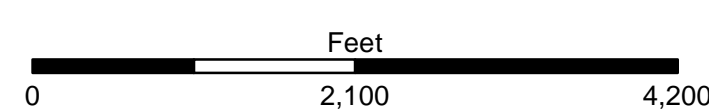
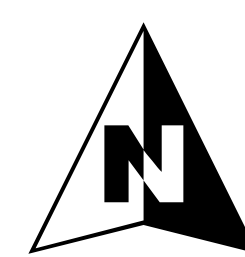
-  Project Boundary
-  Planting Bench
-  Salmonid/GS Impact Area - 31.71 Acres
-  Bank Protect Improvement
-  OHWM - 2021



SHEET
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SR EROSION C2 SALMONID/GREEN STURGEON (ARCF 2016)



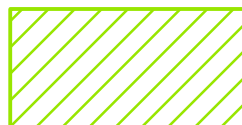





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Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area.

Legend

-  Project Boundary
-  Salmonid/GS Impact Area - 3.94 Acres
-  Planting Bench
-  Bank Protect Improvement
-  OHWM - 2021
-  Site 1 - Segment 4

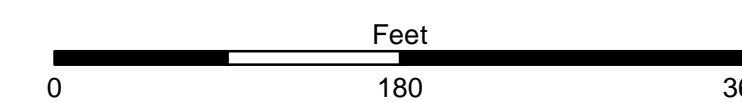
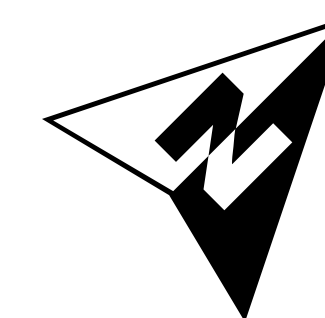


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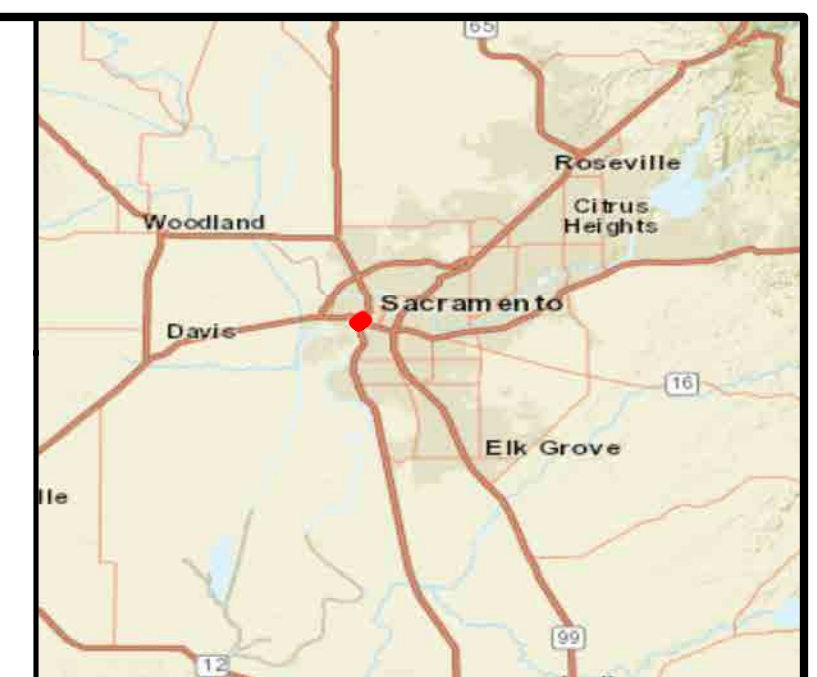
SR EROSION C2 SALMONID/GREEN STURGEON

(ARCF 2016)











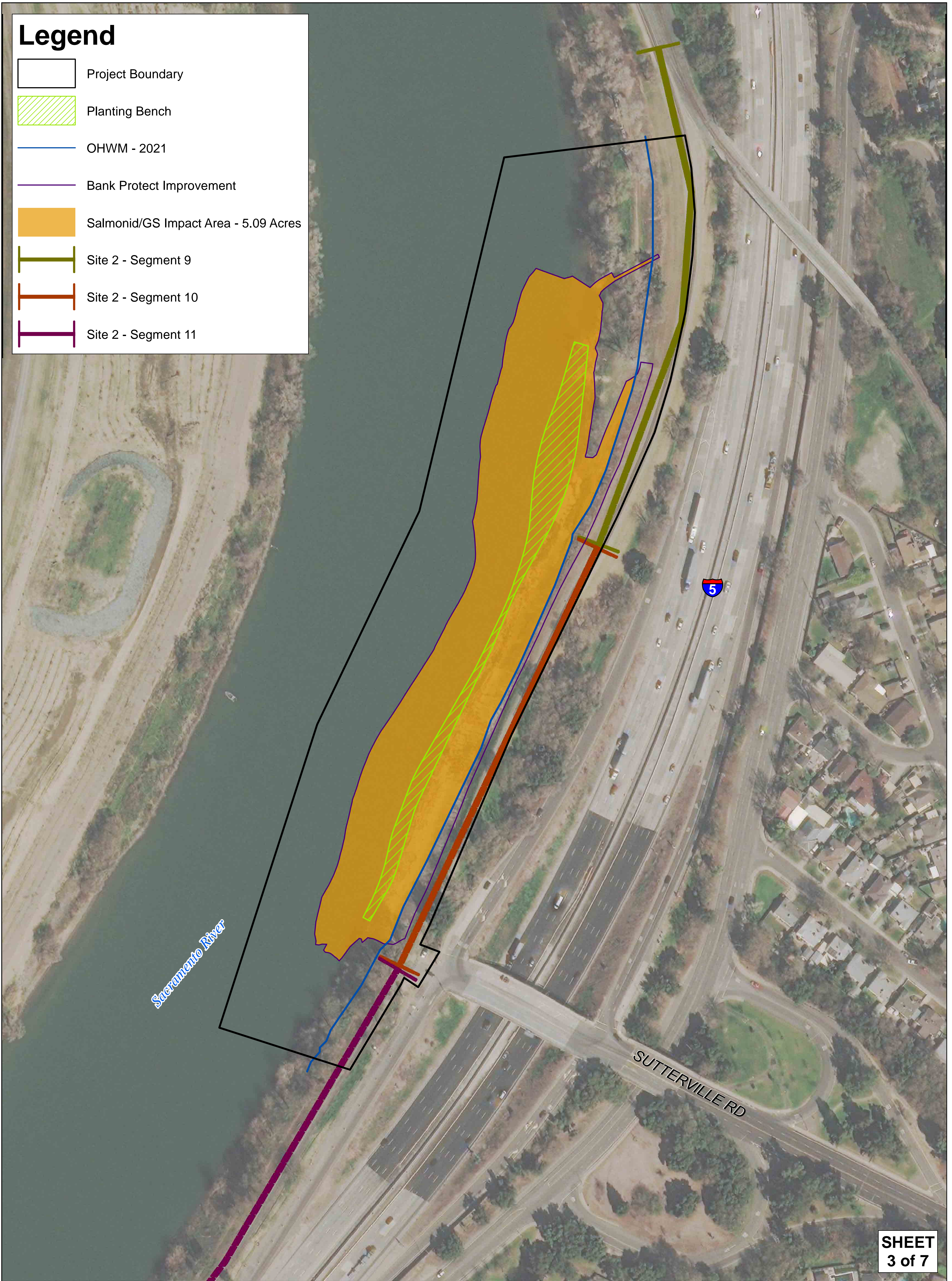
Date Saved: 7/10/2022 8:19:35 PM

Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area

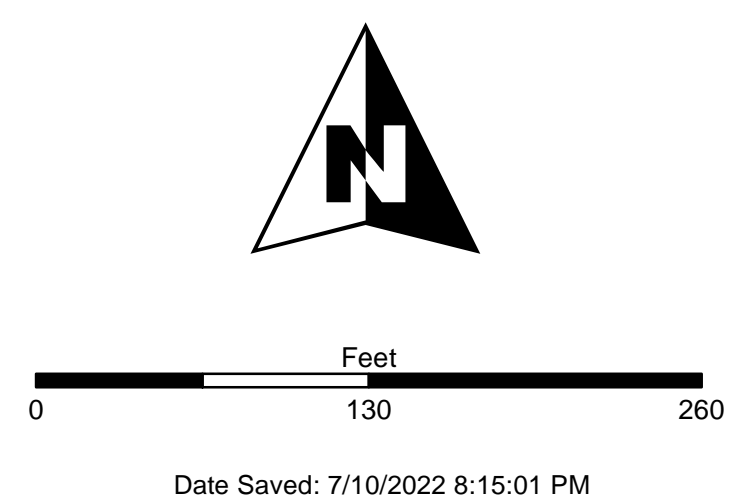


Legend

-  Project Boundary
-  Planting Bench
-  OHWM - 2021
-  Bank Protect Improvement
-  Salmonid/GS Impact Area - 5.09 Acres
-  Site 2 - Segment 9
-  Site 2 - Segment 10
-  Site 2 - Segment 11










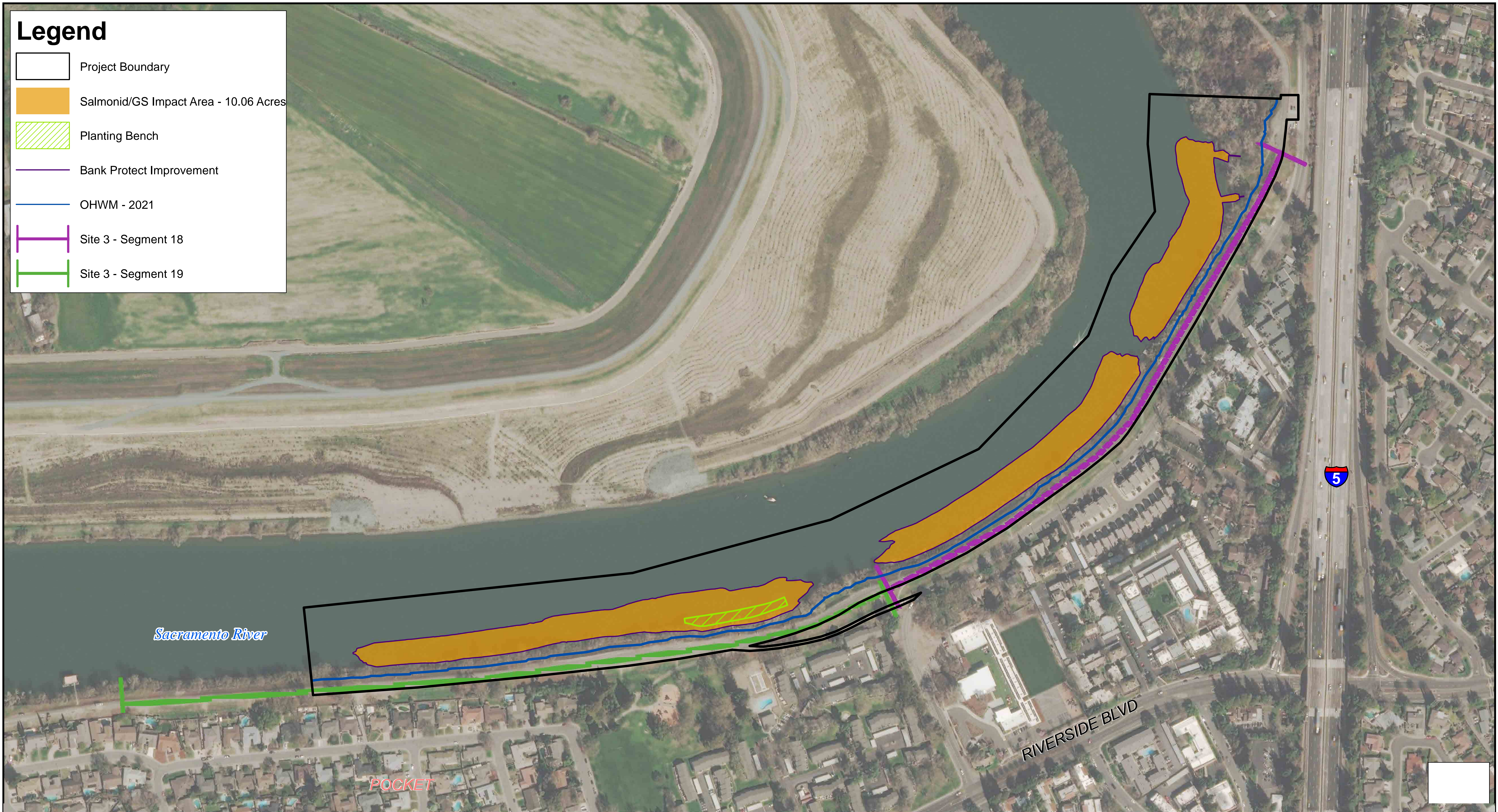
SR EROSION C2 SALMONID/GREEN STURGEON (ARCF 2016)



Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area

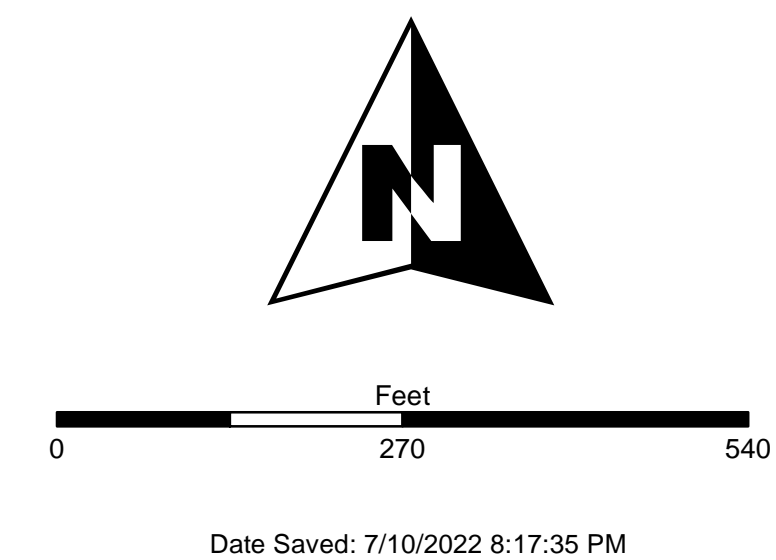
Legend

-  Project Boundary
-  Salmonid/GS Impact Area - 10.06 Acres
-  Planting Bench
-  Bank Protect Improvement
-  OHWM - 2021
-  Site 3 - Segment 18
-  Site 3 - Segment 19



SR EROSION C2 SALMONID/GREEN STURGEON



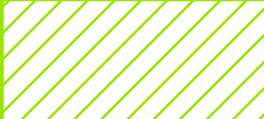




(ARCF 2016)



Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



Legend

-  Project Boundary
-  Salmonid/GS Impact Area - 2.22 Acres
-  Planting Bench
-  Bank Protect Improvement
-  OHWM - 2021
-  Site 4 - Segment 23
-  Site 4 - Segment 24

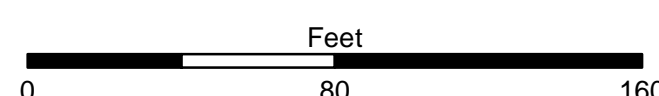
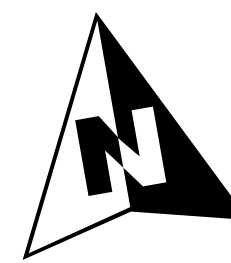
Sacramento River



SHEET
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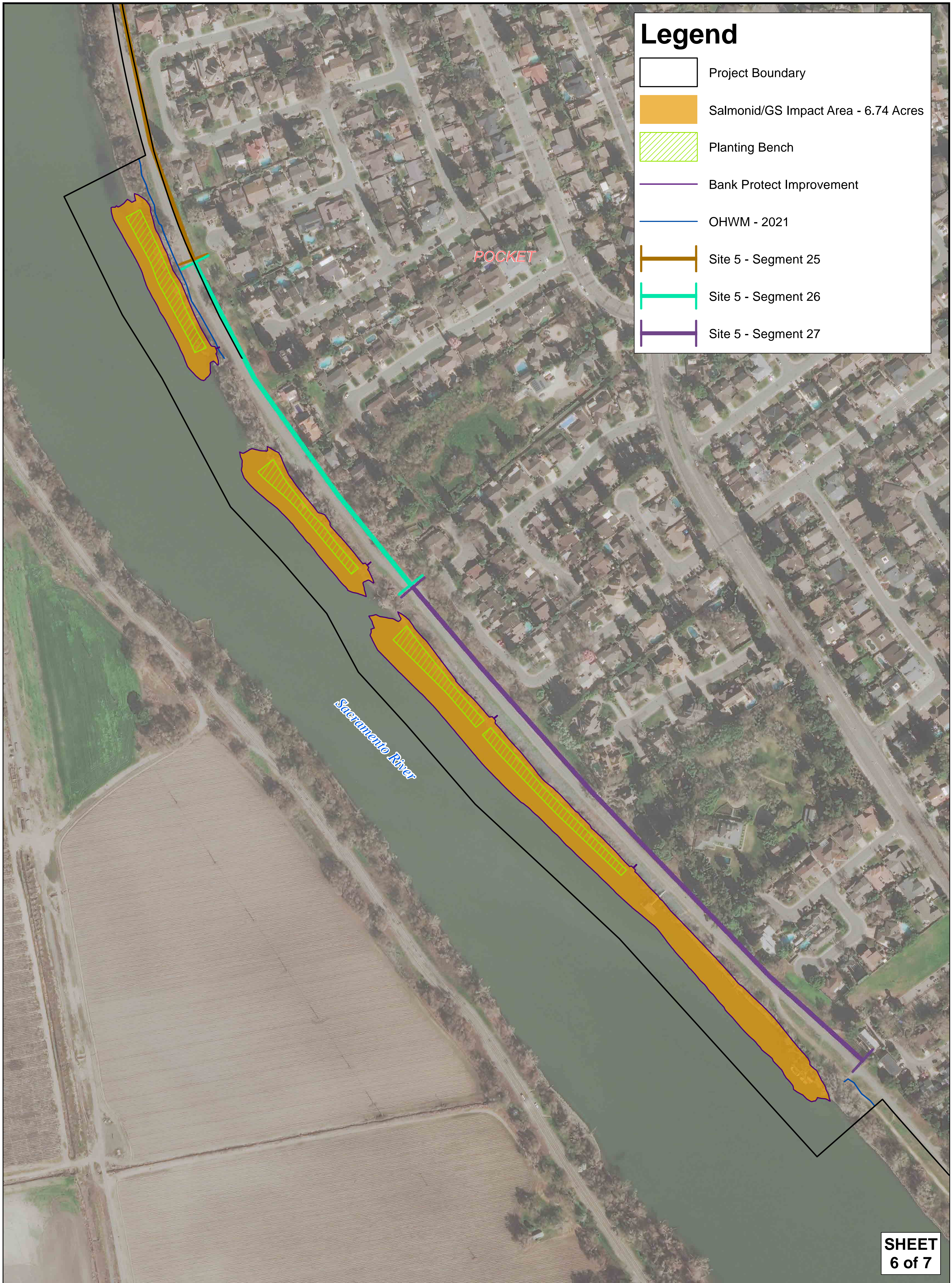
SR EROSION C2 SALMONID/GREEN STURGEON (ARCF 2016)



Date Saved: 3/14/2022 3:04:46 PM

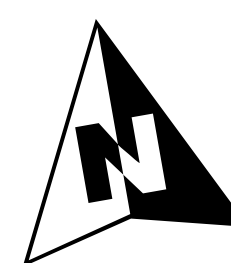
Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area





US Army Corps of Engineers
Sacramento District

SR EROSION C2 SALMONID/GREEN STURGEON (ARCF 2016)

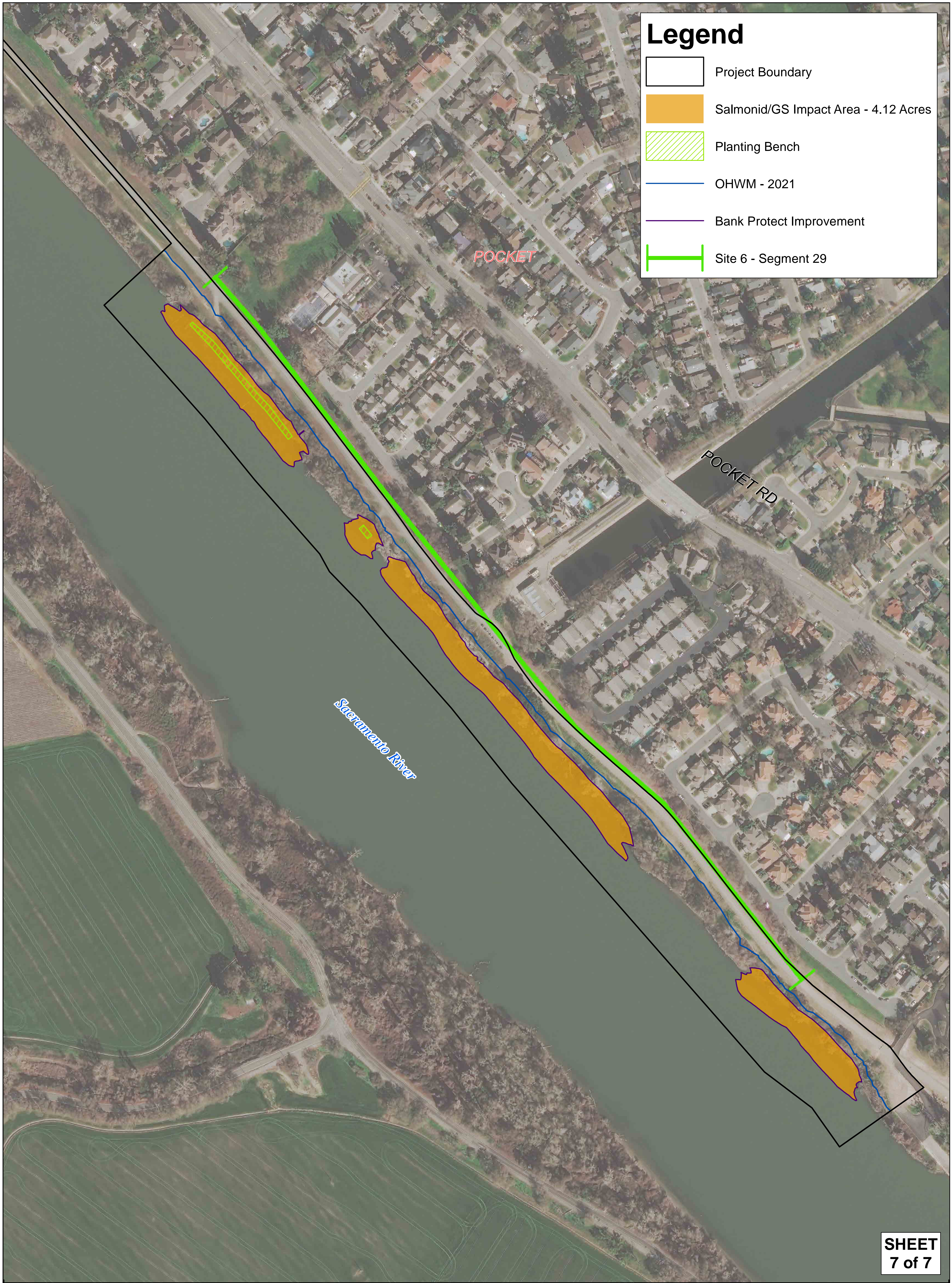


0 220 440
Feet



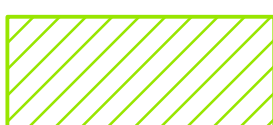



Date Saved: 3/14/2022 3:04:40 PM

Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



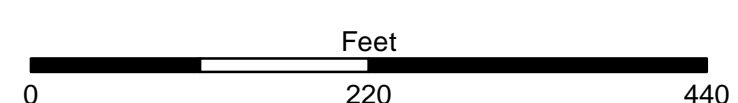
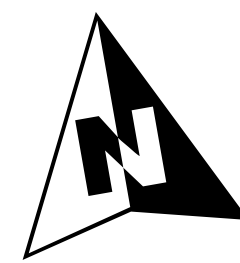


Legend

-  Project Boundary
-  Salmonid/GS Impact Area - 4.12 Acres
-  Planting Bench
-  OHWM - 2021
-  Bank Protect Improvement
-  Site 6 - Segment 29



SR EROSION C2 SALMONID/GREEN STURGEON (ARCF 2016)



Date Saved: 3/14/2022 3:36:21 PM

Note: Mapped areas shows lateral extent. The Impact calculation was done using the slope area



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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad (Sacramento East (3812154) OR Sacramento West (3812155) OR Clarksburg (3812145) OR Taylor Monument (3812165) OR Rio Linda (3812164) OR Florin (3812144) OR Bruceville (3812134) OR Liberty Island (3812136) OR Davis (3812156) OR Grays Bend (3812166))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Accipiter cooperii</i> Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
<i>Agelaius tricolor</i> tricolored blackbird	ABPBXB0020	None	Threatened	G1G2	S1S2	SSC
<i>Antrozous pallidus</i> pallid bat	AMACC10010	None	None	G4	S3	SSC
<i>Archoplites interruptus</i> Sacramento perch	AFCQB07010	None	None	G2G3	S1	SSC
<i>Ardea alba</i> great egret	ABNGA04040	None	None	G5	S4	
<i>Ardea herodias</i> great blue heron	ABNGA04010	None	None	G5	S4	
<i>Astragalus tener var. ferrisiae</i> Ferris' milk-vetch	PDFAB0F8R3	None	None	G2T1	S1	1B.1
<i>Astragalus tener var. tener</i> alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
<i>Athene cunicularia</i> burrowing owl	ABNSB10010	None	None	G4	S3	SSC
<i>Atriplex cordulata var. cordulata</i> heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
<i>Atriplex depressa</i> brittlescale	PDCHE042L0	None	None	G2	S2	1B.2
<i>Bombus crotchii</i> Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
<i>Bombus occidentalis</i> western bumble bee	IIHYM24250	None	None	G2G3	S1	
<i>Branchinecta lynchi</i> vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
<i>Branchinecta mesovallensis</i> midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
<i>Brasenia schreberi</i> watershield	PDCAB01010	None	None	G5	S3	2B.3
<i>Buteo regalis</i> ferruginous hawk	ABNKC19120	None	None	G4	S3S4	WL
<i>Buteo swainsoni</i> Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	



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



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
Charadrius montanus mountain plover	ABNNB03100	None	None	G3	S2S3	SSC
Charadrius nivosus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cicindela hirticollis abrupta Sacramento Valley tiger beetle	IICOL02106	None	None	G5TH	SH	
Cicuta maculata var. bolanderi Bolander's water-hemlock	PDAP10M051	None	None	G5T4T5	S2?	2B.1
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Cuscuta obtusiflora var. glandulosa Peruvian dodder	PDCUS01111	None	None	G5T4?	SH	2B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S3	
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Elderberry Savanna Elderberry Savanna	CTT63440CA	None	None	G2	S2.1	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Fritillaria agrestis stinkbells	PMLIL0V010	None	None	G3	S3	4.2
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S1S2	
Gratiola heterosepala Boggs Lake hedge-hyssop	PDSCR0R060	None	Endangered	G2	S2	1B.2



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



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Hibiscus lasiocarpus var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Hydrochara rickseckeri Ricksecker's water scavenger beetle	IICOL5V010	None	None	G2?	S2?	
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Lasionycteris noctivagans silver-haired bat	AMACC02010	None	None	G3G4	S3S4	
Lasiurus cinereus hoary bat	AMACC05030	None	None	G3G4	S4	
Lasthenia chrysantha alkali-sink goldfields	PDAST5L030	None	None	G2	S2	1B.1
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Legenere limosa legenere	PDCAM0C010	None	None	G2	S2	1B.1
Lepidium latipes var. heckardii Heckard's pepper-grass	PDBRA1M0K1	None	None	G4T1	S1	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Lilaeopsis masonii Mason's lilaeopsis	PDAPI19030	None	Rare	G2	S2	1B.1
Limosella australis Delta mudwort	PDSCR10030	None	None	G4G5	S2	2B.1
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Myrmosula pacifica Antioch multilid wasp	IIHYM15010	None	None	GH	SH	
Nannopterum auritum double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	



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



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Oncorhynchus tshawytscha pop. 11 chinook salmon - Central Valley spring-run ESU	AFCHA0205L	Threatened	Threatened	G5T1T2Q	S2	
Oncorhynchus tshawytscha pop. 7 chinook salmon - Sacramento River winter-run ESU	AFCHA0205B	Endangered	Endangered	G5T1Q	S1	
Plegadis chihi white-faced ibis	ABNGE02020	None	None	G5	S3S4	WL
Pogonichthys macrolepidotus Sacramento splittail	AFCJB34020	None	None	GNR	S3	SSC
Progne subis purple martin	ABPAU01010	None	None	G5	S3	SSC
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Riparia riparia bank swallow	ABPAU08010	None	Threatened	G5	S2	
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Scutellaria galericulata marsh skullcap	PDLAM1U0J0	None	None	G5	S2	2B.2
Scutellaria lateriflora side-flowering skullcap	PDLAM1U0Q0	None	None	G5	S2	2B.2
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Symphotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Xanthocephalus xanthocephalus yellow-headed blackbird	ABPBXB3010	None	None	G5	S3	SSC

Record Count: 81







CNPS Rare Plant Inventory
















Search Results

33 matches found. Click on scientific name for details

Search Criteria: CRPR is one of [1A:1B:2A:2B:3:4] , Quad is one of [3812155:3812165:3812164:3812144:3812154:3812145:3812166:3812156:3812134:3812136]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	PHOTO
<u><i>Astragalus pauperculus</i></u>	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G4	S4	4.3	 ©2012 Tim Kellison
<u><i>Astragalus tener</i> var. <i>ferrisiae</i></u>	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	None	None	G2T1	S1	1B.1	No Photo Available
<u><i>Astragalus tener</i> var. <i>tener</i></u>	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	No Photo Available
<u><i>Atriplex cordulata</i> var. <i>cordulata</i></u>	heartscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G3T2	S2	1B.2	 © 1994 Robert E. Preston, Ph.D.
<u><i>Atriplex depressa</i></u>	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2	 © 2009 Zoya Akulova
<u><i>Brasenia schreberi</i></u>	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	None	None	G5	S3	2B.3	 ©2014 Kirsten Bovee
<u><i>Brodiaea rosea</i> ssp. <i>vallicola</i></u>	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr-May(Jun)	None	None	G5T3	S3	4.2	 © 2011 Steven Perry
<u><i>Carex comosa</i></u>	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1	 Dean Wm. Taylor 1997
<u><i>Centromadia parryi</i></u>	pappose	Asteraceae	annual herb	May-Nov	None	None	G3T2	S2	1B.2	

<u><i>ssp. parryi</i></u>	tarplant										No Photo Available
<u><i>Centromadia parryi</i></u> <u><i>ssp. rudis</i></u>	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	None	None	G3T3	S3	4.2		No Photo Available
<u><i>Chloropyron palmatum</i></u>	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	FE	CE	G1	S1	1B.1		No Photo Available
<u><i>Cicuta maculata</i></u> <u>var. <i>bolanderi</i></u>	Bolander's water-hemlock	Apiaceae	perennial herb	Jul-Sep	None	None	G5T4T5	S2?	2B.1		No Photo Available
<u><i>Cuscuta obtusiflora</i></u> <u>var. <i>glandulosa</i></u>	Peruvian dodder	Convolvulaceae	annual vine (parasitic)	Jul-Oct	None	None	G5T4?	SH	2B.2		No Photo Available
<u><i>Downingia pusilla</i></u>	dwarf downingia	Campanulaceae	annual herb	Mar-May	None	None	GU	S2	2B.2		No Photo Available
<u><i>Extriplex joaquinana</i></u>	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	None	None	G2	S2	1B.2		No Photo Available
<u><i>Fritillaria agrestis</i></u>	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	None	None	G3	S3	4.2		© 2016 Aaron Schusteff
<u><i>Gratiola heterosepala</i></u>	Boggs Lake hedge-hyssop	Plantaginaceae	annual herb	Apr-Aug	None	CE	G2	S2	1B.2		©2004 Carol W. Witham
<u><i>Hesperervax caulescens</i></u>	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	None	None	G3	S3	4.2		© 2017 John Doyen
<u><i>Hibiscus lasiocarpus</i></u> var. <u><i>occidentalis</i></u>	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	None	None	G5T3	S3	1B.2		© 2020 Steven Perry
<u><i>Lasthenia chrysantha</i></u>	alkali-sink goldfields	Asteraceae	annual herb	Feb-Apr	None	None	G2	S2	1B.1		© 2009 California State University, Stanislaus
<u><i>Lasthenia ferrisiae</i></u>	Ferris' goldfields	Asteraceae	annual herb	Feb-May	None	None	G3	S3	4.2		© 2009

<i>Lathyrus jepsonii</i> <i>var. jepsonii</i>	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	None	None	G5T2	S2	1B.2	 © 2003 Mark Fogiel
<i>Legenere limosa</i>	legenere	Campanulaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.1	 ©2000 John Game
<i>Lepidium latipes</i> <i>var. heckardii</i>	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	None	None	G4T1	S1	1B.2	 2018 Jennifer Buck
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	Apiaceae	perennial rhizomatous herb	Apr-Nov	None	CR	G2	S2	1B.1	No Photo Available
<i>Limosella australis</i>	Delta mudwort	Scrophulariaceae	perennial stoloniferous herb	May-Aug	None	None	G4G5	S2	2B.1	 © 2020 Richard Sage
<i>Navarretia</i> <i>cotulifolia</i>	cotula navarretia	Polemoniaceae	annual herb	May-Jun	None	None	G4	S4	4.2	 © 2020 Zoya Akulova
<i>Puccinellia simplex</i>	California alkali grass	Poaceae	annual herb	Mar-May	None	None	G3	S2	1B.2	No Photo Available
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2	 ©2013 Debra L. Cook
<i>Scutellaria</i> <i>galericulata</i>	marsh skullcap	Lamiaceae	perennial rhizomatous herb	Jun-Sep	None	None	G5	S2	2B.2	 © 2021 Scot Loring
<i>Scutellaria</i> <i>lateriflora</i>	side-flowering skullcap	Lamiaceae	perennial rhizomatous herb	Jul-Sep	None	None	G5	S2	2B.2	No Photo Available
<i>Symphotrichum</i> <i>lentum</i>	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	None	None	G2	S2	1B.2	No Photo

Available

Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	None	None	G2	S2	1B.2	No Photo Available
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Showing 1 to 33 of 33 entries

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CONTACT US

Send questions and comments to rareplants@cnps.org.



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IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Sacramento and Yolo counties, California



Local offices

San Francisco Bay-Delta Fish And Wildlife

☎ (916) 930-5603

📠 (916) 930-5654

650 Capitol Mall
Suite 8-300
Sacramento, CA 95814

[http://kim_squires@fws.gov](mailto:kim_squires@fws.gov)

Sacramento Fish And Wildlife Office

☎ (916) 414-6600

📠 (916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [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.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Least Bell's Vireo <i>Vireo bellii pusillus</i> Wherever found There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/5945	Endangered
Yellow-billed Cuckoo <i>Coccyzus americanus</i> There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

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

Amphibians

NAME	STATUS
California Red-legged Frog <i>Rana draytonii</i>	Threatened
Wherever found	
There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/2891	
California Tiger Salamander <i>Ambystoma californiense</i>	Threatened
There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/2076	

Fishes

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

Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i>	Candidate
Wherever found	
No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	
Valley Elderberry Longhorn Beetle <i>Desmocerus californicus dimorphus</i>	Threatened
Wherever found	
There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/7850	

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp <i>Branchinecta conservatio</i>	Endangered
Wherever found	
There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/8246	
Vernal Pool Fairy Shrimp <i>Branchinecta lynchi</i>	Threatened
Wherever found	
There is final critical habitat for this species. The location of the critical habitat is not available. https://ecos.fws.gov/ecp/species/498	

Vernal Pool Tadpole Shrimp *Lepidurus packardii*

Endangered

Wherever found

There is **final** critical habitat for this species. The location of the critical habitat is not available.

<https://ecos.fws.gov/ecp/species/2246>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

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

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

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 (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH

THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

<p>Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p>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.</p> <p>https://ecos.fws.gov/ecp/species/1626</p>	Breeds Jan 1 to Aug 31
<p>Black Tern <i>Chlidonias niger</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/3093</p>	Breeds May 15 to Aug 20
<p>Black-chinned Sparrow <i>Spizella atrogularis</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9447</p>	Breeds Apr 15 to Jul 31
<p>California Thrasher <i>Toxostoma redivivum</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Jan 1 to Jul 31
<p>Clark's Grebe <i>Aechmophorus clarkii</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Jun 1 to Aug 31
<p>Common Yellowthroat <i>Geothlypis trichas sinuosa</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p> <p>https://ecos.fws.gov/ecp/species/2084</p>	Breeds May 20 to Jul 31
<p>Golden Eagle <i>Aquila chrysaetos</i></p> <p>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.</p> <p>https://ecos.fws.gov/ecp/species/1680</p>	Breeds Jan 1 to Aug 31
<p>Lawrence's Goldfinch <i>Carduelis lawrencei</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9464</p>	Breeds Mar 20 to Sep 20
<p>Marbled Godwit <i>Limosa fedoa</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9481</p>	Breeds elsewhere
<p>Nuttall's Woodpecker <i>Picoides nuttallii</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p> <p>https://ecos.fws.gov/ecp/species/9410</p>	Breeds Apr 1 to Jul 20

Oak Titmouse <i>Baeolophus inornatus</i> 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 <i>Contopus cooperi</i> 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 <i>Limnodromus griseus</i> 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 <i>Agelaius tricolor</i> 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
Willet <i>Tringa semipalmata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit <i>Chamaea fasciata</i> 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 <i>Pica nuttalli</i> 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.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

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.

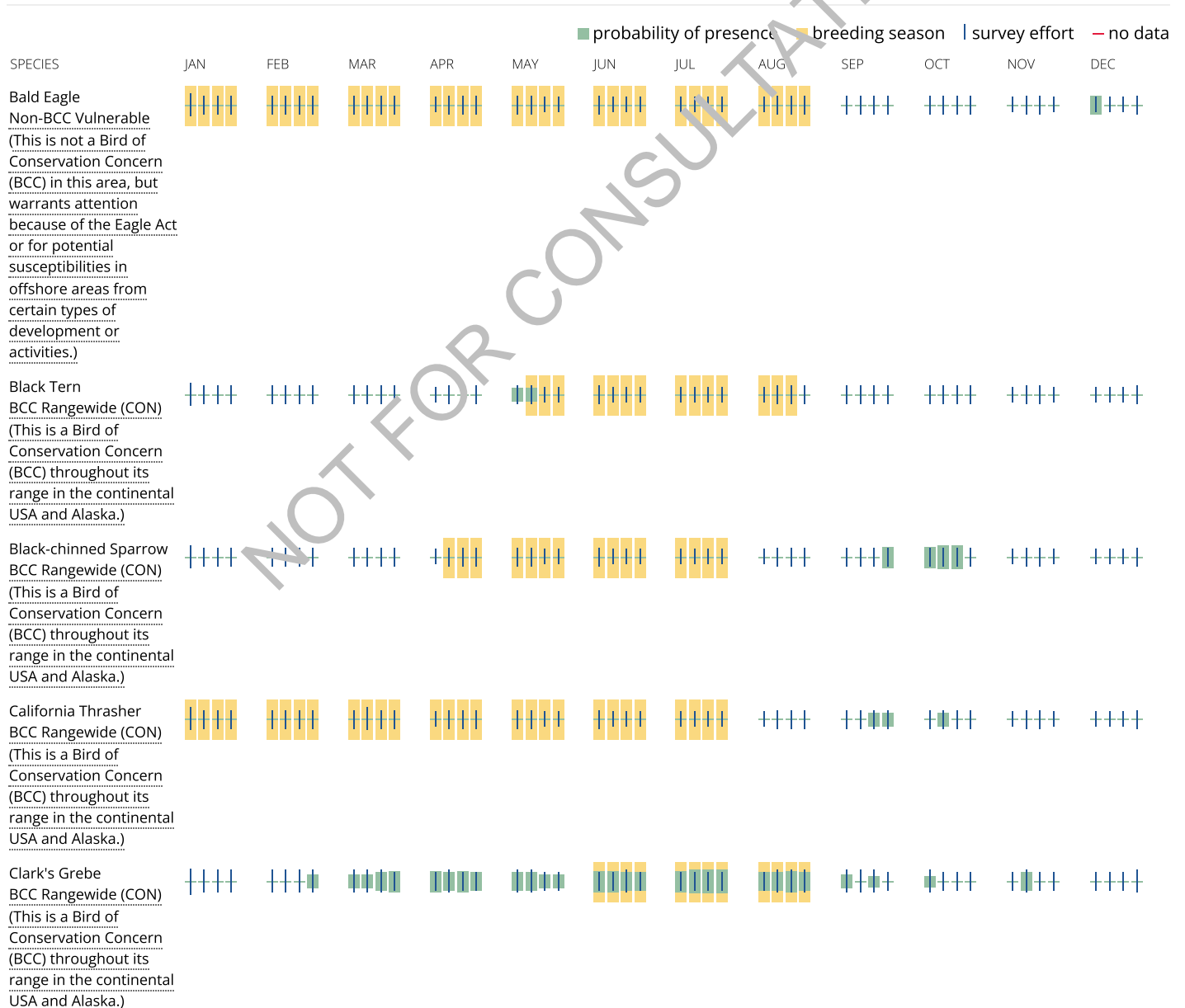
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

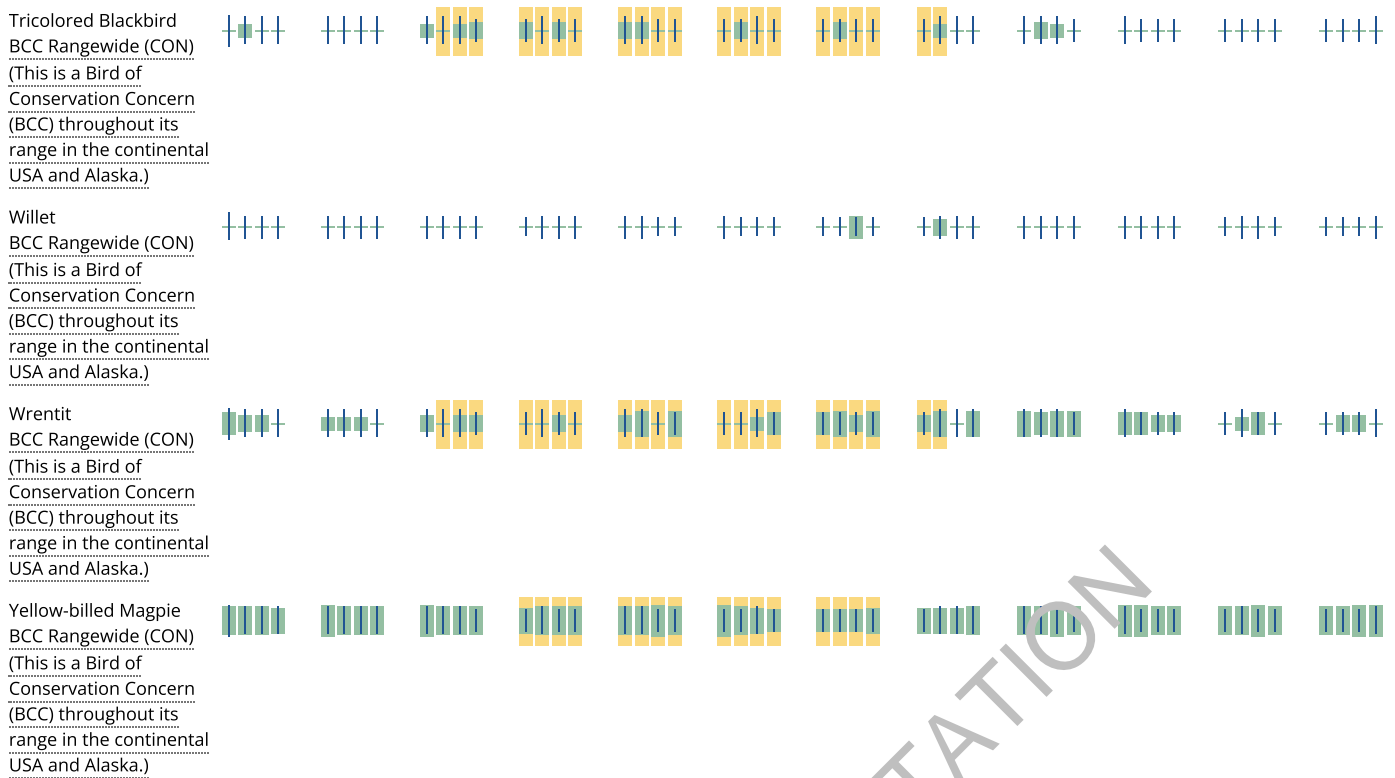
Survey Timeframe

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.



SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Common Yellowthroat BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)												
Golden Eagle Non-BCC Vulnerable (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.)												
Lawrence's Goldfinch BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)												
Marbled Godwit BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)												
Nuttall's Woodpecker BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)												
Oak Titmouse BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)												
Olive-sided Flycatcher BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)												
Short-billed Dowitcher BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)												

NOT FOR CONSULTATION



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 migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of US-rew [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 [AKN Phenology 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, migrating or present year-round in my project 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 refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). 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.

Facilities

National Wildlife Refuge lands

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 AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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](#).

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analyst, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NMFS Database Query (5/11/2021)

Quad 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 -

Quad Name **Clarksburg**

Quad Number **38121-D5**

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 C: COMMENTS AND RESPONSES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

**75 Hawthorne Street
San Francisco, CA 94105-3901**

May 31, 2022

Joe Griffin, Chief
Environmental Resources Branch
U.S. Army Corps of Engineers
1325 J Street, Room 1513
Sacramento, California 95814

Subject: Sacramento River Erosion Contract 2 Draft Supplemental Environmental Assessment/Environmental Impact Report, part of the American River Watershed Common Features General Evaluation Report, Sacramento County, California

Dear Joe Griffin:

The U.S. Environmental Protection Agency has reviewed the Sacramento River Erosion Contract 2 Supplemental Draft Environmental Assessment/Environmental Impact Report pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508) and our NEPA review authority under Section 309 of the Clean Air Act. We also reviewed the associated Supplemental Environmental Impact Report.

The EPA has reviewed and provided comments on the following environmental documents and related components of the American River Watershed Common Features General Evaluation Report (ARCF):

- Draft Environmental Impact Report May 4, 2015
- Final Environmental Impact Report on Feb. 22, 2016
- Sacramento River East Levee Contract 1 Draft Environmental Assessment Oct. 2, 2019
- Sacramento River East Levee Contract 2 Supplemental Draft EA August 13, 2020
- Sacramento Weir Supplemental DEIS Sept 14, 2020 and Supplemental Final EIS on June 23, 2021
- American River Erosion Protection and Arden Pond Mitigation Contract 2 Supplemental Draft EIS July 19, 2021, and Supplemental Final EIS on Dec. 13, 2021.

As ARCF sites are identified and construction designs refined, we appreciate the use of Environmental Assessments and supplemental documentation to evaluate new features or information and will continue to review proposed contracts scheduled from 2022 – 2024 (SEA, p. 12).

The current Proposed Action encompasses five elements that are new or different from those set out in the 2016 ARCF Final EIS and include the locations of haul or access routes, revised methods for placement of rock revetment – the use of tiebacks, key-in and launchable toe or rock trenches to allow for riparian vegetation to grow along the water's edge – and an estimate of barge traffic needed for project activities through the Delta and along the Sacramento River.

(SEA p. 16). We provide the following comments and recommendations to assist with the development of a Final EA and a potential *Finding of No Significant Impact* (FONSI).

Biological Resources

Mitigation Measure FISH-1 was modified in a previous SEIR for Erosion Contract 1 – and is referenced in this Supplemental EIR – for consistency with the National Marine Fisheries Service (NMFS) 2021 Biological Opinion (SEIR p. 60/171). We appreciate continued consultations between the Army Corps of Engineers and NMFS that resulted in numerous additions and refinements to the FISH-1 mitigation measures, including pump screening, modifying engineering designs to avoid potential effects to listed species, and defining the monitoring period to establish the success of revegetation efforts in designated critical habitat (SEIR pgs. 60-63/171).

Recommendation for the Final DEA and FONSI: Incorporate by reference the FISH-1 Mitigation Measures into the Final EA and the FONSI, should such a determination be made.

1-1

The EPA remains concerned with the Corps’ proposed use of launchable rock trenches and their long-term ability to support planting benches and provide riparian and fish habitat mitigation over the 50-year anticipated life span of the project.¹ Planting benches are intended to provide approximately 3.00 acres of onsite mitigation (SEA p. 31). We note that the 2021 Biological Opinions of NMFS and U.S. Fish and Wildlife Service (USFWS)² required the Corps to address the potential for permanent loss of riparian vegetation, native habitat function, reduced fish habitat and food availability if normal erosion or flood scouring events would launch the rock trenches leaving only exposed riprap.

As described in the SEIR, Mitigation Measure VEG-1 discussed in Section 3.4.3 notes that project designs will be refined to reduce the loss of riparian habitat and “will include...constructing bank protection rather than launchable rock trenches whenever feasible” (SEIR p. 56/171). Although this contract proposes to construct a launchable rock toe (as opposed to a launchable rock trench), the SEA states that the effects of an actual launch would be similar because habitat could be disturbed with or without this construction method (SEA p. 26). The SEA concludes that there would be only minor impact to fisheries resources resulting from the construction of launchable rock toes (SEA p. 27).

Recommendations for the Final SEA and FONSI: Incorporate by reference the VEG-1 Mitigation Measure into the Final EA and the FONSI, should such a determination be made. Describe how the Habitat Mitigation, Monitoring and Adaptive Management Plan and Long-term Management Plans would ensure that launchable rock trenches would not compromise required long-term mitigation, including whether this conclusion was supported by consultation with NMFS and USFWS. Detail the specific strategies or remedial actions (e.g., replanting, creation of additional off-site habitat or purchase of

1-2

¹ The EPA previously noted the concerns of resource agencies regarding the proposed use of launchable rock trenches in its July 18, 2021 letter on the *American River Erosion Protection and Arden Pond Mitigation Components, Contract 2*, Draft Supplemental EIS.

² 2021 NMFS Biological Opinion p. 108; 2021 USFWS Biological Opinion p.26

mitigation bank credits) that would be employed to mitigate impacts if onsite mitigation is compromised in the future.

Socioeconomic Resources

The EPA appreciates that impacts to unhoused communities were raised in the SEIR. We note that the document states that there are temporary, intermittent encampments in the project area, and that it is undetermined whether such camps would be present at the time of construction. To support a conclusion of “no Socioeconomic or Environmental Justice impacts” in the SEA, the document describes how the Corps, Central Valley Flood Protection Board and the construction contractor would work with the City and County of Sacramento and the City’s Police Department to “notify and remove encampments while construction occurs” (SEIR p. 45/171).

Without describing what would happen to the unhoused community after removal from the project area, it is unclear how this removal would not be a significant impact to the community. The SEA does not include any estimates for the number of people who may be displaced or describe outcomes that have historically been experienced after a such a removal occurs.

Recommendations for the Final Supplemental EA and FONSI: To support a no impact conclusion to unhoused communities, include an assessment of the scope of the unhoused community in the project area, including seasonality of occupancy if available, and describe what post-removal support would be provided. In Section 3.2.1:

- Estimate the numbers of individuals who would be impacted, and the length of time unhoused communities have been utilizing the area.³
- Based on historic information about seasonality, determine if there is an appropriate project timeframe that would minimize the number of people who would be removed from the site. If feasible, commit to this timeframe in the Final SEA.
- Discuss whether exclusionary fencing, large boulder placement, gating, detours, or other proposed activities would permanently inhibit the ability of displaced persons to reoccupy the area.
- To ensure impacts would be less than significant, describe who would be responsible for assisting the unhoused communities after removal from the project area and how that assistance would be accomplished.

1-3

Water Resources

As described in the document, a Clean Water Act 404(b)(1) sufficiency review will be prepared and included in the Final SEA to demonstrate compliance with Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. Prior to construction, the contractor would be required to obtain a Construction General Permit for potential effects from storm water discharges and prepare a Stormwater Pollution Prevention Plan. To complete the requirement for a CWA Section 401 Water Quality Certification from the State Water Quality Control Board, a “Report 3” would be submitted in compliance with the programmatic certification that was issued on July 13, 2021. The EPA understands that the Corps could begin work when the State Regional Water Quality Control Board issues a Notice of Applicability.

³ HUD may have point in time survey data that may assist with this determination. See, e.g., [Point-in-Time \(PIT\) Count Standards and Methodologies Training - HUD Exchange](#)

Recommendation for the Final SEA: Include the Notice of Applicability and Construction General Permit and any conditions they contain in the Final Supplemental EA or provide an estimated schedule for obtaining each.

1-4

The SEIR discloses potential cumulative impacts to water quality should seven other projects be conducted during the same timeframe. Although this project is the only ARCF project on the Sacramento River that includes bank protection placement below the ordinary high-water mark, construction or project activities undertaken during the same timeframe that involve levee raises or setbacks, flood wall and bank protection construction could release soil and cause turbidity which could diminish water quality (SEIR p. 120, 171).

Recommendations for the Final SEA: Incorporate by reference the cumulative impact analysis in the Final SEA.⁴ Consider managing the start dates and duration of Sacramento River Erosion Contract 2 activities in conjunction with the construction schedules of ongoing or other proposed projects mentioned in Section 4.1.1 of the SEIR to minimize the potential for adverse cumulative impacts to water quality in the Sacramento River.

1-5

The EPA appreciates the opportunity to review this Draft SEA. We request an opportunity to review draft environmental documentation of other ARCF projects. When the Final SEA is issued, please send an electronic copy to Robin Truitt, the lead reviewer for these projects, at truitt.robin@epa.gov. If you have any questions, please contact me at (415) 947-4167, or Robin at (415) 972-3742.

Sincerely,

JEAN PRIJATEL

Digitally signed by JEAN
PRIJATEL
Date: 2022.05.31 16:06:33
-07'00'

Jean Prijatel
Manager, Environmental Review Branch

Cc: Nicole Schleeter, Army Corps of Engineers
Allison Bosworth, National Marine Fisheries Service
Jennifer Norris, U.S. Fish and Wildlife Service
David Moldoff, Department of Water Resources
Dan Tibbetts, Sacramento Area Flood Control Agency
Leslie Gallagher, Central Valley Flood Protection Board

⁴ The Council for Environmental Quality recently restored the definition of ‘effects’ to require an evaluation of all cumulative impacts of the proposed action in NEPA documents (40 CFR 1508.1). These include evaluating potential climate change effects (e.g., effects on water resources, potential sea level rise).

From: [DWR Public Comment ARCF 16](#)
To: [Sutton, Drew](#); [Schleeter, Nicole Marie CIV USARMY CESP \(USA\)](#)
Subject: [Non-DoD Source] FW: American River Watershed Common Features, Water Resources Development Act of 2016 Project, Sacramento River Erosion Contract 2
Date: Wednesday, May 18, 2022 2:37:19 PM
Attachments: [American River Watershed Common Features Sacramento River Erosion Contract 2.pdf](#)

Comment 2.

Doreen

From: McCreary, Gavin@DTSC <Gavin.McCreary@dtsc.ca.gov>
Sent: Friday, May 13, 2022 11:24 AM
To: DWR Public Comment ARCF 16 <PublicCommentARCF16@water.ca.gov>
Cc: Kereazis, Dave@DTSC <Dave.Kereazis@dtsc.ca.gov>; OPR State Clearinghouse <State.Clearinghouse@opr.ca.gov>
Subject: American River Watershed Common Features, Water Resources Development Act of 2016 Project, Sacramento River Erosion Contract 2

Good morning.

Please see the attached comments for American River Watershed Common Features, Water Resources Development Act of 2016 Project, Sacramento River Erosion Contract 2.

Thank you.

Gavin McCreary
Project Manager
Site Evaluation and Remediation Unit
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826
(916)255-3710
Gavin.McCreary@dtsc.ca.gov

From: [Don Murphy](#)
To: [ARCF_SREroC2](#)
Subject: [Non-DoD Source] Comments/Questions about Draft E.I.R. Erosion Contract 2
Date: Sunday, May 29, 2022 9:18:36 AM

To Whom It May Concern:

- Please describe the details of the potential for altering the river depth and flow caused by planting benches when you place rip rap in the water. 9-1
- Is there a significant cost difference to place the rip rap from barges instead of from the levee top? 9-2
- What are the potential side effects/damages to marine life (fish, otters, seals, etc.) along the levee resulting from the planting benches? 9-3
- What are the effects on private boat docks resulting from the planting benches? 9-4

Thank you,
Don Murphy



Jared Blumenfeld
Secretary for
Environmental Protection



Department of Toxic Substances Control

Meredith Williams, Ph.D.
Director
8800 Cal Center Drive
Sacramento, California 95826-3200



Gavin Newsom
Governor

SENT VIA ELECTRONIC MAIL

May 13, 2022

Flood Projects Branch
Department of Water Resources
3464 El Camino Avenue, Room 200
Sacramento, CA 95821
PublicCommentARCF16@water.ca.gov

NOTICE OF AVAILABILITY OF DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT/ENVIRONMENTAL IMPACT REPORT (EA/EIR) FOR AMERICAN RIVER WATERSHED COMMON FEATURES, WATER RESOURCES DEVELOPMENT ACT OF 2016 PROJECT, SACRAMENTO RIVER EROSION CONTRACT 2 – DATED APRIL 2022 (STATE CLEARINGHOUSE NUMBER: 2005072046)

Flood Projects Branch:

The Department of Toxic Substances Control (DTSC) received a Notice of Availability of Draft Supplemental Environmental Assessment/Environmental Impact Report (EA/EIR) for the American River Watershed Common Features, Water Resources Development Act of 2016 Project, Sacramento River Erosion Contract 2 (Project). The Lead Agency is receiving this notice from DTSC because the Project includes one or more of the following: groundbreaking activities, work in close proximity to a roadway, presence of site buildings that may require demolition or modifications, and/or importation of backfill soil. Additionally, a [former manufactured gas plant \(MGP\) site](#) was identified at the approximate location at the end of Broadway at the Sacramento River, which the proposed Project may intersect. Potential contaminants of concern at MGPs can include polycyclic aromatic hydrocarbons, metals, total petroleum hydrocarbons, and others. DTSC recommends evaluating the proposed Project's location for concerns related to MGP operations and mitigating them if necessary.

DTSC recommends that the following issues be evaluated in the Hazards and Hazardous Materials section of the EA/EIR:

1. The EA/EIR should acknowledge the potential for historic or future activities on or near the project site to result in the release of hazardous wastes/substances on the project site. In instances in which releases have occurred or may occur, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. The EA/EIR should also identify the mechanism(s) to initiate any required investigation and/or remediation and the government agency who will be responsible for providing appropriate regulatory oversight. **2-1**
2. Refiners in the United States started adding lead compounds to gasoline in the 1920s in order to boost octane levels and improve engine performance. This practice did not officially end until 1992 when lead was banned as a fuel additive in California. Tailpipe emissions from automobiles using leaded gasoline contained lead and resulted in aerially deposited lead (ADL) being deposited in and along roadways throughout the state. ADL-contaminated soils still exist along roadsides and medians and can also be found underneath some existing road surfaces due to past construction activities. Due to the potential for ADL-contaminated soil, DTSC recommends collecting soil samples for lead analysis prior to performing any intrusive activities for the project described in the EA/EIR. **2-2**
3. If buildings or other structures are to be demolished on any project sites included in the proposed project, surveys should be conducted for the presence of lead-based paints or products, mercury, asbestos containing materials, and polychlorinated biphenyl caulk. Removal, demolition and disposal of any of the above-mentioned chemicals should be conducted in compliance with California environmental regulations and policies. In addition, sampling near current and/or former buildings should be conducted in accordance with DTSC's 2006 [Interim Guidance Evaluation of School Sites with Potential Contamination from Lead Based Paint, Termiticides, and Electrical Transformers.](#) **2-3**
4. If any projects initiated as part of the proposed project require the importation of soil to backfill any excavated areas, proper sampling should be conducted to ensure that the imported soil is free of contamination. DTSC recommends the imported materials be characterized according to [DTSC's 2001 Information Advisory Clean Imported Fill Material.](#) **2-4**
5. If any sites included as part of the proposed project have been used for agricultural, weed abatement or related activities, proper investigation for **2-5**

organochlorinated pesticides should be discussed in the EA/EIR. DTSC recommends the current and former agricultural lands be evaluated in accordance with DTSC's 2008 [Interim Guidance for Sampling Agricultural Properties \(Third Revision\)](#).

DTSC appreciates the opportunity to comment on the EA/EIR. Should you need any assistance with an environmental investigation, please visit DTSC's [Site Mitigation and Restoration Program](#) page to apply for lead agency oversight. Additional information regarding voluntary agreements with DTSC can be found at [DTSC's Brownfield website](#).

If you have any questions, please contact me at (916) 255-3710 or via email at Gavin.McCreary@dtsc.ca.gov.

Sincerely,



Gavin McCreary
Project Manager
Site Evaluation and Remediation Unit
Site Mitigation and Restoration Program
Department of Toxic Substances Control

cc: (via email)

Governor's Office of Planning and Research
State Clearinghouse
State.Clearinghouse@opr.ca.gov

Mr. Dave Kereazis
Office of Planning & Environmental Analysis
Department of Toxic Substances Control
Dave.Kereazis@dtsc.ca.gov

CALIFORNIA STATE LANDS COMMISSION

100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202



Established in 1938

JENNIFER LUCCHESI, Executive Officer

(916) 574-1800

TTY CA Relay Service: 711 or Phone 800.735.2922

from Voice Phone 800.735.2929

or for Spanish 800.855.3000

Contact Phone: (916) 574-1890

May 25, 2022

File Ref: SCH #2022040317
(2005072046)

Doreen Kiruja
Central Valley Flood Protection Board
3464 El Camino Avenue, Room 200
Sacramento, CA, 95821

VIA ELECTRONIC MAIL ONLY: PublicCommentARCF16@water.ca.gov

Subject: Draft Supplemental Environmental Impact Report /Environmental Assessment (SEIR/EA) for the American River Watershed Common Features Project, Sacramento River Erosion Contract 2, Sacramento County

Dear Doreen Kiruja:

The California State Lands Commission (Commission) staff has reviewed the Draft SEIR/EA for the American River Common Features Development Act of 2016, Sacramento River Erosion Contract 2 (Project), which is being prepared by the Central Valley Flood Protection Board (CVFPB), as the lead agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), and the U.S. Army Corps of Engineers (USACE) as the lead agency under the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.). The Commission is a trustee agency for projects that could directly or indirectly affect State sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project involves work on State sovereign land, the Commission will act as a responsible agency.

Commission Jurisdiction and Public Trust Lands

The Commission has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The Commission also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c); 6009.1; 6301; 6306). All tidelands and submerged lands granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court.

The Sacramento River at the various Project sites is natural, subject to artificial conditions (levees, dredging, dams, fill), navigable, and tidal. In addition, the proposed Project appears to extend onto the bed of the Sacramento River. Therefore, an application is required for the project. The application is available on our website at OSCAR.slc.ca.gov.

As the Project proceeds, please submit additional information, including but not limited to ordinary high-water mark (OHWM) and boundary surveys, for a determination of the extent of the Commission's jurisdiction. Please contact Marlene Schroeder, Public Land Management Specialist, for jurisdiction and leasing requirements for the Project (see contact information at end of letter). Additionally, please ensure that the Commission's Land Management Division staff is included on any future distribution mailing list for the Project.

Proposed Project Description

The USACE, CVFPB, and Sacramento Area Flood Control Agency propose to construct levee improvements consisting of approximately 3.4 miles of bank protection. Improvements will include riprap and planting benches to reduce erosion risk along the Sacramento River east levee. Project objectives include the following:

- Reduce the chance of flooding and damages, once flooding occurs, and improve public safety preparedness, and emergency response.
- Reduce maintenance and repair requirements by modifying the flood management system in ways that are compatible with natural processes.
- Integrate the recovery and restoration of key physical processes, self-sustaining ecological functions, native habitat, and species.
- Ensure that technically feasible and cost-effective solutions are implemented to maximize the flood risk reduction benefits given the practical limitations of applicable funding sources.

Commission staff understand that removal of vegetation and the installation of bank protection and riparian benches on Sites 1 through 6 would take place on State sovereign land.

Environmental Review

Commission staff request that the lead agencies consider the following comments on the Draft SEIR/EA.

Cultural Resources


Title to Resources: Commission staff request the Archaeological Discovery Plan (Mitigation Measure CR-2) include a statement that the title to all archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California are vested in the State and under the jurisdiction of the Commission (Pub. Resources Code, § 6313), as follows: "The final disposition of archaeological, historical, and paleontological resources recovered on State lands under the jurisdiction of the California State Lands Commission must be approved by the Commission." Finally, Commission staff request that the lead agencies consult with Staff Attorney Jamie Garrett (see contact information below) should any cultural resources on State land be discovered during construction of the Project.

3-1

Thank you for the opportunity to comment on the Draft SEIR/EA for the Project. As a responsible and trustee agency, the Commission will need to rely on the Final SEIR for the issuance of any lease as specified above and, therefore, we request that you consider our comments prior to certification of the SEIR.

Please send copies of future project-related documents, including electronic copies of the final SEIR/EA, an accessible copy of the Mitigation Monitoring and Reporting Program, Notice of Determination, Findings, Statement of Overriding Considerations (if applicable), and approving resolution when they become available. Please refer questions concerning environmental review to Cynthia Herzog, Senior Environmental Scientist, at (916) 574-1310 or cynthia.herzog@slc.ca.gov. For questions concerning archaeological or historic resources under Commission jurisdiction, please contact Staff Attorney Jamie Garrett, at (916) 574-0398 or jamie.garrett@slc.ca.gov. For questions concerning Commission leasing jurisdiction, please contact Marlene Schroeder, Public Land Management Specialist, at (916) 574-2320 or marlene.schroeder@slc.ca.gov.

Sincerely,



Nicole Dobroski, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
C. Herzog, Commission
J. Garrett, Commission
M. Schroeder, Commission

Central Valley Regional Water Quality Control Board

31 May 2022

Doreen Kiruja
Central Valley Flood Protection Board
3464 El Camino Avenue, Room 200
Sacramento, CA 95821
doreen.kiruja@water.ca.gov

COMMENTS TO REQUEST FOR REVIEW FOR THE SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT, AMERICAN RIVER WATERSHED COMMON FEATURES PROJECT, SACRAMENTO RIVER EROSION CONTRACT 2, SCH#2022040317, SACRAMENTO COUNTY

Pursuant to the State Clearinghouse's 14 April 2022 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Supplemental Environmental Impact Report* for the American River Watershed Common Features Project, Sacramento River Erosion Contract 2, located in Sacramento County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore, our comments will address concerns surrounding those issues.

I. Regulatory Setting

Basin Plan

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has

4-1

adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website:

http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at:

https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_2018_05.pdf

In part it states:

Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.

This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), Construction General Permit Order No. 2009-0009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention

Plan (SWPPP). For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits¹

The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit

Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit

If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration

¹ Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Permit requirements. If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., “non-federal” waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Threat General Order) 2003-0003 or the Central Valley Water Board’s Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Threat Waiver) R5-2018-0085. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation

activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Threat Waiver and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2018-0085.pdf

Limited Threat General NPDES Permit

If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited Threat Discharges to Surface Water* (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit

If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at: <https://www.waterboards.ca.gov/centralvalley/help/permit/>

If you have questions regarding these comments, please contact me at (916) 464-4684 or Peter.Minkel2@waterboards.ca.gov.

Peter Minkel

Peter Minkel
Engineering Geologist

cc: State Clearinghouse unit, Governor's Office of Planning and Research,
Sacramento



May 26, 2022

Flood Projects Branch
Department of Water Resources
3464 El Camino Avenue Room 200
Sacramento, CA 95821
PublicCommentARCF16@water.ca.gov

Public Affairs Office
U.S. Army Corps of Engineers
1325 J Street Room 1513
Sacramento, CA 95814
ARCF_SREroC2@usace.army.mil

Subject: American River Watershed Common Features Project Water Resources Development Act 2016 Project, Sacramento River Erosion Contract 2, Draft Supplemental Environmental Impact Report and Draft Supplemental Environmental Assessment (SAC201301442)

To Whom It May Concern:

Thank you for providing the American River Watershed Common Features Project Water Resources Development Act 2016 Project, Sacramento River Erosion Contract 2, Draft Supplemental Environmental Impact Report (DSEIR) and Draft Supplemental Environmental Assessment (DSEA) to the Sacramento Metropolitan Air Quality Management District (Sac Metro Air District) for review. The project includes the construction of levee improvements (riprap and planting benches) to reduce erosion along 3.4 miles of the Sacramento River east levee between Front Street and the Pocket-Greenhaven neighborhood. The Sac Metro Air District is required by the California Health and Safety Code to represent the residents of Sacramento County in influencing the decisions of other agencies whose actions may have an adverse impact on air quality. In that spirit, Sac Metro Air District staff provides the following comments on the DSEIR and DSEA.

Air Quality Analysis, Mitigation and General Conformity

The DSEIR reports Contract 2 and the American River Common Features project overall emissions for 2023 and 2024 in Tables 3.8-5 through 3.8-8 in the air quality chapter. The emissions cannot be reconciled with the air quality modeling results provided in Appendix A. For full disclosure and to support the emissions tables, Appendix A should include the Road Construction Emissions Model data entry and results sheets for all scenarios analyzed in addition to the inputs and outputs of the Harborcraft, Dredge and Barge Emission Factor Calculator.

5-1

Sac Metro Air District appreciates that mitigation measure AIR-3 incorporates the requirement to use construction equipment with Tier 4 off-road engines and haul trucks with 2010 or newer engines from the American River Common Features General Conformity Determination¹. Sac Metro Air District recommends AIR-3 include the following revisions:

5-2

¹ ARCF Final General Conformity Determination:

https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/WRDA16/Documents/ARCF16_Final-GenConform_Determination-w-AppendixA_Jun2021.pdf?ver=56b3EYmyrsKSWSzYI5ncsQ%3d%3d

1. Add the prohibition of the use of tier 0 engines (General Conformity Determination).
2. Modify the requirement to submit an inventory of off-road construction equipment to be used 40 hours or more on the project to equipment that will be used 8 hours or more (Sac Metro Air District's current mitigation language²).

5-2
cont'd

Although the General Conformity Determination did not anticipate emissions in calendar year 2024, the DSEIR air quality chapter reports NOx emissions in 2024 would exceed the General Conformity de minimis threshold. Mitigation measure AIR-4 states the Army Corps would enter into an agreement with the air district to purchase offsets in years that NOx emissions exceed the de minimis threshold. To ensure NOx offsets will be available for 2024, the Army Corps must coordinate with Sac Metro Air District staff and submit the emission reduction credit loan application and supporting documentation at least 6 months prior to needing the offsets.

5-3

Greenhouse Gas Mitigation

Mitigation measure GHG-1 in the DSEIR climate change chapter includes the purchase of greenhouse gas offsets/credits for emissions that exceed Sac Metro Air District's construction threshold. Although this is consistent with the American River Common Features project mitigation³, Sac Metro Air District recommends the project proponents review and consider the additional detail provided in mitigation measure GHG-1 for the American River Common Features, American River Contract 3A project DSEIR⁴.

5-4

Bicycle and Pedestrian Considerations

As part of transportation mitigation measure TR-1 and recreation mitigation measure REC-1, in addition to working with the City of Sacramento Bicycle and Pedestrian Coordinator, Sac Metro Air District encourages the Army Corps to consult with Civic Thread (formerly WalkSacramento)⁵, Sacramento Area Bicycle Advocates⁶, and neighborhood associations⁷ in the impacted areas to ensure safe and convenient bicycle and pedestrian detour routes are established during construction and the community is well informed of the changes (DSEIR sections 3.1.2 and 3.11.3).

5-5

Implementing Mitigation and Environmental Commitments

Sac Metro Air District recommends that all air quality and greenhouse gas mitigation measures from the DSEIR and DSEA and environmental commitments from the General Conformity Determination be clearly stated in construction specifications and contracts. This will help to ensure the measures will be implemented.

5-6

² Sac Metro Air District On-Site Enhanced Exhaust Control Mitigation:

<https://www.airquality.org/LandUseTransportation/Documents/Ch3On-SiteEnhancedExhaustMitigationFinal4-2019.pdf>

³ American River Watershed Common Features General Reevaluation Report, Final EIS/EIR (December 2015), page 266: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/ARCF_GRR_Final_EIS-EIR_Jan2016.pdf

⁴ American River Common Features, American River Contract 3A, Draft Supplemental EIR (April 2022), page 3-142: https://www.spk.usace.army.mil/Portals/12/documents/civil_works/CommonFeatures/WRDA16/Documents/AmericanRiver/ARCF_ARC3_Draft-SEIR-SEA_April2022.pdf?ver=fVpMUcarpFSyFGM99f7WPQ%3d%3d

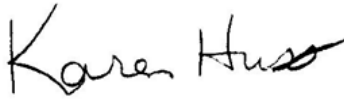
⁵ Civic Thread: <https://civicthread.org/>

⁶ Sacramento Area Bicycle Advocates: <https://sacbike.org/>

⁷ City of Sacramento Neighborhood Directory: <https://www.cityofsacramento.org/economic-development/community-engagement/neighborhood-directory>

Thank you for considering these comments. You may contact me at khuss@airquality.org or 279-207-1131 if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Karen Huss". The signature is written in a cursive style with a long horizontal stroke at the end of the name.

Karen Huss

Associate Air Quality Planner/Analyst

cc: Paul Philley, AICP, Program Supervisor, Sac Metro Air District
Kevin Williams, Program Supervisor, Sac Metro Air District
Kathryn Canepa, Civic Thread
Deb Banks, Sacramento Area Bicycle Advocates
Timothy Murphy, Army Corps Environmental Manager

From: [DWR Public Comment ARCF 16](#)
To: [Don Murphy](#); [ARCF_SREroC2](#); [DWR Public Comment ARCF 16](#)
Cc: [Desmond, Nolan, Livaich & Cunningham](#); [Kiruja, Doreen@DWR](#)
Subject: [Non-DoD Source] RE: Draft Environmental Impact Report - Erosion Contract 2
Date: Tuesday, May 17, 2022 3:16:52 PM

Mr. Murphy,

Thank you for your comment on the Sacramento River Erosion Contract 2 project. Your comment has been received and will be evaluated.

Susie Real
Division of Flood Management
CA Department of Water Resources

-----Original Message-----

From: Don Murphy <donald.murphy.33@gmail.com>
Sent: Tuesday, May 17, 2022 10:34 AM
To: ARCF_SREroC2@usace.army.mil; [DWR Public Comment ARCF 16](#)
<PublicCommentARCF16@water.ca.gov>
Cc: [Desmond, Nolan, Livaich & Cunningham](#) <bmanning@dnlc.net>
Subject: Draft Environmental Impact Report - Erosion Contract 2

Re: Contract 2 Questions

To Whom It May Concern:

In reading the Draft E.I.R. there is mention of the removal of trees and brush to allow for placement of RIP Rap along the water side of the levee but there is no mention of the removal of any elements in the Sacramento River itself.

Will legally-permitted boat docks and boathouses, or any other structures in the river, be removed, either temporarily or permanently, for Contract 2? If so, please update and recirculate the E.I.R. to include any impacts - temporary or permanent, regarding docks, boathouses and any/all other structures currently in the river.

6-1

Such impacts should also be identified in the E.I.R. in order for other agencies, e.g., CA State Lands Commission, to comment on dock/boathouse lease-revenue implications. Also, recreational agencies such as Boat US and RBOC ([Blockedhttps://www.rboc.org/regional-issues/tag/Delta](https://www.rboc.org/regional-issues/tag/Delta)) should be allowed to weigh in on any impacts to boating recreation.

Thank you for providing the opportunity to present these concerns.

Regards,
Don Murphy
7260 Pocket Road
916-607-1551

From: [G. Mills](#)
To: [ARCF_SREroC2; publiccommentarcf16@water.ca.gov](#)
Subject: [Non-DoD Source] Comments
Date: Saturday, May 28, 2022 9:00:47 PM

Hi I have a number of comments upon reading: ARCF_SRC2_Draft-SEIR-SEA_April2022.pdf

Can you please address these?

1. In the land use area it stated " the entire Sacramento River East Bank is zoned for parks and recreation..." however the area behind many of the properties along the river are privately owned and revenue-generating revenue from taxes. 7-1
2. Earlier erosion work behind Zacharias park -- did raise the river bed and create riprarian planting benches-- which in the last 3 years have now become high water levee benches for homeless / transients to camp on. There has been 2 recent fires that destroyed some of the trees there and the transients are now actively chopping large branches down to provide firewood for their night time camp fires... Comment-- If riprarian benches are proposed future Erosion contracts-- then a permanent longitudinal fence needs to be installed to keep levee users on top of the levee path -- and unable to access such planting berms--- to reserve them for active wildlife , protect the riprarian plants that get planted there-- and to eliminate the use by transients for overnight camping. 7-2
3. For areas that are currently privately owned-- the removal of boat docks will cause the riverfront owner to give up chasing off campers / transients and instead defer to City of Sac to handle such issues-- Deferring to City of Sac to take action -- has resulted in prolonged transient camping and entrenched homelessness. Dock removal also eliminates legitimate boating access , loss of littoral rights and loss of State Lands commission dock lease revenue. 7-3
4. for areas that are public -- and already accommodate beach areas-- some folks use the beaches as river landing areas --for legitimate fishing / paddle boarding and taking dogs to the rivers edge. Raising such beach areas with rip rap and then planting them with riprarian vegetation -- will only eliminate such public uses and users. Once those public members leave- due to rocky banks with thick vegetation --- - it will then lead to transient camping instead-- as they will be left alone because no other public users are going there anymore. 7-4
5. The removal of cross levee fences near the old Garcia marina -- was done without any public hearings or notice-- and caused the nesting bald eagle pair at Arabella way-- to abandon their nest and relocate it to the deep water ship channel. These eagles do however still perch early mornings on several cottonwood trees near the removed pipe gates-- any erosion work to re-establish riprarian benches along the river-- needs to take into account if any pipe gates or cross levee fences will be replaced to limit public access-- or if not-- then longitudinal fences between the levee and riverside berm will be needed instead to limit human access to all or portions of the proposed riprarian rip rap restoration areas -- to insure they are successful and not destroyed as is happening behind Zacharias park and South Chickory Bend. 7-5

From: [Mer Mills](#)
To: [ARCF_SREroC2](#); publiccommentarcf16@water.ca.gov
Subject: [Non-DoD Source] Upcoming erosion work
Date: Saturday, May 28, 2022 8:49:54 PM

Hello,

We believe that erosion work is important. However, there has been an increase in homeless camps along the River and boats that are anchored along the shore as past work has been done. There have been 2 recent fires that burned trees and also trees are being used for firewood for campfires. These issues should be addressed and possibly a fence installed to keep people on top of the levee and not camping on the riparian planting benches.

8-1

Another concern is that if docks are removed, there may be potential for more erosion as the docks can protect the shore from waves and water that causes the erosion. If docks are removed at owner's expense, the docks will be less likely to be replaced and cause more crowding at the marinas and less revenue for the State Lands Commission from leases.

8-2

Thank you for your time,

Meredith Mills

From: [richard.hartzell](mailto:richard.hartzell@water.ca.gov)
To: ARCF_SREroC2; PublicCommentARCF16@water.ca.gov
Subject: [Non-DoD Source] SRE C2 -- request to design the water side planting berms to avoid taking existing tidal beaches and to create some protected wildlife berms.
Date: Sunday, May 29, 2022 10:52:42 PM

To Whom it may concern.

My concern regarding the upcoming Sacramento River erosion contract -- is the loss of some tidal sandy beaches-- that are on the INSIDE bend of the Sacramento river in Pocket. These beaches provide habitat for some of the rare riparian wildlife that currently live in our area-- These beaches also provide river "landing" areas for boats, kayaks and paddleboards as well as for people to bring their dogs to the river edge to play.

Previous erosion work in 2006--- placed rock berms on top of such tidal beaches behind North Point Way and Zacharias park -- The rock berms were built high enough to permanently raise the tidal beaches above the high tidal mark/ wake zone-- and were planted with Trees.

The trees and planting on these berms have been very successful and a great aesthetic asset to the riverbank. Well done.

However -- these new berms also permanently eliminated the tidal beaches that were once there. These tidal beaches were used as river landing areas for boats and kayaks,-- and by Geese in the spring and at night by foxes and racoons. Some folks also used these beaches as areas to bring their dogs to the water's edge , to play as well as to fish.

The request-- is for the upcoming erosion contracts to -- as much as possible --- instead plant the trees on the existing berm areas and thereby protect the remaining tidal beaches in our area.- -- This is particularly needed for the river lot behind Arabella as well as behind Dumfries Court which both have EXISTING wide riverside berms that could be planted -- instead of covering the tidal beaches with riprap rock and new planting berms.

10-1

The low water planting berms that were built between 2006 & 2007 behind Zacharias park -- no longer have a beach where fisherman or dog owners use to go-- Instead these planting berms have become private sanctuaries for several transient camps. These transients have unfortunately created fires and even chopped some of the smaller trees down to clear portions of the berm areas for their tents and to build their campfires.

IN addition to the foxes there was a nesting pair of Bald Eagles in a large redwood tree near Harmon Drive. This nesting pair of Eagles used to roost and perch in cotton wood trees above the beaches near the old Garcia Marina-- Unfortunately DWR's recent removal of the pipe Gates at the Old Garcia Marina caused these Eagles to permanently relocate their nest to the Deep water Channel @ Prospect Slough. The Eagles (even during the current SREL 3 work) are still perching early mornings in the cotton wood trees over the remaining Pocket tidal beaches, waiting to catch fish.

For these reasons -- please design the upcoming riverbank berms to avoid covering the beach areas or at least , scallop the planting berms so smaller pockets of sandy beaches can still co-exist with the proposed planting berms.

Please also PERMANENTLY restricted public access to some of the upcoming RIVER bank/ Beach planting berms by installing vandal resistant 5' tall fencing running parallel to the river -- to create protected Riparian wildlife berms.

Thank you for your consideration to adjust the upcoming erosion work to protect the remaining tidal beaches in our area-- and avoid the chasing away of any more rare wildlife.

Regards,

Richard C Hartzell

INTRODUCTION

This Appendix provides responses to public and agency comments on the American River Watershed Common Features 2016 Project, Sacramento River Erosion Contract 2 Draft Supplemental Environmental Assessment/Environmental Impact Report (SEA/EIR) received during the public comment period.

PUBLIC COMMENT SUMMARY

The Draft SEA/EIR was posted with the State Clearinghouse (SCH # 2020070269) on April 15, 2022. The Draft SEA/EIR was circulated for at least 45 days for review by Federal, State, and Local agencies, organizations, and members of the public from April 15, 2022, through May 31, 2022. The Notice of Availability was published in the Sacramento Bee on April 15, 2022. The Draft SEA/EIR was made available on the Sacramento District, U.S. Army Corps of Engineers (USACE) website, www.sacleveeupgrades.com, and on the Central Valley Flood Protection Board (CVFPB) website, and electronic copies of the Draft SEA/EIR were made available at the Sacramento Central Library. Hard copies of the Draft SEA/EIR were made available upon request. USACE posted information about the Proposed Action on its website at www.sacleveeupgrades.com, which included summarized information on the Proposed Action, an electronic copy of the Draft SEA/EIR, and instructions as to how to participate in the virtual public meeting. A virtual public meeting was held on April 26, 2022, to provide additional opportunities for comments on the Draft SEA/EIR. All comments received during the public review period were responded to if possible, but all were requested to be submitted in writing to be incorporated into the Final SEA/EIR as appropriate.

Instead of holding the usual in-person meeting to take comments, due the restrictions on meeting sizes and health concerns during the COVID-19 pandemic, a virtual public meeting was held using WebEx software. During the virtual public meeting on April 26, 2022, attendees could utilize the chat function to ask questions or send comments to the meeting moderator. Meeting attendees were also given an opportunity to voice comments at the end of the presentation directly over the phone or through WebEx software. During the virtual public meeting, several clarifying questions were asked by members of the public regarding the project, impacts, and other ARCF projects. No comments related to the analysis presented in the SEA/EIR were received during the public meeting. In addition to the virtual public meeting, comments could be submitted through mail or electronic mail.

During the Draft SEA/EIR public review period, written comments were submitted in letters and email. The comments were submitted by the following commenters:

- (5) Private Citizen / Company
- (1) Local / Regional Agency
- (3) State Agency
- (1) Federal Agency

COMMENTS AND RESPONSES

The following pages include all public comments received and the responses to those comments. The responses are annotated to refer back to the corresponding letters and comments that precede them.

LETTER 1: U.S. ENVIRONMENTAL PROTECTION AGENCY

1-1: Comment accepted; the SEA will reference FISH-1 in section 3.8. Full text is included in the SEIR, section 3.5.3.

1-2: Comment accepted; the SEA will reference VEG-1 in section 3.6.3 by reference to the text on section 3.4.3 of the SEIR. The HMMAMP and LTMP include regular ongoing maintenance and management for the mitigation sites. The launchable rock toe and planting benches have been engineered to withstand large flood events for the next 50 years. In the scenario that the launchable toe does activate, the damage would be assessed and would be compensated through adaptive management actions that would be coordinated with NMFS and USFWS. The management of the launchable features included in the project design is discussed in the O&M manuals. The O&M manuals will be updated before the project is handed over to the NFS. The flood risk reduction features are managed and maintained by the NFS. This method of mitigation is covered in the 2021 Biological Opinions.

1-3: A section on Socioeconomic, Population, and Environmental Justice has been added to the SEA, see chapter 3.9.

Local ordinance (Sacramento City Code Chapter 8.140) and USACE, CVFPB, and local maintaining agency safety requirements prohibit camping on levees and within 25 feet of levees to avoid damage to critical infrastructure and to ensure that levees can be easily inspected and maintained. These local agency requirements will also be implemented under the No Project Alternative and require the removal of encampments within the Sacramento River Erosion project site to prevent threats to public health, safety, and welfare from damage to critical infrastructure. Encampments on the project site would therefore be subject to removal regardless of USACE action to implement the Sacramento River Erosion Contract 2 project.

Services for those displaced from along the Sacramento River are offered by both Sacramento City and Sacramento County. The City of Sacramento operates “safe ground” and “safe parking” locations where people may safely camp or park vehicles and RVs. These sites are staffed 24 hours a day and offer services including portable toilets and cleaning stations. Case managers operate on these sites and offer support for mental health needs, substance use disorders, and assist with housing coordination. Individuals using these sites are connected to additional service providers through a centralized information system. Several of these locations are in the immediate vicinity of the Sacramento River Erosion Contract 2 project site, including South Front Street, Miller Park, and along the U.S. Highway 50 Viaduct at 6th Street between W and X Streets. The city is also implementing a Comprehensive Siting Plan which includes congregate shelters, safe ground/safe parking sites, emergency shelters, and rooms available through motel vouchers.

1-4: These documents will not be included with the FEA. USACE anticipates obtaining them in October 2022, before the contract is awarded. The contractor is required to follow any and all conditions of the Construction General Permit.

1-5: A cumulative impacts analysis, including water quality impacts, has been included in the Final SEA in Chapter 4.

LETTER 2: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

2-1: The Hazardous Wastes and Materials section of the SEIR (Section 3.13) identifies the potential for past or future release of hazardous materials on the project site. The former Manufactured Gas Plant (MGP) identified by the commenter is included in the Environmental Setting information in Section 3.13.1. Although the MGP site is several hundred feet from the project site, the SEIR nevertheless identifies the potential that contaminated soil and groundwater could be encountered at the project site. To address this potential, Mitigation Measure HAZ-1 requires testing for hazardous materials, including metals and other EPA test methods as appropriate based on site conditions prior to construction and Phase II investigations for any recognized environmental conditions identified during Phase I ESAs.

2-2: The project does not include activities on roadway medians or roadsides; erosion repairs would be constructed along the waterside of levees. Mitigation Measure HAZ-1 does require testing prior to construction.

2-3: No buildings are proposed to be demolished as part of the project. Construction will occur on the waterside of levees and not in proximity to existing or former buildings.

2-4: USACE requires representative sampling for hazardous materials, including metals and other EPA test methods as appropriate based on site conditions of borrow material prior to placement as part of the project.

2-5: The construction footprint does not include areas that were in agricultural use, and due to their proximity to the river, substantial weed abatement activities are not believed to have occurred. Mitigation Measure HAZ-1 nevertheless requires sampling prior to construction.

LETTER 3: CALIFORNIA STATE LANDS COMMISSION

3-1: The comment requests additional text be added to the description of the archaeological discovery plan in Mitigation Measure CR-2. Because the suggested text clarifies State law requirements which would apply to historic or cultural resources discovered on State lands rather than imposing a project-specific mitigation requirement, USACE and CVFPB do not propose to modify the text of Mitigation Measure CR-2. No change to the SEA/EIR is necessary.

LETTER 4: CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

4-1: The comment letter describes regulatory setting and permitting requirements under the Regional Water Quality Control Board's jurisdiction. The Project Partners will ensure that all applicable permits are obtained from the Central Valley Regional Water Quality Control Board prior to project construction. The comment does not identify any changes or comments related to the analysis in the SEA/EIR. No change to the SEA/EIR is necessary.

LETTER 5: SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

5-1: Several sheets (including information from the “data entry” tabs of the Road Construction Emissions Model and the Harborcraft, Dredge, and Barge Emission Factor Calculator) were inadvertently omitted from the Draft SEIR/SEA document. These sheets have been included in Appendix A to the Final SEIR/SEA document.

5-2: As shown below, the requested changes to Mitigation Measure AIR-3 have been incorporated in the Final SEIR/SEA document and will be incorporated in the Mitigation, Monitoring, and Reporting Program (MMRP) for the project.

Mitigation Measure AIR-3: Require Lower Exhaust Emissions for Construction Equipment.

The Project Partners shall require contractors to use a fleet-wide average of 90 percent Tier 4 emissions vehicles for off-road construction equipment and on-road haul trucks must be equipped with 2010 or newer engines. Tier 0 engines will not be permitted. In order to demonstrate compliance with this requirement

- The construction contractor shall submit to USACE and SMAQMD a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that would be used an aggregate of ~~840~~ or more hours during any portion of the construction project.
- The inventory shall include the horsepower rating, engine model year, and projected hours of use for each piece of equipment. The construction contractor shall provide the anticipated construction timeline including start date, and the name and phone numbers of the project manager and the on-site foreman. This information shall be submitted at least 4 business days prior to the use of subject heavy-duty off-road equipment. The SMAQMD Construction Mitigation Tool can be used to submit this information. The inventory shall be updated and submitted monthly throughout the duration of the project, except for any 30-day period in which no construction activity occurs.
- The construction contractor shall provide a plan for approval by USACE and SMAQMD demonstrating that the heavy-duty off-road vehicles (50 horsepower or more) to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet average of 90 percent Tier 4 emissions vehicles. This plan shall be submitted in conjunction with the equipment inventory. Acceptable options for reducing emissions may include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, and/or other options as they become available.
- SMAQMD’s Construction Mitigation Tool can be used to identify an equipment fleet that achieves this reduction. The construction contractor shall ensure that emissions from all off-road diesel-powered equipment used in the project area do not exceed 40

percent opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately. Non-compliant equipment will be documented, and a summary provided monthly to USACE and SMAQMD. A visual survey of all in-operation equipment shall be made at least weekly. A monthly summary of the visual survey results shall be submitted throughout the duration of the project, except for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed, as well as the dates of each survey.

- Use the Construction Mitigation Tool to track PM₁₀ emissions and mileage traveled by on-road trucks, reporting results to USACE and SMAQMD on a monthly basis.

5-3: USACE intends to coordinate with SMAQMD staff to purchase offsets as specified by the commenter and required in Mitigation Measure AIR-4.

5-4: As shown below, changes to Mitigation Measure GHG-1 have been incorporated in the Final SEIR/SEA document and will be incorporated in the Mitigation, Monitoring, and Reporting Program (MMRP) for the project:

- Purchase GHG offset for program-wide GHG emissions (direct emissions plus indirect emissions from on-road haul trucks plus commute vehicles) that meet the criteria of being real, quantifiable, permanent, verifiable, enforceable, and additional, consistent with the standards set forth in Health and Safety Code section 38562, subdivisions (d)(1) and (d)(2). Such credits shall be based on protocols approved by the California Air Resources Board (CARB), consistent with Section 95972 of Title 17 of the California Code of Regulations, and shall not allow the use of offset projects originating outside of California, except to the extent that the quality of the offsets, and their sufficiency under the standards set forth herein, can be verified by USACE or SMAQMD. Such credits must be purchased through one of the following: (i) a CARB-approved registry, such as the Climate Action Reserve, the American Carbon Registry, and the Verified Carbon Standard; (ii) any registry approved by CARB to act as a registry under the California Cap and Trade program; or (iii) through the California Air Pollution Control Officers Association's (CAPCOA's) GHG Rx and SMAQMD. Purchase of carbon offsets shall be sufficient to reduce the project's GHG emissions to below SMAQMD's significance thresholds applicable through a one-time purchase of credits, based on the emissions estimates in this SEIR or on an ongoing basis based on monthly emissions estimates that would be prepared in accordance with procedures established by Measure AQ-3 exceeding SMAQMD significance thresholds applicable at the time of construction. Carbon offset credits shall be purchased from programs that have been approved by SMAQMD.

5-5: The Project Partners will continue to coordinate with the City of Sacramento regarding temporary closures and detours affecting pedestrian and bicycle facilities as specified in Mitigation Measure REC-1. We anticipate that the City will consult with neighborhood associates and advocate groups, likely including those identified by the commenter.

5-6: USACE's environmental managers review construction specifications prior to the release of these documents for bid by contracting. This review includes a requirement to confirm that all actions required by adopted mitigation measures are incorporated into the specifications.

LETTER 6: INDIVIDUAL (MURPHY)

6-1: Docks, boathouse, and any other encroachments within the erosion construction footprint are required to be removed prior to initiation of construction of Contract 2. The removal of encroachments is the responsibility of the property owners and will have to be completed in accordance with the CVFPB's notification letters. The landowners are required to apply for a CVFPB permit and obtain CVFPB's approval before they reconstruct any facilities. They must also obtain permits/lease from all governing agencies prior to replacing encroachments.

The following text has been added to the third bullet under "Construction Details" in Section 2.3 of the Final SEIR/SEA:

- Clear and grub work area, including, but not limited to, removing trees and vegetation along the levee embankment and boat docks and other encroachments.

Physical impacts associated with the removal of the docks and associated features (pilings, access ramps/gangways) are addressed as part of the footprint impacts evaluated throughout the SEIR, particularly including biological resources and water quality impacts. The commenter does not provide evidence that potential economic or revenue effects associated with the removal of private boat docks would result in indirect physical environmental effects that would warrant consideration under CEQA. Recreational effects of the project, including effects on boat traffic in the Sacramento River, are addressed in Section 3.12, "Recreation." The closure or removal of dock facilities that are not open to the public would not create new impacts to recreational activities not already considered in the SEIR.

LETTER 7: INDIVIDUAL (G MILLS)

7-1: The comment expresses concern that the project improvements would increase the number of unsanctioned campers or unhoused people in the project area, and states that new cross-levee fences would be necessary to avoid increasing the use of the project site by unhoused individuals. The Sacramento River Erosion Contract 2 project does not include any changes that affect public access to the levees following construction. The replacement of fences or gates on the levee following the completion of ARCF 2016 construction would be subject to permits by the CVFPB. If fences are required to be removed for construction, the owners of these fences, whether permitted or not permitted, will be required to go through the Central Valley Flood Protection Board's permitting process prior to rebuilding the fence. Local ordinance (Sacramento City Code Chapter 8.140) and USACE, CVFPB, and local maintaining agency safety requirements prohibit camping on levees and within 25 feet of levees to avoid damage to critical infrastructure and to ensure that levees can be easily inspected and maintained. Riparian planting benches and other habitat restoration included in the project will be subject to monitoring and maintenance for a period up to 8 years following construction to ensure that plantings are successfully established. Additional information can be found in the 2016 FEIS/EIR GRR, Appendix I Habitat Mitigation, Monitoring and Adaptive Management Plan.

LETTER 8: INDIVIDUAL (M MILLS)

8-1: Please refer to the response to Comment 7-1.

8-2: The Sacramento River Erosion Contract 2 project has been designed to meet USACE's standards for erosion protection, including addressing wavewash. Boat docks are not considered an effective form of erosion protection by USACE.

LETTER 9: INDIVIDUAL (MURPHY 2)

9-1: Engineering designs have been developed to retain the existing river depth and flow characteristics. Some local scour is expected to occur and is accounted for in modern riprap designs.

9-2: USACE's cost estimates identified a significant cost savings for delivering rip rap by barge and work from barges compared to land hauling of materials on trucks, and access for construction of the erosion protection from the top of the levee.

9-3: Impacts to fish related to the construction activities and changes to habitat conditions are addressed in Section 3.5, "Fisheries," and Mitigation Measures FISH-1, GEO-1, and SRA-1 have been identified to reduce these impacts. As the planting benches mature, they will provide food and shelter for fish, the main food source for otters and seals.

9-4: There is no anticipated effect on private boat docks resulting from the planting benches. The current planting benches are designed to be approximately 50 feet away from existing docks.

LETTER 10: INDIVIDUAL (HARTZELL)

10 -1: Unfortunately, leaving the tidal benches identified by the author undisturbed would result in continued wave wash damage to the levee. Over time, wave wash damage can increase the chance of erosion during a flood event and can over steepen the levee. The designs included in the Sacramento River Erosion Contract 2 project are similar to those constructed in 2006. Those projects have been studied and have performed well from a flood risk reduction and ecological perspective

APPENDIX D: 404(B)(1) ANALYSIS

APPENDIX D
SECTION 404(b)(1) WATER QUALITY EVALUATION
AMERICAN RIVER COMMON FEATURES
SACRAMENTO RIVER EAST LEVEE EROSION CONTRACT 2
SACRAMENTO, CALIFORNIA

This document constitutes the Statement of Findings, and review and compliance determination according to the Section 404(b)(1) Guidelines for the proposed project described in the American River Common Features Environmental Impact Statement/Environmental Impact Report (EIS/EIR) issued by the Sacramento District. This analysis has been prepared in accordance with the Section 404(b)(1) Guidelines, 40 CFR Part 230 and the U.S. Army Corps of Engineers (USACE) Planning Guidance Notebook, Engineer Regulation (ER) 1105-2-100.

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List of Acronyms

ARCF	American River Common Features
BMPs	Best Management Practices
BO	Biological Opinion
CDED	California Data Exchange Center
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CVFPB	Central Valley Flood Protection Board
CVRWQCB	Central Valley Regional Water Control Board
CWA	Clean Water Act of 1972
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FEIR	Final Environmental Impact Report
GRR	General Reevaluation Report
HTRW	Hazardous, Toxic and Radioactive Waste
IWM	Instream Woody Material
LEDPA	Least Environmentally Damaging Proposed Alternative
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric turbidity units
OHWM	Ordinary High Water Mark
pH	potential Hydrogen
SAFCA	Sacramento Area Flood Control Agency
SREC2	Sacramento River Erosion Contract 2
SREL	Sacramento River East Levee
SWPPP	Stormwater pollution Prevention Plan
USACE	US Army Corps of Engineers
WOTUS	Waters of the U.S.

I. Introduction

Background

The Sacramento Metropolitan area is one of the most at risk areas for flooding in the United States. The American River Common Features (ARCF) General Reevaluation Report (GRR) is a cooperative effort by the USACE, the Central Valley Flood Protection Board (CVFPB), the non-federal sponsor, and the Sacramento Area Flood Control Agency (SAFCA), the local sponsor. The purpose of ARCF is to improve the existing infrastructure to reduce flood risk along the American and Sacramento Rivers. The USACE completed the ARCF GRR final Environmental Impact Assessment/Environmental Impact Report (FEIS/EIR) in 2016.

The ARCF FEIS/EIR identifies a number of problems associated with the flood risk management system protecting the city of Sacramento and surrounding areas. There is a high probability that flood flows in the American River and Sacramento River will stress the network of levees protecting Sacramento to the point that levees could fail. The consequences of such a levee failure would be catastrophic, since the area inundated by flood waters is highly urbanized and the flooding could be up to 20 feet deep, in some areas.

The ARCF FEIS/EIR and its 404(b)(1) analysis previously analyzed several alternatives, including a No Action/No Project Alternative and two action alternatives. Sacramento River Erosion Contract 2 (SREC2), a component of the preferred alternative and will be discussed herein.

Consistency Determination

The basis of this consistency analysis is an evaluation of the consistency of SREC2 with the determinations of the 2015 ARCF GRR's 404(b)(1) evaluation and the applicability of the findings of the 2015 404(b)(1) evaluation to the Proposed Action. The source materials are:

- USACE (2015) *Draft Section 404(b)(1) Water Quality Evaluation American River Common Features General Reevaluation Report*. Appendix E in USACE (2016). This Clean Water Act Section 404(b)(1) evaluation first describes the alternatives considered, including the No Action and the Proposed Action. The differences between the alternatives are associated with the type of erosion protection, whether it be through construction of a launchable rock filled trench, bank protection, or a combination of the two. The alternatives description section also provides information on why certain alternatives were not selected, based on impacts to Waters of the U.S. and practicability factors. Lastly, the Proposed Action is compared to the determinations and findings of the 2015 404(b)(1) to demonstrate how the Proposed Action is consistent with those findings and is the Least Environmentally Damaging Practicable Alternative (LEDPA).

- USACE. 2016. *American River Watershed General Reevaluation Report, Final Environmental Impact Statement / Environmental Impact Report*. May. Sacramento, California. State Clearing House Number 2005072046.
- USACE 2022 Draft American River Common Features Erosion Countermeasures, Sacramento River Contracts 2 and 3 Design Documentation Report (DDR). This DDR report describes the engineering analyses supporting the proposed bank protection designs for Sacramento River Contract 2 and 3. The report includes a description of site conditions, repair measure selections, design criteria, assumptions, and methods used for the project design. After presenting the project design, the DDR follows with descriptions of construction procedures, construction materials, site access, operation manuals, and security to implement the design.

Summary

The main differences between the 2015 ARCF GRR's 404(b)(1) evaluation and the SREC2 impacts to waters of the U.S. (WOTUS) primarily consists of the location of the ordinary high water mark (OHWM) and construction methods. In 2015 a OHWM delineation had not been conducted, so its location was assumed. No elevation for the OHWM was cited in the prior documentation. As of 2022, an ordinary high water mark delineation has been completed that covers Contract 2 sites. Also, as the construction designs were conceptual in 2015 and it was assumed that launchable trenches would be the primary bank protection method. This is no longer the case, the east levee of the Sacramento River is also the riverbank in many areas, this does not allow enough room to place a launchable trench between the river and the levee without impacting the levee prism. The 95% designs are comprised of soil filled rock on the bank to protect from wind and wave erosional forces, and a launchable rock toe to protect from scour. Planting benches are placed above launchable rock toes where it will not create an additional life and safety risk. The planting benches will provide habitat for species, shade for recreators and reduce the visual impacts from the bank protection work.

Conclusion

The impacts resulting from the change in construction methods between the 2015 ARCF GRR's 404B1 and SREC2 will lead to an increase in discharge of fill material into navigable waters of the US. Therefore, SREC2 is not consistent with the 2015 ARCF GRR's 404B1 and additional evaluation is required.

II. Proposed Action and Alternatives

a. Location

The project area is in the City of Sacramento, California, along the east bank of the Sacramento River between the confluence of the American River and the City of Freeport. The project area includes 2.8 miles of the 10 miles authorized in the 2016 FESI/EIS, as follows: levee segments 4, 9-11, 18, 19, 23-27, 29 and 30. The levee segment, approximate river miles and site number are shown in Table 1. Figure 1 below show the location of each segment and Overview Maps in Appendix 1 show each segment and work area in detail.

Table 1: Summary Table of River Segments and Approximate River Mile

Sites	1	2	3	4	5	6
Segments	4	9, 10, 11	18, 19	23, 24	25, 26, 27	29, 30
River Miles	58.2-58.6	55.8-56.1	53.1-53.7	51.1-51.3	50.1-50.9	49.2-49.9

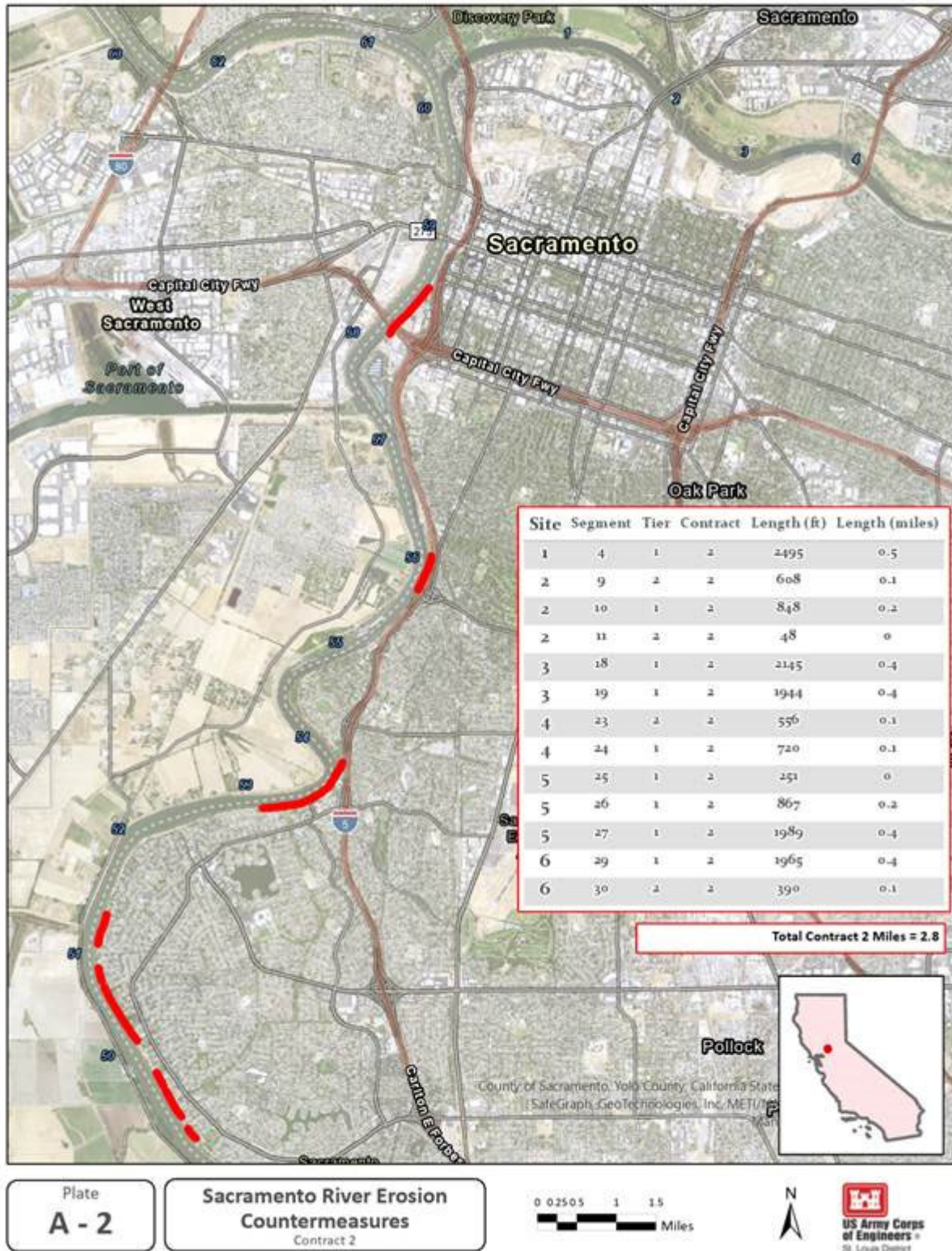


Figure 1: Location Map. Red segments show project locations.

b. Proposed Project

No Action Alternative

The No Action Alternative, under the National Environmental Policy Act (NEPA), assumes that the erosion work identified as Alternative 2 in the 2016 ARCF FEIS/EIR, along with the Proposed Actions planned for Sacramento River East Levee Seepage, Stability and Overtopping (SREL) Contracts 1-3, the Sacramento Weir Widening, and Sacramento River Erosion Contract 1 have been constructed.

The No Action Alternative, under the Clean Water Act (CWA), assumes that there is no discharge of fill material into WOTUS as a result of the project. For SREC2, the no action is the same as the no project alternative.

Alternative 1 – Proposed Action

Alternative 1 involves the construction of fix-in-place levee remediation measures to address the erosion risk on the east bank of the Sacramento River. The proposed project would be constructed entirely below the OHWM of the Sacramento River and would require discharge of fill material into WOTUS

Rock Bank Protection details - A 3.5-foot-thick lens of launchable Grade C quarry stone with a one and a half-foot tolerance will be placed below the water surface to protect the bank from scour and erosion. A 3.5-foot-thick lens of soil filled rock will be placed above the water surface to protect the bank from wave wash generated by boat wakes and wind waves. Figure 2 shows a generic bank protection design that has been used to inform the site specific designs. Transitions to existing grade will be constructed at the upstream and downstream ends of each site for both soil-filled rock and quarry stone measures. A launchable rock toe is placed at the waterside edge of a constructed planting bench, and standard bank protection to prevent future levee failures by launching in the case that additional scour was to occur. The launched material would cover the eroded area and providing additional bank slope stability.

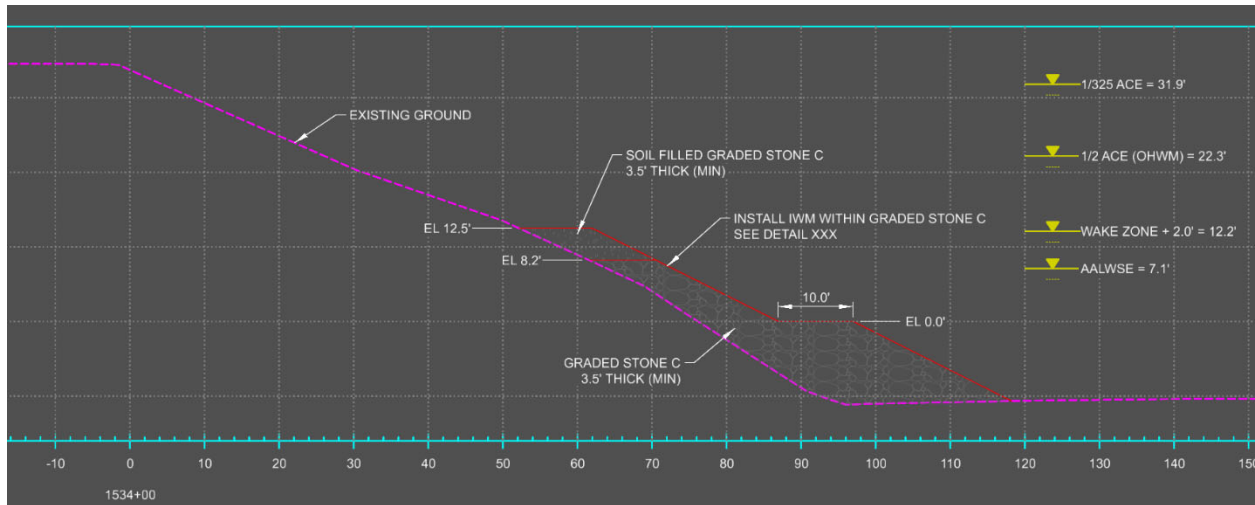


Figure 2. A Generic Bank Protection Design.

Soil filled planting benches vary in width and elevation to allow for planting of native riparian species, they are included at various locations, in every site, except Site 1 which is located under the I-80 bridge. Figure 3 shows a generic planting bench configuration that has been used to inform the site-specific designs.

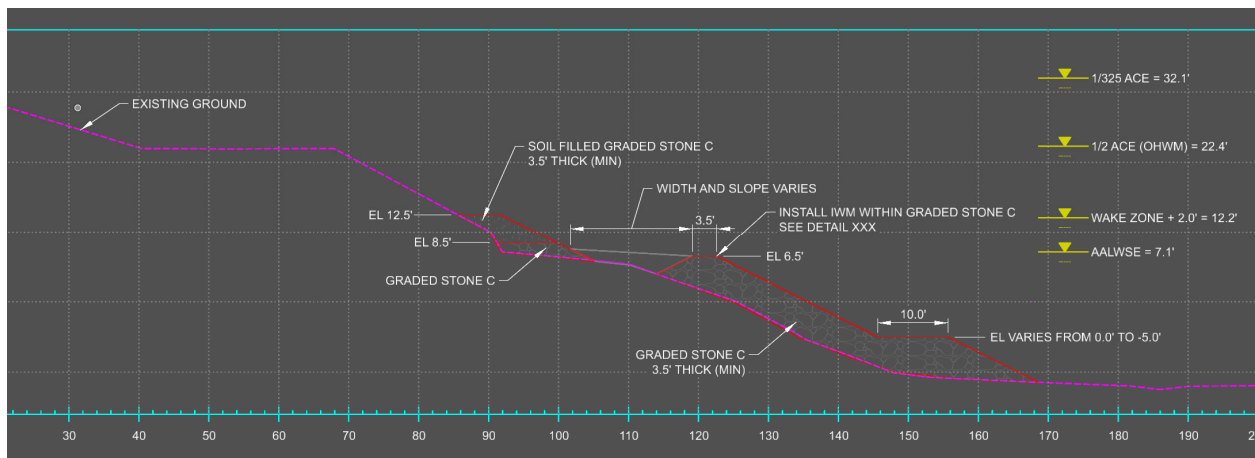


Figure 3. A Generic Planting Bench Design.

In-stream Woody Material (IWM) – In-stream Woody Material would be placed below the planting bench and along the rock revetment, where practical, to create in-stream cover for fisheries year-round. The designs include IWM at a rate between 40-80% of the impacted length in accordance with the GRR and the 2021 National Marine Fisheries Service (NMFS) Biological Opinion (BO).

Utility Replacement of Sump 63 – A City of Sacramento drainage pump station, Sump 63, is located adjacent to the levee between Stations 1360+00 and 1361+00, in Segment 19, site 3. The pump station discharges through four 24-inch diameter steel buried pipelines, which run up and over the levee and have the outlets at the riverbank at about El. 5.5' NAVD 88 datum,

(approximately 30 vertical feet below the levee crown). A 25'x25' sloping concrete slab revetment provides erosion protection for the riverbank at the pipe outlets. On the waterside edge of the levee crown there is a buried concrete vault that houses a siphon breaker valve for each of the pipelines. SREL C2 completed the degrade of the levee, the removal of the four discharge pipes from the land side to just above the waterside toe of the levee at about Elevation 22 feet, valve vault (which are located within the levee degrade prism), and subsequent reconstruction of the pipelines and vault once the cutoff wall has been installed. SREC2 would be analyzing the effects of replacing the four pipes on the water side of the levee, replacing the headwall, and utilizing a cofferdam and the need to dewater. Temporary access below the wetted channel would be required to replace the four pipes, closure devices, headwall, and revetment. Temporary access would be gained by dewatering the area with the use of a sandbag cofferdam or equivalent, approximately five feet high (1.75 feet above the typical water level) and approximately 120 feet in length. Placement of the cofferdam, pipe replacement and cofferdam removal is anticipated to take up to 15 days and would be completed between July 1 and October 31, which is outside of sensitive fish species migration windows.

c. Purpose and Need

The purpose of this project is to construct bank protection along the Sacramento River East Levee. The need of this project is to reduce the risk to life and safety cause by levee failure.

Riverbank Authority

The authority for the USACE to study water resource related issues in the American and Sacramento Rivers is Section 209 of the Flood Control Act of 1962, Pu. L. No.87-875, § 209, 76 Stat. 1180, 1196-98 (1962). The EIS/EIR for the project was prepared as part of the interim general reevaluation study of the ARCF Project, which was authorized by Section 130 Section 130 of the Energy and Water Development and Related Agencies Appropriations Act of 2008, Pub. L. No. 110-161, § 130, 121 Stat. 1844, 1947 (2007). Additional authority was provided in Section 366 of WRDA of 1999. WRDA 1999, Pub. L. No. 106-53, § 366, 113 Stat. 269, 319-320 (1999). Significant changes to the project cost were recommended in the Second Addendum to the Supplemental Information Report of March 2002. This report was submitted to the Assistant Secretary of the Army for Civil Works, but before it could be forwarded to Congress, authorized total cost of the project was increased to \$205,000,000 by Section 129 of the Energy and Water Development Appropriations Act of 2004, Pub. L. No. 108-137, § 129, 117 Stat. 269, 1839 (2003).

e. Alternatives [40 CFR 230.10]

(1) No action:

The No-Action Alternative is also the no fill alternative. The No Action Alternative assumes that SREC2 would not be completed. As a result, the identified erosion problem would not be addressed, and the study area would continue to be at a high risk of levee failure and subsequent flooding of the Sacramento Metropolitan area. Although the No Action Alternative

would have no impacts on waters of the U.S., it does not meet the project purpose since it does not address the flood risk in the study area, and is, therefore, not considered to be the least environmentally damaging practicable alternatives (LEDPA).

(2) Other project alternatives:

Alternative 1 involves the construction of fix-in-place levee remediation measures to address erosion. A complete summary of the measures proposed under Alternative 1 can be found above in section II (a.). The fix in place nature of the work makes the action alternatives site-specific. Additionally, the fixes proposed address erosion in the wake zone making the action alternatives analyzed water-dependent. The project area for Alternative 1 is shown above in Figure 1. This action is considered a practicable alternative and will be retained and evaluated in determining the LEDPA.

f. General Description of Dredged or Fill Material

(i) General Characteristics of Material

Erosion protection measures would involve the discharge of fill material into WOUS. Fill materials for erosion protection would consist of large stone riprap, ranging from 18 to 36 inches, to armor the waterside slope, or to construct a launchable rock toe and planting bench, with a soil, fine sand or silt fill over the top to allow for vegetation planting. The proposed soil, sand or silt for the erosion protection measures would come from clean, imported fill material.

(ii) (2) Quantity of Material

The 2.8 miles of bank protection will require approximately 333,500 cubic yards of material to be placed below the OHWM of the Sacramento River. The breakdown of quantities and types of fill material is included in Table 2.

Table 2: SREC2 Material Quantities

	Summary							Total
	Unit	* Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	
Grade Stone C	yd ³	36,900.0	55,300.0	127,300.0	11,100.0	41,600.0	22,500.0	294,700.0
Soil-filled Riprap	yd ³	3,600.0	2,300.0	2,500.0	2,600.0	6,400.0	3,900.0	21,300.0
Concrete Removal	yd ²		7,300.0					7,300.0
Demolition	yd ³	3,000.0	1,200.0					4,200.0
Topsoil	yd ³		6,300.0	1,000.0	1,800.0	7,900.0	500.0	17,500.0
Seeding	acre	0.7	2.8	1.1	1.1	2.9	1.1	9.7
Beaver Fencing	ft		1,300.0	500.0	700.0	2,200.0	700.0	5,400.0
Instream Woody Material	each	200.0	200.0	500.0	200.0	400.0	300.0	1,800.0

(3) Source of Material

Riprap for bank protection would be imported from a licensed, permitted facility that meets all Federal and State standards and requirements. The material would primarily be transported to the site via barge; however, two locations require land side access, Site 1, and Site 3.

g. Description of the Proposed Discharge Site

(iii) (1) Location

Erosion protection measures would be constructed along approximately 2.8 miles of along the east bank of the Sacramento River downstream from the American River confluence to Freeport, where the levee ties into Beach Lake Levee, the southern defense for Sacramento. Fill material would be placed on the levee slope / riverbank, below the OHWM.

(iv) (2) Size

Approximately 40 acres of fill would be placed into the Sacramento River.

(v) (3) Type of Site

To construct the erosion protection measures, riprap would be placed in the Sacramento River along the waterside slope of the levee, below the OHWM.

(vi) (4) Type of Habitat

The Sacramento River is a highly manipulated waterway that is constrained by maintained, man-made levees on both sides. The river provides habitat for many species; however, it is not a pristine, unaltered environment. The habitat types along the footprint of the bank protection measures include valley foothill riparian habitat and open water habitat. These habitat types are described below.

Valley Foothill Riparian Habitat. Valley foothill riparian habitat occurs along the Sacramento River levees. The overstory of the riparian habitat consists of mature, well-established trees: Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), valley oak (*Quercus lobata*), black willow (*Salix gooddingii*), and box elder (*Acer negundo* var. *californicum*). During the reconnaissance-level field visits, Oregon ash (*Fraxinus latifolia*), western sycamore (*Platanus racemosa*), and white alder (*Alnus rhombifolia*) were also observed. The shrub layer consists of smaller trees and shrubs; representative species observed were poison oak (*Toxicodendron diversilobum*), sandbar willow (*Salix exigua*), and Himalayan blackberry (*Rubus discolor*). Elderberry shrubs (*Sambucus mexicana*), the host plant of the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), which is Federally listed as threatened, were observed in the riparian habitat along the Sacramento River north and south levees. Riparian habitat is listed as a sensitive natural community by the CNDDDB (2009).

Open Water. The Sacramento River is located within the study area and would be impacted by placement of fill into waters of the U.S. the Sacramento River is a navigable waterway that are jurisdictional under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

(vii) (5) Timing and Duration of Discharge

The construction schedule for the ARCF project was estimated based on a 4 month construction window, per year, due to seasonal and environmental constraints. Construction would occur during the summer months, between July 1 and October 31 due to special status species work windows and the flood season. SREC2 work would start with Vegetation removal in 2022 and bank protection work would occur in 2023 and 2024 work windows. Revegetation would occur outside of the high flow season.

h. Description of Disposal Method

The site will be prepared by removal of some trees, small vegetation and any old bank protection materials. Rock above the wetted channel will be moved from the barge to the bank with an excavator, once on land it will be placed by a bulldozer or an excavator. Rock below the wetted channel will be placed by an excavator that is parked either on the barge or on the riverbank.

III. Factual Determinations

a. Physical Substrate Determinations (Sections 230.11 (a) and 230.20)

(viii) (1) Comparison of Existing Substrate and Fill

The project area generally consists of deep soils derived from alluvial sources, which range from low to high permeability rates and low to high shrink-swell potential. Soils immediately adjacent to the Sacramento River are dominated by deep, nearly level, well-drained loamy and sandy soils. The natural drainage is good, and the soils have slow to moderate subsoil permeability. The river terraces consist of very deep, well drained alluvial soils. The porous nature of the soils underneath the existing levee system is an important consideration for the design of levee improvements within the ARCF GRR study area. The major source of sediments deposited in the ARCF GRR study area is from the erosion of the Sierra Nevada Mountain range and foothills to the east of the Sacramento Valley. Naturally occurring asbestos (NOA) is known to occur in the foothill metamorphic belt. Therefore, NOA may be present; however, the likelihood of project area soils containing significant concentrations of NOA is low due to the long distance from the source rock.

As discussed in Section I(f)(1) above, fill material for bank protection construction would consist of large stone riprap ranging from 18 to 36 inches, to armor the waterside slope, with a fine soil, sand or silt fill over the top to allow for vegetation planting on the berms. The proposed sand or silt for the bank protection would come from clean, imported fill material.

(2) Changes to Disposal Area Elevation

Due to the placement of rock bank protection along the riverbanks, there would be an increase in elevation of approximately 3 feet in the locations where fill is placed in the WOTUS. Because some areas will need more site preparation than others, this elevation change will vary by site. However, the project is required and designed to not impact the flow, circulation and capacity of the flood system.

(ix) (3) Migration of Fill

The erosion repairs within the project area are likely to somewhat reduce the sediment supply for riverine reaches directly downstream because the riprap would hold the bank or levee in place. However, from a system sediment perspective, the bank material that would be protected in the project reaches is not a major source of sediment compared to the upstream reaches of the Sacramento, Feather, and, especially, the Yuba River systems.

A typical bank protection site has an approximate life span of 50 years. Over that time period, there would be a natural erosion and migration of fill occurring at the site; however, it would occur at a slightly slower rate than natural conditions if no bank protection were to occur. Riprap established along the waterside levee toe is designed to stay in place and prevent further erosion. However, there is a possibility that there may be slight degradation or migration of

riprap material over the years as well. The sites would be designed to avoid significant migration of newly placed fill through the use of geotextiles and the establishment of on-site vegetation.

(x) *(4) Duration and Extent of Substrate Change*

There would be a permanent change of substrate on the riverbanks from alluvial soils to stone riprap, in most locations. However, the rock berms would be covered with a silty or sandy layer of soil in order to allow for the planting of vegetation along the riverbanks and to reduce the visual impacts of having a rock slope. This silty or sandy layer of soil would be of a similar substrate type to the existing condition, in some cases this would be an improvement over the existing concrete and older hard bank protection. The launchable rock toe measure would result in a change in substrate from undrained hydric soils to buried stone riprap with a silty or sandy layer of soil on the surface to allow for revegetation of the site.

(xi) *(5) Changes to Environmental Quality and Value*

Alternative 1 would result in potential impacts to water quality, including increased turbidity during bank protection construction, runoff of exposed soils, and cement, or fuel spills during construction. Emissions from construction equipment, haul trucks, and barges also pose a potential impact to environmental quality and value during the duration of construction activities. BMPs would be implemented during construction to reduce these impacts to less than significant. There would be a permanent change in substrate in the footprint of the erosion protection areas; however, these sites would be designed to be as consistent as feasible with natural riverbanks through the placement of silt over the rock layer and the planting of on-site shrubby vegetation and native grasses. To the extent feasible, large trees on the lower waterside slope would be left in place to maintain shaded riverine aquatic habitat (SRA) for special-status fish species and new vegetation would be established to provide mitigation for vegetation that must be removed in order to construct the project.

(xii) *(6) Actions to Minimize Impacts*

The following mitigation measures would be used during construction of Alternative 1 to reduce impacts to environmental quality:

- The whole project area was originally evaluated for its erosion risk, then it was divided into areas that did not need remediation, areas that needed a minimal repairs and areas required more significant repairs. The sites that did not need work are not being impacted. The sites with minimal repairs have been designed with less impacts and smaller footprints. The sites that need more intense repairs have gone through intense design evaluations to allow for the smallest, most efficient footprint but continue to provide maxim flood risk reduction.
- Prior to construction, the USACE or its contractor would be required to acquire all applicable permits for construction.
- Prior to construction, a Stormwater Pollution Protection Plan (SWPPP), Spill Prevention Control and Countermeasures Plan, and a bentonite slurry spill contingency plan would

be prepared, and best management practices (BMPs) would be proposed to reduce potential erosion and runoff during rain events.

- Minimize ground and vegetation disturbance during project construction by establishing designated equipment staging areas, ingress and egress corridors, spoils disposal and soil stockpile areas, and equipment exclusion zones prior to the commencement of any grading operations.
- After construction of the flood risk management features is completed, the direct effects to habitat for special status species would be compensated in accordance with the Biological Opinions. Mitigation plantings would be monitored during the plant establishment period for success. Successful habitat mitigation would compensate for significant effects to vegetation, wildlife, special status species, and aesthetic resources.
- BMPs, including the Sacramento Metropolitan Air Quality Management District's Basic Construction Emission Control Practices, would be implemented to reduce emissions of criteria pollutants and greenhouse gases and to reduce potential effects to air quality and associated with climate change.
- During construction, noise-reducing measures would be employed in order to ensure that construction noise complies with local ordinances. Prior to the start of construction, a noise control plan would be prepared that would identify feasible measures to reduce construction noise, when necessary.
- Coordination with recreation user groups would occur prior to and during construction for input into mitigation measures that would reduce affects to the maximum extent practicable. Advance notice would be given to recreation users informing them of anticipated activities and detours to reduce the affects. To ensure public safety, flaggers, warning signs, and signs restricting access would be posted before and during construction, as necessary. In the event that bike trails would be disrupted; detours would be provided. Detour routes would be clearly marked, and fences would be erected in order to prevent access to the project area. In areas where recreational traffic intersects with construction vehicles, traffic control will be utilized in order to maintain public safety.

b. Water Circulation, Fluctuation, and Salinity Determinations

(xiii) (1) Alternation of Current Patterns and Water Circulation

Since Alternative 1 consists of fix-in-place levee improvements, implementation of these measures would have no effect on current patterns and water circulation.

(xiv) (2) Interference with Water Level Fluctuation

Because the Sacramento River system is regulated by upstream dams which allow a specific amount of water to be released into systems, the Alternative 1 and the no action/no project alternative would not change water level fluctuation patterns.

(xv) (3) *Salinity Gradients Alteration*

Salinity gradients would not be affected, as salinity normally only increases in the river system during low flow events when there is a higher than average tidal influx from the Delta. With-project conditions in the system would remain consistent with existing conditions during normal and low flow periods. Flows would be increased during high water events, however the flood flows during these events would be pushing any salinity intrusion back down into the Bay-Delta system and would not result in any salinity increases in the riverine system.

(xvi) (4) *Effects on Water Quality*

The Basin Plan states that where ambient turbidity is between 5 and 50 nephelometric turbidity units (NTUs), projects would not increase turbidity on the Sacramento River by more than 20 percent above the ambient conditions. Furthermore, if the ambient diurnal variation in turbidity fluctuates in and out of the 5 and 50 NTUs threshold, the Basin Plan states that averaging periods can be applied to data to determine compliance. For example, during the summer months, the Sacramento River turbidity could be less than 50 NTUs, and during the winter months, the turbidity could be more than 50 NTUs because of the higher flow rate causing more river scouring. Thus, the monthly average was calculated using hourly California Data Exchange Center (CDED) data and is presented in Table 3 below. Specific construction activities that are part of the potential alternatives would need to comply with the above-stated thresholds for turbidity.

Water quality impacts that could result from project construction activities and project operations were evaluated based on the construction practices and materials that would be used, the location and duration of the activities, and the potential for degradation of water quality or beneficial uses of project area waterways.

Table 3. Monthly Average Total Suspended Sediment and Turbidity for the Sacramento River at Freeport from 1997 to 2007.

Month	Discharge (cfs)	TSS (mg/L)	TSS Load (tons)	Turbidity (NTU)
January	41,414	104	11,670	64
February	44,084	83	9,839	68
March	39,586	70	7,476	15
April	28,552	51	3,946	11
May	25,152	48	3,279	12
June	21,461	30	1,741	17
July	20,432	37	2,019	21
August	18,235	27	1,332	9
September	16,121	29	1,266	10
October	11,950	29	940	6
November	13,612	24	868	8
December	25,105	81	5,463	12

Note: Flow and TSS data are from the USGS and are presented as monthly average from 1997 to 2007. Turbidity data are from CDEC from March 2007 to January 2009 and also are presented as a monthly average. Turbidity data are from the Sacramento River at Hood, a few river miles downstream from the USGS station.
 Source: USGS 2013; DWR 2012b.

The placement of riprap along the riverbanks would temporarily generate increased turbidity in the immediate vicinity of the construction area. Additionally, placement of riprap in the water could result in a sediment plume, generated from the channel bottom and levee side, becoming suspended in the water and could generate turbidity levels above those identified as acceptable by the Basin Plan. Turbidity effects from landside construction (e.g., vehicle, staging, placement of construction equipment) would be limited to stormwater runoff carrying loose soil from staging areas and construction vehicle access areas. Best management practices would be implemented to reduce the effect of runoff into the stormwater system to less than significant. BMPs include such things as coir mats or hay bales to prevent runoff, rock groins to retain sediment, sandbags to prevent erosion, and drain screens to prevent sediment from traveling outside the construction area footprint and into the storm drains system.

As rock riprap is placed in the open water, significant indirect effects would result as the sediment and turbidity plume would drift further downstream and later affect the water quality in those areas further downstream of the project area. By implementing the BMPs contained within the SWPPP, impacts would be reduced to less than significant.

(xvii) (a) Water Chemistry

The potential of hydrogen (pH) is a unit for measuring the concentration of hydrogen ion activity in water and is reported on a scale from 0 to 14. If a solution measures less than 7, it is considered acidic. If a solution measures more than 7, it is considered basic, or alkaline. If a solution measures 7, it is considered neutral. Many biological functions occur only within a narrow range of pH values. The Basin Plan objective for pH is between 6.5 and 8.5.

Furthermore, discharges cannot result in changes of pH that exceed 0.5. The monthly average pH of the Sacramento River from 2003 to 2009 remained stable throughout the year (Table 3-4). Construction materials such as concrete or other chemicals could affect the pH of the Sacramento River if a discharge were to occur. The proposed materials and construction activities have the potential to affect water chemistry during the duration of construction. Construction contractors would be required to prepare and implement a SWPPP and comply with the conditions of the NPDES general stormwater permit for construction activity. The contractor would be required to obtain a permit from the Central Valley Regional Water Control Board (CVRWQCB) detailing a plan to control any spills that could occur during construction. The plan would describe the construction activities to be conducted, BMPs that would be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that would be conducted.

(xviii) (b) Salinity

The proposed materials and construction activities are not expected to affect salinity.

(xix) (c) Clarity

Placement of fill materials would temporarily reduce clarity due to an increase in total suspended solids within the project area. Clarity is not expected to be substantially affected outside the immediate project area. However, the reduction of clarity caused by construction activities would be short in duration and would return to pre-construction levels upon project completion.

(xx) (d) Color

The proposed project is expected to affect color only during fill activities. Placement of fill materials would temporarily induce a color change due to an increase in turbidity. These effects would be consistent with those discussed above for clarity. The change in color caused by construction activities would be short in duration and would return to pre-construction levels upon project completion.

(xxi) (e) Odor

The proposed project would not result in any major sources of odor, and the project would not involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, wastewater treatment facility). Odors associated with diesel exhaust emissions from the use of onsite construction equipment may be noticeable from time to time by adjacent receptors. However, the odors would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Furthermore, as required by CARB regulation 13 CCR 2449(d)(3), no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes. Therefore, this direct effect would be less than significant. In addition, implementation of mitigation measures, which are required under other air quality effects, would further reduce exhaust emissions, and provide advanced notification of construction activity.

(xxii) (f) Taste

The proposed materials and construction activities are not expected to affect taste.

(xxiii) (g) Dissolved Gas Levels

The proposed materials and construction activities are not expected to affect dissolved gases.

(xxiv) (h) Temperature

Construction activities have the potential to create substantial turbidity affecting water temperature. Implementing the BMPs established in the SWPPP, conducting work during low flow periods, and installing sediment barriers to reduce sediment from entering waterways would be required to control turbidity and the mobilization of pollutants that may be present in sediments. There is the potential for some increases in water temperature, due to the removal of waterside vegetation during construction. However, the vegetation that would be removed would primarily consist of shrubby vegetation and grasses, which do not significantly contribute to shade. The larger trees in the bank protection footprint, which are the primary contributors to shade, would be protected in place, which would help to maintain consistent long-term water temperatures after construction. Additionally, shrubs would be planted on the bank protection planting berms during construction to allow the vegetative cover near the banks to redevelop long-term.

(xxv) Nutrients

The proposed materials and construction activities have the potential to affect nutrient levels in the water. Release of suspended sediments during construction could potentially cause turbidity thresholds for metals and nutrients to be exceeded. Turbidity would be controlled outside the working area using a combination of BMPs as appropriate. Development and implementation of an approved SWPPP would also prevent release of excess nutrients. Long-term nutrient levels would not be significantly altered by project construction because existing vegetation on the waterside slopes of the levee would be protected in place, and the SRA corridor would still remain a source of nutrients for the rivers. In addition, nutrients from the upstream watershed would remain in the system.

(xxvi) (j) Eutrophication

The project is not expected to contribute excess nutrients into the stream or promote excessive plant growth due to BMPs and the high content of rock in disposal material.

c. Suspended Particulate/Turbidity Determinations

(xxvii) (1) Alteration of Suspended Particulate Type and Concentration

Where bank protection construction is proposed, riprap would be placed along the riverbank to prevent erosion. The placement of riprap along the riverbank would temporarily generate increased turbidity in the immediate vicinity of the construction area. Additionally, placement of riprap in the water could result in a sediment plume, generated from the channel bottom and levee side, becoming suspended in the water and could generate turbidity levels above those

identified as acceptable by the Basin Plan. Turbidity effects from construction (e.g., vehicle, staging, placement of construction equipment) would be limited to stormwater runoff carrying loose soil from staging areas and construction vehicle access areas. BMPs would be implemented to reduce the effect of runoff into the stormwater system to less than significant. BMPs include such things as coir mats or hay bales to prevent runoff, rock groins to retain sediment, sandbags to prevent erosion, and drain screens to prevent sediment from traveling outside the construction area footprint and into the storm drains system.

As rock riprap is placed in the open water, significant indirect effects would result as the sediment and turbidity plume would drift further downstream and later affect the water quality in those areas found further downstream of the project area. By implementing avoidance and minimization measures, discussed in Section 3.5.6 of the ARCF GRR EIS/EIR, impacts could be reduced to less than significant.

(xxviii) (2) Particulate Plumes Associated with Discharge

Placement of riprap in the water could result in a sediment plume, generated from the channel bottom and levee side, becoming suspended in the water and could generate turbidity levels above those identified as acceptable by the Basin Plan. As rock riprap is placed in the open water, significant indirect effects would result as the sediment and turbidity plume would drift further downstream and later affect the water quality in those areas found further downstream of the project area. By implementing avoidance and minimization measures, discussed in Section 3.5.6 of the ARCF GRR EIS/EIR, impacts could be reduced to less than significant.

(xxix) (3) Changes to Environmental Quality and Value

There could be significant affects to water quality due to increased turbidity during construction, as discussed above. On the Sacramento River, the use of barges to install the riprap could cause additional turbidity as the barge moves into the site and anchors. With the implementation of the BMPs that will be established in the SWPPP, these effects would be temporary and reduced to less than significant during construction. Once construction is complete there could be reduced turbidity in the direct vicinity of the site because there would be no exposed soil to erode and deposit into the river. Further, the bank protection sites would include the installation of riparian vegetation which could slow the flows down and reduce turbidity during high flows.

Construction contractors would be required to prepare and implement a SWPPP and comply with the conditions of the National Pollution Discharge Elimination System (NPDES) general stormwater permit for construction activity. The contractor would be required to obtain a permit from the CVRWQCB detailing a plan to control any spills that could occur during construction. The plan would describe the construction activities to be conducted, BMPs that would be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that would be conducted.

(xxx) (4) *Actions to Minimize Impacts*

Since 2015 the project team has further evaluated the construction sites to reduce the project footprints where possible. Vegetation is being replanted where possible to provide natural bank protection. Trees will be hand selected for removal, rather than clear cutting the levee. Construction contractors would be required to prepare and implement a SWPPP and comply with the conditions of the NPDES general stormwater permit for construction activity. The contractor would be required to obtain a permit from the CVRWQCB detailing a plan to control any spills that would occur during construction. The plan would describe the construction activities to be conducted, BMPs that would be implemented to prevent discharges of contaminated stormwater into waterways, and inspection and monitoring activities that would be conducted. Work below the OHWM would only be permitted during low periods, July 1 to November 30th.

d. Contaminant Determinations

Construction activities would involve the use of potentially hazardous material, such as fuels, oils and lubricants, and cleaners, which are commonly used in construction projects. Construction contractors would be required to use, store, and transport hazardous materials in compliance with Federal, State, and local regulations during project construction and operation. Testing of borrow sites would occur prior to the use of material and sites which have contaminated soils would not be used for this project. Any hazardous substance encountered during construction would be removed and properly disposed of by a licensed contractor in accordance with Federal, State, and local regulations. Compliance with applicable regulations would reduce the potential for accidental release of hazardous materials during transport and construction activities. The risk of significant hazards associated with the transport, use, and disposal of these materials is low.

Project areas would be tested for Hazardous, Toxic and Radioactive Waste (HTRW) contaminants prior to construction, and any materials found would be disposed of by the non-federal sponsor in accordance with all Federal, State, and local laws and regulations at an approved disposal site. Implementation of these mitigation measures would reduce the impacts from hazardous materials at project sites to less than significant. If significant time has elapsed between approval of this document and construction, additional investigations should be done to reduce the risk of encountering a site during construction. If construction activities would occur in close proximity to sites listed in the existing conditions section, a Phase II environmental site assessment should also be conducted. This would further reduce the risk of exposure to workers and the public during construction and assist in the remediation planning.

e. Aquatic Ecosystem and Organism Determinations

(xxxi) (1) *Effects on Plankton*

Plankton are drifting organisms that inhabit the pelagic zone of oceans, seas, or bodies of fresh water. Project construction activities would be temporary and short-term. The only short-term effect would be a less abundant supply of plankton for the Delta smelt, and other fish and aquatic organisms. With implementation of mitigation measures and BMPs, this project would

not introduce materials that would disrupt the nutrient supply for plankton, and as a result effects to plankton would be temporary and not significant.

(xxxii) (2) Effects on Benthos

Benthic organisms would be permanently disturbed as a result of constructing bank protection. However, the rock placed below the water surface will naturally accumulate soil material and plant species. The bank above the low water elevation will be covered in soil to start the redistribution process. The vegetation planted above will provide organic material and food sources for fisheries. The native benthic organisms are expected to recolonize the area in time.

(xxxiii) (3) Effects on Nekton

Nektons are actively swimming aquatic organisms that range in size and complexity from plankton to marine mammals. Native fish present in the project area can be separated into anadromous species and resident species. Native anadromous species include four runs of Chinook salmon, steelhead trout, delta smelt, and green sturgeon. All of these anadromous species are expected to use habitat in parts of the study area.

Within the Sacramento River is designated critical habitat for winter-run Chinook salmon. Critical habitat for spring-run Chinook salmon includes all river channels and sloughs within the ARCF study area on the Sacramento River and on the American River from the confluence to the Watt Avenue bridge (NMFS 2006b). Critical habitat for Central Valley steelhead includes the stream channels and the lateral extent as defined by the ordinary high-waterline or bank-full elevation in the designated stream reaches of the Sacramento and American River, NEMDC and Dry/Robla Creek portions of the ARCF project area. Critical habitat for delta smelt consists of all water and all submerged lands below ordinary high water and the entire water column bounded by and contained in Suisun Bay (including the contiguous Grizzly and Honker bays); the length of Goodyear, Suisun, Cutoff, First Mallard (Spring Branch), and Montezuma sloughs; and the contiguous waters in the Delta (USFWS 1994). Critical habitat for delta smelt is designated in the following California counties: Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo (USFWS 2003). Designated critical habitat for the southern DPS of green sturgeon includes the Sacramento River downstream of Keswick Dam, the Feather River downstream of Oroville Dam, and the Yuba River downstream of Daguerre Dam; portions of Sutter and Yolo Bypasses; the legal Delta, excluding Five Mile Slough, Seven Mile Slough, Snodgrass Slough, Tom Paine Slough, and Trapper Slough; and San Francisco, San Pablo, and Suisun bays.

Rock placement on the Sacramento River would most likely disturb the native resident fish by increasing vibration, water turbulence, and turbidity, causing them to move away from the area of placement. In some pelagic native juvenile species utilizing the near shore habitat for cover, moving away from that cover could put them at a slight risk of predation. Direct effects to resident native fish species are less than significant, with the implementation of mitigation. Proposed mitigation for salmonid species includes the creation of planting berms to provide shade and instream woody material elements of SRA habitat. The natural bank element of SRA would be lost with the placement of rock along the levee slope. Over time sediment would settle

into the rock voids and provide similar substrate characteristics as a natural bank. The direct effects would also not result in a substantial reduction in population abundance, movement, and distribution for salmonid species.

SREC2 would result in permanent impacts to 13.5 acres of Delta smelt shallow water habitat, and spawning habitat. Construction-related effects include disruption of spawning activities, disturbance or mortality of eggs and newly hatched larvae, and alteration of spawning and incubation habitat. With the implementation of compensation for the impacts to Delta smelt shallow water habitat and spawning habitat, these effects would be reduced to less than significant.

SREC2 would result in permanent impacts to 38 acres of salmonid habitat through the loss of existing shallow water vegetation along the riverbanks. These areas provide food and shelter for both adults and juvenile salmon as they migrate seasonally up and down the river. Salmon and green sturgeon use the same habitat in the project area. Construction would result in direct effects to green sturgeon through the loss of benthic feeding habitat due to the change in substrate at the bank protection sites. If larvae or juveniles are present during construction, in-water activities could result in localized displacement and possible injury or mortality to individuals that do not readily move away from the channel or nearshore areas. Project actions associated with bank protection measures may increase sediment, silt, and pollutants, which could adversely affect rearing habitat or reduce food production, such as aquatic invertebrates, for larval and juvenile green sturgeon. Compensation would be implemented in the form of on and off site mitigation, as well as the purchase of mitigation bank credits.

(xxxiv) (4) Effects on Aquatic Food Web

Effects on the aquatic food web, or the plankton, benthic, and nekton communities, would be temporary and less than significant. Indirect effects were not considered significant to resident native fish species because it was determined that existing conditions would not be worsened by project construction and would not result in a substantial reduction in population abundance, movement, and distribution.

(xxxv) (5) Effects on Special Aquatic Sites

(a) Sanctuaries and Refuges

No sanctuaries and refuges are within the project area.

(xxxvi) (b) Wetlands

No wetlands are within the project area.

(xxxvii) (c) Mud Flats

No mud flats are within the project area.

(xxxviii) (d) Vegetated Shallows

No vegetated shallows are within the project area.

(xxxix) (e) Coral Reefs

No coral reefs are within the project area.

(xl) (f) Riffle and Pool Complexes

No riffle pool and complexes are within the project area.

(xli) (6) Threatened and Endangered Species

Implementation of Alternative 1 would result in direct effects to salmonids, green sturgeon, Delta smelt, and Western yellow-billed cuckoo. Impacts to special status fish species were addressed above in Section e (3), nekton.

Adverse effects could occur to Western yellow-billed cuckoo and Swainson's hawk due to the removal of riparian vegetation during construction of Alternative 1 on the Sacramento River. Swainson's hawk is known to nest within the study area. Prior to construction, the Project Partners would survey the construction area per the California Department Fish and Wildlife (CDFW) survey protocols and determine if nesting hawks are present. If they are present, buffers would be set up and the nests would be monitored. Additional avoidance and minimization measures would be coordinated with CDFW, as needed. Western yellow-billed cuckoo is not currently known to nest in the project area, but it is within the cuckoo's migratory corridor, and they are likely to be present during their migration period. Approximately 1.83 acres of riparian canopy will be removed. As a result, the USACE proposes to compensate for the removal of riparian vegetation onsite to the maximum extent possible. If onsite mitigation is not possible, offsite mitigation would occur along the main stem of the Sacramento River, or credits would be purchased at a mitigation bank.

Because avoidance, minimization, and compensation measures would be implemented in accordance with the requirements of the Endangered Species Act (ESA), California Endangered Species Act (CESA) and other relevant regulatory requirements, and the project would protect habitat in place and create habitat, potential adverse effects on special-status species and on sensitive habitats would be reduced to a less than significant level.

(7) Other Wildlife

Wildlife effects associated with the construction are expected to be temporary and no additional measures to minimize effects are needed for fill occurring in the area. Under Alternative 1, construction of levee improvements and vegetation removal would result in significant loss of vegetation and wildlife habitat on the landside of the Sacramento River

Even though this area is very urbanized effects would still occur to wildlife such as avian species, fox, otter, and other terrestrial and aquatic species. The construction disturbance will be temporary, and the species are expected to return to the area. Surveys would be conducted

to determine if any nesting birds are present prior to construction. If nesting birds are located adjacent to the project area, coordination with the resource agencies would occur. Trees where nesting birds are located would not be removed while they are actively nesting. However, once the young have fledged the trees may be removed to construct the project. Once construction is complete the wildlife is expected to return to the area. Both native and non-native fish species, along with some endangered species, use this area of the river and are discussed in Fisheries (Section 3.7) and Special Status Species (Section 3.8).

(xlii) (8) Actions to Minimize Impacts

The proposed project is not likely to result in take to these species for either Alternative as long as the applicable conservation and mitigation measures, as detailed in Section 3.8.6 of the 2016 ARCF GRR FEIS/EIR are adhered to. Among other measures listed in the EIS/EIR, the conclusion of non-jeopardy is based on the USACE' commitments to: (1) avoid direct impacts by maintaining buffers around sensitive habitat and/or conducting construction activities outside of sensitive timeframes (e.g. during the salmonid work window or outside of the fledging period of special-status birds); (2) implement a SWPPP and associated BMPs; including the designation of staging areas for stockpiling of construction materials, portable equipment, vehicles, and supplies and (3) appoint onsite biologists to provide worker environmental awareness training to contractors and to monitor, report, and remove and transport special-status species if necessary or suspend construction activities until special-status species leave the project on their own. Concurrent implementation of these conservation measures would adequately avoid, minimize, and mitigate adverse effects on the special-status fish, wildlife and plant species discussed in this document.

f. Proposed Disposal Site Determinations

(xliii) (1) Mixing Zone Size Determination

Not applicable.

(xliv) (2) Determination of Compliance with Applicable Water Quality Standards

Water quality could be affected within the actual construction area and upstream and downstream of the work area. Construction activities such as rock placement, clearing and grubbing, and slope flattening, have the potential to temporarily degrade water quality through the direct release of soil and construction materials into water bodies or the indirect release of contaminants into water bodies through runoff.

The ARCF study is located within the jurisdiction of the CVRWQCB, within the greater Sacramento Valley watershed. The preparation and adoption of water quality control plans, or Basin Plans, and statewide plans, is the responsibility of the SWRCB. State law requires that Basin Plans conform to the policies set forth in the California Water Code beginning with Section 13000 and any State policy for water quality control. These plans are required by the California Water Code (Section 13240) and supported by the Federal CWA. Section 303 of the CWA requires states to adopt water quality standards which "consist of the designated uses of

the navigable waters involved and the water quality criteria for such waters based upon such uses." According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment for the waters within a specified area of beneficial uses to be protected and water quality objectives to protect those uses. Adherence to Basin Plan water quality objectives protects continued beneficial uses of water bodies. Because beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the Basin Plans are regulatory references for meeting the State and Federal requirements for water quality control (40 CFR 131.20). The potential effects of the proposed project on water quality have been evaluated and are discussed in Section 3.5 of the Contract 2 Supplemental Environmental Assessment. Compliance with the California Water Code will be accomplished by obtaining certifications from the Central Valley RWQCB prior to construction.

(xiv) (3) Potential Effects on Human Use Characteristics

(xvi) a) Municipal and Private Water Supplies

The Sacramento River waterways historically were used as places to dispose of contaminants. In recent decades, treatment for municipal wastewater, industrial wastewater, and management of urban stormwater runoff have increased and improved greatly. Industries and municipalities now provide at least secondary treatment of wastewater. The American River originates in the high Sierra Nevada just west of Lake Tahoe, in the Tahoe and El Dorado National Forests. Its three main forks – the South, Middle, and North – flow through the Sierra foothills and converge east of Sacramento. The waters of the American River provide recreation, municipal power, and irrigation for the northern California area. The fill material would not violate Environmental Protection Agency or State water quality standards or violate the primary drinking water standards of the Safe Drinking Water Act (42 USC 300f-300j). Project design, compliance with State water quality thresholds and standard construction and erosion practices would preclude the introduction of substances into surrounding waters. The groundwater table is separated from the slurry wall by a non-permeable layer of soil, therefore there would be minimal risk to groundwater supply. Materials removed for disposal off-site would be disposed of in an appropriate landfill or other upland area.

(xlvii) b) Recreation and Commercial Fisheries

Under Alternative 1, there would not be long term/long distance closure of recreation facilities including the bike trails, walking trails, parks, and boat launches. Notification and coordination with recreation users and bike groups would be arranged. Flaggers, signage, detours, and fencing would be present to notify and control recreation access and traffic around construction sites.

Alternative 1 would cause direct effects to fish habitat from the removal of vegetation from the levee slopes. Direct effects from the placement of rock at a bank protection site would cause an increase in turbidity. A vegetation variance would allow waterside vegetation, which would include native grasses, shrubs, and trees, to remain on the lower one-third of the waterside slope along the Sacramento River. Bank protection sites and launchable rock toes would be

revegetated with native grasses, shrubs and trees following construction. BMPs would be implemented to address turbidity.

(xlviii) c) Water-related recreation

Recreational boating is one of the primary uses of the Sacramento River. Boat access is located at Discovery Park, Miller Park, and Garcia Bend Park on the Sacramento River.

Construction will occur during the summer months when the river recreation activities are at the peak. There would be short-term term significant effects along the Sacramento River reach of the project, however, there would be no long-term effects because the area would be returned to the pre-construction conditions once completed. The timing of construction cannot be mitigated as it is unsafe to perform construction activities in the floodway during the flood season.

(xlix) d) Aesthetics

Alternatives 1 would result in vegetation loss and construction activities would disrupt the existing visual conditions along the Sacramento River. Native trees would be planted after construction is completed on planting berms and on the riverbank where feasible; however, there would still be a temporal loss of vegetation. Disturbed areas would be reseeded with native grasses.

(l) e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves

Many parks are located along the Sacramento River. Following is a description of the parks and their activities:

Miller Park. Adjacent to the Sacramento Marina, off Harborview Drive from Front Street, this 57 acre city park is right on the Sacramento River. The park includes picnic areas, boat trailer parking, and a boat ramp and dock. There is also a store called Rat's Snack Shop.

Garcia Bend Park. Located between Pocket Road and the Sacramento River, this 19-acre community park is a popular place for recreation providing soccer fields, lighted tennis courts, play areas, picnic areas, restrooms, and a public boat ramp providing access to the Sacramento River.

Zacharias Park. Located in the Pocket neighborhood, off Clipper Way. This 6-acre park is right on the Sacramento River. The park amenities include river access, soccer fields and a picnic area.

The Riverfront Promenade. A new addition to Sacramento's riverfront, a couple blocks were opened in 2001. It is located just downstream of Old Sacramento and is still in the early stages of development. When complete, the promenade will be a mile long walking and cycling path that connects Old Sacramento to Miller Park.

To ensure public safety, flaggers, warning signs, and signs restricting access would be posted before and during construction, as necessary. In the event that bike trails would be disrupted; detours would be provided. Detour routes would be clearly marked, and fences would be erected in order to prevent access to the project area. In areas where recreational traffic intersects with construction vehicles, traffic control will be utilized in order to maintain public safety. Detours would be short duration, only while work is being completed in the immediate vicinity. No access points will be closed during construction of SREC2.

g. Determination of Cumulative Effects on the Aquatic Ecosystem

Effects of the proposed action include reductions in nearshore aquatic and riparian habitats that are used by aquatic and terrestrial species. USACE actions which could create a cumulative effect on waters of the U.S. in the Sacramento area include the other features of ARCF such as Seepage, Stability and Overtopping work and construction of the new Sacramento Weir and Bypass. Other projects occurring in the same area are: Dredging at Miller Park, Sacramento Riverbank Protection Project (SRBP), West Sacramento Project, and the Sacramento River Parkway. Immediately upstream of the project area the I Street Bridge replacement is anticipated to begin construction in the next 5 years and the Broadway Bridge is expected to begin construction in the next 15 years.

Water quality could be affected at the project footprint as well as upstream and downstream of the work area. Construction activities associated with the Proposed Action, West Sacramento Projects and Dredging have the potential to temporarily degrade water quality. All projects occurring simultaneously would be required to coordinate with the Regional Water Quality Control Board and comply with their 401 permits. Although dredging at Miller Boat Launch could occur at the same time as work in Segment 4, there are no anticipated long-term waterway effects and no significant cumulative, water quality effects.

h. Determination of Secondary Effects on the Aquatic Ecosystem

The placement of rock would not only reduce the risk of erosion but would also anchor remaining trees in place and reduce the potential for trees falling over during a high flow event. The understory, which provides habitat for small rodents, ground nesting birds and waterfowl, and various reptiles, would be removed in order to provide a clean surface to place the rock. Because the riprap is a hard surface it would not support the growth of large amounts of vegetation. In areas with a planting bench or soil placed over rock on the lower portion of the slope vegetation would be planted or allowed to establish naturally. The riprap would also provide basking areas for some small reptiles such as snakes and lizards. Because the riparian corridor and shaded river aquatic habitat left in place would still provide value to fish and wildlife species, and compensatory mitigation would be implemented for trees that were removed, impacts are considered less than significant.

Risk exists for the unintentional placement of dredge and/or fill material to be placed outside of the proposed project area. Unintentional placement could result in additional adverse impacts to

water quality, erosion and accretion patterns, aquatic and other wildlife habitat, recreation, aesthetics, and air quality. In order to reduce the risk of such impacts, contract specifications would require the contractor to mark the project boundaries, and that the contractor install erosion control (i.e., silt fencing, silt curtains) where possible within any standing waters.

IV. Findings of Compliance or Non-Compliance with the Restrictions on Discharge

a. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation

No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site

There is no other location that this work can be done to provide the same level of protection. The adjacent community backs up to the levee, therefore no space is available to construct a setback levee in Sacramento metropolitan area. Onsite alternative method such as rock trenches are not feasible because there is not space (remaining floodplain) between the riverbank and the levee itself. They would also result in the removal of additional vegetation. There are no other practicable alternatives that provide the same level of life and safety protection and sufficiently reduce the risk of levee failure.

c. Compliance with Applicable State Water Quality Standards

The proposed project would implement BMPs to ensure that it does not violate State water quality standards identified in the Central Valley Basin Plan (CVRWQCB 1998). The USACE received a 401 Programmatic Order in 2020 for ARCF. Each individual contract is submitting a Notice of Intent under the programmatic and is obligated to follow all BMP's, avoidance, and minimization measures within the order.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act

The discharges of fill materials will not cause or contribute to, after consideration of disposal site dilution and dispersion, violation of any applicable State water quality standards for waters. The discharge operations will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

e. Compliance with Endangered Species Act of 1973

The placement of fill materials in the project area(s) will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973. Formal consultation was completed with the regulatory agencies:

- U.S. Fish & Wildlife Service (USFWS; 08ESMF00-2014-F-0518-R003) Dated March 2021
- National Marine Fisheries Service (NMFS; WCRO-2020-03082) Dated May 2021

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972

Not applicable.

g. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

Appropriate and practicable steps to minimize potential adverse effects of discharge and fill on the aquatic ecosystem include placing fill material only where it is needed for the proposed project and confining it to the smallest practicable area. Conducting work in the dry to the maximum extent possible, during the low flow season. Complying with in water work best management practices. Requiring the project to have no hydraulic impact to eliminate impacts to flow and circulation. The areas disturbed by construction would be returned as close as possible to pre-project conditions when practicable

On the basis of the guidelines, the proposed project is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effect on the aquatic ecosystem.

V. Summary and Conclusion

A. The discharge represents the least environmentally damaging, practicable alternative.

B. The discharge does not cause or contribute to violation of any applicable state water quality standard, does not violate any applicable toxic effluent standard.

C. The discharge does not cause or contribute to significant degradation of the waters of the US.

D. All appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem.